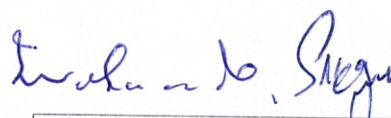


Comparative Statement

Design, Supply, Installation, Testing & Commissioning of 146.26 kWp Carport Grid Tied Utility Interactive Photo Voltaic Solar Power System at IBA Main Campus Karachi
Tender # CW/05/26-27

Engineer's Estimate							M/s. Ideal Power Solutions				M/s. Creative Electronics (Pvt) Ltd.				M/s. Iceberg Industries				M/s. Beyond Green (Private) Limited			
BOQ SOLAR PV SYSTEM AT IBA MAIN CAMPUS ESTIMATED CAPACITY 146.26KWp							Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)
Product	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)																
1 MODULE MOUNTING STRUCTURE																						
BOUNDARY WALL CARPORT																						
Supply of PV Mounting structure in MS Iron with footings. The mounting structures and the civil concrete footings must be designed structurally to be suitable to withstand all static loads (weight of modules, wind loads etc) minimum wind speed 35m/s with 3sec of gust pressure in harsh environment. The design submission must be as per ASTM-A36 and ASCE 7-10. The mounting structure components are bonded together to guarantee potential equalization. The work is to be carried out strictly as per attached drawings approved by IBA Engineer. Supply, Fabrication and the rate quoted is inclusive of the following:	Watt	146260.00	52.00	7,605,520.00	1,368,993.60	8,974,513.60	42.37	6,197,457.63	1,115,542.37	7,313,000.00	56.16	8,213,961.60	1,478,513.09	9,692,474.69	46.00	6,727,960.00	1,211,032.80	7,938,992.80	66.00	9,653,160.00	1,737,568.80	11,390,728.80
a Layout at Site approved by IBA Engineer as per attached drawing																						
b Civil work as per attached drawing and specifications approved by IBA Engineer.																						
c Placing of J Bolts, Nuts bolts as per attached drawing approved by IBA Engineer.																						
d Tilt angle is to be maintained as per recommended																						
e The Contractor shall remove all the debris and clear the site before & after the completion of work as per IBA direction																						
f After completion of the work the contractor shall submit the as-built drawing.																						
g All Allen bolts, nuts, bolts, washers, spring washers and screws for the project should be Stainless steel (SS 316).																						
h Applying protective coating system on MS steel structure, including proper surface preparation by mechanical cleaning to remove rust, mill scale, dust, oil, grease, and other contaminants. The coating system shall comprise two coats of Jotun Jotamastic 90 epoxy primer followed by two coats of Jotun Hardtop XP polyurethane topcoat, complete as per manufacturer's specifications including all materials, labor, tools, equipment, and surface preparation.																						
2 PV MODULES-186.66KWp:	Watt	146260.00	42.00	6,142,920.00	614,292.00	6,757,212.00	60.30	8,819,478.00	881,947.80	9,701,425.80	39.76	5,815,297.60	581,529.76	6,396,827.36	40.77	5,963,020.20	596,302.02	6,559,322.22	39.50	5,777,270.00	577,727.00	6,354,997.00
Supply of N-Type or any latest tech. bifacial Photovoltaic Solar Modules Tier 1 Type anti-reflective high transparency low iron tempered glass, with earthing provision. The modules STC parameters must be as under																						
(a) Min Power Pmax 710 or above Wp rated power																						
(b) Junction Box Protection Degree: IP 68																						
(c) Connection box, 4.0mm2 conductor cross section.																						
(d) Cable with, MC4 male and female connectors,																						
(e) Anodized Aluminum Frame and Support Bars																						
(f) PVC duct, Clamps & Accessories, support and labels to be installed under PV Array.																						
The Contractor shall provide manufacturer warranty for solar panel for a period not less than 25 years.																						
Contractor must submit all the required certificates for each PV solar panel from manufacturer as per specification.																						
All works and materials must be according to the drawings, specifications and supervisor engineer instruction's and approval.																						
Make: Jinko/Longi/Canadian																						





