TABREED DISTRICT COOLING GROUP PROJECT

Document Prepared by

Abu Dhabi Future Energy Company PJSC - Masdar

Project Title	TABREED DISTRICT COOLING GROUP PROJECT
Version	01
Date of Issue	21-06-2023
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1 PROJECT DETAILS

1.1 Summary Description of the Project

National Central Cooling Company PJSC (TABREED) is implementing TABREED DISTRICT COOLING GROUP PROJECT (hereafter called "Project" or "Grouped Project") is to reduce fossil-fuel based electricity consumption by providing highly efficient district cooling solution (air conditioning) to meet the cooling demand for residential and commercial consumers in the Abu Dhabi, United Arab Emirates (UAE). The highly efficient district cooling will displace the cooling from conventional/less efficient cooling system and reduce the electricity consumption which would result in reduction in greenhouse gas (GHG) emissions.

In the UAE air conditioning is necessity to survive. The penetration of cooling technology is almost 100%. Most of the residential and commercial consumers use window air conditioner or split air conditioner to meet the cooling demand. The commercial consumers have started shifting towards air cooled centralized cooling. These technologies are less efficient with respect to district cooling.

The purpose of the Project is to introduce new district cooling plant with a state-of-the-art thermal energy storage system to supply cooling to residential and commercial consumers in the Sea World, Yas Island Abu Dhabi, United Arab Emirates. The Project will replace isolated and less efficient cooling technologies (air-cooled reciprocating chiller systems) and thereby reducing the consumption of electricity and corresponding Carbon Dioxide (CO_2) emissions. This is estimated that the district cooling will save more than 40-50% of electricity with respect to the baseline technology.

The grouped project will install district cooling plants of various capacities to residential and commercial consumers who would have used the less efficient air-cooled reciprocating chiller system. All the project instances to be included in this grouped project will be from within Abu Dhabi, United Arab Emirates.

The first project activity instance is installed in the sea world Abu Dhabi with a capacity of 28,000 TR. The estimates of annual average GHG emission reductions of project activity instance 1 is 28,492 tCO2e/annum.

1.2 Sectoral Scope and Project Type

The project activity under consideration is a grouped project activity. The project activity instances as part of the grouped project will have following sectoral scope, project type and methodologies:

Methodology – UNFCCC CDM Methodology AM0117: Introduction of a new district cooling system; Version 02

Sectoral scope: 01 Energy industries (renewable - / non-renewable sources)

1.3 Project Eligibility

The scope of the VCS Program includes:

- The Grouped Project activity involves replacement of less efficient cooling with more energy efficient district cooling. The baseline & monitoring methodology applied for this project is "UNFCCC CDM Methodology AM0117: Introduction of a new district cooling system; Version 02", which is large scale methodology.
- The six Kyoto Protocol greenhouse gases are considered under the VCS program and project is reducing the emissions of CO2 mainly due to reduction of electricity consumption for cooling.
- Ozone depleting substances: NA
- Project activities supported by a methodology approved under the VCS Program through the methodology approval process: NA
- Project activities supported by a methodology approved under a VCS approved GHG program unless explicitly excluded under the terms of Verra approval: The methodology ACM0117 (version 02.0) is approved under CDM Program, which is a VCS approved GHG program.
- The project does not belong to the projects excluded in Table 1 of VCS Standard 4. 4. Thus, the project is eligible under the scope of the VCS program.

1.4 Project Design

The project has been designed as a grouped project having multiple project activity instances.

Eligibility Criteria

S.No.	Eligibility Criteria – Categories	Eligibility Criteria – Required Condition	Supporting evidence for inclusion
1.	Geographical boundary: Is the project activity located in the Abu Dhabi, United Arab Emirates (UAE)?	The Project Instances (PI) shall be located within the geographical boundary of the *Abu Dhabi,* UAE.	GPS Coordinates, maps as per technical reports, proposals and feasibility studies

2.	Double counting: Is the proposed PI uniquely identified and defined in an ambiguous manner? Is there any other registered CDM/VCS project activity with the same identification data?	The PI is uniquely identified and defined in an ambiguous manner There is no other registered CDM/VCS project activity with the same identification data	PI title, GPS coordinates, technical reports, proposals and feasibility studies. Analysis of projects in VCS/CDM pipeline
3.	Specifications of technology/ measure: Does the PI implement any of the following: 1. Introduction of new district cooling system(s) that supply cooling to residential and commercial consumers through a new dedicated distribution network. 2. Introduction of new district cooling system(s) that supply cooling to residential and commercial consumers through an existing dedicated distribution network. 3. Expansion of the district cooling system(s) by adding a new district cooling plant(s) with or without expanding a dedicated distribution network.	The PI implements one of the following: 1. Introduction of new district cooling system(s) that supply cooling to residential and commercial consumers through a new dedicated distribution network. 2. Introduction of new district cooling system(s) that supply cooling to residential and commercial consumers through an existing dedicated distribution network. 3. Expansion of the district cooling system(s) by adding a new district cooling plant(s) with or without expanding a dedicated distribution network.	Technical reports, proposals and feasibility studies
4.	Start date: Is the PI start date on the day or later of the start date of the First PI	The start date of the PI is later than the start date of the First PI.	(PI) Operation Start Date (First PI) 23/05/2023

5.	Applicability of the methodology: Does the PI comply with criteria of AM0117 (Version 2.0)	Applicability of the chosen methodology for the PI is justified	Description in the VCS MR while including PI
6.	Does the proposed PI consist of a new district cooling plant located at a site where there was no district cooling plant operating prior to the implementation of the project activity (Greenfield plant)?	The PI will be constructed on the site where there is no district cooling plant operating prior to the implementation of the project activity	Technical reports, proposals and feasibility studies, land documents, clearances, equipment purchase orders,

1.5 Project Proponent

Organization name	NATIONAL CENTRAL COOLING COMPANY PJSC – TABREED
Contact person	Antonio Di Cecca
Title	Chief Operating Officer
Address	PO Box 29478, Abu Dhabi, United Arab Emirates
Telephone	T + 971 2 202 0400 Ext 434
Email	adicecca@tabreed.ae

1.6 Other Entities Involved in the Project

Not applicable

1.7 Ownership

The respective project commissioning certificate for project activity are the supporting documents to demonstrate the project ownership. This demonstrates the right of use according to clause 3.7.1 (3) of VCS Standard (v4.4) “a project ownership arising by virtue of a statutory,

property or contractual right in the plant, equipment or process that generates GHG emission reductions and/or removals". Also, other legal compliances may be considered;

- Consent to Operate
- Commissioning documents

1.8 Project Start Date

The starting date is on 23/05/2023.

As per section 3.8 of the VCS Standard (v4.4), the project start date of a non-AFOLU project is the date on which the project began generating GHG emission reductions or removals.

The project activity is a non-AFOLU project and the date of commissioning of first Project is 23/05/2023. Thus, the project start date is as 23/05/2023.

1.9 Project Crediting Period

Renewable crediting period has been chosen (7 years+7years+7years).

