



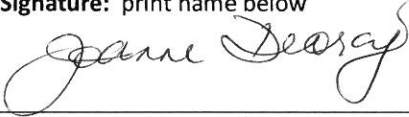
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United Nations Development Programme
Annotated Project Document template for nationally implemented projects
Financed by the GEF/LDCF/SCCF Trust Funds

Project title: Energy Efficiency through the Development of Low-carbon RAC Technologies in Trinidad and Tobago	
Country: Trinidad and Tobago	Implementing Partner: Ministry of Planning and Development (MPD)
Management Arrangements: National Implementation Modality (NIM)	
<p>National priority or goal: (a) Promote a resilient whole-of-government approach to disaster risk management and strengthen capacities to reduce risk and build community resilience to disasters especially within vulnerable groups; (b) Promote energy efficiency and the efficient use of resources for increasing energy security through alternative energy technologies, renewable energy and encouraging private sector investment in areas such as low carbon technologies; and (c) Develop climate change adaptation and mitigation strategies to safeguard those most affected. (Election programme, 2015)</p> <p>UNDAF/MSDF outcome involving UNDP: Policies and programmes for climate change resilience, disaster risk reduction and universal access to clean and sustainable energy</p> <p>Sustainable development goals: 7, 11 and 13</p>	
<p>UNDP Strategic Plan Output:</p> <p>1.5.1 – Solutions adopted to achieve universal access to clean, affordable and sustainable energy,</p> <p>2.5.1 - Solutions developed, financed and applied at scale for energy efficiency and transformation to clean energy and zero-carbon development, for poverty eradication and structural transformation</p>	
UNDP Social and Environmental Screening Category: Moderate	UNDP Gender Marker: 2
Atlas Project ID (formerly Award ID): 00117647	Atlas Output ID (formerly Project ID): 00114399
UNDP-GEF PIMS ID number: 5957	GEF ID number: 9789

Planned start date: <i>September 2019</i>	Planned end date: <i>August 2023</i>
PAC meeting date: <i>July 2019</i>	
<p>Brief project description: 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 components and four substantive outcomes:</p> <ol style="list-style-type: none"> 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. <p>The project will implement a framework to overcome a series of institutional, capacity and financial barriers, engaging a diverse group of stakeholders, including <u>national authorities</u> (the NOU of MPD, MEEI, MTI, MOF, and TTBS), primarily interested in providing an integrated policy guidance for the development of an appropriate administrative and regulatory framework under the country's commitments with the Montreal Protocol and UNFCCC; <u>public agencies</u> acting as a corporate beneficiaries (EMA, UTT and T&T Airports Authority), interested in triggering an alternative cooling path based on the innovative District Cooling technology, <u>technological CSOs</u> (ARIA and RRRR) 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/HFCs alternatives; <u>private sector stakeholders and financiers</u>, fully engaged already in the RAC project investment continuum to cope with the demand of the <u>citizens</u>, as the main beneficiaries, as well as <u>UNDP</u> that will be a fundamental partner for the overall implementation.</p> <p>It is expected that the project will provide global environmental benefits in terms of <u>direct</u> emission savings of at least 450,289 tCO_{2e} in 4 years as well as <u>direct post-project</u> savings of at least 765,351 tCO_{2e} and <u>indirect</u> savings in the 20 years of at least 284,693 tCO_{2e}, after the project completion. Total lifetime direct and indirect GHG emissions avoided: 1,500,333 tCO_{2e}.</p>	
FINANCING PLAN	
GEF Trust Fund <i>or</i> LDCF <i>or</i> SCCF	USD 5,152,392.00
UNDP TRAC resources	USD 0
Cash co-financing to be administered by UNDP	USD 0
(1) Total Budget administered by UNDP	USD 5,152,392.00
PARALLEL CO-FINANCING	
UNDP	USD 100,000.00

Government	USD 3,503,955.00	
Private Sector	USD 17,522,297.00	
(2) Total co-financing	USD 21,126,252.00	
(3) Grand-Total Project Financing (1)+(2)	USD 26,278,644	
SIGNATURES		
Signature: print name below 	Agreed by the Ministry of Planning And Development (Executing Entity)	Date/Month/Year: 01/09/2020
Signature: print name below Randi Davis	Agreed by the United Nations Development Programme (Implementing Agency)	Date/Month/Year: 01/09/2020

I. TABLE OF CONTENTS

I.	Table of Contents.....	4
II.	Development Challenge.....	10
III.	Strategy.....	22
IV.	Results and Partnerships.....	28
V.	Project Management.....	58
VI.	Project Results Framework.....	61
VII.	Monitoring and Evaluation (M&E) Plan.....	67
VIII.	Governance and Management Arrangements.....	73
IX.	Financial Planning and Management.....	78
X.	Total Budget and Work Plan.....	82
XI.	Legal Context.....	87
XII.	Risk Management.....	87
	Annexes.....	90
	Annex A: Multi Year Work Plan.....	92
	Annex B: GHG Emissions Calculations.....	99
	Annex C: GEF Core Indicators.....	103
	Annex D: Overview of Technical Consultancies.....	109
	Annex E: Terms of Reference for Key Project Stakeholders.....	115
	Annex F: UNDP Social and Environmental Screening Procedure (SESP).....	124
	Annex G: Environmental and Social Management Plan (ESMP).....	135
	Annex H: Stakeholder Engagement Plan.....	138
	Annex I: Gender Analysis and Action Plan.....	148
	Annex J: UNDP Risk Log.....	149
	Annex K: DEVCCO District Cooling Report (Analysis).....	155
	Annex L: Additional agreements.....	155
	Annex M: Letters of Co-financing.....	155

LIST OF FIGURES

Figure 1: Theory of Change - Problem Tree Analysis Diagram.....	20
Figure 2: The Theory of Change Diagram.....	24
Figure 3: Project Organization Structure.....	Error! Bookmark not defined.

LIST OF TABLES

Table 1: End-use of Electricity for RAC Technologies (GWh, year 2016).....	12
Table 2: District Cooling Market Potential in Trinidad and Tobago (in kW).....	14
Table 3: Status of Enforcement of Existing RAC Compulsory Standards.....	15
Table 4: Consumption of HCFC-22 in the services sector, Trinidad & Tobago, 2009.....	16
Table 5: DCS Project Pilot Matrix.....	26
Table 6: Project components, outcomes and outputs.....	39
Table 7: Partnerships of the project.....	42

Table 8: Project Risks 46
Table 9: Summary of Support Services to be provided by UNDP **Error! Bookmark not defined.**
Table 10: Mandatory GEF M&E Requirements and M&E Budget: 71
Table 11: Co-Financing Planning..... 78

LIST OF ACRONYMS AND ABBREVIATIONS

AA	Airports Authority
ASL	Annual Spending Limits
ARIA	Air Conditioning and Refrigeration Association
ATI	ARIA Technical Institute Ltd
AWP	Annual Work Plan
BAU	Business As Usual
BEEP	Regional Building Energy Efficiency Project
BUR	Biennial Update Report
C&E	Customs and Excise
CABEF	Caribbean Basin Sustainable Energy Fund
CAPEX	Capital Expenditure
CAL	Caribbean Airlines Limited
CCCD	Cross Cutting Capacity Development
CCM	Climate Change Mitigation
CCHP	Combined Cooling Heating and Power
CDR	Combined Delivery Report
CO	Country Office
CO2	Carbon Dioxide
CNG	Compressed Natural Gas
CPD	Country Programme Document
CRS	Carbon Reduction Strategy
CROSQ	Caribbean Regional Organisation for Standards and Quality
CSO	Civil Society Organization
DCS	District Cooling Services
DIM	Direct Implementation Modality
DO	Development Objective
DPR	Direct Payments Request
DPS	Direct Project Services
EDL	Energy Dynamics Limited
EE	Energy Efficiency
EIA	Environmental Impact Assessment
EMA	Environmental Management Authority
EPPD	Environmental Policy and Planning Division
ERC	UNDP Evaluation Resource Centre
ESCOs	Energy Service Companies
ESMP	Environmental and Social Management Plan
ETS	Energy Transfer Stations
EU	European Union
FACE	Funding Authorization and Certificate of Expenditures
GDP	Gross Domestic Product

GEF	Global Environment Facility
GEFSec	Global Environment Facility Secretariat
GHG	Greenhouse Gases
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
Gg	Gigagrams
GORTT	The Government of the Republic of Trinidad and Tobago
GWh	Gigawatt hour
GWP	Global Warming Potential
HACT	Capacity & Harmonized. Approach to Cash Transfer
HCFCs	Hydrochlorofluorocarbons
HFC	Hydrofluorocarbons
HPMP	HCFCs Phase-out Management Plan
ICAO	International Civil Aviation Organization
ICT	Information and Communication Technologies
IEO	Independent Evaluation Office (UNDP)
Kboe/day	Thousand barrels of petroleum equivalent per day
Kt	Thousands of tons
LAC	Latin America and the Caribbean
LECB	Low Emission Capacity Building Programme
LOA	Letter of Agreement
MEA	Multilateral Environmental Agreement
MEAU	T&T Multilateral Environmental Agreements Unit
MEEI	Ministry of Energy and Energy Industries
MEPS	Minimum Energy Efficiency Standards
MLF	Multilateral Fund of the Montreal Protocol
MOF	Ministry of Finance
MOA	Memorandum of Agreement
MP	Montreal Protocol
MPD	Ministry of Planning and Development
MSP	Medium Sized Project
MRV	Measuring, Reporting and Verification
MTI	Ministry of Trade and Industry
MTR	Mid-term Review
MW	Megawatt
M&E	Monitoring and Evaluation
NAMA	Nationally Appropriate Mitigation Actions
NCP	National Cooling Plan
NCCP	National Climate Change Policy
NDC	Nationally Determined Contribution
NGO	Non-governmental Organization
NIM	National Implementation Modality
NOU	T&T National Ozone Unit

NPM	National Project Manager
NSC	National Steering Committee (Project Board)
OACE	State Central Administration Bodies
ODS	Ozone-Depleting Substances
ODP	Ozone Depleting Potential
OFP	Operational Focal Point
ONURE	National Office of the Rational Use of Energy
OPEX	Operational Expenditures
OSDE	Higher Business Management Organizations
PB	Project Board
PD	Project Director
PIF	Project Identification Form
PIR	GEF Project Implementation Report
PMU	Project Management Unit
POPP	Programme and Operations Policies and Procedures
PM	Project Manager
PPG	Project Preparation Grant
PPR	Project Progress Reports
ProDoc	Project Document
RAC	Refrigeration and Air Conditioning
RIC	Regulated Industries Commission
ROAR	Results-Oriented Annual Reporting
RRRA	Refrigerant Recovery and Recycle Association
RTA	Regional Technical Advisor
SDG	Sustainable Development Goals
SBAA	Standard Basic Assistance Agreement
SES	Social and Environmental Screening
SESP	Social and Environmental Screening Procedure
SIDS	Small Island Developing State
SORAC	School of refrigeration and Air-conditioning
SRM	Stakeholder Response Mechanism
SSTrC	South-South and Triangular Cooperation
STAP	Scientific Technical Advisory Panel
S&L	Standards and Labels
TAC	Technical Advisory Committee
TE	Terminal Evaluation
TPL	Trinity Power Limited
T&T	Trinidad and Tobago
TTBS	Trinidad and Tobago Bureau of Standards
TTMA	Trinidad and Tobago Manufacturers Association
T&TEC	Trinidad and Tobago Electricity Commission
tCO ₂ eq	Equivalent tons of Carbon Dioxide
UNDAF	United Nations Development Assistance Framework

UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNSMS	United Nations Security Management System
USD	US Dollars
US\$c/KWh	US cents per Kilowatt hour
UTT	University of Trinidad and Tobago
UWI	University of the West Indies

II. DEVELOPMENT CHALLENGE

General Background

1. Trinidad and Tobago (T&T), located in the Eastern Caribbean region, consists of two islands (Pop. 1.32 million, 2016) with an extension of 5,128 square kilometres of land; the main island is Trinidad -where the capital, Port of Spain, is located- and most political and economic activity takes place thanks to a growing economy mostly influenced by the petroleum industry where oil and gas account for about 40% of Gross Domestic Product (GDP) and 80% of exports¹, the mainstay of national economic development, while the tourism sector plays a minor role –mostly concentrated on the Island of Tobago- in contrast with most other Caribbean countries. National development policies in place move toward improved sustainable development of the country; this has fueled an expansion in infrastructure with ongoing plans for the construction of new ports, schools, hospitals, public office buildings and business facilities, spurred by both, public and private developers.
2. This project is significant because rising global demand for Refrigeration and Air Conditioning (RAC) equipment is very worrisome worldwide -globally speaking the RAC equipment penetration is growing 8-10% annually in developing countries- and Trinidad and Tobago is following this international trend due to its location in the Tropical belt, with an average temperature of 26.5° Celsius and humidity levels above 80% year-round. Moreover, as recognized by the IPCC in its 2013 Report, it is likely that a warmer climate and the growing demand for RAC equipment will put greater pressure on the demand for thermal power generation over the long term. In this BAU scenario, new RAC equipment, both to replace existing ones and to establish a new, expanded installed base, tend to use High-Global Warming Potential (GWP)/Hydrofluorocarbons (HFC) refrigerants used in air-conditioning units and cooling systems, which are likely to generate more CO₂ emissions when compared to existing commercial, low-GWP alternatives worldwide.
3. In accordance with UNFCCC decisions, Trinidad and Tobago presented plans for reducing global GHG emissions through the Nationally Determined Contribution (NDC) in Paris (Aug. 2015), based on a Carbon Reduction Strategy developed for its industrial, power generation and transportation sectors; these being the major emitting sectors of the economy, and consistent with implementing the provisions stated in the National Climate Change Policy (July 2011). The country's aim is to achieve a reduction objective in overall emissions from these three sectors of 15% by 2030 from BAU, which in absolute terms is an equivalent of one hundred and three million (103,000,000) tons of CO_{2eq}². It is expected that by accessing project grants and international support, would help to address the current high growth in emissions in the RAC sector.
4. This country accounts for only 0.1% of GHG emissions in the global context, but has a relatively high per-capita emission, approximately 23.87 t/CO₂, and the highest in the Caribbean region as a result of having a small population coupled with being a leading producer of oil and natural gas. The country has been moving rapidly towards the use of natural gas, as a relatively clean-burning resource, as its primary means of meeting its growing energy demands; the petrochemical and heavy industry sectors that are the main contributors of GHG emissions, followed by power generation and then the transportation sector. Emissions from power generation have increased from 1,736 gigagrams (Gg)

¹ "Guidebook for Hydrodynamic Considerations in Coastal and Marine CEC Applications", Environmental Management Authority (EMA), August 2011.

² "Trinidad and Tobago. Intended Nationally Determined Contribution (INDC) under the UNFCCC", page 01.

to 2,488 Gg, a growth of 43% over the period 1990-2006³. The 2005 World Resources Institute report ranked Trinidad and Tobago as the 10th highest per capita emitter of greenhouse gas emissions⁴.

5. As a Small Island Developing State (SIDS), Trinidad and Tobago is particularly vulnerable to the adverse impacts of climate change such as those related to global temperature increases, changes in precipitation and sea level rise. These effects are aggravated by its small land space, limited human and technical capacity and the challenges of international trade, specifically the economic variations in the price of a barrel of oil. In this regard, it is in the country's interest to enhance energy security through a low-carbon intensive economy, in particular for power generation.
6. Trinidad and Tobago has already started 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 NDC. Unfortunately, mainstreaming of climate change at the sectoral level has been limited within the power generation, transport, RAC and industry sectors, which has translated to limited mainstreaming at the organizational level⁵. The CRS is a tool, to create the necessary conditions and capacities for multidisciplinary implementation of the NCCP, specifically for the reduction of GHG emissions in the power sector, industry and transport sectors over the 2013-2040 horizon. Specifically, the CRS recognizes the reduction of the energy consumption in the housing, commercial and institutional sectors as a key measure composing the national strategy for GHG mitigation⁶.
7. From the gender perspective, Trinidad and Tobago's women and men need more information on environmental stresses and more data—disaggregated by sex, age and other factors—is urgently needed to build policies that are more comprehensive⁷. The RAC markets, specifically in the context of this project, are usually male oriented, from the supplier and the maintenance perspectives, however from the demand point of view women play a very significant role in influencing indoor environments due to more sensitivity than men to temperature adjustments. Even though women are not strongly represented in the context of supplier and maintenance, they do have a leadership role in decision making at the corporate level for procurement and the design (engineering level) of RAC systems.

Background for Energy Efficiency

8. As an oil-producing country, total energy supply in T&T depends mostly on its domestic production and consumption of natural gas (71%) and crude oil (27%). Final energy consumption in the country stands at 269 kboe/day⁸. The industrial sector accounts for 45 kboe/day, followed by transport with 21 kboe/day, residential with 7 kboe/day, and commercial with 2 kboe/day. Other consumption

3 *"National Climate Change Policy", Government of the Republic of Trinidad and Tobago, July 2011.*

4 *"State of the Environment Report 2010", Environmental Management Authority (EMA).*

5 *MPD, LECB, UNDP: "NDC Policy Brief Series: Policy Brief No.2", October 2016*

6 *Government of the Republic of Trinidad and Tobago. "Strategy for Reduction of Carbon Emissions in Trinidad and Tobago", Page 49, August 2015*

7 *"Climate change connection: Common Ground In Bangladesh, Ghana, Nepal, Senegal and Trinidad and Tobago"*

8 Thousand barrels of petroleum equivalent per day.

accounts for the majority of consumption with 194 kboe/day⁹, the largest due to the high-energy consumption of Trinidad and Tobago’s steel industry and energy end-use in public facilities. The country produces all of its electricity from a large installed thermal power capacity of 2,428 MW, split between four electricity producers while the Trinidad and Tobago Electricity Commission (T&TEC) is solely responsible for power distribution in both islands by law.

9. T&TEC’s customer base is expected to grow from 468,906 customers in 2016 to 550,303 customers in 2025, with an average annually compounded growth rate of 1.8%. Total energy sales are forecast to grow by 41% from 9,363 GWh in 2016 to 13,215 GWh in 2025 at an average annually compounded rate of 3.9 %, with small and medium industrial energy sales growing at an average annually compounded rate of 3.5 %. System peak demand for 2016 was 1.434 MW and expected 2044 MW in 2025, with an average annual compounded growth rate of 4.0%¹⁰.
10. Due to the country’s energy-intensive industries, per capita consumption of electricity is among the highest in the Caribbean at over 6,500 kWh¹¹. The industrial sector represents by far the largest consumer of electricity, accounting for 60 percent of sales (4,825 GWh). The residential sector consumed 29 percent (2,412 GWh) and with an average annual compounded growth rate of 3.6 %. The commercial sector came in as the third largest consumer with 773 GWh, representing 10 percent of power sales, with an average growth rate of about 7% per year. Other end-uses, primarily street lighting, accounted for sales of 109 GWh representing one percent¹². Electricity pricing is controlled by the Regulated Industries Commission (RIC); however, it is heavily subsidized with an average price in the commercial sector to the order of 6.0US\$/kWh being kept since 2011 and at 4.3US\$/kWh for the residential sector¹³ -the lowest electricity prices throughout the Caribbean where the average is of 33US\$/kWh- a major challenge to the promotion and implementation of energy efficiency programs.
11. Historically, the T&T power sector scheme has adopted a traditional supply-side approach encouraged by the low-cost electricity pricing structure. Specifically, electricity consumption for air conditioning and refrigeration equipment by sector is not officially available. During the PPG stage, the following calculation was approached on the most demanding sectors; as shown in Table 1.

Table 1: End-use of Electricity for RAC Technologies (GWh, year 2016)

Sector/RAC System	Refrigeration	Air Conditioning	Total
Commercial (Rates A1 and B1)			
Light	248	166	414
Centralized	373	248	621
Residential (Rates A and B)			
Light	177.6	266.4	444
	Total		1,479

Source: Statistical Data from footnote #10 for 2016 and PPG market assumptions.

12. Within the commercial sector (49,860 customers), the highest end-users of electricity include *hotels and restaurants, services facilities* (mainly hospitals and offices), and *retail stores*. Electricity end-use for

⁹ “Energy Dossier: Trinidad and Tobago”, Interamerican Development Bank, Technical Note No. IDB-TN-938, February 2016.

¹⁰ “Energy Sales and Peak Demand Forecast”, TTEC, Page 1, October 1st, 2015.

¹¹ “Energy Dossier: Trinidad and Tobago”, Interamerican Development Bank, Technical Note No. IDB-TN-938, February 2016.

¹² “Energy Dossier: Trinidad and Tobago”, Interamerican Development Bank, Technical Note No. IDB-TN-938, February 2016.

¹³ The Regulated Industries Commission (RIC).

refrigeration with light systems is made up mainly of medium and small enterprises with an average monthly consumption of 20.66 GWh, for a total consumption of 248 GWh, while centralized units are commonly used in large facilities with areas larger than 500 square meters (373 GWh) and are imported into parts to be installed on-site; average monthly consumption in these sorts of facilities –for example large retail stores and supermarkets– accounts for 621 GWh and operate either with HCFC-22 or HFCs. Both end-uses also have in operation self-contained units for medium and low refrigeration, which are assembled locally or imported as single units. In addition, both subsectors have also installed air conditioning units for acclimatization ranging from 7 tons of capacity up to 50 tonnes, depending on the size and use of the facility, with an annual consumption of 1035 GWh, for the reference year, as indicated in Table 1.

13. In the residential sector (415,360 customers), electricity end-use for refrigeration with light systems depends on the operation of standard self-contained household single units, with an average size of 25 cubic feet and a household penetration rate of 18%¹⁴ nationwide. This consumption represented, for the year 2016, 177.6 GWh. In addition, there is a growing penetration of air conditioning light units in this sector using mostly HCFC-22 of the conventional split-type with quite ample ranges of energy efficiency, which are imported with an average cooling capacity of 12000 - 18000 BTU, and a consumption of 266.4 GWh for the reference year, as indicated in Table 1.
14. In Trinidad and Tobago, the District Cooling technology has been very slowly introduced even though the demand for cooling has increased at a steady rate of 15% due to the growing economic development of the country, as a result of high oil and gas prices coupled with an increase in temperature as observed at 0.29 degrees Celsius¹⁵ per year, over the last decade. The conventional technologies to support cooling demand are isolated chiller systems running on natural gas, with an average capacity of 1000 tons and using mostly R-134A. There have been several attempts in the past to develop District Cooling systems, like the planned District Cooling for the financial district in downtown Port of Spain, which was plagued by installation and configuration issues.
15. The PPG prepared an analysis with cost minimizing perspective, and with focus on bankability and financial performance of the District Cooling investment pipeline. The objective of this analysis is to create a viable, reliable District Cooling product that is in line with international and local market expectations, energy efficiency improvements and refrigerant (HFC) phase-out. The following calculation was approached on the most demanding end-uses for this alternative in the country.

¹⁴ *A Unique Approach for Sustainable Energy in Trinidad and Tobago, Natacha C. Marzolf Et al*

¹⁵ <https://www.metoffice.gov.tt/Climate>

Table 2: District Cooling Market Potential in Trinidad and Tobago (in kW)

Market Demand	2020	2021	2022	2023	2024
Piarco Airport	3,500	4,000	4,500	4,900	4,900
TT Post	600	600	600	600	600
Regent Hotel	600	600	600	600	600
Aero Business Park	0	0	1,500	1,500	2,000
UTT	1,500	1,500	1,500	1,500	1,500
Industrial Park	0	700	700	700	700
Total	6,200	7,400	9,400	9,800	10,300

Ref.: Draft Report. UNDP Trinidad and Tobago. "District Cooling Pilot project – Business Management Reports #1 and #2"

16. The baseline scenario shows that Trinidad and Tobago’s hydrocarbon resources are critical for long-term economic growth and development. The country is a net exporter of petroleum products while the oil and gas industry is the most significant contributor to domestic growth. The growth of the local natural gas-based industry has been remarkable, achieving international and national prominence in the shift towards its use as the primary means of meeting its growing energy demands and the need to utilize a cleaner energy source. Local energy production and consumption have grown significantly in the last few decades and so, despite the increase in the focus on natural gas, local emissions of GHGs such as carbon dioxide continue to grow, with the energy sector being the leading contributor followed by power-generation and transportation. Notwithstanding the continued importance of the country’s petroleum resources, the Government recognizes that renewable energy, clean energy production and the maximization of energy efficiency are critical elements of the drive for sustainable development¹⁶.

17. In light of the barriers to renewable energy development, in particular high up-front costs, it is critical to foster energy efficiency over the short to medium term. Increasing energy efficiency would have a spill over effect on savings in power generation and utility costs. This project is also seen as a way to introduce not-in-kind¹⁷ technologies with substantially improved energy efficiency gains like the District Cooling technology which can use local sources for cooling such as ground water, seawater, waste heat or solar heat. Of relevance, there is a group of existing compulsory standards for labelling of refrigerant cylinders and work in progress on standards for household refrigerators, freezers and air conditioners which are focused on the compliance of technical specifications but without the appropriate focus on the compliance of minimum energy performance standards and energy consumption labelling to promote the recognition and use of energy efficient appliances, in tune with the Framework for the Development of a Renewable Energy Policy for Trinidad and Tobago (January 2011).

18. As a specific energy policy, the country has the foresight and ambition to implement energy efficiency standards necessary to support renewable energy and energy efficient technologies and to reduce the Government’s fuel subsidy liability over time. Under the aegis of the Ministry of Trade and Industry, the Trinidad and Tobago Bureau of Standards (TTBS) is the designated national authority to ensure adherence to standards for goods produced or used in the country. As a "Standards Taker" player in terms of energy efficiency standards and labelling aspects of RAC equipment, the TTBS has nowadays

¹⁶ “Framework for Development of a Renewable Energy Policy for Trinidad and Tobago”, Ministry of Energy and Energy Affairs, January 2011.

¹⁷ The term of **not-in-kind (NIK) cooling technologies** refers to any alternative **cooling** systems other than the vapour compression **cooling** systems that are most commercially dominant today. An example is absorption/adsorption **cooling** which uses the heat to drive the cycle instead of compressors in vapour compression systems. – International journal of refrigeration 62 (2016) 177–192

some limited action in the area of Standardization, Verification and Certification of RAC systems. A set of barriers in institutional and technical capacity have been identified that could enable the country to undertake more proactive action in this area, based on the lack of a proper laboratory facility, certified professionals and EE specific national standards that could handle this new generation of low-carbon, EE RAC technologies and their environmentally-friendly refrigerants. However, RAC EE ratings continue to be established in the international setting and they are mainly geared to manufacturing countries in a different type of climate (with different technical skills) and, therefore, not completely adequate to the Trinidad and Tobago weather setting. Table 3 shows the existing standards and the status of enforcement.

Table 3: Status of Enforcement of Existing RAC Compulsory Standards

Compulsory Standards related to RAC Sector	Status of Enforcement
TTS 76: Part 2: 1994 – Requirements for Labelling – Part 2: Labelling of Pre-packaged Goods	Currently Enforced
TTS 76: Part 20: 2015 – Requirements for Labelling – Part 20: Labelling of Refrigerant Containers	Currently Enforced (under ISO/IEC 17020 Accreditation)
TTS 76: Part 13: 2016 – Requirements for Labelling – Part 13: Labelling for Electrical Appliances (3 rd Revision)	Currently Enforced
TTS/UL 984: 2008 – Hermetic Refrigerant Motor-Compressors	Partially Enforced (Labelling)
TTS/UL 250: 2009 – Household Refrigerators and Freezers	Partially Enforced (Labelling)

Ref.: TTBS, Implementation Division, Pre-Packaged Good Unit.

19. Energy efficiency development in Trinidad and Tobago is currently at a rudimentary stage, as mentioned before due to the high level of subsidies to the price of electricity for all customers. A few initiatives and research projects have been undertaken, such as energy efficiency and green design into new residential and commercial developments incorporated by several local architects and the ongoing capacity building in the tertiary education sector through incorporation of renewable energy and energy efficiency into the academic programs of institutions such as the University of Trinidad and Tobago (UTT) and the University of the West Indies (UWI). Of relevance, is the role of the Air Conditioning and Refrigeration Industry Association (ARIA), a not-for-profit organization established in 1998 devoted to promote professionalism, integrity and environmental awareness in the Air Conditioning & Refrigeration Industry. As a key player for this project, ARIA offers training programs to enhance knowledge and skills for technicians in the RAC industry through the ARIA Technical Institute Ltd (ATI), with support from the Environmental Policy and Planning Division (EPPD) of the Ministry of Planning and Development (MPD), The United Nations Development Programme (UNDP), and the Ministry of Trade and Industry.
20. In Trinidad and Tobago, there is no manufacturers or assembly facilities for RAC equipment. As in many other Caribbean countries, there is a national capacity in the private sector to provide support for the design of conventional systems and for the provision of maintenance services, made up by well-trained engineering support firms, RAC equipment suppliers of most world-commercial brands as well as formal and informal small companies that provide regular maintenance to the installed systems.

Background for Ozone-Depleting Substances

21. T&T is a signatory of the Montreal Protocol (MP) on substances that deplete the ozone layer under a Multilateral Environmental Agreement (MEA), which aims to phase-out the consumption of Ozone-Depleting Substances (ODS). As a country working under the Article 5 of the Montreal Protocol, for

Trinidad and Tobago the Montreal Protocol has set specific phase-out targets for consumption of Hydrochlorofluorocarbons (HCFCs), which must be eliminated through a staggered reduction approach as follows: 2015 (10%), 2020 (35%), 2025 (67,5%), 2030 (97,5%) and 2040 (100%).

22. Trinidad and Tobago does not produce refrigerant therefore all cooling substances, including ODS alternatives in the country, are imported. HFC-134a and R-410A are the main HFC refrigerants imported, used predominantly for servicing refrigeration and air-conditioning (RAC) equipment; some other alternatives used are hydrocarbons and carbon dioxide. The importers retail refrigerants on the local market and export to neighbouring islands such as Barbados, Grenada, St. Vincent and St Lucia.
23. In this regard, T&T is subject to the environmental challenge of moving away from high demand of ODS substances. The country, through the National Ozone Unit (NOU), carried out in 2009 the inventory of consumption and use of HCFCs, which identified an estimated charge of refrigerant of about 745,000 tons of these refrigerants. This study identified that the use of HCFC-22 represents the largest annual consumption (97%), while HCFC-123, HCFC-141b and HCFC-124 the remaining¹⁸. The EPPD of MPD is seeking now opportunities and leading the path to introduce low-GWP alternatives with more efficient technologies to deviate from the projected business-as-usual (BAU) scenario, which is the substitution of HCFCs by HFCs. With the adoption of the Kigali amendment at the 28th Meeting of the Parties to the Montreal Protocol in 2016, the Multilateral Fund of the Montreal Protocol (MLF) will fund the phase down of HFCs.
24. Due to the commitment of Trinidad and Tobago in Phase I under the Montreal Protocol for the elimination of HCFCs, HCFC-22 most likely will be switched away by a high consumption of HFC refrigerants, typically R-134a, R-404A, R-410A and R-507C, substances that have a lower market price but a higher GWP. The main cause for this situation is that market suppliers of cooling refrigerants have promoted compliance with effective Montreal Protocol enforcement without giving proper attention to climate change, mitigation impacts and the limited availability of updated, more global climate-friendly cooling technologies. The following table shows from the 2010 Survey Report that the total charge of HCFC-22 refrigerant in the servicing sector (723,233 tons), where the residential and small commercial consumption accounts for 77% of total demand (562,500 tons), followed by commercial refrigeration and air conditioning (12%), industrial refrigeration (7%), and chillers, marine and transport, the remaining 4%¹⁹.

Table 4: Consumption of HCFC-22 in the services sector, Trinidad & Tobago, 2009

Sector	Total number of units	Total charge of refrigerant (tonnes)	Service frequency per annum	% of equipment requiring charge annually	Average recharge amount (kg)	Services demand (tonnes)	
						mt	ODP
Residential & Small Commercial	375,000	562,500	2	30	2	168.75	9.28
Transport	60	90	1	10	2.5	0.02	0
Commercial Refrigeration	12,235	18,352.5	1.5	25	20	61.18	3.36

¹⁸ Trinidad and Tobago: *Ozone Depleting Substances: 2010 Survey Report*.

¹⁹ Ibid 14.

Commercial Air Conditioning	49,440	74,160	1.5	10	50	247.2	13.6
Marine	30	45	1.5	25	3.75	0.03	0
Industrial Refrigeration	35,000	52,500	1.5	20	4	28	1.54
A/C Chillers	10,390	15,585	1.5	10	180	187.02	10.29
TOTAL DEMAND	482,155	723,232.5				692.2	38.07

Ref: Trinidad and Tobago, HCFC Phase-out Management Plan (HPMP), 2012

25. In T&T, the supply chain of electro-mechanical parts, refrigerants, equipment installation and post-sale servicing for commercial refrigeration is made up of a complex network of manufacturers, suppliers, maintenance companies and servicing technicians. This market condition, from the supply side, needs to be integrated into the project with a holistic approach, including training, implementation of energy efficiency standards and labeling, safe handling and disposal of refrigerants, among other issues, in order to trigger an alternative low-carbon market, such as the use of natural refrigerants which are more energy-efficient, like Hydrocarbons (HC), Carbon Dioxide (CO₂) and Ammonia (NH₃) that offer alternative solutions and the possibility to promote greener businesses.

26. There is also a need to assist in the establishment of a structure for ensuring that the equipment being imported into the country in the RAC industry meets international standards from an energy efficiency perspective. This is specifically crucial given that the ratings on the equipment is usually derived in countries with vastly different weather conditions and operating temperatures and are therefore inaccurate for application locally. Compounded with this is the need for a labelling scheme to ensure proper testing of the equipment for an energy-consumption rating perspective. With regard to the refrigerant disposal, at present Trinidad and Tobago where possible, engages in recovery and recycling of refrigerant during the servicing and regular maintenance of the RAC equipment. There is currently no solution to the final disposal of spent refrigerant; however, this issue is now being addressed through activities of the Refrigerant Recover and Recycling Association (RRRA). The RRRA is a non-profit organisation set up at the national level, which is involved in devising refrigerant management plans for companies as well as is exploring possibilities for final disposal of refrigerants and end of life RAC equipment.

27. In the policy field, the Ministry of Planning and Development (MPD) is responsible for the alignment of the activities of the Government's thrust towards national development by focusing on restoring growth, diversity and confidence. The Environmental Policy and Planning Division (EPPD) falls under this Ministry and has under its purview the following:
 - (a) National Ozone Unit (NOU), which acts as the focal point for Montreal Protocol issues and is responsible for the national implementation of programs and projects related to the Ozone layer.

 - (b) Multilateral Environmental Agreements Unit (MEAU), which ultimately oversees all other multilateral environmental agreements. This Unit addresses climate change matters and supports governmental policy and planning on the related issues.

28. From the operational point of view, the baseline scenario for Ozone-Depleting Substances is composed of a set of programs, policy initiatives and studies driven by the NOU; which carries out a series of associated baseline projects being implemented. The MEAU oversees the baseline studies for climate

change and to some extent energy efficiency. The key challenge for the national public interest is to transform policy instruments and energy saving targets into actions at the ground level. Government initiatives and programs under the baseline scenario include:

- (a) The HCFCs Phase-out Management Plan (HPMP), funded by the Multilateral Fund for the Implementation of the Montreal Protocol United Nations Development Program (UNDP), which is delivering technical assistance to reduce by 35% the consumption of HCFCs in the country by 2020. These actions are based on a series of baseline activities to support the adoption of proper safe handling of toxic and flammable low-GWP alternatives for HCFCs. Technical training is mostly focused on the end-user groups who handle RAC equipment on a daily basis, and therefore are the ultimate persons responsible for the safety of such systems, but currently without any consideration to energy efficiency measures and best practices. This global policy was recently strengthened with the approval of the Kigali amendment to the Montreal Protocol Treaty. This UNDP/GEF project will serve as co-finance and will deal with the safe handling and operation of equipment with natural refrigerants. This project would also put the country on track of its commitment under the Kigali amendment with respect to GWP reduction and the potential global environmental benefit.
- (b) The Government of the Republic of Trinidad and Tobago (GORTT) and the European Union (EU) signed a financing agreement for an EU Environment Programme on May 17, 2013. Under this agreement, the Government will be assisted with the following: i. T&T becoming an Extractive Industry Transparency compliant country, ii. Establishment of a new protected areas system, and iii. Mitigation of greenhouse gases in the medium term through the introduction of clean technologies, such as the conversion of public buses into Compress Natural Gas (CNG). Aligned with this UNDP/GEF project, this EU initiative will strengthen the institutional framework and provide clear strategic elements for reducing carbon emissions.
- (c) The Government, in collaboration with UNDP, has initiated a 3-year project entitled “Low Emission Capacity Building Programme (LECB) for Trinidad and Tobago.” The LECB Programme will support and complement other climate change projects of the Ministry of Planning and Development namely the (ongoing) Carbon Reduction Strategy and the (completed) IDB Technical Cooperation Project: “Mainstreaming Climate Change into National Development in Trinidad and Tobago”, specifically to assist in the implementation of the National Climate Change Policy (NCCP). The LECB Project will also support the capacity required in various emitting sectors, including Government, industry, academia and the private sectors, to conduct and report on GHG inventories in order to facilitate the Third National Communication and first Biennial Update Report (BUR) reporting under the UNFCCC as well as to develop the respective Measuring, Reporting and Verification (MRV) systems. Additionally, the LECB project will support the identification and formulation of Nationally Appropriate Mitigation Actions (NAMAs) based on the outputs of the Carbon Reduction Strategy.
- (d) The Government, also in collaboration with UNDP, has initiated the preparation of the National Cooling Plan (NCP). This Plan mobilizes the research, technical, market and financial resources to develop a sustainable and efficient cooling strategy for the country by establishing a national strategy to address country’s needs in the RAC (develop the food cold chain, support greater comfort and productivity for building occupants); and driving a rapid transition to high performance cooling equipment, linking Montreal Protocol to climate protection efforts, taking

into consideration energy efficiency and HFC phase down (Kigali Amendment) in order to mitigate greenhouse gas emissions, and support country's sustainable development goals.

