

TERMS OF REFERENCE (TOR)

Procurement of Climate Action Awareness System

I. RATIONALE

Quezon City aims to reduce greenhouse gas (GHG) emissions by 30% by 2030 compared to the projected business as usual scenario and commit to pursue net-zero emissions by 2050.

The Climate Change and Environmental Sustainability Department is tasked to develop and implement policies, programs, projects, systems, and strategies on climate change mitigation and adaptation as well as environmental sustainability while ensuring efficient and sustainable resource allocation through advocacy-driven campaigns, environment-friendly technological advances, environmental education, and community engagement.

Quezon City also aims to increase the adaptive capacity of communities and the resilience of natural ecosystems against the impacts of cyclones and floods, droughts, and heat.

The iRISE-UP is the city's Disaster Risk Reduction & Management Office integrated ICT solution that integrates monitoring systems of the City's early warning devices, remote sensors, data loggers, and field equipment dedicated for monitoring of water levels in the rivers and observation of weather parameters such as rainfall amount, temperature, pressure, humidity. The system includes the collection and processing of data from early warning devices, remote sensors, data loggers, and field equipment dedicated for monitoring of water levels in the rivers and observation of weather parameters such as rainfall amount, temperature, pressure, humidity through the use of state-of-the-art ICT systems.

II. PROJECT OBJECTIVES

The project aims to make Climate Action as part of Quezon City's culture by offering climate awareness tools to its residents, households and businesses in a form of a **Mobile Application**. The project aims to be as a starting point to build awareness and start a foundation on how to live sustainably.

The Climate Change and Environmental Sustainability Department plans to make use of the collected information for research and development. A **Web Application** will be implemented to extract and analyze information. **Three (3) Air Quality Sensors** will also be installed within Quezon City and seamlessly integrated to the system. The project also aims digitize **Climate Impact Analysis** information and develop local formats to produce local impact data that can be used in the next phases of the project.

The overall system shall be hosted in the existing cloud-based infrastructure of the Disaster Risk Reduction & Management Office (iRISE-UP) and shall be integrated seamlessly in its existing public facing applications to achieve consolidated climate adaptation/mitigation awareness campaigns for the public.

The project aims to implement informational **Digital Campaigns** on a monthly basis thru digital and social media methods to reach its target audience.

III. TECHNICAL SPECIFICATIONS

Requirements and specifications of the Climate Action Awareness System

Description	Delivery Time
<p>1. NATIVE MOBILE APPLICATION</p> <ul style="list-style-type: none">• Carbon Footprint Questionnaire (Scope 1 and Scope 2) for Individual, Household and Companies with option for Monthly and Annually• Scan electric and water bill for questions related to electric & water consumption• Carbon Footprint Analysis with<ul style="list-style-type: none">○ Monthly carbon footprint computation○ Annual carbon footprint computation○ Comparisons between the user, QC parameters and Philippines (average)○ Carbon footprint analysis per category○ Carbon footprint record○ Share carbon footprint record○ Climate impact assessment• Display feeds posted by the Climate Change and Environmental Sustainability Department and Disaster Risk Reduction & Management Office (informational with text, image, video content)• The system will be a new feature to be added in the iRISE-UP IOS & Android Application (Quezon City to provide the development environment)• Application Perpetual License with 1 year maintenance & support	45 Calendar Days
<p>2. DATA MANAGEMENT WEB APPLICATION</p> <ul style="list-style-type: none">• Web application for the maintenance of the system and content management of the system shall be independent from the iRISE-UP System• Feeds Content Management System• Map, Table and Graph Dashboards for analysis• Climate / Weather Sensor Map with Threat Matrix displaying Air Quality and all available sensors of Quezon City (data integration is required)• Historical Data Management & Data Download• Automated Data Delivery in Report and CSV format• Application Perpetual License with 1 year maintenance & support	45 Calendar Days
<p>3. DIGITAL CAMPAIGNS</p> <ul style="list-style-type: none">• Micro website with Content Management System (CMS)	

