LIST OF COMMUNITY/ PUBLIC FACILITIES TO BE SOLARISED - PUNJAB - LOT#8					
Sr. No.	**Facility Name**	**Province**	**District**	**Coordinates**	**Sector**
1	Boys Middle School No.1 Kot Chandna	Punjab	Mianwali	32.970911, 71.488071	Education
2	Boys Primary School No.2 Kot Chandna	Punjab	Mianwali	32.977782, 71.489107	Education
3	Boys Primary School No.3 Kot Chandna	Punjab	Mianwali	32.975498, 71.470406	Education
4	Girls Middle School No. 1 Kot Chandna	Punjab	Mianwali	32.97071, 71.489703	Education
5	Girls Primary School No.3 Kot Chandna	Punjab	Mianwali	32.982769, 71.489848	Education
6	Govt Girls High School Mari Kanjoor District Attock	Punjab	Attock	33.75661389, 72.35349722	Education
7	Govt Girls Primary School Dhoke Sharfa District Attock	Punjab	Attock	33.76038333, 72.36533611	Education
8	Govt Girls Elementary School Jassian District Attock.	Punjab	Attock	33.75704167, 72.367925	Education
9	Govt Boys High School No. 02 Hazro District Attock.	Punjab	Attock	33.91225278, 72.4937	Education
10	Govt Boys High School No. 01 Fateh Jang District Attock	Punjab	Fateh Jung/ Attock	33.57527778, 72.65694444	Education
11	Govt Girls Primary School No. 02 Fateh Jang District Attock.	Punjab	Fateh Jung/ Attock	33.56557222, 72.656318	Education
12	Govt Boys Primary School Mian Noor Tehsil Fateh Jang District Attock	Punjab	Fateh Jung/ Attock	33.56557222, 72.656318	Education
13	Govt Girls Primary School No. 01 Fateh Jang District Attock.	Punjab	Fateh Jung/ Attock	33.56546111, 72.64375833	Education
14	Govt Boys Elementary School Hassan abdal Tehsil & District Attock	Punjab	Attock	34.2414, 72.6867	Education
15	Govt Boys High School Hassan abdal Tehsil & District Attock	Punjab	Attock	33.81699167, 72.69401389	Education
16	Govt Girls Elementary School Hassan abdal Tehsil & District Attock	Punjab	Attock	33.82091389, 72.68366667	Education
17	Govt Boys High School PindiGheb No. 02 Tehsil Pindigheb District Attock	Punjab	Attock	33.81699167, 72.69401389	Education

SOLARIZATION OF BOYS MIDDLE SCHOOL NO 01 KOT CHANDNA			
BILL OF QUANTITIES (BOQ)			
S.#	**Description**	**Unit**	**Qty**
1	**PV System Capacity: 5.6 kW**	**TO BE PROVIDED BY UNHCR**	
2	**OFF-GRID HYBRID INVERTERS: 5 kVA**		
3	**Lithium Ion Battery: 7 kWh**		
4	**PV Mounting Structure**		
a	Hot dipped (80 microns Average) Galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	per Watt	5590
5	**Misc Items**		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to Inverter	R.M	50
b	Single Core DC Flexible Copper Cables 35mm sq for battery connections	R.M	6
c	DC Breakers 16A-2P between PV Modules and Inverter	Each	1
d	50 Amp/48V 2-P DC Breaker b/w inverter & battery bank	Each	1
e	AC Cables 25 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	100
f	32 Amp AC Breaker 2-P in Main Distribution Box	Each	1
g	10 Amp AC Breaker 1-P b/w inverter & Load	Each	3
h	Changeover Switches 30 Amp	No	1
i	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	1
j	Inauguration/Sign Board	No	1
k	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.), Surge Protection Device at DC & AC input, complete in all respect.	Job	1

