

CLIENT		PROJECT				
Catholic Medical Mission Board (CMMB) South Sudan		Solar Power System for; CMMB Mvolo Field Office, Western Equatoria State, South Sudan				
K E. Detailed Engineer's BOQ for Hybrid with LiFeP04 ESS, PV System Design.		UOM	Make/Model	Qty	Rate (\$)	Amount (\$)
Item description		3.60 KWp				
1	PV array - KWp					
	Photovoltaic Modules: MonoCrystalline. 450Wp, 24V Nominal. High Efficiency, >20-years warranty	Pcs		8.0		
	Stable PV Premium Aluminum Solar Rails, 5100mm Long	Pcs		4.0		
	Aluminum Stable PV Solar Splice for Premium Rail	Pcs		4.0		
	Aluminum Stable PV L-Foot Kit for Solar Rail	Pcs		20.0		
	Aluminum Stable PV Mid Clamp kit	Pcs		16.0		
	Aluminum Stable PV End Clamp Kit for solar Rail	Pcs		8.0		
		Sub total				
		3.6 KW				
2	Hybrid Inverter/Charger/MPPT Solar Charge Controller					
	MPP Trackers-1 or more; Usable solar input current <20A; Usable MPP voltage range-270-800V; Nominal, AC output Voltage-415V - 230V / 50Hz; Total harmonic distortion <5%; Ideal Self-Consumption <1W; Peak efficiency >97%; Transformerless, Programmable; Sealed and designed for >40°C temps under extreme Weather Conditions	Pcs	SUN-3.6K-SG03LP1-EU	1.0		
		Sub total				
		10.40 KW/h				
3	Energy Storage System; - Lithium ion (LiFeP04) Battery bank - KWH					
	LiFePO4; 51.2VDC; Rated: >105Ah; Charge/Discharge Current: 100A/200A; efficiency: 97%; DoD: 100%; BMS-CAN Compatibility for Low or High Voltage Inverter Chargers; temp: -10°C to 55°C; Wall Mount or Stack Mount Configuration with Standard Accessories; Designed for long life.	Each	WECO 5K3 XP	2.0		
		Sub total				
4	Balance of System					
	Specialised PV Array Cable, fine multi stranded tinned copper, 2 Core, 6mm2, 1.5KVdc, UV resistant, XLPE insulated	meters		30.0		
	MC4 Connector, Male-Female, Housing & Connector Crimp Conductor Kit, 1500V - 30A	Pair		4.0		
	Breaker Box, with Din Rail, 8 ways, Metallic	Pcs		1.0		
	DC Disconnect: Cylindrical Cartridge fuse 10X38mm, 20Amp, 1000VDC	Each		2.0		
	Cylindrical fuse holder, 10X38mm, 500 - 1000VDC, for 2 to 32A fuses, DIN Rail mount.	Pcs		2.0		
	DC Surge Protective device, 2 Pole DIN Rail mount. - KHYS12. Un: 12V/DC, In: 20KA, Imax:40KA, Up: 350V	Each		2.0		
	DC Disconnect 200A / 48VDC (On/Off Switch for Battery Bank - Hybrid Inverter / Charger)	Each		1.0		
	Terminal Busbar, Pure Copper, 450mm2, rated for 1350A DC Max & 675A AC, 20 Terminal Studs - 3/8" 16	Pair		1.0		
	Metal Enclosure Box 600x500x240	Each		1.0		
	DC Cable, fine multi stranded copper 2X.50mm2, 450/750VDC, PVC insulated with standard Colour codes	meters		3.0		
	Cable lugs 10 mm2 - 8	Pcs		20.0		
	Cable lugs 16 mm2 - 8	Pcs		20.0		
	Cable lugs 50 mm2 - 10	Pcs		10.0		
	Consumer Unit, 1 phase 6way - Complete, Metallic (AC input and output BusBars)	Each		2.0		

