شركة كهرباء محافظة القدس المساهمة المحدودة
JERUSALEM DISTRICT ELECTRICITY CO. LTD.
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Our Ref:
Date: 22.11.2026

Dear Sir,

JDECO Training Center Labs

RFP 33-2026

You are kindly requested to quote for the supply, delivery, installation & commissioning to our new training center in Jericho for the following materials according to the detailed specifications:

Bill of Quantities (BoQ):

Item No.	Description	Quantity	Unit	Unit Price (NIS)	Total Price (NIS)
1	Multifunction I-V curve tracer and photovoltaic (PV) installation efficiency tester rated up to 1500V DC	1	*Pcs*		
2	Handheld electrical safety, insulation resistance, and ground fault locating tester built for photovoltaic (PV) installations up to 1,500V DC	1	*Pcs*		
3	Photovoltaic Solar Energy Advanced Trainer with ESS	1	*Pcs*		
4	photovoltaic (PV) commissioning and electrical safety tester rated up to 1,500V DC and 40A	1	*Pcs*		
5	Setting up a training PV system (12 to 16 panels 600W to 750W , structure , on grid inverter 10KW , hybrid inverter 10KW LV ,hybrid inverter 10KW HV ,all material for connection, battary 10KWH LV &10KWH HV , Installation work , Different types of solar panels for display, weather station).	1	*Pcs*		

6	Educational Component, Material Display, and Diagnostic Sample Kit	1	***Pcs***		
7	Electrical Demonstration Board- *تمديدات منزلية*	1	***Pcs***		
8	Electrical Safety and Quality Application Trainer with photovoltaic systems Trainer module	1	***Pcs***		
9	HMI AND PLC TRAINING KIT	6	***Pcs***		
10	Virtual Reality (VR) Training / VR Headset	***10***	***Pcs***		
11	(VR) Workstation	***1***	***Pcs***		
12	VR Software - annual subscription	***10***	***Pcs***		
Total Amount in NIS Excluding VAT					

Items Specification:

Item 1: Multi-Function Solar I-V Curve Tracer and Efficiency Tester

- **Function:** Portable, multi-function analyzer for verifying PV string efficiency, performance, and operational parameter tracking.
- **I-V Curve Tracing:** Measures and maps current-voltage characteristics up to 1500V DC and 40A DC (or higher).
- **Efficiency Analysis:** Simultaneous measurement of DC-side solar generation and AC-side inverter output parameters to calculate overall inverter conversion efficiency.
- **Irradiation & Temperature:** Includes wireless solar irradiance sensor and cell temperature probe for STC (Standard Test Conditions) data normalization.

- **Database & Memory:** Built-in internal memory with a user-expandable database of PV module characteristics for automated performance verification and report generation.
- **(equivalent to I-Ve from HT)**

Item 2: High-Voltage PV Insulation and Continuity Tester (1500V)

- **Function:** Dedicated safety tester for insulation resistance measurements on live, high-voltage PV strings.
- **Insulation Test Voltage:** Variable test voltage generation up to 1500V DC.
- **Testing Modes:** Performs insulation resistance testing using Dual-Function methods (testing both positive and negative terminals safely under live string voltages without short-circuiting).
- **Continuity:** Low-resistance continuity measurement (minimum 200mA test current) for protective conductor (PE) bonding integrity checks.
- **Safety Category:** Rated to minimum CAT III 1500V DC or CAT IV 1500V working environments.
- **(equivalent to PV-ISOTEST 1500v)**

Item 3: Photovoltaic Solar Energy Advanced Trainer with ESS:

Modular trainer for the theoretical and practical study of the electric energy generation from photovoltaic panels, possible to perform experiments to determine the characteristics of a photovoltaic panel, study its off-grid operation with a battery charge regulator and its on-grid operation with the connection to the mains network, hybrid operation, supplied with a sun simulation module for indoor use

Measuring solar radiation: Changing the inclination and azimuth of the solar panel

Investigating the PV module response to shadow formation

- Recording the characteristics of the solar modules: Solar Panel Voltage-Irradiation Curve, Solar Panel Current-Irradiation Curve (calculating the inner resistance of the solar panel), Obtaining the solar panel current-voltage curve, Obtaining the solar panel current-power curve, Measurement of the voltage and current of the photovoltaic module with overload
- Off grid system: Measuring the generated power of a PV system and battery charging • Off grid system: Using Solar Panel and Battery to supply a DC Load

- Off grid system: Design and testing of a standalone PV system in direct storage operation and 230V AC
- On grid system: Measuring the electricity delivered to the mains grid
- On grid system: Measuring the electricity produced by the solar panel, delivered/taken from the mains grid, and the loading of AC lamps
- On grid system: Determining the efficiency of the grid connected inverter
- On grid system: Investigating the response of a PV system to a mains failure

