

Terms of Reference:

"EYCARE" - Empowering Youth and Community for Automated Renewable Energy-Integration in Water Systems.

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March - 2025

"EYCARE" - Empowering Youth and Community for Automated Renewable Energy-Integration in Water Systems.

Section	Content
Background	The impacts of climate change driven water scarcity are already being felt by the population, deteriorating their well-being and human capital. Global evidence highlights the long-lasting negative consequences of climate shocks, especially during the early stages of life. For example, severe water scarcity can directly impact childhood stunting, which in turn affects a child's future health and productivity. For the poor and vulnerable populations, managing these shocks often leads to behaviors that further erode their human capital. The pressures on water resources are intensified by population growth, economic development, increased water withdrawals from riparian countries, and climate change. At the same time, Iraq's carbon emissions have doubled over the last decade, driven by population growth and oil production. Although Iraq accounted for only 0.45 percent of global greenhouse gas (GHG) emissions in 2019, it ranked fourth in the MENA region and has one of the highest carbon intensities (emissions per GDP) compared to its peers. This trend is partly due to a steep population increase of 21 percent between 2012 and 2018 and increased internal use of oil and natural gas, particularly in power generation and transportation. Addressing these intertwined challenges of water scarcity and high carbon emissions requires innovative, sustainable solutions. Solarization of water boreholes represents a strategic approach to enhancing water access while reducing reliance on non-renewable energy sources. By using solar power for boreholes, communities can ensure a more stable water supply, even in the face of growing water stress and climatic variability. This approach reduces the carbon footprint associated with conventional energy use, contributing to Iraq's climate adaptation efforts. The integration of automation through real-time monitoring of these solar-powered boreholes further strengthens this approach. Automation allows for continuous monitoring of water levels/pressure, quality/FRC, and system efficiency, enabling communities to respond quickly to maintenance needs and optimize water use. This data-driven approach ensures the sustainability and reliability of water systems, helping to mitigate the impacts of climate-driven water scarcity. Empowering youth to take an active role in the implementation and management of these solarized, automated water systems adds a crucial social dimension to this strategy. By equipping youth with the skills needed for installing and maintaining solar systems, and data analysis, the project provides them with economic opportunities and fosters a new generation of environmental stewards. This project thus aims to bridge the gap between urgent water needs and sustainable energy solutions, while also investing in youth as key agents of change. Also, this project will give opportunities to connect the youth with the relevant stakeholders in the water sector, private sector, and ILO for job opportunities. The project aligns with the United Nations Sustainable Development Goals, particularly SDG 6 (Clean Water and Sanitation) and SDG 7 (Affordable and Clean Energy), highlighting the commitment to ensuring accessible and sustainable water and energy for all.

Project Description:	This project aims to Empower youth and community for Empowering Youth and Community for Automation and Renewable Energy-Integration in Water Systems through engaging them in leading the management, Monitoring, Operation, and Evaluation of the transformed infrastructure of the Boreholes (#1 Qurshaghlo, #2 Shamamk-Tajel, and #3 Bnslawa-Bistana) which are located in Dashti Hawler district, which is severely impacted by water scarcity, and serve as the primary water source for the residents of the three villages, accommodating approximately 4,440 (1,080, 2,700, and 660) individuals respectively including 2,264 female, 140 refugees and 140 IPDs by integrating renewable energy solutions and Automation of the boreholes. The primary objective is to mitigate the challenges posed by erratic power supplies and water scarcity, which significantly impact the population, reduce GHG emissions and youth empowerment. The transformation of the infrastructure will be done through the following components: 1. <u>Provision and installation of Solar power system</u>: The boreholes are equipped with high-efficiency solar panel systems to ensure a reliable and sustainable energy supply to ensure that the communities have access to safely managed water. 2. <u>Provision and installation of smart sensors</u>: automation of the operation, (FRC, water pressure, etc.) for the three boreholes to generate real-time data and monitor the borehole's performance. 3. <u>Water monitoring and Reporting Hub</u>: Establish two Hubs one at the DESW and the other at the DOW taking responsibility for monitoring water levels, system efficiency, and overall maintenance. These groups will be trained on how to use data from real-time monitoring systems to generate reports and alert authorities to any issues. These groups will be linked with the team in the GDOWS and do regular monitoring of the existing real-time monitoring system by providing feedback and suggestions for improvement. Any similar projects in the future will be under the responsibility of these Hubs according to the geographical location in the Erbil governorate. 4. <u>Water Quality Monitoring</u>: Equip teams (government technical team and youth) with comprehensive training on water management, Data analysis, and how to monitor, report, and address issues such as contamination or turbidity in borehole water. 5. <u>Solar Installation and Maintenance Training</u>: Provide youth with hands-on training in solar technology, including installation, routine maintenance, and troubleshooting for solar-powered boreholes. The project not only addresses immediate infrastructural needs but also aligns with broader environmental goals, equipping youth with the importance of green energy and real time monitoring of the water sources.
	Objectives: • Youth Empowerment and Capacity Building: Equip youth with technical skills to install, maintain, and troubleshoot solar power systems for boreholes and data monitoring sensors. • Improve water access in the community: The Automated solar-powered boreholes will provide sustainable water to the targeted community.

