

RFQ Reference: 67/12/STAR-C/2023-ISA

Date: 08 December 2023

Subject: Supply, Installation, Testing & Commissioning (SITC) of equipment and instruments for setting up the STAR Centre in Bangladesh including one year Comprehensive Maintenance Contract (CMC).

SECTION 1: REQUEST FOR QUOTATION (RFQ)

ISA kindly requests your quotation for the provision of goods, works and/or services as detailed in Annex 1 of this RFQ.

This Request for Quotation comprises the following documents:

Section 1: This Request Letter

Section 2: RFQ Instructions and Data

Annex 1: Schedule of Requirements

Annex 2: Quotation Submission Form

Annex 3: Technical and Financial Offer

Annex 4: Checklist

When preparing your quotation, please be guided by the RFQ Instructions and Data. Please note that quotations must be submitted using Annex 2: Quotation Submission Form and Annex 3 Technical and Financial Offer, by the method and by the date and time indicated in Section 2. It is your responsibility to ensure that your quotation is submitted on or before the deadline. Quotations received after the submission deadline, for whatever reason, will not be considered for evaluation.

The ISA recognizes the importance of valuing diversity and promoting inclusion in all our work programs and partnerships. The ISA highly values engaging with organizations and/or teams that reflect its geographical and diverse nature.

Thank you and we look forward to receiving your quotations.

Issued by:

Signature: _____

Name: Procurement Unit

Date: 08/12/2023

SECTION 2: RFQ INSTRUCTIONS AND DATA

Introduction	<p>Bidders shall adhere to all the requirements of this RFQ, including any amendments made in writing by ISA. This RFQ is conducted in accordance with the ISA Financial Regulations and Procedures and ISA Procurement Manual</p> <p>Any Bid submitted will be regarded as an offer by the Bidder and does not constitute or imply the acceptance of the Bid by ISA. ISA is under no obligation to award a contract to any Bidder as a result of this RFQ.</p> <p>ISA reserves the right to cancel the procurement process at any stage without any liability of any kind for ISA, upon notice to the bidders or publication of cancellation notice on ISA website</p>
Deadline for the Submission of Quotation	<p>2nd January 2024 by 1900 HRS IST</p> <p>If any doubt exists as to the time zone in which the quotation should be submitted, refer to http://www.timeanddate.com/worldclock/.</p> <p>For eTendering submission - as indicated in eTendering system. Note that system time zone is in EST/EDT (New York) time zone.</p>
Method of Submission	<p>Quotations must be submitted as follows:</p> <p><input type="checkbox"/> E-tendering <input checked="" type="checkbox"/> Dedicated Email Address <input type="checkbox"/> Courier / Hand delivery <input type="checkbox"/> Other Click or tap here to enter text.</p> <p>Bid submission address: procurement@isolaralliance.org</p> <ul style="list-style-type: none"> ▪ File Format: PDF files only ▪ File names must be maximum 60 characters long and must not contain any letter or special character other than from Latin alphabet/keyboard. ▪ All files must be free of viruses and not corrupted. ▪ Max. File Size per transmission: 10 MB ▪ It is recommended that the entire Quotation be consolidated into as few attachments as possible. ▪ The bidder should receive an email acknowledging email receipt.
Cost of preparation of quotation	<p>ISA shall not be responsible for any costs associated with a Bidder's preparation and submission of a quotation, regardless of the outcome or the manner of conducting the selection process.</p>
Supplier Code of Conduct, Fraud, Corruption,	<p>All prospective suppliers must read the ISA Supplier Code of Conduct and acknowledge that it provides the minimum standards expected of suppliers to the ISA. The Code of Conduct, which includes principles on labour, human rights, environment and ethical conduct may be found at: https://isolaralliance.org/images/ISA%20Supplier%20Code%20of%20Conduct_14.4.2023.final%20version.pdf</p> <p>Moreover, ISA strictly enforces a policy of zero tolerance on proscribed practices, including fraud, corruption, collusion, unethical or unprofessional practices, and obstruction of ISA vendors and requires all bidders/vendors to observe the highest standard of ethics during the procurement process and contract implementation.</p>
Gifts and Hospitality	<p>Bidders/vendors shall not offer gifts or hospitality of any kind to ISA staff members including recreational trips to sporting or cultural events, theme parks or offers of holidays, transportation, or invitations to extravagant lunches, dinners or similar. In pursuance of this policy, ISA: (a) Shall reject a bid if it determines that the selected bidder has engaged in any corrupt or fraudulent practices in competing for the contract in question; (b) Shall declare a vendor ineligible, either indefinitely or for a stated period, to be awarded a contract if at any time it determines that the</p>

	<p>vendor has engaged in any corrupt or fraudulent practices in competing for, or in executing a ISA contract.</p>
Conflict of Interest	<p>ISA requires every prospective Supplier to avoid and prevent conflicts of interest, by disclosing to ISA if you, or any of your affiliates or personnel, were involved in the preparation of the requirements, design, specifications, cost estimates, and other information used in this RFQ. Bidders shall strictly avoid conflicts with other assignments or their own interests, and act without consideration for future work. Bidders found to have an undisclosed conflict of interest shall be disqualified.</p> <p>The ISA shall have the discretion to disqualify or proceed with a bidder who has disclosed a probable conflict of interest subject to further evaluation and review of various factors such as access to sensitive information which may confer unfair advantage as against other bidders. The decision on a probable conflict of interest shall be made in the best interest of the work of the ISA.</p> <p>Bidders must disclose in their Bid their knowledge of the following: a) If the owners, part-owners, officers, directors, controlling shareholders, of the bidding entity or key personnel who are family members of ISA staff involved in the procurement functions and/or the Government of the country or any Implementing Partner receiving goods and/or services under this RFQ.</p> <p>The eligibility of Bidders that are wholly or partly owned by the Government shall be subject to ISA's further evaluation and review of various factors such as being registered, operated and managed as an independent business entity, the extent of Government ownership/share, receipt of subsidies, mandate and access to information in relation to this RFQ, among others. Conditions that may lead to undue advantage against other Bidders may result in the eventual rejection of the Bid.</p>
General Conditions of Contract	<p>Any Purchase Order or contract that will be issued as a result of this RFQ shall be subject to the General Conditions of Contract</p> <p><input type="checkbox"/> https://www.isolaralliance.org/images/ISA_GTB.pdf</p>
Special Conditions of Contract	<p><input type="checkbox"/> Cancellation of PO/Contract if the delivery/completion is delayed by 10 days</p> <p><input type="checkbox"/> Others [pls. specify]</p>
Pre-bid Conference	<p>Not Applicable</p>
Eligibility	<p>A vendor who will be engaged by ISA may not be suspended, debarred, or otherwise identified as ineligible by any UN Organization or the World Bank Group or any other international Organization. Vendors are therefore required to disclose to ISA whether they are subject to any sanction or temporary suspension imposed by these organizations. Failure to do so may result in termination of any contract or PO subsequently issued to the vendor by ISA.</p> <p>It is the Bidder's responsibility to ensure that its employees, joint venture members, sub-contractors, service providers, suppliers and/or their employees meet the eligibility requirements as established by ISA.</p> <ul style="list-style-type: none"> • Bidders must have the legal capacity to enter a binding contract with ISA and to deliver in the country, or through an authorized representative. Company registration certificate or any other document proving legal entity. • The bidder must have the experience of supply of solar equipment's / hardware components. Submit copy of work order or completion certificate • The bidder must have annual turnover of more than USD 100,000 - Please attach relevant documents.

Currency of Quotation	Quotations shall be quoted in USD
Joint Venture, Consortium or Association	<p>If the Bidder is a group of legal entities that will form or have formed a Joint Venture (JV), Consortium or Association for the Bid, they shall confirm in their Bid that : (i) they have designated one party to act as a lead entity, duly vested with authority to legally bind the members of the JV, Consortium or Association jointly and severally, which shall be evidenced by a duly notarized Agreement among the legal entities, and submitted with the Bid; and (ii) if they are awarded the contract, the contract shall be entered into, by and between ISA and the designated lead entity, who shall be acting for and on behalf of all the member entities comprising the joint venture, Consortium or Association.</p> <p>Refer to Clauses 22 – 27 under Solicitation Process in the Procurement Manual (will be provided on request) for details on the applicable provisions on Joint Ventures, Consortium or Association.</p>
Only one Bid	<p>The Bidder (including the Lead Entity on behalf of the individual members of any Joint Venture, Consortium or Association) shall submit only one Bid, either in its own name or, if a joint venture, Consortium or Association, as the lead entity of such Joint Venture, Consortium or Association.</p> <p>Bids submitted by two (2) or more Bidders shall all be rejected if they are found to have any of the following:</p> <ol style="list-style-type: none"> they have at least one controlling partner, director or shareholder in common; or b) any one of them receive or have received any direct or indirect subsidy from the other/s; or they have the same legal representative for purposes of this RFQ; or they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about, or influence on the Bid of, another Bidder regarding this RFQ process; they are subcontractors to each other's Bid, or a subcontractor to one Bid also submits another Bid under its name as lead Bidder; or some key personnel proposed to be in the team of one Bidder participates in more than one Bid received for this RFQ process. This condition relating to the personnel, does not apply to subcontractors being included in more than one Bid.
Duties and taxes	<p>The United Nations (privileges and immunities) Act, 1947 is applicable to ISA pursuant to a notification by the host country. Therefore, ISA is exempt from all direct taxes, except charges for public utility services, and is exempt from customs restrictions, duties, and charges of a similar nature in respect of articles imported or exported for its official use in India. All quotations shall be submitted net of any direct taxes and any other taxes and duties, unless otherwise specified below:</p> <p>All prices must:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> be inclusive of VAT and other applicable indirect taxes <input type="checkbox"/> be exclusive of VAT and other applicable indirect taxes <p>[according to project and applicable country agreement]</p>
Language of quotation	<p>English</p> <p>Including documentation including catalogues, instructions and operating manuals.</p>
Documents to be submitted	<p>Bidders shall include the following documents in their quotation:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Annex 2: Quotation Submission Form duly completed and signed <input checked="" type="checkbox"/> Annex 3: Technical and Financial Offer duly completed and signed and in accordance with the Schedule of Requirements in Annex 1 <input checked="" type="checkbox"/> Company Profile. <input checked="" type="checkbox"/> Registration certificate. <input checked="" type="checkbox"/> Descriptive Literature: Bidders shall provide full technical details of products being offered, including technical sheets and pictures showing details and general views. Specific details of items offered should be clearly stated as standard catalogues may offer options; <input checked="" type="checkbox"/> Documents showing that the bidder has minimum of five (5) years of relevant experience – proof of purchase orders/ contract is to be submitted. <input checked="" type="checkbox"/> Documents showing that the bidder has an experience of design, supply, installation and commissioning of Grid connected/off grid Solar PV Power Plant and experience of rendering operation and maintenance services for Solar PV units.

	<input checked="" type="checkbox"/> Statement of satisfactory Performance (Certificates) from the top two clients in terms of Contract value in similar field, plus client's contact details who may be contacted for further information on those contracts;
Quotation validity period	Quotations shall remain valid for 90 days from the deadline for the Submission of Quotation.
Price variation	No price variation due to escalation, inflation, fluctuation in exchange rates, or any other market factors shall be accepted at any time during the validity of the quotation after the quotation has been received.
Partial Quotes	<input checked="" type="checkbox"/> Not permitted <input type="checkbox"/> Permitted Insert conditions for partial quotes and ensure that the requirements are properly listed in lots to allow partial quotes
Alternative Quotes	<input checked="" type="checkbox"/> Not permitted
Payment Terms	<input checked="" type="checkbox"/> Within 30 days upon ISA's acceptance and receipt of invoice.
Conditions for Release of Payment	<input checked="" type="checkbox"/> Written Acceptance of Goods & Services, based on full compliance with RFQ requirements. <input checked="" type="checkbox"/> 100% of <u>goods charges</u> after successful delivery and acceptance of goods. <input checked="" type="checkbox"/> 100% of <u>Installation & Commissioning charges</u> after successful installation and commissioning <input checked="" type="checkbox"/> 100% of <u>training charges</u> after completion of Training on Operation and Maintenance. <input checked="" type="checkbox"/> 100% of <u>Comprehensive maintenance charges</u> after successful 1 year of installation and commissioning
Contact Person for correspondence, notifications and clarifications	E-mail address: anupol@isolaralliance.org Attention: Quotations shall not be submitted to this address but to the address for quotation submission above. Otherwise, offer shall be disqualified. Any delay in ISA's response shall be not used as a reason for extending the deadline for submission, unless ISA determines that such an extension is necessary and communicates a new deadline to the Proposers.
Clarifications	Requests for clarification from bidders will not be accepted any later than 2 days before the submission deadline. Responses to request for clarification will be communicated thru email.
Evaluation method	<input checked="" type="checkbox"/> The Contract or Purchase Order will be awarded to the lowest price substantially compliant offer
Evaluation criteria	<input checked="" type="checkbox"/> Full compliance with all requirements as specified in Annex 1 <input checked="" type="checkbox"/> Full acceptance of the General Conditions of Contract <input checked="" type="checkbox"/> Comprehensiveness of after-sales services <input type="checkbox"/> Earliest Delivery /shortest lead time <input type="checkbox"/> Others Click or tap here to enter text.
Right not to accept any quotation	ISA is not bound to accept any quotation, nor award a contract or Purchase Order
Right to vary requirement at time of award	At the time of award of Contract or Purchase Order, ISA reserves the right to vary (increase or decrease) the quantity of services and/or goods, by up to a maximum twenty-five per cent (25%) of the total offer, without any change in the unit price or other terms and conditions.
Type of Contract to be awarded	<input type="checkbox"/> Purchase Order <input checked="" type="checkbox"/> Contract for Works <input type="checkbox"/> Other Type/s of Contract [pls. specify]
Expected date for contract award.	20 January 2024
Policies and procedures	This RFQ is conducted in accordance with ISA Financial Regulation and Procedures and ISA procurement manual

Other Provisions	<p>The ISA is striving to achieve gender parity in all its activities. In this regard, female-owned organizations and/or teams with significant gender diversity are strongly encouraged to submit a proposal.</p> <p>The ISA recognizes the importance of valuing diversity and promoting inclusion in all our work programs and partnerships. The ISA strives to engage with organizations and/or teams that reflect its geographical representation and diversity.</p>
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ANNEX 1: SCHEDULE OF REQUIREMENTS

Recognizing the urgent need to support the developing country (ISA members) with high potential for solar technology deployment, the ISA Assembly agreed to establish an international network of STAR C (Solar technology Application Resource Centre). The overarching objective of the STAR C initiative is to provide solar technology and application resourcing services to Member Countries so that these countries can achieve the ISA's vision of scaled up and accelerated large scale deployment of solar energy to meet the respective countries' priority energy access, energy transformation and energy security needs.