Start date of first crediting period: 23/05/2023

End date of first crediting period: 22/05/2030

Total number of years: 07 years, 00 months

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

The estimated annual GHG emission reductions/removals of the project are:

☐ <20,000 tCO_2e/year

☒ 20,000 – 100,000 tCO_2e/year

☐ 100,001 – 1,000,000 tCO_2e/year

☐ >1,000,000 tCO_2e/year

The estimated volume of emission reduction from the project activity instance 1 is 28,492 tCO_2 which is less than 300,000 tonnes of CO2e per year. Therefore, in accordance with the para. 3.10.1 of the VCS Standard, v4.4 the scale of the project activity is under "Project" category.

Project Scale	
Project	x

Large project	

Year	Estimated GHG emission reductions or removals (tCO_2e)
Year 1	26,245
Year 2	28,867
Year 3	28,867
Year 4	28,867
Year 5	28,867
Year 6	28,867
Year 7	28,867
Total estimated ERs	**199,447**
Total number of crediting years	**7**
Average annual ERs	**28,492**

1.11 Description of the Project Activity

The Project Instance 1 is the introduction of a new district cooling plant with a state-of-the-art thermal energy storage system to supply cooling to residential and commercial consumers in sea world, Yas island, Abu Dhabi.

The proposed Project Activity includes the erection of a new district cooling plant of 28000 RT in two phases 13000 RT and 15000 RT.

Plant Capacity Configurations					
Phases	Chillers		Thermal Energy Storage Tank		Total Capacity (RT)
	Numbers	Unit Capacity (RT)	Numbers	Unit Capacity (RT)	
Phase-1	3	3000	1	4000	13000
Phase -2	5	3000	0	0	15000
Total Capacity					**28000**

Technical information on key equipment employed by the proposed Project Activity is described in the following.

District Cooling Plant

The new district cooling plant will employ water cooled 3.3 kV electric driven centrifugal chillers with thermal energy storage and associated auxiliary equipment like cooling towers and pumps for the production and distribution of chilled water to various building via a network of underground insulated primary piping system.

The total district cooling plant capacity is 28,000 Refrigeration Tones (RT). The district cooling plant capacity is achieved through the use of centrifugal chillers and the chilled water storage concept. The district cooling plant will serve new buildings.

Thermal Energy Storage (TES) systems provide the ability to store cooling energy during economically more viable periods for re-use during the period of higher costs. Other advantages to use Thermal Energy Storage systems are that lower nighttime temperatures allow refrigeration equipment to operate more efficiently than during the day, reducing energy consumption. With TES less chiller capacity is required, which means lower capital equipment costs, use of off-peak electricity to store energy for use during peak hours and daytime peaks of power consumption is reduced, avoiding the need for expensive power capacity additions and associated emissions.

The district cooling plant will use 3.3 kV electrical-driven centrifugal chillers with R-134a or equivalent environment-friendly refrigerant with zero ozone depletion potential. The proposed chillers can deliver a cooling capacity of 3,000 TR at zero tolerance. A total of three chillers have been selected for the current phase. The cooling capacity and operating conditions of the chiller evaporator / condenser side are as indicated in the following schedule.

Chiller Cooling Capacity	Chilled Water Temperature		Condenser Water Temperature	
TR	*Supply (ºC)/(ºF)*	*Return (ºC)/(ºF)*	*Supply (ºC)/(ºF)*	*Return (ºC)/(ºF)*
3,000	4.44/40	13.33/56	35/95	40.56/105

The district cooling plant will supply chilled water at 4.44 C. The return temperature is 13.33 C.

The table below presents the technical specification of the district cooling plant for phase 1:

Unit Description	Unit capacity		Duty	Total capacity	
Chiller	3,000 (10,563)	TR (KW)	3	9,000 (31,690)	TR (KW)
Cooling Tower	9,150 (577.3)	GPM (L/s)	3	27,450 (1731.9)	GPM (L/s)
Thermal Energy Storage	4,000 (14,084.5)	TR (KW)	1	4,000 (14,084.5)	TR (KW)
Primary Chilled Water Pumps	6,000 (378.5)	GPM (L/s)	3	18,000 (1135.5)	GPM (L/s)
Secondary Chilled Water Pumps	4,875 (307.6)	GPM (L/s)	4	19,500 (1230.4)	GPM (L/s)
Condenser Pump	9,150 (577.3)	GPM (L/s)	3	27,450 (1731.9)	GPM (L/s)

Expected seasonal energy efficiency ratio: 0.84 kW/TR

The new primary district cooling network will be developed for new buildings. There is an already existing primary district cooling network in Yas Island, project will be connecting to that network as well.