AC Surge protective Device, 2 pole, Din rail mount.	Each		2.0
Cable, AC Load, Armoured, 4 core, 6mm, stranded pure copper, PVC / SWA. with standard colour codes	meters		25.0
Changeover Switch. 63 A , 230Vac 415Vac. 4 Pole, Manual, IP65, Metal Clad Enclosure	Each		1.0
Earth Wire. Single Core, 16mm, multi stranded pure copper. PVC Insulated with standard colour codes	meters		25.0
Earth Rod (Electrode) with clamp, 4 Feet. - Pure Copper	Each		3.0
Betonite Earthing Compound (Electrical Earthing Material) - 25Kg Bag	Bag		2.0
Lightning Arrester (Air terminal Component) 0.5m, pure Copper	Sets		1.0
Copper Tape, (Down Conductor), pure copper	meters		15.0
Copper Tape Clips	Each		30.0
Sub total			
5 Installation Supplies/Miscellaneous items			
MDF or Marine plex board	Each		1.0
Customized Battery Rack -Steel Fabricated.	lump sum		4.0
Perforated Metallic Cable Trays 150*50	Each		4.0
Trunking 100X100X3000 pvc heavy gauge	Each		4.0
Trunking 50X50X3000 pvc heavy gauge	Each		4.0
Trunking 25X38X3000 pvc heavy gauge	Each		6.0
Conduit pipes 25mm - 4 meters long, pvc heavy gauge	Each		10.0
Conduit Elbow / Bend 25mm 90 degrees pvc heavy Gauge	Each		10.0
Conduit couplers 25mm pvc heavy gauge	Each		10.0
Saddles clips 25mm GI	Each		30.0
PVC Solvent cement clear 118ml	Tins		2.0
Silicone Sealant	Each		2.0
Drywall Screw, twinfast thread, phosphated head. M4.2x32/3x1-1/4"	kgs		1.0
Steel Concrete Nails, 3" (12pcs package)	Pkts		3.0
Steel Concrete Nails, 2" (12pcs package)	Pkts		5.0
Expand Nails with Screws (Wall fisher plugs with screw in nails) 8mm	Pkts		2.0
Cable Zip Ties - 4.8 mm x 300 mm - Nylon (100pcs per packet)	Pkts		5.0
PVC Insulating tape - 0.18mm x 18mm x 20m	Each		10.0
Sub total			
6 Remuneration for; Feasibility study, System design, Installation and Commissioning			
Installation of all PV system Components; Testing, Commissioning & End-user Training	lump sum		1.0
Sub total			

Lot	Item description	U	Costs %	Qty	Rates(\$)	Costs(\$)
1	Photovoltaic Modules (Solar Panels): 450Wp, 241' Nominal Voltage Solar Array mount - Rooftop: using Aluminum rails and accessories	Pcs LS		8.0 1.0	\$0.0 \$0.0	
2	Hybrid Inverter/Charger/MPTT Solar Charge Controller, DEYE 3.6KW	Pcs		1.0	\$0.0	
3	Energy Storage System -LFP Battery Pack WECO 5k3 XP	Pcs		2.0	\$0.0	
4	Balance of System (Wires, Breakers, Fuses, SPDs, Earthing etc.)	LS		1.0	\$0.0	
5	Installation supplies (Fittings, Fixtures, ties, Battery racks, etc.)	LS		1.0	\$0.0	
6	Installation, Testing, Commissioning & End-user Training	LS		1.0	\$0.0	
Grade Totals						