29. In the baseline scenario for ODS, other independent interventions funded by the Montreal Protocol will continue to have limited focus on specific technical assistance to small scale end-users, in order to phase-out HCFCs-based equipment. Although Decision XIX/6 – from the Parties of the Montreal Protocol – had urged that "low carbon technologies should be prioritized in the process", there are institutional, technical, economic and financial barriers that block a wider adoption of such advanced technologies in this country. Moreover, the Montreal Protocol focuses its actions on the consumption of ODS (production + import - exports), and not on emissions of the stock equipment already in place or to be installed.
30. More specifically, the implementation of energy efficiency and ODS programs are also effected in conjunction with several government stakeholders such as the Ministry of Finance (Customs and Excise Division), the Ministry of Energy and Energy Industries, and Ministry of Trade and Industry (Trade Licensing Unit and the Trinidad and Tobago Bureau of Standards). However, due to several issues, including a separate source of public funds, separate administrative controls by various ministries, and national priorities given different national plans and policies, it is difficult to apply joint/synergistic work on cross-cutting themes as championed through the MEAU and the NOU throughout the entire Government. The lack of inter-governmental coordination is particularly evident in matters that are under another Ministry's authority, such as issues related to energy (with the Ministry of Energy) or fiscal barriers (Ministry of Finance), and this has been considered a stumbling block to any eventual holistic approach to promote the adoption of a sustainable market trend for low-carbon, ground-breaking technologies for RAC end-use.
31. In the prevailing institutional context of the Republic of Trinidad and Tobago and its global commitments with the UNFCCC and the Montreal Protocol, this project will make a significant change in the existing consumption of inefficient technologies for refrigeration and air conditioning, mostly in the commercial and residential sectors, but with ample opportunities to expand the global impact into other sectors of the national economy, like the growing and large industrial sector due to its role in the national economic development. During the PPG stage, UNDP in close collaboration with the Environmental Policy and Planning Division of the Ministry Planning and Development used a participatory approach with other policymakers, national and international private market actors and Civil Society Organizations (CSOs), to identify those structural barriers that limit the potential for establishing an innovation-friendly, market approach for the adoption of low-carbon technologies for RAC end-use and other large-scale, market-driven alternatives like District Cooling and Combined Cooling Heating and Power (CCHP).
32. Without a proper coordination mechanism that can filter, evaluate, define priorities, monitor and guide holistic approaches and interventions, such baseline projects, programs and national policies may continue to have limited reach and may not be properly systematized and disseminated in an optimal manner. Moreover, without the appropriate roots for an enabling policymaking environment, private sector participation is limited to changing the current paradigm.
33. Therefore, the development challenge is to overcome a national context, which leads to a series of institutional, capacity, environmental and financial externalities, including the lack of an integrated management approach linked to an optimal deployment of RAC technologies. This leads to a tendency to increase GHG emissions and the use of ODS refrigerants, contributing to global warming and

depletion of the ozone layer, due to the market growth of highly inefficient RAC equipment. (See Figure 1 –Theory of Change - Problem Tree Analysis Diagram)²⁰.

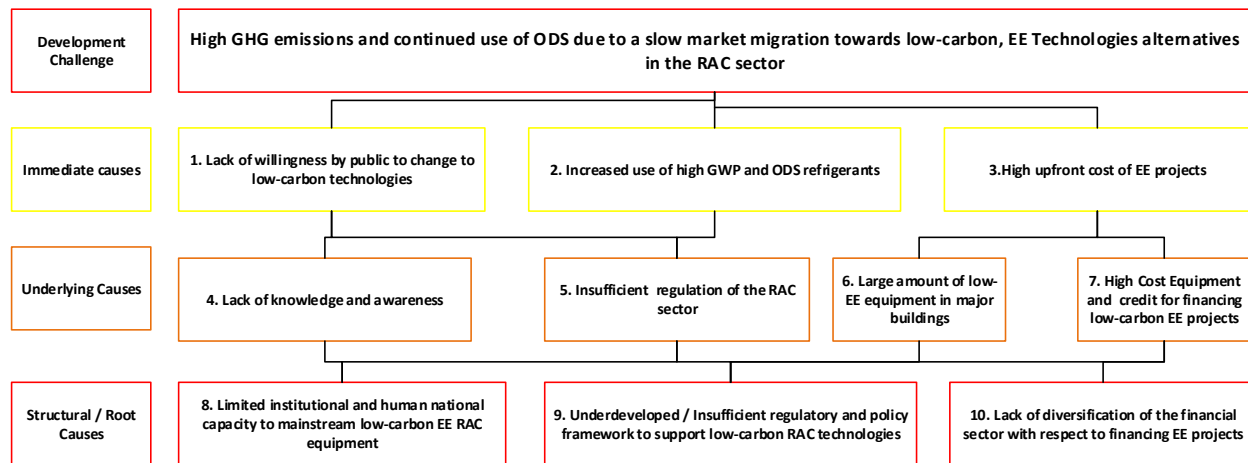


Figure 1: Theory of Change - Problem Tree Analysis Diagram

Barriers to change

34. During the analysis of the development challenge carried out in the preparation of the problem tree (Figure 1), three different levels of causes were distinguished: immediate causes, underlying causes and structural / root causes. The three immediate causes identified were:

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)

35. Four major underlying causes were also identified as the basis of the immediate causes mentioned above. These were as follows:

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

36. The three main structural / root causes identified were as follows:

8. Limited institutional and human national capacity to mainstream low-carbon EE RAC equipment

²⁰ This is based on the Theory of Change analysis carried out during the PPG.

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

37. Based on the Theory of Change analysis, the immediate cause related to a lack of willingness by the public to change to low-carbon technologies, in a country where the cost of energy is highly subsidized is a major barrier to the desired transformation. There is insufficient awareness and sustained communication on the benefits of EE among the public and the private sector including financial institutions. Generally, people are unable to make sound and informed decisions on energy related products and services because they lack information and education on the types of technologies available and the choices that will bring optimum benefits. This is due to a lack of public awareness and communication about the availability, benefits and incentives related to the adoption of low-GWP, EE RAC technologies. The lack of awareness is also experienced at the level of the technician who needs to have the relevant technical capacities to safely handle and recover refrigerant, but also to effectively advise and influence the consumption of these technologies.
38. On the other hand, increase in the use of high GWP and ODS refrigerants is due to insufficient regulation of the RAC industry and a lack of technical capacities. Absence of legislative instruments and technical capacities on issues related to the safe handling and use of low carbon technologies to establish the basis for market transformation is apparent. This type of technology, like those using natural refrigerants, pose one or more safety-related issues due to sensitive parameters like high toxicity and high flammability, especially for end-use. Another consideration the knowledge and availability of avenues for effective recovery, recycling and disposal of the ODS refrigerants, which is also tied to technical capacities and awareness.
39. There are no quality standards for EE low-carbon RAC equipment labelling or performance currently in existence in Trinidad and Tobago. The Trinidad and Tobago Bureau of Standards (TTBS) is the sole entity in the country responsible for standards development, testing and certification of these types of products. However, TTBS currently has no developed quality standards for EE RAC technologies, and lacks the capacity to test this specific specialized equipment to verify or give an energy savings rating. This also lends to the inability to regulate the sector. This UNDP-GEF project will attempt to build the relevant capacity to enable the TTBS to develop a mechanism for verification of energy efficient devices and develop the requisite labelling and testing standards to ensure the quality of equipment on the market, which would enhance confidence in the use of it.
40. Thirdly, high upfront cost of EE projects (new installations and conversion and retrofits) is due to a lack of human technical capacities, the large amount of split units and the high cost of financing. Accelerated adoption of EE low-carbon RAC technologies in Trinidad and Tobago, will require an increase in the skill sets for various personnel and companies within the sector. Undertaking installations and retrofits with entities that lack the required capacities can result in high costs due to rework, thus training is required to have more people available to support market growth and to ensure quality delivery of services within the sector. Failure to develop the technical capacity in the country to support a growing EE, low-carbon, RAC market, will result in the loss of job opportunities and slow adoption of the new technologies. It is also recognized that the RAC sector is typically a male-dominated sector and that market expansion should support greater and equal access to opportunities for all.
41. The large number of multi-split and split systems in major buildings is a barrier for the development of EE systems such as District Cooling and other large centralized systems, and would increase the upfront

cost of retrofits and installations due to extensive building modification required to convert to ducted-centralized cooling and air conditioning systems.

42. The upfront investment cost of purchasing EE technologies and making EE retrofits is either prohibitive for many potential customers or requires them to secure debt financing. Since the lending market for EE is relatively young in Trinidad, many financial institutions lack a full understanding of the risks, opportunities, and paybacks of investments in EE projects. This leads to the structuring of lending terms that are not optimally designed for EE investments. This can lead to high interest rates, collateral requirements or short tenures, which lead many consumers to decide that a loan is not worthwhile, especially in a country with low tariffs on electricity.
43. Insufficient policymaking coherence leads to an inadequate regulatory and policy framework that does not support the uptake of EE low-carbon RAC technologies. There is a need for improved coordination between the leading Ministry of Planning & Development and other public agencies as it relates to the synergies between Ozone Depleting commitments, actions on Climate Change mitigation and energy efficiency, environmental policy development and implementation, technical regulations, and standards and labelling to achieve additional gains in energy efficiency and lower greenhouse gas emissions.
44. For the global development agenda, this project is aligned with Sustainable Development Goal (SDG) 11 (Sustainable Cities and Communities), while innovative interventions will also help achieve Goal 5 (Gender Equality), Goal 7 (Affordable and Clean Energy), Goal 9 (Industry, Innovation and Infrastructure), and Goal 13 (Climate Action).

III. STRATEGY

45. This project proposal 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 emissions in the residential and commercial sectors in Trinidad and Tobago. It will bring about integrated institutional planning and coordination of ground-breaking technology interventions aligned with, greater efficiency and increasingly equitable socioeconomic returns on low-emission public and private investments in a very innovative way. Despite those programs and policy initiatives being undertaken in Trinidad and Tobago at the moment, their long-term successful continuance remains challenged due to the lack of coordinated implementation within the public sector responsible for the potentially synergic themes (ozone, climate, power sector, regulation, and ODS waste disposal). The project will look at treating the issue of energy efficiency for large-scale systems (District Cooling) as well as smaller scale units to represent a holistic approach to encouraging a more sustainable energy consumption path.
46. The project will look for synergies between the implementation of the UNFCCC and the Montreal Protocol. Apart from their depletion effects to the ozone layer, HCFCs are also potent greenhouse gases (GHG). The most common HCFCs used in RAC applications can cause severe side effects to the global climate. Although low-GWP technological solutions exist at commercial levels, they are mostly applied in developed countries, where the enabling policy and regulatory environments are better suited to support this transition. In this case, it is being noticed that developing countries, due to many political, technical and economic barriers, are widely adopting high-GWP Hydrofluorocarbons (HFCs) substances as an

interim leading solution in this HCFCs phase-out process. All activities related to phase-out of Hydrochlorofluorocarbons (HCFCs) and high GWP/HFC phase down in the future, e.g. natural refrigerants, will be fully funded and implemented via projects supported by the Multilateral Fund (MLF) for the implementation of the Montreal Protocol (MP), as described in Section II above.

47. This FSP 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. In this regard, this project will also build on significant baseline national policies as well as on enacted programs that are in the planning stage for implementation in the coming years to address a change in the current paradigm for the use of RAC technologies with a long-term strategic vision, in accordance with its National Plan for Climate Change. 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 MLF. However, the baseline actions on these two fronts have significant limitations; one of these is the need to ensure –jointly- the maximum delivery of global environmental benefits and boost climate change resilience.
48. In the energy policy arena, the leading entity is the Ministry of Energy and Energy Industries (MEEI), with a focus on creating partnerships and innovations that foster self-reliance and a resilient energy sector, and a very strong emphasis on extractive energy sources, mostly in the oil and gas industries. Nevertheless, through its Energy Research and Planning Division, there is a mandate to provide guidance on drafting local legislation on renewable energy and energy efficiency policies. Along this path, this project proposal will strengthen and facilitate current efforts in T&T to curb the growth of CO₂ emissions in the energy sector. In fact, T&T, as a signatory to the UNFCCC, has stated this in its National Climate Change Policy (July 2011). This public policy will provide policy guidance for the development of an appropriate administrative and legislative framework, in harmony with other sectoral policies, for the pursuance of a low-carbon development path through suitable and relevant strategies and actions to address climate change, such as increasing energy efficiency measures in the commercial and residential sectors, in an effort to reduce the carbon footprint of the country.
49. The National Climate Change Policy and the Multilateral Environmental Agreement under the Montreal Protocol aim to provide policy guidance for the development of an appropriate administrative and legislative framework, in harmony with other sectoral policies, for the pursuance of a low-carbon development path for Trinidad and Tobago through suitable and relevant strategies and actions to address climate change, including sectoral and cross-sectoral mitigation and ozone depleting measures such as capacity building and the market development of cleaner and energy efficient ground-breaking technologies and best practices.

Theory of Change for the project

50. The project's vision is to create a sustained market change toward the adoption of low-carbon RAC technologies in Trinidad and Tobago, which will deliver multiple benefits at local and global levels—through the integration of energy efficient technologies that would reduce the use of high GWP and

ODS refrigerants. The country’s aim is to achieve a reduction objective in overall emissions of 15% by 2030 from BAU, which in absolute terms is an equivalent of one hundred and three million (103,000,000) tons of CO2eq, while achieving economic and social benefits from lower carbon development and increasing the country’s economic competitiveness. The project also aims at introducing an innovative approach and business model for District Cooling development, which will be a major breakthrough deployment for air conditioning not only in Trinidad and Tobago but also for all Eastern Caribbean countries.

51. This vision is achieved by direct interventions on the immediate, underlying and root causes identified in the previous section. The project will provide institutional and capacity-building support, incorporating a break-through experience for UNDP in Trinidad and Tobago by contributing to the severe development challenge – that of increasing the use of low-GWP energy efficient technologies in support of the MP and the UNFCCC.

52. As summarized from the Theory of Change analysis, Figure 2 shows that the alternative path proposed by the project (entries) is geared at:

- i. Strengthening the policy and regulatory framework in support of low-carbon EE, RAC technology end-use.
- ii. Fostering an Energy Efficiency culture by building the capacity of the human capital 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, through targeted outreach with local stakeholders
- iii. Developing and promoting successful pilots that can serve as an example for financial institution to adjust their risk and lending models for fiscal investments into similar EE initiatives and for scale-up projects in not only Trinidad and Tobago but also the Caribbean region.

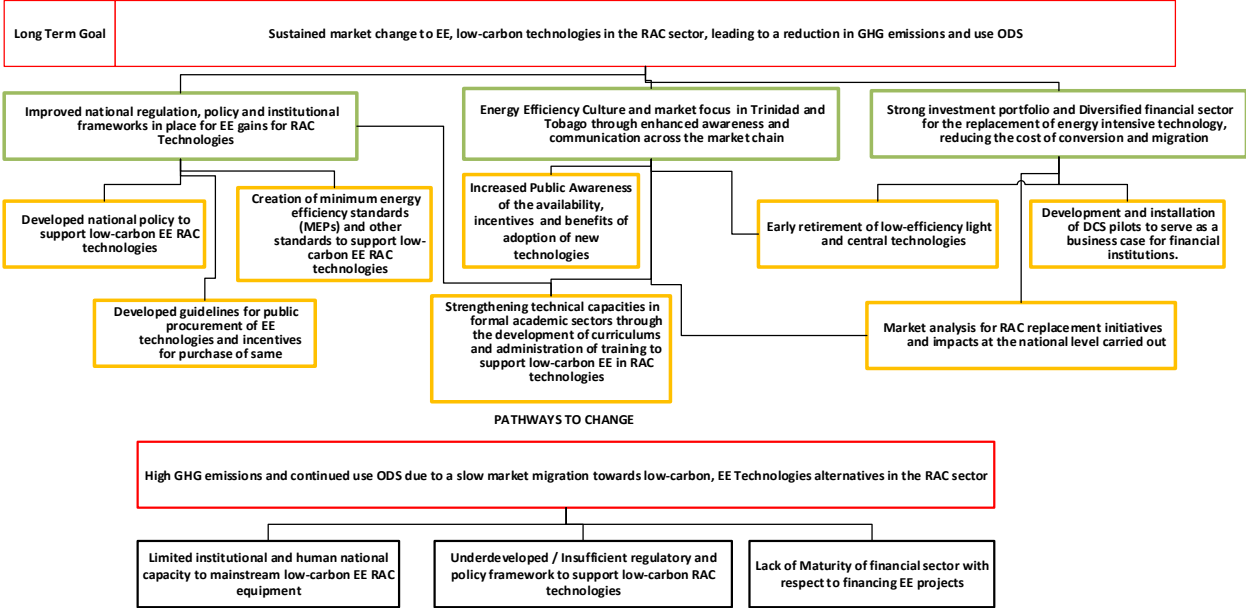


Figure 2: The Theory of Change Diagram

The project approach

53. As indicated in Figure 2, the objective of this project is to create a sustained market change toward EE, low-carbon technologies in the RAC sector, leading to a reduction in GHG emissions and the use of ODS. This impact is clearly linked to UNDAF/CPD Outcome 28 *“Communities and key sectors develop and increase energy efficiency and the use of renewable energy”*. Additionally, the project is aligned with UNDP Strategic Plan Output 1.5 *“Inclusive and sustainable solutions adopted to achieve increased energy efficiency and universal modern energy access (especially off-grid sources of renewable energy)”*.
54. This project has three major components. 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 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. A third component 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.
55. A strengthened national policy, regulatory and legislative environment for EE RAC technologies in Trinidad and Tobago would provide an atmosphere that promotes and enables the use of low-carbon RAC technologies, creating more coherence between policy makers, regulators, importers and consumers. The project through its Component I, would explore the development of specific policies, regulations, and standards supported by incentives to promote the importation of quality equipment that meet international standards with benchmarked public procurement guidelines, ensure proper installation, and create a sustainable market for EE, low-carbon RAC technologies. Outcomes under this component would directly attack causes 1, 2, 5, 6, 8 and 9 as indicated in Figure 1: The Theory of Change – Problem Tree Analysis Diagram.
56. The project seeks to catalyse an accelerated market transformation in the RAC sector towards energy efficient and low-carbon / GWP technologies, building upon a collaborative approach to problem solving that focuses on the analysis of the RAC market for replacement initiatives, technical capacity building, customize financing mechanisms in the financial sector to support the required market change, through engagement and continuous interaction with the project stakeholders.
57. Under Component II, as part of the accelerated market transformation, the project foresees to design and implement at least two District Cooling system (DCS) pilots building upon technical and financial performance feasibility studies conducted in Trinidad and Tobago. Table 5 show the DCS project pilot matrix used to prioritise the most feasible sites for the DCS pilots. These DCS projects would serve as a business case and evidence for climate change mitigation actions, which will assist with the design of financing strategies in support of low-carbon, energy efficiency initiatives in the RAC sector. The project through the initiatives identified above will catalyse the migration towards the early-retirement of decentralized / and light low-efficiency technologies in the commercial and

residential RAC sectors in Trinidad and Tobago. The project will also seek to provide a business / risk model for use by financial institutions when reviewing EE project applications for financing, and also provide capacity development to transition these instructions to a higher level of diversification with respect to creation of financial instrument for lending in EE projects. Outcomes for Component II would remedy causes 3, 6, 7 and 10.

Table 5: DCS Project Pilot Matrix

#	Pilot project	Energy efficiency improvements	Refrigerant use reduction	CO2 emission	Capex range (MUSD)	Priority DC	Priority Centralization	Remarks
1	Piarco International Airport	High	Medium but with low/no GWP	High	13 - 15	1		Recommended as pilot for DC. Capex indicates fully built-out system including the airport and potential off-takers outside the airport.
2	UTT Couva	High	High	High	3 - 4	1		Recommended as pilot for DC.
3	Downtown area Port of Spain	Medium	Medium	Medium	16 - 18	2		Good potential for DC but higher complexity due to technical and construction challenges. Involvement of large amount of stakeholders.
4	ANR Robinson International Airport	High	Medium	Medium	0,5 - 1	2	1	Recommended as pilot for centralization of building system as a first stage.
5	University of West Indies	Medium	Low	Low	N.A.	3		Centralized system in place.
6	Environmental Management Authority	High	High	High	0,2 - 0,3	3	1	Recommended as pilot for centralization of building system as a first stage.

58. Finally, under Component III, the project will capture lessons-learned, monitor the project’s activities and provide the required feedback, through an awareness raising campaign and information strategy, which includes dissemination at the national, regional and global levels. Annual workshops will be organized to create awareness, allow request for and capture of feedback. Information on the benefits of EE technologies, its benefits and available technologies would also now reach stakeholders and the public through information and outreach, acting directly on causes 1, 2 and 4.

Key assumptions

59. The project’s approach is based on various assumptions that will be critical for achieving the expected changes as per the Theory of Change analysis:

- A collaborative approach to policy making that is sustained and continuously improves, integrating gender related issues across the implementation of the proposed activities.
- Collecting the lessons learnt would foster continuous improvement during the implementation phase and assisting in the development of a commercial-driven model for other similar implementations after the project’s completion.

- Enhancement along the market chain through the creation of barriers to the import of low EE and high GWP technologies will open opportunities for market growth in the EE, low GWP RAC industry.
- The creation and implementation of Minimum Energy Efficiency Standards (MEPs), combined with regulation at the ports of entry would boost the EE market within Trinidad and Tobago for RAC technologies.
- Successful pilots demonstrating the potential of EE, low-GWP RAC technology would attract an investment portfolio on replacement of energy intensive technologies.
- Increased attention to gender and social equity in the RAC sector, since there is a growing concern regarding fairness and opportunities for marginalized groups in society.

IV. RESULTS AND PARTNERSHIPS

60. Trinidad and Tobago, and its capital city in particular, Port of Spain, offers great prospects for successfully demonstrating how a growing metropolitan region in the Caribbean could make the shift in the current paradigm due to the conventional use of RAC technologies, with the implementation of an alternative path based on more sustainable means of air conditioning and cooling servicing. In accordance with its national policy indicated in the provisions stated in the “*National Climate Change Policy*”, the contributions expected from this UNDP/GEF project should facilitate the implementation of this Policy by taking action in two stages.
61. The first stage will focus on fostering a more resilient policy environment by adopting an integrated approach and coherent strategy for market development of EE gains for RAC end-uses; over the long-run enhancing global environmental benefits and socio-economic co-benefits. This will be done by improving institutional capabilities and inter-governmental coordination, empowering stakeholders, both in the public and private sectors, updating the current regulation for RAC technologies regarding Standards and Labels (S&L), mainstreaming the public procurement of RAC EE equipment and the creation of fiscal instruments and economic incentives.
62. The second stage is to accelerate RAC market transformation towards less energy intensive and low-GWP technologies. The approach will be based in the execution of innovative pilot interventions to demonstrate progress for a change over the business-as-usual paradigm, for policymakers, national power and environmental regulators, project developers, investors and end-users. This alternative path includes more energy efficient RAC systems conventionally used and the innovative District Cooling system (DCS)²¹. The latest is based on central production of cold water, which is distributed to customers (usually a large facility), in a closed loop pipe network. At the customer end of the system, the cooling is transferred to buildings in Energy Transfer Stations (ETS).
63. 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 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/HCFE phase-out RAC technologies and best practices at all levels, from regulators to operators to end users over the long run.
64. 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.

²¹ District Cooling System (DCS) means a system in which chilled water is supplied from one or more central chiller plants to user buildings within the area served by the system through a network of pipes for air conditioning in the buildings.

Component I: Enhance national policy, regulatory and institutional frameworks for sustainable end-use of RAC technologies.

65. The heart of this component is to strengthen the national policy, regulatory and institutional frameworks in order to make the transition to a more energy efficient environment for RAC technologies in which market-oriented goals govern policy, planning, and investment decisions, for both, the short and long term.
66. 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 and 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.
67. The rationale to explain this outcome and the following six closely-interrelated outputs is that without the GEF, the technological transition to low-carbon/HFC phase out will probably progress at a much slower rate. Effectively improving the promotion of commercially driven, alternative technologies in T&T demands appropriate regulations and technical measures necessary to implement innovative EE demand management measures that are foreseen in the following outputs. Developments related to District Cooling technologies cultural change in policy makers and regulators, decision maker behaviour as well as in developing national capacities, would not happen at the desired speed without GEF resources due to policy fragmentation and the lack of technical knowledge.
68. Output 1.1.1: *“Improved inter-governmental coordination for integrated policy making of environmentally-friendly approaches among national public institutions”*. Only with synergies between government policy makers, would there truly be advancement of the various initiatives with respect to protection of the ozone layer and climate change mitigation; in response to one of the critical barriers identified in the overall governance for triggering more sustainable RAC markets in T&T.
69. The following activities will be carried out to achieve Output 1.1.1:
- i. Development of a national policy that synergises the MP, NDC, and CRS engaging all parties from public and private sector regarding decision-making, and propose, as needed, reflecting gender impact guidelines.
 - ii. An analysis of the current building regulations for public and private structures with a view to upgrade them to ensure that building designs are aligned to national standards and practices and thereby promote energy efficiency and to identify any barriers that may need to be addressed to facilitate implementation of RAC energy efficiency applications in public buildings; and a study on the outlook for power market subsidies in T&T on electricity tariffs (commercial, residential), their impact on investment and financial returns for energy efficient RAC applications, and recommendations to improve market development and financial sustainability.

70. Output 1.1.2: *“Strengthened national planning and policy framework for market development of EE gains for RAC end-uses”*. Three AC technologies are being used, all using HCFC/HFC, i.e.: centralized systems, split systems and multi-split systems for major buildings, using HCFC and HFC as circulating refrigerants. The project will support an alternative framework that will lead in twofold: i. assist policy makers in structuring a low-carbon path for RAC technologies, and ii. steer a new market for a very efficient/HFC free zones.

71. The following activities will be carried out to achieve Output 1.1.2:

- i. Develop a national policy for the development of RAC sustainable markets based on high EE rating and low GWP as a core element of the National Cooling Plan.
- ii. Development of Minimum Energy Performance Standards (MEPs) for RAC equipment, including the review of existing energy efficiency/consumption reduction targets for the RAC sector, description of existing Minimal Energy Performance: requirements, enforcement, national testing procedures, and description of existing labelling system: requirements and enforcement.
- iii. Implement an awareness raising campaign for the MEPs developed for the RAC equipment.

72. Output 1.1.3: *“Standards & Labelling (S&L) 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”*. Energy labels and Minimum Energy Performance Standards (MEPS) are recognized by T&T energy and environmental policy makers among the most important ways to influence the market. MEPS are an effective regulatory instrument to drive the increase of product efficiencies. They are very effective policy measures, especially for small RAC appliances, such as refrigerators and air conditioners. The project aimed at implementing the best experience related to the energy labelling of RAC equipment and supporting the proper implementation of a labelling scheme. This goal is in tune with the national policy to enhance the visibility and credibility of the market for labelled products as a means to improve energy efficiency for other end-uses.

73. The following activities will be carried out to achieve Output 1.1.3:

- i. Development and approval of national standards and labelling for EE, RAC equipment, including the implementation of procedures for conformity assessment.
- ii. Development of technical specifications for installation and connection to DCS.
- iii. Establish a MOA for testing, validation and certification of EE RAC equipment, through recognition and partnerships with testing facility duly accredited and authorized for RAC product certification.
- iv. Implementing an awareness raising campaign to enforce S&L for EE RAC equipment including technical specifications for DCS.
- v. Develop a codified system for certification of RAC EE equipment, systems and products (energy efficient air conditioning system) in Trinidad and Tobago.

74. 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”*. The role of the entire public sector is fundamental to trigger an alternative path; in this regard, the project will promote through this output that all public procurement steps for new

RAC equipment should comply with, commercially-drive, the state-of-art high EE, low GWP equipment.

75. The following activities will be carried out to achieve Output 1.1.4:

- i. Analysing the current public procurement system for central and split RAC systems.
- ii. Preparing a procurement system for high EE, low GWP Refrigeration and Air Conditioning systems in the public system.
- iii. Preparing a road map, for making the procurement system mandatory.

76. Output 1.1.5: *“Fiscal instruments and economic incentives for the import of high EE rating RAC equipment with natural refrigerants where applicable, developed”*. This project would catalyse the increased importation of EE RAC technologies by the development and enhancement of existing financial incentives, which promote the usage, and importation of these types of technologies.

77. The following activities will be carried out to achieve Output 1.1.5:

- i. Analysing the current tax system (such as import, value-added and sale taxes) and on-going incentives for infrastructure retrofit and electro-mechanical reconversion, in the commercial and industrial sectors.
- ii. Develop a tax incentive proposal to promote the low-carbon and low-GWP markets.

78. 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”*. In tune with the national energy policy to deploy energy efficient technologies, this output aims at providing training of the stakeholders involved in the project in order to sustain the market transformation in the future. The project will lead to the generation of a very Energy Efficient/HFC free zone, as the absorption chillers will not need refrigerants, leading to a significant reduction in CO₂ emissions. ARIA, UWI and UTT also, in their training programmes will include the best practices related to maintenance of other type of installed RAC systems to ensure optimum air quality, considering particular gender needs of women, men and children in indoor environments.

79. The following activities will be carried out to achieve Output 1.1.6:

- i. Carrying out training programs for officials and practitioners of public and private institutions in EE project development for RAC end-use.
- ii. Carrying out training programs for officials and practitioners of public and private institutions in the design, equipment procurement, and technology transfer, handling procedures, and monitoring performance operation for low-GWP, low-carbon RAC technologies for different end-use applications.
- iii. Carrying out a training program for bank officers and other financiers on life-cycle costs, financial risk analysis, cost-benefit analysis for RAC replacement initiatives.
- iv. Carrying out a training program for the launch of the District Cooling technology under the leadership of the T&T Air Conditioning and Refrigeration Association (ARIA), called *“training the trainees”*. It will be implemented with the assistance of international experts during the

execution of the project and will be continued on a regular basis as part of ARIA's training curricula. The District Cooling program includes the following modules:

- Gathering and analysing data based on technical concepts and the economic and financial model adapted to the country's capacities.
- Technology Production: compression, absorption and free cooling.
- Storage: seasonal and day-and-night storage.
- Distribution and Energy Transfer Stations (ETS): types of distribution systems and connections to large facilities through ETS.
- District Cooling system design: estimate the cooling demand profile.
- Technical Guidelines for connection to DCS, including specifications, DCS connecting design, testing and commissioning and handover of substations, operation and maintenance.
- Guideline for utilisation and optimisation of consumer's air conditioning installation.

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

80. This component will gear the reduction of GHG emissions resulting from the implementation of low-carbon, cost-effective pilot investments over the short term (4 years) and to sustain the alternative structural change over the long term (20 years). This component will also be implemented under the leadership of the Environmental Policy and Planning Division of the MPD in very close interaction with two key stakeholders, i.e.: mainly with the UNDP CO as the implementing counterpart under the National Implementation Modality (NIM), and the Environmental Management Agency (EMA) to assure that all steps of the investment continuum are in compliance with the national environmental regulation. In order to guarantee technology neutrality, the project will consider the best low-GWP technology in order to support innovation and sustainability of the project. This consideration cannot be limited to only CO₂ and hydrocarbons but must give equal consideration to all potential low-GWP alternatives to HCFCs and HFCs. This component will build upon some actions already underway, mainly institutional programs by TTBS on S&L and the feasibility study for the implementation of District Cooling systems; through two expected outcomes.

81. 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, described above, which make policymakers and project developers sceptical towards new RAC alternatives. The project will be supporting this outcome, providing the necessary assistance to project developers and investors in the piloting interventions. These pilot interventions in selected public and private buildings will be executed according to the national policy developed in Output 1.1.2. Outcome 2.1 is expected to be achieved through four outputs:

82. Output 2.1.1: *"Market analysis for RAC replacement initiatives and impacts at the national level carried out"*. This output would provide substantive information to sustain a major market transformation for the growing RAC technologies in the commercial and household sectors. For conventional RAC equipment, the project will focus on light and centralized RAC systems in the

commercial sector, mostly running on HCFC-22 refrigerant. In the residential sector, it will focus on air conditioning light units also using mostly HCFC-22 of the conventional split-type. For District Cooling systems, it is expected that a market transformation will be triggered, as a result of the project, based on the financial opportunities identified during the execution of the PPG, as shown in Table 2. The ProDoc has planned to carry out a detailed market analysis during year 1 of project implementation (Annex A: Multi-year Work Plan).

83. The following activities will be carried out to achieve Output 2.1.1:

- i. Formulating a feasibility study for the triggering, nationwide, a major market transformation for the use of low-carbon, low RAC units in the commercial and household sectors.
- ii. Preparing a data collection and monitoring plan to evaluate performance over time, energy savings, compliance with the S&L regulations and levels of equipment sales.

84. Output 2.1.2: *“In-country technical capacity and backstopping for assembling energy efficient RAC systems has been improved”*. To mainstream innovative knowledge for low-carbon RAC systems, the involvement of large CSOs, such as ARIA, is necessary. Activities under this output will support fresh knowledge to complement current training efforts for RAC technicians and practitioners.

85. The following activities will be carried out to achieve Output 2.1.2:

- i. Development of curriculum for technicians on installation, and maintenance of EE RAC systems.
- ii. Carry out training sessions at both the trainer level and the technician level to build capacity.

86. Output 2.1.3: *“A structure for ensuring that RAC equipment meets international energy efficiency standards through the TTBS established”*. The project, through the PMU, will collaborate with the TTBS and the RAC sector to develop and adopt quality standards that would ensure through the activities of the implementation division of the TTBS, that the RAC equipment being imported meet international standards, which by extension would make them more attractive to consumers.

87. The following activities will be carried out to achieve Output 2.1.3:

- i. Development an inspection regime for EE standards for RAC equipment.
- ii. Sensitization on the new standard through public awareness campaign.
- iii. Training of TTBS on implementation of the new standards.

88. 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”*. The project, through the PMU, will trigger the participation of the financial sector by promoting innovative financial mechanisms for RAC investments, including but not limited to conventional financing, Energy Servicing Companies (ESCOs), shared savings, and guarantee funds; among others. Activities under this output will target both, conventional banking sources and private investment funds actively engaged in green financing at the regional and international level in the Caribbean.

89. The following activities will be carried out to achieve Output 2.1.4:

- i. Provide training to staff of lending agencies for a deeper understanding of analysing the risks, opportunities, returns on loans and the reality of favourable paybacks of EE investments.
 - ii. Provide training to project developers, on investment proposal designing.
 - iii. Development of business cases based on the DCS market approach.
90. 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 project stakeholders sceptical towards new RAC alternatives. The project will be supporting this outcome, providing the necessary assistance to project developers in the piloting interventions. These pilot interventions in selected public and private facilities will be executed according to the investment path developed in Output 2.1.1. This outcome is expected to be achieved through four outputs:
91. 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 and Couva areas in Island of Trinidad)”*. Effective District Cooling solutions have so far not been introduced in the country. Under this output, this project is seen as a way to introduce non HCFC/HFC with substantially improved energy efficiency with a very innovative approach because energy efficient / HFC free zones currently do not exist in T&T.
92. The following activities will be carried out to achieve Output 2.2.1:
- i. Completing the business development phase and preparation of the business memorandum for all stakeholders.
 - ii. Validating the feasibility study and business case for the development of the demonstrative interventions cooling systems, which includes the baseline energy consumption for identified pilots and defining the actual market cooling demand for the project.
 - iii. Preparing a data collection and monitoring plan to evaluate performance over time.
93. Output 2.2.2: *“Implementation of District Cooling pilot at Piarco and Couva”*. The Couva pilot project would introduce of District Cooling by using waste heat from power plants located next to their facilities, owned by the Trinity Power Limited (TPL), whilst the Piarco pilot would introduce conventional chillers, with EE and low GWP technologies. Both pilots aim at demonstrating the technical and financial viability of introducing District Cooling systems. The PPG stage has also considered other potential business interventions, as presented in Table 5, in case the financial and technical decision-making process by project developers of the Piarco and Couva sites is not favourable during the project implementation period.
94. Existing power production units, in this case gas turbines located at Trinity Power Plant, generates also heat that is currently wasted. This heat can be used for cooling purposes by adding heat recovery equipment. With the new absorption chiller technique waste heat from existing sources at the Trinity Power Plant can be converted into cooling energy with only a small supply of electricity. New absorption chillers, cooling towers with auxiliaries for cooling production and heat recovery equipment will supply cooling energy through pre-insulated steel pipes to reach new

Energy Transfer Stations (ETS) located in the selected customer buildings for transfer into the building's internal cooling system.