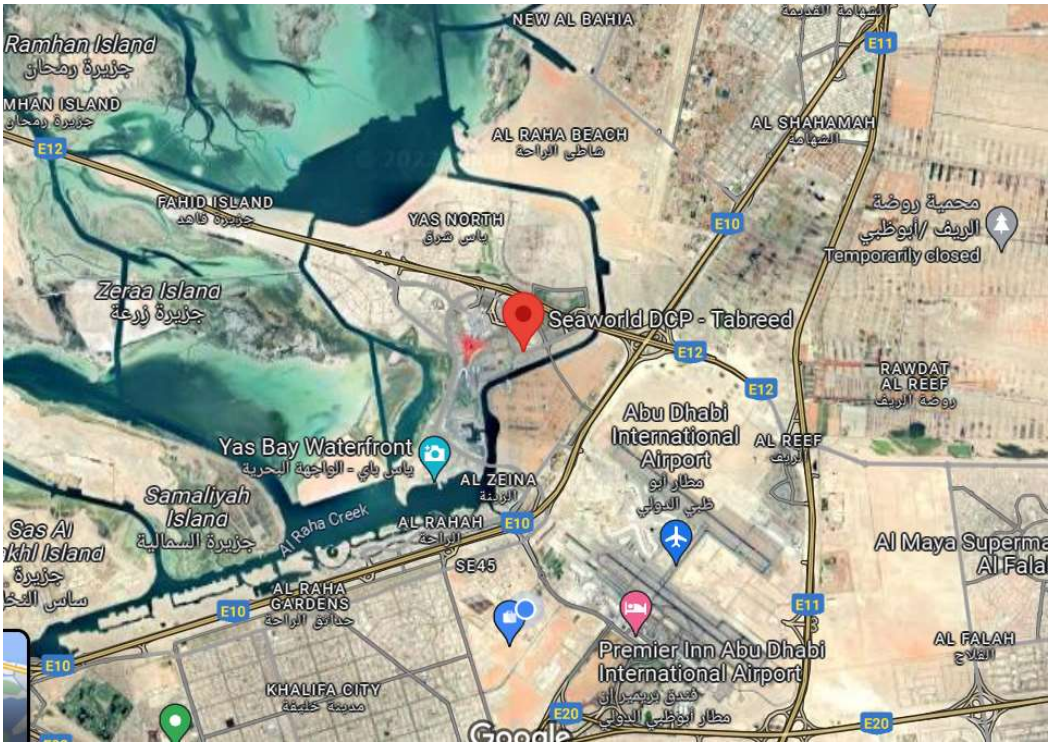
1.12 Project Location

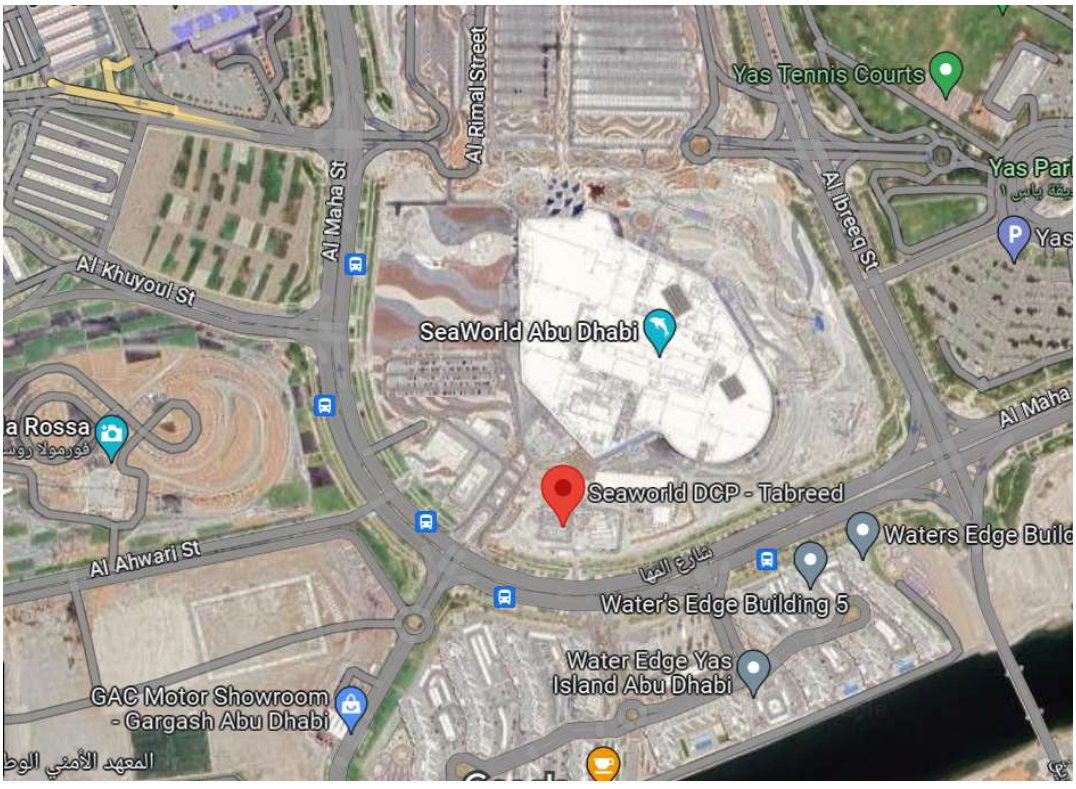
The grouped project will be located in Abu Dhabi Emirates in United Arab Emirates. The grouped project covers UAE boundary between: Latitudes: 23.4241° N, Longitudes: 53.8478° E.

The project activity instance 1 is installed in Sea World Abu Dhabi with following coordinates:

Facility Name	Sea World District Cooling Plant
Facility Activity	District Cooling Plant
Plot Area	10099.95-meter square
Location	Yas Island Sector YS6

Plot number	P10
Latitude	24.483103977 N
Longitude	54.618530045 E


Ramhan Island
جزيرة رمحان
NEW AL BAHIA
AL RAHA BEACH
شاطئ الراحة
AL SHAHAMAH
FAHID ISLAND
جزيرة فاهد
YAS NORTH
ياس شرق
Zeraa Island
جزيرة زرعة
Seaworld DCP - Tabreed
Temporarily closed
RAWDAT AL REEF
روضة الريف
Abu Dhabi International Airport
مطار أبو ظبي الدولي
AL REEF
Yas Bay Waterfront
ياس باي - الواجهة البحرية
AL ZEINA
Samaliyah Island
جزيرة السمالية
Al Raha Creek
AL RAHAH
SE45
AL RAHA GARDENS
حدائق الراحة
Premier Inn Abu Dhabi International Airport
AL FALAH
KHALIFA CITY
مدينة خليفة
E10
E11
E12
E20


Al Rimal Street
Yas Tennis Courts
Al Maha St
Al Ibreeq St
Al Khuyoul St
SeaWorld Abu Dhabi
Seaworld DCP - Tabreed
Waters Edge Build
Al Ahwari St
Water's Edge Building 5
Water Edge Yas Island Abu Dhabi
GAC Motor Showroom - Gargash Abu Dhabi

1.13 Conditions Prior to Project Initiation

The baseline scenarios are the same as the conditions existing prior to the project initiation. The details are showed in the Section 3.4.

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

The Project complies with all applicable laws. The main laws are:

1. Environmental laws of Abu Dhabi: The project has already received the environmental permit for construction and operation.

2. District cooling regulatory framework under Department of Energy (DoE)[1]: Under Law No 11 of 2018, the Department of Energy (DoE) has a duty to regulate the central / district cooling sector in the Emirate of Abu Dhabi. Following extensive consultation with the public and private stakeholders, the DOE has launched the District Cooling regulations upon the government approval, comprising technical, legal and economic dimensions.

   The economic dimension of this framework will look into aspects of market competition and price regulation, to ensure that:

   - There is increased fairness and transparency in the market as well as enhance service levels for end-users.
   - The price for new district cooling schemes is fair and lower than the cost of the best alternative available for cooling.
   - The benefits of district cooling are properly reflected in end-users tariffs.
   - District cooling providers can recover their efficient costs and sector profitability is fostered.
   - The price control process is easy to implement and sustainable in the long term.

3. The two technical regulations have been published and project is in compliance with these codes:

   a. District Cooling Technical Code dated 15/03/2020

   b. District Cooling Metering Code dated 15/03/2020

1.15 Participation under Other GHG Programs

[1] https://www.doe.gov.ae/en/Legislation-and-Compliance/Economic-Regulations/District-Cooling

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The project has neither been registered nor seeking registration under any other GHG programs.

The project is seeking registration only in the VCS program.

1.15.2 Projects Rejected by Other GHG Programs

The Project has not been rejected by any GHG programs.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

No. The project will not generate any other form of GHG-related environmental credit for GHG emission reductions claimed under the VCS program. The project activity under VCS shall not claim emission reductions for the same period that has been/will be covered under other GHG Programs. Thus, there will not be any possibility of double accounting of emission reductions

1.16.2 Other Forms of Environmental Credit

The Project has no intent to generate any other form of GHG related environmental credit for GHG emission reductions or removals claimed under the VCS Program.

The initial project activity instances are neither has nor intends to generate any other form of GHG related environmental credit for GHG emission reductions or removals claimed under the VCS Program.

Supply Chain (Scope 3) Emissions

Not applicable

1.17 Sustainable Development Contributions

The proposed Project Activity contributes to sustainable development in the United Arab Emirates by the following means:

Economic indicators

The Project Instance contributes to the

1. Conservation of energy sources through a more efficient way of generation and distribution of cooling energy, thus allowing for decreased electricity consumption per ton of cooling supplied. This contributes to UN SDG indicator 11 ‘sustainable cities’ Target 11.6: "Reduce the environmental impacts of cities".