SOLARIZATION OF BOYS PRIMARY SCHOOL NO 02 KOT CHANDNA			
BILL OF QUANTITIES (BOQ)			
S.#	**Description**	**Unit**	**Qty**
1	**PV System Capacity: 3.8 kW**	**TO BE PROVIDED BY UNHCR**	
2	**OFF-GRID HYBRID INVERTERS: 5 kVA**		
3	**Lithium Ion Battery: 6 kWh**		
4	**PV Mounting Structure**		
a	Hot dipped (80 microns Average) Galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	per Watt	3780
5	**Misc Items**		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to Inverter	R.M	50
b	Single Core DC Flexible Copper Cables 35mm sq for battery connections	R.M	6
c	DC Breakers 16A-2P between PV Modules and Inverter	Each	1
d	50 Amp/48V 2-P DC Breaker b/w inverter & battery bank	Each	1
e	AC Cables 25 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	100
f	32 Amp AC Breaker 2-P in Main Distribution Box	Each	1
g	10 Amp AC Breaker 1-P b/w inverter & Load	Each	3
h	Changeover Switches 30 Amp	No	1
i	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	1
j	Inauguration/Sign Board	No	1
k	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.), Surge Protection Device at DC & AC input, complete in all respect.	Job	1

SOLARIZATION OF BOYS PRIMARY SCHOOL NO 03 KOT CHANDNA			
BILL OF QUANTITIES (BOQ)			
S.#	**Description**	**Unit**	**Qty**
1	**PV System Capacity: 5.1 kW**	**TO BE PROVIDED BY UNHCR**	
2	**OFF-GRID HYBRID INVERTERS: 5 kVA**		
3	**Lithium Ion Battery: 6 kWh**		
4	**PV Mounting Structure**		
a	Hot dipped (80 microns Average) Galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	per Watt	5120
5	**Misc Items**		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to Inverter	R.M	50
b	Single Core DC Flexible Copper Cables 35mm sq for battery connections	R.M	6
c	DC Breakers 16A-2P between PV Modules and Inverter	Each	1
d	50 Amp/48V 2-P DC Breaker b/w inverter & battery bank	Each	1
e	AC Cables 25 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	100
f	32 Amp AC Breaker 2-P in Main Distribution Box	Each	1
g	10 Amp AC Breaker 1-P b/w inverter & Load	Each	3
h	Changeover Switches 30 Amp	No	1
i	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	1
j	Inauguration/Sign Board	No	1
k	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.), Surge Protection Device at DC & AC input, complete in all respect.	Job	1

SOLARIZATION OF GIRLS MIDDLE SCHOOL NO 01 KOT CHANDNA			
BILL OF QUANTITIES (BOQ)			
S. #	**Description**	**Unit**	**Qty**
1	**PV System Capacity: 3.15 kW**	**TO BE PROVIDED BY UNHCR**	
2	**OFF-GRID HYBRID INVERTERS: 5 kVA**		
3	**Lithium Ion Battery: 3 kWh**		
4	**PV Mounting Structure**		
a	Hot dipped (80 microns Average) Galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	per Watt	3150
5	**Misc Items**		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to Inverter	R.M	50
b	Single Core DC Flexible Copper Cables 35mm sq for battery connections	R.M	6
c	DC Breakers 16A-2P between PV Modules and Inverter	Each	1
d	50 Amp/48V 2-P DC Breaker b/w inverter & battery bank	Each	1
e	AC Cables 25 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	100
f	32 Amp AC Breaker 2-P in Main Distribution Box	Each	1
g	10 Amp AC Breaker 1-P b/w inverter & Load	Each	3
h	Changeover Switches 30 Amp	No	1
i	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	1
j	Inauguration/Sign Board	No	1
k	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.), Surge Protection Device at DC & AC input, complete in all respect.	Job	1