95. Once the two pilot interventions are completed and under operation during the execution period of the project, the scope to accomplish in this Output 2.2.2 is to develop a set of minimum commercial and technical requirements for District Cooling to:

- i. Drive efficiency upwards and optimize long-term costs.
- ii. Rely on best industrial practice and design standards.
- iii. Review and access the market expected cooling demand.
- iv. Identify the optimal system configuration for the District Cooling systems based on market sector demand, national context as well as national policies.
- v. Estimate the Project Capital Expenditures (CAPEX) due to the equipment needed together with civil, mechanical, and electrical works, management and engineering as well as Operational Expenditures (OPEX).
- vi. Prepare the "Project Business Model" with OPEX/CAPEX/Income of the District Cooling system to be developed during the project implementation period.
- vii. Based on the Business Model, this exercise will serve to develop standardized procurement strategies as well as the District Cooling tariff in order to mainstream this alternative over the long run.
- viii. Identify key success factors and risks.

96. 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"*. The rationale for this output is to continue strengthening the nation's capacities for the RAC replacement considering both, energy efficiency and global benefits of phasing out ODS integrating the different phases of the project continuum targeting both, the public and private sectors.

97. The following activities will be carried out to achieve Output 2.2.3:

- i. Formulating a feasibility study for the triggering a major market transformation for large centralized RAC HCFC-based technologies nationwide, including an impact assessment study for RAC replacement nation-wide.
- ii. Implementing at least three demonstration projects of intensive RAC end-use in the private sector, such as large hotels, private schools and shopping malls.
- iii. Implementing at least three demonstration projects of intensive RAC end-use in the public sector implementing the mandatory procurement of green public goods, such as hospitals and academic facilities.
- iv. Enhancing the capacities of the Refrigerant Recover and Recycling Association (RRRA) to support the recovery and recycling of the retired decentralized, energy-intensive RAC equipment.
- v. Preparing a data collection and monitoring plan to evaluate performance over time, energy savings, compliance with the S&L regulations and levels of equipment sales.

98. 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 sectors triggered”*. RRRA is currently attempting to assist with the compliance to the Montreal Protocol for the recovery and recycling of spent RAC refrigerants, in this regard, the project will continue supporting and enhancing current actions to avoid intentional or unintentional release of refrigerants that may occur during the processing and delivery of gases to the point of final use. For waste metals and electronics of light AC units, the project will convey with RRRA an alternative plan based on its current experience with the refrigerant element.

99. The following activities will be carried out to achieve Output 2.2.4:

- i. Design of an innovative scheme, privately driven, for the recovery and recycling of waste metals and electronics of light AC units, including capacity building entrepreneurial capacities including business modelling and planning), co-financing recovery and recycling facilities, and outreach activities.
- ii. Supporting commercially driven initiatives responsible for recovering and recycling of refrigerants, like building up entrepreneurial capacities (business modelling and planning), co-financing recovery and recycling facilities, and outreach activities.
- iii. Developing a mechanism to collect and record data on the types and volumes of refrigerant recovered by recovery and recycling organisations.
- iv. Establishing a RAC recycling hotline and drop-off points in both islands of Trinidad and Tobago with assistance from RRRA.
- v. Design variants of RAC equipment replacement or early retirement fully documented and made publicly available.

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

100. This component has been established for project monitoring and evaluation (M&E). It includes the design of an awareness raising campaign and information strategy and a programmatic monitoring of project global indicators (GEF Core Indicators 6.1, 6.3), together with a review of on-going, activities to ensure successful project implementation in accordance with UNDP and GEF procedures. The Project Management Unit (see Section VIII below on Governance and Management arrangements for detailed information) will design the project’s M&E system and will be responsible for implementing the project’s M&E plan, including the project’s inception workshop and annual planning workshops.

101. 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. This outcome is expected to be achieved through two outputs:

102. 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”*. Information outreach for the citizens, as main beneficiaries of the project, is critical to sustain the project’s interventions over time. Cost-efficient innovations will be documented for the public as well as for specific audiences, as the project develops.

103. The following activities will be carried out to achieve Output 3.1.1:

- i. Preparing an impact assessment study for RAC replacement nation-wide.
- ii. Designing variants of RAC equipment replacement or early retirement fully documented and made publicly available.
- iii. Carrying out technical workshops to socialize with policy makers, RAC traders and importers, large end-users and the academia, the main findings of this study.

104. Output 3.1.2: *“National capacities for the public and private sectors for calculations and monitoring of global impact indicators enhanced”*. This output seeks to build the capacity of the both the public and private sectors stakeholders on the collection, calculation and monitoring of global impact indicators and related information. The information collected and provided by these stakeholders would be added to the MRV and inform policymaking and decision-making activities.

105. The following activity will be carried out to achieve Output 3.1.2:

- i. Provide training to the public and private sectors in collaboration with the EPPD of the MPD, in support of data collection for the MRV. For DCS, national capacities would be enhanced considering the global benefit of using waste heat generated by thermal power plants, with key stakeholders in the RAC sector.

106. 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 (Section VI).

107. Output 3.2.1: *“Design and implementation of a module for data collection on GHG and HCFC/HFC emissions by residential and commercial buildings integrated with the national MRV system (including the consolidation of relevant indicators)”*. The project through the PMU in collaboration with the EPPD of the MPD will design a module for data collection that integrates into the MRV systems with a focus on collecting data related to GHG and HCFC/HFC emissions, which would be used for reporting to the respective conventions and inform policy development.

108. The following activity will be carried out to achieve Output 3.2.1:

- i. Design of a module for data to be collected and recorded in the knowledge management system under the MRV system, adapted to the different cooling capacities of the most commonly used systems.
109. 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)”*. This output includes close monitoring of the Project Risks matrix described in Table 8 and validating mitigation measures to reduce those unexpected risks. The project, through the PMU, will give special attention to the compliance of national legislation as per the EMA Act No 3 of 2000, Chapter 35:01 enforced by EMA during the implementation of the pilot investments, as per Annex G: Environmental and Social Management Plan (ESMP). For the DCS pipeline installation, Trinidad and Tobago has developed strong environmental measures due to the existing oil and gas industry that has well established environmental protocols.
110. The following activity will be carried out to achieve Output 3.2.2:
- i. Implementing a program for monitoring and evaluation (M&E) of social and environmental risks in order to comply with the national environmental legislation.
111. Output 3.2.3: *“Monitoring of project progress in compliance with UNDP and GEF guidelines”*. This output includes monitoring of outcomes, outputs, activities, budget and monitoring in accordance with UNDP and GEF procedures and the guidance of this ProDoc and its annexes. The project –through the PMU- will deliver each year to UNDP the Program of Activities and the procurement plan in order to guarantee Annual Spending Limits (ASLs) assurance.
112. The following activities will be carried out to achieve Output 3.2.3:
- i. Carrying out “at least one meeting of the National Steering Committee held every six months”. The Project Management Unit (PMU), in coordination with the DGTPH, will organize these biannual meetings to guarantee successful project implementation in accordance with UNDP and GEF procedures.
 - ii. Implementing a program for monitoring and evaluation (M&E) of project results in order to inform adaptive management of the programme and improve the implementation of the project, in accordance with the UNDP management procedures.
113. Output 3.2.4: *“Carrying out of project progress report(s), including PIRs, Mid-term Review and a Terminal Evaluation”*. Progress reporting is an essential activity of project and would be the responsibility of the UNDP and the PMU. Annual reports on progress against budget, schedule and scope would be carried out.
114. The following activities will be carried out to achieve Output 3.2.4:
- i. Carrying out “Annual progress reports in accordance with the established monitoring plan agreed in the ProDoc”. The National Project Manager will prepare annual Project Progress Reports (PPR) and will provide inputs to the UNDP-CO for preparing the annual Project Implementation Report (PIR). These reports will include the Project Results Framework with outcome indicators, GEF Core Indicators, baseline and annual target indicators, monitoring of

the Project Risks matrix, and identifying potential risks and mitigation measures (see Section VII for further details).

- ii. Carrying out the “Mid-term review –MTR-”. The MTR will be carried out two years after project start-up, at the latest, and will assess the progress of each project activity and attainment of the project’s indicators presented in the Project Results Framework (Section V) and Multi Year Work Plan (Annex A). This evaluation will also assess the disbursement of financial resources and co-financing provided by project partners, and it will monitor and assess administrative aspects for the execution of the project. The Mid-Term Review (MTR) will also inform the adaptive management of the project and improve its implementation for the remainder of the project’s duration.
- iii. Carrying out the Terminal Evaluation (TE). The TE aims to evaluate whether all planned project activities have been developed, resources granted by the GEF have been disbursed and spent in line with GEF and UNDP policies and rules, and in accordance with the activities as set-out in this Project Document (ProDoc). The Terminal Evaluation will also extract and identify lessons-learned, how to disseminate them most efficiently and make recommendations to ensure that project results become sustainable.

115. Table 6 summarizes the three components described above, as well as the outcomes and outputs of each component:

Table 6: Project components, outcomes and outputs

Project Objective:		
Project Component	Project Outcomes	Project Outputs

<p>I. Enhance national policy, regulatory and institutional frameworks for sustainable end-use of RAC technologies.</p>	<p>1.1 The national policy, regulatory and institutional frameworks for Energy Efficiency (EE) gains for RAC technologies have been strengthened.</p>	<p>1.1.1 Improved inter-governmental coordination for integrated policy making of environmentally friendly approaches among national public institutions.</p> <p>1.1.2 Strengthened a national planning and policy framework for market development of EE gains for RAC end-uses.</p> <p>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.</p> <p>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.</p> <p>1.1.5 Fiscal instruments and economic incentives for the import of high EE rating RAC equipment with natural refrigerants where applicable, developed.</p> <p>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.</p>
<p>II. Accelerate RAC market transformation towards less energy intensive and low-GWP technologies.</p>	<p>2.1 Investment path along the RAC market chain enhanced.</p>	<p>2.1.1 Market analysis for RAC replacement initiatives and impacts at the national level carried out.</p> <p>2.1.2 In-country technical capacity and backstopping for assembling energy efficient RAC systems has been improved.</p> <p>2.1.3 A structure for ensuring that RAC equipment meets international energy efficiency standards through the TTBS established.</p> <p>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</p>

	2.2 Investment portfolio on replacement of energy intensive technologies implemented.	<p>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).</p> <p>2.2.2 Implementation of District Cooling concept at Piarco International Airport and the University of T&T.</p> <p>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</p> <p>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.</p>
III. Information outreach and Monitoring & Evaluation (M&E) implemented.	3.1 An information strategy to share knowledge gained, lessons-learned and best practices developed.	<p>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.</p> <p>3.1.2 National capacities for the public and private sectors for calculations and monitoring of global impact indicators enhanced.</p>
	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.	<p>3.2.1 Design and implementation of a module for data collection on GHG and HCFC/HFC emissions by residential and commercial buildings integrated with the national MRV system (including the consolidation of relevant indicators).</p> <p>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).</p> <p>3.2.3 Monitoring of project progress in compliance with UNDP and GEF guidelines.</p> <p>3.2.4 Carrying out of project progress report(s), including PIRs, Mid-term Review and a Terminal Evaluation.</p>

116. By project closure, it is expected that from an investment standpoint, innovation embrace a multilevel governance approach to scale up District Cooling, CCHP and more efficient de-centralized

RAC investments in Trinidad and Tobago. It is also estimated that the project will enable the conditions to integrate national policies on climate change with low-emission, energy efficiency air conditioning technologies with low-GWP alternatives. The aggregation of these initiatives - endorsed politically at the highest level- will result in a set of actions that are likely to create positive local impacts and large environmental benefits over the long run, and having a full transformative impact on the RAC markets of the country and the overall Caribbean region.

Partnerships:

117. To achieve the planned outcomes, the project needs to get a variety of stakeholders involved: national policy makers (mainly MEEI in energy efficiency and MPD in HCFC phase-out), primarily interested in achieving the project’s overarching objective of development by accomplishing the necessary implementation of national policies, in accordance with the mandates of the corresponding conventions signed by the country as well as reporting the environmental benefits to the GEF, regulators in charge of institutional and regulatory reforms (RIC and EMA, respectively), public utilities (like T&TEC) dedicated to become a greener public corporation, technological civil society organizations (CSOs) and academic stakeholders (TTBS, UTT, ARIA, and RRRRA), private sector players (private chambers, local and regional investors and project developers), participating also with a gender equality approach and the cultural change needed to achieve the project’s objective.

118. Alliances will be established with the corresponding municipal authorities of the urban areas where the pilot projects will be implemented, based on workshops and awareness-raising meetings that will be held with local authorities and beneficiaries.

119. In short, the implementation of this project requires the active participation of several partners. Responsibilities of these partners in the project’s implementation as well as initiatives supported by these partners in addressing the project’s development challenge are presented in the Table below²².

Table 7: Partnerships of the project

TYPE	STAKEHOLDER	ROLE
National Government	Ministry of Planning and Development (MPD)	The MPD, the project’s Executing Entity, as the focal point of the UNFCCC and the Montreal Protocol, is the lead public partner responsible for development, detailed design and execution of the project, and as such, member of the Project Steering Committee. It is also responsible for liaison work with the other ministries and public agencies; the Project Management Unit (PMU) will be located in their premises.
	Ministry of Energy and Energy Industries (MEEI)	The MEEI is in charge of enforcing the country’s energy policy and planning. In this regard, its role in promoting fiscal instruments for triggering alternative RAC technologies is central to the main objective of the project through its Energy Research and Planning Division. The MEEI will be also an official member of the Project Steering Committee.

²² See Figure 2 “Project Organization Structure”, Section VIII below for further details.

	Ministry of Trade and Industry (MTI)	The MTI is a key stakeholder in the implementation of the Montreal Protocol through the licensing system of refrigerants and refrigeration equipment. It grants import and export permits and as such closely regulates what can come in and out of the country. MTI will be also an official member of the Project Steering Committee.
	Ministry of Finance (MOF)	The MOF is in charge of fiscal appropriations of Government funds for various projects and programmes such as climate change, energy efficiency and any other related programmes inclusive of environment. The MOF currently in its legislation is responsible for any tax incentive to be identified and implemented for any initiative under the project, including tax exemptions and other fiscal measures.
	Trinidad and Tobago Bureau of Standards (TTBS)	The TTBS is a crucial partner to monitor the import of ODS-dependent equipment and national labelling standards for refrigerants. The primary role of TTBS is to develop, promote and enforce energy efficiency standards and labelling in order to improve the quality and performance of RAC technologies used in the country, based on minimum energy performance indicators and testing procedures.
Public agencies	Environmental Management Authority (EMA)	EMA is a statutory body established by the Government of the Republic of Trinidad and Tobago in June 1995 under the Environmental Management Act 1995, which was later repealed and re-enacted as the Environmental Management Act Chapter 35:05. The role of EMA in the project is to provide guidance and surveillance for compliance with national environmental regulation, in particular, issues and concerns related to the development of large RAC systems such as the District Cooling system as well as with the standards and guidelines on safety transportation, handling and use of natural refrigerants.
	Trinidad and Tobago Airports Authority	This public agency manages the Piarco International Airport, which has become a major air transportation facility in the Caribbean region. It is made up by two terminals: the North Terminal inaugurated in 2011 is dedicated to the commercial passenger movements and the South Terminal, which is a 24-hour servicing cargo facility. Both demand a permanent cooling load based on a large chiller system with a cooling demand of 2000 tons, which makes this facility a top priority for developing a District Cooling system during the execution of the project.
	Trinidad and Tobago Electricity Commission (T&TEC)	The T&TEC is the single power utility servicing the whole country and the largest utility in the entire English speaking Caribbean. Its role is to participate in the project as a key leading actor for the sustainable management of the demand side, in particular, supporting the change in the existing paradigm for appropriate RAC technologies and business models for electricity end-users.
	Regulated Industries Commission (RIC)	RIC regulates public sector services (water, wastewater and electricity) and represents the interests of consumers. RIC will participate in the project in setting up appropriate tariffs for upcoming cutting-edge technologies, such as the District Cooling system.

	University of Trinidad and Tobago (UTT)	The UTT is a state-owned university established in 2004. There are several campuses located throughout the country with a diverse range of disciplines taught. The <i>Couva Point Lisas</i> Campus is known as the energy campus; as it looks at renewable energy and energy efficiency major initiatives. The UTT could also serve as an important pilot intervention for the District Cooling Development.
CSOs	Air Conditioning and Refrigeration Association (ARIA)	As a Civil Society Organization, ARIA will support in-country capacity building activities to enhance technical capacity for assembling and manufacturing of low-carbon, low-GWP RAC alternatives as well as on safety transportation, handling and use of low-GWP/HCFCs alternatives. ARIA plays a key role during the execution of the project and afterwards a long-established training centre to serve both, public and private interests.
	Refrigerant Recovery Recycle Association (RRRA)	RRRA is a non-profit organization formed to encourage and support all stakeholders involved in the protection of the Ozone Layer and reducing Global Warming. Its main role in the project will be to assist in the recovery, recycling and final disposal of refrigerants.
	T&T Chamber of Industry and Commerce	This CSO will bridge the interest of the private sector, mainly wholesale traders of RAC equipment and importers and retailers, with key public stakeholders, mainly MPD and MEEI, to foster a sustainable business strategy for low-carbon, HCFC phase-out alternatives. It participates in the execution the National Carbon Reduction Strategy initiative. This Chamber is an active player representing also the interests of investors, real estate developers, owners and operators when the investments have attractive returns and on top of provide good environmental benefits, improve corporate social responsibility and green profile.
Private sector	Edan K Properties Limited	This private property management and real estate firm is the owner of the Point Lisas Industrial Business Park. Their proximity to the UTT Point Lisas campus and the TPL Power Plant make it ideal for them to be considered as a potential off-taker of both district cooling and heating to supply their tenants and customers.
	School of Refrigeration and Air-conditioning (SORAC)	The School of Refrigeration and Air-conditioning (SORAC) is a private institution formed in 1993 with its focus being the training Refrigeration & Air Conditioning (RAC) Technicians at the craft level. The institute provides theoretical & practical training, and has trained over one thousand craftsmen in this field. Since this institute has twenty-five years' experience in the educational field they would be a welcomed partner for the development of the capacity building activities of the project with respect to installation and maintenance of DCS technologies.
	Caribbean Airlines Limited (CAL)	Caribbean Airline Limited is an airline that operates on the compound of airports authority. They occupy bonded areas and offices on the compound, which are cooled with upwards of 120 mini-split units, as quoted by their operations manager. Their proximity to the Piarco Airport main terminal makes them a

		potential off taker of the DCS, which would improve their energy consumption, and thus reduce their operations cost.
	Caribbean Basin Sustainable Energy Fund (CABEF)	CABEF is a venture capital fund that invests in clean energy and energy efficiency projects and companies in the Caribbean Basin. Sustainable Energy Central America and Sustainable Energy Caribbean (SECA) act as Investment Advisors of CABEF. CABEF has indicated a strong interest in the project and is willing to play an important role in providing investment capital to assist with funding pilot project related activities and fund scale-up actions.
	Trinity Power Limited (TPL)	This large private contractor supplies power to T&TEC the single electric power utility on the Island of Trinidad. It plays a key role in providing relevant information to explore the potential to promote the use of District Cooling in the country.
	Energy Dynamics Ltd (EDL)	This is a local engineering firm with experience of District Cooling and absorption technology. EDL is a Trinidad based Energy Service Company (ESCO) with projects and operations undertaken throughout the English speaking Caribbean and the Dominican Republic. It will play a significant role in catalysing the required market change towards energy efficiency in the RAC sector focusing on the development of the District Cooling and Combined Cooling Heating and Power (CCHP) pilot investments.
UNDP	Implementing agency	UNDP T&T CO will be responsible for the overall implementation of the project under the National Implementation Modality (NIM), as well as for its overall management, under the leadership of a National Project Manager.
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.	

120. There are a few GEF- financed projects in T&T currently under implementation, which could provide some additional support to strengthening this institutional partnership approach: in 2016, the UNDP started the UNDP/GEF project “*Third National Communication and the First Biennial Update Report (BUR) of Trinidad and Tobago to UNFCCC (3CN-1BUR)*”. Considering the relevance of energy efficiency to the whole country for T&T’s GHG emissions, and the involvement of some of the institutional partners in all of them (MPD, MEEI, EMA), it seems likely that mutual benefit would be achieved by their interaction.

Risks and Assumptions:

121. A group of risks has been identified and must be taken into account during the execution of the project. As per standard UNDP requirements, the National Project Manager will monitor risks quarterly and report on the status of risks to the UNDP Country Office (CO). The UNDP Country Office will record progress in the UNDP ATLAS risk log. Risks will be reported as critical when the impact and probability are HIGH (i.e. when impact is rated as 5, and when impact is rated as 4 and probability is rated at 3 or higher). Management responses to critical risks will also be reported to the GEF in the annual Project Implementation Report (PIR).

122. The key risks that could threaten the achievement of project results have been summarized in Table 8 below. In addition, social and environmental risks identified in the SESP (Annex F) are included in the UNDP Risk Log in Annex J.

Table 8: Project Risks

Project risks					
Description	Type	Impact & Probability	Mitigation Measures	Owner	Status
1. The project's pilot actions with the implementation of the District Cooling technology using fresh water cooling (like sea water) to operate this sort of centralized system, may result in negative impacts on the flora and fauna near the exhaust of the cooling plant due to the excess of hot water, a context that poses additional challenges for maritime habitats or environmentally sensitive areas.	Environmental	The City of Port of Spain, particularly the coastal area where the large financial and commercial areas are located has a high demand of cooling systems but water-drainage issues, with a potential to mix the exhaust flows from the cooling plant with the sea water, threatening the sea life in this surrounding area. This situation has worsened in recent years with the higher frequency of heavy rains due to storms and hurricanes. P = 2 I = 4	The PPG phase has acknowledged this environmental risk and search for a mitigation path following international best practices. The pilot site for the proposed cooling plant for the Piarco International Airport, first of all, will be located far away from the coastal area, as it is indicated in the preliminary layout developed by the international consulting firm DEVCCO (please, refer to Annex K). In addition, the design has taken into consideration the impacts of extreme climate events following the ASHRAE international specifications for District Cooling in coastal areas. Besides the proposed pilot interventions, the project will ensure that over the long run, compliance with the national environmental regulations (EMA Chapter 35:05) will be enforced considering that the District Cooling technology chosen for T&T is of least impact to the environment.	MPD	No change
2. Replacement of old RAC equipment and refrigerants can generate waste and ODS that must be discarded accordingly.	Environmental	The replacement of metallic and electronic elements of the inefficient RAC systems would generate both waste metals and refrigerants which can have adverse effects on the environment. The refrigerants discarded from replacement activities can further threaten the global	The PPG phase has identified this risk and takes it on-board during the planning phase. The project has established an integral partnership with the RRRRA in order to mitigate this risk, through their commitment to co-financing in kind all activities related to the recycling, and recovery of spent RAC equipment, which is in line with the association's mandate.	MPD RRRA	Reducing

Project risks					
Description	Type	Impact & Probability	Mitigation Measures	Owner	Status
		environment once not properly contained. P = 5 I = 3	This would be implemented by the establishment of a recycling hotline and drop-off points in both islands. With this specific risk in the national context, the project will ensure that the activities are in compliance with the national environmental regulations enforced by Environment Management Authority (EMA).		
3. During the formulation of the project, concerns have been raised in terms of gender, which should be taken into account in the implementation of the project, especially regarding participation in design and implementation or access to incremental benefits.	Social	National cooling policies and projects are very gender sensitive since women and seniors are more affected by sudden indoor changes in temperature. This project has stated the gender equality perspective in the outputs and activities, especially related to the need to enforce women role in the design and operation of RAC systems. P = 2 I = 2	As a GEF 6 project, the PPG phase carried out a gender analysis, which will be crucial to understand the current baseline and enhance the integration of women specific needs in the appropriation of alternative RAC technologies, as clearly presented in Annex 9: "Gender Analysis and Action Plan". The project also takes benefit of the alternative approach to accelerate the integration of women in what has thus far seen as a male-dominated working environment. By the implementation of this project, opportunities for increasing women participation in the training activities carried out by ARIA, leading to increased employment within the RAC market.	MPD	No change
4. Biological factors — notably size and physiological differences between women and men and between adults and children — influence susceptibility to health	Social	In daily life, men, women, and children are exposed to different kinds of chemicals, in varying concentrations that can cause adverse health issues and reduce performance in indoor environments. P = 3 I = 3	The project will enforce that the specifications for alternative RAC systems take into consideration the ASHRAE international standards for design as it relates to air quality of install RAC systems. ARIA would also include the best practices as it relates to maintenance of installed RAC systems, in their training programmes, to ensure optimum air quality, considering the needs of women, men and children.	MPD	No change

Project risks					
Description	Type	Impact & Probability	Mitigation Measures	Owner	Status
damage from exposure to chemicals and poor air quality, including those used as refrigerant fluids in RAC equipment.					
5. Incremental technical capacities among ozone depleting substance (ODS) and energy policy makers are not effectively neither timely implemented, limiting the synergies that would advance the country's commitments with the Montreal Protocol and the Nationally Determined Contribution under the UNFCCC.	Organizational	Commercially driven alternative RAC technologies can be enhanced with an improved inter-governmental coordination amongst key policy makers (e.g. MPD, EMA, MEEI) but in the absence of key synergies the market change towards low-carbon alternatives will be delayed. P = 1 I = 3	Improvements in the current institutional framework have been identified during the PPG stage. These alternatives have been fully discussed and respond to the implementation of the "Climate Change Policy" and the "National Cooling Plan". In addition, the selection of most promising pilot interventions has been a key input to this ProDoc during the PPG and validated with policy makers and private developers.	MPD	Improved
6. Market driven pilot investments are not effectively implemented, which limits the required take-off of low-carbon energy efficient technologies which causes	Financial	Target investors could see conventional RAC technologies and their current pricing structure as more attractive and low risk than the proposed low-carbon energy efficient technologies and based on market factors would choose not to fund projects that involve the new RAC technologies. P = 3 I = 3	The project during the PPG phase has approached and validated the pilot investments, especially for the district cooling as indicated in Annex K, with committed developers, such as the Airports Authority's senior management team and acquired their commitment to advance to the pre-investment and final design stage of the DCS pilot. At the PPG phase, the technical consultants (DEVCCO) assessed the feasibility of the DCS pilots and	MPD AATT	No change

Project risks					
Description	Type	Impact & Probability	Mitigation Measures	Owner	Status
a limited access to senior financing to create sustained innovation within the RAC sector.			developed business cases to support successful implementation, reducing the perceived risks to investors. For decentralized / splits the project has considered an awareness raising campaign and information strategy following the "National Cooling Plan".		
7. Updating current standards for A/C systems and changes in regulations are not agreed or implemented in a timely manner.	Regulatory	There is strong political will favouring low-carbon energy efficient RAC alternatives based on existing commitments to the global environmental conventions. The consensus is weakened by the BAU RAC investors regarding the lack of market awareness to cost effective, environmentally friendly alternatives. P = 3 I = 3	The project has identified two mitigation measures: • The update of the standard the standard (TTS 76: Part 20, 2015 - Requirements for labelling of refrigerant containers) will use a collaborative approach including member of academia, public and private sectors under the leadership of the TTBS. • The data collected on GHG and HCFC/HFC emissions as part of the overall MRV plan will be used to inform the update and creation of new national standards to be developed and implemented by the TTBS.	TTBS	No change

123. Climate change risks are associated with the vulnerability of project outcomes to the potential impacts of climate change, mainly related to the occurrence of extreme weather events, most likely recurrent floods affecting urban infrastructure due to the path of tropical storms. The implementation of the pilot interventions will consider, since the planning stage and the design phase the climate prevention measures, in accordance with the enforced environmental regulation mainstreamed in the country. The PMU, with assistance from the Ministry of Planning and Development (MPD), will provide essential information that supports the design of major cooling facilities considering appropriate preventive and reactive measures for each extreme climate event. These reactive measures are already defined in the guidance documents for any Environmental Impact Assessment process in the country. In this regard, the increasing knowledge on these innovative cooling systems generated during the project execution will strengthen coherence and convergent management to reduce CO2 emissions, should extreme weather events occur.

124. Environmental and social risks mentioned above have been discussed with the executing partners and with a variety of stakeholders through the workshops held during the PPG²³. These risks were discussed and were analysed in the "Social and Environmental Screening Procedure"

²³ Please, refer to Section 3 of the "Stakeholder Engagement Plan", in Annex H.

(SESP, Annex F) and the ones rated as MODERATE have been reviewed in more detail within the “*Environmental and Social Management Plan*” (ESMP, Annex G).

125. Reduced resilience of the potential outcomes of the Project due to potential impacts of extreme climate change-related risk events as a SIDS country, like thunderstorms and heavy rain. The project design has addressed this challenge with two main avoidance actions: the first one refers to project Outcome 2.2 on selecting the sites for the innovative District Cooling pilot interventions in order to avoid the negative impacts on the flora and fauna near the exhaust of the cooling plant due to the excess of hot water. National institutional capacity, through the project, will be enhanced to identify cost-efficient pilot measures to gain robustness. The second one refers to the close project collaboration with EPPD of MPD to strengthen national capacities with the methodologies developed by T&T in facing extreme climate-change related events, in particular floods due to storms and hurricanes. This risk has been assessed as MODERATE, given the high probability of occurrence of these types of events on this Caribbean Island.
126. Another environmental risk is associated with the replacement of the old and inefficient RAC equipment, which can generate solid waste and ODS. In fact, mitigation options within the project will include recycling, which is a key element in the waste management directives of T&T. The actions for implementing this policy are described in Annex 7 “*Environmental and Social Management Plan (ESMP)*”. Although the expected number of RAC waste involved in the pilots is relatively low enough to pose no environmental hazard during the lifetime of the project, an adequate regulatory and management solution has to be envisaged for the future. Accordingly, this risk is therefore assessed as MODERATE.
127. On the other hand, the waste of HCFC refrigerants has been fully considered in the design of this project. T&T has developed a learning curve in this aspect with heavy involvement of the Refrigerant Recover and Recycling Association (RRRA). Under the leadership of the MP and technical participation of the RRRA, HCFC refrigerants would be recovered and stored until they can be disposed of, ensure secure containment and reducing the risk of release into the atmosphere.
128. It cannot be fully discounted that social and environmental grievances will not arise during project implementation. The following channels will be used by the project:
- i. Public Consultations in accordance with the Environmental Management Act, Chapter 35:05 and the Certificate of Environmental Clearance Rules that are the guidance documents for any EIA process in the country.
 - ii. Consultations with the relevant stakeholders to gather information/feedback/input to inform the preparation of a revised national planning and policy framework for market development of EE gains for RAC end-uses.

Stakeholder engagement plan:

129. A stakeholder engagement plan was undertaken in order to identify key stakeholder institutions and relevant beneficiaries to be involved in the project implementation process. Annex H describes the process of assessing the project's key stakeholder's interests and the ways in which these stakeholders may influence the project's outcomes. This Plan is important because it enhances local

ownership, strengthens project integrity and design, and helps to create foundational relationships that may contribute to constructive problem solving if difficulties or challenging issues arise.

130. The “*Stakeholder Engagement Plan*” seeks to strengthen UNDP 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. This Plan follows the Guidance Note UNDP Social and Environmental Standards (SES). For regulations and requirements in Trinidad and Tobago, public consultation and disclosure requirements related to the social and environmental assessment process is a key element of public policies overall, as a guiding process to execute the Environmental Impact Assessment (EIA) required by EMA. Thus, given the policy context and regulatory framework in which the project will be implemented, there is no risk that project interventions will exclude potentially affected stakeholders from fully participating in decisions that may affect them.

131. The EIA refers to the rationale to the Environmental Management Act, Chapter 35:05, as a process of identifying, predicting, evaluating and mitigating the biophysical and other relevant effects of development proposals. EMA considers an EIA crucial to its decision making when determining whether or not a project can operate without severe environmental consequences. The process provides an opportunity for all stakeholders, including the public, to participate in the identification of issues of concern, practical alternatives, and opportunities to avoid or mitigate adverse impacts²⁴. This process considers holding public consultation/public engagement strategies, which will depend on the application at hand and the circumstances surrounding the application, such as the case of the District Cooling pilot investments. The objective of the public engagement strategy is to ensure that meaningful consultation takes place in a transparent and effective manner.

132. A diverse group of stakeholders was engaged during the project preparation stage and their roles clearly stated during its execution, as described in Annex H. Stakeholders are 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. This Annex also provides an overview of stakeholder interests, importance and influence on project outcomes. Transversally, from the gender perspective, the *Stakeholder Engagement Plan* provides an overview of stakeholder interests, importance and influence on project outcomes or operations that were validated at the PPG stage through a participatory exercise with stakeholders. Finally, this Annex includes a grievance mechanism, a process by which people concerned with or potentially affected by the project can express their grievances for consideration and redress will be geared directly to EMA, as stated in the Environmental Management Act, Chapter 35:05.

Gender equality and empowering women:

133. The project will promote equal benefits to women and men of increased low-carbon RAC technologies and energy efficiency as well as encouraging women to become energy entrepreneurs by building their capacity to be an integral part of sustainable energy solutions in their working environments. Annex I describes the process of assessing the gender challenges for the project and how these may influence the project’s outcomes.

²⁴ EMA: Environmental Impact Assessment, FAQ, “*A Guide to the Environmental Impact Assessment (EIA) Process*”.

134. The project has developed a strategy that links the most important gaps identified in relation to its components, the country's reality in terms of equality and the SDGs, particularly SDG 5. The gaps identified in the analysis and which are considered in the strategy include parity in decision-making spaces around energy efficiency, HFC phase-down and improvement of women's income and livelihoods. These gaps require the strengthening of institutional capacities to promote equality between women and men in a structural manner. The specific data of the Ministry of Gender and Youth Affairs were analysed, and several events were held with local stakeholders to develop the best strategy for the project, as described in Annex I.
135. For this purpose, and in accordance with the proposed gender strategy:
- Each activity was analysed to include the necessary elements to guarantee the reduction of identified gaps and establish more pro-active actions when appropriate.
 - Specific activities that focus on the empowerment of women have been included (capacities, and access to planning and decision-making processes).
 - Two indicators have been included to help measure progress in this field and will be monitored as part of the M & E process²⁵.
 - A budget has been included to guarantee the measures and actions to be taken. The strengthening of the project team's capacities is planned to ensure the adequate mainstreaming of the gender perspective into all project activities.

South-South and Triangular Cooperation (SSTrC):

136. Considering the growing concern of climate change impacts in the Caribbean basin, there are promising opportunities for getting this project actively engaged in South-South and Triangular Cooperation (SSTrC) and strengthening worldwide cooperation for the achievement of the Sustainable Development Goals. The GEF, the Multilateral Fund for the implementation of the Montreal Protocol and UNDP are promoting the use of more energy efficient systems in the AC sector as well as the concept of District Cooling as a mean to reduce the use of high GWP refrigerants.
137. Developing the potential of more efficient RAC technologies and the implementation of business models for District Cooling, in particular for an oil-producing country like T&T can furnish, along the SSTrC, the kind of cooperation that improves infrastructure, transfers technology, promotes regional integration, and benefits citizens of all the other Caribbean countries.
138. Therefore, networking efforts will be developed at two levels during the four years of project execution: UNDP/GEF project-to-project (through a screening of similar on-going projects and selection of those that are closer in their innovative approaches to this initiative) and project-to-region wide platforms by getting into contact with key energy efficiency-related initiatives active in this region. As one of the four founding members of the Caribbean Community (CARICOM) whose main objective is to promote economic integration and cooperation among its members, to ensure that the benefits of integration are equitably shared, T&T will incorporate elements of this initiative and actively participate with its knowledge exchange in disseminating the District Cooling technology through the Regional Building Energy Efficiency Project (BEEP), a programme to improve the use of

²⁵ Please, refer to Section VI: Indicators 3 and 4.

energy in buildings across the region with technical assistance from the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ).

139. Trinidad and Tobago Bureau of Standards is actively involved at the regional level in the development of a series of regional standards for energy efficiency including the labelling of energy efficient RAC technologies. The Caribbean Regional Organisation for Standards and Quality (CROSQ) is facilitating this activity related to the development of these standards. Under this project and in line with the South-South and Triangular Cooperation, it intends to encourage the harmonization of MEPS among other Caribbean countries with similar usage and energy cost conditions across the same product categories can help with verification and compliance. Harmonized measurement standards facilitate the work of market surveillance authorities because only one test is required and used across different markets, hence avoiding test duplication.
140. UNDP/GEF is currently involved in another energy efficiency-related project under implementation in the LAC region. This offers unique opportunities for the networking of project teams, exchange of practices and common dissemination actions in a different sub-regional context in Latin America, which could offer some synergistic opportunities with this project. The most promising area for SStrC is probably the implementation of the UNDP/GEF MSP, which will open up additional prospects for SStrC worthy of exploration in the medium term. The UNDP/GEF FSP #9038. *San Salvador Low-emission Urban Development Path*. This project will bring about opportunities for greater efficiency, integrated planning, and increasing returns on low-emission public investments, specifically in energy efficiency, including policy, planning, and implementation, in the Greater Metropolitan Area of San Salvador, the capital city of El Salvador. Specifically, this project will implement capacity building for the establishment of sustainable urban development programs and information systems in the metropolitan municipal system, including energy audits and S&L enforcement by means of toolkits, training courses, and workshops. It will also create a mechanism to increase financial flows to low-carbon investments on urban financing, such as energy efficient technologies.
141. The UNDP/GEF Regional Hub will facilitate SStrC under this CC GEF Program by two means; in order to give consideration to the growing number of energy efficiency projects as well as to enable the conditions and sustaining results in LAC, i.e.: i. continuously promoting information sharing among the two projects being implemented and prepared already in the portfolio, and ii. organizing workshops, webinars or side events at conferences and seminars dedicated to low-emission RAC technologies, with special attention to District Cooling and CCHP systems in LAC.