ISA aims to have a number of STAR centres across the globe acting as a shared facility that provides capacity for deployment of solar energy applications and research, business modelling, incubation, training, standardization, and testing engaging faculty members from different disciplines/institutes of excellence and provide/use shared facilities, labs, testing centres etc.

To equip these STAR Centres, ISA aims to procure equipment and instruments that help the centres to offer hands on training, act as a testing facility and setup a knowledge management centre. Such a centre is being created by ISA in **Dhaka, Bangladesh**.

This RFQ is for Supply, Installation, Testing & Commissioning (SITC) of equipment and instruments for setting up the STAR Centre in Dhaka, Bangladesh including one-year Comprehensive Maintenance Contract (CMC).

A preliminary needs assessment and situation analysis is being done in Bangladesh, to identify the high growth sectors within solar energy technology, and the attendant training needs. The sectors such as SHS, PV Parks, Solar rooftop and Solar Pumps drive solar training needs in the medium to long term and require trained technicians and engineers to size, install, operate, and maintain solar systems for socio-economic development, especially in rural and peri-urban areas. The current solar training and testing facilities as well as the solar curriculum was evaluated for gaps through primary stakeholder interviews with the private sector companies, industry bodies, government, and academia. A comprehensive country assessment is underway to identify the capacity building gaps.

The major findings were the need for understanding of the various solar components, design, sizing, installation, operations, and maintenance. According to the evaluation of the needs and gaps, a list of solar equipment has been suggested for the STAR C to prioritize in its implementation. A detailed list of the technical specifications is provided:

Recommended Technical Specifications for Goods

Item	Equipment	Specification EN	Quantity	Unit
A	Tools and instruments			
A1	Personal Protective Equipment	Specification	Quantity	Unit
1	Reflective vests	Reflective vests	20	pcs
2	Helmets	Helmets	20	pcs
3	Work gloves	Work gloves	20	pairs
A2	Instruments	Specification	Quantity	Unit
4	Digital multimeter (medium quality)	TRMS values, capable of measuring AC (750 V) & DC (1000 V) voltages, DC current 10 A, continuity/resistance, fused for current measurements, overvoltage CAT III 1,000 V and CAT IV 600 V. Lower-cost instruments are suitable for work board exercises	6	pcs
5	Spare fuses for above multimeter (medium quality)	30 of each type of fuse in multimeter	30	pcs
6	Digital multimeter (professional standard)	TRMS values, Capable of measuring 1000 V AC/DC voltages, DC current 10 A, continuity/resistance, fused for current measurements, overvoltage CAT III 1,000 V and CAT IV 600 V, temperature probe, test leads and accessories This needs to be a 'professional standard' instrument such as the the Fluke 179 or similar	2	pcs
7	Spare fuses for above multimeter (professional standard)	5 of each type of fuse in multimeter	5	pcs
8	Clamp meter (medium quality)	Capable of measuring AC & DC (600 V) voltages, DC and AC current ranges 40 A / 400 A, continuity/resistance, overvoltage CAT III 600 V. Lower-cost instruments are suitable for work board exercises	6	pcs
9	Clamp meter (professional standard)	TRMS values, capable of measuring AC & DC (600 V) voltages, DC and AC current ranges 40 A / 400 A, continuity/resistance, overvoltage CAT III 600 V and CAT IV 300 V. This needs to be a 'professional standard' instrument such as the the Fluke 325 or similar	1	pcs

10	Insulation resistance tester	Capable of measuring insulation resistance at 250 V, 500 V and 1000 V, isolations-resistance measurement to 20 G Ω , resistance measurement 0,01 Ω - 20 k Ω , AC voltage measurement 0 - 500 V AC, overvoltage CAT IV 600 V	1	pcs
11	Plug-in wattmeter	To fit AC sockets being used in country (Type C, D or G sockets, the most common one to be selected); capable of measuring appliance power consumption (W), energy (kWh) and cost of electricity consumed	3	pcs
12	Hand-held solar irradiance meter	Capable of measuring solar irradiation, hand-held, 0 - 2000 W/m ² range, resolution 1 W/m ² , digital display	1	pcs
13	Infrared thermometer	Hand held laser Infrared thermometer, -20 to 100 ° C minimum range, digital display	1	pcs
14	Solar Pathfinder	The Solar Pathfinder is the instrument specified. It is relatively low-cost, does not require batteries and is ideal for didactic purposes. To be supplied with tripod.	2	pcs
15	Sun path diagrams for the Solar Pathfinder (only if Solar Pathfinder can be procured)	For correct latitudes: Available from manufacturer/supplier of Solar Pathfinder	15	pcs
16	Compass	Basic, low cost, pocket size compass, of type used by walkers	4	pcs
A3	Tools	Specification	Quantity	Unit
17	Crimp/termination tools for PV interconnectors	For MC4 PV module connectors, 4-6mm ² wires (minimum range)	2	pcs
18	Crimping tool kit & crimps	Crimping tool kit & supply of 800 min. crimps/lugs. For insulated cable lugs from 0.5 to 6 mm ² (red-blue-yellow) and non-insulated cable lugs from 1.5 to 10 mm ² , VDE certified	3	pcs
19	Electrician's tools kit	Set of electricians' insulated hand tools, screwdrivers, pliers, cable cutter, cable stripper, 1000 V insulation, standard IEC EN 60900	20	pcs
20	Adjustable spanners	Maximum opening: 30 mm	3	pcs
21	Spanner set	For nuts and bolts widths 6 - 22 mm (recommended range)	2	pcs
22	Screwdriver set for precision mechanics	For single slot and Philipps screws: 6 different standard sizes	2	pcs
23	Basic vehicle mechanics tools set	Basic set, socket set, suitable for work on cars and motor cycles, metric	2	pcs
24	Long tape measures	Also called builder/surveyor's tapes, 20m or more, fibreglass tape (not steel), metric	3	pcs
25	Hydrometer	For measuring battery electrolyte specific gravity	3	pcs

26	Allen key set	Key sizes : 1.5 - 10 mm approx.	2	pcs
27	Clipboards	Suitable for outdoor use, A4, perspex	15	pcs
A4	Extras and spares	Specification	Quantity	Unit
28	Safety harness kit for working at height / on roofs	Complete kit. including harness, fall arrest lanyard, D rings, and packing case/rucksack	2	pcs
29	Replacement batteries for multi- and clamp meters	spare part for multimeters, check requirements of procured meters and provide multiple spare batteries of all required types	20	
30	multimeter special cables (thermocouples, croco clamps, etc.)	only if not supplied with original equipment	10	
31	Soldering iron/station	60W, 230 Volts	2	pcs
32	Soldering tips	according to soldering station	5	pcs
33	Solder	100g roll, lead-free	2	pcs
34	Multiple socket strip with personal protection	5+ sockets	2	pcs
35	Hot air gun		2	pcs
36	Schottky Diode 15 A 45 V	THT axial bypass diode, 15A, 45V	25	pcs
37	Soldering station	Adjustable temperature range (100°C-450°C), 70W, 5 different solder tips, tip stand and sponge	2	pcs
38	Multifunction Tool	Battery powered, fully variable speed 5.000 35.000 1/min, at least with 30 accessories, 12VDC, carry case	2	pcs
39	Bench power supply	1-channel, adjustable voltage 0VDC-40VDC, display, adjustable current 0A-10A, 150W minimum	2	pcs
40	Anti-static pad for work space with earth wall plug	heat-resistant, DIN EN 61340-5-1 , 0.5m x 0.3m minimum	2	pcs
41	Anti-static wrist band with earthing connection	anti-static wrist band with cable and compatible with pad	3	pcs
B	PV EXERCISE BOARDS			
	PV modules	Specification	Quantity	Unit
1	PV module	PV module, polycrystalline , 36 cells, 120 Wp approx., 20 Voc approx., 36 cells, aluminium frame, junction box not pre-cabled (openable, not sealed), product certification IEC 61215	3	pcs
2	PV module	PV module, monocrystalline , 36 cells, 120 Wp approx., 20 Voc approx., 36 cells, aluminium frame, junction box not pre-cabled (openable, not sealed), product certification IEC 61215	3	pcs

3	PV module	Mono or polycrystalline, 150 Wp approx., 40 Voc approx., 72 cells, aluminium frame, junction box not pre-cabled (openable, not sealed), product certification IEC 61215	3	pcs
4	PV module	20 -50 Wp (small), monocrystalline and polycrystalline, 20 Voc approx., 36 cells, aluminium frame, junction box not pre-cabled (openable, not sealed), product certification IEC 61215, a selection of different types	3	pcs
	PV cable connectors	Specification	Quantity	Unit
5	PV module inter-connection connectors (male)	MC4 male connectors for 4 mm ² solar cable. and suitable for above crimp/termination tool, IP65, 30 A, 1000 DC	100	pcs
6	PV module inter-connection connectors (female)	MC4 female connectors for 4 mm ² solar cable. and suitable for above crimp/termination tool, IP65, 30 A, 1000 DC	100	pcs
7	PV module inter-connection connectors (female)	MC-4 compatible PV connectors, male, which do not require specialised tools, for 4 mm ² solar cable, IP65, 30 A, 1000 DC	100	pcs
8	PV module inter-connection connectors (male)	MC-4 compatible PV connectors, female, which do not require specialised tools, for 4 mm ² solar cable, IP65, 30 A, 1000 DC	100	pcs
9	MC4 Y-plug	MC4 compatible Y-connector for parallel connection of PV modules	10	pcs
	DC exercise boards	Specification	Quantity	Unit
10	Solar charge controller (standard, without MPPT)	10A module current / 10A load current minimum, PWM, 12/24 V, no MPPT, LED (3 indicating battery state of charge) or LC display, cable input/output terminals for 6 mm ² cable min., for lead-acid batteries, overload protection, low voltage disconnect, reverse polarity protection, temperature compensation, open circuit protection when not connected to battery, IP 20 min., 2-year manufacturer's warranty	3	pcs
11	Solar charge controller (standard, without MPPT)	20A solar module current / 20A load current minimum, other specs as above	3	pcs
12	Solar charge controller (with MPPT)	25 A min. approx. (in/out), 12/24 V, with MPPT range 17 V ... 100+ V (34 V ... 100+ V approx.), LC display, cable input/output terminals for 10 mm ² cable min., for lead-acid batteries, overload protection, low voltage disconnect (deep discharge protection), regular equalisation charge, overcharge protection, reverse polarity protection, temperature compensation,	2	pcs

		open circuit protection when not connected to battery, IP 20 min.		
13	Inverter (battery inverter)	12 V DC input, from 220 - 240 V 50 Hz power output, 200 - 500 W (200 - 500 VA continuous power), pure sine wave, IP 20 min, overload and short circuit protection, reverse polarity protection as internal fuse, deep discharge battery protection, to be sourced from a supplier of equipment for PV systems and recommended by that PV supplier for use in off-grid PV systems (not a cheap inverter of the type used in motor vehicles), <u>not</u> to contain integrated solar charge controller If possible provide inverters from 2 different manufacturers	6	pcs
14	DC lamps, 12 V, florescent	12 V, florescent lamps with replaceable bulb/tube 3 x 7 W 3 x 9 W 3 x 11 W	12	pcs
15	DC lamps, 12 V, LED	12 V DC, LED, 2 W, E27, 200 lumens min., warm white various wattage, e.g. 3 x 5 W 3 x 10 W 3 x 15 W	12	pcs
16	DC lamps, 12 V halogen	12V, halogen, with reflectors, selection between 10W and 40W	12	pcs
17	Lamp holders	E 27 lamp holder, plastic, heavy duty, for surface mounting on work board	14	pcs
18	DC fans	12 V DC desk fan. 10 W min., 20 W max.	3	pcs
19	DC/DC converter	DC/DC converter, 12 V to 24 V, 1,5 A minimum output	6	pcs
20	DC sockets	Socket outlet for 12/24 V DC, for surface mounting on work board	12	pcs
21	DC plugs	DC plugs to fit above DC sockets	12	pcs
22	Junction boxes	100 x 100 x 40 mm (LxWxH) approx., surface mounting (for work board)	30	pcs
23	DC miniature circuit breakers	DC miniature circuit breaker, 1-pole, 80VDC, 6A tripping current, 1 pole, suitable for DIN rail mounting	6	pcs
24	DC miniature circuit breakers	DC miniature circuit breaker, 1-pole, 80VDC, 10A or 16A tripping current, 1 pole, suitable for DIN rail mounting	12	pcs

25	DC miniature circuit breakers	DC miniature circuit breaker, 1-pole, 80VDC, 40A or 50A tripping current, 1 pole, suitable for DIN rail mounting	8	pcs
	AC exercise boards	Specification	Quantity	Unit
26	Consumer unit / fuse board	To fit DP main switch and 2 - 3 MCBs and E terminal, for 220 - 240 V 50/60 Hz power supply, IP65	3	pcs
27	Miniature circuit breaker (MCB) AC	Single-pole, 6A, Type B, 220 - 240 V 50/60 Hz, to fit above consumer unit / fuse board	3	pcs
28	Miniature circuit breaker (MCB) AC	Single-pole, 16A, Type B, 220 - 240 V 50/60 Hz, to fit above consumer unit / fuse board	3	pcs
29	Residual current device (RCD)	<u>Type A</u> 25A 30mA RCD, 220 - 240 V 50/60 Hz, to fit above consumer unit / fuse board	3	pcs
30	Socket outlet	Type C 230 V, 2 pole excl. Grounding surface mounted (incl box for surface mounting on board), indoor use, IP22 or IP2X min.	8	pcs
31	Socket outlet	Type D 230 V, 3 pole incl grounding surface mounted (incl box for surface mounting on board), indoor use, IP22 or IP2X min	8	pcs
32	Socket outlet	Type G 230 V, 3 pole incl grounding surface mounted (incl box for surface mounting on board), indoor use, IP22 or IP2X min.	8	pcs
33	Plug	Type C, to fit above sockets	4	pcs
34	Plug	Type D, to fit above sockets	4	pcs
35	Plug	Type G, to fit above sockets	4	pcs
36	Connector blocks / terminal strips	Screw terminal strip, 3A, 400VAC, for 2.5 mm ² cable (10-12 connector blocks per strip, 240 blocks in total)	25	strips
37	Connector blocks / terminal strips	Screw terminal strip, 6A, 400VAC, for 4 mm ² cable (10-12 connector blocks per strip, 240 blocks in total)	25	strips
38	Connector blocks / terminal strips	Screw terminal strip, 16A, 400VAC, for 6 mm ² cable (10-12 connector blocks per strip, 240 blocks in total)	25	strips
39	Earth blocks	4-Way Earth Block Nickel-plated, Suitable for 16-25mm ² Cables, Brass Construction	6	pcs