SOLARIZATION OF GIRLS PRIMARY SCHOOL NO 03 KOT CHANDNA			
BILL OF QUANTITIES (BOQ)			
S.#	**Description**	**Unit**	**Qty**
1	**PV System Capacity: 4.62 kW**	**TO BE PROVIDED BY UNHCR**	
2	**OFF-GRID HYBRID INVERTERS: 5 kVA**		
3	**Lithium Ion Battery: 6 kWh**		
4	**PV Mounting Structure**		
a	Hot dipped (80 microns Average) Galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	per Watt	4620
5	**Misc Items**		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to Inverter	R.M	50
b	Single Core DC Flexible Copper Cables 35mm sq for battery connections	R.M	6
c	DC Breakers 16A-2P between PV Modules and Inverter	Each	1
d	50 Amp/48V 2-P DC Breaker b/w inverter & battery bank	Each	1
e	AC Cables 25 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	100
f	32 Amp AC Breaker 2-P in Main Distribution Box	Each	1
g	10 Amp AC Breaker 1-P b/w inverter & Load	Each	3
h	Changeover Switches 30 Amp	No	1
i	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	1
j	Inauguration/Sign Board	No	1
k	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.), Surge Protection Device at DC & AC input, complete in all respect.	Job	1

SOLARIZATION OF GGHS MARI KANJOR			
BILL OF QUANTITIES (BOQ)			
S.#	**Description**	**Unit**	**Qty**
1	**PV System Capacity: 23.65 kW**	**TO BE PROVIDED BY UNHCR**	
2	**On-GRID HYBRID INVERTERS: 20 kVA**		
3	**Lithium Ion Battery: 10 kWh**		
4	**PV Mounting Structure**		
a	Hot dipped (80 microns Average) Galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	per Watt	23650
5	**Misc Items**		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to DC combiner box to Inverter	R.M	100
b	Single Core DC Flexible Copper Cables 16mm sq from DC combiner box to Inverter	R.M	50
c	Single Core DC Flexible Copper Cables 25mm sq for battery connections	R.M	10
d	DC Breakers 63A-2P between DC combiner box and Inverter	Each	1
e	63 Amp/48V 2-P DC Breaker b/w inverter & battery bank	Each	1
f	AC Cables 10 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	30
g	63 Amp 4-P AC Breaker btw WAPDA & Inverter, Inverter & Load	Each	2
h	10 Amp AC Breaker 1-P b/w inverter & Load	Each	6
i	Changeover Switches 100 Amp	No	1
j	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	1
l	Inauguration/Sign Board	No	1
m	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.) DC Combiner box, Surge Protection Device at DC & AC input. complete in all respect.	Job	1
6	**Application for Net-Metering and Installation of Bi-Directional Energy Meter**		
a	Preparation & Submission of Complete Net-Metering Case as per the guidelines of DISCO, AEDB, NEPRA including supply and installation of Bi-directional, Approved Energy Meter with all requisite utility fee on behalf of the Employer and fulfillment of all prescribed formalities, complete in all respect.	Job	1

SOLARIZATION OF GGPS DHOKE SHARFAN			
BILL OF QUANTITIES (BOQ)			
S.#	**Description**	**Unit**	**Qty**
1	**PV System Capacity: 5.9 kW**	**TO BE PROVIDED BY UNHCR**	
2	**OFF-GRID HYBRID INVERTERS: 5 kVA**		
3	**Lithium Ion Battery: 3 kWh**		
4	**PV Mounting Structure**		
a	Hot dipped (80 microns Average) Galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	per Watt	5930
5	**Misc Items**		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to Inverter	R.M	50
b	Single Core DC Flexible Copper Cables 35mm sq for battery connections	R.M	6
c	DC Breakers 16A-2P between PV Modules and Inverter	Each	1
d	50 Amp/48V DC Breaker 2-P String b/w inverter & battery bank	Each	1
e	AC Cables 25 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	100
f	32 Amp AC Breaker 2-P in Main Distribution Box	Each	1
g	10 Amp AC Breaker 1-P b/w inverter & Load	Each	6
h	Changeover Switches 30 Amp	No	1
i	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	1
j	Inauguration/Sign Board	No	1
k	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.), Surge Protection Device at DC & AC input, complete in all respect.	Job	1