Sustainability and Scaling Up:

Sustainability

142. For the global environment, the strategy of the project for greater results is intended to seize opportunities for higher impact through three manners:
 - i. a sharper focus on the drivers of market inefficiencies for energy efficient/low-carbon RAC technologies in order to bear on a sustainable basis a growing demand in all sectors of the economy;

- ii. integration to harness synergies across the public sector and between a more sustainable policy environment in order to enhanced efforts to mobilize investments for highly efficient, very low-carbon cooling technologies, such as District Cooling.
 - iii. this innovative cooling technology will also reflect the fact that many Caribbean countries face the same challenges. This project will generate significant lessons that can be amplified in the whole region increasing the potential to deliver significant global environmental benefits (GHG emission reductions).
143. At the national level, Trinidad and Tobago, as a large gas-producing country, mainly uses Compressed Natural Gas (CNG) for power generation. Enhancing the use of energy efficient will support the growing for RAC equipment and will provide greater energy security for the future. This is in tune with its commitments under the UNFCCC: to formulate, implement and regularly update national programmes containing measures to mitigate climate change.
144. The strengthening of the public policy context proposed by this project is characterized as consistent with long-term strategies state on its National Climate Change Policy effective since 2011. Furthermore, the Nationally Determined Contributions (NDC) for the country, prepared in 2015, aims at reducing the intensity of CO₂ emissions compared to GDP of 25% by 2030, based on 1990 levels. This commitment also includes the modernization and technological development of the country on a sustainable basis as well as a strengthening of the national capabilities, like the current high growth in CO₂ emissions in the RAC sector.
145. Trinidad and Tobago has signed and ratified the Montreal Protocol and all the subsequent amendments. The country has been a vocal supporter of the Kigali Amendment on HFCs, and has played an important role in the Caribbean to move an HFC agreement forward in recent years. As an oil and gas producing country, most of the electricity production comes from fossil fuels and as a result, energy efficiency has previously not been a priority. The cost of fossil fuels has been subsidized in T&T, which has led to a situation with many energy intensive businesses with inefficient standards necessary to support alternative energy efficient technologies and to reduce the government's fuel subsidy liability over time.
146. In the Caribbean context, Port of Spain offers fertile ground for integrating operations of interdependent systems of reliable provision of cooling services, reduced fossil fuel consumption and less polluted environments. Specifically, by introducing District Cooling in T&T's large facilities, there is a direct impact on HFC phase out. Fringe benefits for the cooling system of the City are:
- i. capacity reduction due to redundancy and simultaneous factor with respect to conventional cooling systems,
 - ii. financially optimized system by the use of large size chillers due to 24/7 operation control, and
 - iii. direct environmental benefits by production mix due to the use of alternative refrigerant without or low GWP (ammonia, HFO-1234ze).
147. The project has been designed to create an enabling framework for a sustainable use of air conditioning systems through enhanced inter-institutional coordination, based on sectorial planning and defining short, medium and long-term goals, thus ensuring sustainability. In this sense, Outcome 1.1 of the project is specifically designed to promote project sustainability, since it is focused on the medium and long term. It will ensure –through the Ministry of Planning and

Development- that the benefits derived from integrated public policy framework are mainstreamed into the project developer's and investor's decision-making processes.

148. By strengthening and updating the existing policy and regulatory frameworks and building the capacities of the public institutions, mainly MPD and MEEI, the project will generate a much more cohesive and well-funded governance framework.
149. It will be better prepared to efficiently and effectively promote low-carbon RAC technologies. Capacity development activities in components I and II will enable project partners to improve their capacities for planning, implementation of the different development initiatives, and facilitation of information and knowledge sharing and MRV systems to track progress; for instance, it will help to achieve the right balance between the interests and needs of urban developers and investors, policy makers, energy regulators, and equipment suppliers, thus ensuring sustainability of project results.
150. Outcome 2 will implement coordinated actions to demonstrate in the field the opportunities of integration and coordination, thus delivering solutions to global environment problems in a cost effective way. The proposed on the ground actions (e.g. reducing fossil fuel consumption, reducing ODS, increasing energy efficiency and facilitating access to information) will serve to demonstrate ways to mainstream those alternative practices into medium and long-term public policies. By demonstrating that these pilots offer practical solutions to environmental problems in the major city of the country, it is expected that other countries' policy-makers will incorporate similar strategies in their energy management behaviour, as is the case of most of the large cities in the Caribbean.
151. The project is also aiming at reducing the gap between men and women. Components I and II are gender sensitive, facilitating the access of women to leadership positions associated with decision-making on energy efficiency and focusing on those barriers women identify as jeopardizing their accessibility to low-carbon RAC technologies. This approach is expected to be sustained after project termination through the full inclusion of the project's gender Action Plan within the business-as-usual operations of the key stakeholders. The different gender mainstreaming strategies to be promoted are innovative (e.g. measures to encourage equal gauge of air conditioning temperatures and other indoor-climate parameters by men and women) and will generate a number of lessons that will be documented and shared with the beneficiaries and with the relevant national institutions and regional initiatives in the Caribbean basin.
152. In short, the sustainability after completion of this FSP depends on three main effects aligned with the development challenge:
 - i. Improve the institutional and regulatory frameworks in Trinidad and Tobago,
 - ii. increase the flow of investment capital to update and replace old-fashion RAC technologies for more energy efficient RAC technologies while eliminating ODS, and
 - iii. building up the national capacity to sustain an alternative, private sector-driven market for different capacities of RAC systems over the long-run.

Scaling Up

153. In terms of replication, the potential for scale-up is primarily linked to the direct benefits for: i. the RAC end-users in terms of reducing their electricity consumption and improving customer confidence, ii. for major AC customers and the manufacturing sector, cost-effective District Cooling solutions to replace over-time the existing technology based on air-cooled chillers using HFC 134-a and increased demand for an energy efficient technology through research and development of such technology, respectively, and iii. for the country as a whole, increasing a low-carbon/environment awareness image by implementing energy efficiency standards necessary to support energy efficient and HFC phase-out technologies and to reduce the existing energy landscape with subsidized electricity.
154. The project will generate significant experiences and lessons to promote upscaling of results for the T&T RAC end-use. Under Outcome 1, the strengthening of the national planning and policy frameworks for market development for low-carbon RAC technologies will provide valuable feedback in terms of integrated planning covering multiple aspects and institutions. This will be useful to other sectors of the economy to help them mainstream energy efficiency, integrated energy cooling systems, gender mainstreaming and climate change resilience. The policy and regulatory instruments to be developed will be applicable at different scales, for instance, guidelines and model documents for mainstreaming the public procurement of RAC EE equipment and may be used nation-wide.
155. Activities planned for Components I and II address a problem of an increasing dependency on inefficient AC units, which is not merely a problem of T&T but for all the Caribbean countries. These pilot interventions have been designed by a diverse group of stakeholders considering that they may be replicated within the country and in the Caribbean region. Of special attention is the innovative District Cooling alternative for large AC systems, as is a common practice in other large cooling systems around the world. The lessons provided by both pilot projects on District Cooling may be replicable at the national level in different locations where large conventional AC systems operate.
156. Triggering District Cooling systems in T&T is also associated to another technology that also brings up opportunities to scale-up energy efficiency in order to achieve high-energy savings, and therefore, more environmental global benefits, the Combined Cooling Heating and Power (CCHP) where waste heat (exhaust gas) from large thermal-powered plants can co-generate hot water to feed fuel absorption chillers which cool nearby premises. Additionally, hot water can also serve other purposes such as domestic and industrial end-uses nearby.
157. It is expected that collaboration with the Regional Building Energy Efficiency Project (BEEP) will ensure that the most up-to-date knowledge and international high-level expertise on District Cooling systems will be available to the other CARICOM members in building the new capacities. Information dissemination of this innovative technology will enable sharing the experiences and lessons with the different Caribbean cities involved in the implementation of the BEEP. This will be accomplished through knowledge transfer activities that support energy efficiency investments, peer-to-peer work on standards and labels, as well as participation in regional working groups on specific issues, documentation and outreach activities promoted by CARICOM.

V. PROJECT MANAGEMENT

158. The project design has included a strategy to deliver optimum results with the available resources to move towards a more sustainable path: the adoption of low-carbon technologies for Refrigeration and Air Conditioning (RAC) end-use.; focused on low-cost/high-delivery innovative approaches already tested in other major energy-intensive environments worldwide. In addition, it will provide specific liaison assistance to improve the integration of the climate change mitigation with the allocation of complimentary resources to phase-out the consumption of Ozone-Depleting Substances, thus optimizing multiple benefits available at the national level. For each action, the use of resources is kept to the minimum needed to achieve the desired change. Therefore, the project is expected to prove the effectiveness of each action in an innovative way for a much larger replication overtime.
159. In Component 1, capacity-building activities, including training and better information management through the promotion of inter-institutional coordination, will allow for the incorporation of innovative approaches along the project continuum not only taking into account the decision making process of the high-level national authorities with the policy and regulatory instruments but also including specific actions for the proactive participation of the private sector through fiscal incentives and levelling off the ground for mainstreaming the public procurement of EE RAC/HFCF phase-out equipment and technologies. This approach increases the impacts of the project; for the public sector with the policy and regulatory instruments, a more efficient use of the resources of the institutions is expected, as well as an increase in long-term public financing that will serve to strengthen synergies, avoid duplication of efforts and reduce overall costs. In the collective context of Trinidad and Tobago, regular inter-institutional coordination meetings will serve to identify complementarity and joint planning together with the execution of activities in the field and make this unique project in the Caribbean region very cost-effective.
160. The selected pathway should facilitate the removal of barriers to the deployment of low-carbon mobility options. A substantial part of the project resources is budgeted under Component 2, accounting for 72% of the GEF funding (excluding project management) which is dedicated to this Component. This high share is justified by the lack of experience in District Cooling technologies in most of the Caribbean energy systems facing institutional and regulatory barriers: a wide array of regulations has to be modified, requiring the involvement of a variety of technical services within the national government and other public agencies.
161. On the other hand, actions in the field of the EE RAC technologies are profitable. Pilot demonstrations are the most convenient way to test the validity or viability of a process before it is applied on a large scale. For example, the pilot demonstrations under Outcome 2.2 are considered sufficient to represent the entire system and generate benefits, based on the consultations and raising awareness activities carried out with project stakeholders in Outcome 3.1. The proposed pilot investments (USD8.8M) are profitable since they will apply the practices and technologies that are being widely used in different parts of the world such as DCS, in addition to generating much greater benefits since they promote a citizen's culture committed with their environment.
162. The participation of stakeholders at all levels will contribute to the cost/effectiveness of the project. Overall Governance (National Steering Committee, PMU, national and international consultants, UNDP), as well as the dialogue platforms will ensure adequate planning and execution

of activities in line with the project's objectives, low-carbon sustainability priorities, as well as the complementarity with national policies.

163. Outcome 3.1 of Component I, a public awareness and communication strategy for low-carbon RAC technologies will contribute to a cost-effective expansion and reproduction of project results, as well as other large urban centres, for example, the Island of Tobago. This is complemented by a strategy to facilitate the access of women to the new jobs generated from the shift in the use of energy. Cultural change is foreseen to generate a more positive attitude towards urban citizens and more careful consideration of their needs.
164. **Agreement on intellectual property rights and use of logo on the project's deliverables and disclosure of information:** In order to accord proper acknowledgement to the GEF for providing grant funding, the GEF logo will appear together with the UNDP logo on all promotional materials, other written materials such as publications developed by the project, and project hardware. Any citation of publications regarding projects funded by the GEF will also accord proper acknowledgement to the GEF. Information will be disclosed in accordance with relevant policies, notably the UNDP Disclosure Policy²⁶ and the GEF policy on public involvement²⁷.
165. **Location:** Office space will be provided by the EPPD of the Ministry of Planning and Development (MPD) in the City of Port of Spain at the following location: MPD Headquarters; to host the daily operations of the Project Management Unit (PMU), including permanent office space for the National Project Manager and the Administrative and Technical Assistant. It will provide additional office space for regular meetings of the project team and consultants involved in the ongoing activities.
166. **To work with other projects at the national level:** The project is expected to liaise with UNDP/GEF project BUR (T&T's Second Biennial Update Report). The main area of collaboration regards the estimate, monitoring and reporting of GHG emissions from the residential and commercial sectors. UNDP will support the PMU so that the project coordinates with the International Projects Roundtable, which is one of the mechanisms established for this purpose by the 3CN- -1BUR Project.
167. The UNDP/GEF project will coordinate, at the national level, with the *"Capacity Development for improved management of Multilateral Environmental Agreements for Global Environmental Benefits"*, an initiative to be implemented in T&T from 2017 up to 2020 and aligned with the GEF-6 Cross Cutting Capacity Development (CCCD) strategy. Through a learning-by-doing process, this project will implement capacity development activities in Trinidad and Tobago to improve the synergistic implementation of the Multilateral Environmental Agreement (MEA). Outcome 1.1 of this UNDP/GEF project will focus on improving the national policy and regulatory frameworks for energy efficiency gains for RAC equipment while the second outcome of the MEA initiative will support activities to strengthen the existing Green Fund, enhancing national awareness of financing environmental activities. Under the leadership of the Environmental Policy and Planning Division of the MPD, both projects will be aligned; hence contributing to national environmental benefits and by extension to global environmental benefits, specifically to shared obligations under the UNFCCC.

²⁶ See http://www.undp.org/content/undp/en/home/operations/transparency/information_disclosurepolicy/

²⁷ See https://www.thegef.org/gef/policies_guidelines

168. This project will also coordinate activities with the upcoming project “*Capacity Building for CO2 Mitigation*”, a joint initiative of the European Union (EU) and the International Civil Aviation Organization (ICAO) on the use of renewable energy at the Piarco International Airport. ICAO seeks to assess and demonstrate the feasibility of replacing carbon-intensive gate equipment with electric types powered by solar energy consistent with the UN’s Clean Development Mechanism Small-scale Methodology “Solar Power for Domestic Aircraft At-Gate Operations”. The ICAO-EU initiative is complimentary to the UNDP/GEF project because once the large the use of solar photovoltaic systems is fully operational, it will help to cope with the Airport’s power generation, specifically the chiller power demand and the amount of power used by the gate electrification equipment; in about half of the total required supply of the Piarco International Airport²⁸.
169. **To work with other projects at the regional level:** At the regional level Trinidad and Tobago Bureau of Standards is actively involved in the development of a series of regional standards for energy efficiency including the labelling of energy efficient RAC technologies. The Caribbean Regional Organisation for Standards and Quality (CROSQ) is facilitating this activity for Standards development.
170. Also, at the regional level -through the coordination of the RTA for LAC- the project is also expected to cooperate with other energy efficiency-related UNDP/GEF projects in LAC, and has assigned some resources under knowledge management for this purpose, such as the El Salvador UNDP/GEF FSP #5462 “*San Salvador Low-emission Urban Development Path*”; specifically with procurement of public goods (air conditioning units) in the municipal sector and the design of mandatory standards and labels for air conditioning units. Once both projects are under implementation, areas of common interest are basically related to triggering actions for an integrated strategy for low-emissions urban development involving the public and private sectors, including policy, planning, and implementation, as well as capacity building for the establishment of long-term RAC market transformation.

²⁸ Trinidad and Tobago. “Feasibility Study on the use of SOLAR energy at Piarco International Airport”. ICAO-EUROPEAN UNION Assistance Project: Capacity Building for CO2 Mitigation from International Aviation, 2018.

VI. PROJECT RESULTS FRAMEWORK

<p>This project will contribute to the following Sustainable Development Goal (s): 5 (Gender Equality), 7 (Affordable and Clean Energy), 9 (Industry, Innovation and Infrastructure), 11 (Sustainable Cities and Communities), and 13 (Climate Action).</p>					
<p>This project will contribute to the following country outcome included in the UNDAF/Country Programme Document: Outcome #3: Increased environmental sustainability to achieve sustainable development through environmental management, compliance with international treaties, adaptation to climate change, and improvement in capacity for policy and strategy development.</p>					
<p>This project will be linked to the following output of the UNDP Strategic Plan: Output 1.5: <i>Inclusive and sustainable solutions adopted to achieve increased energy efficiency and universal modern energy access (especially off-grid sources of renewable energy).</i></p>					
	Objective and Outcome Indicators	Baseline	Mid-term Target	End of Project Target	Data Collection Methods and Risks/Assumptions
<p>Project Objective: To promote the adoption of low-carbon technologies for Refrigeration and Air Conditioning (RAC) end-use.</p>	<p><u>Project Indicator 1</u> (GEF Core Indicator 6.2): Number of GHG emissions avoided over the investment period of the project (direct).</p>	0	200,000 CO _{2eq}	651,000 CO _{2eq}	<p><u>Data Collection Method:</u> CO₂ emissions model implemented by the Environmental Policy and Planning Division of the MPD, based on monitoring of project outcomes and outputs.</p> <p><u>Risk:</u> Incremental national capacities among policy makers and project developers for alternative RAC technologies are not effectively implemented, reducing priority for sustainable low-carbon options.</p> <p><u>Assumption:</u> Regular (annual) checking of baseline assumptions carried out by the PMU and validated by the MTR and TE with the support of the UNDP CO and RTA for LAC.</p>
	<p><u>Project Indicator 2</u> (GEF Core Indicator 6.3): Energy saved GWh (equivalent to 3.6 million mega joules).</p>	0	8	22	<p><u>Data Collection Method:</u> Annual update of national import for energy efficient, alternative low-carbon systems, as reported by TTBS, gathered and analysed by the PMU.</p> <p><u>Risks:</u> 1. Failure to harmonize policy making of environmentally-friendly approaches among national public institutions (ministries of the Central Government</p>

					<p>and power and environmental regulators).</p> <p>2. Poor coordination between government agencies and private sector stakeholders to implement the required pilot investments.</p> <p><u>Assumptions:</u></p> <p>1. Low-carbon and ODS-phase out policies have been developed under the guidance of a National Steering Committee and during the project execution will be implemented under a similar arrangement for ensuring coordination.</p> <p>2. All alternative proposed activities executed by the project will be followed-up by training and awareness-raising.</p> <p>3. Legal agreements and Memorandum of Understanding will be prepared to ensure the delivery of implementation arrangements.</p>
	<p><u>Project Indicator 3</u> (GEF Core indicator 11):</p> <p>Number of direct project beneficiaries disaggregated by gender as co-benefit of GEF investment during the project implementation period.</p>	<p><i>Total: 145</i> (100%)</p> <p><i>Men: 100</i> (69%)</p> <p><i>Women: 45</i> (31%)</p>	<p><i>Total: 160</i> (100%)</p> <p><i>Men: 104</i> (65%)</p> <p><i>Women: 56</i> (35%)</p>	<p><i>Total: 250</i> (100%)</p> <p><i>Men: 150</i> (60%)</p> <p><i>Women: 100</i> (40%)</p>	<p><u>Data Collection Method:</u></p> <p>Annual report on the number of persons trained and in attendance at awareness, sessions collected by and reported on by the PMU. This information would be de-aggregated by gender and recorded in a project beneficiaries database.</p>
					<p><u>Risk:</u></p> <p>Incremental national capacities among project stakeholders integrating the gender approach are not effectively or timely implemented.</p> <p><u>Assumption:</u></p> <p>Enhanced capacity building activities implemented by the project and related to the execution of the RAC pilot investments are able to create an enabling commercial</p>

					environment for low carbon RAC technologies.
	<p><u>Indicator 4:</u> Number of women participating in leadership positions for the execution of the pilot projects.</p>	0	2	5	<p><u>Data Collection Method:</u> Annual surveys conducted by Ministry of Gender and Youth Affairs and adjusted by the PMU in accordance with project outcomes, outputs and activities.</p> <p><u>Risk:</u> Project stakeholders would potentially reproduce discriminations against women based on gender, especially regarding participation in design, implementation and access to incremental benefits of this FSP.</p> <p><u>Assumption:</u> Implementation of the Gender Action Plan (Annex 9) will help strengthen gender equality and empower women by improving their working conditions when directly employed in those activities related to low-carbon RAC implementations.</p>
<p>Component I /Outcome 1.1 The national policy, regulatory and institutional frameworks for Energy Efficiency (EE) gains for RAC technologies have been strengthened.</p>	<p><u>Indicator 5:</u> Regulations and code of practice for DCS and CCHP published by the T&T Government.</p>	0	1	1	<p><u>Data Collection Method:</u> Methodology for monitoring imports of EE equipment carried out by TTBS and in compliance with EMA regulations during the implementation of the project.</p> <p><u>Risk:</u> Limited capacity in government due to insufficient trained staff on the implementation of low-carbon RAC alternatives.</p> <p><u>Assumption:</u> High effectiveness of the national policy makers (MPD, MEEI, TTBS and EMA) engaged in carrying out different collaborative activities to address the identified barriers.</p>

	<p><u>Indicator 6:</u> Standards & Labelling (S&L) regulations for RAC technologies developed, approved and ready for enforcement by the T&T Bureau of Standards (TTBS).</p>	3	4	5	<p><u>Data Collection Method:</u> Official records of TTBS based on S&L procedures carried out in the technical committees.</p> <p><u>Risks:</u></p> <ol style="list-style-type: none"> 1. Poor coordination between government agencies and private sector stakeholders. 2. Limited capacity of stakeholders to conceptualize S&L for innovative RAC technologies. <p><u>Assumption:</u> High level of local participation and synergy from both, public and private sectors, to adopt and mobilize up-to-date knowledge of low-carbon RAC technologies.</p>
<p>Component II / Outcome 2.1 Accelerate RAC market transformation towards less energy intensive and low-GWP technologies.</p>	<p><u>Indicator 7:</u> Number of trained professionals and technicians directly linked to the project execution to sustainable RAC technologies and the reduction of GHG emissions.</p>	0	50	150	<p><u>Data Collection Method:</u> Annual update -of the number of trained personnel- carried out by the PMU and the EPPD of the MPD, with technical support from UNDP, as an activity associated to the implementation and monitoring of the Carbon Reduction Strategy (CRS). The data captured would be stored in the Knowledge Management system currently developed through the MRV</p> <p><u>Risks:</u></p> <ol style="list-style-type: none"> 1. Project progress delayed. 2. Changes in government management systems and priorities due to change in the national political status. <p><u>Assumptions:</u></p> <ol style="list-style-type: none"> 1. The project design has considered multiple stakeholders from the public, private and CSO sectors. 2. Government commitment to align policies and institutions to fully comply

					with national obligations under the UNFCCC and the Montreal Protocol.
	<p><u>Indicator 8:</u> Number of financial and market mechanisms for the development of low-carbon RAC technologies.</p>	0	1	2	<p><u>Data Collection Method:</u> Methodology for monitoring imports of EE equipment carried out by TTBS and in compliance with EMA regulations during the implementation of the project.</p> <p><u>Risks:</u></p> <ol style="list-style-type: none"> 1. Project implementation delayed due to the limited capacity of stakeholders to develop innovative financial mechanisms. 2. Staff turnover and limited resources to commit to training in a timely manner. <p><u>Assumption:</u> Project activities are implemented by stakeholders under respective annual corporate plans.</p>
<p>Component II / Outcome 2.2 Investment portfolio on replacement of energy intensive technologies implemented.</p>	<p><u>Indicator 9:</u> Amount of private sector capital investment mobilized by the project.</p>	0	250,000	750,000.00	<p><u>Data Collection Method:</u> Methodology for monitoring imports of EE equipment carried out by TTBS and in compliance with EMA regulations during the implementation of the project. Information is then analysed to extrapolate a capital investment figures.</p> <p><u>Risks:</u></p> <ol style="list-style-type: none"> 1. Project implementation delayed due to the limited capacity of stakeholders to assist in the deployment of the new technologies. 2. Unwillingness to invest in cooling system upgrades due to energy prices low and high fuel subsidies. <p><u>Assumptions:</u></p> <ol style="list-style-type: none"> 1. The PPG stage has already advanced with the definition of a private sector-driven investment pipeline and

					<p>interested investors (please, refer to Annex K (DEVCCO Study).</p> <p>2. Decision / policy makers have been engaged throughout the PIF and the PPG and are ready to bring the institutional changes and approve financial commitments.</p> <p>3. Awareness will be raised among stakeholders about the economic and global benefits of the alternative low-carbon technologies.</p>
Component III / Outcome 3.1 Knowledge Management and M&E	<u>Indicator 10:</u> 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	<u>Data Collection Method:</u> CO ₂ emissions model implemented by the Environmental Policy and Planning Division of the MPD, based on monitoring of project outcomes and outputs.
					<u>Risk:</u> Lack of national capacity to support the process in a timely manner.
	<u>Indicator 11:</u> Percentage of project expenditure spent on the MSP planned activities.	0	50%	100%	<u>Data Collection Method:</u> UNDP Expenditures as reported in Atlas.
					<u>Risk:</u> Lack of adequate public financial allocations for the procurement of the proposed low-carbon measures.
					<u>Assumption:</u> Success in the implementation of the co-financed investment activities, as 72% of the GEF contribution is committed to Component 2 of the project.

VII. MONITORING AND EVALUATION (M&E) PLAN

176. The project results as outlined in the project results framework will be monitored annually and evaluated periodically during project implementation to ensure the project effectively achieves these results.
177. Project-level monitoring and evaluation will be undertaken in compliance with UNDP requirements as outlined in the [UNDP POPP](#) and [UNDP Evaluation Policy](#). The UNDP Country Office will work with the relevant project stakeholders to ensure UNDP M&E requirements are met in a timely fashion and to high quality standards. Additional mandatory GEF-specific M&E requirements (as outlined below) will be undertaken in accordance with the [GEF M&E policy](#) and other relevant GEF policies²⁹.
178. In addition to these mandatory UNDP and GEF M&E requirements, other M&E activities deemed necessary to support project-level adaptive management will be agreed during the Project Inception Workshop and will be detailed in the Inception Report. This will include the exact role of project target groups and other stakeholders in project M&E activities including the GEF Operational Focal Point and national institutes assigned to undertake project monitoring. The GEF Operational Focal Point will strive to ensure consistency in the approach taken to the GEF-specific M&E requirements (notably the GEF Tracking Tools) across all GEF-financed projects in the country. This could be achieved for example by using one national institute to complete the GEF Tracking Tools for all GEF-financed projects in the country, including projects supported by other GEF Agencies.³⁰

M&E Oversight and monitoring responsibilities:

179. **Project Manager:** The Project Manager is responsible for day-to-day project management and regular monitoring of project results and risks, including social and environmental risks. The Project Manager will ensure that all project staff maintain a high level of transparency, responsibility and accountability in M&E and reporting of project results. The Project Manager will inform the Project Board, the UNDP Country Office and the UNDP-GEF RTA of any delays or difficulties as they arise during implementation so that appropriate support and corrective measures can be adopted.
180. The Project Manager will develop annual work plans based on the multi-year work plan included in Annex A, including annual output targets to support the efficient implementation of the project. The Project Manager will ensure that the standard UNDP and GEF M&E requirements are fulfilled to the highest quality. This includes, but is not limited to, ensuring the results framework indicators are monitored annually in time for evidence-based reporting in the GEF PIR, and that the monitoring of risks and the various plans/strategies developed to support project implementation (e.g. ESMP, gender action plan, stakeholder engagement plan etc..) occur on a regular basis.
181. **Project Board:** The Project Board will take corrective actions as needed to ensure the project achieves the desired results. The Project Board will hold project reviews to assess the performance of the project and appraise the Annual Work Plan for the following year. In the project's final year, the Project Board will hold an end-of-project review to capture lessons learned and discuss opportunities for scaling up and to highlight project results and lessons learned with relevant audiences. This final

²⁹ See https://www.thegef.org/gef/policies_guidelines

³⁰ See https://www.thegef.org/gef/gef_agencies

review meeting will also discuss the findings outlined in the project Terminal Evaluation report and the management response.

182. Project Implementing Partner: The Implementing Partner is responsible for providing all required information and data necessary for timely, comprehensive and evidence-based project reporting, including results and financial data, as necessary. The Implementing Partner will strive to ensure project-level M&E is undertaken by national institutes, and is aligned with national systems so that the data used and generated by the project supports national systems.

183. UNDP Country Office: The UNDP Country Office will support the National Project Manager as needed, including through annual supervision missions. The annual supervision missions will take place according to the schedule outlined in the Annual Work Plan (AWP). Supervision mission reports will be circulated to the project team and Project Board within one month of the mission. The UNDP Country Office will initiate and organize key GEF M&E activities including the annual GEF PIR, the *independent Mid-term Review* and the independent Terminal Evaluation. The UNDP Country Office will also ensure that the standard UNDP and GEF M&E requirements are fulfilled to the highest quality.

184. The UNDP Country Office is responsible for complying with all UNDP project-level M&E requirements as outlined in the [UNDP POPP](#). This includes ensuring the UNDP Quality Assurance Assessment during implementation is undertaken annually; that annual targets at the output level are developed, and monitored and reported using UNDP corporate systems; the regular updating of the ATLAS risk log; and, the updating of the UNDP gender marker on an annual basis based on gender mainstreaming progress reported in the GEF PIR and the UNDP ROAR. Any quality concerns flagged during these M&E activities (e.g. annual GEF PIR quality assessment ratings) must be addressed by the UNDP Country Office and the Project Manager.

185. The UNDP Country Office will retain all M&E records for this project for up to seven years after project financial closure to support ex-post evaluations undertaken by the UNDP Independent Evaluation Office (IEO) and/or the GEF Independent Evaluation Office (IEO).

186. UNDP-GEF Unit: Additional M&E and implementation quality assurance and troubleshooting support will be provided by the UNDP-GEF Regional Technical Advisor and the UNDP-GEF Directorate as needed.

187. Audit: The project will be audited as per UNDP Financial Regulations and Rules and applicable audit policies on NIM implemented projects.³¹

Additional GEF monitoring and reporting requirements:

188. Inception Workshop and Report: A project inception workshop will be held within 60 days of project CEO endorsement, with the aim to:

³¹ No audit costs will be charged to the M&E Budget. For additional information on UNDP audits see: https://poppp.undp.org/UNDP_POPP_DOCUMENT_LIBRARY/Public/NIM_for_Government_english.pdf

- a. Familiarize key stakeholders with the detailed project strategy and discuss any changes that may have taken place in the overall context since the project idea was initially conceptualized that may influence its strategy and implementation.
- b. Discuss the roles and responsibilities of the project team, including reporting lines, stakeholder engagement strategies and conflict resolution mechanisms.
- c. Review the results framework and monitoring plan.
- d. Discuss reporting, monitoring and evaluation roles and responsibilities and finalize the M&E budget; identify national/regional institutes to be involved in project-level M&E; discuss the role of the GEF OFP and other stakeholders in project-level M&E.
- e. Update and review responsibilities for monitoring project strategies, including the risk log; SESP report, Social and Environmental Management Framework and other safeguard requirements; project grievance mechanisms; gender strategy; knowledge management strategy, and other relevant management strategies.
- f. Review financial reporting procedures and budget monitoring and other mandatory requirements and agree on the arrangements for the annual audit.
- g. Plan and schedule Project Board meetings and finalize the first-year annual work plan.
- h. Formally launch the Project.

189. GEF Project Implementation Report (PIR): The annual GEF PIR covering the reporting period July (previous year) to June (current year) will be completed for each year of project implementation. Any environmental and social risks and related management plans will be monitored regularly, and progress will be reported in the PIR. The PIR submitted to the GEF will be shared with the Project Board. The quality rating of the previous year's PIR will be used to inform the preparation of the subsequent PIR.

190. Knowledge management: The project team will ensure extraction and dissemination of lessons learned and good practices to enable adaptive management and upscaling or replication at local and global scales. Results will be disseminated to targeted audiences through relevant information sharing fora and networks. The project will contribute to scientific, policy-based and/or any other networks as appropriate (e.g. by providing content, and/or enabling participation of stakeholders/beneficiaries)

191. GEF and/or LDCF Core Indicators: The GEF and/or LDCF/SCCF Core indicators included as Annex will be used to monitor global environmental benefits and will be updated for reporting to the GEF prior to MTR and TE. Note that the project team is responsible for updating the indicator status. The updated monitoring data should be shared with MTR/TE consultants prior to required evaluation missions, so these can be used for subsequent groundtruthing. The methodologies to be used in data collection have been defined by the GEF and are available on the GEF website. The required Protected Area Management Effectiveness Tracking Tool (METTs) have been prepared and the scores include in the GEF Core Indicators.

192. Independent Mid-term Review (MTR): The terms of reference, the review process and the final MTR report will follow the standard templates and guidance prepared by the UNDP IEO for GEF-financed projects available on the UNDP Evaluation Resource Center (ERC).

193. The evaluation will be 'independent, impartial and rigorous'. The consultants that will be hired by UNDP evaluation specialists to undertake the assignment will be independent from organizations that were involved in designing, executing or advising on the project to be evaluated. Equally, the

consultants should not be in a position where there may be the possibility of future contracts regarding the project under review.

194. The GEF Operational Focal Point and other stakeholders will be actively involved and consulted during the evaluation process. Additional quality assurance support is available from the UNDP-GEF Directorate.
195. The final MTR report and MTR TOR will be publicly available in English and will be posted on the UNDP ERC at the same year as the 3rd PIR.. A management response to MTR recommendations will be posted in the ERC within six weeks of the MTR report's completion.
196. Terminal Evaluation (TE): An independent terminal evaluation (TE) will take place upon completion of all major project outputs and activities. The terms of reference, the evaluation process and the final TE report will follow the standard templates and guidance prepared by the UNDP IEO for GEF-financed projects available on the UNDP Evaluation Resource Center.
197. The evaluation will be 'independent, impartial and rigorous'. The consultants that will be hired by UNDP evaluation specialists to undertake the assignment will be independent from organizations that were involved in designing, executing or advising on the project to be evaluated. Equally, the consultants should not be in a position where there may be the possibility of future contracts regarding the project being evaluated.
198. The GEF Operational Focal Point and other stakeholders will be actively involved and consulted during the terminal evaluation process. Additional quality assurance support is available from the UNDP-GEF Directorate.
199. The final TE report and TE TOR will be publicly available in English and posted on the UNDP ERC by (add date). A management response to the TE recommendations will be posted to the ERC within six weeks of the TE report's completion.
200. Final Report: The project's terminal GEF PIR along with the terminal evaluation (TE) report and corresponding management response will serve as the final project report package. The final project report package shall be discussed with the Project Board during an end-of-project review meeting to discuss lesson learned and opportunities for scaling up.
201. Agreement on intellectual property rights and use of logo on the project's deliverables and disclosure of information: To accord proper acknowledgement to the GEF for providing grant funding, the GEF logo will appear together with the UNDP logo on all promotional materials, other written materials like publications developed by the project, and project hardware. Any citation on publications regarding projects funded by the GEF will also accord proper acknowledgement to the GEF. Information will be disclosed in accordance with relevant policies notably the UNDP Disclosure Policy and the GEF policy on public involvement.

Table 9: Mandatory GEF M&E Requirements and M&E Budget:

GEF M&E requirements	Primary responsibility	Indicative costs to be charged to the Project Budget ³² (US\$)		Time frame
		GEF grant	Co-financing	
Inception Workshop	UNDP Country Office	USD 12,000	10,000	Within two months of project document signature
Inception Report	Project Manager	None	None	Within two weeks of inception workshop
Standard UNDP monitoring and reporting requirements as outlined in the UNDP POPP	UNDP Country Office	None	None	Quarterly, annually
Risk management	Project Manager Country Office	5,000 (1,000 per year)	None	Quarterly, annually
Monitoring of indicators in project results framework	Project Manager	20,000 (4,000 per year)		Annually before PIR
GEF Project Implementation Report (PIR)	Project Manager and UNDP Country Office and UNDP-GEF team	None	None	Annually
Lessons learned and knowledge generation	Project Manager	None	None	Annually
Monitoring of environmental and social risks, and corresponding management plans as relevant	Project Manager UNDP Country Office	None	None	On-going
Monitoring of stakeholder engagement plan	Project Manager UNDP Country Office	10,000 (2,000 per year)	None	On-going
Monitoring of gender action plan	Project Manager UNDP Country Office UNDP GEF team	10,000 (2,000 per year)	None	On-going
Addressing environmental and social grievances	Project Manager UNDP Country Office	2,000 (200 per meeting, two meetings per year)	None	On-going
Project Board meetings	Project Board UNDP Country Office Project Manager	None	None	At minimum annually
Supervision missions	UNDP Country Office	None ³³		Annually
Oversight missions	UNDP-GEF team	None ³³		Troubleshooting as needed
GEF Secretariat learning missions/site visits	UNDP Country Office and Project Manager and UNDP-GEF team	None		To be determined.

³² Excluding project team staff time and UNDP staff time and travel expenses.