<p>For purposes of application information, user guide, training information and other informational content</p> <ul style="list-style-type: none"> • 4 informational infographic videos at 2min max (1 video per quarter) • Monthly content maintenance for one (1) blog and four (4) social media post • Website Perpetual License with 1 year support and maintenance 	45 Calendar Days
<p>4. CLIMATE IMPACT ASSESSMENT</p> <ul style="list-style-type: none"> • Climate Change and Hazard Information • Potential Impacts of Climate Change • Exposure Database • Sensitivity Database • Disaster Risk Assessment • Hazard Map Template for 1 Barangay <ul style="list-style-type: none"> ○ Hazard map should have the scale of 1:50,000 ○ Flood, Ground Shaking, and Severe Wind hazards should have the following maps: Susceptibility Map, Exposure Map ○ Evacuation Map ○ Hazard map template will be used for future phases of the project to achieve granularity per Barangay • Delivery in digital and five (5) hard copies • Data will be integrated in the Climate Impact Assessment section of the Mobile Application 	45 calendar days
<p>5. AIR QUALITY SENSORS</p> <ul style="list-style-type: none"> • Three (3) Air Quality Sensors Set • Proposed locations are QC DRRMO Building, QC DRRMO Regional Evacuation Center, and Brgy Batasan Hills • Installation • Integration to Web Application (Item#2) for Data Display, Analysis & Download • Three (3) years warranty & maintenance including data communications <p>Gases</p> <p><i>Sensor: Type, Units, Range, LOD, LOC, Precision, Accuracy</i></p> <ul style="list-style-type: none"> • NO: Electrochemical, ppb or µg/m3, 0-20,000 ppb, <1 ppb, <5 ppb, >0.9, 1 ppb • NO2: Electrochemical, ppb or µg/m3, 0-20,000 ppb, <1 ppb, <5 ppb, >0.85, 4 ppb • NOx: Electrochemical, ppb or µg/m3, 0-40,000 ppb, <2 ppb, <10 ppb, >0.9, 4 ppb • O3: Electrochemical, ppb or µg/m3, 0-20,000 ppb, <1 ppb, <5 ppb, >0.9, 5 ppb 	45 calendar days

- CO: Electrochemical, ppb or $\mu\text{g}/\text{m}^3$, 0-1,000,000 ppb, <30 ppb, <50 ppb, >0.8, 20 ppb
- SO₂: Electrochemical, ppb or $\mu\text{g}/\text{m}^3$, 0-100,000 ppb, <2 ppb, <10 ppb, >0.7, 20 ppb
- H₂S: Electrochemical, ppb or $\mu\text{g}/\text{m}^3$, 0-100,000 ppb, <1 ppb, <5 ppb, >0.7, 1 ppb
- TVOC: Electrochemical, ppb, 0-2,500 ppb, <10 ppb, <50 ppb, >0.95, 0.05 ppm
- CO₂: NDIR, ppm or mg/m^3 , 0-5,000 ppm, <1 ppm, <1 ppm, >0.9, 50 ppb

Particles

Sensor: Type, Units, Range, LOD, Precision, Accuracy

- PM₁: Optical particle counter, $\mu\text{g}/\text{m}^3$, 0-100,000 $\mu\text{g}/\text{m}^3$, 0 $\mu\text{g}/\text{m}^3$, >0.9, 5 $\mu\text{g}/\text{m}^3$
- PM_{2.5}: Optical particle counter, $\mu\text{g}/\text{m}^3$, 0-150,000 $\mu\text{g}/\text{m}^3$, 0 $\mu\text{g}/\text{m}^3$, >0.9, 5 $\mu\text{g}/\text{m}^3$
- PM₄: Optical particle counter, $\mu\text{g}/\text{m}^3$, 0-225,000 $\mu\text{g}/\text{m}^3$, 0 $\mu\text{g}/\text{m}^3$, >0.9, 5 $\mu\text{g}/\text{m}^3$
- PM₁₀: Optical particle counter, $\mu\text{g}/\text{m}^3$, 0-250,000 $\mu\text{g}/\text{m}^3$, 0 $\mu\text{g}/\text{m}^3$, >0.85, 5 $\mu\text{g}/\text{m}^3$
- PM_{Total}: Optical particle counter, $\mu\text{g}/\text{m}^3$, 0-350,000 $\mu\text{g}/\text{m}^3$, 0 $\mu\text{g}/\text{m}^3$, >0.85, 5 $\mu\text{g}/\text{m}^3$

Power

- External DC, >5 years, 9 – 24V DC
- Lithium metal battery pack
- External high capacity battery pack
- NiMH rechargeable battery pack
- Solar power pack