	Cables, etc.	Specification	Quantity	Unit
40	Flex	1.5 mm ² flexible cable for connecting appliances to plugs, 3-core incl. PE), very flexible, copper. PVC sheathed, H05-VVF, 50 m roll	2	pcs
41	Cable	1.5mm ² , 2-core (no PE), <u>multi-stranded</u> , very flexible, copper, PVC sheathed, H05-VVF, 50 m roll	2	pcs
42	Cable	2.5mm ² , 2-core (no PE), <u>multi-stranded</u> , very flexible, copper, PVC sheathed, H05-VVF, 100 m roll	2	pcs
43	Cable	2.5 mm ² flexible cable for connecting appliances to plugs, 3-core incl. PE), very flexible, copper. PVC sheathed, H05-VVF, 50 m roll	2	pcs
44	PV cable / 'solar cable'	4 mm ² , double insulated, single-core, UV protected, cable specified for the interconnection of PV modules, <u>fine multi-stranded</u> , copper, temperature rating - 40°C -90°C, 1000 DC, Class II (double insulated), halogen free, flame resistant, 100 m roll	4	pcs
45	Cable	6 mm ² single-core, <u>fine multi-stranded</u> , PVC, red, very flexible, copper, unshathed, H07V-K 100 m red roll	2	pcs
46	Cable	6 mm ² single-core, <u>fine multi-stranded</u> , PVC, red, very flexible, copper, unshathed, H07V-K 100 m black roll	2	pcs
47	Cable	6 mm ² single-core, <u>fine multi-stranded</u> , PVC, red, very flexible, copper, unshathed, H07V-K 100 m yellow-green roll	2	pcs
48	Cable	10 mm ² single-core, <u>fine multi-stranded</u> , PVC, red, very flexible, copper, unshathed, H07V-K 100 m red roll	2	pcs
49	Cable	10 mm ² single-core, <u>fine multi-stranded</u> , PVC, red, very flexible, copper, unshathed, H07V-K 100 m black roll	2	pcs
50	Cable	10 mm ² single-core, <u>fine multi-stranded</u> , PVC, red, very flexible, copper, unshathed, H07V-K 100 m yellow-green roll	2	pcs

51	Electrical insulation tape	25 m length rolls, 20 mm width, approx., max heat resistant temperature 90 °C 5 x red 10 x black 5 x blue 5 x yellow/green	25	rolls
	Batteries & accessories	Specification	Quantity	Unit
52	Battery	12 V lead gel, 60 - 90Ah, sealed, maintenance-free, 'solar batteries'	8	pcs
53	Battery terminals (pairs)	To fit above battery	10	pcs
54	Lead-acid batteries	12 V lead-acid, 60 - 90Ah, flooded, 'solar batteries', dry, to be filled with supplied acid at site	5	pcs
55	Battery terminals (pairs)	To fit above battery	6	pcs
56	Battery charger	Suitable for charging sealed 12 V 100 Ah lead-acid battery, from 220 - 240 V 50/60 Hz power supply, charging rate 0.8 A / 3.6 A, robust quality, IP65	2	pcs
57	Funnel	For safely pouring distilled water into batteries, resistant to acids	3	pcs
58	Acid pump (hand-driven)	Device for safely filling a battery with acid, for demonstration purposes mainly	2	pcs
59	Work board	1 x 1.5 m approx., thickness 20-25 mm, wood or wood composite, suitable for firmly fixing electrical components to it via wood screws	10	pcs
C	HYBRID SYSTEM			
1	PV modules	300+ W each, mono- or polycrystalline, IEC certified	16	pieces
2	Hybrid inverter	-Should have the capacity to charge the battery bank from PV solar and Electricity with option of priority setting. - Three-phase connection (single-phase optional if three-phase system not common) - Should have capability of exporting power to grid - 5000 W AC output, capable to provide backup power in case of grid-failure - Min. 5000 W PV power to be connected		
3	Battery system	Cell chemistry: LiFePo4 - Min. 4000 Wh usable storage capacity at 100% DOD) - Min. 4000 cycles - system voltage and integrated BMS compatible with the installed battery (or hybrid) inverter (certified by manufacturer of inverter)	1	piece

4	Monitoring	If not included as a functionality of the battery inverter (or hybrid inverter), provide a separate monitoring system that monitors the main system parameters and sends them to the manufacturer's data portal.		
5	BOS-set	set to include all wires, connectors, distribution boxes, switchgear, fuses, installation material to integrate a fully operational system	1	set
6	Consumables	4mm ² DC solar cable: double-insulated, UV-resistant, single core, black	200	m
7	Consumables	DC-connectors: MC4, Sunclix or similar for 4mm ² cable, male	50	pieces
8	Consumables	DC-connectors: MC4, Sunclix or similar for 4mm ² cable, female	50	pieces
9	Consumables	Cable ties, 20 cm, UV-resistant	400	pieces
10	Mounting	Ground-mounted mounting system for 20 solar modules of the model offered in this bid (item 1)	1	set
11	Mounting	Concrete ballast for mounting system foundation	10	pieces
12	EPC-service	Concept, engineering, procurement, shipping, installation, and commissioning of hybrid system - to include a complete set of system documentation (manuals, datasheets, SLD, wiring diagrams, etc.)	1	lump sum
D	SOLAR HOME SYSTEM			
	Solar Home System Installation (made up of the following components)	PV = min. 300Wp Inverter = min. 500W nom. Charge controller if Inverter does not include charge controller Battery display required showing SoC in %, Ampere in/out Battery Voltage, etc. Battery = min. 2.4kWh @c10 set, complete mounting board with pre-installed material as noted below for complete turn-key installation and additional consumables (e.g., wires, fuses, battery fuses, combiner and distribution boxes, load centre, earthing system, surge protection devices, etc.) lump sum, turn-key installation at site by a qualified technician Documentation for all technical products shall be available		
1	Solar Charge Controller MPPT	Nominal Power range 400 W Nominal Voltage (PV Input) max 42 VDC (if designed as 24 VDC system a DC/DC converter will be needed to ensure that	1	pcs

		<p>standard 12 VDC appliances/loads can be used. Converter can be included into load distribution box if cooling is sufficient under load.)</p> <p>Nominal PV Input Current range 5...20 A Nominal Voltage (Load Output) 12 VDC Nominal Current (Load Output) min 25 A Nominal Battery Voltage range 12...24 VDC (autodetect feature mandatory) Operating Temperature range 0...50 °C MPPT Technology 3-Way Battery Charging Profile or better (battery voltage setpoints according to used battery chemistry in 2.0) IP Class Overcharging Protection, adapted to batteries offered Charging Profile, adapted to batteries offered Overload Protection (the solar charge controller must be able to handle the situation when a battery is not being connected while PV is already providing power to it) Over-temperature Protection Over-voltage Protection Short Circuit Protection Battery Temperature Compensation (if not available a Battery Temperature Sensor is mandatory) Reverse Polarity Protection on PV and battery terminals (A reverse polarity event shall be resettable without replacing blown fuses. MCBs are preferred but Polyfuses or Crowbar circuit might be an option. If not provided by the charge controller it has to be provided by an external circuit or device. Internal fuses can't be changed locally and will result in unusable equipment) Status Display, Soc in %</p>		
2	VRLA AGM Battery for Cycling Solar applications Total capacity min 2.4kWh @ c10 including interconnection, cable, screws, isolator, and cable to Battery Fuse and from Fuse to Inverter--> Charge controller	Nominal Voltage 12 VDC Nominal Capacity (C10) min 100 Ah Charge Cycles at 50% DoD min 1400 Maintenance Free, AGM (has to be a solar battery suitable for daily dis/charge cycles) DC Battery Fuse	2	pcs

3	PV Modules Total min 300Wp, Voltage suitable for Charge Controller, Inverter	PV saline protection (IEC 61701) if location is close to the sea Nominal Power per PV Module min 150 W (when using multiple PV Modules they have to be the same manufacturer and model) Open Circuit Voltage (STC) max 42 VDC Bypass diodes min 3 Reverse Current min 15 A Voltage Capability min 1000 VDC IP Class Junction Box min IP65 Temperature Range -40...85°C Cell Efficiency min 18% Power Tolerance max 5% MC4 Compatible Connectors Monocrystalline or Polycrystalline Technology	2	pcs
4	Roof Mounting Substructure, Aluminium for Metal sheet Roof with wooden Screws for wooden substructure on a training rood		2	pcs
5	Remote Monitoring Device	compatible with solar charge controller unit or Inverter can be wireless (Bluetooth, Wi-Fi) or wired. When wired it has to be USB compliant. If this can be only achieved with a converter it needs to be provided and documented. Compatible with PC (MS Windows) or Android Smartphone	1	pcs
6	DC Load Distribution Box	Nominal voltage 12 VDC DC Connectors female 5.5/2.1 mm, 2 pcs min 3 A DC Connectors female 5.5/2.5 mm, 2 pcs min 3 A DC Connectors female 4mm safety terminals, 2 pcs min 16 A compatible with 4mm safety cables connector DC Connectors female USB type A, 1 pcs min 0.5 A can also be provided by solar charge controller if available DC Connectors female USB type A, 1 pcs min 1.5 A can also be provided by solar charge controller if available	1	pcs
7	Inverter	"Nominal Power at 20°, Suitable for humidity > 80 % " max 500 W Nominal Voltage Input 12 VDC Nominal Voltage Output range 220...240 VAC one IEC Type F outlet is sufficient but adapter for Type M must be provided	1	pcs

		Nominal Frequency 50 Hz Nominal Continuous Output Current min 1.4 A Nominal Peak Output Current min 3 A True Sine Wave Dedicated Power Switch Overload Protection Over-temperature Protection Over-voltage Protection Short Circuit Protection		
8	Mounting Board	all components besides PV modules and batteries shall be installed on a mounting board Dimensions: Width max 1...2 m, depth max 0.5 m including installed components on mounting structure, Height max 1...1.5 m Material, Coating and Grounding as defined by manufacturer and local rules	1	pcs
Solar Home System Kit				
9	Solar Home System Kit or Bundle	Verasol Certification, Lithium Iron Phosphate Battery, GSM (mobile network) remote monitoring, PAYGO integration, MPPT controller, PV input power up to 100W,	1	pcs
10	SHS Solarworx lamps 1W		5	pcs
11	SHS Solarworx 32 inch TV		1	pcs
12	SHS Solarworx fridge		1	pcs
13	SHS Solarworx Victron PayG Dongle or switch		1	pcs
E SOLAR STREET LIGHT				
Solar street light outdoor				
1	Solar Street Light Kit	Park lamp for public areas and paths, 12W high efficiency LEDs, 1620 lumens, incl. lamp bracket, module mounting structure, top of pole mount battery box, solar charge controller with time program function, 80Wp module, 60Ah sealed battery	1	pcs
2	Lamp post for Street Light Kit	lamp post 5 metres heigh with accessories for ground assembly, corrosion safe (anodized)	1	pcs
3	Scaffold complete assembly	TÜV certified; 5,30 m working height, 200 kg/m ² load according to DIN EN 1004-1; movable with castors	1	pcs

4	Scaffolding Elevator Console with Pulley	compatible with scaffolding system, load capacity: minimum 200 kg; rope and attachment to pull up batteries and PV modules to train part exchange	1	pcs
5	Ladder	6 m working height with stair function, aluminium, must withstand up to 150kg	1	pcs
Solar street light indoor				
1	100Wp Solar Street Lighting System, 20 W LED light (made up of the following components)	set, complete mounting board with pre-installed material as noted below for complete turn-key installation and additional consumables (e.g., wires, fuses, battery fuses, combiner and distribution boxes, load centre, earthing system, surge protection devices, etc.) lump sum, turn-key installation at site by a qualified technician Documentation for all technical products shall be available		
2	Solar Charge Controller MPPT	Nominal Power range 200 W Nominal Voltage (PV Input) max 42 VDC (if designed as 24 VDC system a DC/DC converter will be needed to ensure that standard 12 VDC appliances/loads can be used. Converter can be included into load distribution box if cooling is sufficient under load.) Nominal PV Input Current range 5...15 A Nominal Voltage (Load Output) 12 VDC Nominal Current (Load Output) min 10 A Nominal Battery Voltage range 12...24 VDC (autodetect feature mandatory) Operating Temperature range 0...50 °C MPPT Technology 3-Way Battery Charging Profile or better (battery voltage setpoints according to used battery chemistry in 2.0) IP Class Overcharging Protection, adapted to batteries offered Charging Profile, adapted to batteries offered Overload Protection (the solar charge controller must be able to handle the situation when a battery is not being connected while PV is already providing power to it) Over-temperature Protection Over-voltage Protection Short Circuit Protection Battery Temperature Compensation (if not available a Battery Temperature Sensor is	1	pcs

		mandatory) Reverse Polarity Protection on PV and battery terminals (A reverse polarity event shall be resettable without replacing blown fuses. MCBs are preferred but Polyfuses or Crowbar circuit might be an option. If not provided by the charge controller it has to be provided by an external circuit or device. Internal fuses can't be changed locally and will result in unusable equipment) Status Display, Soc in %		
3	VRLA Gel Battery for Cycling Solar applications Total capacity min 2.4kWh @ c10 including interconnection, cable, screws, isolator, and cable to Battery Fuse and from Fuse to Inverter--> Charge controller	Nominal Voltage 12 VDC Nominal Capacity (C10) min 50 Ah Charge Cycles at 50% DoD min 1400 Maintenance Free (has to be a solar battery suitable for daily dis/charge cycles) DC Battery Fuse	2	pcs
4	DC bench power supply (to simulate PV modules)	at least 2 channels; adjustable 0 - 30 VDC; 0 - 3A; 195W; Resolution: Voltage: $\leq 0.01\% + 2\text{mV}$; Current: $\leq 0.01\% + 250\mu\text{A}$	1	pcs
5	Remote Monitoring Device	compatible with solar charge controller unit or Inverter can be wireless (Bluetooth, Wi-Fi) or wired. When wired it has to be USB compliant. If this can be only achieved with a converter it needs to be provided and documented. Compatible with PC (MS Windows) or Android Smartphone	1	pcs
6	DC Load Distribution Box	Nominal voltage 12 VDC DC Connectors female 5.5/2.1 mm, 2 pcs min 3 A DC Connectors female 5.5/2.5 mm, 2 pcs min 3 A DC Connectors female 4mm safety terminals, 2 pcs min 16 A compatible with 4mm safety cables connector DC Connectors female USB type A, 1 pcs min 0.5 A can also be provided by solar charge controller if available DC Connectors female USB type A, 1 pcs min 1.5 A can also be provided by solar charge controller if available	1	pcs
7	LED lamp	2x60cm tube, 20-26VDC, 920mA, 22W, 4000K, 2200lm, G13, IP22	1	pcs