SOLARIZATION OF GGES JESSIAN BILL OF QUANTITIES (BOQ)			
S. #	**Description**	**Unit**	**Qty**
1	**PV System Capacity: 15 kW**	**TO BE PROVIDED BY UNHCR**	
2	**On-GRID HYBRID INVERTERS: 15 kVA**		
3	**Lithium Ion Battery: 6 kWh**		
4	**PV Mounting Structure**		
a	Hot dipped (80 microns Average) Galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	per Watt	14960
5	**Misc Items**		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to DC Combiner box	R.M	80
b	Single Core DC Flexible Copper Cables 35mm sq for battery connections	R.M	6
c	DC Breakers 32A-2P between PV Modules and Inverter	Each	1
d	50 Amp/48V DC Breaker 2-P String b/w inverter & battery bank	Each	1
e	AC Cables 25 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	100
f	63 Amp AC Breaker 2-P in Main Distribution Box	Each	1
g	10 Amp AC Breaker 1-P b/w inverter & Load	Each	10
h	Changeover Switches 30 Amp	No	1
i	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	1
j	Inauguration/Sign Board	No	1
k	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.) DC Combiner box, Surge Protection Device at DC & AC input.complete in all respect.	Job	1
6	**Application for Net-Metering and Installation of Bi-Directional Energy Meter**		
a	Preparation & Submission of Complete Net-Metering Case as per the guidelines of DISCO, AEDB, NEPRA including supply and installation of Bi-directional, Approved Energy Meter with all requisite utility fee on behalf of the Employer and fulfillment of all prescribed formalities, complete in all respect.	Job	1

SOLARIZATION OF GBHS NO 2 HAZRO BILL OF QUANTITIES (BOQ)			
S. #	**Description**	**Unit**	**Qty**
1	**PV System Capacity: 13 kW**	**TO BE PROVIDED BY UNHCR**	
2	**On-GRID HYBRID INVERTERS: 10 kVA**		
3	**Lithium Ion Battery: 6 kWh**		
4	**PV Mounting Structure**		
a	Hot dipped (80 microns Average) Galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	per Watt	12900
5	**Misc Items**		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to DC combiner box to Inverter	R.M	80
b	Single Core DC Flexible Copper Cables 35mm sq from DC combiner box to Inverter	R.M	6
c	DC Breakers 32A-2P between PV Modules and Inverter	Each	1
d	50 Amp/48V DC Breaker 2-P String b/w inverter & battery bank	Each	1
e	AC Cables 25 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	100
f	63 Amp AC Breaker 2-P in Main Distribution Box	Each	1
g	10 Amp AC Breaker 1-P b/w inverter & Load	Each	10
h	Changeover Switches 30 Amp	No	1
i	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	1
j	Inauguration/Sign Board	No	1
k	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.) DC Combiner box, Surge Protection Device at DC & AC input. complete in all respect.	Job	1
6	**Application for Net-Metering and Installation of Bi-Directional Energy Meter**		
a	Preparation & Submission of Complete Net-Metering Case as per the guidelines of DISCO, AEDB, NEPRA including supply and installation of Bi-directional, Approved Energy Meter with all requisite utility fee on behalf of the Employer and fulfillment of all prescribed formalities, complete in all respect.	Job	1