CLIENT		PROJECT				
Catholic Medical Mission Board (CMMB) South Sudan		Solar Power System for: Mvolo PHCC Maternity and Pediatric Ward, Western Equatoria State, South Sudan				
RF Detailed Engineer's BOQ for Hybrid with LiFePO4 ESS, PV System Design.						
Lot	Item description	UOM	Make/Model	Qty	Rate (\$)	Amount (\$)
6.30 KWp						
1	PV array - KWp			14.0		
	Photovoltaic Modules; MonoCrystalline, 445Wp , 24V Nominal, High Efficiency, >20-years warranty	Pcs	AFRO450M18-	14.0		
	Stable PV Premium Aluminum Solar Rails, 5100mm Long	Pcs		7.0		
	Aluminum Stable PV Solar Splice for Premium Rail	Pcs		7.0		
	Aluminum Stable PV L-Foot Kit for Solar Rail	Pcs		35.0		
	Aluminum Stable PV Mid Clamp kit	Pcs		28.0		
	Aluminum Stable PV End Clamp Kit for solar Rail	Pcs		14.0		
Sub total						
5.0 KW						
2	Hybrid Inverter/Charger/MPPT Solar Charge Controller					
	MPP Trackers-1 or more; Usable solar input current <20A; Usable MPP voltage range-270-800V; Nominal, AC output Voltage-415V - 230V / 50Hz; Total harmonic distortion <5%; Ideal Self-Consumption <1W; Peak efficiency >97%; Transformerless, Programmable; Sealed and designed for >40°C temps under extreme Weather Conditions	Pcs	SUN-5K-SG03LPI-EU	1.0	1.0	
Sub total						
20.80 KWh						
3	Energy Storage System; - Lithium ion (LiFePO4) Battery bank -KWH					
	LiFePO4; 51.2VDC; Rated: >105Ah; Charge/Discharge Current: 100A/200A; efficiency: 97%; DoD: 100%; BMS-CAN Compatibility for Low or High Voltage Inverter Chargers; temp: -10°C to 55°C; Wall Mount or Stack Mount Configuration with Standard Accessories; Designed for long life.	Each	WECO 5K3 XP	4.0	4.0	
Sub total						
Balance of System						
4	Specialised PV Array Cable, fine multi stranded tinned copper, 2 Core, 6mm2, 1.5KVdc, UV resistant, XLPE insulated	meters		60.0		
	MC4 Connector, Male-Female, Housing & Connector Crimp Conductor Kit, 1500V - 30A	Pair		4.0		
	Breaker Box, with Din Rail, 8 ways, Metallic	Pcs		1.0		
	DC Disconnect: Cylindrical Cartridge fuse 10X38mm, 20Amp, 1000VDC	Each		2.0		
	Cylindrical fuse holder, 10X38mm, 500 - 1000VDC, for 2 to 32A fuses, DIN Rail mount.	Pcs		2.0		
	DC Surge Protective device, 2 Pole DIN Rail mount. - KHYS12. Un: 12V/DC, In: 20KA, Imax:40KA, Up: 350V	Each		2.0		
	DC Disconnect 200A / 48VDC (On/Off Switch for Battery Bank - Hybrid Inverter / Charger)	Each		1.0		
	Terminal Busbar, Pure Copper, 450mm2, rated for 1350A DC Max & 675A AC, 20 Terminal Studs - 3/8" 16	Pair		1.0		
	Metal Enclosure Box 600x500x240	Each		1.0		
	DC Cable, fine multi stranded copper 2X50mm2, 450/750VDC, PVC insulated with standard Colour codes	meters		5.0		
	Cable lugs 10 mm2 - 8	Pcs		20.0		
	Cable lugs 16 mm2 - 8	Pcs		20.0		
	Cable lugs 50 mm2 - 10	Pcs		14.0		
	Consumer Unit, 1 phase 6way - Complete, Metallic (AC input and output BusBars)	Each		2.0		

AC Surge protective Device, 2 pole, Din rail mount.	Each	2.0
Cable, AC Load, Armoured. 4 core, 6mm, stranded pure copper, PVC / SWA, with standard colour codes	meters	25.0
Changeover Switch, 63 A , 230Vac 415Vac, 4 Pole, Manual, IP65, Metal Clad Enclosure	Each	1.0
Earth Wire, Single Core, 16mm, multi stranded pure copper, PVC Insulated with standard colour codes	meters	25.0
Earth Rod (Electrode) with clamp, 4 Feet. - Pure Copper	Each	3.0
Betonite Earthing Compound (Electrical Earthing Material) - 25Kg Bag	Bag	2.0
Lightning Arrestor (Air terminal Component) 0.5m, pure Copper	Sets	1.0
Copper Tape, (Down Conductor), pure copper	meters	15.0
Copper Tape Clips	Each	30.0
Sub total		

5 Installation Supplies/Miscellaneous items

MDF or Marine plex board	Each	1.0
Customized Battery Rack -Steel Fabricated.	lump sum	4.0
Perforated Metallic Cable Trays 150*50	Each	4.0
Trunking 100X100X3000 pvc heavy gauge	Each	4.0
Trunking 50X50X3000 pvc heavy gauge	Each	4.0
Trunking 25X38X3000 pvc heavy gauge	Each	6.0
Conduit pipes 25mm - 4 meters long, pvc heavy gauge	Each	10.0
Conduit Elbow / Bend 25mm 90 degrees pvc heavy Gauge	Each	10.0
Conduit couplers 25mm pvc heavy gauge	Each	10.0
Saddles clips 25mm GI	Each	30.0
PVC Solvent cement clear 118ml	Tins	2.0
Silicone Sealant	Each	2.0
Drywall Screw, twinfast thread, phosphated head, M4.2x32/3x1-1/4"	kgs	1.0
Steel Concrete Nails, 3" (12pcs package)	Pkts	3.0
Steel Concrete Nails, 2" (12pcs package)	Pkts	5.0
Expand Nails with Screws (Wall fisher plugs with screw in nails) 8mm	Pkts	2.0
Cable Zip Ties - 4.8 mm x 300 mm - Nylon (100pcs per packet)	Pkts	5.0
PVC Insulating tape - 0.18mm x 18mm x 20m	Each	10.0
Sub total		