Item 4: General Purpose PV Installation Commissioning Instrument

- **Function:** Compact, multifunction field commissioning instrument optimized for Category 1 IEC 62446 verification checks.
- **Key Measurements:** Measures open-circuit voltage (Voc) up to 1000V/1500V), short-circuit current ISC up to 40A), and automatic polarity status in a single test cycle.
- **Insulation Functionality:** Performs standard insulation testing up to 1500V DC on isolated strings or components.
- **User Interface:** Rugged, hand-held form factor with a backlit graphic display and a one-click automated sequence execution feature.
- **(equivalent to MI 3116)**

Item 5: Complete Training PV System, Structure, Storage, and Accessories

(Generic equivalent for the custom training system description)

- **Solar Modules:** 12 to 16 high-efficiency PV panels, rated between 600W to 750W each, provided with an array-mounting framework/structure with Topcon technology or equivalent.
- **Grid-Tied Inverter:** 10kW On-Grid string inverter.
- **Hybrid Storage Inverters:** One 10kW Low-Voltage (LV) hybrid inverter and one 10kW High-Voltage (HV) hybrid inverter.
- **Battery Storage:** One 10kWh Low-Voltage (LV) battery bank and one 10kWh High-Voltage (HV) battery bank, compatible with the respective hybrid inverters.

- **Educational Display Items:** A collection of varied solar panel sample types (e.g., Monocrystalline, Polycrystalline, Thin-Film, Bifacial) for architectural display and material comparison.
- **Environmental Monitoring:** Weather station kit including digital sensors for ambient temperature, cell back-temperature, wind speed, and pyranometer (irradiance).
- **Installation Scope:** Provision of all balance-of-system (BOS) materials (cabling, disconnect switches, conduits, connectors) along with turnkey installation, wiring, and commissioning work.

Item 6: Educational Component, Material Display, and Diagnostic Sample Kit

1. **Crystalline and Thin-Film Cell Technology Samples**

   The kit must include a minimum of four (4) distinct panel sample pieces (minimum dimensions 15cm x 15cm or full cells) securely mounted and labeled for structural comparison:

- **Monocrystalline Cell:** Showing uniform dark coloring and clipped/pseudo-square corners.
- **Polycrystalline Cell:** Showing distinct blue silicon crystal grain structures.
- **Thin-Film / Amorphous Silicon:** Showing a flexible or rigid uniform substrate layer layout.
- **Bifacial Solar Cell Section:** Demonstrating dual-sided grid lines and glass-on-glass encapsulation.
- **All Back Contact (ABC) Cell:** Demonstrating next-generation premium cell design.
- ***Heterojunction Technology (HJT / "HGT") Cell:*** *Demonstrating composite cell design.*
- **Tunnel Oxide Passivated Contact (Topcon) Cell:** Demonstrating ultra-thin passivated layer technology

2. **Mechanical and Electrical Samples**

- **Internal Module Electronics:** One opened PV module junction box sample showing integrated bypass diodes and sealing gaskets.
- **DC Safety Components:** One DIN-rail mountable DC Surge Protection Device (SPD) housing, one DC-rated miniature circuit breaker (MCB), and one inline cylindrical solar gPV fuse with holder.
- **Connectors and Cabling:** Pre-cut, stripped, and crimped samples of standard 4mm² and 6mm² UV-stabilized solar DC cabling alongside a set of standard toolless locking inline solar connectors (male, female, and Y-branch configurations).
- **Mounting and Grounding Infrastructure:** Short sample profiles (20–30cm) of aluminum mounting rails, mid-clamps, end-clamps, stainless steel cable management clips, grounding lugs, and serrated bonding washers.

3. **Defect Demonstration & Visual Fault Training Samples**

The kit must contain physical examples or clear replicas of defective components to train students on visual field inspection and troubleshooting before they use testing instruments:

- **Micro-Crack / Snail Trail Sample:** A cell or module piece demonstrating localized cell fractures or silver paste oxidation.
- **Delamination Sample:** A sample showing polymer back sheet peeling, yellowing, or moisture blistering.
- **Thermal/Physical Failure Sample:** A sample showing localized hot-spot burn marks or fractured tempered front glass.

Item 7: Electrical Demonstration Board (low voltage electrical installations):

(Different measurements in accordance with EN 61557 (insulation resistance, continuity of PE conductors, earth resistance, specific earth resistance, line and loop impedance, phase rotation, leakage current, RCD testing, voltage and frequency).

- **Different errors can be selected.**

- **Different types of RCD are integrated for measurement of trip-out time, trip - out current and contact voltage**
- **Possibility of connection to single phase or 3-phase supply system.**
- **Booklet with theory and exercises for training centers is included in standard set.**
- **Education of students of electrotechnical specialties.**
- **Education and practical training of electrical contractors about measurements on low voltage electrical installations.**
- **Demonstration on how to use different measurement instruments.**
- **Standards: Electromagnetic compatibility: IEC/EN 61326, Safety: IEC/EN 61010-1**
- **Technical Data: Power supply 230 V / 400 V, 50 Hz**
- **Equivalent to MI 3399**