Physical

- Enclosure: ABS, protection IP65
- Environmental: Temperature range: -20°C to +40°C
Humidity range: 15 to 95% RH
- Mounting: Pod supplied with mounting bracket for walls / posts
- Approx. size and weight:
- Length: 170 mm
- Width: 220 mm Height (excl antenna): 250mm
- Height (incl antenna): 430mm Weight: 2 – 2.7kg

Data Access & Communication

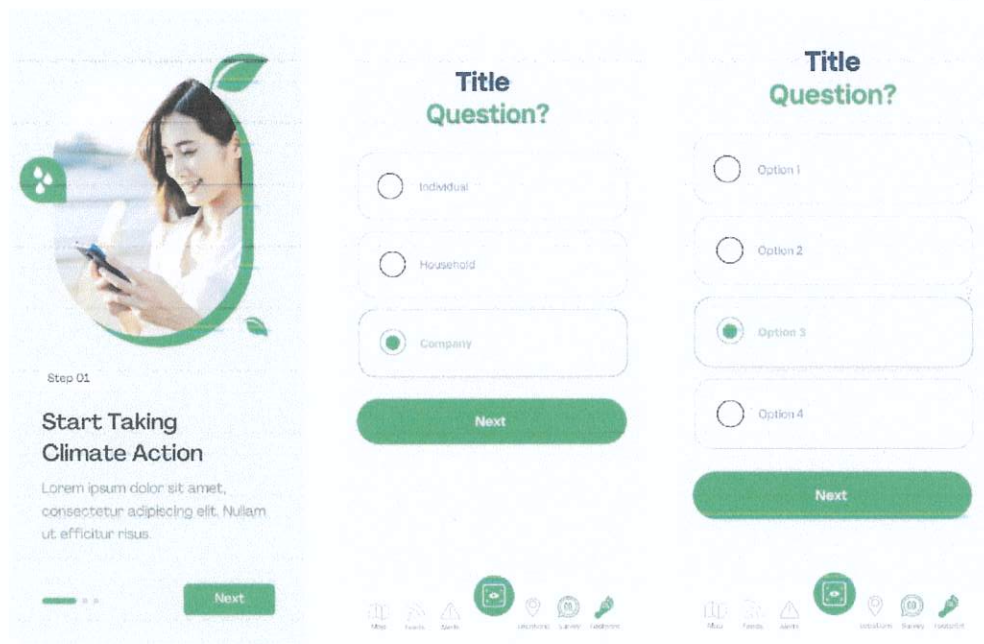
- Communication: Raw data sent to the server by cellular network. Worldwide coverage 4G/5G LTE Cat M1/NB1 with 2G fallback.
- Measurement period: Variable, from 1 minute to 1 hour.
- Transmission frequency: Variable, from 5 minutes to 12 hour intervals
- Server Software
- Web browser based
- Processing of sensor output to give reading

<ul style="list-style-type: none">• Database storage on secure server• Data Access• Data download• Multi-user access• Customizable API Facility & API Endpoint	
<p>6. TRAINING & DOCUMENTATION</p> <ul style="list-style-type: none">• 3 Days Train the Trainer• 3 Days System Admin Training• 3 Days End-User Training• Digital User Manuals• All trainings will have eight (8) hours per day with five (5) attendees.	14 calendar days

IV. INTERFACE REQUIREMENTS & SYSTEM ARCHITECTURE

Bidder should comply with the basic design components or provide a better, efficient and easily understandable user interface.