Objectives & Expected Results	• Water monitoring and Reporting Hubs: Establish two water monitoring teams responsible for analyzing real-time data from boreholes and generating reports to inform local authorities and communities. These two Hubs will be based at the DESW and DOW and any similar projects in the future will be under the responsibility of these Hubs according to the geographical location. Expected Results: Main expected results of this project is to Empowering Youth and Community for Automation and Renewable Energy-Integration in Water Systems, this is through: • Improved Water Access: the automated Solar-powered boreholes will provide reliable, sustainable water access to at least 4,440 community members. • The water and monitoring Hub will be established, and the technical teams will be trained on water management and reporting using the IOT system for real-time monitoring data. • Enhanced Local Capacity: Communities will have the tools, knowledge, and youth leaders to manage and maintain solar-powered boreholes and water systems independently. • Environmental Benefits: The project is expected to result in significant reductions in carbon emissions and promote sustainable water management practices. • Alignment with Global Goals: Demonstrable contributions to achieving the United Nations Sustainable Development Goals, particularly Goals 6, 7 through practical, local action.
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Scope of Work	Scope of Work for Enhancing water supply/Wells Infrastructure: This initiative is dedicated to significantly upgrading selected boreholes by integrating cutting-edge solar power systems and real-time data-generated sensors. It directly tackles the critical issues of unreliable electricity supply and water scarcity and furthers the adoption of sustainable environmental practices within the community. • Preliminary Borehole Selection Criteria and Assessments Prior to detailed project execution, an initial joint technical and demographic assessment of Boreholes is undertaken between UNICEF, DESW/GDOWS, and the contractor to ensure eligibility and readiness for the integration of solar power systems and real-time monitoring sensors. This assessment phase encompasses: • Electrical Infrastructure and Power Availability: Examination of the existing electrical infrastructure and analysis of power availability, including grid connectivity and the typical number of electricity supply hours per day. This helps in designing a solar system that complements the current power setup
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	and meets the energy needs. • Environmental and Safety Assessments: Identification of potential environmental impacts and safety considerations associated with project implementations, ensuring compliance with environmental mitigation measures and safety protocols. The scope of work for this multifaceted project includes: A. Solar Power System Implementation: <u>1. Power Generation:</u> • Solar Panels type & Efficiency: Provide and install high-quality solar panels featuring Heterojunction Technology (HJT), N-Type, Half-Cut-Cell design with either 12 or 9 Busbars (MBB), and Bifacial High-Cut-Cell (HCC). These solar panels must come with a product warranty of 12 years and a power output warranty of 25 years, ensuring the lowest possible degradation over time. • Capacity & Standards: The minimum total capacity shall be according to the BOQ for each location, the photovoltaic (PV) modules should have a minimum production capacity of 570 Wp each and a minimum module conversion efficiency of 22%. Only panels from Western European manufacturers or other globally recognized brands that meet IEC 61215 standards for Crystalline Silicon Modules are acceptable. Additionally, these panels must be internationally certified by TUV Rhineland and adhere to ISO, BS, and UV standards. Certificates of origin for the panels must be provided. • Inverter and Energy Management: According to the BoQ items requirement, inverter to efficiently convert DC from solar panels and batteries to AC, incorporating an ATS changeover circuit from leading brands for seamless power transition. • Online platform: showcasing the generate power, the carbon reduction, location, working hours, ..etc. B- Enhanced Structural Engineering Procedure for Solar Panel Support Systems: The engineering process for designing and installing solar panel support structures is a critical component of the overall project, ensuring the safety, durability, and effectiveness of the solar power installations. This enhanced procedure outlines a comprehensive approach, from initial assessments to final certifications, incorporating specific engineering standards and practices. Initial Site and Structural Assessments: • Data Collection for Environmental Loads: Collect region-specific environmental data, including wind speeds, snow loads, and other relevant conditions. For wind load, refer to local building codes or the American Society of Civil Engineers (ASCE) standards, ensuring calculations account for the worst-case scenario wind speeds recorded in each governorate. C- Design of Steel Frame Structures: • Steel Sections Design-Based Specification: The selection of steel sections and their thickness for the support structure will be rigorously determined through design calculations. This process ensures that each dimension is optimized for structural demands, including load-bearing capacity and
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	environmental resilience. • Corrosion Resistance: Galvanized steel is chosen for its corrosion resistance, essential for the longevity of the structure under various environmental conditions. • Calculated Thickness: Thickness will be precisely calculated based on structural analysis, incorporating the weight of solar panels, potential environmental forces (wind, snow), and maintenance considerations, ensuring the framework's adequacy and durability without over-specification. • Load Analysis: Perform a comprehensive load analysis, considering the weight of the solar panels, the steel frame itself, wind loads, potential snow loads, and maintenance loads. This analysis will guide the design process to ensure all factors are adequately addressed. • Connection Design Strategy: Implement an advanced connection design strategy for the steel framework, focusing on ensuring the system's resilience to both static and dynamic stresses for enhanced long-term stability and safety. This strategy concentrates on: • Uplift Resistance: Tailor connections to effectively withstand uplift forces from high winds or extreme weather, securing the solar panels firmly to the ground. The design incorporates specific mechanisms to distribute these forces evenly, safeguarding against panel detachment or structural damage. • Mitigating Joint Failure: Utilize cutting-edge design elements to significantly reduce the potential for joint failure, which is vital for the solar support system's integrity. Employ reinforced bolting, welding, and other securing techniques to bolster joint strength and resilience under variable loads. • Thermal Flexibility: Design connection points to accommodate the steel structure's thermal expansion and contraction without impacting its integrity. opt for materials and fasteners designed for elasticity and strength across temperature changes, ensuring a consistently strong connection. D- Footing and Load Transfer Analysis: • Advanced Footing Design: Focus on the creation of specialized footings tailored for the installations. These elements are designed to uniformly distribute the imposed loads across the base, integrating advanced anchoring methods to secure the installation against sliding, overturning, and uplift forces. • Concrete Compressive Strength ($f'c$): The analysis will review or assume the concrete's compressive strength in megapascals (MPa), taking a conservative approach to account for variability in material quality across different construction periods or practices. • Structural Integrity Recommendations: Based on the findings, a suitable footing will be designed for the solar structure and installation. Note:
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All assumptions made during the footing and load transfer analysis must be realistic and justifiable to UNICEF. Assumptions should be backed by data or sound engineering principles. Where assumptions introduce uncertainty, direct measurements or tests are preferred to ensure the accuracy and safety of the project.