8	LED lamp	Nominal Power, range 20 W Nominal Voltage Input 12 VDC Luminous Flux min 5000 lm heat dissipation of the lamp shall not affect other components on the mounting board. Colour Temperature min 5500 K Radiation Angle min 120° lamp screen shall be parallel to the floor (90° angle between mounting board in upright position and lamp screen) so that blinding of personnel is prevented Working Life min 25,000 h On/Off Cycles min 100,000 Temperature Range, range -20...65°C IP Class min IP65 Material Aluminium and Glass Lamp Post or mounting bracket for board mounting must be included (negotiable if lamp itself already covers this by design) Length of LED Lamp and Lamp Post max 1 m (may exceed mounting board dimensions but shall be removable for transport)	1	pcs
9	Twilight Switch /w Relay (not mandatory if already included in LED Lamp)	Nominal Voltage 12 VDC Nominal Switching Power min 30 W Switching Capability Power according to selected LED lamp in 6.0 (must switch LED lamp safely with enough headroom power)	1	pcs
10	Movement Sensor (not mandatory if already included in LED Lamp)	detection angle: 180°, programmable twilight and switching time, IP44, 12-24 V	1	pcs
11	Mounting Board	Dimensions: Width max 1...2 m, depth max 0.5 m including installed components on mounting structure, Height max 1...1.5 m Material, Coating and Grounding as defined by manufacturer and local rules	1	pcs
12	Mobile work bench	including RCD with 6 AC outlets, electrically safe and acid resistive coating, dimensions: 1250 x 1970 x 700 mm	1	pcs
F	SOLAR WATER PUMPING SYSTEM OUTDOOR and INDOOR			
	Solar water pumping outdoor			

1	Reservoir	water will be pumped from one reservoir to the other and vice versa using two pumps Volume min 1000 litres (1m ³) Material Non-Corrosive Big Top Opening Opening Valve at the Bottom	2	pcs
2	Flange for reservoir connection with outlet tap	output flange in metal according to reservoir outlet, including shutter valve	2	pcs
3	Water pipe DN 50	water pipe compatible with flange above to connect to the surface pump, can be sewage type, installation needs to cover all eventual misalignments or deviations from horizontal or vertical positioning of pumps and reservoirs	2	pcs
4	Surface pump complete kit	Complete kit containing: - surface pump - surface pump controller - surface pump switch box - surface pump controller for AC grid connection as backup - 2x 330 Wp PV Modules, - MNPV3 combiner box - MC4 extension cable - top of pole solar panel mount - 40 steel pipe - grounding lugs - submersible pump cable - submersible pump water lifting pipe - water level switch - lightning arrestors	1	pcs
5	Submersible pump complete kit	Complete kit containing:- submersible pump - submersible pump controller- submersible pump1 controller for AC grid connection as backup - 2x 330 Wp PV Modules, - MNPV3 combiner box - MC4 extension cable - top of pole solar panel mount - 40 steel pipe - grounding lugs - submersible pump cable - submersible pump water lifting pipe - water level switch - lightning arrestors	1	pcs

6	Cast resin sleeve for submersible pump electric connection	Pass 3 x 1,5 to 5 x 6mm ² , lateral 3 x 1,5 to 5 x 4mm ² , hardener 0,225kg, incl. sleeve, polyurethane cast-resin, hardener, gloves, two foam seals and abrasive paper	20	pcs
7	Submersible cable to train cast resin application	Submersible cable	50	metres
8	Water pressure gauge	PRESSURE GAUGE WITH TEE 0-60PSIG, EA	2	pcs
9	Closing valve	Ball valve with spring return DN40 - 1 1/2" inch GK13, brass	4	pcs
10	Water flow meter	Range: 2...40 l/min, Pressure: min. 12 bar; temperature control; compatible with water pipe diameters (adapters must be supplied if device differs from piping), display with values in metric, IP65, supply voltage according to pump electrical specifications (power supply must be supplied if device cannot be powered from the pump controller)	2	pcs
11	PV Modules Total min 300Wp, Voltage suitable for Charge Controller, Inverter AS REFERENCE FOR THE PV MODULES INCLUDED IN PUMP KITS ABOVE!	PV saline protection (IEC 61701) if location is close to the sea Nominal Power per PV Module min 300 W (when using multiple PV Modules they have to be the same manufacturer and model) Open Circuit Voltage (STC) max 42 VDC Bypass diodes min 3 Reverse Current min 15 A Voltage Capability min 1000 VDC IP Class Junction Box min IP65 Temperature Range -40...85°C Cell Efficiency min 18% Power Tolerance max 5% MC4 Compatible Connectors Monocrystalline or Polycrystalline Technology	4	pcs
12	Roof Mounting Substructure, Aluminium for Metal sheet Roof with wooden Screws for wooden substructure on a training rood		12	pcs
	Solar water pumping indoor			
13	500...700 W Solar Water Pumping System (made up of the following components)	set, complete mounting board with pre-installed material as noted below for complete turn-key installation and additional consumables (e.g., wires, fuses, battery fuses, combiner and distribution	1	pcs

		<p>boxes, load centre, earthing system, surge protection devices, etc.)</p> <p>All components shall be pre-installed on a mounting board covering electrical components and consumables. PV modules and batteries are not part of the mounting board, but their cabling and connection must be designed for plug and play usage.</p> <p>lump sum, turn-key installation at site by a qualified technician</p> <p>Documentation for all technical products shall be available</p>		
14	Submersible pump system (will be inserted into reservoir)	<p>Submersible Pump, range 500...700 W</p> <p>Complete submersible pump kit</p> <ul style="list-style-type: none"> - DC submersible water pump - DC submersible water pump controller - submersible cable for electrical connection - flexible water pipes of sufficient length (installation set) <p>Pump has to be attached to the mounting board at the lowest point with no electrical components below. Electronic equipment has to be protected from accidental water pipe bursts by using transparent shielding.</p> <p>Pumping Head max 15 m</p> <p>Flow Rate min 15 m³/h</p> <p>Water Pipe Length, 2 pcs, min 30 m, One for each reservoir. Reservoirs will be installed outside the building for safety reasons. Connection has to be pluggable without tools for setup and removal.</p> <p>Dry Run Protection Sensor. Has to be attached to mounting board</p> <p>Tank Full Sensors, 2 pcs, One for each reservoir. Cable length must be 30m.</p>	1	pcs
15	Safety water level sensor for safety water reservoirs		2	pcs
16	DC bench power supply (to simulate PV modules)	<p>voltage and current specifications according to both pumps; at least 2 channels; adjustable 0 - 30 VDC; 0 - 3A; 195W; Resolution: Voltage: $\leq 0.01\% + 2\text{mV}$; Current: $\leq 0.01\% + 250\mu\text{A}$</p>	2	pcs

17	Surface Pump (wall mount on mobile work bench)	complete surface pump kit - DC surface water pump - DC surface water pump controller - flexible water pipes of sufficient length (installation set) - 2 water level sensors (high/low) - dry running protection	1	pcs
18	Surface Pump Control Unit (wall mount on mobile work bench)	only for reference (must be included in surface pump kit)	0	pcs
19	Surface Pump tubes, pipes, sensors	only for reference (must be included in surface pump kit)	0	pcs
20	Water pressure gauge	according to used water pipes	2	pcs
21	Water reservoir	200 litres with cover	2	pcs
22	Safety water reservoir (water reservoir will stand inside)	PE, must be able to take up all the water from both reservoirs plus safety (volume of one reservoir)	2	pcs
23	Mobile work bench	including RCD with 6 AC outlets, electrically safe and acid resistive coating, dimensions: 1250 x 1970 x 700 mm	1	pcs
24	Acrylic safety housing for surface pump	dimensions must match the surface pump	1	pcs
25	Emergency stop switch for pumps	red emergency stop button on yellow background, surface mounted	1	pcs
26	Relay box with 4mm laboratory safety connectors	plastic box with DIN rail mount to hold 3 relays - 6 red 4mm terminals (32 A rated) with 2.5mm ² cable connections to 3 relays - 6 black 4mm terminals (32 A rated) with 2.5mm ² cable connections to 3 relays	1	pcs
27	Work board (to be attached to the mobile work bench)	dimensions must match and fit to the mobile work bench, e.g. 1250 x 1000 mm; 20 mm thickness	2	pcs
G	TESTING EQUIPMENT			
	Tools for testing			
1	IV-Curve tracer - HT I-V500W	Testing Equipment: IV-Curve Tracer; Isolation tester, Camera, EL-Camera (Electroluminescence), Thermography camera, laboratory power supply	1	pcs

2	Isolation measurement equipment/ installation tester	Benning PV 1-1 Installations tester kalibriert (ISO) VDE-Norm 0126	1	pcs
3	Thermography camera	Image quality with IR resolution of minimum 320 x 240 pixels (with testo SuperResolution technology 640 x 480 pixels)	1	pcs
4	Camera	Technical specifications: Min. 12 MP	1	pcs
5	Electroluminescence camera	Modified Consumer Camera (preferred SLR Camera from Sony: Sony Alpha 7a)	1	pcs
6	IR thermometer	Fluke 62 MAX Infrarot-Thermometer Optik 10:1	2	pcs
7	Multimeter x2	Fluke 289 FlukeView® Forms Combo Kit	2	pcs
8	Pressure valve	Flux 0.4-10 m ³ /h, regulate flow rate	1	pcs
9	Flow meter	Min. 0.4 m ³ /h - 10 m ³ /h/ Digital output via USB	1	pcs
	Technical testing equipment			
10	Laboratory power supply x2	Technical specifications: 15A, 60V	2	
11	PV modules testing stand	2 PV modules + alum. structure/rack (other already included in and "Tools")	1	pcs
12	Small inverters testing stand	Just price for small inverters, as this can be included in modules testing setup and "Tools"	1	pcs
13	Test Stand Charge Controller	Included in stand-alone/SHS rig and "Tools"	1	pcs
14	Test Stand Batteries	Included in stand-alone/SHS rig and "Tools" + lead-acid battery and 4-Quadranten PV power supply kit	1	pcs
15	Stand-alone/Solar-home-systems testing kit	Costs mainly for building up the rig: akku, micro-inverter, bulbs and small electronic devices	1	pcs
16	PV water pumping testing stand	As part of the Water Pumping outdoor training unit	1	pcs
17	Cable and connectors testing kit	"Tools" should be enough + prices for some cables (as sample)	1	pcs
18	Lighting	For this one the testing and training rig would be the same	1	pcs
19	Material (tools, racking, test stand setup, pipes, cable, safety equipment, spare parts)		1	
20	Microinverter x5		5	
21	Bulbs		1	
22	Computer/office x2		2	

The company selected for installation and commissioning should ensure proper synchronization and integration of the solar system and associated components to enable productive loads and smooth operation.

Notes:

1. The offered PV Modules should comply with the relevant IEC standards, including but not limited to IEC 61215, IEC 61730, UL 61730, IEC 62716 as well as local country's standards.
2. All solar components imported to Bangladesh must comply with the import quality standards for the country.
3. Brands mentioned (if any) are indicative only. ISA may consider equivalent brands meeting the specifications.
4. Bidders are free to procure items locally within the mentioned country as well.

The company needs to submit relevant documents towards compliance of the above standard.

General Guidance

- The bidder can source the equipment from anywhere, but the equipment should be of good quality meeting the specifications as listed in the table.
- In case of battery, the bidder can procure it locally where the centre is being established.
- The preferred mode of transportation will be air freight, however economical route needs to be considered.
- The delivery, commissioning time in the country for all the equipment is maximum 90 days.
- It is bidder's responsibility to arrange labour or technicians for installation of equipment. The cost can be included in the final costing of the equipment.
- The bidder will provide manufacturer's warranty for all the equipment with complete documentation.

B. Objective

The objective of the assignment is to set up a model solar training and application resource centre (STAR C) lab in **Dhaka, Bangladesh**.

C. Scope of Work

1. **Component A:** Supply, installation, and Commissioning of the equipment's given in the above table.
2. **Component B:** Training of the Country's staff on Operation and Maintenance practice of the equipment and instruments.
3. **Component C:** Comprehensive Operation and Maintenance for 1 year post commissioning.

The roles and responsibilities of the bidder and ISA are outlined below:

Bidder's Terms of reference:

- Design concepts
- Supply of materials and products
- Provide adequate skilled labour for installation and commissioning
- Construction supervision / contract management
- Quality control plan (QCP) and Safety plan
- Commissioning of project
- Mentoring and training, building operating staff for operation and maintenance
- Operation and Maintenance for first year and optional service plan after the first year

STAR-C responsibilities:

- Provide location to install solar panels as per the contract.
- Review for approval design submittals
- Witness inspections and test witnesses to verify attainment of performance requirements
- Make progress payments for any service agreed
- Allow consultants access to STAR-C premises for site visit/energy audit exercise.
- Approve any contracts agreed with the consultant.

Payment Terms

For Component-A (Supply, Installation and Commissioning of the equipment's)

S. No.	Description of Deliverables	Timelines	Release of payment
1	Kick-off meeting with a tentative plan for supply of material, Installation & Commissioning	1 Week	20%
2	Dispatch of material (Document proof of dispatch)	3 Weeks	10%
3	Successful delivery of material on site.	10 Weeks	50%
4	Successful Installation, Commissioning	12 Weeks	15%
5	After successful operation for 3 months		5%

Notes:

- i. Transportation cost will be paid at the time of dispatching of the material on providing the dispatch proofs.
- ii. Custom duty/excise duty will be paid on actual after submission of invoice and proofs.
- iii. Part payments will be allowed for Component-A pricing.