6 Remuneration for; Feasibility study, System design, Installation and Commissioning

Installation of all PV system Components; Testing, Commissioning & End-user Training	lump sum	1.0
Sub total		

Lot	Item description	U	Costs %	Qty	Rates(\$)	Costs(\$)
1	Photovoltaic Modules (Solar Panels): 450Wp, 24V Nominal Voltage	Pcs		14.0	\$0.0	
	Solar Array mount - Rooftop; using Aluminum rails and accessories	LS		1.0	\$0.0	
2	Hybrid Inverter/Charger/MPPT Solar Charge Controller, DEYE 5KW	Pcs		1.0	\$0.0	
3	Energy Storage System -LFP Battery Pack WECO 5k3 XP	Pcs		4.0	\$0.0	
4	Balance of System (Wires, Breakers, Fuses, SPDs, Earthing etc.)	LS		1.0	\$0.0	
5	Installation supplies (Fittings, Fixtures, ties, Battery racks, etc.)	LS		1.0	\$0.0	
6	Installation Testing, Commissioning & End-user Training	LS		1.0	\$0.0	
Grade Totals						



CLIENT		PROJECT				
Catholic Medical Mission Board (CMMB) South Sudan		Solar Power System for; Mvolo PHCC Operation Theater, Western Equatoria State, South Sudan				
RE: Detailed Engineer's BOQ for Hybrid with LiFePO4 ESS, PV System Design.						
Lot	Item description	UOM	Make/Model	Qty	Rate (\$)	Amount (\$)
7.20 KWp						
1	PV array - KWp Photovoltaic Modules; MonoCrystalline, 450Wp , 24V Nominal, High Efficiency, >20-years warranty	Pcs	AFRO450M8-72H	16.0	16.0	
	Stable PV Premium Aluminum Solar Rails, 5100mm Long	Pcs		8.0	8.0	
	Aluminum Stable PV Solar Splice for Premium Rail	Pcs		8.0	8.0	
	Aluminum Stable PV L-Foot Kit for Solar Rail	Pcs		40.0	40.0	
	Aluminum Stable PV Mid Clamp kit	Pcs		32.0	32.0	
	Aluminum Stable PV End Clamp Kit for solar Rail	Pcs		16.0	16.0	
Sub total						
5.0 KW						
2	Hybrid Inverter/Charger/MPPT Solar Charge Controller MPP Trackers-1 or more; Usable solar input current <20A; Usable MPP voltage range-270-800V; Nominal, AC output Voltage-415V - 230V / 50Hz; Total harmonic distortion <5%; Ideal Self-Consumption <1W; Peak efficiency >97%; Transformerless, Programmable; Sealed and designed for >40°C temps under extreme Weather Conditions	Pcs	SUN-5K-SG03LP1-EU	1.0	1.0	
Sub total						
3	Energy Storage System; - Lithium ion (LiFePO4) Battery bank -KWH LiFePO4; 51.2VDC; Rated: >105Ah; Charge/Discharge Current: 100A/200A; efficiency: 97%; DoD: 100%; BMS-CAN Compatibility for Low or High Voltage Inverter Chargers; temp: -10°C to 55°C; Wall Mount or Stack Mount Configuration with Standard Accessories; Designed for long life.	Each	WECO 5K3 XP	5.0	5.0	
Sub total						
26.00 KWWh						
4	Balance of System Specialised PV Array Cable, fine multi stranded tinned copper, 2 Core, 6mm ² , 1.5KVdc, UV resistant, XLPE insulated MC4 Connector, Male-Female, Housing & Connector Crimp Conductor Kit, 1500V - 30A Breaker Box, with Din Rail, 8 ways, Metallic DC Disconnect: Cylindrical Cartridge fuse 10X38mm, 20Amp, 1000VDC Cylindrical fuse holder, 10X38mm, 500 - 1000VDC, for 2 to 32A fuses, DIN Rail mount. DC Surge Protective device, 2 Pole DIN Rail mount. - KHYS12. Un: 12V/DC, In: 20KA, Imax:40KA, Up: 350V DC Disconnect 200A / 48VDC (On/Off Switch for Battery Bank - Hybrid Inverter / Charger) Terminal Busbar, Pure Copper, 450mm ² , rated for 1350A DC Max & 675A AC, 20 Terminal Studs - 3/8" 16 Metal Enclosure Box 600x500x240 DC Cable, fine multi stranded copper 2X50mm ² , 450/750VDC, PVC insulated with standard Colour codes Cable lugs 10 mm ² - 8 Cable lugs 16 mm ² - 8 Cable lugs 50 mm ² - 10 Consumer Unit, 1 phase 6way - Complete, Metallic (AC input and output BusBars)	meters Pair Pcs Each Pcs Each Each Pair Each meters Pcs Pcs Pcs Each	60.0 4.0 1.0 2.0 2.0 2.0 1.0 1.0 1.0 8.0 20.0 20.0 16.0 2.0			