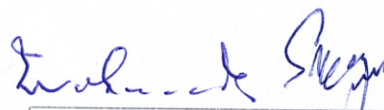

Muhammad Anwar Chairperson PC-A Chief Librarian, IBA Karachi	Syed Akbar Hussain Kazmi Member PC-A Manager Finance, IBA Karachi	Muhammad Harris Qureshi External Member PC-A Procurement Specialist, HEJ	Sadia Jabeen Asim External Member PC-A Senior Engineer (Civil), HEJ	Muhammad Hameez Member PC-A Sr. Manager Projects, IBA Khl.
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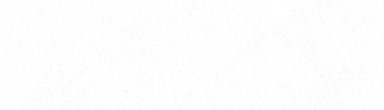
Comparative Statement

Design, Supply, Installation, Testing & Commissioning of 146.26 kW Carport Grid Tied Utility Interactive Photo Voltaic Solar Power System at IBA Main Campus Karachi

Tender # CW/05/26-27

3	GRID-TIED INVERTER (PCU)	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)
	Supply of DC/AC grid tie 3-phase inverter with data communication unit with Ethernet connection. The inverter must be suited to any PV module configuration, and depending on the system design and installation proposed and for the future extended also. (Leading Market brand, having annual production greater than 30W). The DC max power input rating should be at least 1.2 times of AC power at standard test condition (STC). The inverter unit shall be suitable for indoor and outdoor installations with IP65. The inverter must include safety concepts such as (triple protection with Opti protect, electronic strings fuses, self-learning string failure detection, DC surge arrester type (2) to ensure max availability. The inverter includes online monitoring with Wi-Fi Dongle. All works and materials must be according to the drawings, specifications and supervisor engineer instructions and approval.	Each	1.00	1,550,000.00	1,550,000.00	279,000.00	1,829,000.00	1,050,847.46	1,050,847.46	189,152.54	1,240,000.00	1,166,949.00	1,166,949.00	210,050.82	1,376,999.82	1,247,457.63	1,247,457.63	224,542.37	1,472,000.00	1,093,220.34	1,093,220.34	196,779.66	1,290,000.00
	Make: Sungrow/Huawei/SMA Power Rating: 110KW to 125KW																						
	Brief specification is as under:																						
	a. Max Input DC Voltage: 1100V																						
	b. MPPT Operating Voltage Range: 200V~1000V																						
	c. Min. 09 Independent MPPT Trackers																						
	d. Minimum Efficiency 98.0%																						
	e. Warranty: 5 Years (Extendable to 10 Years)																						
	f. Minimum IP rating should be IP65																						
	Supply of DC/AC grid tie 3-phase inverter with data communication unit with Ethernet connection. The inverter must be suited to any PV module configuration, and depending on the system design and installation proposed and for the future extended also. (Leading Market brand, having annual production greater than 16W). The DC max power input rating should be at least 1.2 times of AC power at standard test condition (STC). The inverter unit shall be suitable for indoor and outdoor installations with IP65. The inverter must include safety concepts such as (triple protection with Opti protect, electronic strings fuses, self-learning string failure detection, DC surge arrester type (2) to ensure max availability. The inverter includes online monitoring with Wi-Fi Dongle. All works and materials must be according to the drawings, specifications and supervisor engineer instructions and approval.	Each	1.00	750,000.00	750,000.00	135,000.00	885,000.00	542,372.88	542,372.88	97,627.12	640,000.00	631,525.00	631,525.00	113,674.50	745,199.50	701,694.92	701,694.92	126,305.08	828,000.00	627,118.64	627,118.64	112,881.36	740,000.00
	Make: Sungrow/Huawei/SMA Power Rating: 50KW to 60KW																						
	Brief specification is as under:																						
	a. Max Input DC Voltage: 1100V																						
	b. MPPT Operating Voltage Range: 200V~1000V																						
	c. Min. 09 Independent MPPT Trackers																						
	d. Minimum Efficiency 98.0%																						
	e. Warranty: 5 Years (Extendable to 10 Years)																						
	f. Minimum IP rating should be IP65																						
4	COMBINER BOXES	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)
a	DC COMBINER BOX																						
	Supply of DC box/Array Junction Box 14-gauge wall/frame mounted, Colour Code: RAL7035, MS Powder Coated with all accessories for outdoor usage IP65, proper cable glands as per cable size, slotted cable ducts should be installed for internal DC cabling. DC Combiner Box shall be provided with One DC Breaker 4Pole per string.	Each	1.00	250,000.00	250,000.00	45,000.00	295,000.00	127,118.64	127,118.64	22,881.36	150,000.00	126,085.00	126,085.00	22,695.30	148,780.30	253,389.83	253,389.83	45,610.17	299,000.00	450,000.00	450,000.00	81,000.00	531,000.00