For Component-B (Training of the Country's staff on Operation and Maintenance practice of the equipment and instruments)

S. No.	Description of Deliverables	Timelines	Release of payment
1	Training of the Country's staff on Operation and Maintenance practices	Within 2 Weeks after Successful Installation & Commissioning	100%

Notes:

- i. Training of 3-5 people for maximum 4 days on day-to-day O&M of the equipment's.

For Component-C (Comprehensive Operation and Maintenance for 1 year post commissioning)

S. No.	Description of Deliverables	Timelines	Release of payment
1	Operation and Maintenance service for 1 year	1 st tranche- After Six months of commissioning 2 nd tranche- After 1 year of commissioning	100%

Notes:

- i. Payment will be processed in two tranches: 1st tranche at the end of **six months** after commissioning and 2nd Tranche at the end of **12 months** after commissioning.

Delivery Requirements

Delivery Requirements	
Delivery date and time	Bidder shall complete the delivery and installation within 90 days from the issuance of Contract.
Delivery Terms (INCOTERMS 2020)	Delivered at Place
Customs clearance	<input type="checkbox"/> Not applicable Shall be done by: <input type="checkbox"/> Name of organisation (where applicable) <input checked="" type="checkbox"/> Supplier/bidder <input type="checkbox"/> Freight Forwarder

Exact Address(es) of Delivery Location(s)	Dhaka, Bangladesh. Exact address in Dhaka will be communicated on award of the contract
Distribution of shipping documents (if using freight forwarder)	Bidder responsibility
Packing Requirements	Safe delivery of supplies, handling will be bidders responsibility
Training on Operations and Maintenance	Within 14 days of delivery and installation
Warranty Period	At least one year
After-sales service and local service support requirements	One year
Preferred Mode of Transport	Air

NOTES:

- a. The products/goods/parts of machineries must be recalled by the manufacturer/ bidder/ supplier at the manufacturers/ bidder/ suppliers cost if rejected by ISA/ purchaser or end user because of the problems with quality. The supplier/ bidder/ manufacturer will be obliged to replace the products/goods/parts of machineries in question at its own cost with a new one of acceptable quality.
- b. The supplier will be responsible for protection of materials, property and equipment before successful delivery and handover to ISA.
- c. Prices quoted must be inclusive of all costs necessary to supply these items, including delivery, warranty, transport cost, insurance, materials, installation, training and commissioning etc.
- d. OEM of equipment's' can be from any country. However, meeting the technical specifications is mandatory requirement.
- e. Items can be procured locally, within the country. However, bidder shall provide 1 year CMC as per the contract.

ANNEX 2: QUOTATION SUBMISSION FORM

Bidders are requested to complete this form, including the Company Profile and Bidder’s Declaration, sign it and return it as part of their quotation along with Annex 3: Technical and Financial Offer. The Bidder shall fill in this form in accordance with the instructions indicated. No alterations to its format shall be permitted and no substitutions shall be accepted.

Name of Bidder:	Click or tap here to enter text.	
RFQ reference:	Click or tap here to enter text.	Date: Click or tap to enter a date.

Company Profile

Item Description	Detail
Legal name of bidder or Lead entity for JVs	Click or tap here to enter text.
Legal Address, City, Country	Click or tap here to enter text.
Website	Click or tap here to enter text.
Year of Registration	Click or tap here to enter text.
Legal structure	Choose an item.
Are you a UNGM registered vendor?	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, insert UNGM Vendor Number
Quality Assurance Certification (e.g. ISO 9000 or Equivalent) (If yes, provide a Copy of the valid Certificate):	<input type="checkbox"/> Yes <input type="checkbox"/> No
Does your Company hold any accreditation such as ISO 14001 or ISO 14064 or equivalent related to the environment? (If yes, provide a Copy of the valid Certificate):	<input type="checkbox"/> Yes <input type="checkbox"/> No
Does your Company have a written Statement of its Environmental Policy? (If yes, provide a Copy)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Does your organization demonstrate significant commitment to sustainability through some other means, for example internal company policy documents on women empowerment, renewable energies or membership of trade institutions promoting such issues (If yes, provide a Copy)	<input type="checkbox"/> Yes <input type="checkbox"/> No

Is your company a member of the UN Global Compact	<input type="checkbox"/> Yes <input type="checkbox"/> No			
Bank Information	Bank Name: Click or tap here to enter text. Bank Address: Click or tap here to enter text. IBAN: Click or tap here to enter text. SWIFT/BIC: Click or tap here to enter text. Account Currency: Click or tap here to enter text. Bank Account Number: Click or tap here to enter text.			
Previous relevant experience: 3 contracts				
Name of previous contracts	Client & Reference Contact Details including e-mail	Contract Value	Period of activity	Types of activities undertaken

Bidder's Declaration

Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	Requirements and Terms and Conditions: I/We have read and fully understand the RFQ, including the RFQ Information and Data, Schedule of Requirements, the General Conditions of Contract, and any Special Conditions of Contract. I/we confirm that the Bidder agrees to be bound by them.
<input type="checkbox"/>	<input type="checkbox"/>	I/We confirm that the Bidder has the necessary capacity, capability, and necessary licenses to fully meet or exceed the Requirements and will be available to deliver throughout the relevant Contract period.
<input type="checkbox"/>	<input type="checkbox"/>	Ethics: In submitting this Quote I/we warrant that the bidder: has not entered any improper, illegal, collusive, or anti-competitive arrangements with any Competitor; has not directly or indirectly approached any representative of the Buyer (other than the Point of Contact) to lobby or solicit information in relation to the RFQ; has not attempted to influence, or provide any form of personal inducement, reward, or benefit to any representative of the Buyer.
<input type="checkbox"/>	<input type="checkbox"/>	I/We confirm to undertake not to engage in proscribed practices, , or any other unethical practice, with the UN or any other party, and to conduct business in a manner that averts any financial, operational, reputational or other undue risk to the UN and we have read the United Nations Supplier Code of Conduct : https://www.un.org/Depts/ptd/about-us/un-supplier-code-conduct and acknowledge that it provides the minimum standards expected of suppliers to the UN.
<input type="checkbox"/>	<input type="checkbox"/>	Conflict of interest: I/We warrant that the bidder has no actual, potential, or perceived Conflict of Interest in submitting this Quote or entering a Contract to deliver the Requirements. Where a Conflict of Interest arises during the RFQ process the bidder will report it immediately to the Procuring Organisation's Point of Contact.
<input type="checkbox"/>	<input type="checkbox"/>	Prohibitions, Sanctions: I/We hereby declare that our firm, its affiliates or subsidiaries or employees, including any JV/Consortium members or subcontractors or suppliers for any part of the contract is not under procurement prohibition by the United Nations, including but not limited to prohibitions derived from the Compendium of United Nations Security Council Sanctions Lists and have not been suspended, debarred, sanctioned or otherwise identified as ineligible by any UN Organization or the World Bank Group or any other international Organization.
<input type="checkbox"/>	<input type="checkbox"/>	Bankruptcy: I/We have not declared bankruptcy, are not involved in bankruptcy or receivership proceedings, and there is no judgment or pending legal action against them that could impair their operations in the foreseeable future.

Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	Offer Validity Period: I/We confirm that this Quote, including the price, remains open for acceptance for the Offer Validity.
<input type="checkbox"/>	<input type="checkbox"/>	I/We understand and recognize that you are not bound to accept any Quotation you receive, and we certify that the goods offered in our Quotation are new and unused.
<input type="checkbox"/>	<input type="checkbox"/>	By signing this declaration, the signatory below represents, warrants and agrees that he/she has been authorised by the Organization/s to make this declaration on its/their behalf.

Signature: _____

Name: Click or tap here to enter text.

Title: Click or tap here to enter text.

Date: Click or tap to enter a date.

ANNEX 3: TECHNICAL AND FINANCIAL OFFER - GOODS

Bidders are requested to complete this form, sign it and return it as part of their quotation along with Annex 2 Quotation Submission Form. The Bidder shall fill in this form in accordance with the instructions indicated. No alterations to its format shall be permitted and no substitutions shall be accepted.

Name of Bidder:	Click or tap here to enter text.	
RFQ reference:	RFQ/XXXX/IND 2023	Date: Click or tap to enter a date.

Technical Offer

Qualification Criteria

Please fill this and attach relevant documents. Only quotations of bidders qualifying against the below criteria will be evaluated.

Qualifying Criteria	Yes/No	List of supporting documents
Bidders must have the legal capacity to enter a binding contract with ISA and to deliver in the country, or through an authorized representative. Company registration certificate or any other document proving legal entity.		
The bidder must have the experience of supply of solar equipment's / hardware components. Submit copy of work order or completion certificate		
The bidder must have annual turnover of more than USD 100,000 - Please attach relevant documents.		

ISA reserves the right to reject the bid if it determines that the selected bidder has not provided the supporting documents against the Qualifying Criteria.

Technical Criteria

Provide the following:

- a brief description of your qualification and capacity that is relevant to the Scope of Works;
- a brief method statement and implementation plan;

Technical offer should encompass detailed specifications, including make, complying standards, relevant test certificate as applicable for each of the component proposed to be supplied by the bidder under the RFQ in line with the table below.

Item	Equipment	Quantity	Detailed Specification	Make/ Model	Complying standard	Period of Warranty
A	Tools and instruments					
A1	Personal Protective Equipment					
1	Reflective vests					
2	Helmets					
3	Work gloves					
A2	Instruments					
4	Digital multimeter (medium quality)					
5	Spare fuses for above multimeter (medium quality)					
6	Digital multimeter (professional standard)					
7	Spare fuses for above multimeter (professional standard)					
8	Clamp meter (medium quality)					
9	Clamp meter (professional standard)					
10	Insulation resistance tester					
11	Plug-in wattmeter					
12	Hand-held solar irradiance meter					
13	Infrared thermometer					
14	Solar Pathfinder					
15	Sun path diagrams for the Solar Pathfinder (only if Solar Pathfinder can be procured)					
16	Compass					
A3	Tools					
17	Crimp/termination tools for PV interconnectors					
18	Crimping tool kit & crimps					
19	Electrician's tools kit					
20	Adjustable spanners					
21	Spanner set					
22	Screwdriver set for precision mechanics					
23	Basic vehicle mechanics tools set					
24	Long tape measures					
25	Hydrometer					
26	Allen key set					
27	Clipboards					
A4	Extras and spares					

28	Safety harness kit for working at height / on roofs					
29	Replacement batteries for multi-und clamp meters					
30	multimeter special cables (thermocouples, croco clamps, etc.)					
31	Soldering iron/station					
32	Soldering tips					
33	Solder					
34	Multiple socket strip with personal protection					
35	Hot air gun					
36	Schottky Diode 15 A 45 V					
37	Soldering station					
38	Multifunction Tool					
39	Bench power supply					
40	Anti-static pad for work space with earth wall plug					
41	Anti-static wrist band with earthing connection					
B	PV EXERCISE BOARDS					
	PV modules					
1	PV module					
2	PV module					
3	PV module					
4	PV module					
	PV cable connectors					
5	PV module inter-connection connectors (male)					
6	PV module inter-connection connectors (female)					
7	PV module inter-connection connectors (female)					
8	PV module inter-connection connectors (male)					
9	MC4 Y-plug					
	DC exercise boards					
10	Solar charge controller (standard, without MPPT)					
11	Solar charge controller (standard, without MPPT)					
12	Solar charge controller (with MPPT)					
13	Inverter (battery inverter)					
14	DC lamps, 12 V, florescent					
15	DC lamps, 12 V, LED					

16	DC lamps, 12 V halogen					
17	Lamp holders					
18	DC fans					
19	DC/DC converter					
20	DC sockets					
21	DC plugs					
22	Junction boxes					
23	DC miniature circuit breakers					
24	DC miniature circuit breakers					
25	DC miniature circuit breakers					
	AC exercise boards					
26	Consumer unit / fuse board					
27	Miniature circuit breaker (MCB) AC					
28	Miniature circuit breaker (MCB) AC					
29	Residual current device (RCD)					
30	Socket outlet					
31	Socket outlet					
32	Socket outlet					
33	Plug					
34	Plug					
35	Plug					
36	Connector blocks / terminal strips					
37	Connector blocks / terminal strips					
38	Connector blocks / terminal strips					
39	Earth blocks					
	Cables, etc.					
40	Flex					
41	Cable					
42	Cable					
43	Cable					
44	PV cable / 'solar cable'					
45	Cable					
46	Cable					
47	Cable					

48	Cable					
49	Cable					
50	Cable					
51	Electrical insulation tape					
	Batteries & accessories					
52	Battery					
53	Battery terminals (pairs)					
54	Lead-acid batteries					
55	Battery terminals (pairs)					
56	Battery charger					
57	Funnel					
58	Acid pump (hand-driven)					
59	Work board					
C	HYBRID SYSTEM					
1	PV modules					
2	Hybrid inverter					
3	Battery system					
4	Monitoring					
5	BOS-set					
6	Consumables					
7	Consumables					
8	Consumables					
9	Consumables					
10	Mounting					
11	Mounting					
12	EPC-service					
D	SOLAR HOME SYSTEM					
	Solar Home System Installation (made up of the following components)					
1	Solar Charge Controller MPPT					
2	VRLA AGM Battery for Cycling Solar applications Total capacity min 2.4kWh @ c10 including interconnection, cable, screws, isolator, and cable to Battery Fuse and from Fuse to Inverter--> Charge controller					

3	PV Modules Total min 300Wp, Voltage suitable for Charge Controller, Inverter					
4	Roof Mounting Substructure, Aluminium for Metal sheet Roof with wooden Screws for wooden substructure on a training rood					
5	Remote Monitoring Device					
6	DC Load Distribution Box					
7	Inverter					
8	Mounting Board					
	Solar Home System Kit					
9	Solar Home System Kit or Bundle					
10	SHS Solarworx lamps 1W					
11	SHS Solarworx 32 inch TV					
12	SHS Solarworx fridge					
13	SHS Solarworx Victron PayG Dongle or switch					
E	SOLAR STREET LIGHT					
	Solar street light outdoor					
1	Solar Street Light Kit					
2	Lamp post for Street Light Kit					
3	Scaffold complete assembly					
4	Scaffolding Elevator Console with Pulley					
5	Ladder					
	Solar street light indoor					
6	100Wp Solar Street Lighting System, 20 W LED light (made up of the following components)					
7	Solar Charge Controller MPPT					
8	VRLA Gel Battery for Cycling Solar applications Total capacity min 2.4kWh @ c10 including interconnection, cable, screws, isolator, and cable to Battery Fuse and from Fuse to Inverter--> Charge controller					
9	DC bench power supply (to simulate PV modules)					