2. Education and training of staff in the operation of the district cooling system. In addition, staff will be trained in the application of the international VCS standards of the Project Instance Activity monitoring and quality assurance / quality control.

Social indicators

The Project Instance contributes to the positive quality of life and benefits the local community by helping ensure a less energy intensive generation and supply of cooling energy.

Environmental indicators

The Project Instance

1. Will be reducing an estimated total of 197,021 tCO_2 of emission reductions per year and therefore contributing to UN SDG 13 'Climate Action'.

2. Complies with all applicable national environmental regulations and standards and has no impact on air, water, soil or groundwater pollution.

3. will be reducing the usage of desalinated water as it allows for the future introduction of grey water (treated sewage water) to be used as cooling medium.

Technical indicators

The Project Instance introduces a new and energy efficient technology and know-how into the United Arab Emirates, which can successfully be replicated to other cities within the region. The Project Instance will contribute to the increase in utilization and application know-how of this type of technology (district cooling).

1.18 Additional Information Relevant to the Project

Leakage Management

Leakage emissions are considered as per the applicable methodology.

Commercially Sensitive Information

No commercially sensitive information has been excluded from the public version of the project description.

Further Information

There are no information or incidents that will have bearing on the eligibility of the project, the net GHG emission reductions or removals, or the quantification of the project's net GHG emission reductions or removals.

2 SAFEGUARDS

2.1 No Net Harm

There are no harms identified form the project and hence no mitigations measures are applicable.

2.2 Local Stakeholder Consultation

Stakeholder consultation is an important component of how the Project Proponent conducts its businesses and is an integral part of its ESG commitment. Stakeholder engagement enables project teams and management to identify, monitor and address issues as they pertain to a Project. It also provides opportunities for stakeholders (e.g. regulatory authorities, interest groups, local community and the general public) to provide commentary on the Project and its real and perceived adverse impacts and benefits. Engagement requires not only dialogical processes but also the use of transparent issues management. The details are provided on the website:

1. https://www.tabreed.ae/customer/
2. https://www.tabreed.ae/investor-relations/
3. https://www.tabreed.ae/supplier-relations/

This section describes the stakeholder consultation activities undertaken for the Project to date.

The concept of the Project was announced in January 2021 and notifications made via media releases including the following:

1. https://www.tabreed.ae/news/tabreed-miral-sign-cooling-agreement-seaworld-abu-dhabi/
2. https://www.thenationalnews.com/business/economy/tabreed-signs-deal-with-miral-to-provide-district-cooling-at-seaworld-abu-dhabi-1.1141317
3. https://www.gccbusinessnews.com/uaes-tabreed-unites-with-miral-to-provide-district-cooling-at-seaworld-abu-dhabi/

Tabreed's company website (https://www.tabreed.ae/contact/) provides the following options for contacting the Proponent regarding the Project and any of its projects:

- Postal address
- Telephone and facsimile number
- Email (info@tabreed.ae)

Consultation Meetings and Discussion

Consultation meetings and discussions has been undertaken by the Proponent with various government departments that have jurisdiction of environmental values that may be impacted by the Project Instance.

Mechanism for on-going communication

Tabreed has a customer service charter (https://www.tabreed.ae/customer/) which provides the detailed process on how the complaints are recorded and addressed. The main extract from the charter:

5- Complaints Handling Process

5.1- Lodging a Complaint

End-user Customers can lodge complaints by calling 800 TASLEEM (8275336), emailing customerservice@tasleem.ae, or visiting the Tasleem website: www.tasleem.ae.
Bulk-offtake customers will be able to log complaints by calling 800 Tabreed (8227333), sending an email to customerservice@tabreed.ae, or contacting their designated Account Manager.
The complaint can be assigned, tracked, and monitored by the Customer Service team leads. When a call type is selected in the billing system, the operator has the option to list the complaint. All complaint types are included in the complaint reports.

5.2- Receipt and Acknowledgment of Complaint

Customers will receive an acknowledgment receipt of their complaint via either a phone call or an e-mail. This acknowledgement is made on the day the complaint is lodged, provided it is a business day, or the following business day if the complaint was made during the weekend or on a public holiday.

5.3- Accessibility to the Complaint

End-user Customers can request copies of their complaint log by emailing customerservice@tasleem.ae or calling 800 TASLEEM (8275336) during normal business hours.
Bulk-offtake Customers can request copies of their complaint log by emailing customerservice@tabreed.ae or calling 800 TABREED (8227333) during normal business hours.

2.3 Environmental Impact

The Project doesn't have any negative environmental impacts. As per the host country regulations, Project owner has completed environmental technical questionnaire and submitted to Environment Agency Abu Dhabi for the Environmental Permit. Project has received Environmental Permit on 10/02/2023 for operation.

2.4 Public Comments

This will be updated after the public comments period.

2.5 AFOLU-Specific Safeguards

For non AFOLU projects, this section is not required.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

The approved consolidated methodology applied in the project activity is **AM0117: Introduction of a new district cooling system — Version 2.0** .

This methodology also refers to the latest approved version of the following tools:

1. Tool for the demonstration and assessment of additionality (version 07)
2. Tool to calculate project or leakage CO2 emissions from fossil fuel combustion (version 03)
3. Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (version 03)
4. Tool to calculate the emission factor for an electricity system (version 07)
5. Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period (version 03.0.1)
6. Additionality of first-of-its-kind project activities (version 03.0)

For more detailed information about the methodology and tools, please refer to the following link:

https://cdm.unfccc.int/methodologies/DB/EQEGREXNGR6VOFAP0PR7D0ERUS0OOX

3.2 Applicability of Methodology

AM0117 methodology applies to project activities that provide district cooling to residential and commercial consumers through a dedicated cooling distribution network. Applicability of Project and eligibility criteria of ACM0117 is demonstrated in table below:

Applicability criteria	Justification
The methodology is applicable to project activities that reduce CO2 emissions by means of one, or a combination, of the following measures: (a) Introduction of new district cooling system(s) that supply cooling to residential and commercial consumers through a new dedicated distribution network;	Applicable The Project is new district cooling system that supply cooling to residential and commercial consumers through dedicated distribution network. In

(b) Introduction of new district cooling system(s) that supply cooling to residential and commercial consumers through an existing dedicated distribution network; (c) Expansion of the existing district cooling system(s) by adding a new district cooling plant(s) with or without expanding a dedicated distribution network.	the second phase of the Project, it will be connected with the existing dedicated distribution network.
Emission reductions that are gained due to the switch of the energy sources shall not be claimed by applying this methodology alone. Therefore, emission reductions due to displacement of the baseline power source can be claimed by the means of the application of this methodology in combination with another relevant approved methodology. In doing so, interactive effects shall be considered as per the "Guidelines for the consideration of interactive effects for the application of multiple CDM methodologies for a programme of activities". For example, if the project district cooling plant is powered partially or completely by a dedicated renewable energy power plant, a project proponent may wish to consider small scale methodology 'AMS-I.F: Renewable electricity generation for captive use and mini-grid' to account for emission reductions due to shift of the power source. Otherwise, the most conservative electricity emission factor should be applied to determine emission reductions.	Not applicable Project will not replace the energy source and therefore this condition is not applicable.