Item 8: Electrical Safety and Power Quality Demonstration Trainer

- **Function:** Integrated diagnostic simulator table/module for teaching safety verification, troubleshooting, and grid connection principles.
- **Network Emulation:** Switchable power network grounding topologies including TT, TN, and IT configurations.
- **Fault Injection Matrix:** Integrated physical or digital switchboard capable of injecting at least 15 distinct distribution and array-level faults (e.g., insulation breakdown, phase failures, earth leakage).
- **PV Application Extension:** Dedicated addon panel to interface testing instruments with simulated solar DC circuitry, bypass diodes, and specialized solar grounding configurations.
- **Safety Systems:** Fully integrated protective measures including active Residual Current Devices (RCDs), fuses, and circuit breakers accessible via 4mm safety sockets.
- *(equivalent for: MI 3399 Electrical Safety and Quality Application Trainer)*

Item 9: HMI AND PLC Training KIT

Typical HMI AND PLC Training KIT

Item 10: Virtual Reality (VR) Training Lab (VR Headset):

- **4K+ Infinite Display: 2064 x 2208 pixels per eye**
- **Qualcomm Snapdragon XR2 Gen 2 platform with 8 GB RAM and 128GB of Internal Storage**
- **Pancake lens optics in a slim optical stack**
- **Full-color passthrough for mixed reality experiences**
- **Continuous IPD adjustment**
- **Inside-out tracking; controller-free hand tracking supported**
- **Includes Touch Plus controllers**
- **Wi-Fi**
- **Battery Life Min 2.5 Hours**

Item 11: Virtual Reality (VR) Training Lab (Workstation):

- **CPU: Intel® Core i7-14700, 20C (8P + 12E) / 28T, Max Turbo up to 5.4GHz, P-core 2.1 / 5.3GHz, E-core 1.5 / 4.2GHz, 33MB**
- **RAM:32 GB UDIMM DDR5-5600**
- **HDD:512GB SSD M.2 2280**
- **GPU: NVIDIA GeForce RTX 3050, 6GB GDDR6**
- **Video Outputs: 1 × HDMI® 2.1 TMDS and 1 × DisplayPort™ 1.4a (HBR2)**
- **USB Ports: 1 × USB-C® (USB 5Gbps / USB 3.2 Gen 1), supporting data transfer and 15W charging; 4 × USB-A (USB 5Gbps / USB 3.2 Gen 1); 1 × USB-A (Hi-Speed USB / USB 2.0) with Smart Power On support**
- **Audio Ports: 1 × Headphone/Microphone combo jack (3.5mm); 1 × Microphone jack (3.5mm); 1 × Line-out (3.5mm)**
- **1 × Gigabit Ethernet (RJ-45)**
- **Windows 11 Pro 64-bit, licensed**
- **Business/Professional Desktop suitable for continuous operation in a meeting room environment**
  *** With Screen 24"**

Item 12: Virtual Reality (VR) Training Lab (VR Software - annual subscription):

I- **Manage VR Training**
Content at a Scale Connection and interaction with each other , saving on physical resources in training and education A safe environment to practice and learn skills in a controlled environment.

- **Headsets management Easily set up your VR devices, upload content remotely, manage access**
- **Training analytics Real-time AI-powered performance tracking and reporting.**
- **VR classrooms 360 group training sessions with remote video playback and sync streaming**
- **VR training library VR training bundle, starting from basic knowledge to high-end training modules.**

II- VR Training modules (Minimum)

- **High Voltage Electrical Substation Tour**
- **Transform Oil Sampling**
- **Occupational Safety and Health**
- **Heat shrink cable joint**
- **MV Substation transformer isolating and LOTO**
- **Motor control center**
- **Work at height**
- **Fire Safety**

*** 360 Video feature included**

Essential Bidding Requirements:

- Quotation should be enclosed in a sealed envelope or package and handed over to the "Procurement Department" by the representative of the bidder or their agent not later than **06-12-2026 11:00 AM**. At JDECO Building- Al Masyoun, 6th Floor.

- The main envelope or package should include the following in separate envelopes:
  a. The financial offer includes Delivery Time.
  b. The technical offer.
  Technical offers will be studied separately from the financial offer. The financial offers for bidders whose technical offers do not meet JDECO's technical requirements will not be opened.
- In case offers are submitted by an agent on behalf of a certain supplier, a copy of the agreement between the agent and the supplier must also be submitted.
- Offers have to be attached with a letter confirming the authorized person's signing on behalf of the bidder.
  Any bid package not according to the above will not be considered.

Payment method in case of offer acceptance:

- 90 days after delivery of goods through bank transfers.
- The currency of the suppliers' invoices must be the same as the currency of their submitted offer and as specified in the letter of award, otherwise they will not be accepted.

Notes:

- The company has the liberty not to accept any or the lowest offer or to assign any reason for rejection of any offer.
- The company has the liberty to divide the order between different suppliers and / or to buy partial quantities.
- Upon acceptance of offer the bidder will be requested to submit a **Performance Bond** equivalent to **10%** of the tender total value and should be valid for **3 months** from the date of a receipt letter signed formally by JDECO confirming executing all terms of contract (supply, delivery, installation & commissioning to our new training center in Jericho).

Yours Faithfully

Mohammad Zeidan
CEO