10	Remote Monitoring Device					
11	DC Load Distribution Box					
12	LED lamp					
13	LED lamp					
14	Twilight Switch /w Relay (not mandatory if already included in LED Lamp)					
15	Movement Sensor (not mandatory if already included in LED Lamp)					
16	Mounting Board					
17	Mobile work bench					
F	SOLAR WATER PUMPING SYSTEM OUTDOOR and INDOOR					
	Solar water pumping outdoor					
1	Reservoir					
2	Flange for reservoir connection with outlet tap					
3	Water pipe DN 50					
4	Surface pump complete kit					
5	Submersible pump complete kit					
6	Cast resin sleeve for submersible pump electric connection					
7	Submersible cable to train cast resin application					
8	Water pressure gauge					
9	Closing valve					
10	Water flow meter					
11	PV Modules Total min 300Wp, Voltage suitable for Charge Controller, Inverter AS REFERENCE FOR THE PV MODULES INCLUDED IN PUMP KITS ABOVE!					
12	Roof Mounting Substructure, Aluminium for Metal sheet Roof with wooden Screws for wooden substructure on a training rood					
	Solar water pumping indoor					
13	500...700 W Solar Water Pumping System (made up of the following components)					
14	Submersible pump system (will be inserted into reservoir)					
15	Safety water level sensor for safety water reservoirs					

16	DC bench power supply (to simulate PV modules)					
17	Surface Pump (wall mount on mobile work bench)					
18	Surface Pump Control Unit (wall mount on mobile work bench)					
19	Surface Pump tubes, pipes, sensors					
20	Water pressure gauge					
21	Water reservoir					
22	Safety water reservoir (water reservoir will stand inside)					
23	Mobile work bench					
24	Acrylic safety housing for surface pump					
25	Emergency stop switch for pumps					
26	Relay box with 4mm laboratory safety connectors					
27	Work board (to be attached to the mobile work bench)					
G	TESTING EQUIPMENT					
	Tools for testing					
1	IV-Curve tracer - HT I-V500W					
2	Isolation measurement equipment/ installation tester					
3	Thermography camera					
4	Camera					
5	Electroluminescence camera					
6	IR thermometer					
7	Multimeter x2					
8	Pressure valve					
9	Flow meter					
	Technical testing equipment					
10	Laboratory power supply x2					
11	PV modules testing stand					
12	Small inverters testing stand					
13	Test Stand Charge Controller					
14	Test Stand Batteries					
15	Stand-alone/Solar-home-systems testing kit					
16	PV water pumping testing stand					
17	Cable and connectors testing kit					
18	Lighting					

19	Material (tools, racking, test stand setup, pipes, cable, safety equipment, spare parts)					
20	Microinverter x5					
21	Bulbs					
22	Computer/office x2					

Financial Offer

Financial offer should encompass the quantity and price as applicable for each of the component proposed to be supplied by the bidder under the RFQ in line with the table below:

Item	Equipment	Specification EN	Quantity	Unit Price (USD)	Total Price (USD)
A	Tools and instruments				
A1	Personal Protective Equipment	Specification			
1	Reflective vests	Reflective vests			
2	Helmets	Helmets			
3	Work gloves	Work gloves			
A2	Instruments	Specification			
4	Digital multimeter (medium quality)	TRMS values, capable of measuring AC (750 V) & DC (1000 V) voltages, DC current 10 A, continuity/resistance, fused for current measurements, overvoltage CAT III 1,000 V and CAT IV 600 V. Lower-cost instruments are suitable for work board exercises			
5	Spare fuses for above multimeter (medium quality)	30 of each type of fuse in multimeter			
6	Digital multimeter (professional standard)	TRMS values, Capable of measuring 1000 V AC/DC voltages, DC current 10 A, continuity/resistance, fused for current measurements, overvoltage CAT III 1,000 V and CAT IV 600 V, temperature probe, test leads and accessories This needs to be a 'professional standard' instrument such as the Fluke 179 or similar			
7	Spare fuses for above multimeter (professional standard)	5 of each type of fuse in multimeter			
8	Clamp meter (medium quality)	Capable of measuring AC & DC (600 V) voltages, DC and AC current ranges 40 A / 400 A, continuity/resistance, overvoltage CAT III 600 V. Lower-cost instruments are suitable for work board exercises			

9	Clamp meter (professional standard)	TRMS values, capable of measuring AC & DC (600 V) voltages, DC and AC current ranges 40 A / 400 A, continuity/resistance, overvoltage CAT III 600 V and CAT IV 300 V. This needs to be a 'professional standard' instrument such as the Fluke 325 or similar			
10	Insulation resistance tester	Capable of measuring insulation resistance at 250 V, 500 V and 1000 V, isolations-resistance measurement to 20 G Ω , resistance measurement 0,01 Ω - 20 k Ω , AC voltage measurement 0 - 500 V AC, overvoltage CAT IV 600 V			
11	Plug-in wattmeter	To fit AC sockets being used in country (Type C, D or G sockets, the most common one to be selected); capable of measuring appliance power consumption (W), energy (kWh) and cost of electricity consumed			
12	Hand-held solar irradiance meter	Capable of measuring solar irradiation, hand-held, 0 - 2000 W/m ² range, resolution 1 W/m ² , digital display			
13	Infrared thermometer	Hand held laser Infrared thermometer, -20 to 100 ° C minimum range, digital display			
14	Solar Pathfinder	The Solar Pathfinder is the instrument specified. It is relatively low-cost, does not require batteries and is ideal for didactic purposes. To be supplied with tripod.			
15	Sun path diagrams for the Solar Pathfinder (only if Solar Pathfinder can be procured)	For correct latitudes: Available from manufacturer/supplier of Solar Pathfinder			
16	Compass	Basic, low cost, pocket size compass, of type used by walkers			
A3	Tools	Specification			
17	Crimp/termination tools for PV interconnectors	For MC4 PV module connectors, 4-6mm ² wires (minimum range)			

18	Crimping tool kit & crimps	Crimping tool kit & supply of 800 min. crimps/lugs. For insulated cable lugs from 0.5 to 6 mm ² (red-blue-yellow) and non-insulated cable lugs from 1.5 to 10 mm ² , VDE certified			
19	Electrician's tools kit	Set of electricians' insulated hand tools, screwdrivers, pliers, cable cutter, cable stripper, 1000 V insulation, standard IEC EN 60900			
20	Adjustable spanners	Maximum opening: 30 mm			
21	Spanner set	For nuts and bolts widths 6 - 22 mm (recommended range)			
22	Screwdriver set for precision mechanics	For single slot and Philipps screws: 6 different standard sizes			
23	Basic vehicle mechanics tools set	Basic set, socket set, suitable for work on cars and motor cycles, metric			
24	Long tape measures	Also called builder/surveyor's tapes, 20m or more, fibreglass tape (not steel), metric			
25	Hydrometer	For measuring battery electrolyte specific gravity			
26	Allen key set	Key sizes : 1.5 - 10 mm approx.			
27	Clipboards	Suitable for outdoor use, A4, perspex			
A4	Extras and spares	Specification			
28	Safety harness kit for working at height / on roofs	Complete kit. including harness, fall arrest lanyard, D rings, and packing case/rucksack			

29	Replacement batteries for multi- und clamp meters	spare part for multimeters, check requirements of procured meters and provide multiple spare batteries of all required types			
30	multimeter special cables (thermocouples, croco clamps, etc.)	only if not supplied with original equipment			
31	Soldering iron/station	60W, 230 Volts			
32	Soldering tips	according to soldering station			
33	Solder	100g roll, lead-free			
34	Multiple socket strip with personal protection	5+ sockets			
35	Hot air gun				
36	Schottky Diode 15 A 45 V	THT axial bypass diode, 15A, 45V			
37	Soldering station	Adjustable temperature range (100°C-450°C), 70W, 5 different solder tips, tip stand and sponge			
38	Multifunction Tool	Battery powered, fully variable speed 5.000 35.000 1/min, at least with 30 accessories, 12VDC, carry case			
39	Bench power supply	1-channel, adjustable voltage 0VDC-40VDC, display, adjustable current 0A-10A, 150W minimum			
40	Anti-static pad for work space with earth wall plug	heat-resistant, DIN EN 61340-5-1 , 0.5m x 0.3m minimum			
41	Anti-static wrist band with earthing connection	anti-static wrist band with cable and compatible with pad			
B	PV EXERCISE BOARDS				
	PV modules	Specification			
1	PV module	PV module, polycrystalline , 36 cells, 120 Wp approx., 20 Voc approx., 36 cells, aluminium frame, junction box not pre-cabled (openable, not sealed), product certification IEC 61215			
2	PV module	PV module, monocrystalline , 36 cells, 120 Wp approx., 20 Voc approx., 36 cells, aluminium frame, junction box not pre-cabled (openable, not sealed), product certification IEC 61215			

3	PV module	Mono or polycrystalline, 150 Wp approx., 40 Voc approx., 72 cells, aluminium frame, junction box not pre-cabled (openable, not sealed), product certification IEC 61215			
4	PV module	20 -50 Wp (small), monocrystalline and polycrystalline, 20 Voc approx., 36 cells, aluminium frame, junction box not pre-cabled (openable, not sealed), product certification IEC 61215, a selection of different types			
	PV cable connectors	Specification			
5	PV module inter-connection connectors (male)	MC4 male connectors for 4 mm ² solar cable. and suitable for above crimp/termination tool, IP65, 30 A, 1000 DC			
6	PV module inter-connection connectors (female)	MC4 female connectors for 4 mm ² solar cable. and suitable for above crimp/termination tool, IP65, 30 A, 1000 DC			
7	PV module inter-connection connectors (female)	MC-4 compatible PV connectors, male, which do not require specialised tools, for 4 mm ² solar cable, IP65, 30 A, 1000 DC			
8	PV module inter-connection connectors (male)	MC-4 compatible PV connectors, female, which do not require specialised tools, for 4 mm ² solar cable, IP65, 30 A, 1000 DC			
9	MC4 Y-plug	MC4 compatible Y-connector for parallel connection of PV modules			
	DC exercise boards	Specification			
10	Solar charge controller (standard, without MPPT)	10A module current / 10A load current minimum, PWM, 12/24 V, no MPPT, LED (3 indicating battery state of charge) or LC display, cable input/output terminals for 6 mm ² cable min., for lead-acid batteries, overload protection, low voltage disconnect, reverse polarity protection, temperature compensation, open circuit protection when not connected to battery, IP 20 min., 2-year manufacturer's warranty			
11	Solar charge controller (standard, without MPPT)	20A solar module current / 20A load current minimum, other specs as above			

12	Solar charge controller (with MPPT)	25 A min. approx. (in/out), 12/24 V, with MPPT range 17 V ... 100+ V (34 V ... 100+ V approx.), LC display, cable input/output terminals for 10 mm ² cable min., for lead-acid batteries, overload protection, low voltage disconnect (deep discharge protection), regular equalisation charge, overcharge protection, reverse polarity protection, temperature compensation, open circuit protection when not connected to battery, IP 20 min.			
13	Inverter (battery inverter)	12 V DC input, from 220 - 240 V 50 Hz power output, 200 - 500 W (200 - 500 VA continuous power), pure sine wave, IP 20 min, overload and short circuit protection, reverse polarity protection as internal fuse, deep discharge battery protection, to be sourced from a supplier of equipment for PV systems and recommended by that PV supplier for use in off-grid PV systems (not a cheap inverter of the type used in motor vehicles), <u>not</u> to contain integrated solar charge controller If possible provide inverters from 2 different manufacturers			
14	DC lamps, 12 V, florescent	12 V, florescent lamps with replaceable bulb/tube 3 x 7 W 3 x 9 W 3 x 11 W			
15	DC lamps, 12 V, LED	12 V DC, LED, 2 W, E27, 200 lumens min., warm white various wattage, e.g. 3 x 5 W 3 x 10 W 3 x 15 W			
16	DC lamps, 12 V halogen	12V, halogen, with reflectors, selection between 10W and 40W			
17	Lamp holders	E 27 lamp holder, plastic, heavy duty, for surface mounting on work board			
18	DC fans	12 V DC desk fan. 10 W min., 20 W max.			

19	DC/DC converter	DC/DC converter, 12 V to 24 V, 1,5 A minimum output			
20	DC sockets	Socket outlet for 12/24 V DC, for surface mounting on work board			
21	DC plugs	DC plugs to fit above DC sockets			
22	Junction boxes	100 x 100 x 40 mm (LxWxH) approx., surface mounting (for work board)			
23	DC miniature circuit breakers	DC miniature circuit breaker, 1-pole, 80VDC, 6A tripping current, 1 pole, suitable for DIN rail mounting			
24	DC miniature circuit breakers	DC miniature circuit breaker, 1-pole, 80VDC, 10A or 16A tripping current, 1 pole, suitable for DIN rail mounting			
25	DC miniature circuit breakers	DC miniature circuit breaker, 1-pole, 80VDC, 40A or 50A tripping current, 1 pole, suitable for DIN rail mounting			
	AC exercise boards	Specification			
26	Consumer unit / fuse board	To fit DP main switch and 2 - 3 MCBs and E terminal, for 220 - 240 V 50/60 Hz power supply, IP65			
27	Miniature circuit breaker (MCB) AC	Single-pole, 6A, Type B, 220 - 240 V 50/60 Hz, to fit above consumer unit / fuse board			
28	Miniature circuit breaker (MCB) AC	Single-pole, 16A, Type B, 220 - 240 V 50/60 Hz, to fit above consumer unit / fuse board			
29	Residual current device (RCD)	<u>Type A</u> 25A 30mA RCD, 220 - 240 V 50/60 Hz, to fit above consumer unit / fuse board			