E- Engineering Documentation and Certification:

- **Detailed Design Documentation:** Prepare comprehensive design documentation, including drawings, specifications, and calculation sheets for the steel frame structure, connections, and foundation designs. This documentation will detail every aspect of the design process and the rationale behind each decision.
- **Certification by Licensed Professionals:** All design work and analyses should be prepared and certified by a licensed engineering firm/ institution or individual designer with the authority to approve structural designs. This certification ensures compliance with local and international engineering standards, building codes, and safety regulations.
- **Governorate-Specific Approvals:** Obtain necessary approvals from local governing bodies in the governorate, ensuring the designs meet or exceed local requirements for structural safety and environmental resilience.

The contractor is responsible for all tasks outlined in the above three points, Engineering Documentation and Certification section, including preparing and submitting design documentation and obtaining necessary certifications.

• Comprehensive Scope of Work for the smart monitoring system:

The contractor shall be responsible for integrating the three boreholes into the existing SMART MONITORING SYSTEMS for boreholes in Erbil, the following are the key tasks, deliverables, and methodology for the project:

- Integrating the 3 selected boreholes into the existing SMART MONITORING SYSTEMS according to the technical specifications listed in the BoQs attached in full accordance with the listed items.
- Provision and installation of specific sensors and process controller devices (control relays) attached to remote terminal units (RTU). Multiple remote terminal units at different sites transmit the data collected to a single master station which displays the information in a browser and can be controlled by a single top-level master.
- Real-time measurement of the FRC and flow characteristics, Pressure, electrical (current, voltage, etc.).
- Give personnel operators onsite training to manually control the system and intervene, if necessary, in case of any emergency.
- The alarm system is designed to be activated based on a pre-set threshold for any or the pumps are opened for too long a time or the operator did an unauthorized action).