³³ The costs of UNDP Country Office and UNDP-GEF Unit's participation and time are charged to the GEF Agency Fee.

GEF M&E requirements	Primary responsibility	Indicative costs to be charged to the Project Budget ³² (US\$)		Time frame
		GEF grant	Co-financing	
Mid-term GEF Tracking Tool to be updated by <i>(add name of national/regional institute if relevant)</i>	Project Manager	USD 15,000		Before mid-term review mission takes place.
Independent Mid-term Review (MTR) and management response <i>(add name of national/regional institute if relevant)</i>	UNDP Country Office and Project team and UNDP-GEF team	USD 20,000		Between 2 nd and 3 rd PIR.
Terminal GEF Tracking Tool to be updated by Project Manager	Project Manager	USD 12,000		Before terminal evaluation mission takes place
Independent Terminal Evaluation (TE) included in UNDP evaluation plan, and management response	UNDP Country Office and Project team and UNDP-GEF team	USD 20,000		At least three months before operational closure
TOTAL indicative COST Excluding project team staff time, and UNDP staff and travel expenses		USD 126,000		

VIII. GOVERNANCE AND MANAGEMENT ARRANGEMENTS

Roles and responsibilities of the project's governance mechanism:

202. Implementing Partner: The Implementing Partner (Executing Entity – EA) for this project is The Ministry of Planning and Development (MPD).

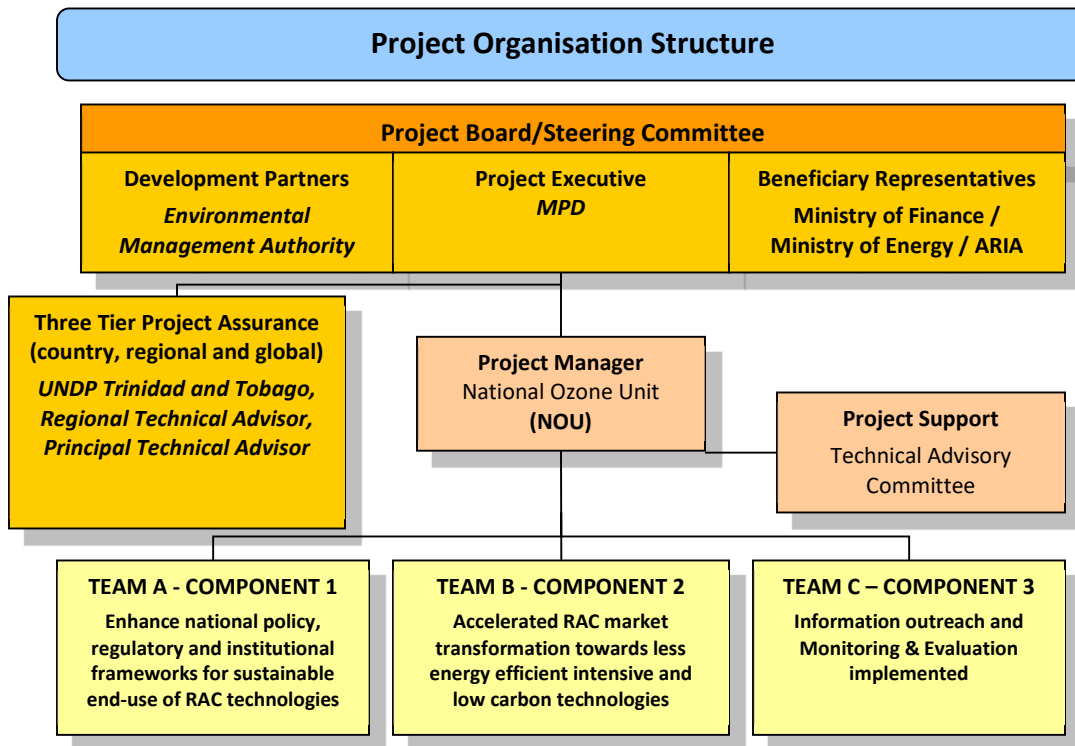
203. The Implementing Partner is the entity to which the UNDP Administrator has entrusted the implementation of UNDP assistance specified in this signed project document along with the assumption of full responsibility and accountability for the effective use of UNDP resources and the delivery of outputs, as set forth in this document.

204. The Implementing Partner is responsible for executing this project. Specific tasks include:

- Project planning, coordination, management, monitoring, evaluation and reporting. This includes providing all required information and data necessary for timely, comprehensive and evidence-based project reporting, including results and financial data, as necessary. The Implementing Partner will strive to ensure project-level M&E is undertaken by national institutes and is aligned with national systems so that the data used and generated by the project supports national systems.
- Risk management as outlined in this Project Document;
- Procurement of goods and services, including human resources;
- Financial management, including overseeing financial expenditures against project budgets;
- Approving and signing the multiyear workplan;
- Approving and signing the combined delivery report at the end of the year; and,
- Signing the financial report or the funding authorization and certificate of expenditures.

205. UNDP 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 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 organisation structure:



206. **Project Board:** The Project Board (also called Project Steering Committee) 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 money, fairness, integrity, transparency and effective international competition.

207. The Project Board will be integrated by the Ministry of Planning and Development, the Ministry of Energy, the 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. The responsibilities of the National Steering Committee are described in Annex E.

208. In case consensus cannot be reached within the Board, the UNDP Resident Representative (or their designate) will mediate to find consensus and, if this cannot be found, will take the final decision to ensure project implementation is not unduly delayed.

209. Specific responsibilities of the Project Board include:

- Provide overall guidance and direction to the project, ensuring it remains within any specified constraints;
- Address project issues as raised by the project manager;
- Provide guidance on new project risks, and agree on possible mitigation and management actions to address specific risks;

- Agree on project manager's tolerances as required, within the parameters set by UNDP-GEF, and provide direction and advice for exceptional situations when the project manager's tolerances are exceeded;
- Advise on major and minor amendments to the project within the parameters set by UNDP-GEF;
- Ensure coordination between various donor and government-funded projects and programmes;
- Ensure coordination with various government agencies and their participation in project activities;
- Track and monitor co-financing for this project;
- Review the project progress, assess performance, and appraise the Annual Work Plan for the following year;
- Appraise the annual project implementation report, including the quality assessment rating report;
- Ensure commitment of human resources to support project implementation, arbitrating any issues within the project;
- Review combined delivery reports prior to certification by the implementing partner;
- Provide direction and recommendations to ensure that the agreed deliverables are produced satisfactorily according to plans;
- Address project-level grievances;
- Approve the project Inception Report, Mid-term Review and Terminal Evaluation reports and corresponding management responses;
- Review the final project report package during an end-of-project review meeting to discuss lesson learned and opportunities for scaling up.

210. The composition of the Project Board must include the following roles:

- a. **Project Executive:** Is an individual who represents ownership of the project and chairs the Project Board. The Executive is normally the national counterpart for nationally implemented projects. The Project Executive is: The Ministry of Planning and Development.
- b. **Beneficiary Representative(s):** Individuals or groups representing the interests of those who will ultimately benefit from the project. Their primary function within the board is to ensure the realization of project results from the perspective of project beneficiaries. Often civil society representative(s) can fulfil this role. The Beneficiary representatives are the Ministry of Finance, Ministry of Energy and ARIA.
- c. **Development Partner:** Individuals or groups representing the interests of the parties concerned that provide funding and/or technical expertise to the project. The Development Partner is the Environmental Management Authority
- d. **Project Assurance:** UNDP performs the quality assurance role and supports the Project Board and Project Management Unit by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed. The Project Board cannot delegate any of its quality assurance responsibilities to the Project Manager. UNDP provides a three – tier oversight services involving the UNDP Country Offices and UNDP at regional and headquarters levels. Project assurance is totally independent of the Project Management function.

211. Project Management Unit (PMU): The PMU shall have two members of staff, the National Project Manager, and a Finance and Administrative Assistant. This operational unit will be housed at the Ministry of Planning and Development and supported by technical teams indicated in the Figure 3. Members of the groups can be invited to the National Steering Committee sessions, with specific roles described in Annex E. The following stakeholders support the Technical Teams:

- Trinidad and Tobago Bureau of Standards - TTBS
- Refrigerant Recovery Recycle Association - RRRRA
- Air Conditioning and Refrigeration Industry Association - ARIA
- The University of Trinidad and Tobago - UTT
- Ministry of Public Utilities - MPU
- Ministry of Energy and Energy Industries - MEEI

212. Project Manager: The Project Manager has the authority to run the project on a day-to-day basis on behalf of the Implementing Partner within the constraints laid down by the Project Board. The Implementing Partner appoints the Project Manager, who must be different from the Implementing Partner's representative in the Project Board.

213. The Project Manager's primary responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost. The Project Manager will inform the Project Board and the Project Assurance roles of any delays or difficulties as they arise during implementation so that appropriate support and corrective measures can be adopted. The Project Manager will remain on contract until the Terminal Evaluation report and the corresponding management response have been finalized and the required tasks for operational closure and transfer of assets are fully completed.

214. Specific responsibilities include:

- Manage the overall conduct of the project.
- Plan the activities of the project and monitor progress against the approved workplan.
- Execute activities by managing personnel, goods and services, training and low-value grants, including drafting terms of reference and work specifications, and overseeing all contractors' work.
- Monitor events as determined in the project monitoring plan, and update the plan as required.
- Provide support for completion of assessments required by UNDP, spot checks and audits.
- Manage requests for the provision of UNDP financial resources through funding advances, direct payments or reimbursement using the FACE form.
- Monitor financial resources and accounting to ensure the accuracy and reliability of financial reports.
- Monitor progress, watch for plan deviations and make course corrections when needed within project board-agreed tolerances to achieve results.
- Ensure that changes are controlled and problems addressed.
- Perform regular progress reporting to the project board as agreed with the board, including measures to address challenges and opportunities.
- Prepare and submit financial reports to UNDP on a quarterly basis.

- Manage and monitor the project risks – including social and environmental risks - initially identified and submit new risks to the Project Board for consideration and decision on possible actions if required; update the status of these risks by maintaining the project risks log;
- Capture lessons learned during project implementation.
- Prepare revisions to the multi-year workplan, as needed, as well as annual and quarterly plans if required.
- Prepare the inception report no later than one month after the inception workshop.
- Ensure that the indicators included in the project results framework are monitored annually in advance of the GEF PIR submission deadline so that progress can be reported in the GEF PIR.
- Prepare the GEF PIR;
- Assess major and minor amendments to the project within the parameters set by UNDP-GEF;
- Monitor implementation plans including the gender action plan, stakeholder engagement plan, and any environmental and social management plans;
- Monitor and track progress against the GEF Core indicators.
- Support the Mid-term review and Terminal Evaluation process.

215. The National Project Manager will be supported by one full-time person providing administrative, financial and technical support. Specific responsibilities of the National Project Manager, administrative position and consultants are presented in Annex E “Terms of Reference for Key Project Stakeholders”.

216. Project Assurance: UNDP provides a three – tier supervision, oversight and quality assurance role – funded by the GEF agency fee – involving UNDP staff in Trinidad and Tobago and at regional and headquarters levels. Project Assurance must be very independent of the Project Management function. The UNDP Country Office specifically by the Environmental Programme Associate will provide the project assurance role. The UNDP Regional Technical Advisor as needed will provide additional quality assurance. The quality assurance role supports the Project Board and Project Management Unit by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed. The Project Board cannot delegate any of its quality assurance responsibilities to the Project Manager. This project oversight and quality assurance role is covered by the GEF Agency.

217. Other strategic partners: Local stakeholders will be formally represented in the planning and decision-making structures of the project through a series of organizations. These public organizations will be engaged at different stages of the project execution in order to share specific experiences and to participate in the project’s activities:

- Customs and Excise – C&E
- Ministry of Trade and Industry - MTI
- Environmental Management Authority – EMA

218. Governance role for project target groups: The project is targeting a variety of groups, with different levels of engagement in decision-making, as presented in Section 4.1 of the Stakeholder Engagement Plan (Annex H). Stakeholders are 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. Of special attention are the end-users of the District cooling pilots.

This group is critical for a sound approach to quality improvement and will be fully engaged through the established stakeholder linkages developed during the PPG phase. It is expected that the PMU will set up appropriate collaboration mechanisms during implementation of project components.

IX. FINANCIAL PLANNING AND MANAGEMENT

219. The total cost of the project is USD 26,278,644. This is financed through a GEF grant of USD5,152,392, and USD 21,126,252 in parallel co-financing. UNDP, as the GEF Implementing Agency, will be responsible for the execution of the GEF resources and any cash co-financing transferred to UNDP bank account only.

220. **Parallel Co-financing:** The actual realization of project co-financing will be monitored during the *Mid-term Review* and *Terminal Evaluation* process and will be reported to the GEF. The co-financing indicated as *Grants*, includes the contribution of the following national entities: MPD, TTBS, Airports Authority, UTT, national private banks, ARIA, RRRRA and multilaterals UNDP and the MLF of the Montreal Protocol to implement the proposed activities in accordance with AWP such as the installation of RAC technologies in the pilot interventions, salaries, and other miscellaneous operational costs spent during the execution of the project. *In-kind* contribution, on the other hand, is the estimated value of using existing office space, previously purchased furniture, official vehicles, and other existing equipment for the execution of the planned activities, which will be made available by those public institutions and UNDP to the project.

The planned co-financing will be used as indicated in Table 11:

Table 10: Co-Financing Planning

Government (MPD)	In-kind	406,064	Outputs: all Grants: staff working hours. In-kind: office and meeting space.	Low since the resources belong to the national budget	PMU and UNDP CO will monitor co-financing
Government (TTBS)	In-kind	839,458	Output: 1.1.3 Grants: staff working hours. In-kind: office and meeting space.	Low since the resources belong to the national budget	PMU and UNDP CO will monitor co-financing
Government (MLF)	Grants	2,258,433	Outputs: all		
Private Companies (Edan Properties, K)	Cash	1,500,000	Outputs 2.2.1 and 2.2.2	Unable to finance Project Pilots.	Loan provided by CABEF or appropriate financial body

Trinity Power Limited)					
Private Companies Caribbean Basin Sustainable Energy fund (CABEF)	Cash	15,000,000	Outputs 2.2.1 and 2.2.2	Low since they have capacity	PMU and UNDP CO will monitor co-financing.
Private Companies Energy Dynamics Limited (EDL)	In-kind	100,000	Outputs: all	Low since they have capacity	PMU and UNDP CO will monitor co-financing.
Private Companies School of Refrigeration and Air-conditioning (SORAC)	In-kind	150,000	Outputs: 1.1.6, 1.2.1 and 2.1.2 In-kind: training facilities and meeting rooms.	Low since they have the existing capacity	PMU and UNDP CO will monitor co-financing.
CSO (ARIA)	In-kind	420,000	Outputs: 1.1.6, 1.2.1 and 2.1.2 Grants: staff working hours. In-kind: training facilities.	Low since they have the existing capacity	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.	Low since they have the existing capacity	PMU and UNDP CO will monitor co-financing.
UNDP	In-kind	100,000	Grants: staff working hours. In-kind: office and meeting space.		

221. Budget Revision and Tolerance: As per UNDP requirements outlined in the UNDP POPP, the project board will agree on a budget tolerance level for each plan under the overall annual work plan allowing the

project manager to expend up to the tolerance level beyond the approved project budget amount for the year without requiring a revision from the Project Board. Should the following deviations occur, the Project Manager and UNDP Country Office will seek the approval of the UNDP-GEF team to ensure accurate reporting to the GEF: a) Budget re-allocations among components in the project with amounts involving 10% of the total project grant or more; b) Introduction of new budget items/or components that exceed 5% of original GEF allocation.

222. Any over expenditure incurred beyond the available GEF grant amount will be absorbed by non-GEF resources (e.g. UNDP TRAC or cash co-financing).

223. Refund to GEF: Should a refund of unspent funds to the GEF be necessary, this will be managed directly by the UNDP-GEF Unit in New York.

224. Project Closure: Project closure will be conducted as per UNDP requirements outlined in the UNDP POPP.³⁴ On an exceptional basis only, a no-cost extension beyond the initial duration of the project will be sought from in-country UNDP colleagues and then the UNDP-GEF Executive Coordinator.

225. Operational completion: The project will be operationally completed when the last UNDP-financed inputs have been provided and the related activities have been completed. This includes the final clearance of the Terminal Evaluation Report (that will be available in English) and the corresponding management response, and the end-of-project review Project Board meeting. The Implementing Partner through a Project Board decision will notify the UNDP Country Office when operational closure has been completed. At this time, the relevant parties will have already agreed and confirmed in writing on the arrangements for the disposal of any equipment that is still the property of UNDP.

226. Transfer or disposal of assets: In consultation with the NIM Implementing Partner and other parties of the project, UNDP programme manager (UNDP Resident Representative) is responsible for deciding on the transfer or other disposal of assets. Transfer or disposal of assets is recommended to be reviewed and endorsed by the project board following UNDP rules and regulations. Assets may be transferred to the government for project activities managed by a national institution at any time during the life of a project. In all cases of transfer, a transfer document must be prepared and kept on file³⁵.

227. Financial completion: The project will be financially closed when the following conditions have been met: a) The project is operationally completed or has been cancelled; b) The Implementing Partner has reported all financial transactions to UNDP; c) UNDP has closed the accounts for the project; d) UNDP and the Implementing Partner have certified a final Combined Delivery Report (which serves as final budget revision).

³⁴ see <https://info.undp.org/global/popp/ppm/Pages/Closing-a-Project.aspx>

³⁵ See https://popp.undp.org/_layouts/15/WopiFrame.aspx?sourcedoc=/UNDP_POPP_DOCUMENT_LIBRARY/Public/PPM_Project%20Management_Closing.docx&action=default.

228. The project will be financially completed within 12 months of operational closure or after the date of cancellation. Between operational and financial closure, the implementing partner will identify and settle all financial obligations and prepare a final expenditure report. The UNDP Country Office will send the final signed closure documents including confirmation of final cumulative expenditure and unspent balance to the UNDP-GEF Unit for confirmation before the project will be financially closed in Atlas by the UNDP Country Office.

X. TOTAL BUDGET AND WORK PLAN

TOTAL BUDGET AND WORK PLAN	
Atlas Proposal or Award ID:	00117647
Atlas Primary Output Project ID:	00114399
Atlas Proposal or Award Title:	Energy efficiency through RAC technologies
Atlas Business Unit	TTO10
Atlas Primary Output Project Title	GEF6- RAC Energy Efficiency
UNDP-GEF PIMS No.	5957
Implementing Partner	Ministry of Planning and Development (MPD)

Component	GEF Component/Atlas Activity	Responsible Partner	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	See Budget Note:
		(Atlas Implementing Agent)											
I. Enhance national policy, regulatory and institutional frameworks for sustainable end-use of RAC technologies.	Component 1: The national policy, regulatory and institutional frameworks for Energy Efficiency (EE) gains for RAC technologies have been strengthened.	UNDP	62000	GEF	71400	Contractual Services - individuals	10,000	35,000	35,000	35,000	35,000	150,000	a
					71300	Local Consultants	-	25,000	25,000	25,000	25,000	100,000	b
					71600	Travel	5,000	10,000	10,000	10,000	10,000	45,000	c
					72100	Contractual Services - companies	-	87,500	87,500	114,000	37,500	326,500	d
					74200	Audio Visual & Print Prod Costs	3,500	10,000	10,000	10,000	10,000	43,500	e
					75700	Training, workshop, and conferences	5,000	10,000	10,000	10,000	10,000	45,000	f
					Subtotal						23,500	177,500	177,500
II. Accelerate RAC market transformation towards less energy intensive and low-GWP technologies.	Component 2.1: Investment path along the RAC market chain enhanced.	UNDP	62000	GEF	71200	International consultants	-	25,000	25,000	25,000	25,000	100,000	g
					71300	Local Consultants	-	37,500	37,500	37,500	37,500	150,000	h
					71600	Travel	20,000	40,000	40,000	40,000	40,000	180,000	i
					72100	Contractual Services - companies	-	75,000	-	-	-	75,000	j
					72100	Contractual Services - companies	-	37,500	37,500	37,500	37,500	150,000	k

					74200	Audio Visual & Print Prod Costs	5,000	20,000	20,000	20,000	20,000	85,000	l
					75700	Training, workshop, and conferences	40,000	60,000	60,000	60,000	60,000	280,000	m
					Subtotal		65,000	295,000	220,000	220,000	220,000	1,020,000	
	Component 2.2: Investment portfolio on replacement of energy intensive technologies implemented.	UNDP	62000	GEF	72100	Contractual Services - companies	20,000	125,000	125,000	125,000	125,000	520,000	n
72100					Contractual Services - companies	-	125,000	125,000	125,000	125,000	500,000	s	
72100					Contractual Services - companies	-	375,000	375,000	125,000	125,000	1,500,000	t	
Subtotal					20,000	625,000	625,000	625,000	625,000	2,520,000			
III. Information outreach and Monitoring & Evaluation (M&E) implemented.	Component 3: Information outreach and Monitoring & Evaluation (M&E) implemented.	UNDP	62000	GEF	71200	International consultants	-	36,000	61,000	36,000	61,000	194,000	v
					71300	Local Consultants	5,000	80,000	80,000	80,000	80,000	325,000	w
					71600	Travel	10,000	10,000	10,000	10,000	10,000	50,000	x
					72100	Contractual Services - companies	-	5,000	5,000	5,000	5,000	20,000	y
					74200	Audio Visual & Print Prod Costs	-	5,000	5,000	5,000	5,000	20,000	z
					75700	Training, workshop, and conferences	10,000	9,347	9,347	9,347	10,000	48,041	aa
					Subtotal		25,000	145,347	170,347	145,347	171,000	657,041	
Project Management Cost	Project Management	UNDP	62000	GEF	71300	Contractual Services - individuals	18,137	50,452	50,452	50,452	50,472	219,965	bb
					74100	Professional Services	-	500	500	500	500	2,000	cc
					72200	Equipment and Furniture	5,000	-	-	-	-	5,000	dd
					72500	Supplies	1,500	1,000	1,000	1,000	1,000	5,500	ee
					74200	Audio Visual & Print Prod Costs	-	-	-	-	5,000	5,000	ff
					75700	Training, workshop, and conferences	2,000	1,980	-	2,000	1,906	7,886	gg
					Subtotal		26,637	53,932	51,952	53,952	58,878	245,351	
		SUB-TOTAL GEF				160,137	1,296,779	1,244,799	1,248,299	1,202,378	5,152,392		
		PROJECT TOTAL				160,137	1,296,779	1,244,799	1,248,299	1,202,378	5,152,392		

Summary of funds

Institution	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total
GEF	160,137	1,296,779	1,244,799	1,248,299	1,202,378	5,152,392
CABEF	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000	15,000,000
Government of Trinidad and Tobago (MPD)	532,899	532,899	532,899	532,899	532,899	2,664,497
Government (TTBS)	167,892	167,892	167,892	167,892	167,892	839,458
Energy Dynamics	20,000	20,000	20,000	20,000	20,000	100,000
Private Companies (Edan K Properties, Trinity Power Limited)	300,000	300,000	300,000	300,000	300,000	1,500,000
Private Companies School of Refrigeration and Air-conditioning (SORAC)	25,000	25,000	25,000	25,000	50,000	150,000
CSO (ARIA)	84,000	84,000	84,000	84,000	84,000	420,000
CSO (RRRA)	70,459	70,459	70,459	70,459	70,459	352,297
United Nations Development Programme	20,000	20,000	20,000	20,000	20,000	100,000
Total	4,380,388	5,517,029	5,465,049	5,468,549	5,447,628	26,278,644

Budget Notes

No.	Budget Line	Component 1: The national policy, regulatory and institutional frameworks for Energy Efficiency (EE) gains for RAC technologies have been strengthened.
a	71400	Local individual engaged to develop and coordinate Component 1, that is, to strengthen the national policy, regulatory and institutional frameworks in order to make the transition to a more energy efficient environment for RAC technologies in which market-oriented goals govern policy, planning, and investment decisions, for both, the short and long term. Engagement for a total of 50 months at \$ 3000/month
b	71300	1 Local consultant engaged to support Output 1.1.1 and Output 1.1.4 activities include Development of a national policy that synergizes the MP, NDC, and CRS engaging all parties from public and private sector regarding decision-making, and propose, as needed, reflecting gender impact guidelines; an analysis of the current building regulations for public and private structures with a view to upgrade them to ensure that building designs are aligned to national standards and practices and thereby promote energy efficiency; identify any barriers that may need to be addressed to facilitate implementation of RAC energy efficiency applications in public buildings, analysing the current public procurement system for central and split RAC systems, preparing a procurement system for high EE, low GWP Refrigeration and Air Conditioning systems in the public system and preparing a road map, for making the procurement system mandatory; and a Study on the outlook for power market subsidies on electricity tariffs (commercial, residential), their impact on investment and financial returns for energy efficient RAC applications, and recommendations to improve market development and financial sustainability.– \$62,500 (25 months over a 4-year period at \$2,500 / month); 1 Local consultant engaged to support Output 1.1.2 – Activities include Development of a national

		policy for the development of RAC sustainable markets based on high EE rating and low GWP as a core element of the National Cooling Plan, Development of Minimum Energy Performance Standards , (MEPs) for RAC equipment, including the review of existing energy efficiency/consumption reduction targets for the RAC sector, description of existing Minimal Energy Performance: requirements, enforcement, national testing procedures, and description of existing labelling system: requirements and enforcement and Implement an awareness raising campaign for the MEPs developed for the RAC equipment.- \$37,500 (15 months over a 4 year period at \$2,500 / month)
c	71600	Travel for the strenghtening of National Capacities and Regional Outreach
d	72100	Contractual services to support Output 1.1.3, including enhancement of technical capacities of public officers to assure S&L compliance – activities should include Development and approval of national standards and labelling for EE, RAC equipment, including the implementation of procedures for conformity assessment, Development of technical specifications for installation and connection to DCS., Establish a MOA for testing, validation and certification of EE RAC equipment, through recognition and partnerships with testing facility duly accredited and authorized for RAC product certification, Implementing an awareness raising campaign to enforce S&L for EE RAC equipment including technical specifications for DCS and development of a codified system for certification of RAC EE equipment, systems and products (energy efficient air conditioning system) in Trinidad and Tobago. - \$150,000; Contractual services to support Output 1.1.5 – activities should include Analysing the current tax system (such as import, value-added and sale taxes) and on-going incentives for infrastructure retrofit and electro-mechanical reconversion, in the commercial and industrial sectors and development of a tax incentive proposal to promote the low-carbon and low-GWP markets - \$76,500; Contractual services support Output 1.1.6 – including the development and implementation of all relevant training modules - \$100,000.
e	74200	Printing and Production Costs for Outputs: 1.1.1 Improved inter-governmental coordination for integrated policy making of environmentally friendly approaches among national public institutions, 1.1.2 Strengthened a national planning and policy framework for market development of EE gains for RAC end-uses, 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, 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, 1.1.5 Fiscal instruments and economic incentives for the import of high EE rating RAC equipment with natural refrigerants where applicable and 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.
f	75700	Workshops for Coordination of Stakeholders: Outputs 1.1.1 Improved inter-governmental coordination for integrated policy making of environmentally friendly approaches among national public institutions and 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.
No.	Budget Line	Component 2.1: Investment path along the RAC market chain enhanced.
g	71200	International consultants engaged to develop trainings to support coordination and trainings for technicians and technical organizations for Output 2.1.2: In-country technical capacity and backstopping for assembling energy efficient RAC systems. The international consultants should provide the development of curriculum for technicians on installation, and maintenance of EE RAC systems and carry out training sessions at both the trainer level and the technician level to build capacity: \$100,000 (two international consultants at USD\$50,000 each)
h	71300	Three National consultants engaged for Output 2.1.3: structure for ensuring that RAC equipment meets international energy efficiency standards through the TTBS. 1 consultant to develop an inspection regime for EE standards for RAC equipment - \$50,000 (20 months over a 4 year period at \$2,500 / month); 1 consultant to perform Sensitization on the new standard through public awareness campaign - \$50,000 (20 months over a 4 year period at \$2,500 / month); and 1 consultant to perform Training of TTBS on implementation of the new standards - \$50,000 (20 months over a 4 year period at \$2,500 / month).
i	71600	Travel to support technical knowledge and update for Output 2.1.2: In-country technical capacity and backstopping for assembling energy efficient RAC systems.
j	72100	Contractual services to support Output 2.1.1: Market analysis for RAC replacement initiatives and impacts at the national level – USD\$75,000
k	72100	Contractual services for the development of 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. Services should provide training to staff of lending agencies for a deeper understanding of analysing the risks, opportunities, returns on loans and the reality of favourable paybacks of EE investments, training to project developers, on investment proposal designing and development of business cases based on the DCS market approach - \$150,000
l	74200	Expenses related to the public awareness campaign for Output Output 2.1.3 A structure for ensuring that RAC equipment meets international energy efficiency standards through the TTBS established
m	75700	Trainings to support coordination and trainings for technicians and technical organizations for Output 2.1.2: In-country technical capacity and backstopping for assembling energy efficient RAC systems.
No.	Budget Line	Component 2.2: Investment portfolio on replacement of energy intensive technologies implemented.

n	72100	Contractual services to support Output 2.2.1 Investment portfolio on replacement of energy intensive technologies including a complete business development phase and preparation of the business memorandum for all stakeholders, including a validated the feasibility study and business case for the development of the demonstrative interventions cooling systems, which includes the baseline energy consumption for identified pilots and defining the actual market cooling demand for the project and data collection and monitoring plan to evaluate performance over time - \$520,000
s	72100	Contractual services to support Outputs 2.2.2, 2.2.3, 2.2.4 and 2.2.5 at Piarco Airport DC Pilot Site - \$500,000
t	72100	Contractual services to support Outputs 2.2.2, 2.2.3, 2.2.4 and 2.2.5 at Couva (UTT, IBP and Trinity Power) DC Pilot Site - \$1,500,000
No.	Budget Line	Component 3: Information outreach and Monitoring & Evaluation (M&E) implemented.
v	71200	International consultants engaged to develop the following: In output 3.1.2 - the consultant should provide training to the public and private sectors in collaboration with the EPPD of the MPD, in support of data collection for the MRV. For DCS, national capacities would be enhanced considering the global benefit of using waste heat generated by thermal power plants, with key stakeholders in the RAC sector- \$48,000 (80 days over a four year period at \$600/day); in Output 3.2.1 the consultant should Design of a module for data to be collected and recorded in the knowledge management system under the MRV system, adapted to the different cooling capacities of the most commonly used systems - \$96,000 (160 days over a four year period at \$600/day); In output 3.2.4 Carrying out of project progress report(s), including PIRs, Mid-term Review and a Terminal Evaluation, \$50,000 (\$25,000 for MTR and \$25,000 for the TE).
w	71300	National consultants engaged to develop the following: in Output 3.1.2 National capacities for the public and private sectors for calculations and monitoring of global impact indicators - \$100,000 (One team of two consultants engaged – one for the private sector and one for the public sector- at \$50,000 each) the consultants must provide training to the public and private sectors in collaboration with the EPPD of the MPD, in support of data collection for the MRV. For DCS, national capacities would be enhanced considering the global benefit of using waste heat generated by thermal power plants, with key stakeholders in the RAC sector; in Output 3.2.1 the consultant must design of a module for data to be collected and recorded in the knowledge management system under the MRV system, adapted to the different cooling capacities of the most commonly used systems. - \$100,000 (One team of two consultants engaged at \$50,000 each); in 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 consultant must implement and perform oversight of a program for monitoring and evaluation (M&E) of social and environmental risks in order to comply with the national environmental legislation. \$125,000 (One consultant for the duration of the project, at \$2,500 / month for 50 months)
x	71600	Travel for international conferences on Climate Change / Montreal Protocol Reporting
y	72100	Contractual services to support Outreach activities
z	74200	Printing and audio-visual costs for lessons learned dissemination & south-south Cooperation (Output 3.1.1)
aa	75700	Training workshops, seminars and meetings for (Output 3.1): inception workshop, annual presentations with steering committee
No.	Budget Line	Project Management
bb	71300	Project staff to undertake day-to-day project implementation and management activities for a total of 50 months at \$ 4399/month
cc	74100	Professional Services 74100 (Audit)
dd	72200	Standard office and computing equipment
ee	72500	Basic office supplies for duration of project period
ff	74200	Standard project communication strategy
gg	75700	Training workshops, seminars and meetings to strengthen project management capabilities

XI. LEGAL CONTEXT

Option a. Where the country has signed the [Standard Basic Assistance Agreement \(SBAA\)](#)

229. This project document shall be the instrument referred to as such in Article 1 of the Standard Basic Assistance Agreement between the Government of Trinidad and Tobago and UNDP, signed on (1972). All references in the SBAA to “Executing Agency” shall be deemed to refer to “Implementing Partner.”
230. This project will be implemented by **Ministry of Planning and Development (MPD)** (“Implementing Partner”) in accordance with its financial regulations, rules, practices and procedures only to the extent that they do not contravene the principles of the Financial Regulations and Rules of UNDP. Where the financial governance of an Implementing Partner does not provide the required guidance to ensure best value for money, fairness, integrity, transparency, and effective international competition, the financial governance of UNDP shall apply.
231. Any designations on maps or other references employed in this project document do not imply the expression of any opinion whatsoever on the part of UNDP concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries.

XII. RISK MANAGEMENT

UNDP (NIM)

232. Consistent with the Article III of the SBAA [or the Supplemental Provisions to the Project Document], the responsibility for the safety and security of the Implementing Partner and its personnel and property, and of UNDP’s property in the Implementing Partner’s custody, rests with the Implementing Partner. To this end, the Implementing Partner shall:
- a. put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
 - b. assume all risks and liabilities related to the Implementing Partner’s security, and the full implementation of the security plan.
233. UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of the Implementing Partner’s obligations under this Project Document.
234. The Implementing Partner agrees to undertake all reasonable efforts to ensure that no UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/sc/committees/1267/aq_sanctions_list.shtml
235. The Implementing Partner acknowledges and agrees that UNDP will not tolerate sexual harassment and sexual exploitation and abuse of anyone by the Implementing Partner, and each of its responsible parties, their respective

sub-recipients and other entities involved in Project implementation, either as contractors or subcontractors and their personnel, and any individuals performing services for them under the Project Document.

- a. In the implementation of the activities under this Project Document, the Implementing Partner, and each of its sub-parties referred to above, shall comply with the standards of conduct set forth in the Secretary General's Bulletin ST/SGB/2003/13 of 9 October 2003, concerning "Special measures for protection from sexual exploitation and sexual abuse" ("SEA").
- b. Moreover, and without limitation to the application of other regulations, rules, policies and procedures bearing upon the performance of the activities under this Project Document, in the implementation of activities, the Implementing Partner, and each of its sub-parties referred to above, shall not engage in any form of sexual harassment ("SH"). SH is defined as any unwelcome conduct of a sexual nature that might reasonably be expected or be perceived to cause offense or humiliation, when such conduct interferes with work, is made a condition of employment or creates an intimidating, hostile or offensive work environment.

236.a) In the performance of the activities under this Project Document, the Implementing Partner shall (with respect to its own activities), and shall require from its sub-parties referred to in paragraph 4 (with respect to their activities) that they, have minimum standards and procedures in place, or a plan to develop and/or improve such standards and procedures in order to be able to take effective preventive and investigative action. These should include: policies on sexual harassment and sexual exploitation and abuse; policies on whistleblowing/protection against retaliation; and complaints, disciplinary and investigative mechanisms. In line with this, the Implementing Partner will and will require that such sub-parties will take all appropriate measures to:

- i. Prevent its employees, agents or any other persons engaged to perform any services under this Project Document, from engaging in SH or SEA;
- ii. Offer employees and associated personnel training on prevention and response to SH and SEA, where the Implementing Partner and its sub-parties referred to in paragraph 4 have not put in place its own training regarding the prevention of SH and SEA, the Implementing Partner and its sub-parties may use the training material available at UNDP;
- iii. Report and monitor allegations of SH and SEA of which the Implementing Partner and its sub-parties referred to in paragraph 4 have been informed or have otherwise become aware, and status thereof;
- iv. Refer victims/survivors of SH and SEA to safe and confidential victim assistance; and
- v. Promptly and confidentially record and investigate any allegations credible enough to warrant an investigation of SH or SEA. The Implementing Partner shall advise UNDP of any such allegations received and investigations being conducted by itself or any of its sub-parties referred to in paragraph 4 with respect to their activities under the Project Document, and shall keep UNDP informed during the investigation by it or any of such sub-parties, to the extent that such notification (i) does not jeopardize the conduct of the investigation, including but not limited to the safety or security of persons, and/or (ii) is not in contravention of any laws applicable to it. Following the investigation, the Implementing Partner shall advise UNDP of any actions taken by it or any of the other entities further to the investigation.

b) The Implementing Partner shall establish that it has complied with the foregoing, to the satisfaction of UNDP, when requested by UNDP or any party acting on its behalf to provide such confirmation. Failure of the Implementing Partner, and each of its sub-parties referred to in paragraph 4, to comply of the foregoing, as determined by UNDP, shall be considered grounds for suspension or termination of the Project.

237. Social and environmental sustainability will be enhanced through application of the UNDP Social and Environmental Standards (<http://www.undp.org/ses>) and related Accountability Mechanism (<http://www.undp.org/secu-srm>).