30	Socket outlet	Type C 230 V, 2 pole excl. Grounding surface mounted (incl box for surface mounting on board), indoor use, IP22 or IP2X min.			
31	Socket outlet	Type D 230 V, 3 pole incl grounding surface mounted (incl box for surface mounting on board), indoor use, IP22 or IP2X min			
32	Socket outlet	Type G 230 V, 3 pole incl grounding surface mounted (incl box for surface mounting on board), indoor use, IP22 or IP2X min.			
33	Plug	Type C, to fit above sockets			
34	Plug	Type D, to fit above sockets			
35	Plug	Type G, to fit above sockets			
36	Connector blocks / terminal strips	Screw terminal strip, 3A, 400VAC, for 2.5 mm ² cable (10-12 connector blocks per strip, 240 blocks in total)			
37	Connector blocks / terminal strips	Screw terminal strip, 6A, 400VAC, for 4 mm ² cable (10-12 connector blocks per strip, 240 blocks in total)			
38	Connector blocks / terminal strips	Screw terminal strip, 16A, 400VAC, for 6 mm ² cable (10-12 connector blocks per strip, 240 blocks in total)			
39	Earth blocks	4-Way Earth Block Nickel-plated, Suitable for 16-25mm ² Cables, Brass Construction			
	Cables, etc.	Specification			
40	Flex	1.5 mm ² flexible cable for connecting appliances to plugs, 3-core incl. PE), very flexible, copper. PVC sheathed, H05-VVF, 50 m roll			
41	Cable	1.5mm ² , 2-core (no PE), <u>multi-stranded</u> , very flexible, copper, PVC sheathed, H05- VVF, 50 m roll			
42	Cable	2.5mm ² , 2-core (no PE), <u>multi-stranded</u> , very flexible, copper, PVC sheathed, H05- VVF, 100 m roll			

43	Cable	2.5 mm2 flexible cable for connecting appliances to plugs, 3-core incl. PE), very flexible, copper. PVC sheathed, H05-VVF, 50 m roll			
44	PV cable / 'solar cable'	4 mm2, double insulated, single-core, UV protected, cable specified for the interconnection of PV modules, <u>fine</u> multi-stranded, copper, temperature rating - 40°C -90°C, 1000 DC, Class II (double insulated), halogen free, flame resistant, 100 m roll			
45	Cable	6 mm2 single-core, <u>fine multi-stranded</u> , PVC, red, very flexible, copper, unsheathed, H07V-K 100 m red roll			
46	Cable	6 mm2 single-core, <u>fine multi-stranded</u> , PVC, red, very flexible, copper, unsheathed, H07V-K 100 m black roll			
47	Cable	6 mm2 single-core, <u>fine multi-stranded</u> , PVC, red, very flexible, copper, unsheathed, H07V-K 100 m yellow-green roll			
48	Cable	10 mm2 single-core, <u>fine multi-stranded</u> , PVC, red, very flexible, copper, unsheathed, H07V-K 100 m red roll			
49	Cable	10 mm2 single-core, <u>fine multi-stranded</u> , PVC, red, very flexible, copper, unsheathed, H07V-K 100 m black roll			
50	Cable	10 mm2 single-core, <u>fine multi-stranded</u> , PVC, red, very flexible, copper, unsheathed, H07V-K 100 m yellow-green roll			
51	Electrical insulation tape	25 m length rolls, 20 mm width, approx., max heat resistant temperature 90 °C 5 x red 10 x black 5 x blue 5 x yellow/green			
	Batteries & accessories	Specification			

52	Battery	12 V lead gel, 60 - 90Ah, sealed, maintenance-free, 'solar batteries'			
53	Battery terminals (pairs)	To fit above battery			
54	Lead-acid batteries	12 V lead-acid, 60 - 90Ah, flooded, 'solar batteries', dry, to be filled with supplied acid at site			
55	Battery terminals (pairs)	To fit above battery			
56	Battery charger	Suitable for charging sealed 12 V 100 Ah lead-acid battery, from 220 - 240 V 50/60 Hz power supply, charging rate 0.8 A / 3.6 A, robust quality, IP65			
57	Funnel	For safely pouring distilled water into batteries, resistant to acids			
58	Acid pump (hand-driven)	Device for safely filling a battery with acid, for demonstration purposes mainly			
59	Work board	1 x 1.5 m approx., thickness 20-25 mm, wood or wood composite, suitable for firmly fixing electrical components to it via wood screws			
C	HYBRID SYSTEM				
1	PV modules	300+ W each, mono- or polycrystalline, IEC certified			
2	Hybrid inverter	<ul style="list-style-type: none"> -Should have the capacity to charge the battery bank from PV solar and Electricity with option of priority setting. - Three-phase connection (single-phase optional if three-phase system not common) - 5000 W AC output, capable to provide backup power in case of grid-failure - Min. 5000 W PV power to be connected 			
3	Battery system	<ul style="list-style-type: none"> Cell chemistry: LiFePo4 - Min. 4000 Wh usable storage capacity at 100% DOD) - Min. 4000 cycles - system voltage and integrated BMS compatible with the installed battery (or hybrid) inverter (certified by manufacturer of inverter) 			
4	Monitoring	If not included as a functionality of the battery inverter (or hybrid inverter), provide a separate monitoring system that monitors the main system parameters and			

		sends them to the manufacturer's data portal.			
5	BOS-set	set to include all wires, connectors, distribution boxes, switchgear, fuses, installation material to integrate a fully operational system			
6	Consumables	4mm ² DC solar cable: double-insulated, UV-resistant, single core, black			
7	Consumables	DC-connectors: MC4, Sunclix or similar for 4mm ² cable, male			
8	Consumables	DC-connectors: MC4, Sunclix or similar for 4mm ² cable, female			
9	Consumables	Cable ties, 20 cm, UV-resistant			
10	Mounting	Ground-mounted mounting system for 20 solar modules of the model offered in this bid (item 1)			
11	Mounting	Concrete ballast for mounting system foundation			
12	EPC-service	Concept, engineering, procurement, shipping, installation, and commissioning of hybrid system - to include a complete set of system documentation (manuals, datasheets, SLD, wiring diagrams, etc.)			
D	SOLAR HOME SYSTEM				
	Solar Home System Installation (made up of the following components)	PV = min. 300Wp Inverter = min. 500W nom. Charge controller if Inverter does not include charge controller Battery display required showing SoC in %, Ampere in/out Battery Voltage, etc. Battery = min. 2.4kWh @c10 set, complete mounting board with pre-installed material as noted below for complete turn-key installation and additional consumables (e.g., wires, fuses, battery fuses, combiner and distribution boxes, load centre, earthing system, surge protection devices, etc.) lump sum, turn-key installation at site by a qualified technician Documentation for all technical products shall be available			
1	Solar Charge Controller MPPT	Nominal Power range 400 W Nominal Voltage (PV Input) max 42 VDC (if designed as 24 VDC system a DC/DC converter will be needed to ensure that standard 12 VDC appliances/loads can be used. Converter can be included into load distribution box if cooling is sufficient			

		<p>under load.)</p> <p>Nominal PV Input Current range 5...20 A</p> <p>Nominal Voltage (Load Output) 12 VDC</p> <p>Nominal Current (Load Output) min 25 A</p> <p>Nominal Battery Voltage range 12...24 VDC (autodetect feature mandatory)</p> <p>Operating Temperature range 0...50 °C</p> <p>MPPT Technology</p> <p>3-Way Battery Charging Profile or better (battery voltage setpoints according to used battery chemistry in 2.0)</p> <p>IP Class</p> <p>Overcharging Protection, adapted to batteries offered</p> <p>Charging Profile, adapted to batteries offered</p> <p>Overload Protection (the solar charge controller must be able to handle the situation when a battery is not being connected while PV is already providing power to it)</p> <p>Over-temperature Protection</p> <p>Over-voltage Protection</p> <p>Short Circuit Protection</p> <p>Battery Temperature Compensation (if not available a Battery Temperature Sensor is mandatory)</p> <p>Reverse Polarity Protection on PV and battery terminals (A reverse polarity event shall be resettable without replacing blown fuses. MCBs are preferred but Polyfuses or Crowbar circuit might be an option. If not provided by the charge controller it has to be provided by an external circuit or device. Internal fuses can't be changed locally and will result in unusable equipment)</p> <p>Status Display, Soc in %</p>			
2	<p>VRLA AGM Battery for Cycling Solar applications</p> <p>Total capacity min 2.4kWh @ c10 including interconnection, cable, screws, isolator, and cable to Battery Fuse and from Fuse to Inverter--> Charge controller</p>	<p>Nominal Voltage 12 VDC</p> <p>Nominal Capacity (C10) min 100 Ah</p> <p>Charge Cycles at 50% DoD min 1400</p> <p>Maintenance Free, AGM (has to be a solar battery suitable for daily dis/charge cycles)</p> <p>DC Battery Fuse</p>			
3	<p>PV Modules</p> <p>Total min 300Wp, Voltage suitable for Charge Controller, Inverter</p>	<p>PV saline protection (IEC 61701) if location is close to the sea</p> <p>Nominal Power per PV Module min 150 W (when using multiple PV Modules they</p>			

		<p>have to be the same manufacturer and model)</p> <p>Open Circuit Voltage (STC) max 42 VDC</p> <p>Bypass diodes min 3</p> <p>Reverse Current min 15 A</p> <p>Voltage Capability min 1000 VDC</p> <p>IP Class Junction Box min IP65</p> <p>Temperature Range range -40...85°C</p> <p>Cell Efficiency min 18%</p> <p>Power Tolerance max 5%</p> <p>MC4 Compatible Connectors</p> <p>Monocrystalline or Polycrystalline Technology</p>			
4	Roof Mounting Substructure, Aluminium for Metal sheet Roof with wooden Screws for wooden substructure on a training rood				
5	Remote Monitoring Device	<p>compatible with solar charge controller unit or Inverter</p> <p>can be wireless (Bluetooth, Wi-Fi) or wired. When wired it has to be USB compliant. If this can be only achieved with a converter it needs to be provided and documented.</p> <p>Compatible with PC (MS Windows) or Android Smartphone</p>			
6	DC Load Distribution Box	<p>Nominal voltage 12 VDC</p> <p>DC Connectors female 5.5/2.1 mm, 2 pcs min 3 A</p> <p>DC Connectors female 5.5/2.5 mm, 2 pcs min 3 A</p> <p>DC Connectors female 4mm safety terminals, 2 pcs min 16 A compatible with 4mm safety cables connector</p> <p>DC Connectors female USB type A, 1 pcs min 0.5 A can also be provided by solar charge controller if available</p> <p>DC Connectors female USB type A, 1 pcs min 1.5 A can also be provided by solar charge controller if available</p>			
7	Inverter	<p>"Nominal Power at 20°, Suitable for humidity > 80 % " max 500 W</p> <p>Nominal Voltage Input 12 VDC</p> <p>Nominal Voltage Output range 220...240 VAC one IEC Type F outlet is sufficient but adapter for Type M must be provided</p> <p>Nominal Frequency 50 Hz</p> <p>Nominal Continuous Output Current min 1.4 A</p>			

		Nominal Peak Output Current min 3 A True Sine Wave Dedicated Power Switch Overload Protection Over-temperature Protection Over-voltage Protection Short Circuit Protection			
8	Mounting Board	all components besides PV modules and batteries shall be installed on a mounting board Dimensions: Width max 1...2 m, depth max 0.5 m including installed components on mounting structure, Height max 1...1.5 m Material, Coating and Grounding as defined by manufacturer and local rules			
	Solar Home System Kit				
9	Solar Home System Kit or Bundle	Verasol Certification, Lithium Iron Phosphate Battery, GSM (mobile network) remote monitoring, PAYGO integration, MPPT controller, PV input power up to 100W,			
10	SHS Solarworx lamps 1W				
11	SHS Solarworx 32 inch TV				
12	SHS Solarworx fridge				
13	SHS Solarworx Victron PayG Dongle or switch				
E	SOLAR STREET LIGHT				
	Solar street light outdoor				
1	Solar Street Light Kit	Park lamp for public areas and paths, 12W high efficiency LEDs, 1620 lumens, incl. lamp bracket, module mounting structure, top of pole mount battery box, solar charge controller with time program function, 80Wp module, 60Ah sealed battery			
2	Lamp post for Street Light Kit	lamp post 5 metres high with accessories for ground assembly, corrosion safe (anodized)			

3	Scaffold complete assembly	TÜV certified; 5,30 m working height, 200 kg/m ² load according to DIN EN 1004-1; movable with castors			
4	Scaffolding Elevator Console with Pulley	compatible with scaffolding system, load capacity: minimum 200 kg; rope and attachment to pull up batteries and PV modules to train part exchange			
5	Ladder	6 m working height with stair function, aluminium, must withstand up to 150kg			
Solar street light indoor					
6	100Wp Solar Street Lighting System, 20 W LED light (made up of the following components)	set, complete mounting board with pre-installed material as noted below for complete turn-key installation and additional consumables (e.g., wires, fuses, battery fuses, combiner and distribution boxes, load centre, earthing system, surge protection devices, etc.) lump sum, turn-key installation at site by a qualified technician Documentation for all technical products shall be available			
7	Solar Charge Controller MPPT	Nominal Power range 200 W Nominal Voltage (PV Input) max 42 VDC (if designed as 24 VDC system a DC/DC converter will be needed to ensure that standard 12 VDC appliances/loads can be used. Converter can be included into load distribution box if cooling is sufficient under load.) Nominal PV Input Current range 5...15 A Nominal Voltage (Load Output) 12 VDC Nominal Current (Load Output) min 10 A Nominal Battery Voltage range 12...24 VDC (autodetect feature mandatory) Operating Temperature range 0...50 °C MPPT Technology 3-Way Battery Charging Profile or better (battery voltage setpoints according to used battery chemistry in 2.0) IP Class Overcharging Protection, adapted to batteries offered Charging Profile, adapted to batteries offered Overload Protection (the solar charge controller must be able to handle the situation when a battery is not being			