	• Integration of the new boreholes to the designed mobile application, where the operator can monitor pump situation remotely, and the mobile application will guide the operator to the required corrective actions. Additionally, the mobile application will also alert the operator of an emergency error and guide him to the correct action. • These values include but are not limited to: A. Pumps Electrical Values; Over/Under of (Voltage+ Current+ Frequency), Phase Failure, Unbalanced Phases Load, Over Operation Time Schedule, and motor temp. B. Inlet Canal Variables; Under/Over Inlet Water Level & Low Inlet Water Flow Rate C. Outlet Transmission Line Variables; Under/Over Outlet Water Pressure & Under/Over Outlet Water Flow Rate. • All hardware components on site should be connected to the Internet using a 3G/4G network via SIM Cards without using Wi-Fi gateways or routers. • Recorded database to be used in reporting system and tracking all the system parameter history. • All boreholes are located in the Erbil governorate. • Generate weekly, monthly, and yearly reports for each location. • Integrate to the existing remote IoT system to allow monitoring of all the systems etc.) and customize web dashboard and mobile app to access the system from different locations and based on different roles. Designated water authority to read the transmitted data and send these values to the IoT platform. • The contractor shall submit samples of materials used in the project to the supervising committee for approval before using them in work. Additionally, the contractor shall submit a certificate of origin (CoO). The supervising committee may reject any equipment that does not comply with the specifications, in which case the contractor without any extra cost shall replace the materials. The supervising committee from the GDWS and DSSW shall request for any test or official documents such as (a certificate of conformity, FAT factory acceptance test, and any other document proving the quality) to ensure the quality of the materials used and work. Only approved materials/ equipment and workmanship shall be used. • Responsible for all defects and damages due to the use of low-performance materials or due to improper workmanship, defects in interior and/ or exterior were pipeline and network, electrical shorts, etc. • Responsible and required to supply all the required highly qualified technical expertise, tools, manpower, highly experienced management, etc. as required to implement all the required components as per the Bill of Quantities and ToR. • Provide two copies of the operation manual (1 copy in Kurdish and 1 copy in the English language) for each location, which includes Operations and maintenance SOPs and a manual with a list of errors guide to be used to tackle future operations problems or system failure. • Responsible for works and damages due to misuse, theft, deliberate destruction of materials or components, vandalism, and inappropriate or unjustified acts or behaviors within the valid period of the contract.
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	• The work will not be considered approved/completed and will not be certified unless approved by the UNICEF WASH programme and the GDWS and DSSW in KRG/Iraq. • 22. The SMART MONITORING SYSTEMS with all other components shall fall under a six-month of defect liability period after the initial handover of the project. parameters (Pump status, switch status ...etc.) • After the 6-month liability period, the final handover of the project will be done once all details are checked, and no defects are found. Excavation and Site Preparation: • Strategy and Management: Develop a comprehensive excavation plan tailored to the site's soil types and groundwater conditions, ensuring minimal disruption and adherence to safety standards. Maintain a clean and orderly site throughout the process, with clear signage and warning tape to enhance safety and operational efficiency. • Soil Handling and Infrastructure Protection: Excavate all soil types with precision, storing topsoil for site restoration. Implement measures to prevent damage to existing infrastructure; promptly repair and adjust any impacted facilities to maintain functionality. • Debris Management: Responsibly manage and remove debris and waste materials. All debris shall be transported out of the building site in accordance with the directions of the supervision committee and with municipality approval for designated dump areas, ensuring compliance with environmental regulations. Quality Control, Training, and Maintenance • Quality Assurance: Enforce rigorous quality control measures throughout the construction and installation phases to meet or exceed project standards. • Comprehensive Training: - At least five days of On-site training for at least 15 technical local staff and 15 youth from the community on operation and maintenance of the Smart monitoring system and also, the data interpretation and analysis - At least 3 days training on the operation and maintenance, troubleshooting of the solar power system and online platform. • Maintenance Planning: Develop a proactive maintenance schedule, covering all aspects of the system from civil works, electrical work, online platform, to mechanical components, supported by regular monitoring to ensure optimal performance.
	The implementation period should not exceed three months (90 calendar days) after the site handing over. The implementation period is the actual period of provision, installation, and proper operation of the whole system. Operation and warranty period shall not exceed 6 months from the date of the official preliminary