SOLARIZATION OF GBHS NO 01 FATEH JANG BILL OF QUANTITIES (BOQ)			
S. #	**Description**	**Unit**	**Qty**
1	**PV System Capacity: 105 kW**	**TO BE PROVIDED BY UNHCR**	
2	**On-GRID HYBRID INVERTERS: 90 kVA**		
3	**Lithium Ion Battery: 74 kWh**		
4	**PV Mounting Structure**		
a	Hot dipped (80 microns Average) Galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	per Watt	104980
5	**Misc Items**		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to DC combiner box	R.M	500
b	Single Core DC Flexible Copper Cables 50mm sq from DC combiner box to Inverter	R.M	200
c	Single Core DC Flexible Copper Cables 50mm sq for battery connections	R.M	20
d	DC Breakers 170A-4P between DC combiner box and Inverter	Each	1
e	200 Amp/48V 4-P DC Breaker b/w inverter & battery bank	Each	1
f	AC Cables 70 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	50
g	220 Amp 4-P AC Breaker btw WAPDA & Inverter, Inverter & Load	Each	2
h	10 Amp AC Breaker 1-P b/w inverter & Load	Each	20
i	Changeover Switches 150 Amp	No	1
j	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	4
k	Inauguration/Sign Board	No	1
l	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.) DC Combiner box, Surge Protection Device at DC & AC input. complete in all respect.	Job	1
6	**Application for Net-Metering and Installation of Bi-Directional Energy Meter**		
a	Preparation & Submission of Complete Net-Metering Case as per the guidelines of DISCO, AEDB, NEPRA including supply and installation of Bi-directional, Approved Energy Meter with all requisite utility fee on behalf of the Employer and fulfillment of all prescribed formalities, complete in all respect.	Job	1

SOLARIZATION OF GGPS NO 2 FATEH JANG BILL OF QUANTITIES (BOQ)			
S. #	**Description**	**Unit**	**Qty**
1	**PV System Capacity: 7.2 kW**	**TO BE PROVIDED BY UNHCR**	
2	**OFF-GRID HYBRID INVERTERS: 5 kVA**		
3	**Lithium Ion Battery: 8 kWh**		
4	**PV Mounting Structure**		
a	Hot dipped (80 microns Average) Galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	per Watt	7220
5	**Misc Items**		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to Inverter	R.M	50
b	Single Core DC Flexible Copper Cables 35mm sq for battery connections	R.M	6
c	DC Breakers 16A-2P between PV Modules and Inverter	Each	1
d	50 Amp/48V DC Breaker 2-P String b/w inverter & battery bank	Each	1
e	AC Cables 25 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	100
f	32 Amp AC Breaker 2-P in Main Distribution Box	Each	1
g	10 Amp AC Breaker 1-P b/w inverter & Load	Each	6
h	Changeover Switches 30 Amp	No	1
i	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	1
j	Inauguration/Sign Board	No	1
k	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.), Surge Protection Device at DC & AC input, complete in all respect.	Job	1

SOLARIZATION OF GBPS MIAN NOOR FATEH JANG			
BILL OF QUANTITIES (BOQ)			
S. #	**Description**	**Unit**	**Qty**
1	**PV System Capacity: 4.4 kW**	**TO BE PROVIDED BY UNHCR**	
2	**OFF-GRID HYBRID INVERTERS: 5 kVA**		
3	**Lithium Ion Battery: 4 kWh**		
4	**PV Mounting Structure**		
a	Hot dipped (80 microns Average) Galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	per Watt	4400
5	**Misc Items**		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to Inverter	R.M	50
b	Single Core DC Flexible Copper Cables 35mm sq for battery connections	R.M	6
c	DC Breakers 16A-2P between PV Modules and Inverter	Each	1
d	50 Amp/48V DC Breaker 2-P String b/w inverter & battery bank	Each	1
e	AC Cables 25 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	100
f	32 Amp AC Breaker 2-P in Main Distribution Box	Each	1
g	10 Amp AC Breaker 1-P b/w inverter & Load	Each	6
h	Changeover Switches 30 Amp	No	1
i	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	1
j	Inauguration/Sign Board	No	1
k	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.), Surge Protection Device at DC & AC input, complete in all respect.	Job	1