		<p>connected while PV is already providing power to it)</p> <p>Over-temperature Protection</p> <p>Over-voltage Protection</p> <p>Short Circuit Protection</p> <p>Battery Temperature Compensation (if not available a Battery Temperature Sensor is mandatory)</p> <p>Reverse Polarity Protection on PV and battery terminals (A reverse polarity event shall be resettable without replacing blown fuses. MCBs are preferred but Polyfused or Crowbar circuit might be an option. If not provided by the charge controller it has to be provided by an external circuit or device. Internal fuses can't be changed locally and will result in unusable equipment)</p> <p>Status Display, Soc in %</p>			
8	<p>VRLA Gel Battery for Cycling Solar applications</p> <p>Total capacity min 2.4kWh @ c10 including interconnection, cable, screws, isolator, and cable to Battery Fuse and from Fuse to Inverter--> Charge controller</p>	<p>Nominal Voltage 12 VDC</p> <p>Nominal Capacity (C10) min 50 Ah</p> <p>Charge Cycles at 50% DoD min 1400</p> <p>Maintenance Free (has to be a solar battery suitable for daily dis/charge cycles)</p> <p>DC Battery Fuse</p>			
9	<p>DC bench power supply (to simulate PV modules)</p>	<p>at least 2 channels; adjustable 0 - 30 VDC; 0 - 3A; 195W;</p> <p>Resolution: Voltage: $\leq 0.01\% + 2\text{mV}$;</p> <p>Current: $\leq 0.01\% + 250\mu\text{A}$</p>			
10	<p>Remote Monitoring Device</p>	<p>compatible with solar charge controller unit or Inverter</p> <p>can be wireless (Bluetooth, Wi-Fi___33) or wired. When wired it has to be USB compliant. If this can be only achieved with a converter it needs to be provided and documented.</p> <p>Compatible with PC (MS Windows) or Android Smartphone</p>			
11	<p>DC Load Distribution Box</p>	<p>Nominal voltage 12 VDC</p> <p>DC Connectors female 5.5/2.1 mm, 2 pcs min 3 A</p> <p>DC Connectors female 5.5/2.5 mm, 2 pcs min 3 A</p> <p>DC Connectors female 4mm safety terminals, 2 pcs min 16 A compatible with 4mm safety cables connector</p> <p>DC Connectors female USB type A, 1 pcs min 0.5 A can also be provided by solar</p>			

		charge controller if available DC Connectors female USB type A, 1 pcs min 1.5 A can also be provided by solar charge controller if available			
12	LED lamp	2x60cm tube, 20-26VDC, 920mA, 22W, 4000K, 2200lm, G13, IP22			
13	LED lamp	Nominal Power, range 20 W Nominal Voltage Input 12 VDC Luminous Flux min 5000 lm heat dissipation of the lamp shall not affect other components on the mounting board. Colour Temperature min 5500 K Radiation Angle min 120° lamp screen shall be parallel to the floor (90° angle between mounting board in upright position and lamp screen) so that blinding of personnel is prevented Working Life min 25,000 h On/Off Cycles min 100,000 Temperature Range, range -20...65°C IP Class min IP65 Material Aluminium and Glass Lamp Post or mounting bracket for board mounting must be included (negotiable if lamp itself already covers this by design) Length of LED Lamp and Lamp Post max 1 m (may exceed mounting board dimensions but shall be removable for transport)			
14	Twilight Switch /w Relay (not mandatory if already included in LED Lamp)	Nominal Voltage 12 VDC Nominal Switching Power min 30 W Switching Capability Power according to selected LED lamp in 6.0 (must switch LED lamp safely with enough headroom power)			
15	Movement Sensor (not mandatory if already included in LED Lamp)	detection angle: 180°, programmable twilight and switching time, IP44, 12-24 V			
16	Mounting Board	Dimensions: Width max 1...2 m, depth max 0.5 m including installed components on mounting structure, Height max 1...1.5 m Material, Coating and Grounding as defined by manufacturer and local rules			
17	Mobile work bench	including RCD with 6 AC outlets, electrically safe and acid resistive coating, dimensions: 1250 x 1970 x 700 mm			

F	SOLAR WATER PUMPING SYSTEM OUTDOOR and INDOOR				
	Solar water pumping outdoor				
1	Reservoir	water will be pumped from one reservoir to the other and vice versa using two pumps Volume min 1000 litres (1m ³) Material Non-Corrosive Big Top Opening Opening Valve at the Bottom			
2	Flange for reservoir connection with outlet tap	output flange in metal according to reservoir outlet, including shutter valve			
3	Water pipe DN 50	water pipe compatible with flange above to connect to the surface pump, can be sewage type, installation needs to cover all eventual misalignments or deviations from horizontal or vertical positioning of pumps and reservoirs			
4	Surface pump complete kit	Complete kit containing: - surface pump - surface pump controller - surface pump switch box - surface pump controller for AC grid connection as backup - 2x 330 Wp PV Modules, - MNPV3 combiner box - MC4 extension cable - top of pole solar panel mount - 40 steel pipe - grounding lugs - submersible pump cable - submersible pump water lifting pipe - water level switch - lightning arrestors			

5	Submersible pump complete kit	Complete kit containing:- submersible pump- submersible pump controller- submersible pump1 controller for AC grid connection as backup- 2x 330 Wp PV Modules,- MNPV3 combiner box- MC4 extension cable- top of pole solar panel mount- 40 steel pipe- grounding lugs- submersible pump cable- submersible pump water lifting pipe- water level switch- lightning arrestors			
6	Cast resin sleeve for submersible pump electric connection	Pass 3 x 1,5 to 5 x 6mm ² , lateral 3 x 1,5 to 5 x 4mm ² , hardener 0,225kg, incl. sleeve, polyurethane cast-resin, hardener, gloves, two foam seals and abrasive paper			
7	Submersible cable to train cast resin application	Submersible cable			
8	Water pressure gauge	PRESSURE GAUGE WITH TEE 0-60PSIG, EA			
9	Closing valve	Ball valve with spring return DN40 - 1 1/2" inch GK13, brass			
10	Water flow meter	Range: 2...40 l/min, Pressure: min. 12 bar; temperature control; compatible with water pipe diameters (adapters must be supplied if device differs from piping), display with values in metric, IP65, supply voltage according to pump electrical specifications (power supply must be supplied if device cannot be powered from the pump controller)			
11	PV Modules Total min 300Wp, Voltage suitable for Charge Controller, Inverter AS REFERENCE FOR THE PV MODULES INCLUDED IN PUMP KITS ABOVE!	PV saline protection (IEC 61701) if location is close to the sea Nominal Power per PV Module min 300 W (when using multiple PV Modules they have to be the same manufacturer and model) Open Circuit Voltage (STC) max 42 VDC Bypass diodes min 3 Reverse Current min 15 A			

		<p>Voltage Capability min 1000 VDC IP Class Junction Box min IP65 Temperature Range -40...85°C Cell Efficiency min 18% Power Tolerance max 5% MC4 Compatible Connectors Monocrystalline or Polycrystalline Technology</p>			
12	<p>Roof Mounting Substructure, Aluminium for Metal sheet Roof with wooden Screws for wooden substructure on a training rood</p>				
	<p>Solar water pumping indoor</p>				
13	<p>500...700 W Solar Water Pumping System (made up of the following components)</p>	<p>set, complete mounting board with pre- installed material as noted below for complete turn-key installation and additional consumables (e.g., wires, fuses, battery fuses, combiner and distribution boxes, load centre, earthing system, surge protection devices, etc.) All components shall be pre-installed on a mounting board covering electrical components and consumables. PV modules and batteries are not part of the mounting board, but their cabling and connection must be designed for plug and play usage. lump sum, turn-key installation at site by a qualified technician Documentation for all technical products shall be available</p>			
14	<p>Submersible pump system (will be inserted into reservoir)</p>	<p>Submersible Pump, range 500...700 W Complete submersible pump kit - DC submersible water pump - DC submersible water pump controller - submersible cable for electrical connection - flexible water pipes of sufficient length (installation set)</p> <p>Pump has to be attached to the mounting board at the lowest point with no electrical components below. Electronic equipment has to be protected from accidental water pipe bursts by using transparent shielding. Pumping Head max 15 m Flow Rate min 15 m³/h Water Pipe Length, 2 pcs, min 30 m, One</p>			

		for each reservoir. Reservoirs will be installed outside the building for safety reasons. Connection has to be pluggable without tools for setup and removal. Dry Run Protection Sensor. Has to be attached to mounting board Tank Full Sensors, 2 pcs, One for each reservoir. Cable length must be 30m.			
15	Safety water level sensor for safety water reservoirs				
16	DC bench power supply (to simulate PV modules)	voltage and current specifications according to both pumps; at least 2 channels; adjustable 0 - 30 VDC; 0 - 3A; 195W; Resolution: Voltage: $\leq 0.01\% + 2\text{mV}$; Current: $\leq 0.01\% + 250\mu\text{A}$			
17	Surface Pump (wall mount on mobile work bench)	complete surface pump kit - DC surface water pump - DC surface water pump controller - flexible water pipes of sufficient length (installation set) - 2 water level sensors (high/low) - dry running protection			
18	Surface Pump Control Unit (wall mount on mobile work bench)	only for reference (must be included in surface pump kit)			
19	Surface Pump tubes, pipes, sensors	only for reference (must be included in surface pump kit)			
20	Water pressure gauge	according to used water pipes			
21	Water reservoir	200 litres with cover			
22	Safety water reservoir (water reservoir will stand inside)	PE, must be able to take up all the water from both reservoirs plus safety (volume of one reservoir)			
23	Mobile work bench	including RCD with 6 AC outlets, electrically safe and acid resistive coating, dimensions: 1250 x 1970 x 700 mm			
24	Acrylic safety housing for surface pump	dimensions must match the surface pump			
25	Emergency stop switch for pumps	red emergency stop button on yellow background, surface mounted			

26	Relay box with 4mm laboratory safety connectors	plastic box with DIN rail mount to hold 3 relays - 6 red 4mm terminals (32 A rated) with 2.5mm ² cable connections to 3 relays - 6 black 4mm terminals (32 A rated) with 2.5mm ² cable connections to 3 relays			
27	Work board (to be attached to the mobile work bench)	dimensions must match and fit to the mobile work bench, e.g. 1250 x 1000 mm; 20 mm thickness			
G	TESTING EQUIPMENT				
	Tools for testing				
1	IV-Curve tracer - HT I-V500W	Testing Equipment: IV-Curve Tracer; Isolation tester, Camera, EL-Camera (Electroluminescence), Thermography camera, laboratory power supply			
2	Isolation measurement equipment/ installation tester	Benning PV 1-1 Installations tester kalibriert (ISO) VDE-Norm 0126			
3	Thermography camera	Image quality with IR resolution of minimum 320 x 240 pixels (with testo SuperResolution technology 640 x 480 pixels)			
4	Camera	Technical specifications: Min. 12 MP			
5	Electroluminescence camera	Modified Consumer Camera (preferred SLR Camera from Sony: Sony Alpha 7a)			
6	IR thermometer	Fluke 62 MAX Infrarot-Thermometer Optik 10:1			
7	Multimeter x2	Fluke 289 FlukeView® Forms Combo Kit			
8	Pressure valve	Flux 0.4-10 m ³ /h, regulate flow rate			
9	Flow meter	Min. 0.4 m ³ /h - 10 m ³ /h/ Digital output via USB			
	Technical testing equipment				
10	Laboratory power supply x2	Technical specifications: 15A, 60V			
11	PV modules testing stand	2 PV modules + alum. structure/rack (other already included in and "Tools")			
12	Small inverters testing stand	Just price for small inverters, as this can be included in modules testing setup and "Tools"			
13	Test Stand Charge Controller	Included in stand-alone/SHS rig and "Tools"			
14	Test Stand Batteries	Included in stand-alone/SHS rig and "Tools" + lead-acid battery and 4-Quadranten PV power supply kit			

15	Stand-alone/Solar-home-systems testing kit	Costs mainly for building up the rig: akku, micro-inverter, bulbs and small electronic devices			
16	PV water pumping testing stand	As part of the Water Pumping outdoor training unit			
17	Cable and connectors testing kit	"Tools" should be enough + prices for some cables (as sample)			
18	Lighting	For this one the testing and training rig would be the same			
19	Material (tools, racking, test stand setup, pipes, cable, safety equipment, spare parts)				
20	Microinverter x5				
21	Bulbs				
22	Computer/office x2				
Grand Total (\$)					

SL NO.	BRIEF DESCRIPTION OF GOODS/ SERVICES	Price in USD	Customs duty/excise duty/other taxes#
1	Component A: Supply of required solar equipment's* (As detailed out above) and Installation & Commissioning		
2	Component B: Training Charges		
3	Component C: Comprehensive maintenance of the system for the period of one year form the date of commissioning.		
Total Price			
Transportation Price (up to delivery site)			
Insurance Price (up to delivery site)			
Other Charges (specify)			
Total Final and All-inclusive Price			

- ISA will evaluate the financial offers received from the bidders based on total quoted price excluding tax.
- # Please provide details of the nature of the taxes. Taxes will be paid on actual basis on submission of documents proving the nature and the amount of tax.
- * ISA reserves the rights to select/deselect items from list of equipment's.

Compliance with Requirements

	You Responses		
	Yes, we will comply	No, we cannot comply	If you cannot comply, pls. indicate counter - offer
Minimum Technical Specifications	<input type="checkbox"/>	<input type="checkbox"/>	Click or tap here to enter text.
Delivery Term (INCOTERMS)	<input type="checkbox"/>	<input type="checkbox"/>	Click or tap here to enter text.
Delivery Lead Time	<input type="checkbox"/>	<input type="checkbox"/>	Click or tap here to enter text.
Warranty and After-Sales Requirements	<input type="checkbox"/>	<input type="checkbox"/>	Click or tap here to enter text.
Validity of Quotation	<input type="checkbox"/>	<input type="checkbox"/>	Click or tap here to enter text.
Payment terms	<input type="checkbox"/>	<input type="checkbox"/>	Click or tap here to enter text.
Other requirements <i>[pls. specify]</i>	<input type="checkbox"/>	<input type="checkbox"/>	Click or tap here to enter text.

Other Information:

Estimated weight/volume/dimension of the Consignment:	Click or tap here to enter text.
Country/ies of Origin: <i>(if export licence required this must be submitted if awarded the contract)</i>	Click or tap here to enter text.

I, the undersigned, certify that I am duly authorized to sign this quotation and bind the company below in event that the quotation is accepted.	
<i>Exact name and address of company</i> Company Name: Click or tap here to enter text. Address: Click or tap here to enter text. Click or tap here to enter text. Phone No.: Click or tap here to enter text. Email Address: Click or tap here to enter text.	Authorized Signature: Date: Click or tap here to enter text. Name: Click or tap here to enter text. Functional Title of Authorised Signatory: Click or tap here to enter text. Email Address: Click or tap here to enter text.

ANNEX 4: CHECKLIST FOR SUBMISSION OF BID

Item	Yes, we have submitted	If you cannot submit, pls. indicate the reason
Technical Proposal	<input type="checkbox"/>	Click or tap here to enter text.
Filled up Annex 2 and Bidder Declaration form	<input type="checkbox"/>	
Registration Certificate	<input type="checkbox"/>	
Annual Turnover Certificate	<input type="checkbox"/>	
Documents against Qualifying criteria as per Annexure-3	<input type="checkbox"/>	
Financial Proposal	<input type="checkbox"/>	Click or tap here to enter text.
Quoted prices for all items in the list	<input type="checkbox"/>	
Quoted prices for Transportation (up to the delivery site)	<input type="checkbox"/>	
Quoted prices for Insurance (up to the delivery site)	<input type="checkbox"/>	
Quoted prices for VAT or other taxes and duties	<input type="checkbox"/>	

The submission of proposal should highlight in subject line “SITC for equipment in Bangladesh”