Deliverables	handing over. 1. The implementation shall be scheduled by the contractor, while the time schedule shall be agreed upon among three parties and approved by the established-supervising committee by the DESW/ GDWS. 2. The contractor must commence the works within a maximum period of 7 calendar days from the signing date of the contract and receipt of the sites via official site handover from DESW/ GDWS. 3. The contractor shall submit a detailed progress chart/activities schedule highlighting the activities to be conducted with their duration within 5 days after site handover. The planned progress chart shall also include the dates and durations of all tests that are to be made for quality assurance. and will be used to guide all parties with the monitoring and supervision of the progress of the works. the progress is to be updated on a daily basis. 4. The Contractor shall execute the activities listed in the BOQs in accordance with the TOR. 5. Prior to the Photovoltaic (PV) System installation, the Contractor will provide documentation for approval by UNICEF defining the installation and operation plan of the water system. Documentation shall, at a minimum, consist of the following: - Manufacturers' data sheets for PV modules, charge controllers, inverter/charger, mounting structures, combiner boxes, and other major components like Electrical Power Grid Transformer... etc as required in the BoQ. - Installation and operation manuals available from manufacturers in English and Kurdish. - Warranty information and user manuals for all major system components. - Single-line electrical schematic of the as-built system. 6. The contractor should provide a detailed manual/ guidance about the O & M of the Solar system. Comprehensive guide covering basics of system operation for the specific installed system: - How to operate equipment displays - How to safely disconnect and reconnect the system. - Basic tests to ensure the system is operating correctly. - Maintenance allowed by non-qualified personnel. - Proper safety procedures when working around the system. - Contact info of the contractor's technician (s) for any queries. 7. After installation, connecting, and connecting the solar PV panels to the submersible pumps, the smart invertors, and installation of the entire wiring system, the system should be safely, efficiently, and actively working for a period of 10 hours in sunny weather days.
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	8. The solar panel system must be protected by fencing the surrounding area of the project, as described in the BoQ. 9. The solar panels must be installed to the best tilt angles and its direction to the Azimuth, proper site planning for the allocated land and to avoid any shadow appearances in the surroundings. 10. Comprehensive training on system maintenance, operation, and troubleshooting, Data analysis and managmnet for at least 20 local technicians and 15 youth from the community shall be provided by the Contractor. The training will be delivered immediately after completion of the system installation. The contractor's installation staff should be available during training and provide all the tools and equipment required for training. 11. The contractor should assign one of the staff to train the government supervision committee during work installation/implementation for capacity building. 12. The contractor is in charge of documenting all the operation data and information (power output, quantity of water discharged, maximum hours of daily operation, and any others) right after the project completion and during the warranty period. 13. Should the Contractor fail to fulfill any of his obligations under the contract, the relevant remedies will be applied in line with UNICEF contractual provisions for construction works as provided in the attached RFP and the resultingcontract. 14. There will be no variation in the contract price as a result of any variation in the costs of materials for permanent or temporary works or of consumable storesfuel or power or in the rates of wages or allowances payable to or respect of labor or as a result of any changes in the labor employment conditions or as a result of the introduction or operation of any law statute or order. 15. The contractor should familiarize him/herself with the characteristics of the project and the location where the contractor will have to deliver the assignment in the actual conditions of the project location as it is, BOQs and drawings will not be modified for convenience purposes.
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	16. The contractor shall submit samples and Certificates of Origin of all the materials that will be used in the project to the Supervision Committee for approval before using them in the work. The contract will bear the costs of all tests required for quality assurance of materials and works, the tests shall be done in government labs and as instructed by the supervision committee (UNICEF+ relevant DESW/ GDWS), the frequency of tests and their sampling shall be determined by Iraqi standards of practice. 17. The total cost of each item includes testing costs for all works and materials as they need to be the contractor's responsibility, sampling to be according to Iraqi Engineering standards: concrete works (compression strength), earthworks, (compaction test), cement, fine and coarse aggregate, sub-base, steel bars (tensile test), electrical works and connection, hydraulic and pressure and leakage tests for the pipeline works, all the required tests for the soil investigation, etc. all need to be tested. 18. The test pending time (time consumed for test results to be released from the lab) should be factored in the overall project duration, and the contractor should plan in a way that test pending time does not halt the work progress, no extension of contract period shall be given for test pending time. 19. All the tests are to be conducted in a Governmental laboratory, and all are the contractor's responsibility with no additional cost or time. 20. Site is to be cleaned and cleared from any debris by the contractor prior to handover, debris is to be disposed to an authorized location. 21. All the hidden works need to be approved first by the supervision committee before covering, for example, the trenches need to be handed over to the supervision committee prior to laying the pipes, and the pipes laying and connection need to be approved by the supervision committee prior to filling/backfilling, the filling/backfilling work need to be approved for each layer by the supervision committee prior to proceeding to lay the next layer, etc. if the contractor contradicts this then and as requested by the supervision committee, the contractor will have to undo/remove the implemented work that covers the unapproved one.
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	22. The contractor is responsible for proper transportation, storage, and guarding of the construction materials during the project period, the cost is included in the relevant item lines. 23. The Contractor shall be responsible for the preparation and actualization of detailed Health & Safety and Accident Prevention Plans, Detailed Time Schedules and Cash Flow Estimates, site Protection, and ensuring people and traffic mobility. 24. It will be the contractor's responsibility to fix all that is damaged/deteriorated/diverted services and/or facilities in the project path or impacted by the project path with no extra cost. 25. UNICEF reserves the right to make any variation in writing and with approval from both sides in the form of quality or quantity of the works that may be necessary, the variation may include: - Increase or decrease the quantity of any work included in the contract. - Omit any work included in the contract. - Change the character or quality or kind of any work included in the contract. - Where there are rates for comparable work in the bills of quantities such rates are to be used. Where no such comparable rates are available from the bills of quantities UNICEF in negotiation with the contractor shall determine such rates as it considers fair and reasonable after a reasonable and documented market assessment, the due allowance shall be made for the market value of articles purchased, the intricacy and the location of the work involved and the current value of similar work in other contracts. The variation must be agreed by both parties and the contract must be amended before execution of the work. 26. Execute additional work (communicated in writing) of any kind necessary for the completion of the works. And no such variation shall in any way violate or invalidate the contract but the value (if any) of all such variations shall be considered in ascertaining the amount of the contract price. No such variation shall be made by the contractor without an order in writing by UNICEF who shall determine the amount (if any) to be added to or deducted from the sum named in the tender in respect of any extra or additional work done or work omitted by its order. 27. Remark: all BOQs, drawings, and details shall be provided by UNICEF, the contractor is requested to study the details in the BoQ and drawing before execution of the work. 28. If there is any unclarity between the BOQ and the drawing, the contractor must immediately notify UNICEF in writing for clarification. If not, the BOQ will supersede the Drawings.
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	29. There will be no variation in the contract price as a result of any variation in the costs due to fluctuation of currency for materials for permanent or temporary works or consumable stores fuel or power or the rates of wages or allowances payable to or in respect of labor or as a result of any changes in the labor employment conditions or as a result of the introduction or operation of any law statute or order. 30. The Contractor shall transport and at his expense all demolished rubbles and exceeded building materials to locations a minimum distance of 10 km or as specified by the municipality and shall be responsible for cleaning out the site and it is surrounding areas at the end of usage. 31. The latest issue of “UNICEF’s GTCs and Contractual Provisions for Construction” shall be applicable to this contract, especially clauses concerning the Settlement of Disputes, Arbitration, etc. 32. Submit a completion certificate certified, signed, and stamped by the nominated handover committee with a cover letter by the relevant water directorate.
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Project Execution and Oversight	Quality Assurance and Compliance • Material Standards and Workmanship: The Contractor is required to submit materials and equipment samples, along with Certificates of Origin, for the Supervision Committee and UNICEF approval. This step ensures all project materials comply with technical specifications and adhere to reliable International and Iraqi standards. • The supervising committee reserves the right to reject any materials not meeting the required specifications. In such instances, the contractor must replace the non-compliant materials at no additional cost. Additionally, the site engineer may request tests to verify the quality of materials and workmanship. Only materials and workmanship that have received approval will be used in the project. Site Management • Site Cleanliness and Waste Management: Maintain cleanliness across the project site and ensure responsible debris disposal. Obtain necessary approvals for all concealed works before moving forward, aligning with environmental and safety standards. Health, Safety, and Environmental Management • Safety Practices and Environmental Compliance: Develop and implement Health & Safety and Accident Prevention Plans in alignment with UNICEF's zero tolerance policy towards corruption, fraud, and child labor. These plans must ensure the safety of all employees and visitors on-site and incorporate environmental protection practices. Warranty Responsibilities
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	After preliminary handover, the contractor enters a 6-month warranty period, undertaking maintenance and support to rectify any operational issues and guarantee long-term system functionality. This commitment is crucial for maintaining project integrity and performance standards.
Reporting, Monitoring, and Final Handover	To ensure transparency and accountability throughout the project lifecycle, comprehensive reporting on various milestones is mandated. These reports will serve as formal documentation of progress, key decisions, and project completion stage. Progress and Meetings Documentation Bi-Weekly Updates: Submit bi-weekly reports detailing progress, challenges, and achievements. Include minutes of meetings and ensure reports are provided in a timely manner to facilitate payment processing. Handover Reports Preliminary Handing Over Report: Upon physical completion of all works, a technical report must be submitted, detailing the execution phases in alignment with the Bill of Quantities (BOQs), any time adjustments made, and including signed delivery notes. This report must be accompanied by an official cover letter endorsed by Handover committee/ school administrations. Final Project and Warranty Period Report - A thorough final report, submitted post-warranty period, must detail the outcomes of training sessions, lists of participants, and include an official approval letter from the handover committee. This serves as confirmation of the project's satisfactory completion and training effectiveness. - The warranty period involves contractor obligations for maintenance and support, ensuring the system's functionality. Upon fulfilling these responsibilities and successful project outcomes, the final handover process includes obtaining a completion certificate from the handover committee, marking the project's official closure.
Variation Order Management	Managing variations in the project scope, quality, or quantities is crucial to meeting objectives while accommodating necessary adjustments. This process is governed by the following steps: Variation Requests: Contractors must submit formal requests for any scope, quality, or quantity variations, including BoQ changes. These requests should outline the variation's nature, rationale, and expected impact on project execution and outcomes. UNICEF Review and Approval: UNICEF's Authority: UNICEF reserves the right to make necessary variations to work scope, quality, or quantity, including changes in the BoQ. Review Process: Upon receiving a variation request, UNICEF will review the necessity and feasibility of proposed changes, assessing their impact on project goals, budget, and timeline. Decision Making: Decisions on variation requests will be made