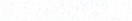



Muhammad Anwar Chairperson PC-A Chief Librarian, IBA Karachi	Syed Akbar Hussain Kazmi Member PC-A Manager Finance, IBA Karachi	Muhammad Haris Gurevshi External Member PC-A Procurement Specialist, HEJ	Sadia Jabeen Asim External Member PC-A Senior Engineer (Civil), HEJ	Muhammad Rameez Member PC-A Sr. Manager Projects, IBA KHI.
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Tender # CW/05/26-27

				
Muhammad Anwar Chairperson PC-A	Syed Akbar Hussain Kazmi Member PC-A	Muhammad Harris Qureshi External Member PC-A	Sedra Iqbal Awan External Member PC-A	Muhammad Rameez Member PC-A
Chief Librarian, IBA Karachi	Manager Finance, IBA Karachi	Procurement Specialist, HEJ	Senior Engineer (Civil), HEJ	Sr. Manager Projects, IBA Khi.

Design, Supply, Installation, Testing & Commissioning of 146.26 kWp Carport Grid Tied Utility Interactive Photo Voltaic Solar Power System at IBA Main Campus Karachi
Tender # CW/05/26-27

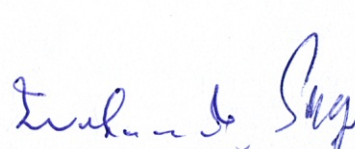
				
Muhammad Anwar Chairperson PC-A	Syed Akbar Hussain Kazmi Member PC-A	Muhammad Harris Qureshi External Member PC-A	Sadia Jabeen Asim External Member PC-A	Muhammad Rameez Member PC-A
Chief Librarian, IBA Karachi	Manager Finance, IBA Karachi	Procurement Specialist, HEJ	Senior Engineer (Civil), HEJ	Sr. Manager Projects, IBA Khi.

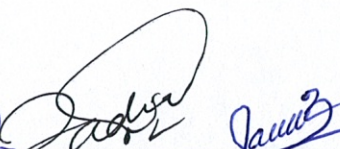
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ii)	Supply of following sizes 14SWG heavy Duty Perforated Powder coated Colour code RAL 7035 as per site requirement. Cable Tray 100mm x 75mm. Complete with all installation material such as angle iron support of size, round bar, elbows, Tee, Nuts, Bolts, Washer, Hilti drop-in anchor, etc. complete in all respect, as per the specification and drawings.	Meter	135.00	3,000.00	405,000.00	72,900.00	477,900.00	2,372.88	320,338.98	57,661.02	378,000.00	3,024.00	408,240.00	73,483.20	481,723.20	4,025.00	543,375.00	97,807.50	641,182.50	2,100.00	283,500.00	51,030.00	334,530.00
9	MISCELLANEOUS ITEMS	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)
i)	Supply of 3-inch UPVC SCH 40 conduit sockets, Bends, Elbows, T-Joints, G.I Clamps, complete in all respects. Make: Dadek/Jeddah/Galco/Steelex as IBA Engineer Approved.	Meter	30.00	600.00	18,000.00	3,240.00	21,240.00	1,118.64	33,559.32	6,040.68	39,600.00	540.00	16,200.00	2,916.00	19,116.00	862.50	25,875.00	4,657.50	30,532.50	2,400.00	72,000.00	12,960.00	84,960.00
ii)	Supply of 2-inch UPVC SCH 40 conduit sockets, Bends, Elbows, T-Joints, G.I Clamps, complete in all respects. Make: Dadek/Jeddah/Galco/Steelex as IBA Engineer Approved.	Meter	50.00	589.00	29,450.00	5,301.00	34,751.00	542.37	27,118.64	4,881.36	32,000.00	270.00	13,500.00	2,430.00	15,930.00	460.00	23,000.00	4,140.00	27,140.00	1,900.00	95,000.00	17,100.00	112,100.00