SOLARIZATION OF GGPS NO 1 FATEH JANG BILL OF QUANTITIES (BOQ)			
S. #	**Description**	**Unit**	**Qty**
1	**PV System Capacity: 4.5 kW**	**TO BE PROVIDED BY UNHCR**	
2	**OFF-GRID HYBRID INVERTERS: 5 kVA**		
3	**Lithium Ion Battery: 5 kWh**		
4	**PV Mounting Structure**		
a	Hot dipped (80 microns Average) Galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	per Watt	4540
5	**Misc Items**		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to Inverter	R.M	50
b	Single Core DC Flexible Copper Cables 35mm sq for battery connections	R.M	6
c	DC Breakers 16A-2P between PV Modules and Inverter	Each	1
d	50 Amp/48V DC Breaker 2-P String b/w inverter & battery bank	Each	1
e	AC Cables 25 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	100
f	32 Amp AC Breaker 2-P in Main Distribution Box	Each	1
g	10 Amp AC Breaker 1-P b/w inverter & Load	Each	6
h	Changeover Switches 30 Amp	No	1
i	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	1
j	Inauguration/Sign Board	No	1
k	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.), Surge Protection Device at DC & AC input, complete in all respect.	Job	1

SOLARIZATION OF GBES HASSAN ABDAL			
BILL OF QUANTITIES (BOQ)			
S. #	**Description**	**Unit**	**Qty**
1	**PV System Capacity: 36 kW**	**TO BE PROVIDED BY UNHCR**	
2	**On-GRID HYBRID INVERTERS: 30 kVA**		
3	**Lithium Ion Battery: 15 kWh**		
4	**PV Mounting Structure**		
a	Hot dipped (80 microns Average) Galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	per Watt	36040
5	**Misc Items**		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to DC combiner box	R.M	150
b	Single Core DC Flexible Copper Cables 35mm sq from DC combiner box to Inverter	R.M	50
c	Single Core DC Flexible Copper Cables 35mm sq for battery connections	R.M	10
d	DC Breakers 100A-4P between DC combiner box and Inverter	Each	1
e	100 Amp/48V 4-P DC Breaker b/w inverter & battery bank	Each	1
f	AC Cables 16 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	30
g	63 Amp 4-P AC Breaker btw WAPDA & Inverter, Inverter & Load	Each	2
h	10 Amp AC Breaker 1-P b/w inverter & Load	Each	6
i	Changeover Switches 100 Amp	No	1
j	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	2
k	Inauguration/Sign Board	No	1
l	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.) DC Combiner box, Surge Protection Device at DC & AC input. complete in all respect.	Job	1
6	**Application for Net-Metering and Installation of Bi-Directional Energy Meter**		
a	Preparation & Submission of Complete Net-Metering Case as per the guidelines of DISCO, AEDB, NEPRA including supply and installation of Bi-directional, Approved Energy Meter with all requisite utility fee on behalf of the Employer and fulfillment of all prescribed formalities, complete in all respect.	Job	1

SOLARIZATION OF GBHSS HASSAN ABDAL BILL OF QUANTITIES (BOQ)			
S. #	**Description**	**Unit**	**Qty**
1	**PV System Capacity: 77 kW**	**TO BE PROVIDED BY UNHCR**	
2	**On-GRID HYBRID INVERTERS: 65 kVA**		
3	**Lithium Ion Battery: 63 kWh**		
4	**PV Mounting Structure**		
a	Hot dipped (80 microns Average) Galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	per Watt	77230
5	**Misc Items**		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to DC combiner box	R.M	300
b	Single Core DC Flexible Copper Cables 35mm sq from DC combiner box to Inverter	R.M	60
c	Single Core DC Flexible Copper Cables 50mm sq for battery connections	R.M	10
d	DC Breakers 155A-4P between DC combiner box and Inverter	Each	1
e	200 Amp/48V 4-P DC Breaker b/w inverter & battery bank	Each	1
f	AC Cables 50 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	30
g	150 Amp 4-P AC Breaker btw WAPDA & Inverter, Inverter & Load	Each	2
h	10 Amp AC Breaker 1-P b/w inverter & Load	Each	21
i	Changeover Switches 150 Amp	No	1
j	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	2
k	Inauguration/Sign Board	No	1
l	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.) DC Combiner box, Surge Protection Device at DC & AC input. Dry Chemical Powder Fire Extinguisher 6Kg Capacity complete in all respect.	Job	1
6	**Application for Net-Metering and Installation of Bi-Directional Energy Meter**		
a	Preparation & Submission of Complete Net-Metering Case as per the guidelines of DISCO, AEDB, NEPRA including supply and installation of Bi-directional, Approved Energy Meter with all requisite utility fee on behalf of the Employer and fulfillment of all prescribed formalities, complete in all respect.	Job	1