Comparison of project and eligibility criteria of the tools

Tool	Applicability Criteria	Justification
Tool for the demonstration and assessment of additionality (version 07)	The use of the "Tool for the demonstration and assessment of additionality" is not mandatory for project participants when proposing new methodologies. Project participants may propose alternative methods to demonstrate additionality for consideration by the Executive Board. They may also submit revisions to approved methodologies using the additionality tool.	Not applicable The Project is using the approved methodology and using the additionality as per the approved methodology.

	Once the additionally tool is included in an approved methodology, its application by project participants using this methodology is mandatory.	Not applicable Methodology provided the specific additionality procure and additionality tool is provided as an option.
Tool 03 'Tool to calculate project or leakage CO2 emissions from fossil fuel combustion	This tool provides procedures to calculate project and/or leakage CO2 emissions from the combustion of fossil fuels. It can be used in cases where CO2 emissions from fossil fuel combustion are calculated based on the quantity of fuel combusted and its properties. Methodologies using this tool should specify to which combustion process j this tool is being applied.	Applicable The project involves calculation of CO2 emissions from fossil fuel combustion based on the quantity of fuel combusted and its properties.
Tool 05 'Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation	If emissions are calculated for electricity consumption, the tool is only applicable if one out of the following three scenarios applies to the sources of electricity consumption: (a) Scenario A: Electricity consumption from the grid. The electricity is purchased from the grid only, and either no captive power plant(s) is/are installed at the site of electricity consumption or if any captive power plant exists on site, it is either not operating or it is not physically able to provide electricity to the electricity consumer; (b) Scenario B: Electricity consumption from (an) off grid fossil fuel fired captive power plant(s). One or more fossil fuel fired captive pow er plants are installed at the site of the electricity consumer and supply the consumer with electricity. The captive	Applicable The project consume electricity from grid, which belongs to Scenario A.

	power plant(s) is/are not connected to the electricity grid; or (c) Scenario C: Electricity consumption from the grid and (a) fossil fuel fired captive power plant(s). One or more fossil fuel fired captive power plants operate at the site of the electricity consumer. The captive power plant(s) can provide electricity to the electricity consumer. The captive power plant(s) is/are also connected to the electricity grid. Hence, the electricity consumer can be provided with electricity from the captive power plant(s) and the grid.	
Tool 07 'Tool to calculate the emission factor for an electricity system'	This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand side energy efficiency projects).	Applicable This project replaces grid power supply and uses this tool to calculate the values of OM, BM and CM of this project.
	Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off grid power plants. In the latter case, two sub options under the step 2 of the tool are available to the project participants, i.e. option IIa and option IIb. If option IIa is chosen, the conditions specified in "Appendix 1: Procedures related to off grid power generation" should be met. Namely, the total capacity of off grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the	Applicable The emission factor for this project electricity system was calculated for grid power plants.

	total electricity generation by off grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	
	In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	This condition is not relevant, there is no part of the power system of this project located in Annex I countries.
	Under this tool, the value applied to the CO2 emission factor of biofuels is zero.	This condition is not relevant, there is no biofuels used in this project.
Tool 11 "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period"	This tool provides a stepwise procedure to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period, as required by paragraph 49 (a) of the modalities and procedures of the clean development mechanism. The tool consists of two steps. The first step provides an approach to evaluate whether the current baseline is still valid for the next crediting period. The second step provides an approach to update the baseline in case that the current baseline is not valid anymore for the next crediting period.	Applicable The Project will use this tool during renewal of crediting period.
Tool 23:" Additionality of first-of-its-kind project Activities"	This methodological tool is applicable to project activities that wish to use the "first-of-itskind" approach to demonstrate additionality and that use versions of baseline and monitoring	Not applicable Project will not be using first of its kind approach for the additionality and

	methodologies, or the "Tool for the demonstration and assessment of additionality" or the "Combined tool to identify the baseline scenario and demonstrate additionality", which allow using the "first-of-its-kind" approach for demonstrating additionality.	therefore this tool is not applicable.

3.3 Project Boundary

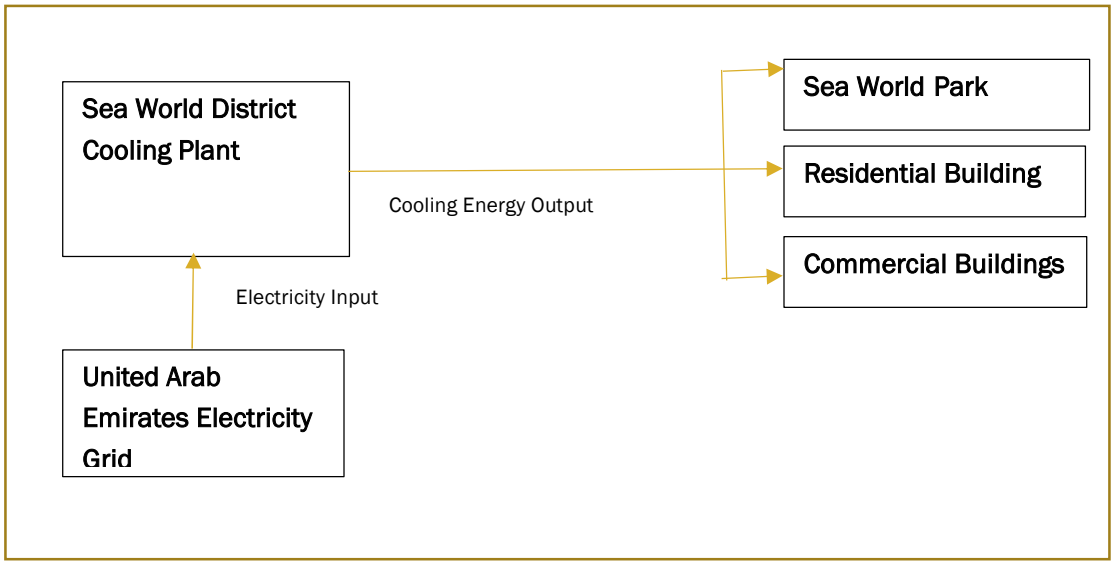
As per the methodology the spatial extent of the project boundary includes:

(a) Sea World district cooling system, including district cooling plant(s) pipes, sub-stations and buildings, existing and new, that are or will be connected to the district cooling system;

(b) All the power plant/unit connected physically to the UAE electricity system.