iii)	Supply of 1-inch UPVC SCH 40 conduit sockets, Bends, Elbows, T-Joints, G.I Clamps, complete in all respects. Make: Dadek/Jeddah/Galco/Steelex as IBA Engineer Approved.	Meter	40.00	279.00	11,160.00	2,008.80	13,168.80	279.66	11,186.44	2,013.56	13,200.00	130.00	5,200.00	936.00	6,136.00	402.50	16,100.00	2,898.00	18,998.00	1,290.00	51,600.00	9,288.00	60,888.00
iv)	Supply of 6-inch G.I conduit sockets, Bends, Elbows, T-Joints, G.I Clamps, complete in all respects. Make: IBA as IBA Engineer Approved.	Meter	20.00	18,000.00	360,000.00	64,800.00	424,800.00	3,050.85	61,016.95	10,983.05	72,000.00	3,780.00	75,600.00	13,608.00	89,208.00	2,530.00	50,600.00	9,108.00	59,708.00	3,100.00	62,000.00	11,160.00	73,160.00
v)	Supply and installation of a shed structure fabricated from 10-gauge steel, designed for Inverters, AC combiners, and DC combiners. The structure shall be engineered to safely withstand all relevant static loads, including the weight of equipment, and wind pressure corresponding to a minimum wind speed of 35 m/s. Structural and Installation Requirements: *The structure shall include complete footing works suitable for site conditions. *Minimum spacing of 500 mm shall be maintained between each inverter. *RCC Concrete 3000PSI footing pads shall be constructed. *Shed dimensions shall be adequate to accommodate the installation of at least two inverters, DC combiner boxes and AC combiner box, or as per actual site layout requirements. *All fasteners including nuts, bolts, plain washers, spring washers, Rawal bolts, and any other hardware components shall be of stainless steel grade S316 to ensure corrosion resistance and durability. *The complete shed structure shall be finished with a minimum of two coats of weather-resistant powder coating suitable for outdoor environmental conditions.	Job	1.00	750,000.00	750,000.00	135,000.00	885,000.00	423,728.81	423,728.81	76,271.19	500,000.00	216,000.00	216,000.00	38,880.00	254,880.00	843,065.00	843,065.00	151,751.70	994,816.70	1,050,000.00	1,050,000.00	189,000.00	1,239,000.00
vi)	Supply & Installation of 400A TP MCCB in existing LV Panel, including installation, testing, and commissioning. Ensure new breakers should be compatible with physical size and mounting to fit existing panels. Use appropriate insulation sleeves or heat shrink for phase identification. All installations to follow manufacturer's torque settings and guidelines. Ensure proper alignment and mechanical fixing using SS hardware.	Job	1.00	150,000.00	150,000.00	27,000.00	177,000.00	127,118.64	127,118.64	22,881.36	150,000.00	118,983.00	118,983.00	21,416.94	140,399.94	345,000.00	345,000.00	62,100.00	407,100.00	320,000.00	320,000.00	57,600.00	377,600.00