238. The Implementing Partner shall: (a) conduct project and programme-related activities in a manner consistent with the UNDP Social and Environmental Standards, (b) implement any management or mitigation plan prepared for the

project or programme to comply with such standards, and (c) engage in a constructive and timely manner to address any concerns and complaints raised through the Accountability Mechanism. UNDP will seek to ensure that communities and other project stakeholders are informed of and have access to the Accountability Mechanism.

239. All signatories to the Project Document shall cooperate in good faith with any exercise to evaluate any programme or project-related commitments or compliance with the UNDP Social and Environmental Standards. This includes providing access to project sites, relevant personnel, information, and documentation.
240. The Implementing Partner will take appropriate steps to prevent misuse of funds, fraud or corruption, by its officials, consultants, responsible parties, subcontractors and sub-recipients in implementing the project or using UNDP funds. The Implementing Partner will ensure that its financial management, anti-corruption and anti-fraud policies are in place and enforced for all funding received from or through UNDP.
241. The requirements of the following documents, then in force at the time of signature of the Project Document, apply to the Implementing Partner: (a) UNDP Policy on Fraud and other Corrupt Practices and (b) UNDP Office of Audit and Investigations Investigation Guidelines. The Implementing Partner agrees to the requirements of the above documents, which are an integral part of this Project Document and are available online at www.undp.org.
242. In the event that an investigation is required, UNDP has the obligation to conduct investigations relating to any aspect of UNDP projects and programmes in accordance with UNDP's regulations, rules, policies and procedures. The Implementing Partner shall provide its full cooperation, including making available personnel, relevant documentation, and granting access to the Implementing Partner's (and its consultants', responsible parties', subcontractors' and sub-recipients') premises, for such purposes at reasonable times and on reasonable conditions as may be required for the purpose of an investigation. Should there be a limitation in meeting this obligation, UNDP shall consult with the Implementing Partner to find a solution.
243. The signatories to this Project Document will promptly inform one another in case of any incidence of inappropriate use of funds, or credible allegation of fraud or corruption with due confidentiality.
244. Where the Implementing Partner becomes aware that a UNDP project or activity, in whole or in part, is the focus of investigation for alleged fraud/corruption, the Implementing Partner will inform the UNDP Resident Representative/Head of Office, who will promptly inform UNDP's Office of Audit and Investigations (OAI). The Implementing Partner shall provide regular updates to the head of UNDP in the country and OAI of the status of, and actions relating to, such investigation.
245. UNDP shall be entitled to a refund from the Implementing Partner of any funds provided that have been used inappropriately, including through fraud or corruption, or otherwise paid other than in accordance with the terms and conditions of the Project Document. Such amount may be deducted by UNDP from any payment due to the Implementing Partner under this or any other agreement. Recovery of such amount by UNDP shall not diminish or curtail the Implementing Partner's obligations under this Project Document.
246. Where such funds have not been refunded to UNDP, the Implementing Partner agrees that donors to UNDP (including the Government) whose funding is the source, in whole or in part, of the funds for the activities under this Project Document, may seek recourse to the Implementing Partner for the recovery of any funds determined by UNDP to have been used inappropriately, including through fraud or corruption, or otherwise paid other than in accordance with the terms and conditions of the Project Document.

Note: The term "Project Document" as used in this clause shall be deemed to include any relevant subsidiary agreement further to the Project Document, including those with responsible parties, subcontractors and sub-recipients.

247. Each contract issued by the Implementing Partner in connection with this Project Document shall include a provision representing that no fees, gratuities, rebates, gifts, commissions or other payments, other than those shown in the proposal, have been given, received, or promised in connection with the selection process or in contract execution, and that the recipient of funds from the Implementing Partner shall cooperate with any and all investigations and post-payment audits.
248. Should UNDP refer to the relevant national authorities for appropriate legal action any alleged wrongdoing relating to the project, the Government will ensure that the relevant national authorities shall actively investigate the same and take appropriate legal action against all individuals found to have participated in the wrongdoing, recover and return any recovered funds to UNDP.
249. The Implementing Partner shall ensure that all of its obligations set forth under this section entitled "Risk Management" are passed on to each responsible party, subcontractor and sub-recipient and that all the clauses under this section entitled "Risk Management Standard Clauses" are included, mutatis mutandis, in all sub-contracts or sub-agreements entered into further to this Project Document.

ANNEXES

- A. Multiyear Work plan (see template below)
- B. GEF Emissions Calculations
- C. GEF Core Indicators
- D. Overview of technical consultancies
- E. Terms of Reference for Key Stakeholders (Project Board, Project Manager, Chief Technical Advisor and other positions as appropriate)
- F. UNDP Social and Environmental and Social Screening Procedure (SESP)
- G. Environmental and Social Management Plan (ESMP)
- H. Stakeholder Engagement Plan
- I. Gender Analysis and Action Plan

- J. UNDP Risk Log
- K. DEVCCO District Cooling Reports
- L. Additional agreements
- M. Letters of Co-financing

Annex A: Multi Year Work Plan

Task	Output	Indicator	Responsible Party (ies)	Year 1				Year 2				Year 3				Year 4			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
0	Inception: Hire PMU, Review project strategy, work plan and finalize ToRs for consultants	PMU hired, Finalised work plan, finalised ToRs for all consultants engaged	UNDP																
0	PMU Pre-start gender Training	PMU officers trained on gender	UNDP (IC)																
0	PMU Capacity Building	Training of PMU staff completed	UNDP, PMU																
1	Component I: Enhance national policy, regulatory and institutional frameworks for sustainable end-use of RAC technologies.																		
1.1	The national policy, regulatory and institutional frameworks for Energy Efficiency (EE) gains for RAC technologies have been strengthened																		
1.1.1	Improved inter-governmental coordination for integrated policy making of environmentally friendly approaches among national public institutions	1 Policy document developed, 1 Gap analysis report on current building regulations completed with recommendation for inclusion of EE design completed, 1 Study on the outlook for power market subsidies on electricity tariffs (commercial, residential), their impact on investment and financial returns for energy efficient RAC applications, and recommendations to improve market development and financial sustainability.	UNDP, PMU (NC)																
1.1.2	Strengthen a national planning and policy framework for market development of EE gains for RAC end-uses	Completed policy review report, completed policy document, Completed MEPS for RAC equipment	UNDP, PMU (IC, NC)																
1.1.3	Standards & Labelling (S&L) regulations for RAC technologies developed, including enhancement of technical capacities of public officers to ensure S&L	1 standard developed and approved: Labelling Standard for EE RAC Equipment, 1 technical specification developed and approved for	UNDP, PMU (IC)																

		installation and connection to DCS, 1 Codified system for certification of EE, RAC equipment developed																	
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	Developed procurement system for EE, low-carbon RAC systems and equipment, Developed roadmap to make procurement system mandatory	UNDP, PMU (NC)																
1.1.5	Fiscal Instruments and economic incentives for the import of high EE rated RAC equipment with natural refrigerants where applicable, developed	Developed tax incentive proposal of the adoption of low carbon, EE RAC market	UNDP, PMU (NC)																
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	4 training programmes executed for each of the following categories of stakeholders: public and private institutions, bank and financial institutions, technical companies and personnel on DCS.	UNDP, PMU (IC and NC)																
1.2.1	Standards and guidelines on safety transportation, handling and use of energy efficient alternatives developed and ready for enforcement through technical assistance interventions	Guidelines on safety transportation, application and handling of low-GWP technologies developed.	UNDP, PMU																
1.2.2	Capacity-building program at the national level to end-users on safety issues implemented	4 training and awareness raising programs nationwide (both islands) in safety transportation standards, application of guidelines and handling to deliver HCFC's alternatives to end-users	UNDP, PMU (NC)																
Component II. Accelerate RAC market transformation towards less energy intensive and low-GWP technologies.																			
2.1.1	Market analysis for RAC replacement initiatives and impacts at the national level carried out	Completed feasibility study for the triggering, nationwide, a major market transformation for the use of	UNDP, PMU (NC)																

		low-carbon, low RAC units in the commercial and household sectors. Data collection and monitoring plan to evaluate performance over time, energy savings, compliance with the S&L regulations and levels of equipment sales, completed																	
2.1.2	In-country technical capacity and backstopping for assembling energy efficient RAC systems has been improved	1 Curriculum for technicians on installation, and maintenance of EE RAC systems developed 4 Training sessions each, at both the trainer level and the technician level carried out to build capacity	UNDP, PMU (NC, IC)																
2.1.3	A structure for ensuring that RAC equipment meets international energy efficiency standards through the TTBS established	4 sensitization workshops on the new standard through public awareness campaigns completed. Training of TTBS on implementation of the new standards completed	UNDP, PMU (NC)																
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	2 training sessions for the staff of lending agencies for a deeper understanding of analysing the risks, opportunities, returns on loans and the reality of favourable paybacks of EE investments completed. 2 training sessions for project developers, on investment proposal crafting and development of business cases based on the DCS market approach completed.	UNDP, PMU (NC, IC)																
2.2.1	Investment portfolio on replacement of energy intensive technologies implemented	Completed business development phase and preparation of the business	UNDP, PMU (NC, IC)																

		<p>memorandum for all stakeholders.</p> <p>Validated the feasibility study and business case for the development of the demonstrative interventions cooling systems, which includes the baseline energy consumption for identified pilots and defining the actual market cooling demand for the project.</p> <p>Data collection and monitoring plan to evaluate performance over time, completed</p>																	
2.2.2	Implementation of District Cooling pilot at Pilot Sites	<p>Completion of report that: 1. Reviewed and assessed the market expected cooling demand, 2. Identified the optimal system configuration for the District Cooling systems based on market sector demand, national context as well as national policies identified, 3. Reviewed and verified the previously submitted Operational Expenditures (OPEX) and Capital Expenditure (CAPEX), 4. Identified key success factors and risks for implementation of DCS.</p>	UNDP and PMU (IC, NC, PSC)																
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 (Tobago Island Intl. Airport and EMA Building)	<p>Feasibility study for the triggering a major market transformation for large centralized RAC HCFC-based technologies nationwide, including an impact assessment study for RAC replacement nation-wide completed.</p> <p>3 demonstration projects implemented showing</p>	UNDP and PMU (IC, NC, PSC)																

		<p>intensive RAC end-use in the private sector, such as large hotels, private schools and shopping malls, intensive RAC end-use in the public sector implementing the mandatory procurement of green public goods, such as hospitals and academic facilities, completed.</p> <p>Development and implementation of a capacity enhancement plan for the Refrigerant Recover and Recycling Association (RRRA) to support the recovery and recycling of the retired decentralized, energy-intensive RAC equipment.</p> <p>A data collection and monitoring plan to evaluate performance over time, energy savings, compliance with the S&L regulations and levels of equipment sales implemented.</p>																		
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 sectors triggered	<p>Design of an innovative scheme, privately driven, for the recovery and recycling of waste metals and electronics of light AC units, including capacity building entrepreneurial capacities, co-financing recovery and recycling facilities, and outreach activities.</p> <p>Supporting commercially driven initiatives responsible for recovering and recycling of refrigerants, like building up entrepreneurial capacities, co-financing recovery and recycling facilities, and outreach activities. Development of a</p>	NC, PMU, PSC																	

		<p>mechanism to collect and record data on the types and volumes of refrigerants recovered by recovery and recycling organisations</p> <p>A recycling hotline and drop-off points in both islands of Trinidad and Tobago established with assistance from RRRRA.</p> <p>Design variants of RAC equipment replacement or early retirement fully documented and made publicly available.</p>																		
Component III. Information outreach and Monitoring & Evaluation (M&E) implemented.																				
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	<p>Preparing an impact assessment study for RAC replacement nation-wide.</p> <p>Designing variants of RAC equipment replacement or early retirement fully documented and made publicly available</p> <p>Carrying out technical workshops to socialize with policy makers, RAC traders and importers, large end-users and the academia, the main findings of this study.</p>	NC, PMU																	
3.1.2	National capacities for the public and private sectors for calculations and monitoring of global impact indicators enhanced	Provide training to the public and private sector in collaboration with MPD, in support of data collection for the MRV. For DCS, national capacities would be enhanced considering the global benefit of using waste heat generated by thermal power plants, with key stakeholders in the RAC sector.	NC, PMU																	

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)	Design of a module for data to be collected and recorded in the knowledge management system under the MRV system. For DCS, the key beneficiary high-energy intensive sectors and the policy makers such as the EPPD of the MPD and the EMA.	NC, PMU,																
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)	Implementing a program for monitoring and evaluation (M&E) of social and environmental risks in order to comply with the national environmental legislation.	UNDP, PMU																
3.2.3	Monitoring of project progress in compliance with UNDP and GEF guidelines	National Steering Committee held every six months Monitoring and evaluation (M&E) programme for project, in accordance with the UNDP management procedures, implemented.	UNDP, PMU																
3.2.4	Carrying out of project progress report(s), including PIRs, Mid-term Review and a Terminal Evaluation	Annual Project Progress Reports (PPR) completed. Annual Project Implementation Report (PIR) completed. Mid-term review –MTR completed Terminal Evaluation (TE) completed.	UNDP, PMU																

PSC – Private Sector Company, PMU – Project Management Unit, IC – International Consultant, NC – National Consultant

Annex B: GHG Emissions Calculations

1. Introduction

The calculation for the GHG benefits of the UNDP/GEF “Energy Efficiency through the Development of Low-carbon RAC Technologies in Trinidad and Tobago” was structured in three avenues in order to estimate avoided *direct*, *direct post-project* and *indirect* emissions, due to the adoption of more efficient cooling and refrigeration equipment and District Cooling systems.

- The Scientific and Technical Advisory Panel (STAP) has prepared the guide “Calculating Greenhouse Gas Benefits of the Global Environment Facility Energy Efficiency Projects³⁶”. Based on this methodology, the PPG has estimated the global benefits of GEF energy efficiency tasks following the Standards and labelling module, for avoided *direct*, *direct post-project* and *indirect* emissions.
- Estimations of global benefits in terms of mitigated CO2 emissions associated with the development of two pilot projects of District Cooling systems.

These calculations have been assessed individually, without considering potential synergic effects among them; in this regard this analysis -a conservative approach to calculating global benefits- must be verified in the Mid-Term Review during project implementation and adjusted according to the activities planned in Annex A: Multiyear Work Plan, as well as in the Terminal Evaluation at FSP project completion.

At the end of the project, the reduction of emissions linked to the implementation of standards and labelling activities would provide a *direct reduction*³⁷ of 154,359 tCO_{2eq} by the year 2023 and 202,930 by the year 2043; a *direct post-project*³⁸ reduction of 334,851 tCO_{2eq} by the year 2043 and *indirect*³⁹ emissions avoided of 284,693 tCO_{2eq}.

At the end of the project, the reduction of energy consumption related to the implementation of District Cooling Systems would provide a *direct reduction* of 93,000 tCO_{2eq} and *direct post-project* savings estimated at 430,500 tCO_{2eq}.

The total accumulation of GHG emissions avoided by the project is approximately 1,500,333 tCO_{2eq}; of which 450,289 are *direct* at the project end, 765,351 are *direct post-project* and 284,693 estimated as *indirect*, as summarized in the following Table:

Actions	Direct Savings CO2	Direct post-project savings	Indirect CO2
Standards & Labeling	357,289	334,851	284,693
District Cooling	93,000	430,500	
Sub-Total	450,289	765,351	284,693
Total	1,500,333		

³⁶ STAP: Calculating Greenhouse Gas Benefits of the Global Environment Facility Energy Efficiency Projects. “GEF_EE_Methodology_v1.0_2/Version 1.0”.

³⁷ Ibid 1, page 9: Energy and emission savings associated with equipment or appliances purchased prior to the date of project close are considered *direct* project impacts.

³⁸ Ibid 1, page 4: Building improvements and equipment purchases and dissemination of results from demonstration projects that occur after project closure are considered to result in *direct post-project* impacts.

³⁹ Ibid 1, page 12. Enter total market potential for CO2 emission reductions, based on market studies or scenario analysis, achievable during the 10-year project influence period after project closure.

2. Calculation of Emission Reductions associated with the implementation of S&L for cooling and refrigeration equipment

For this project, the GEF-EE-Tool model for Standards and Label was used over a 20-year period, due to the implementation of technological changes to replace inefficient RAC equipment with more efficient systems, such as highly rated Energy Efficiency Ratio (EER); using the GEF project-based methodology for calculating GHG emission reductions from energy efficiency projects. The following technologies were considered:

- Commercial Central AC and Heat pump (with capacity in the range of 5-15 Ton)
- Commercial Chiller (with capacity in the range of 20-4000 Ton)
- Home Refrigerator
- Home Air Conditioner

Please refer to file GEF-EE-Tool attached for basic project information and data assumptions. The following Table presents the overall results of this calculation:

All Components	Cumulative			Annual			
	Total	2019-2023	2024-2043	2019	2023	2025	2035
Direct Electricity Savings (MWh)	416 421	179 906	236 515	0	68 042	55 348	0
Direct Natural Gas Savings (GJ)	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	1 499 114	647 661	851 453	0	244 951	199 251	0
Direct GHG Emission Savings (tCO ₂)	357 289	154 359	202 930	0	58 380	47 488	0
Direct Post-project GHG Emission Savings (tCO ₂)	334 851		334 851	0	0	19 748	11 744
Indirect Bottom-up Emission Savings (tCO ₂)	0		0				
Indirect Top-down Emission Savings (tCO ₂)	284 693		284 693				

Ref.: GEF-EE-Tool-v1 T&T

Note: For the calculation of the reduction of indirect emissions, it was assumed 2025 as the reference year (47,488 tCO₂e) over a 10-year period (accumulative).

3. Calculation of Emission Reductions associated with District Cooling systems

For the City of Port of Spain, where the capital of T&T is located, there are many opportunities to develop the District Cooling technology in an innovative way. The calculation of the emissions related to these proposed measures to be implemented in the pilot DC systems was calculated using an emission factor of 0.77 ton CO₂/MWh of electricity.

During the PPG, an international consulting firm specialized on DC systems, performed a detailed analysis and presented the projected direct emissions to be avoided because of project interventions. The estimated mitigation due to the two pilot locations analysed by the international consultant are as follows (direct tCO_{2eq} savings):

- **Pilot 1 (Piarco):**
With the new District Cooling system fully developed, the reduction of electricity consumption is about 2.3 GWh annually. With an emission factor of 0.77 ton CO₂/MWh electricity, it results in about 1,800 ton CO₂/year reduction.
- **Pilot 2 (Couva):**
This initiative will reduce the amount of electricity needed to operate on-site electrical driven chillers. With the new District Cooling system fully developed, the reduction of electricity consumption is about 3.7 GWh annually. This will result in potential mitigation of about 2,850 ton CO₂/year reduction.

With an assumed the replicability of systems similar to the pilots 1 being implemented within Trinidad and Tobago over the next 20 years, the *direct, and direct post* tCO₂eq mitigation impact was calculated and summarized in table 12 below.

Summary of estimated direct and post direct tCO2eq for DCS :

Year	Number of sites																				Total (tCO2eq)	
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038		
Piarco @ 1800 tCO2eq	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	36,000.00
Couva @ 2850 tCO2eq	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	57,000.00
Replication sites @ 1800 tCO2eq					2	2	4	4	5	4	5	6	7	7	8	8	9	10	10	11		183,600.00
Replication sites @ 2850 tCO2eq					2	2	3	3	3	4	4	5	5	6	6	7	7	9	10	10		245,100.00
Total (tCO2eq)																					428,700.00	

Annex C: GEF Core Indicators

GEF 7 Core Indicator Worksheet

Annex C

Core indicator 6.1 and 6.2 were the indicators filled as relate directly to this project.

Core Indicator 1		Terrestrial protected areas created or under improved management for conservation and sustainable use				(Hectares)		
		Hectares (1.1+1.2)						
		Expected			Achieved			
		PIF stage	Endorsement	MTR	TE			
		n/a						
Indicator 1.1		Terrestrial protected areas newly created						
Name of Protected Area	WDPA ID	IUCN category	Hectares					
			Expected		Achieved			
			PIF stage	Endorsement	MTR	TE		
			(select)		n/a			
		(select)						
		Sum						
Indicator 1.2		Terrestrial protected areas under improved management effectiveness						
Name of Protected Area	WDPA ID	IUCN category	Hectares	METT Score				
				Baseline		Achieved		
						Endorsement	MTR	TE
				(select)				
		(select)						
		Sum						
Core Indicator 2		Marine protected areas created or under improved management for conservation and sustainable use				(Hectares)		
		Hectares (2.1+2.2)						
		Expected			Achieved			
		PIF stage	Endorsement	MTR	TE			
		n/a						
Indicator 2.1		Marine protected areas newly created						
Name of Protected Area	WDPA ID	IUCN category	Hectares					
			Expected		Achieved			
			PIF stage	Endorsement	MTR	TE		
			(select)					
		(select)						
		Sum						
Indicator 2.2		Marine protected areas under improved management effectiveness						
Name of Protected Area	WDPA ID	IUCN category	Hectares	METT Score (Scale 1-3)				
				Baseline		Achieved		
				PIF stage	Endorsement	MTR	TE	
				(select)				
		(select)						
		Sum						
Core Indicator 3		Area of land restored				(Hectares)		

		Hectares (3.1+3.2+3.3+3.4)			
		Expected		Achieved	
		PIF stage	Endorsement	MTR	TE
		n/a			
Indicator 3.1	Area of degraded agricultural land restored				
			Hectares		
			Expected		Achieved
			PIF stage	Endorsement	MTR TE
Indicator 3.2	Area of forest and forest land restored				
			Hectares		
			Expected		Achieved
			PIF stage	Endorsement	MTR TE
Indicator 3.3	Area of natural grass and shrublands restored				
			Hectares		
			Expected		Achieved
			PIF stage	Endorsement	MTR TE
Indicator 3.4	Area of wetlands (including estuaries, mangroves) restored				
			Hectares		
			Expected		Achieved
			PIF stage	Endorsement	MTR TE
Core Indicator 4	Area of landscapes under improved practices (hectares; excluding protected areas)				(Hectares)
			Hectares (4.1+4.2+4.3+4.4)		
			Expected		Expected
			PIF stage	Endorsement	MTR TE
			n/a		
Indicator 4.1	Area of landscapes under improved management to benefit biodiversity				
			Hectares		
			Expected		Achieved
			PIF stage	Endorsement	MTR TE
Indicator 4.2	Area of landscapes that meet national or international third-party certification that incorporates biodiversity considerations				
Third party certification(s):			Hectares		
			Expected		Achieved
			PIF stage	Endorsement	MTR TE

Indicator 4.3	Area of landscapes under sustainable land management in production systems					
			Hectares			
			Expected		Achieved	
			PIF stage	Endorsement	MTR	TE
Indicator 4.4	Area of High Conservation Value Forest (HCVF) loss avoided					
			Hectares			
			Expected		Achieved	
			PIF stage	Endorsement	MTR	TE
Core Indicator 5	Area of marine habitat under improved practices to benefit biodiversity					(Hectares)
Indicator 5.1	Number of fisheries that meet national or international third-party certification that incorporates biodiversity considerations					<i>n/a</i>
Third party certification(s):			Number			
			Expected		Achieved	
			PIF stage	Endorsement	MTR	TE
Indicator 5.2	Number of large marine ecosystems (LMEs) with reduced pollution and hypoxial					
			Number			
			Expected		Achieved	
			PIF stage	Endorsement	MTR	TE
Core Indicator 6	Greenhouse gas emission mitigated					(Tons)
			Tons (6.1+6.2)			
			Entered		Entered	
			PIF stage	Endorsement	MTR	TE
		Expected CO2e (direct)	357500	450289		
		Expected CO2e (indirect)	335000	1048244		
Indicator 6.1	Carbon sequestered or emissions avoided in the AFOLU sector					
			Tons			
			Entered		Entered	
			PIF stage	Endorsement	MTR	TE
		Expected CO2e (direct)				
		Expected CO2e (indirect)				
		Anticipated Year				
Indicator 6.2	Emissions avoided					

			Tons CO2eq			
			Expected		Achieved	
			PIF stage	Endorsement	MTR	TE
		Expected CO2e (direct)	357500	450289		
		Expected CO2e (indirect)	335000	1048244		
		Anticipated Year	2035	2038		
Indicator 6.3	Energy saved					
			GWH / MJ			
			Expected		Achieved	
			PIF stage	Endorsement	MTR	TE
		Expected energy savings (GWh)	<i>n.a.</i>	22GWH or 79,200,000 MJ		
Indicator 6.4	Increase in installed renewable energy capacity per technology					
		Technology	Capacity (MW)			
			Expected		Achieved	
			PIF stage	Endorsement	MTR	TE
		(select)				
		(select)				
Core Indicator 7	Number of shared water ecosystems (fresh or marine) under new or improved cooperative management					(Number)
Indicator 7.1	Level of Transboundary Diagnostic Analysis and Strategic Action Program (TDA/SAP) formulation and implementation					<i>n/a</i>
		Shared water ecosystem	Rating (scale 1-4)			
			PIF stage	Endorsement	MTR	TE
Indicator 7.2	Level of Regional Legal Agreements and Regional Management Institutions to support its implementation					
		Shared water ecosystem	Rating (scale 1-4)			
			PIF stage	Endorsement	MTR	TE
Indicator 7.3	Level of National/Local reforms and active participation of Inter-Ministerial Committees					
		Shared water ecosystem	Rating (scale 1-4)			
			PIF stage	Endorsement	MTR	TE
Indicator 7.4	Level of engagement in IWLEARN through participation and delivery of key products					
		Shared water ecosystem	Rating (scale 1-4)			
			Rating		Rating	
			PIF stage	Endorsement	MTR	TE

Core Indicator 8	Globally over-exploited fisheries Moved to more sustainable levels					(Tons)
			Metric Tons			
			PIF stage	Endorsement	MTR	TE
Core Indicator 9	Reduction, disposal/destruction, phase out, elimination and avoidance of chemicals of global concern and their waste in the environment and in processes, materials and products					(Tons)
			Metric Tons (9.1+9.2+9.3)			
			Expected		Achieved	
			PIF stage	PIF stage	MTR	TE
Indicator 9.1	Solid and liquid Persistent Organic Pollutants (POPs) and POPs containing materials and products removed or disposed					
			Metric Tons			
			Expected		Achieved	
			PIF stage	Endorsement	MTR	TE
	(select)	(select)	(select)			
	(select)	(select)	(select)			
	(select)	(select)	(select)			
Indicator 9.2	Quantity of mercury reduced					
			Metric Tons			
			Expected		Achieved	
			PIF stage	Endorsement	MTR	TE
Indicator 9.3	Number of countries with legislation and policy implemented to control chemicals and waste					
			Number of Countries			
			Expected		Achieved	
			PIF stage	Endorsement	MTR	TE
Indicator 9.4	Number of low-chemical/non-chemical systems implemented particularly in food production, manufacturing and cities					
		Technology	Number			
			Expected		Achieved	
			PIF stage	Endorsement	MTR	TE
Core Indicator 10	Reduction, avoidance of emissions of POPs to air from point and non-point sources					(Grams)
Indicator 10.1	Number of countries with legislation and policy implemented to control emissions of POPs to air					
			Number of Countries			
			Expected		Achieved	
			PIF stage	Endorsement	MTR	TE

Indicator 10.2	Number of emission control technologies/practices implemented					
			Number			
			Expected		Achieved	
			PIF stage	Endorsement	MTR	TE
Indicator 10.3	Number of countries with legislation and policy implemented to control chemicals and waste					
			Number of Countries			
			Expected		Achieved	
			PIF stage	Endorsement	MTR	TE
Core Indicator 11	Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment					(Number)
			Expected		Number Achieved	
			PIF Stage	Endorsement	MTR	TE
Female			N/A	45		
Male			N/A	100		
Total			N/A	145		

Annex D: Overview of Technical Consultancies

Consultant	Time Input	Tasks, Inputs and Outputs
For Project Management / Monitoring & Evaluation		
Local / National contracting		
Project Manager Rate: \$3,000.00/week	50 Months / over 5 years	The Project Manager (PM), together with the PMU will be responsible for the overall management of the project, including the mobilization of all project inputs, supervision over project staff, consultants and sub-contractors. See the full TOR in Annex E Terms of Reference for Key Project Stakeholders for details.
International / Regional and global contracting		
International consultants Rate: \$600.00/ day	80 days / over 4 years	Engaged to develop the following: In output 3.1.2 - the consultant should provide training to the public and private sectors in collaboration with the EPPD of the MPD, in support of data collection for the MRV. For DCS, national capacities would be enhanced considering the global benefit of using waste heat generated by thermal power plants, with key stakeholders in the RAC sector- \$48,000 (80 days over a four year period at \$600/day)
International consultants Rate: \$600.00 / day Rate:	160 day / 4 years	Engaged to develop Output 3.2.1 the consultant should Design of a module for data to be collected and recorded in the knowledge management system under the MRV system, adapted to the different cooling capacities of the most commonly used systems - \$96,000 (160 days over a four year period at \$600/day);
International Consultant (PIR, MTR, TE) Rate: \$50,000.00	4 weeks / over	In output 3.2.4, Carrying out of project progress report(s), including PIRs, Mid-term Review and a Terminal Evaluation, \$50,000 (\$25,000 for MTR and \$25,000 for the TE).
For Technical Assistance		
Outcome 1		
Local / National contracting		

Consultant	Time Input	Tasks, Inputs and Outputs
Strengthen the national policy, regulatory and institutional frameworks Legal Expert Rate: \$3000/month	50 Month / over 5 years	Local individual engaged to develop and coordinate Component 1, that is, to strengthen the national policy, regulatory and institutional frameworks in order to make the transition to a more energy efficient environment for RAC technologies in which market-oriented goals govern policy, planning, and investment decisions, for both, the short and long term. Engagement for a total of 50 months at \$ 3000/month
Local Consultant – Energy Efficiency and District Cooling Rate: \$2,500 / month Rate: \$2,500.00 / month	25 month / over 4 years 15 Months / 4 years	Local consultant engaged to support Output 1.1.1 and Output 1.1.4 activities include Development of a national policy that synergizes the MP, NDC, and CRS engaging all parties from public and private sector regarding decision-making, and propose, as needed, reflecting gender impact guidelines; an analysis of the current building regulations for public and private structures with a view to upgrade them to ensure that building designs are aligned to national standards and practices and thereby promote energy efficiency; identify any barriers that may need to be addressed to facilitate implementation of RAC energy efficiency applications in public buildings, analysing the current public procurement system for central and split RAC systems, preparing a procurement system for high EE, low GWP Refrigeration and Air Conditioning systems in the public system and preparing a road map, for making the procurement system mandatory; and a Study on the outlook for power market subsidies on electricity tariffs (commercial, residential), their impact on investment and financial returns for energy efficient RAC applications, and recommendations to improve market development and financial sustainability.– \$62,500 (25 months over a 4-year period at \$2,500 / month); Local consultant engaged to support Output 1.1.2 – Activities include Development of a national policy for the development of RAC sustainable markets based on high EE rating and low GWP as a core element of the National Cooling Plan, Development of Minimum Energy Performance Standards , (MEPs) for RAC equipment, including the review of existing energy efficiency/consumption reduction targets for the RAC sector, description of existing Minimal Energy Performance: requirements, enforcement, national testing procedures, and description of existing labelling system: requirements and enforcement and Implement an awareness raising campaign for the MEPs developed for the RAC equipment.- \$37,500 (15 months over a 4 year period at \$2,500 / month)
Local Consultant – Inspection Service Development (EE Standards) Rate: \$2,500.00 / month	20 month / 4 years	Engaged for Output 2.1.3: structure for ensuring that RAC equipment meets international energy efficiency standards through the TTBS. Consultant to develop an inspection regime for EE standards for RAC equipment - \$50,000 (20 months over a 4 year period at \$2,500 / month);
Local Consultant – Sensitisation (EE Standards) Rate: \$2,500.00 / month	20 month / 4 years	Engaged for Output 2.1.3: structure for ensuring that RAC equipment meets international energy efficiency standards through the TTBS. Consultant to perform Sensitization on the new standard through public awareness campaign - \$50,000 (20 months over a 4 year period at \$2,500 / month);

Consultant	Time Input	Tasks, Inputs and Outputs
Local Consultant – Training (EE Standards) Rate: \$2,500.00 / month	20 month / 4 years	Engaged for Output 2.1.3: structure for ensuring that RAC equipment meets international energy efficiency standards through the TTBS. Consultant to perform Training of TTBS on implementation of the new standards - \$50,000 (20 months over a 4 year period at \$2,500 / month).
Market Analyst Flat Rate: \$75,000.00	6 months / 1 year	Contractual services to support Output 2.1.1: Market analysis for RAC replacement initiatives and impacts at the national level – USD\$75,000
National consultants – Global Impact Indicators (Team A) Flat Rate: \$100,000.00 (2 consultants at \$50,000.00 each)	3 years	National consultants engaged to develop the following: in Output 3.1.2 National capacities for the public and private sectors for calculations and monitoring of global impact indicators - \$100,000 (One team of two consultants engaged – one for the private sector and one for the public sector- at \$50,000 each) the consultants must provide training to the public and private sectors in collaboration with the EPPD of the MPD, in support of data collection for the MRV. For DCS, national capacities would be enhanced considering the global benefit of using waste heat generated by thermal power plants, with key stakeholders in the RAC sector;
National consultants – Global Impact Indicators (Team B) Flat Rate: \$100,000.00 (2 consultants at \$50,000.00 each)	3 years	National consultants engaged in Output 3.2.1 the consultant must design of a module for data to be collected and recorded in the knowledge management system under the MRV system, adapted to the different cooling capacities of the most commonly used systems. - \$100,000 (One team of two consultants engaged at \$50,000 each);
National consultant – Global Impact Indicators \$2,500 / month	50 months	National consultants in 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 consultant must implement and perform oversight of a program for monitoring and evaluation (M&E) of social and environmental risks in order to comply with the national environmental legislation. \$125,000 (One consultant for the duration of the project)
International / Regional and global contracting		
International Consultant - Energy Efficiency and District Cooling Flat Rate: \$150,000.00	20 weeks / over 10 months	Contractual services to support Output 1.1.3, including enhancement of technical capacities of public officers to assure S&L compliance – activities should include: <ul style="list-style-type: none"> • Development and approval of national standards and labelling for EE, RAC equipment, including the implementation of procedures for conformity assessment, • Development of technical specifications for installation and connection to DCS. • Establish a MOA for testing, validation and certification of EE RAC equipment, through recognition and partnerships with testing facility duly accredited and authorized for RAC product certification, Implementing an awareness raising campaign to enforce S&L

Consultant	Time Input	Tasks, Inputs and Outputs
		for EE RAC equipment including technical specifications for DCS and development of a codified system for certification of RAC EE equipment, systems and products (energy efficient air conditioning system) in Trinidad and Tobago.
<i>International Tax Advisor</i> <i>Flat Rate: \$76,500.00</i>	12 weeks / over 4 months	Contractual services to support Output 1.1.5 – activities should include <ul style="list-style-type: none"> Analysing the current tax system (such as import, value-added and sale taxes) and on-going incentives for infrastructure retrofit and electro-mechanical reconversion, in the commercial and industrial sectors and development of a tax incentive proposal to promote the low-carbon and low-GWP markets
<i>International Consultant - Energy Efficiency and District Cooling - Training and Development</i> <i>Flat Rate; \$100,000.00</i>	12 months / 3 years	Contractual services support Output 1.1.6 – including the development and implementation of all relevant training modules - \$100,000.
<i>International Consultant - Energy Efficient RAC Systems</i> <i>Training and Development</i> <i>Flat Rate: \$50,000.00</i> <i>Consultant Curriculum development</i> <i>Flat Rate: \$50,000.00</i>	6 months / 3 years	International consultants engaged to develop training to support coordination and training for technicians and technical organizations for Output 2.1.2: In-country technical capacity and backstopping for assembling energy efficient RAC systems. The international consultants should provide the development of curriculum for technicians on installation, and maintenance of EE RAC systems and carry out training sessions at both the trainer level and the technician level to build capacity: \$100,000 (two international consultants at USD\$50,000 each)
<i>International Consultant – Investment analysis and Finance (DCS Markets)</i>	12 months / 3 years	Contractual services for the development of 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. Services should provide training to staff of lending agencies for a deeper understanding of analysing the risks, opportunities, returns on loans and the reality of favourable paybacks of EE investments, training to project developers, on investment proposal designing and development of business cases based on the DCS market approach

Consultant	Time Input	Tasks, Inputs and Outputs
<i>Flat Rate; \$150,00.00</i>		
<i>International Consultant - Energy Efficiency and District Cooling</i> <i>Flat Rate: \$500,000.00</i>	<i>15 months</i>	Contractual services to support Output 2.2.1 Investment portfolio on replacement of energy intensive technologies including a complete business development phase and preparation of the business memorandum for all stakeholders, including a validated the feasibility study and business case for the development of the demonstrative interventions cooling systems, which includes the baseline energy consumption for identified pilots and defining the actual market cooling demand for the project and data collection and monitoring plan to evaluate performance over time - \$500,000
<i>Contractual Services – DCS Pilot activities</i> <i>Flat Rate (Piarco Airport DC Pilot Site): \$500,000.00</i> <i>Flat Rate (Couva Pilot Site): \$1,500,000.00</i>	<i>21 months</i>	Contractual services to support Outputs 2.2.2, 2.2.3, 2.2.4 and 2.2.5 at Piarco Airport DC Pilot Site - \$500,000 <ul style="list-style-type: none"> • Drive efficiency upwards and optimize long-term costs. • Rely on the best industrial practice and design standards. • Review and access the market expected cooling demand. • Identify the optimal system configuration for the District Cooling systems based on market sector demand, national context as well as national policies. • Estimate the Project Capital Expenditures (CAPEX) due to the equipment needed together with civil, mechanical, and electrical works, management and engineering as well as Operational Expenditures (OPEX). • Prepare the “Project Business Model” with OPEX/CAPEX/Income of the District Cooling system to be developed during the project implementation period. • Based on the Business Model, this exercise will serve to develop standardized procurement strategies as well as the District Cooling tariff in order to mainstream this alternative over the long run. • Identify key success factors and risks. • Design of an innovative scheme, privately driven, for the recovery and recycling of waste metals and electronics of light AC units, including capacity building entrepreneurial capacities including business modelling and planning), co-financing recovery and recycling facilities, and outreach activities. • Supporting commercially driven initiatives responsible for recovering and recycling of refrigerants, like building up entrepreneurial capacities (business modelling and planning), co-financing recovery and recycling facilities, and outreach activities. • Developing a mechanism to collect and record data on the types and volumes of refrigerant recovered by recovery and recycling organisations. • Establishing a RAC recycling hotline and drop-off points in both islands of Trinidad and Tobago with assistance from RRRRA. • Design variants of RAC equipment replacement or early retirement fully documented and made publicly available. • Formulating a feasibility study for the triggering a major market transformation for large centralized RAC HCFC-based technologies nationwide, including an impact assessment study for RAC replacement nation-wide.