Source		Gas	Included?	Justification/Explanation
Baseline	Electricity and/or thermal energy consumed by baseline cooling technologies	CO_2	Yes	Main emission source
		CH_4	No	Excluded for simplification, this is conservative
		N_2O	No	Excluded for simplification, this is conservative
Project	Electricity and/or thermal energy consumed by the district cooling system	CO_2	Yes	Main source of emissions
		CH_4	No	Excluded for simplification
		N_2O	No	Excluded for simplification

The Project boundary is illustrated in the figure below:



3.4 Baseline Scenario

As per the methodology AM 0117 the baseline scenario is the continuation of the cooling energy production by the baseline cooling technologies. All the conditions are explained in the table below:

Paragraph number/ Condition	Justification
14. The methodology assumes that the baseline scenario is the continuation of the cooling energy production by the baseline cooling technologies.	Applicable In Project the baseline scenario is continuation of the cooling energy production by baseline technologies.
15. District cooling projects implemented in least developed countries (LDCs) are deemed to be automatically additional	Not Applicable UAE is non- LDC and therefore automatic additionality is not applicable.
16. If district cooling projects are implemented in non-LDCs and face the first-if-its-kind barrier, the latest approved version of the "Additionality of first-of-its-kind project activities" shall be followed to demonstrate the additionality of these project activities.	Applicable UAE is non – LDC and this option is applicable. However, the Project is not applying this additionality demonstration option.
17. For district cooling projects, which are implemented in non-LDCs and which are not	Applicable The Project is using this option for additionality and baseline justification.

the first-of-its-kind, the procedure described below shall be applied.	
5.2.1. Step 1: Penetration and performance assessment 18. This step aims to determine whether the proposed project activity is common practice in the city where the proposed CDM project activity is intended to be implemented.	Applicable The Project activity is not a common practice in the UAE.
19. The project activity is deemed to be additional if: (a) The seasonal energy efficiency ratio (SEER) of the district cooling plant involved in the project activity (determined as per section 5.2.3.2) is higher than a benchmark SEER (determined as per section 5.2.3.3); and (b) The share of the district cooling technologies at the moment of the project registration is less than 20 per cent of all cooling technologies within the benchmark boundary in terms of cooling output. The share of technologies can be derived from official country reports, third party surveys and/or credible international sources (e.g. International Energy Agency).	Applicable (a) As per the survey The SEER of Project is Higher than the benchmark SEER. (b) Share of district cooling technologies in the UAE is less than 20% of total cooling output. A third party survey report will be submitted during validation.
20. If any of two conditions above is not met, the project proponent should proceed to Step 2.	Not applicable Both the conditions above are meeting.

3.5 Additionality

Benchmark determination procedure

The benchmark value serves for two purposes: (a) additionality demonstration and (b) baseline emissions determination.

Benchmark boundary

As per the Methodology the default benchmark boundary is a city where the project activity is located which is Abu Dhabi. As this is grouped project and therefore the boundary is limited to Abu Dhabi, United Arab Emirates.

Data vintage and data source

Benchmark SEER shall be determined using SEERs values and cooling output of the installations used within the benchmark boundary.

As the Project boundary is vast and therefore the sampling is used to collect the data as per 'Standard: Sampling and surveys for CDM project activities and programmes of activities'. While collecting data through the sampling, existing cooling installations shall be grouped based on technology, capacity and the function of the building. The third party that provided report on the penetration of technology.

The values of SEER for the existing installations included in the benchmark boundary shall be determined using any of the three options below. Options are ranked in terms of preference. SEER for the greenfield buildings included in the benchmark boundary shall be determined using only option 2.

Option 1: Directly from manufacturer of the baseline cooling technology;

Option 2: SEER of the (BAT) in a host country for a building with the same function (e.g. office, apartments) and similar GFA, i.e. in the range from 50 per cent to 150 per cent of the baseline building GFA.

Option 3: Calculated based on cooling output and energy input. If the cooling output of baseline technology i ($OPC_{B,i}$) and the thermal energy input of baseline technology i ($IPT_{B,i}$) are provided in GJ, apply equation 1; if provided in MWh, apply equation 2:

$$SEER_{B,i} = \frac{OPC_{B,i}}{\left(IPE_{B,i} \times 3.6 + IPT_{B,i}\right)} \quad \text{Equation (1)}$$

Where:

$SEER_{B,i}$ = Seasonal Energy Efficiency Ratio of the baseline cooling technology i, defined as energy output divided by energy input (GJ/GJ). If different units are used for the SEERB,i (e.g. BTU/Wh instead of GJ/GJ), appropriate conversion factors shall be applied.

$OPC_{B,i}$ = Cooling output of baseline technology i (GJ)

$IPE_{B,i}$ = Electrical energy input of baseline technology i (MWh)

$IPT_{B,i}$ = Thermal energy input of baseline technology i (GJ)

$$SEER_{B,i} = \frac{OPC_{B,i}}{(IPE_{B,i} + IPT_{B,i})}$$ Equation (2)

Where:

$SEER_{B,i}$	=	Seasonal Energy Efficiency Ratio of the baseline cooling technology i, defined as energy output divided by energy input (MWh/MWh). If different units are used for the SEERB,i (e.g. BTU/Wh instead of MWh/MWh), appropriate conversion factors shall be applied.
$OPC_{B,i}$	=	Cooling output of baseline technology i (MWh)
$IPE_{B,i}$	=	Electrical energy input of baseline technology i (MWh)
$IPT_{B,i}$	=	Thermal energy input of baseline technology i (MWh)

The parameter $IPT_{B,i}$ is to account for thermal energy input in an absorption-based baseline technology and is determined based in one of the following approaches:

(a) Applying equation 3 below if $IPT_{B,i}$ is in GJ

$$IPT_{B,i} = FF_{B,i} \times NCV_{B,i}$$ Equation (3)

Where:

$IPT_{B,i}$	=	Thermal energy input of baseline technology i (GJ)
$FF_{B,i}$	=	Fossil fuel consumption used in the baseline technology i (mass or volume unit)
$NCV_{B,i}$	=	Net calorific value of the fossil fuel used in the baseline technology i (GJ/mass or volume unit)

(b) Applying equation 4 below if $IPT_{B,i}$ is in MWh

$$IPT_{B,i} = FF_{B,i} \times NCV_{B,i} \times 0.2778$$ Equation (4)

Where:

$IPT_{B,i}$	=	Thermal energy input of baseline technology i (MWh)
$FF_{B,i}$	=	Fossil fuel consumption used in the baseline technology i (mass or volume unit)
$NCV_{B,i}$	=	Net calorific value of the fossil fuel used in the baseline technology i (GJ/mass or volume unit)

When determining the parameter $IPT_{B,i}$ for an installation where more than one type of the fossil fuel used in the baseline technology, the least carbon intensive type shall be used. In case renewable energy (e.g. solar) is used or waste energy is used, $SEER_{B,i}$ is considered as one.

In case a baseline technology is electricity driven (e.g. water cooled electric driven centrifugal chillers), $IPT_{B,i}$ becomes zero.

Data for the most recent three years should be used to determine the values of SEER for the existing installations included in the benchmark boundary.

The values of cooling output for the existing installations included in the benchmark boundary shall be determined as a sum of cooling output provided over the most recent three years. For the installation with less than three years of historical data, all available data shall be used.