	solely by UNICEF, with formal notifications issued to the contractor. This ensures clear documentation and mutual understanding. 3. Implementation of Approved Variations: • Contractor's Role: Upon UNICEF's approval, variations must be documented and executed according to UNICEF's directives, ensuring alignment with agreed standards. • Adjustments in BoQs: Approved variations may lead to adjustments in BoQs, which require endorsement by all stakeholders, including the Supervision committee and/ or school administration, and UNICEF. 4. Valuation of Work: • Using BoQ Rates: For comparable work, existing BoQ rates will be applied. • Determining Rates for Unlisted Work: If no comparable rates are available, UNICEF will determine fair and reasonable rates, taking into account market value, work intricacy, location, and current value of similar work. • No Variation in Contract Price: There will be no variation in the contract price due to changes in material costs, labor wages, or the introduction/operation of laws affecting the project. 5. Written Orders Requirement: No variation by the contractor is to be made without a written order from UNICEF, ensuring all additional or omitted work is appropriately authorized and valued.
Qualification Requirements	Required Qualifications for Project Management • Project Manager Qualifications: • A minimum of 10 years' experience in managing similar projects, with a focus on renewable energy and environmental sustainability, smart monitoring system. • A degree in Mechanical or Electrical or Civil Engineering, with significant exposure to solar power technology and/or smart monitoring systems. • Operational Capacity and Geographic Coverage: • The ability to access and efficiently operate across all project sites, including remote or challenging locations in the Erbil governorate. • Portfolio and Experience Documentation: • Detailed portfolio of past projects that parallels the scope and magnitude of the proposed work, highlighting successful implementations and outcomes. • References from previous clients or employing authorities with contact details for verification. • Team Members: • Comprehensive profiles of key team members, including their roles, expertise, and contributions to project success. • Additional Compliance and Operational Details: • Compliance with local regulations, ensuring no direct or indirect