Consultant	Time Input	Tasks, Inputs and Outputs
		<ul style="list-style-type: none"> • Implementing at least three demonstration projects of intensive RAC end-use in the private sector, such as large hotels, private schools and shopping malls. • Implementing at least three demonstration projects of intensive RAC end-use in the public sector implementing the mandatory procurement of green public goods, such as hospitals and academic facilities. • Enhancing the capacities of the Refrigerant Recover and Recycling Association (RRRA) to support the recovery and recycling of the retired decentralized, energy-intensive RAC equipment. • Preparing a data collection and monitoring plan to evaluate performance over time, energy savings, compliance with the S&L regulations and levels of equipment sales.
<i>International consultant</i> <i>Rate: \$600.00 / day</i>	<i>80 day / over 4 years</i>	International consultants engaged to develop the following: In output 3.1.2 - the consultant should provide training to the public and private sectors in collaboration with the EPPD of the MPD, in support of data collection for the MRV. For DCS, national capacities would be enhanced considering the global benefit of using waste heat generated by thermal power plants, with key stakeholders in the RAC sector- \$48,000
<i>International consultant</i> <i>Rate: \$600.00 / day</i>	<i>160 day / over 4 year</i>	Output 3.2.1 the consultant should Design of a module for data to be collected and recorded in the knowledge management system under the MRV system, adapted to the different cooling capacities of the most commonly used systems - \$96,000

Annex E: Terms of Reference for Key Project Stakeholders

Terms of Reference for the Project Steering Committee (PSC)

The Project Steering Committee (PSC) will serve as the project’s decision-making body. It will meet according to necessity, at least twice each year, to review project progress, approve project work plans and approve major project deliverables. The PSC is responsible for providing the strategic guidance and oversight to project implementation to ensure that it meets the requirements of the approved Project Document and achieves the stated outcomes. The PSC’s role will include:

- *Provide strategic guidance to project implementation;*
- *Ensure coordination between various donor funded and government funded projects and programmes;*
- *Ensure coordination with various government agencies and their participation in project activities;*
- *Approve annual project work plans and budgets, at the proposal of the Project Manager;*
- *Approve any major changes in project plans or programmes;*
- *Oversee monitoring, evaluation and reporting in line with GEF requirements;*
- *Ensure commitment of human resources to support project implementation, arbitrating any issues within the project;*
- *Negotiate solutions between the project and any parties beyond the scope of the project;*
- *Ensure that UNDP Social and Environmental Safeguards Policy is applied throughout project implementation; and, address related grievances as necessary.*

These terms of reference will be finalized during the Project Inception Workshop.

Terms of Reference for the Technical Advisory Committee (TAC)

The TAC will provide technical advice and inputs relating to project implementation and shall be chaired by the appointed public officer with support from the NPM. The members of the TAC will consist of representatives from Government Ministry, UNDP, other relevant government agencies, research and educational organizations, NGOs (including WCS), technical experts and other relevant stakeholders to be agreed by the Project Steering Committee. Technical experts may be invited in to discuss specific issues. Indicative Terms of Reference are as follows. These will be reviewed by the Project Board during project inception and may be extended as necessary.

- *Review planned activities and ensure that they are technically sound and that, wherever possible, there is integration and synergy between the various project components during planning and implementation;*
- *Promote technical coordination between institutions, where such coordination is necessary and where opportunities for synergy and sharing of lessons exist;*
- *Provide technical advice and guidance on specific issues concerning illegal and unsustainable wildlife trade;*
- *Share information on project progress and lessons learned with related stakeholders at the national level;*
- *The TAC or a subset of its members may be requested to undertake specific project-related tasks, such as preparing or reviewing analytical reports, strategies and action plans, etc.;*
- *Other tasks as indicated by the Project Steering Committee.*

Terms of Reference for Key Project Staff

National Project Manager (NPM)

Background

The National Project Manager (NPM) will be locally recruited following UNDP procedure, with input to the selection process from the Project partners. The position will be appointed by the project implementing agencies and funded entirely from the Project. The NPM will be responsible for the overall management of the Project, including the mobilisation of all project inputs, supervision over project staff, consultants and sub-contractors. The NPM will report to the NSC in close consultation with the assigned UNDP Programme Manager for all of the Project's substantive and administrative issues. From the strategic point of view of the Project, the NPM will report on a periodic basis to the National Steering Committee. The NPM will perform a liaison role with the government, UNDP and other UN agencies, CSOs and project partners, and maintain close collaboration with other donor agencies providing co-financing.

Duties and Responsibilities

- overall management of the project,
- checking on progress and plan deviations, ensuring that changes are controlled and problems addressed
- monitoring progress and risks
- work closely with project stakeholders and ensure the project deliveries as per project document and work plan,
- ensure technical coordination of the project and the work related to legal and institutional aspects,
- mobilize all project inputs in accordance with UNDP procedures and GEF principles,
- finalize the ToR for the consultants and subcontractors and coordinate with UNDP Procurement for recruitment, procurement and contracting,
- supervise and coordinate the work of all project staff, consultants and sub-contractors,
- ensure proper management of funds consistent with UNDP requirements, and budget planning and control,
- prepare and ensure timely submission of monthly reports, quarterly consolidated financial reports, quarterly consolidated progress reports, annual, mid-term and terminal reports, and other reports as may be required by UNDP;
- submit the progress reports and key issue report to the National Steering Committee, including measures to address challenges and opportunities.
- prepare quarterly and annual work plan,
- provide regular input to UNDP corporate system ATLAS for financial and program management on project progress, financial status and various logs,
- arrange for an audit of all project accounts for each fiscal year
- undertake field visits to ensure the quality of work, and
- undertake any activities that may be assigned by UNDP and National Steering Committee.

Required skills

The incumbent should have a minimum Bachelor degree in Natural Sciences, Engineering or Business with an MBA/Master degree or Masters in energy/environment or other relevant academic discipline and professional qualifications with at least five (5) years professional experience. S/he should have extensive experience and technical ability to manage a large project and a good technical knowledge in the fields related to private sector development, climate change, energy efficiency and institutional development and/or regulatory aspects.

Competencies

- Must have effective interpersonal and negotiation skills proven through successful interactions with all levels of project stakeholder groups, including senior government officials, financial sectors, private entrepreneurs, technical groups and communities;
- Should have the ability, to coordinate a complex, multi-stakeholder project and to lead, manage and motivate teams of international and local consultants to achieve results;
- Good capacities for strategic thinking, planning and management and excellent communication skills in English are essential;

- Knowledge of UNDP project implementation procedures, including procurement, disbursements, and reporting and monitoring will be an added advantage;
- Strong leadership, managerial and coordination skills, with a demonstrated ability to effectively coordinate the implementation of large multi-stakeholder projects, including financial and technical aspects;
- Ability to effectively manage technical and administrative teams, work with a wide range of stakeholders across various sectors and at all levels, to develop durable partnerships with collaborating agencies;
- Ability to consult with relevant institutions, government officers, financial institutions, and the consulting industry on the EE knowledge gaps of these stakeholders;
- Ability to administer budgets, train and work effectively with counterpart staff at all levels and with all groups involved in the project;
- Ability to coordinate and supervise multiple Project Implementation Units in their implementation of technical activities in partnership with a variety of subnational stakeholder groups, including community and government;
- Strong drafting, presentation and reporting skills;
- Strong communication skills, especially in timely and accurate responses to emails;
- Strong computer skills, in particular mastery of all applications of the MS Office package and internet search;
- Strong knowledge about the political and socio-economic context related to the Indonesian protected area system, biodiversity conservation and law enforcement at national and subnational levels;
- Excellent command of English and local languages.

Finance and Administrative Assistant (FAA)

Background

The incumbent will be responsible to provide general administration and financial services of the project such as processing payments, raising requisition, purchase order, projects logs etc. using UNDP corporate software ATLAS. This officer, hired on full time basis, will report to the NPM.

Duties and Responsibilities

Under the guidance and supervision of the Project Manager, the Finance and Administrative Assistant will have the following specific responsibilities:

- Provide overall administration and financial services of the project such as processing payments, raising requisitions, creating purchase orders, generating projects logs etc. using UNDP corporate software ATLAS;
- Will be responsible for providing information to UNDP Project web, RRMC reporting and administrative troubleshooting;
- Perform word processing, drafting routine letters/messages/reports, mailing, arrange travel, itinerary preparation for project related travels, assist to arrange workshops/seminar/training programs and mailing, make appointments and schedule meetings assist in work-plan and budgeting, photocopying, binding and filing, maintenance of all office equipment and keeping inventory/records of supplies and their usage and any other duties assigned by Project Manager or concerned officials;
- Keep records of project funds and expenditures, and ensure all project-related financial documentation are well maintained and readily available when required by the Project Manager;
- Review project expenditures and ensure that project funds are used in compliance with the Project Document and financial rules and procedures;
- Validate and certify FACE forms before submission to UNDP;
- Provide necessary financial information as and when required for project management decisions;
- Provide necessary financial information during project audit(s);

- *Review annual budgets and project expenditure reports, and notify the Project Manager if there are any discrepancies or issues;*
- *Consolidate financial progress reports submitted by the responsible parties for implementation of project activities;*
- *Liaise and follow up with the responsible parties for implementation of project activities in matters related to project funds and financial progress reports.*
- *Assist the Project Manager in day-to-day management and oversight of project activities;*
- *Disseminating relevant information to stakeholders and network with similar projects to develop areas of collaboration;*
- *Preparing and updating projects documents and preparing the required financial and other reports required for monitoring and supervision of project progress*

Required skills

The FAA will be recruited based on the following qualifications:

- *A Bachelor's degree or an advanced diploma in accounting/ financial management from a recognized university;*
- *At least three years of relevant work experience preferably in a project management setting involving multi-lateral/ international funding agency. Previous experience with United Nations projects will be a definite asset;*
- *Computer proficiency in MS Office (Word, Excel and PowerPoint) and other common software is a prerequisite. Diploma in computer/secretarial science is desirable but not essential;*
- *Basic knowledge of procurement, petty cash handling, logistics support, and filing systems are basic requirements;*
- *Knowledge of UNDP project implementation procedures, including procurement, disbursements, and reporting and monitoring is preferable;*
- *Excellent language skills in English (writing, speaking and reading)*

Key Short-term Consultants

Background

In addition to these guidelines, detailed TORs of the national and international consultants (a consultant or a consulting firm) will be developed during the Project Inception period, in the first 3 months after project start-up, by the NPM in consultation with UNDP.

International Consultant –Energy Efficiency and District Cooling

Duties & Responsibilities

The Energy Efficiency and District Cooling International Consultant (Individual or Company) will be responsible for supporting the development of the UNDP-GEF District Cooling System (DCS) pilots. The DCS International Consultant will build upon the framework established by UNDP-GEF in the Project Document with the aim of:

- *Providing a comprehensive baseline of international and regional experiences in District Cooling;*
- *Creating a strong network in Trinidad and Tobago that fosters knowledge sharing among pilot participants;*
- *Promoting the experience, successes and lessons learned in order to create demand for the use of District cooling as an EE Low carbon alternative RAC technology. Working together with project partners to build capacity and institutionalize knowledge in District Cooling Systems in Trinidad and Tobago to ensure future project scale-up;*
- *Formulating and delivery of a robust training program together with the Local Consultant, the Project Management Unit (PMU), Civil Society Organizations (CSO), Ministry of Planning and Development (MPD) and UNDP-GEF that aligns with the capacity development needs, with respect to DCS and other EE technologies to support wider scale-up and capacity building opportunities in Trinidad and Tobago;*
- *Assist the Legal consultant in matters related to their function as it relates to energy efficiency and district cooling.*

Specific tasks of the DCS International Consultant include:

1. *UNDP-GEF DCS Pilot Business Case:*
 - a. *Conduct a gap analysis. Building on work conducted during the PPG, identify gaps (e.g. regulatory, financial, social) that might constrain the effectiveness of the DCS pilots and develop associated mitigation approaches.*
 - b. *Govern the DCS pilot Business Case. This task will include:*
 - i. *Business Management support to PMU;*
 - ii. *Governance of the pilot Business Case;*
 - iii. *Business modelling and cash flow projections;*
 - iv. *Business case reviews and audits during pre-construction, construction and operation;*
 - v. *Develop Cooling Supply Agreement (CSA) in co-operation with legal consultant;*
 - vi. *Development of customer charging models;*
 - vii. *Implement Risk Management process;*
 - viii. *Reporting on auditing outcomes and proposed corrective action plans where required.*
2. *Development of Training Materials & Delivery of Associated Trainings:*
 - a. *Training curriculum for training institutions (e.g. ARIA). Together with the Local Consultant, develop and deliver a complete training curriculum for training institutions that aims to:*
 - i. *Deepen service sector understanding of DCS;*
 - ii. *Develop service sector knowledge on the installation of, configuration and maintenance of DCS.*

3. *Work with PMU to ensure effective business project monitoring and evaluation.*

Required skills

The consultant or consulting firm shall have at least 10 years of experience with energy-efficient technologies, district cooling systems, and programme development globally and in the Caribbean region. The consultant will be knowledgeable on:

- *District cooling technology from development to implementation;*
- *Implementation and capacity building;*
- *Development and/or review of contracts and associated project contracting materials;*
- *International best practices on energy efficiency, DCS supplier contracting, and de-risking approaches.*

This project will be conducted in English and an excellent command of written and spoken English is necessary.

Local Consultant –Energy Efficiency and District Cooling

Duties & Responsibilities

The Energy Efficiency and District Cooling Local Consultant (Individual or Company) will be responsible for locally supporting the development of the UNDP-GEF District Cooling System (DCS) pilots. The DCS Local Consultant will build upon the framework established by UNDP-GEF in the Project Document with the aim of:

- *Providing a comprehensive technical baseline of regional and local experiences in District Cooling;*
- *Creating a strong network in Trinidad and Tobago that fosters knowledge sharing among pilot participants;*
- *Promoting the experience, successes and lessons learned in order to create demand for the use of District cooling as an EE Low carbon alternative RAC technology. Working together with project partners to build capacity and institutionalize knowledge in District Cooling Systems in Trinidad and Tobago to ensure future project scale-up;*
- *Formulating and delivery of a robust training program together with the International Consultant, the Project Management Unit (PMU), Civil Society Organizations (CSO), Ministry of Planning and Development (MPD) and UNDP-GEF that aligns with the capacity development needs, with respect to DCS and other EE technologies to support wider scale-up and capacity building opportunities in Trinidad and Tobago;*

Specific tasks of the DCS Local Consultant include:

4. *UNDP-GEF DCS Pilot technical scope:*
 - a. *Conduct a gap analysis. Building on work conducted during the PPG in parallel with DEVCCO, identify gaps (e.g. regulatory, financial, social) that might constrain the effectiveness of the DCS pilots and develop associated mitigation approaches.*
 - b. *Prepare DCS pilot engineering design or conceptual design and associated documentation depending of the final procurement structure. This task will include:*
 - i. *A detailed pilot plan including steps, milestones, implementation timelines, key documents and roles of key partners;*
 - ii. *Prepare engineering design or conceptual design for the whole DCS (production, distribution and energy transfer stations);*
 - iii. *Prepare environmental documents which may be requested and provide input to permits and permission applications;*
 - iv. *A final model including engineering drawings and schematics to be followed;*

- v. Prepare tender documents;
 - vi. Assist the PMU with the technical review of tenders submitted by potential contractors regarding the installation of the respective DCS pilots;
 - vii. Assist the PMU with the procurement process to award;
 - viii. Technical audit and construction supervision of the pilot DCS installations, reporting on auditing outcomes and proposed corrective action plans where required.
5. Development of technical Training Materials & Delivery of Associated Trainings:
- a. Training curriculum for training institutions (e.g. ARIA). Together with the International Consultant, develop and deliver a training curriculum for training institutions that aims to:
 - i. Deepen service sector understanding of DCS;
 - ii. Develop service sector knowledge on the installation of, configuration and maintenance of DCS.

The technical content will be a part of wider training scope provided by the International Consultant.

Required skills

The consultant or consulting firm shall have at least 5 years of experience with energy-efficient technologies, district cooling systems, and programme development in the Caribbean region. The consultant will be knowledgeable on:

- District cooling technology from design to implementation;
- Project design, implementation and national capacity building;
- Development and/or review of contracts and associated project contracting materials;
- International best practices on energy efficiency, DCS supplier contracting, and de-risking approaches;
- Designing and delivering training.

This project will be conducted in English and an excellent command of written and spoken English is necessary.

Legal Expert - Legal and Regulatory Review

Background

The overall objective of this consultancy is to review the current laws of Trinidad and Tobago with an aim at making recommendations for supporting policy and regulatory framework required for the market change toward more energy-efficient, low-carbon RAC technologies. Some focus would be placed licensing / certification of EE equipment, systems and products; and building regulations and standards, thereby making the legislation relevant to support the market change toward EE low-carbon technologies in Trinidad and Tobago.

The purpose is to review the existing legal and regulatory framework with a view to making the necessary adjustments to facilitate the scale-up of energy efficient low-carbon RAC Technologies in Trinidad and Tobago. The review will engender a number of legal and regulatory adjustments aimed at creating an enabling framework. The Consultant will be required to provide appropriate recommendations where necessary.

Duties and Responsibilities

The Consultant will be required to undertake the following activities to fulfil his/her obligations under this contract:

- Participate in a briefing meeting with the implementation agency of the project (the UNDP Country Office);
- Submit an Inception Report which must include the work plan, timescale, methodology, and budget;
- Conduct a desk research to review various project documentation, policy documents, studies, reports etc. on previous and ongoing work in energy efficiency and District Cooling Systems in Trinidad and Tobago to be

familiar with the developments in EE so that the information gathered can inform the completion of the assignment;

- *In-dept review and gap analysis performed on the current government policies and legislation as it relates to MP, EE and UNFCCC*
- *Development of a policy document that synergises all three above stated dimensions (MP, EE and UNFCCC) and finalise a terms of reference with all parties involved regarding decision-making, through relevant legislation.*
- *Interface with key stakeholders such as the Ministry of Planning and Development, Ministry of Trade and Industry, TTBS, Ministry of Energy and Energy Industries, etc.;*
- *Review ways to support the development of the institutional and regulatory framework, policy, protocol and regulations to govern the RAC sector concerning the adoption of energy efficient, low-carbon, low ODS technologies as standards and norms*
- *Develop a codified system for possible inspection, licensing and certification of low-carbon EE equipment, systems and products in the Trinidad and Tobago RAC sector.*
- *An analysis of the current building regulations with a view to assisting with legal advice to upgrade them to ensure that building designs are aligned to national standards and practices and thereby promote energy efficiency, and to identify any barriers that may need to be addressed to facilitate implementation energy efficient RAC applications in public buildings;*
- *Interact with the Energy Efficiency / District Cooling consult to ensure the context of designed regulations and advice is relevant and accurate.*
- *Develop Cooling Supply Agreement (CSA) in co-operation with legal consultant*

Qualifications and Experience

- *University Degree in Law from a recognized University and a Legal Education Certificate;*
- *Candidate must possess postgraduate qualifications and experience in legislative drafting including seven years (7) standing at the Bar;*
- *Sound knowledge the current energy issues, trends and perspectives, including a range of EE options and possibilities in respect of the Trinidad and Tobago would be an asset;*
- *Candidates should be fluency in the English Language with excellent analytical and communication skills and must be computer proficient in MS Office Suite and a digital project management tool such as MS Project.*

Project Gender Officer

Under the overall supervision and guidance of the National Project Manager, the Gender Officer will have the responsibility for the implementation of the Gender Action Plan. The Gender Officer will work closely with the M&E Officer, Safeguards Officer and Communications Officers on related aspects of project implementation, reporting, monitoring, evaluation and communication. Specific responsibilities will include:

- *Monitor progress in implementation of the project Gender Action Plan ensuring that targets are fully met and the reporting requirements are fulfilled;*
- *Oversee/develop/coordinate implementation of all gender-related work;*
- *Review the Gender Action Plan annually, and update and revise corresponding management plans as necessary;*
- *Work with the M&E officer and Safeguards Officer to ensure reporting, monitoring and evaluation fully address the gender issues of the project;*

The Project Gender Officer will be recruited based on the following qualifications:

- *Master's degree in gender studies, gender and development, environment, sustainable development or closely related area.*
- *Demonstrated understanding of issues related to gender and sustainable development; at least 5 years of practical working experience in gender mainstreaming, women's empowerment and sustainable development in relevant Country/Region/Area of Work;*
- *Proven experience in gender issues in Country/Region/Area of Work*
- *Previous experience with UN projects will be a definite asset;*
- *Demonstrated understanding of the links between sustainable development, social and gender issues;*
- *Experience in gender responsive capacity building;*
- *Experience with project development and results-based management methodologies is highly desired/required;*
- *Excellent analytical, writing, advocacy, presentation, and communications skills.*

Excellent language skills in English (writing, speaking and reading) and in local languages

Annex F: UNDP Social and Environmental Screening Procedure (SESP)

The completed template, which constitutes the Social and Environmental Screening Report, must be included as an annex to the Project Document. Please refer to the [Social and Environmental Screening Procedure](#) and [Toolkit](#) for guidance on how to answer the 6 questions.

Project Information

Project Information	
1. Project Title	Energy Efficiency through the Development of Low-carbon RAC Technologies in Trinidad and Tobago
2. Project Number	5957 (GEF Agency Project ID)
3. Location (Global/Region/Country)	Trinidad and Tobago

Part A. Integrating Overarching Principles to Strengthen Social and Environmental Sustainability

QUESTION 1: How Does the Project Integrate the Overarching Principles in order to Strengthen Social and Environmental Sustainability?

Briefly describe in the space below how the Project mainstreams the human-rights based approach

As a Small Island Developing State (SIDS), Trinidad and Tobago is particularly vulnerable to the adverse impacts of climate change such as those related to global temperature increases, changes in precipitation and sea level rise. This UNDP-GEF project aims for social and environmental impacts that may reduce these impacts on vulnerable groups and by including them in the positive effect of the technological changes proposed. This country is highly representative of Refrigeration and Air Conditioning (RAC) penetration trends in the Caribbean region, due to experiencing accelerated economic growth patterns but also facing sustainability problems. High demand of these technologies with inefficient units –with high energy consumption and high global warming potential- puts more pressure on thermal power production at the national level and increases unhealthy indoor environments for building residents, visitors and housing dwellers. This situation, in turn, does not contribute to T&T iNDC’s commitment for developing a low-carbon economy in order to assist in the achievement of sustainable development goals. It also affects severely the citizen’s quality of life, especially for those that are not able to purchase the latest, more energy efficient, RAC climate-friendly technologies.

The project acknowledges the human rights of persons and issues of human rights that may likely to arise. The project looks at best practices to increase safety, transportation and handling of low GWP/HCFCs phase-out refrigerants through technical assistance interventions contributing to an appropriate use of these alternatives, like natural refrigerants; however, these pose one or more safety-related issues including sensitive parameters like high toxicity and high flammability, especially for end-users. This is why this project is a significant step with regards to human rights protection in terms of improving indoor health (breathing air) and living and working conditions (comfort temperatures).

Briefly describe in the space below how the Project is likely to improve gender equality and women's empowerment

The project's main goal in the social area is to have positive impacts on women, men, youth and seniors. Each component of the project, whether it is enhancing national policies, accelerating market transformation and information outreach, considers the role women play in the different activities that are part of those components. Despite the fact that there is not much data available, one of the project's goals is precisely to include more gender-oriented objectives to reach out and empower women in the different activities. There is also a lack of availability of gender related information on the RAC sector, and maturity of the stakeholders as it relates to gender and gender related issues.

Therefore, during the project's implementation an analysis of the RAC sector as it relates to gender would be performed to establish a baseline. A capacity building and awareness campaign would also be launched starting with the immediate team on understanding gender in general and gender as it relates to climate change mitigation and adoption.

The project is designed with capacity building and awareness components that target training institutions, civil society, financiers and policy makers. This design encourages participation of marginalized groups as women and youths. There would be several employment opportunities emanating during and after the implementation of the project. There is also the potential for job creation opportunities will positively affect marginalized groups.

Briefly describe in the space below how the Project mainstreams environmental sustainability

This project has a high potential to improve air quality aspects as a co-benefit through the employment of new technology and more efficient operation of existing technologies, which reduces the amount of particulate matter released to the air and harmful gases. This may help reduce the development of respiratory diseases in indoor environments, and therefore indirectly in lower social costs, reduced workforce illness and absenteeism, and increased workforce productivity. However, the replacement of harmful fluorinated gases –CFCs, HCFCs and HFCs – with more climate-friendly alternatives such as the use of natural refrigerants, which have, lower Ozone Depletion Potential and lower Global Warming Potential, like Hydrocarbons (HC), Carbon Dioxide (CO₂) and Ammonia (NH₃). Although environmentally superior, these natural refrigerants are not free of other concerns, such as corrosion, toxicity, high pressures, flammability so they could also pose a health and safety hazard.

Furthermore, the project has also proposed to significantly reduce Ozone Depleting Substances (ODS) and increase energy efficiency in use of conventional RAC technologies in the commercial sector by introducing the District Cooling alternative which will decrease the current electricity capacity demand and avoid the use of ODS refrigerants. This centralized cooling technology requires a large and separate facility (plant) to host the chillers, boilers, and pumps and the system for the fresh water-cooling to operate this sort of centralized system. One issue that needs to be taken into consideration is any proposed site should not affect any critical maritime habitats or environmentally sensitive areas on either of the two islands.

Part B. Identifying and Managing Social and Environmental Risks

<p>QUESTION 2: What are the Potential Social and Environmental Risks?</p> <p><i>Note: Describe briefly potential social and environmental risks identified in Attachment 1 – Risk Screening Checklist (based on any “Yes” responses). If no risks have been identified in Attachment 1 then note “No Risks Identified” and skip to Question 4 and Select “Low Risk”. Questions 5 and 6 not required for Low Risk Projects.</i></p>	<p>QUESTION 3: What is the level of significance of the potential social and environmental risks?</p> <p><i>Note: Respond to Questions 4 and 5 below before proceeding to Question 6</i></p>			<p>QUESTION 6: What social and environmental assessment and management measures have been conducted and/or are required to address potential risks (for Risks with Moderate and High Significance)?</p>
<p>Risk Description</p>	<p>Impact and Probability (1-5)</p>	<p>Significance (Low, Moderate, High)</p>	<p>Comments</p>	<p>Description of assessment and management measures as reflected in the Project design. If ESIA or SESA is required note that the assessment should consider all potential impacts and risks.</p>
<p>Risk 1: Human Rights. Is there a risk that rights-holders do not have the capacity to claim their rights?</p>	<p>I = 2 P = 2</p>	<p>Low</p>	<p>Vulnerable end-users are well represented taking into consideration potential risks associated with the use of natural refrigerants and compliance with standards and labelling for energy efficiency.</p> <p>Over the long-run, the operation of a District Cooling Development should comply with environmental legislation, under the guidance and surveillance of the Environmental Management Authority (EMA), which is a key stakeholder of this Project.</p>	
<p>Risk 2: Gender Equality and Women’s Empowerment: have women’s groups raised gender equality concerns regarding the</p>	<p>I = 3 P = 2</p>	<p>Low</p>	<p>During the PPG phase, it was identified that there exist policy initiative regarding gender and</p>	<p>The project will undertake a detailed analysis of the sector, to establish and record the baseline information,</p>

Project during the stakeholder engagement process?			climate change; however there exist limited knowledge and baseline data on gender issues specific to the energy sector including the cooling sector.	and to build knowledge capacity on topic of gender equality and women's empowerment.
Risk 3: Biodiversity and Natural Resources: are any Project activities proposed within or adjacent to critical habitats?	I = 3 P = 3	Moderate	This is a moderate risk as the project will consider the development of a District Cooling system. Due to the limited amount of land space in the country, special attention should be dedicated to the main facility in order to avoid disruptive operations that could affect the surrounding maritime habitats or any other sort of protected areas.	During the business development and pre-construction phases of the district cooling pilots, an environmental impact assessment and certificate of environmental clearance would be acquired for each site, under the guidance and surveillance of EMA.
Risk 2: Gender Equality and Women's Empowerment: have women's groups raised gender equality concerns regarding the Project during the stakeholder engagement process?	I = 3 P = 2	Low	The project will undertake a detailed analysis as a matter to promote and mainstream gender equality and women's empowerment during the PPG phase.	
Risk 3: Biodiversity and Natural Resources: are any Project activities proposed within or adjacent to critical habitats?	I = 3 P = 3	Moderate	This is a moderate risk as the project will consider the development of a District Cooling system. Due to the limited amount of land space in the country, special attention should be dedicated to the main facility in order to avoid disruptive operations that could affect the surrounding maritime habitats or any other sort of protected areas.	The feasibility study for the District Cooling is a critical step for the decision-making process to develop this alternative on a larger scale. This risk will be fully assessed and mitigated during the implementation of the project, under the guidance and surveillance of EMA).
	I = 2 P = 2	Low	The use of alternative natural refrigerants for refrigeration and air conditioning in the domestic	Under Output 1.2.1, the project is developing appropriate standards and guidelines on safety transportation, handling

Risk 4: Community Health, Safety and Working Conditions: does the Project involve large-scale infrastructure development?			and commercial sectors may pose health and safety hazards to end-users, such as corrosion, toxicity, high pressures, and flammability.	and use of low-GWP/HCFCs alternatives, enforced by the Environmental Management Authority (EMA).
Risk 5: Indigenous Peoples: are indigenous peoples present in the Project area?	I= 1 P= 1	Low	None	
Risk 6: Pollution Prevention and Resource Efficiency	I = 3 P = 3	Moderate	As mentioned in Risk 3, the operation of a District Cooling Development will be considered over the long-run, as an alternative for a major RAC end-use transformation in the commercial sector. The project does identify a potential risk due to increased unintentional release of ODS refrigerants due to leakage during retrofits, recovery and extended storage for eventual disposal.	This risk will be fully assessed and mitigated during the implementation of the project with specific attention on reducing the release of ODS. This would be done in collaboration with the local Refrigerant Recycling and Recovery Association (RRRA), with inputs from the EMA, to develop a mitigation strategy.
	QUESTION 4: What is the overall Project risk categorization?			
	Select one (see SESP for guidance)		Comments	
	<i>Low Risk</i>	<input type="checkbox"/>		
	<i>Moderate Risk</i>	<input checked="" type="checkbox"/>	The overall risk is assessed as moderate where the greatest risks stem from the implementation of pilot projects in the proximity of any category of protected areas and the introduction of refrigerants with some level of flammability or toxicity during the fostering of more climate-friendly RAC technologies that will be put in place by the incremental activities of this UNDP/GEF project. An ESMP will be developed during the initial phase of the Project's implementation.	
	<i>High Risk</i>	<input type="checkbox"/>		
	QUESTION 5: Based on the identified risks and risk categorization, what requirements of the SES are relevant?			
	Check all that apply		Comments	

	Principle 1: Human Rights	<input checked="" type="checkbox"/>	During project implementation, the Project Manager will request a review of compliance of applicable SES requirements and will ensure that mitigation measures, if required, will protect end- users of low-carbon RAC technologies.
	Principle 2: Gender Equality and Women's Empowerment	<input checked="" type="checkbox"/>	The project will ensure that gender empowerment, especially women inclusion, is transversally incorporated into the all aspects of the project, including capacity development.
	1. Biodiversity Conservation and Natural Resource Management	<input type="checkbox"/>	
	2. Climate Change Mitigation and Adaptation	<input type="checkbox"/>	
	3. Community Health, Safety and Working Conditions	<input checked="" type="checkbox"/>	During the initial stages of project implementation, the Project will request a review of compliance with the IDB's social and environmental safeguards during the preparation of the business development phase for the District Cooling pilot (or any other of international recognition), in accordance with international protocols and means of verification.
	4. Cultural Heritage	<input type="checkbox"/>	
	5. Displacement and Resettlement	<input type="checkbox"/>	
	6. Indigenous Peoples	<input type="checkbox"/>	
	7. Pollution Prevention and Resource Efficiency	<input checked="" type="checkbox"/>	During the start of project implementation, the Project will request a review of compliance with the IDB's social and environmental safeguards during the business development phase for the District Cooling Pilots (or any other of international recognition), in accordance with international protocols and means of verification.

Final Sign Off

<i>Signature</i>	<i>Date</i>	<i>Description</i>
QA Assessor		UNDP staff member responsible for the Project, typically a UNDP Programme Officer. Final signature confirms they have “checked” to ensure that the SESP is adequately conducted.
QA Approver		UNDP senior manager, typically the UNDP Deputy Country Director (DCD), Country Director (CD), Deputy Resident Representative (DRR), or Resident Representative (RR). The QA Approver cannot also be the QA Assessor. Final signature confirms they have “cleared” the SESP prior to submittal to the PAC.
PAC Chair		UNDP chair of the PAC. In some cases, PAC Chair may also be the QA Approver. Final signature confirms that the SESP was considered as part of the project appraisal and considered in recommendations of the PAC.

SESP Attachment 1. Social and Environmental Risk Screening Checklist

Checklist Potential Social and Environmental Risks		
Principles 1: Human Rights		Answer (Yes/No)
1.	Could the Project lead to adverse impacts on enjoyment of the human rights (civil, political, economic, social or cultural) of the affected population and particularly of marginalized groups?	No
2.	Is there a likelihood that the Project would have inequitable or discriminatory adverse impacts on affected populations, particularly people living in poverty or marginalized or excluded individuals or groups? ⁴⁰	No
3.	Could the Project potentially restrict availability, quality of and access to resources or basic services, in particular to marginalized individuals or groups?	No
4.	Is there a likelihood that the Project would exclude any potentially affected stakeholders, in particular marginalized groups, from fully participating in decisions that may affect them?	No
5.	Is there a risk that duty-bearers do not have the capacity to meet their obligations in the Project?	No
6.	Is there a risk that rights-holders do not have the capacity to claim their rights?	No
7.	Have local communities or individuals, given the opportunity, raised human rights concerns regarding the Project during the stakeholder engagement process?	No
8.	Is there a risk that the Project would exacerbate conflicts among and/or the risk of violence to project-affected communities and individuals?	No
Principle 2: Gender Equality and Women's Empowerment		
1.	Is there a likelihood that the proposed Project would have adverse impacts on gender equality and/or the situation of women and girls?	No
2.	Would the Project potentially reproduce discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits?	No
3.	Have women's groups/leaders raised gender equality concerns regarding the Project during the stakeholder engagement process and has this been included in the overall Project proposal and in the risk assessment?	No
4.	Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services? <i>For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their livelihoods and well being</i>	No
Principle 3: Environmental Sustainability: Screening questions regarding environmental risks are encompassed by the specific Standard-related questions below		
Standard 1: Biodiversity Conservation and Sustainable Natural Resource Management		
1.1	Would the Project potentially cause adverse impacts to habitats (e.g. modified, natural, and critical habitats) and/or ecosystems and ecosystem services? <i>For example, through habitat loss, conversion or degradation, fragmentation, hydrological changes</i>	No

⁴⁰ Prohibited grounds of discrimination include race, ethnicity, gender, age, language, disability, sexual orientation, religion, political or other opinion, national, social, or geographical origin, property, birth or other status including as an indigenous person or as a member of a minority. References to "women and men" or similar is understood to include women and men, boys and girls, and other groups discriminated against based on their gender identities, such as transgender people and transsexuals.