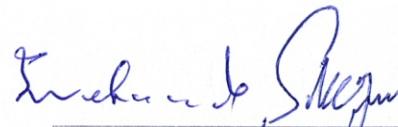

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Comparative Statement

Design, Supply, Installation, Testing & Commissioning of 146.26 kWp Carport Grid Tied Utility Interactive Photo Voltaic Solar Power System at IBA Main Campus Karachi

Tender # CW/05/26-27

Sl	SERVICES	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)
11	DESIGNING, FABRICATION, INSTALLATION, TESTING & COMMISSIONING OF FOLLOWING ITEMS COMPLETE IN ALL RESPECTS:	Watt	146260.00	3.00	438,780.00	65,817.00	504,597.00	2.18	319,227.08	47,884.06	367,111.14	11.39	1,665,901.40	249,885.21	1,915,786.61	5.75	840,677.04	126,101.56	966,778.60	1.63	238,403.80	-	238,403.80
i)	Fabrication, Installation, Testing & Commissioning of PV Mounting structure																						
ii)	Installation, Testing & Commissioning of Photovoltaic Solar Modules																						
iii)	Installation, Testing & Commissioning of Grid tie 3-phase Inverter with data communication unit with Ethernet connection																						
iv)	Installation, Testing & Commissioning of DC Box/Array Junction Box 14-gauge wall mounted with all accessories for outdoor usage																						
v)	Installation, Testing & Commissioning of AC Combiner Box (LV Panel) 14 gauge with all accessories for outdoor usage																						
vi)	Installation, Testing & Termination of DC Cable, 1 Core 6mm ² Cu/XLPO/XLFO cable complete in all respect with accessories.																						
vii)	Installation, Testing & Termination of the AC power cables complete in all respect with accessories.																						
viii)	Installation, Testing & Termination of Earthing Cables complete in all respect with accessories.																						
ix)	Installation, Testing and Commissioning of data Manager with Remote Monitoring System complete in all respect with accessories																						
x)	Installation of following sizes 165WG heavy Duty Perforated as per site requirement Cable Tray complete with all installation material.																						
xi)	Installation of UPVC conduit sockets, Bends, Elbows, T-joints, G.I. Clamps, complete in all respects.																						
xii)	Re-fixing pavers/Tiles/ Road Cutting as in position including providing sand, backfilling etc for AC & DC cables as per site requirements	Job	1.00	585,040.00	585,040.00	87,756.00	672,796.00	347,826.09	347,826.09	52,173.91	400,000.00	27,000.00	27,000.00	4,050.00	31,050.00	115,000.00	115,000.00	17,250.00	132,250.00	100,000.00	100,000.00	-	100,000.00
xiii)	Removal/Cutting of trees or shrubs at designated places for avoiding shadow at solar structure. Contractor also removes the debris/Tress from the site before start of the project and after completion of the project.	Job	1.00	87,756.00	87,756.00	13,163.40	100,919.40	80,000.00	80,000.00	12,000.00	92,000.00	10,800.00	10,800.00	1,620.00	12,420.00	252,919.50	252,919.50	37,937.93	290,857.43	100,000.00	100,000.00	-	100,000.00
xiv)	Removal/dismantling of street lighting poles at designated places for avoiding shadow at solar structure. The dismantled poles were subsequently transported safely from the IBA Main Campus to the IBA Staff Town scrap yard without any damage.	Job	1.00	731,300.00	731,300.00	109,695.00	840,995.00	434,782.61	434,782.61	65,217.39	500,000.00	21,600.00	21,600.00	3,240.00	24,840.00	345,000.00	345,000.00	51,750.00	396,750.00	145,000.00	145,000.00	-	145,000.00
xv)	Construct of concrete manholes/cable chambers (600mm x 600mm x 600mm deep) with heavy duty PCC covers with anti-rust paint, including all required sleeves for pulling underground power cables laid in pipes.	Each	5.00	50,000.00	250,000.00	37,500.00	287,500.00	25,000.00	125,000.00	18,750.00	143,750.00	10,800.00	54,000.00	8,100.00	62,100.00	57,500.00	287,500.00	43,125.00	330,625.00	32,000.00	160,000.00	24,000.00	184,000.00
12	OPERATION & MAINTENANCE	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)
	Two years of operations and maintenance is an integral activity of this EPC project, which will determine the success of this project. It is to be noted that 2 years O&M will be initiated after project closet is intended that the project performs as per design "Performance Commitment Table" while also maintaining the project to ensure reliability and longevity for 25 years. Industry best practices to be used to operate and maintain the solar PV Project. All necessary preventive and corrective actions to be shared and implemented before the start of the O&M contract. The following key performance metrics to be monitored and reported are as follows:	Watt	146260.00	4.00	585,040.00	87,756.00	672,796.00	4.92	719,920.97	107,988.15	827,909.12	7.00	1,023,820.00	153,573.00	1,177,393.00	10.54	1,541,453.22	231,217.98	1,772,671.20	5.75	840,995.00	-	840,995.00






Muhammad Anwar Chairperson PC-A	Syed Akbar Hussain Kazmi Member PC-A	Muhammad Hameed External Member PC-A	Hafida Jabeen Aslam External Member PC-A	Muhammad Rameez Member PC-A
Chief Librarian, IBA Karachi	Manager Finance, IBA Karachi	Procurement Specialist, HEJ	Senior Engineer (Civil), HEJ	Sr. Manager Projects, IBA KHI.

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- Cleaning of solar panels to remove dirt, dust, and debris (minimum twice in a month).
- Inspection of cables, connectors, junction boxes, and grounding systems.
- Tightening of bolts, screws, and clamps in mounting structures.
- Identifying and resolving faults in modules, inverters, or other components.
- Rapid response to critical failures to minimize downtime.
- Tracking key performance indicators (KPIs) such as energy output, PR (performance ratio), and system availability.
- Implementing software updates for inverters and monitoring systems.
- Managing claims for defective components under warranty.
- Implementing and maintaining safety measures for O&M personnel.

Performance Ratio (burn test) to be carried out for 15 days once project is completely installed and ready for testing. Monthly reports to be shared covering all aspects of solar PV performance including an event log. Any system under performance or failure of equipment will automatically trigger the requirement of a detailed root cause analysis RCA (based on site-based tests) and a report will have to be submitted at the earliest completion of an RCA.

				
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