MOBILE APP INFORMATION AND QUESTIONNAIRE



FOOTPRINT RECORD AND ANALYSIS SECTION



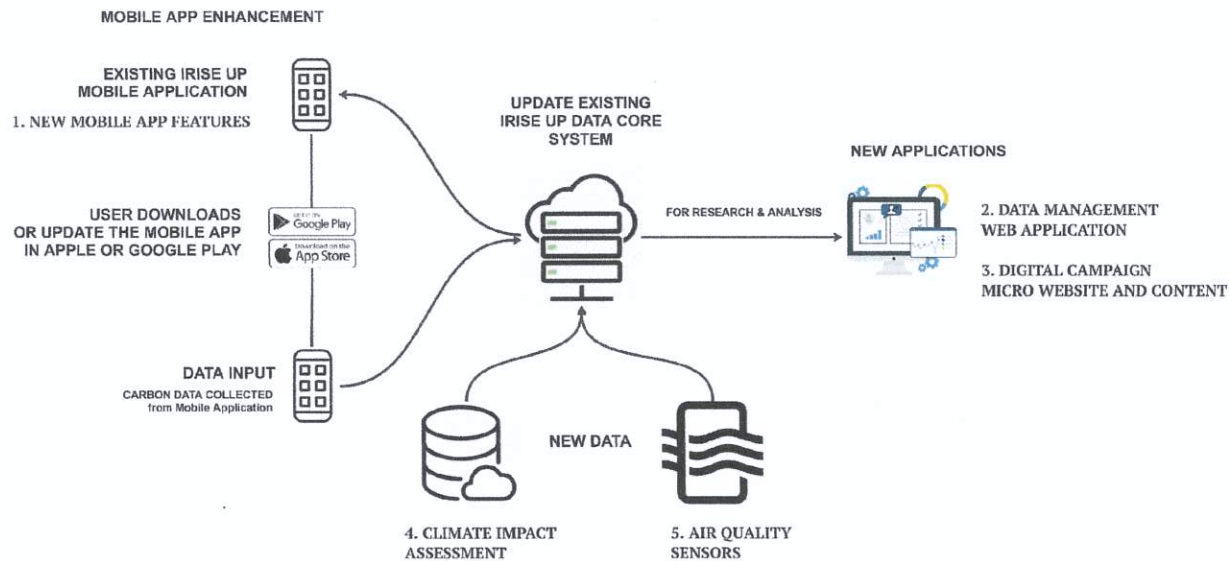
WEB APPLICATION FOR DATA MANAGEMENT

Web Application Dashboards, Automated Reports and Data Delivery



INTEGRATION OVERVIEW

Bidder should have the capacity and systems compatibility to integrate in the existing iRISE-UP Systems. Quezon City shall provide the development environment and necessary access for integration.



V. APPROVED BUDGET FOR THE CONTRACT

The approved budget for the contract is nineteen million and one hundred thousand pesos (P19,100,000).

ITEM	BUDGET (PHP)
1. NATIVE MOBILE APPLICATION	5,000,000 (Perpetual License)
2. DATA MANAGEMENT WEB APPLICATION	5,000,000 (Perpetual License)
3. DIGITAL CAMPAIGNS	2,000,000 (Perpetual License)
4. CLIMATE IMPACT ASSESSMENT	3,000,000
5. THREE (3) AIR QUALITY SENSORS	4,000,000
6. TRAINING & DOCUMENTATION	100,000
TOTAL	19,100,000

VI. PROJECT DURATION

The delivery period of the Project shall be within forty-five (45) calendar days upon issuance of Notice to Proceed.

VII. TERMS OF PAYMENT

Below are the deliverables that will be used as the basis for full payment.

Item	Deliverables
Delivery of native mobile application	Project Acceptance Document: Fully

	delivered system and documentation
Delivery of data management web application	Project Acceptance Document: Fully delivered system and documentation
Delivery of digital campaigns	Project Acceptance Document: Fully delivered system and documentation
Delivery of climate impact assessment	Project Acceptance Document: Fully delivered system and documentation
Delivery and installation of three (3) air quality sensors	Project Acceptance Document: Receipt, Installation Completion and Maintenance & Warranty Certificate
Training & documentation	Training certificate and documentation

VIII. PROJECT STANDARD & REQUIREMENTS

Bidder must have at least one (1) Sustainability Manager with at least ten (10) years of experience working with Private and Government sustainability projects, one (1) Meteorologist or Environmental Scientist for the assessment of Climate Impact (1) Data Scientist resources for Training and continuous consultation within the project as this is a science-based data driven project and (1) Digital Marketing Manager to support the information campaigns.

The bidder must have demonstrated capability, experience and have implemented climate adaptation or mitigation information solutions to highly urbanized city (HUC) in the Philippines. These systems must be already existing and proven working by other highly urbanized cities (HUC) in the Philippines. The system must be aligned with smart city models or solutions that are automated, faster to implement, easy to manage, and more cost effective.

IX. PENALTIES FOR BREACH OF CONTRACT

Incomplete and delayed delivery will result in penalties based on standard Government implementing rules and regulations.

X. CANCELLATION FOR OR TERMINATION OF CONTRACT

Incomplete and delayed delivery and non-performance of services will result in penalties and termination of contract based on standard Government implementing rules and regulations.

Prepared and recommended by:



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