AC Surge protective Device, 2 pole, Din rail mount.	Each		2.0
Cable, AC Load, Armoured, 4 core, 6mm, stranded pure copper, PVC / SWA, with standard colour codes	meters		25.0
Changeover Switch, 63 A, 230Vac 415Vac, 4 Pole, Manual, IP65, Metal Clad Enclosure	Each		1.0
Earth Wire, Single Core, 16mm, multi stranded pure copper, PVC Insulated with standard colour codes	meters		25.0
Earth Rod (Electrode) with clamp, 4 Feet, - Pure Copper	Each		3.0
Betonite Earthing Compound (Electrical Earthing Material) - 25Kg Bag	Bag		2.0
Lightning Arrester (Air terminal Component) 0.5m, pure Copper	Sets		1.0
Copper Tape, (Down Conductor), pure copper	meters		15.0
Copper Tape Clips	Each		30.0
Sub total			

5 Installation Supplies/Miscellaneous items			
MDF or Marine plex board	Each		1.0
Customized Battery Rack -Steel Fabricated.	lump sum		4.0
Perforated Metallic Cable Trays 150*50	Each		4.0
Trunking 100X100X3000 pvc heavy gauge	Each		4.0
Trunking 50X50X3000 pvc heavy gauge	Each		4.0
Trunking 25X38X3000 pvc heavy gauge	Each		6.0
Conduit pipes 25mm - 4 meters long, pvc heavy gauge	Each		10.0
Conduit Elbow / Bend 25mm 90 degrees pvc heavy Gauge	Each		10.0
Conduit couplers 25mm pvc heavy gauge	Each		10.0
Saddles clips 25mm GI	Each		30.0
PVC Solvent cement clear 118ml	Tins		2.0
Silicone Sealant	Each		2.0
Drywall Screw, twinfast thread, phosphated head, M4.2x32/3x1-1/4"	kgs		1.0
Steel Concrete Nails, 3" (12pcs package)	Pkts		3.0
Steel Concrete Nails, 2" (12pcs package)	Pkts		5.0
Expand Nails with Screws (Wall fisher plugs with screw in nails) 8mm	Pkts		2.0
Cable Zip Ties - 4.8 mm x 300 mm - Nylon (100pcs per packet)	Pkts		5.0
PVC Insulating tape - 0.18mm x 18mm x 20m	Each		10.0
Sub total			

6 Remuneration for; Feasibility study, System design, Installation and Commissioning			
Installation of all PV system Components; Testing, Commissioning & End-user Training	lump sum		1.0
Sub total			

Lot	Item description	U	Costs %	Qty	Rates(\$)	Costs(\$)
1	Photovoltaic Modules (Solar Panels); 450Wp, 24V Nominal Voltage	Pcs		16.0		
	Solar Array mount - Rooftop; using <i>Aluminum rails and accessories</i>	LS		1.0		
2	Hybrid Inverter/Charger/MPPT Solar Charge Controller, DEYE 5KW	Pcs		1.0		
3	Energy Storage System -LFP Battery Pack WECO 5k3 XP	Pcs		5.0		
4	Balance of System (<i>Wires, Breakers, Fuses, SPDs, Earthing etc.</i>)	LS		1.0		
5	Installation supplies (<i>Fittings, Fixtures, ties, Battery racks, etc.</i>)	LS		1.0		
6	<i>Installation, Testing, Commissioning & End-user Training</i>	LS		1.0		
Grade Totals						