	participation of government employees in the tender process. • A certificate of site visit issued by the respective f the DESSW/GDOWS mandatory with the tender submission to confirm the tenderer's understanding of site-specific requirements. Submission Requirements: Tenderers must accompany their bids with detailed documentation, including team member CVs, a portfolio of previous work, operational plans for geographic coverage, and a certificate of site visit. These documents are crucial for UNICEF and its partners to assess the tenderer's technical and financial capacity for executing the proposed works successfully.
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Project Timeline and Locations	1- The implementation period should not exceed three months (90 calendar days) after the site handing over. The implementation period is the actual period of provision, installation, and proper operation of the whole system. 2- Operation and warranty period shall not exceed 6 months from the date of the official preliminary handing over. 3- The contractor must commence the works within a maximum period of 7 calendar days from the signing date of contract and receipt of the sites via official site handover from. 4- Summary of timeline starting from the day of contract signature: 7 days for site handover + 90 days for implementation + 180 days for warranty period = 277 calendar days.				
	#	District	location	Borehole name	
	1	Shamam k	Tajel	36.034557, 43.928440	3
	2	Qushtap a	Qurshaghl o	35.92253, 43.931838	1
	3	Bnslawa	Bistana	36.030589, 44.189585	2
	4.1 Initial Technical Evaluation Pass/Fail approach:				
	MANDATORY REQUIREMENTS		SUPPORTING DOCUMENTS	SCORE	

Evaluation process and methods	Lead bidder is a legal entity regulated and licensed in Iraq	A copy of the certificate of incorporation (i.e. company legal registration) or equivalent document verifying legal status/capacity in Iraq. The contractor to submit a valid contractor classification card. International companies are not excluded provided by to be registered in Iraq.	Pass / Fail
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	The bidder shall submit evidence of implementing similar projects	List of similar projects on green energy and/ or Smart monitoring system in Iraq or outside Iraq	Pass / Fail
	TAX Clearance	Bidder to provide tax clearance for 2023.	Pass/Fail
	Bidder keeps updated and compliant financial records	The most recent Audited Financial Statements of the lead bidder. (Financial Statement (Approved by the legal auditor) for last 2 years: 2022 and 2023	Pass / Fail
	Evidence of site visit	A certificate of site visit issued by the respective f the DESSW/GDOWS mandatory with the tender submission to confirm the tenderer's understanding of site-specific requirements	Pass/Fail

Then Bid shall be evaluated based on technical and financial criteria. The ratio weight between technical and financial criteria is (65:35).