Benchmark determination

The following steps applied:

(c) Rank all installations included in the benchmark boundary in order of decreasing SEER;

(d) Plot the SEER values (y axis) as a function of the cumulative cooling output (x-axis);

(e) Identify the benchmark installation that corresponds to at least 80 per cent of the cumulative cooling output;

(f) Match the value of the benchmark SEER that corresponds to at least 80 per cent of the cumulative cooling output determined in step (c) above.

Validity of the benchmark

The first benchmark value shall be identified before the start of the validation process for the purpose of additionality demonstration and ex-ante emission reduction calculations. The benchmark value for baseline emissions estimation is valid for three years.

The benchmarking report will be provided during validation.

3.6 Methodology Deviations

The project did not apply any methodology deviations.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Baseline emissions are estimated using Approach 1 as the benchmark installation is electricity driven technology.

Total baseline emissions are calculated as follows, using Equation (2) from the methodological tool 05; Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation version 3.0. When applying the tool, parameter QB,y shall correspond to parameter $EC_{BL,k,y,}$ whereas BE_y shall correspond to $BE_{EC,y}$.

$$BE_y = Q_{B,y} \times EF_{B,y} x\,(1 + TDL_{B,y}) \qquad \text{Equation (5)}$$

Where

BE_y	=	Baseline emissions in year y (tCO2e/yr)
$Q_{B,y}$	=	Estimated electricity consumption of isolated and less efficient air-cooled reciprocating chiller systems in year y (MWh/yr)
TDL_{BY}	=	Average technical transmission and distribution losses for providing electricity to the baseline in year y
$EF_{EL,y}$	=	Grid CO_2 emission factor calculated in accordance with the "Tool to calculate the emission factor for an electricity system" (Version 7.0) (tCO2e/MWh)

The estimate cooling output of isolated and less efficiency cooling technologies is determined as follows:

$$Q_{B,y} = \sum_r \frac{OPC_{r,y}}{SEER_{B,i}} \qquad \text{Equation (6)}$$

Where:

$Q_{B,y}$	=	Energy consumed in baseline by baseline cooling technologies in year y (MWh)
$OPC_{,r,y}$	=	Cooling output of new district cooling plant r in year y (MWh)
$SEER_{B,i}$	=	Benchmark Seasonal Energy Efficiency Ratio of the baseline cooling technology i, defined as energy output divided by energy input (MWh/MWh)

The grid CO_2 emission factor is calculated in accordance with the "Tool to calculate the emission factor for an electricity system" (Version 07) for the respective grid ex-ante and is fixed throughout the crediting period.

The following steps are applied:
STEP 1 Identify the relevant electricity systems;
STEP 2 Choose whether to include off-grid power plants in the project electricity system (optional);
STEP 3 Select a method to determine the operating margin (OM);
STEP 4 Calculate the operating margin emission factor according to the selected method;
STEP 5 Calculate the build margin (BM) emission factor;
STEP 6 Calculate the combined margin (CM) emission factor.

$OPC_{r,y}$ is determined in MWh, as per below equation

$$OPC_{r,y} = c_P \times F_{P,r,y} \times \Delta T_{r,y} \times h_{r,y} \times 2.77 \times 10^{-10}$$ Equation (7)

Where:

$OPC_{r,y}$ = Cooling output of new district cooling plant r in year y (MWh)

$F_{P,r,y}$ = Average mass flow rate (integrated over the year) of new district cooling plant r in year y (g/hour)

$\Delta T_{r,y}$ = Temperature difference between supply and return of chilled water from/to new district cooling plant r in year y (°C)

$h_{r,y}$ = Number of the operating hours of the new district cooling plant r in year y (hours)

c_P = Specific heat capacity of coolant (J/g.°C)

4.2 Project Emissions

Project emissions include emissions from electricity consumption associated with the generation of cooling output in the new district cooling plant.

These emissions are calculated using the “Methodological tool: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” version 3.0.

$$PE_y = PE_{EC,y} + PE_{FC,j,y}$$ Equation (8)

Where:

PE_y = Project emissions in year y (tCO2e)

$PE_{EC,y}$ = Emissions from electricity consumption associated with the generation of cooling output in the new district cooling plant(s) (tCO2e)

$PE_{FC,j,y}$ = CO2 emissions from fossil fuel combustion associated with the generation of cooling output in the new district cooling plant(s) (tCO2e)

$$PE_{EC,j,y} = EC_{PJ,j,y} \times EF_{EL,y} x\ (1 + TDL_y) \quad \text{Equation (9)}$$

Where

$EC_{PJ,j,y}$ = Quantity of electricity consumed by the new district cooling plant j in year y (MWh/yr)

$Q_{B,y}$ = Grid CO2 emission factor calculated in accordance with the "Tool to calculate the emission factor for an electricity system" (Version 7.0) (tCO2e/MWh)

TDL_Y = Average technical transmission and distribution losses for providing electricity in year y

4.3 Leakage

Leakage emissions are calculated as follows:

$$LE_y = LE_{Ref,y} + LE_{Ref,sc} + LE_{water} \quad \text{Equation (10)}$$

Where:

LE_y = Leakage emissions in year y (tCO_{2e})

$LE_{Ref,y}$ = Refrigerant leakage emissions from the project in year y (tCO_{2e})

$LE_{Ref,sc}$ = Refrigerant leakage emissions from the baseline cooling equipment that is scrapped as a result of the project activity (only accounted in the first year of the crediting period) (tCO2e)

$LE_{water,y}$ = Emissions due to the freshwater usage in the project system in year y (tCO2e)

Emissions due to the refrigerants leakage during the project activity is calculated as:

$$LE_{Ref,y} = \sum_k R_{k,y} \times GWP_k \quad \text{Equation (11)}$$

Where:

$LE_{Ref,y}$ = Refrigerant leakage emissions from the project in year y (tCO2)

$R_{k,y}$ = Quantity of refrigerant k filled in the district cooling system year y (t)

GWP_k = Global Warming Potential of the refrigerant k

Emissions due to the refrigerant leakage from the baseline cooling equipment that is scrapped as a result of the project activity2 are calculated (only for the first year of the crediting period) as below:

$$LE_{Ref,SC} = \sum_z R_z \times GWP_z \quad \text{Equation (12)}$$

Where:

$LE_{Ref,SC}$ = Refrigerant leakage emissions from the baseline individual cooling equipment that is scrapped as a result of the project activity (tCO2e)

R_z = Quantity of refrigerant z leaked from the baseline individual cooling equipment that is scrapped as a result of the project activity (t)

GWP_z = Global Warming Potential of the refrigerant z

Emissions due to use of freshwater shall be considered in sites where freshwater is produced through the desalination. As emissions associated with the production of make-up water are considered negligible, this source of leakage shall be considered once, i.e. at the first monitoring and calculated as below:

$$LE_{water} = Q_{water} \times EF_{water} \quad \text{Equation (13)}$$

Where:

LE_{water} = Emissions due to the freshwater usage in the project system (tCO2e)

Q_{water} = Maximum designed quantity of freshwater to be used in the project system (t)

EF_{water} = Emission factor associated with the production of freshwater (tCO2e/t)

In cases where the emission factor is not available directly from the supplier, but amount of energy used for freshwater production and total amount of freshwater supplied within the project boundary are known, the emission factor shall be calculated as per equation below. The data for the most recent year prior to the start of the project activity shall be used:

$$EF_{water} = \frac{\sum_l FC_l \times NCV_l \times EF_{CO2,l}}{WP} \quad \text{Equation (14)}$$

Where:

EFwater = Emission factor associated with the production of freshwater (tCO2e/t)

FCl = Amount of fuel type l consumed to produce freshwater (t)

NCVl = Net calorific value (energy content) of fuel type l (GJ/t)

[2] Emissions due to the possible refrigerant leakage from the baseline individual cooling equipment that is scrapped as a result of the project activity are accounted taking into consideration the decision taken by the Board at its 34th meeting, Paragraph 17 of the meeting report.