SOLARIZATION OF GGES HASSAN ABDAL			
BILL OF QUANTITIES (BOQ)			
S. #	**Description**	**Unit**	**Qty**
1	**PV System Capacity: 28.4 kW**	**TO BE PROVIDED BY UNHCR**	
2	**On-GRID HYBRID INVERTERS: 25 kVA**		
3	**Lithium Ion Battery: 14 kWh**		
4	**PV Mounting Structure**		
a	Hot dipped (80 microns Average) Galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	per Watt	28430
5	**Misc Items**		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to DC combiner box	R.M	150
b	Single Core DC Flexible Copper Cables 35mm sq from DC combiner box to Inverter	R.M	50
c	Single Core DC Flexible Copper Cables 35mm sq for battery connections	R.M	10
d	DC Breakers 63A-4P between DC combiner box and Inverter	Each	1
e	100 Amp/48V 4-P DC Breaker b/w inverter & battery bank	Each	1
f	AC Cables 25 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	30
g	63 Amp 4-P AC Breaker btw WAPDA & Inverter, Inverter & Load	Each	2
h	10 Amp AC Breaker 1-P b/w inverter & Load	Each	6
i	Changeover Switches 100 Amp	No	1
j	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	1
k	Inauguration/Sign Board	No	1
l	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.) DC Combiner box, Surge Protection Device at DC & AC input. Dry Chemical Powder Fire Extinguisher 6Kg Capacity complete in all respect.	Job	1
6	**Application for Net-Metering and Installation of Bi-Directional Energy Meter**		
a	Preparation & Submission of Complete Net-Metering Case as per the guidelines of DISCO, AEDB, NEPRA including supply and installation of Bi-directional, Approved Energy Meter with all requisite utility fee on behalf of the Employer and fulfillment of all prescribed formalities, complete in all respect.	Job	1

SOLARIZATION OF GBHS NO 2 PINDI GHEB			
BILL OF QUANTITIES (BOQ)			
S. #	**Description**	**Unit**	**Qty**
1	**PV System Capacity: 43.7 kW**	**TO BE PROVIDED BY UNHCR**	
2	**On-GRID HYBRID INVERTERS: 40 kVA**		
3	**Lithium Ion Battery: 29 kWh**		
4	**PV Mounting Structure**		
a	Hot dipped (80 microns Average) Galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	per Watt	43700
5	**Misc Items**		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to DC combiner box	R.M	150
b	Single Core DC Flexible Copper Cables 35mm sq from DC combiner box to Inverter	R.M	50
c	Single Core DC Flexible Copper Cables 50mm sq for battery connections	R.M	10
d	DC Breakers 100A-4P between DC combiner box and Inverter	Each	1
e	200 Amp/48V 4-P DC Breaker b/w inverter & battery bank	Each	1
f	AC Cables 25 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	30
g	100 Amp 4-P AC Breaker btw WAPDA & Inverter, Inverter & Load	Each	2
h	10 Amp AC Breaker 1-P b/w inverter & Load	Each	16
i	Changeover Switches 100 Amp	No	1
j	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	2
k	Inauguration/Sign Board	No	1
l	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.) DC Combiner box, Surge Protection Device at DC & AC input. Dry Chemical Powder Fire Extinguisher 6Kg Capacity complete in all respect.	Job	1
6	**Application for Net-Metering and Installation of Bi-Directional Energy Meter**		
a	Preparation & Submission of Complete Net-Metering Case as per the guidelines of DISCO, AEDB, NEPRA including supply and installation of Bi-directional, Approved Energy Meter with all requisite utility fee on behalf of the Employer and fulfillment of all prescribed formalities, complete in all respect.	Job	1