1.2	Are any Project activities proposed within or adjacent to critical habitats and/or environmentally sensitive areas, including legally protected areas (e.g. nature reserve, national park), areas proposed for protection, or recognized as such by authoritative sources and/or indigenous peoples or local communities?	Yes
1.3	Does the Project involve changes to the use of lands and resources that may have adverse impacts on habitats, ecosystems, and/or livelihoods? (Note: if restrictions and/or limitations of access to lands would apply, refer to Standard 5)	No
1.4	Would Project activities pose risks to endangered species?	No
1.5	Would the Project pose a risk of introducing invasive alien species?	No
1.6	Does the Project involve harvesting of natural forests, plantation development, or reforestation?	No
1.7	Does the Project involve the production and/or harvesting of fish populations or other aquatic species?	No
1.8	Does the Project involve significant extraction, diversion or containment of surface or ground water? <i>For example, construction of dams, reservoirs, river basin developments, groundwater extraction</i>	No
1.9	Does the Project involve utilization of genetic resources? (e.g. collection and/or harvesting, commercial development)	No
1.10	Would the Project generate potential adverse transboundary or global environmental concerns?	No
1.11	Would the Project result in secondary or consequential development activities which could lead to adverse social and environmental effects, or would it generate cumulative impacts with other known existing or planned activities in the area? <i>For example, a new road through forested lands will generate direct environmental and social impacts (e.g. felling of trees, earthworks, potential relocation of inhabitants). The new road may also facilitate encroachment on lands by illegal settlers or generate unplanned commercial development along the route, potentially in sensitive areas. These are indirect, secondary, or induced impacts that need to be considered. Also, if similar developments in the same forested area are planned, then cumulative impacts of multiple activities (even if not part of the same Project) need to be considered.</i>	No
Standard 2: Climate Change Mitigation and Adaptation		
2.1	Will the proposed Project result in significant ⁴¹ greenhouse gas emissions or may exacerbate climate change?	No
2.2	Would the potential outcomes of the Project be sensitive or vulnerable to potential impacts of climate change?	No
2.3	Is the proposed Project likely to directly or indirectly increase social and environmental vulnerability to climate change now or in the future (also known as maladaptive practices)? <i>For example, changes to land use planning may encourage further development of floodplains, potentially increasing the population's vulnerability to climate change, specifically flooding</i>	No
Standard 3: Community Health, Safety and Working Conditions		
3.1	Would elements of Project construction, operation, or decommissioning pose potential safety risks to local communities?	No
3.2	Would the Project pose potential risks to community health and safety due to the transport, storage, and use and/or disposal of hazardous or dangerous materials (e.g. explosives, fuel and other chemicals during construction and operation)?	No
3.3	Does the Project involve large-scale infrastructure development (e.g. dams, roads, buildings)?	No
3.4	Would failure of structural elements of the Project pose risks to communities? (e.g. collapse of buildings or infrastructure)	No

⁴¹ In regards to CO₂, 'significant emissions' corresponds generally to more than 25,000 tons per year (from both direct and indirect sources). [The Guidance Note on Climate Change Mitigation and Adaptation provides additional information on GHG emissions.]

3.5	Would the proposed Project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, erosion, flooding or extreme climatic conditions?	No
3.6	Would the Project result in potential increased health risks (e.g. from water-borne or other vector-borne diseases or communicable infections such as HIV/AIDS)?	No
3.7	Does the Project pose potential risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during Project construction, operation, or decommissioning?	No
3.8	Does the Project involve support for employment or livelihoods that may fail to comply with national and international labor standards (i.e. principles and standards of ILO fundamental conventions)?	No
3.9	Does the Project engage security personnel that may pose a potential risk to health and safety of communities and/or individuals (e.g. due to a lack of adequate training or accountability)?	No
Standard 4: Cultural Heritage		
4.1	Will the proposed Project result in interventions that would potentially adversely impact sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g. knowledge, innovations, practices)? (Note: Projects intended to protect and conserve Cultural Heritage may also have inadvertent adverse impacts)	No
4.2	Does the Project propose utilizing tangible and/or intangible forms of cultural heritage for commercial or other purposes?	No
Standard 5: Displacement and Resettlement		
5.1	Would the Project potentially involve temporary or permanent and full or partial physical displacement?	No
5.2	Would the Project possibly result in economic displacement (e.g. loss of assets or access to resources due to land acquisition or access restrictions – even in the absence of physical relocation)?	No
5.3	Is there a risk that the Project would lead to forced evictions? ⁴²	No
5.4	Would the proposed Project possibly affect land tenure arrangements and/or community based property rights/customary rights to land, territories and/or resources?	No
Standard 6: Indigenous Peoples		
6.1	Are indigenous peoples present in the Project area (including Project area of influence)?	No
6.2	Is it likely that the Project or portions of the Project will be located on lands and territories claimed by indigenous peoples?	No
6.3	Would the proposed Project potentially affect the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples (regardless of whether indigenous peoples possess the legal titles to such areas, whether the Project is located within or outside of the lands and territories inhabited by the affected peoples, or whether the indigenous peoples are recognized as indigenous peoples by the country in question)? <i>If the answer to the screening question 6.3 is “yes” the potential risk impacts are considered potentially severe and/or critical and the Project would be categorized as either Moderate or High Risk.</i>	No
6.4	Has there been an absence of culturally appropriate consultations carried out with the objective of achieving FPIC on matters that may affect the rights and interests, lands, resources, territories and traditional livelihoods of the indigenous peoples concerned?	No

⁴² Forced evictions include acts and/or omissions involving the coerced or involuntary displacement of individuals, groups, or communities from homes and/or lands and common property resources that were occupied or depended upon, thus eliminating the ability of an individual, group, or community to reside or work in a particular dwelling, residence, or location without the provision of, and access to, appropriate forms of legal or other protections.

6.5	Does the proposed Project involve the utilization and/or commercial development of natural resources on lands and territories claimed by indigenous peoples?	No
6.6	Is there a potential for forced eviction or the whole or partial physical or economic displacement of indigenous peoples, including through access restrictions to lands, territories, and resources?	No
6.7	Would the Project adversely affect the development priorities of indigenous peoples as defined by them?	No
6.8	Would the Project potentially affect the physical and cultural survival of indigenous peoples?	No
6.9	Would the Project potentially affect the Cultural Heritage of indigenous peoples, including through the commercialization or use of their traditional knowledge and practices?	No
Standard 7: Pollution Prevention and Resource Efficiency		
7.1	Would the Project potentially result in the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and/or transboundary impacts?	No
7.2	Would the proposed Project potentially result in the generation of waste (both hazardous and non-hazardous)?	No
7.3	Will the proposed Project potentially involve the manufacture, trade, release, and/or use of hazardous chemicals and/or materials? Does the Project propose use of chemicals or materials subject to international bans or phase-outs? <i>For example, DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Conventions on Persistent Organic Pollutants or the Montreal Protocol</i>	Yes
7.4	Will the proposed Project involve the application of pesticides that may have a negative effect on the environment or human health?	No
7.5	Does the Project include activities that require significant consumption of raw materials, energy, and/or water?	No

Annex G: Environmental and Social Management Plan (ESMP)

1. General approach and scope

The Environmental and Social Management Plan (ESMP) defines a set of institutional measures, mitigation and monitoring, as well as the actions required for its implementation, in order to achieve the results expected in the project, in a socially and environmentally sustainable manner.

The level of detail and complexity of the ESMP, as well as the defined management measures, respond to the risks and impacts of the project, identified during the application of the Environmental and Social Risk Assessment tool (SESP, Annex F).

The impacts identified in the SESP were the following:

- **Social impacts:** associated with the raising of concerns regarding gender equality identified during the PPG phase of the project (Principle 2, Question 3 of the SESP tool-Low Risk).
- **Environmental impacts:**
 - Associated with the sensitivity or vulnerability of project outcomes to the potential impacts on pollution prevention (Principle 3, Standard 1, Question 1.2 of the SESP tool-Moderate Risk, and Principle 3, Standard 7, Question 7.3 of the SESP tool-Moderate Risk).
 - Associated with community health, safety and working conditions (Principle 3, Standard 7, Question 7.3 of the SESP tool- Low Risk).

The ESMP only reviews the two moderate risks; the environmental impact as it relates to the construction of the project's pilots that may be within or adjacent to critical habitats and/or environmentally sensitive areas, and the potential the project may indirectly cause the release of pollutants due to the change it seeks to achieve. This is done through the following sections: mitigation of environmental impact, monitoring, capacity building, stakeholder engagement, and implementation of the action plan.

The social impact identified, related to Gender, is addressed through the Gender Analysis and Action plan, Annex I.

2. Mitigation of Environmental Impacts

2.1 Risk related to the possible effects of the activities of the project on critical habitats and/or environmentally sensitive areas where project pilots are implemented.

The installation of the District cooling pilots as part of the project implementation poses a possible risk for the pollution of the surrounding environment and water table only during the construction phase. Other considerations of the disruption of habitats may exist due to the location of the chosen sites for the pilot District Cooling installations since there may be Greenfield⁴³ land between supplier and off-taker of the DCS technologies. The intervention of the project in relation to these risks is through abiding by national regulations and due diligence. The project shall abide by environmental law and requirements including those stipulated by the EMA: the development of pre-construction

⁴³ The term Greenfield refers to land that has never been used or develop. These are usually agricultural lands or land left to evolve naturally.

Environmental Impact Assessments (EIA), adherence to the Water pollution Rules, 2001, and the acquisition of Certificates of Environmental Clearance (CEC) for the sites to be developed.

2.2 Risk related to the possible effects of the activities of the project related to the release of pollutants to the environment.

The operation of a District Cooling market development will be considered over the long-run, as an alternative for a major RAC end- use transformation in the commercial sector and would contribute towards the replacement and phase out of ODS. The project does identify a potential environmental risk due to an increase in recovery, collection and stockpiling of the end of life ODS refrigerants, which may create an increased potential for leakage and possible unintentional release. This is due to the lack of relevant mechanisms and technologies for disposal of refrigerants on the island.

This risk will be fully assessed and mitigated during the implementation of the project with specific attention on reducing the release of ODS through stakeholder engagement and capacity development, and the development of a mechanism to suitably dispose of them at their end of life. This will be done in collaboration with the local Refrigerant Recycling and Recovery Association (RRRA), with inputs from the EPPD of the MPD and the EMA, to develop a mitigation strategy.

As part of the mitigation measures for these risks, the design of the UNDP/GEF project has foreseen that the public may be potentially affected by the different interventions and should be consulted as part of the development of the project activities. This particular has been addressed in Annex H of the ProDoc "Stakeholder Engagement Plan", where the Environmental Management Authority (EMA) and the Refrigerant Recover and Recycling Association has been identified as key stakeholders. Particular attention would be paid to the involvement of these actors in the implementation of the DCS ensuring that all mitigating measures are executed.

3. Monitoring

The monitoring of the social and environmental standards and the environmental and social risk management plan of the project will be done permanently by the National Project Manager during the life of the project, as defined in Section VII "Monitoring and Evaluation Plan", of the ProDoc. It will also be monitored as part of the PIR process and the Terminal Evaluation. In this process, particular attention will be paid to monitoring the mitigation measures defined in the SESP tool, as set forth in this Environmental and Social Management Plan, specifically in relation to risks classified as moderate.

4. Development of Capacities

On the subject of the identified environmental risks, in the legal and regulatory framework in force in Trinidad and Tobago, there exist strong regulations to support the measures identified through the Environmental Management Act (EM Act), Chapter 35:05 of 2000. The EM Act is legislation with the goal of ensuring the protection, conservation, enhancement and wise use of the environment of Trinidad and Tobago.

Enhanced capacities with respect to recovery, tracking, documenting and disposal of end of life ODS (refrigerants) would need to be undertaken in order to mitigate the environmental risk as described above in of the Refrigerant Recover and Recycling Association (RRRA) to support the recovery and recycling of the retired decentralized, energy-intensive RAC equipment.

The legal and regulatory framework is also favourable with respect to the engagement of stakeholders in the managed and mitigation of the identified risks. The project will be based on the experience and capacity created in the country to support the application of mitigation measures for the identified risk.

5. Key Actors Commitment

The main stakeholders for the purposes of managing the environmental risks identified are the Environmental Management Authority (EMA), the Refrigerant Recover and Recycling Association (RRRA), and the Environmental Policy and Planning Division of the Ministry of Planning and Development (EPPD of the MPD). These stakeholders must be consulted and involved in the development of actions that will support the design of the project and its pilots. In this regard, the EPPD of the MPD has an important role in guiding the process, both because it houses the Project Management Unit and because of the corresponding competence related to the management of ODS and its reach within the refrigeration and air-conditioning sector in Trinidad and Tobago.

6. Implementation of the Action Plan

In accordance with the provisions of the Project Document, the management of environmental and social risks classified as MODERATE will be made within the framework of the implementation of the following interventions:

- Output 2.2.1: "District Cooling technical and financial performance feasibility study completed".
- Output 2.2.2: "Implementation of District Cooling pilot at Piarco and Couva".
- Output 2.2.3: "Early-retirement of decentralised, energy-intensive units and replacement with more energy efficient, centralised-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 sectors triggered"
- 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".

Annex H: Stakeholder Engagement Plan

Stakeholder Engagement Plan for Energy Efficiency through the development of Low carbon RAC Technologies in Trinidad and Tobago

2. Introduction

This Plan seeks to strengthen UNDP partner capacities for managing social and environmental risks and ensure full and effective stakeholder engagement, including appropriate mechanisms to respond to complaints from project-affected people⁴⁴. As noted in the UNDP Social and Environmental Screening (SES) Guidance Plan, “*effective stakeholder engagement is a cornerstone to achieving sustainable development*”⁴⁵.

The vision of this project is to create a sustained market change toward 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. The project will contribute to the reduction of greenhouse gas emissions while meeting the needs and rights of children, women and the elderly. This UNDP-GEF project aims for the social and environmental impacts that may reduce these effects on vulnerable groups and to including them in the positive effect of the technological changes proposed.

As per the SESP⁴⁶, the following elements and potential social and environmental risks are being considered in the design of this project:

Risks	Comments
<i>Biodiversity and Natural Resources</i>	Due to the limited amount of land space in the country and the location of the proposed pilots, special attention should be dedicated to the main facility when considering the development of the District Cooling System, in order to avoid disruptive operations that could affect the surrounding maritime habitats or any other sort of protected areas.
<i>Community Health, Safety and Working Conditions</i>	The use of alternative natural refrigerants for refrigeration and air conditioning in the domestic and commercial sectors may pose health and safety hazards to end-users, such as corrosion, toxicity, high pressures, and flammability.
<i>Pollution Prevention and Resource Efficiency</i>	The operation of a District Cooling market development will be considered over the long run, as an alternative for a major RAC end-use transformation in the commercial sector. The project does identify a potential risk due to increased unintentional release of ODS refrigerants due to leakage during retrofits, recovery and extended storage for eventual disposal. Over the long run, the operation of a District Cooling Development should comply with environmental legislation, under the guidance and surveillance of the Environmental Management Authority (EMA), which is a key stakeholder of this Project.

⁴⁴ This Plan follows the Guidance Note UNDP Social and Environmental Standards (SES)”, drafted by UNDP on 25 May 2017.

⁴⁵ Guidance Note UNDP SES, pg. 06.

⁴⁶ Please refer to Annex F of the ProDoc “UNDP Social and Environmental Screening Procedure”.

Gender Equality and Women's Empowerment	In Trinidad and Tobago, there exist policy initiatives regarding gender and climate change; however, there is limited knowledge and baseline data on gender issues specific to the energy sector including the cooling sector. Due to the sensitive nature of policy development and project execution, data desegregation is required. The project will undertake a detailed analysis of the sector, to establish and record the baseline information, and to build knowledge capacity on the topic of gender equality and women's empowerment.
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It is important to note that no indigenous peoples will be affected whatsoever by any of the outputs of this project.

3. Regulations and Requirements

Currently in Trinidad and Tobago, there exist no laws, which speaks directly to how stakeholder consultations should be performed or structured. There exist however under the Summary Offences Act Chapter 11:02, page 53, requirements for holding or calling a public meeting, which will be followed by the project once required. The policy context and regulatory framework in which the project will be implemented, mitigate the risk of project interventions excluding any potentially affected stakeholders, particularly marginalized groups, from fully participating in decisions that may affect them.

4. Summary of any previous stakeholder engagement activities

The following Table details the activities that have been developed to date to engage stakeholders in the project:

Activity	Date	Location	Discussed topics	Undertaken actions	Means of Verification
Workshops to prepare technical and business cases for the Pilot District Cooling Systems	June 11, 2018 June 12, 2018 June 13, 2018 June 14, 2018	EPPD of MPD AATT UTT (am), TTBS (pm) ARIA	Site locations and surrounding environments, existing technologies at sites, site initial and scale-up potential. Local legal and permitting requirements.	Compilation and analysis of data from workshops and inventory questionnaires.	Draft Technical and Business reports and presentations submitted to PPG team
Workshop to prepare the project baseline	Sept. 04, 2018	TTBS	Review of the proposal submitted by the Consultant	Amend the initial proposal. Development of Section II of the ProDoc	Section II of the ProDoc sent to the Consultant
Workshop to validate the project	Sept. 05, 2018	TTBS	Validate the proposal prepared by the	Section II and III of the ProDoc completed	Section II and III of the ProDoc sent

baseline and prepare the Theory of Change			Consultant, carry out the process for the Theory of Change and the Problem Tree		to the Consultant
Workshop to prepare and validate the Project Results Framework	Sept. 11, 2018	EPPD of MPD	Validate the Project Results Framework	Final Project results framework developed.	Project Results Framework sent to the Consultant
Workshop to prepare and validate the Project Risk Analysis and SES analysis	Sept. 12, 2018 Sept. 13, 2018	EPPD of MPD	Prepare the Project Risk Analysis and SES analysis	Risk Analysis of the Project and the SES analysis prepared.	Project Risk Analysis and the SES analysis sent to the Consultant
Workshops to validate technical and business cases for the Pilot District Cooling Systems	Oct. 15 2018 Oct. 16, 2018 Oct. 18, 2018	AATT UTT EPPD of MPD	Proposed CAPEX and OPEX for each pilot. Technical configuration and equipment requirements for each site	Amendment of reports based on feedback from stakeholders.	Final Technical and Business reports submitted to the PPG team
The Gender Analysis Workshop	Nov. 22, 2018 Nov. 23, 2018	TTBS EPPD of MPD	Prepare the Gender Analysis for the Project	Gender Analysis developed	Gender Analysis and Gender Action Plan sent to the Consultant and PPG team
Workshop to calculate CO2 reductions	Nov. 15, 2018 Nov 16, 2018	TTBS EPPD of MPD	CO2 reduction calculations, data and approaches to be used	Draft, CO2 reductions calculations prepared.	Draft CO2 reductions calculations sent to the Consultant for review and comment.
Validation Workshop	Nov. 28, 2018	TTBS	Confirmation and validation of the project plan and way forward	Concerns reviewed and amendments to the ProDoc	Finalisation for the ProDoc

				made where required.	
Workshop to Validate CO2 reduction calculations	Nov. 29, 2018	EPPD of MPD	Review of the calculations. Review of the methodology and data/tools utilised.	GHG Emissions calculations Annex Prepared	GHG Emissions calculations Annex sent to consultant

With the start of project implementation, an inception workshop shall be held to assist project partners to understand the approved project design, their role and responsibilities in the project including stakeholder engagement during project implementation and monitoring, as well as communications, reporting, and conflict resolution and grievance redress.

5. Project Stakeholders

4.1 Stakeholder Identification

Stakeholders are defined as the beneficiaries and public institutions with an *interest* in the project, or who have the ability to *influence* project outcomes, either positively or negatively and which are directly or indirectly affected by the project. The following Table describes all the stakeholders engaged in project preparation and their roles during its execution:

List of stakeholders and their roles in the project:

TYPE	STAKEHOLDER	ROLE
National Government	Environmental Planning and Policy Division (EPPD) of the Ministry of Planning and Development (MPD)	The MPD, as the focal point of the UNFCCC and the Montreal Protocol, is the lead public partner responsible for development, detailed design and execution of the project, and as such, member of the Project Steering Committee. It is also responsible for liaison work with the other ministries and public agencies; the Project Management Unit (PMU) will be located in their premises.
	Ministry of Energy and Energy Industries (MEEI)	The MEEI is in charge of enforcing the country's energy policy and planning. In this regard, its role in promoting fiscal instruments for triggering alternative RAC technologies is central to the main objective of the project through its Energy Research and Planning Division. The MEEI will be also an official member of the Project Steering Committee.
	Ministry of Trade and Industry (MTI)	The MTI is a key stakeholder in the implementation of the Montreal Protocol through the licensing system of refrigerants and refrigeration equipment. It grants import and export permits and as such closely regulates what can come in and out of the country. MTI will be also an official member of the Project Steering Committee.

	Ministry of Finance (MOF)	<p>The MOF is in charge of fiscal appropriations of Government funds for various projects and programmes such as climate change, energy efficiency and any other related programmes inclusive of the environment.</p> <p>The MOF currently in its legislation is responsible for any tax incentive to be identified and implemented for any initiative under the project, including tax exemptions and other fiscal measures.</p>
	Trinidad and Tobago Bureau of Standards (TTBS)	<p>The TTBS is a crucial partner to monitor the import of ODS-dependent equipment and national labelling standards for refrigerants. The primary role of TTBS is to develop, promote and enforce energy efficiency standards and labelling in order to improve the quality and performance of RAC technologies used in the country, based on minimum energy performance indicators and testing procedures.</p>
Public agencies	Environmental Management Authority (EMA)	<p>EMA is a statutory body established by the Government of Trinidad and Tobago in June 1995 under the Environmental Management Act 1995, which was later repealed and re-enacted as the Environmental Management Act Chapter 35:05. The role of EMA in the project is to provide guidance and surveillance for compliance with national environmental regulation, in particular, issues and concerns related to the development of large RAC systems such as the District Cooling system as well as with the standards and guidelines on safety transportation, handling and use of natural refrigerants.</p>
	Trinidad and Tobago Airports Authority (AATT)	<p>This public agency manages the Piarco International Airport, which has become a major air transportation facility in the Caribbean region. Two terminals make it up the North Terminal inaugurated in 2011 is dedicated to the commercial passenger movements and the South Terminal, which is a 24-hour servicing cargo facility. Both demand a permanent cooling load based on a large chiller system with a cooling demand of 2000 tons, which makes this facility a top priority for developing a District Cooling system during the execution of the project.</p>
	Trinidad and Tobago Electricity Commission (T&TEC)	<p>The T&TEC is the single power utility servicing the whole country and the largest utility in the entire English speaking Caribbean. Its role is to participate in the project as a key leading actor for the sustainable management of the demand side, in particular, supporting the change in the existing paradigm for appropriate RAC technologies and business models for electricity end-users.</p>
	Regulated Industries Commission (RIC)	<p>RIC regulates public sector services (water, wastewater and electricity) and represents the interests of consumers. RIC will participate in the project in setting up appropriate tariffs for upcoming cutting-edge technologies, such as the District Cooling system.</p>
	University of Trinidad and Tobago (UTT)	<p>The UTT is a state-owned university established in 2004. There are several campuses located throughout the country with a diverse range of disciplines taught. The <i>Couva Point Lisas</i> Campus is known as the energy campus; as it looks at renewable energy and energy efficiency major initiatives. The UTT could</p>

		also serve as an important pilot intervention for the District Cooling Development.
CSOs	Air Conditioning and Refrigeration Association (ARIA)	As a Civil Society Organization, ARIA will support in-country capacity building activities to enhance technical capacity for assembling and manufacturing of low-carbon, low-GWP RAC alternatives as well as on safety transportation, handling and use of low-GWP/HCFs alternatives. ARIA plays a key role during the execution of the project and afterwards a long-established training centre to serve both, public and private interests.
	Refrigerant Recovery Recycle Association (RRRA)	RRRA is a non-profit organization formed to encourage and support all stakeholders involved in the protection of the Ozone Layer and reducing Global Warming. Its main role in the project will be to assist in the recovery, recycling and final disposal of refrigerants.
Private sector	Edan K Properties Limited	This private property management and real estate firm is the owner of the Point Lisas Industrial Business Park. Their proximity to the UTT Point Lisas campus and the TPL Power Plant make it ideal for them to be considered as a potential off-taker of both district cooling and heating to supply their tenants and customers.
	School of Refrigeration and Air-conditioning (SORAC)	The School of Refrigeration and Air-conditioning (SORAC) is a private institution formed in 1993 with its focus being the training Refrigeration & Air Conditioning (RAC) Technicians at the craft level. The institute provides theoretical & practical training and is responsible for training over one thousand craftsmen in this field. Since this institute has twenty-five years' experience in the educational field they would be a welcomed partner for the development of the capacity building activities of the project with respect to installation and maintenance of DCS technologies.
	Caribbean Airlines Limited (CAL)	Caribbean Airline Limited is an airline that operates on the compound of airports authority. They occupy bonded areas and offices on the compound, which are cooled with upwards of 120 mini-split units, as quoted by their operations manager. Their proximity to the Piarco Airport main terminal makes them a potential off-taker of the DCS, which would improve their energy consumption, and thus reduce their operations cost.
	Caribbean Basin Sustainable Energy Fund (CABEF)	CABEF is a venture capital fund that invests in clean energy and energy efficiency projects and companies in the Caribbean Basin. Sustainable Energy Central America and Sustainable Energy Caribbean (SECA) act as Investment Advisors of CABEF. CABEF has indicated a strong interest in the project and is willing to play an important role in providing investment capital to assist with the funding of pilots and related scale-up actions.
	Trinity Power Limited (TPL)	This large private contractor supplies power to T&TEC the single electric power utility on the Island of Trinidad. It plays a key role in providing relevant information to explore the potential to promote the use of District Cooling in the country.
	Energy Dynamics Ltd (EDL)	This is a local engineering firm with experience of District Cooling and absorption technology. EDL is a Trinidad based Energy Service Company (ESCo) with projects and operations

		undertaken throughout the English speaking Caribbean and the Dominican Republic. It will play a significant role in catalysing the required market change towards energy efficiency in the RAC sector focusing on the development of the District Cooling and Combined Cooling Heating and Power (CCHP) pilot investments.
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.	

The above stakeholder identification was initiated for this project from the preparation of the PIF (2017) and this group of individuals and organisations expanded through the PPG stage. They all are very active in defining the full scope of the project and are fully committed to be engaged during its implementation. During the implementation of the project, it is envisaged that this group of stakeholders will be further augmented to enhance awareness, capacity building, gender-related, environmental and policy development activities.

4.2 Stakeholder analysis

The following analysis shows the process of assessing the project's key stakeholder interests and the ways in which these stakeholders may influence the project's outcomes. This exercise is essential because it builds local ownership, strengthens project integrity and design, and helps create foundational relationships that may contribute to constructive problem solving if difficulties or challenging issues arise.

The following Table provides an overview of stakeholder interests, importance and influence on project outcomes or operations that were validated at the PPG stage.

Stakeholders	Interests at stake in relation to the project	Effect of project on Interests (+ 0 -)	Importance (scale 1 to 5, 5 = highest)	Influence (scale 1 to 5, 5 = highest)
EPPD of MPD	Opportunity to change the existing paradigm and greater citizen participation.	+	5	5
MEEI	Opportunity to change the existing paradigm	+	5	5
MTI	Fairness, greater influence	+	3	3
MOF	Opportunities for influence	+	4	4

TTBS	Opportunities for influence and to change the existing paradigm	+	5	5
EMA	Opportunities for influence	+	5	5
ARIA	Technical backstopping	+	5	5
SORAC	Technical backstopping	+	4	3
AATT	Opportunity to change existing paradigm	+	5	5
T&TEC	Opportunities for influence	+	4	4
RIC	Opportunities for influence	+	3	3
UTT	Opportunity to change existing paradigm	+	5	5
RRRA	Opportunity to change the existing paradigm and opportunity to influence.	+	4	4
CABEF	Opportunity to change existing paradigm, greater influence	+	4	3
Edan K Properties	Opportunity to change the existing paradigm	+	5	5
TPL	Opportunity to change existing paradigm	+	5	5
EDL	Opportunity to change the existing paradigm and opportunity to influence	+	5	5

6. Stakeholder Engagement Approach

The target users for this Plan are UNDP CO staff and stakeholders who are involved in developing and implementing the project during the execution period. Its compliance will be assessed during the MTR and at the TE.

During the implementation of the project, the population's perception of the implementation of the activities foreseen in the project will be monitored. The information for the public (beneficiaries) will be disclosed as follows:

- In telephone communication. Telephone service for the population is permanently available to receive calls about the project and its implementation. This will serve as a medium to receive feedback and ensure ongoing communications with stakeholders.
- Design and printing of informative posters to be located in visible public areas, and the distribution of flyers where required.
- Public media channels such as radio and television.
- Educational outreach and educational programmes
- Interviews with these stakeholder representatives and key informants
- Public meetings, workshops and focus groups
- Surveys, polls, and questionnaires aligned with the strategy for execution of the project.

7. Timetable

The timetable will be prepared by the PMU prior to implementation of the project. The PMU will provide a schedule outlining periodicity and locations where various stakeholder engagement activities, including consultation, disclosure, and partnerships will take place and the date by which such activities will be undertaken. This timetable will be in line with the requirements of the stakeholder engagement plan, the SESP and the components of the project.

8. Grievance Mechanism

A person with concerns regarding the project implementation or are potentially affected by the project can express their grievances for consideration and redress directly to PMU. The PMU would record the grievance and report the matter to the Project Steering Committee for a decision. This decision will either directly address complaints, or identify a means of improving the impacts of the project presented by the citizens (beneficiaries).

During the consultation and disclosure activities, participants will be informed of the availability of UNDP's Accountability Mechanism (Stakeholder Response Mechanism, SRM, and Social and Environmental Compliance Unit, SECU) as additional avenues of grievance redress.

9. Monitoring and Reporting

The project will set in place a variety of communication channels to become aware of their concerns and to react to them as explained in Section 5 above. The following Table shows the principles associated with the identified risks and risk categorization of the SES analysis has been classified as relevant together with the management/mitigation measures:

Table 10.e: Risks and management and mitigation measures	
Risks	Management and mitigation measures
<i>Biodiversity and Natural Resources</i>	Annex G: Environmental and Social Management Plan (ESMP).
<i>Community Health, Safety and Working Conditions</i>	Annex G: Environmental and Social Management Plan (ESMP).
<i>Gender Equality and Women's Empowerment</i>	Annex I: Gender Analysis and Action Plan.
<i>Pollution Prevention and Resource Efficiency</i>	Annex G: Environmental and Social Management Plan (ESMP).

Annex I: Gender Analysis and Action Plan



Gender Analysis &
Action Plan

Annex J: UNDP Risk Log

	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Update	Status
1	The project's pilot actions with the implementation of the District Cooling technology using fresh water cooling (like sea water) to operate this sort of centralized system, may result in negative impacts on the flora and fauna near the exhaust of the cooling plant due to the excess of hot water, a context that poses additional challenges for maritime habitats or environmentally sensitive areas.	During the PPG Phase	Environmental	The City of Port of Spain, particularly the coastal area where the large financial and commercial areas are located has a high demand of cooling systems but water-drainage issues, with a potential to mix the exhaust flows from the cooling plant with the sea water, threatening the sea life in this surrounding area. This situation has worsened in recent years with the higher frequency of heavy rains due to storms and hurricanes. P = 2 I = 4	The PPG phase has acknowledged this environmental risk and search for a mitigation path following international best practices. The pilot site for the proposed cooling plant for the Piarco International Airport, first of all, will be located far away from the coastal area, as it is indicated in the preliminary layout developed by the international consulting firm DEVCCO (please, refer to Annex K). In addition, the design has taken into consideration the impacts of extreme climate events following the ASHARE international specifications for District Cooling in coastal areas. Besides the proposed pilot intervention, the project will ensure that over the long run, compliance with the	MPD, and the PMU	PPG Team	During PPG Phase	No change

					national environmental regulations (EMA Chapter 35:05) will be enforced considering that the District Cooling technology chosen for T&T is of least impact to the environment.				
2.	Replacement of old RAC equipment and refrigerants can generate waste and ODS that must be discarded accordingly.	During the PIF and PPG Phase	Environmental	The replacement of metallic and electronic elements of the inefficient RAC systems would generate both waste metals and refrigerants, which can have adverse effects on the environment. The refrigerants discarded from replacement activities can further threaten the global environment once not properly contained. P = 5 I = 3	The PPG phase has identified this risk and takes it on-board during the planning phase. The project has established an integral partnership with the RRRRA in order to mitigate this risk, through their commitment to co-financing in kind all activities related to the recycling, and recovery of spent RAC equipment, which is in line with the association's mandate. This would be implemented by the establishment of a recycling hotline and drop-off points in both islands. With this specific risk in the national context, the project will ensure that the activities are in compliance with the national environmental regulations enforced by	MPD, PMU, RRRRA	PPG Team	During PPG Phase	Reducing

					Environment Management Authority (EMA).				
3.	During the formulation of the project, concerns have been raised in terms of gender, which should be taken into account in the implementation of the project, especially regarding participation in design and implementation or access to incremental benefits.	During the PPG Phase	Social	National cooling policies and projects are very gender sensitive since women and seniors are more affected by sudden indoor changes in temperature. This project has stated the gender equality perspective in the outputs and activities, especially related to the need to enforce women role in the design and operation of RAC systems. P = 2 I = 2	As a GEF 6 project, the PPG phase carried out a gender analysis, which will be crucial to understand the current baseline and enhance the integration of women specific needs in the appropriation of alternative RAC technologies, as clearly presented in Annex I: "Gender Analysis and Action Plan". The project also takes benefit of the alternative approach to accelerate the integration of women in what has thus far seen as a male-dominated working environment. By the implementation of this project, opportunities for increasing women participation in the training activities carried out by ARIA, leading to increased employment within the RAC market.	MPD and PMU	PPG Team	During the PPG Phase	No Change
4.	Biological factors — notably size and physiological	During the PPG Phase	Social	In daily life, men, women, and children are exposed to different	The project will enforce that the specifications for alternative RAC	MPD and PMU	PPG Team	During the PPG Phase	No Change

	differences between women and men and between adults and children — influence susceptibility to health damage from exposure to chemicals and poor air quality, including those used as refrigerant fluids in RAC equipment.			kinds of chemicals, in varying concentrations that can cause adverse health issues and reduce performance in indoor environments. P = 3 I = 3	systems take into consideration the ASHRAE international standards for design as it relates to air quality of install RAC systems. ARIA would also include the best practices as it relates to maintenance of installed RAC systems, in their training programmes, to ensure optimum air quality, considering the needs of women, men and children.				
5.	Incremental technical capacities among ozone depleting substance (ODS) and energy policy makers are not effectively neither timely implemented, limiting the synergies that would advance the country's commitments with the Montreal Protocol and the Nationally Determined Contribution under the UNFCCC.	During the PPG Phase	Organisational	Commercially driven alternative RAC technologies can be enhanced with an improved inter-governmental coordination amongst key policy makers (e.g. MPD, EMA, and MEEI) but in the absence of key synergies, the market change towards low-carbon alternatives will be delayed. P = 1 I = 3	Improvements in the current institutional framework have been identified during the PPG stage. These alternatives have been fully discussed and respond to the implementation of the "Climate Change Policy" and the "National Cooling Plan". In addition, the selection of most promising pilot interventions has been a key input to this ProDoc during the PPG and validated with policy makers and private developers.	MPD	PPG Team	During the PPG Phase	Improved

6.	Market driven pilot investments are not effectively implemented, which limits the required take-off of low-carbon energy efficient technologies which causes a limited access to senior financing to create sustained innovation within the RAC sector.	During the PPG Phase	Financial	<p>Target investors could see conventional RAC technologies and their current pricing structure as more attractive and low risk than the proposed low-carbon energy efficient technologies and based on market factors would choose not to fund projects that involve the new RAC technologies.</p> <p>P = 3 I = 3</p>	<p>The project during the PPG phase has approached and validated the pilot investments, especially for the district cooling as indicated in Annex K, with committed developers, such as the Airports Authority's senior management team and acquired their commitment to advance to the pre-investment and final design stage of the DCS pilot.</p> <p>At the PPG phase, the technical consultants (DEVCCO) assessed the feasibility of the DCS pilots and developed business cases to support successful implementation, reducing the perceived risks to investors.</p> <p>For decentralized / splits the project has considered an awareness raising campaign and information strategy following the "National Cooling Plan".</p>	MPD AATT	PPG Team	During the PPG Phase	No change
7.	Updating current standards for A/C systems and changes in regulations are not	During the PPG Phase	Regulatory	There is strong political will favouring low-carbon energy efficient	The project has identified two mitigation measures:	TTBS			

	<p>agreed or implemented in a timely manner.</p>			<p>RAC alternatives based on existing commitments to the global environmental conventions.</p> <p>The consensus is weakened by the BAU RAC investors regarding the lack of market awareness to cost effective, environmentally friendly alternatives.</p> <p>P = 3</p> <p>I = 3</p>	<ul style="list-style-type: none"> • The update of the standard the standard (TTS 76: Part 20, 2015 - <i>Requirements for labelling of refrigerant containers</i>) will use a collaborative approach including member of academia, public and private sectors under the leadership of the TTBS. • The data collected on GHG and HCFC/HFC emissions as part of the overall MRV plan will be used to inform the update and creation of new national standards to be developed and implemented by the TTBS. 				
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Annex K: DEVCCO District Cooling Report (Analysis)



DEVCCO Business
Management Report



DEVCCO Technical
Report

Annex L: Additional agreements



Letter of Intent -
AATT

Annex M: Letters of Co-financing



Cofinancing letters (Command Line)