EFCO2,l	=	CO2 emission factor of fuel type l (tCO2/GJ)
WP	=	Net amount of freshwater produced and supplied within the project boundary (t)
l	=	All fuel types combusted for freshwater production

4.4 Net GHG Emission Reductions and Removals

$$ER_y = BE_y - PE_y - LE_y$$ Equation (15)

Where:

ER_y	=	Emissions reductions in year y (t CO2e)
BE_y	=	Baseline emissions in year y (t CO2e)
PE_y	=	Project emissions in year y (t CO2e)
LE_y	=	Leakage emissions in year y (t CO2e)

Year	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals (tCO_2e)
Year 1	76,609	42,902	7,462	26,245
Year 2	76,609	42,902	4,840	28,867
Year 3	76,609	42,902	4,840	28,867
Year 4	76,609	42,902	4,840	28,867
Year 5	76,609	42,902	4,840	28,867
Year 6	76,609	42,902	4,840	28,867
Year 7	76,609	42,902	4,840	28,867
Total	**536,263**	**300,314**	**36,502**	**199,447**

5 MONITORING

5.1 Data and Parameters Available at Validation

Data / Parameter	Building Type
Data unit	-
Description	Categories grouped by type of buildings (new/existing). For each category, all connected buildings should be clearly identified.
Source of data	Maps or schematic plan diagrams of the district cooling system and the area where project is implemented obtained from the district cooling company
Value applied	-
Justification of choice of data or description of measurement methods and procedures applied	-
Purpose of Data	• *Calculation of baseline emissions*
Comments	-

Data / Parameter	Baseline cooling technologies
Data unit	-
Description	Categories grouped by type of Baseline cooling technologies used in the absence of the project. The following needs to be clearly documented for each technology for the last 3 years. If the age of the building is less than 3 years, document the information from the start of the building's commissioning: Number of buildings in the project boundary supported by the technology Annual cooling output from the technology
Source of data	Third Party Survey
Value applied	-
Justification of choice of data or description of measurement methods and procedures applied	-
Purpose of Data	• *Calculation of baseline emissions*

Comments	-

Data / Parameter	$C_{P,r,y}$
Data unit	*J/g °C*
Description	Specific heat capacity of coolant
Source of data	Coolant provider
Value applied	-
Justification of choice of data or description of measurement methods and procedures applied	-
Purpose of Data	• *Calculation of baseline emissions*
Comments	-

Data / Parameter	EF_{water}
Data unit	*tCO2e/t*
Description	Emission factor associated with the production of freshwater
Source of data	EWEC
Value applied	0.0106
Justification of choice of data or description of measurement methods and procedures applied	This is provided by the water supplier.
Purpose of Data	• *Calculation of leakage*
Comments	-

Data / Parameter	Q_{water}
Data unit	*Ton*

Description	Maximum designed quantity of freshwater to be used in the project system
Source of data	Technology supplier
Value applied	703954
Justification of choice of data or description of measurement methods and procedures applied	Data provided by technology provider and submitted to Environmental agency Abu Dhabi
Purpose of Data	• *Calculation of leakage*
Comments	

5.2 Data and Parameters Monitored

Data / Parameter	OPC,r,y
Data unit	T*Rh*
Description	Cooling output of new district cooling plant r in year y
Source of data	Flow-meter
Description of measurement methods and procedures to be applied	*This will be monitored and calculated through online monitoring system.*
Frequency of monitoring/recording	Continuous
Value applied	85,848,000
Monitoring equipment	*SCADA Dashboard*
QA/QC procedures to be applied	This is regulatory requirement and has QA/QC system applied.
Purpose of data	• Calculation of baseline emissions

Calculation method	As per equation in Baseline Emission section above.
Comments	-

Data / Parameter	$EC_{PJ,j,y}$
Data unit	MWh
Description	Quantity of electricity consumed by the new district cooling plant j in year y
Source of data	On-site measurements
Description of measurement methods and procedures to be applied	This will be monitored and calculated through online monitoring system.
Frequency of monitoring/recording	Continuous
Value applied	72,112
Monitoring equipment	Electricity Meter
QA/QC procedures to be applied	This is regulatory requirement and has QA/QC system applied.
Purpose of data	• Calculation of project emissions
Calculation method	-
Comments	-

Data / Parameter	$SEER_{B,i}$
Data unit	kW/TR
Description	Benchmark Seasonal Energy Efficiency Ratio of the baseline cooling technology i
Source of data	From manufacturers of the baseline cooling technology

Description of measurement methods and procedures to be applied	
Frequency of monitoring/recording	Every 3 years
Value applied	1.5
Monitoring equipment	Technology supplier
QA/QC procedures to be applied	
Purpose of data	• Calculation of baseline emissions
Calculation method	-
Comments	-

Data / Parameter	$R_{k,y}$
Data unit	T
Description	Quantity of refrigerant k used in the project in year y
Source of data	Records from the plant operator
Description of measurement methods and procedures to be applied	Metering will rely on the simple counting of cylinders
Frequency of monitoring/recording	Continuous, As and when cylinder will be used
Value applied	0.156
Monitoring equipment	Supplier
QA/QC procedures to be applied	Crosschecked with purchase records. All meters and scales will be calibrated as per manufacturers' recommendations

Purpose of data	• Calculation of leakage emissions
Calculation method	-
Comments	-

Data / Parameter	GWPk,
Data unit	1300
Description	Global Warming Potential of the refrigerant k
Source of data	Records from the plant operator
Description of measurement methods and procedures to be applied	Intergovernmental Panel of Climate Change (IPCC)'s latest reports or any other relevant scientific body's assessment
Frequency of monitoring/recording	-
Value applied	1300
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	• Calculation of leakage emissions
Calculation method	-
Comments	-

5.3 Monitoring Plan

The project is operated by Tabreed which ensures the overall site management in accordance with the UAE Laws and technology providers' guidelines and will perform the monitoring in house.

The project monitoring will comply with the monitoring methodology ACM0117 Version 2.0. Therefore, all relevant parameters stated in Section 5.1. above will be reliably monitored and cross checked through calibrated measurement equipment.

Additionally, all workers will receive the appropriate training for the operation and maintenance of all equipment based on the monitoring equipment maintenance/calibration procedures, the emergency strategy and sampling protocols for waste composition analysis.

All data collected as part of monitoring will be archived electronically and be kept at least for 2 years after the end of the last crediting period.