- Technical Evaluation:

- The Bid shall be technically evaluated as below:
- The passing score of the technical criteria is 40 out of 65. See the criteria on annex below.

- Financial Evaluation:

- The bidder will be financially scored based on formula below:

$$\text{Bidder (A)} = (\text{Maximum score for price proposal (35 points)} \times \text{Price of lowest priced proposal among technically passed bidders}) / \text{Price of proposal (A)}$$

- The total weight of the bidder will be the cumulative of the two above formulas (Technical and Financial).

- Below are the selection criteria to be used in Bid Evaluation:

No.	Criteria	Weight
	Company and organizational profile	25
(i)	Approved “similar works” for supply and installation experience of SMART MONITORING SYSTEMS and solar power systems for water utilities and projects. The approved similar projects/works to be submitted within the list supported by contact info of the managing agency. Similar works that were successfully implemented by the bidder with the government, agencies/ private sector. 10 points for concrete evidence of similar works and 15 points for completed works on SMART MONITORING SYSTEMS and SOLAR POWER SYSTEM FOR WATER BOREHOLES/PROJECTS the evidence shall contain the following information: - Nature of the works previously executed. - Employing authorities and supervising	25

	engineers. - Value of various contracts. - Locations of implemented works. - Dates when they were implemented. - Any other information the bidders may present as evidence for his capability. - Certificate of completion of works.	
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(ii)	Proposed work plan and approach	35
	Proposed work plan (Progress chart) and approach of implementation of the tasks as per the TOR and BOQ and the suggested period.	5
	Catalogues submission of the required items needed to be supplied and installed (datasheet)	12
	Submission of risks mitigation plan for this project. (Quality Control Plan, safety plan...etc) Detailed plan/s with a clear mitigation measure for each risk type	3
	Suggested typical design of the system, it's clarity and simplicity, way of presentation, drawings, and layout. 5 points for the design 5 points for drawings 5 points for layout	15
(vi)	Company Key Staff and Organogram	5
	List of specialized technical staff that will manage and track supply and installation process, CVs to be shared. 2 points for the Organogram 3 points for submission of CVs (project manager, engineers, and technicians with relevant experience), along with a copy of the employment contract. • Project Manager Qualifications: • A minimum of 10 years' experience in managing similar projects, with a focus on renewable energy and environmental sustainability, smart monitoring system. • A degree in Mechanical or Electrical or Civil Engineering, with significant exposure to solar power technology and/or smart monitoring systems.	5

	Total	65

Administrative Issues	For site visits please coordinate with Eng. Khozga Ahmed/WASH officer, (phone: 07833352587, Email: khahmed@unicef.org)
Project management	Project Management and Coordination • UNICEF Supervision: UNICEF provides overarching supervision to ensure the project aligns with specific goals and quality standards. • Local Oversight: Representatives and/or official committees from the government partner (DESW, GDOWS), offer day-to-day oversight, ensuring quality and adherence to project objectives. • Project Manager Role: The contractor appoints a project manager responsible for: • Daily management of project implementation. • Liaising between UNICEF, the government partner, and the project team. • Ensuring all project activities comply with specifications and contractual terms. • The contractor shall have an experienced electrical engineer on site for the work. Coordination, Approval, and Accountability: • The project manager coordinates closely with all involved parties. • Seeks and obtains necessary approvals for project milestones and deliverables from all parties. • All activities shall be conducted according to the terms and conditions embedded in the contract with due considerations to UNICEF rules and regulations. The contractor shall also obtain endorsement from the GDWS of all its submittals.
Payment Schedule	Payments shall be made to the contractor in installments upon accomplishment of the deliverables and as follows: - First Payment: 45 % of contract value upon completion of provision and installation of the solar power system and the sensors for all boreholes. - Second Payment: 45% of the contract value upon completion of running the solar power system and the SMART MONITORING SYSTEMS, remote monitoring system (RTU), and on-site training. - Warranty payment: 10% of contract value upon completion of maintenance that might be required within 6 months after the preliminary

	handover of the project. The retention amount shall be released by UNICEF after: - Training for 15 local staff working at the community water system and local staff from the directorates of water in Erbil and the 15 youths (total 30), embedded the training materials, list of attendees, the outcome of the training, and an official approval letter from the GDWS per terms and conditions of the contract. - Submission of the certificate of final handing over after adequate maintenance during the warranty period issued by the final handing over committee. The contract is considered completed when a maintenance certificate from the DESW/GDWS in Erbil is endorsed and submitted to UNICEF stating that all works have been completed and maintained to their satisfaction.
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Prepared By:
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5 March 2025



Reviewed by:
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5 March 2025



Cleared by:
Ali Auob
WASH Chief

5 March 2025



Approved by:
Godwin Mindra
OIC/ Deputy
Representative,
programme