



١٧ / ٣ / ٢٠٢١ زاینی

پاریزگای ههولیر
بهریوه بهرایهتی گریبهسته گشتیهکان
دەرچوو
ژماره :
بەرۆار :

ژماره: ٤٤

ئاگاداری

ب/ کهم کردنه وهی نهینی / ژماره (٩) بۆ جاری دووهم

پاریزگای ههولیر / بهریوه بهرایهتی گریبهسته گشتیهکان / کهم کردنه وهی نهینی رادهگهینیت بۆ پرۆژهی (دانانی سیستمی ووزهی خۆر بۆ (٤٠) بیری کشتوکالی له گهڵ (٥) بیری ئاوی خواردنه وه له دهورووبه ری ههولیر) که (بهریوه بهرایهتی گشتی کاره بای ههولیر به هه ماههنگی له گهڵ پاریزگای ههولیر و ریکخراوی (UNDP)) پیتی هه لدهستیت. جا ههر به لینهدر و کۆمپانیایهک ئاره زووی به شدار بوونی هه یه با سه ر له بهریوه بهرایهتی گریبهسته گشتیهکان له دیوانی پاریزگا بدن یان سهردانی سایتی پاریزگای ههولیر (www.hawlergov.org) بکهن بۆ وهرگرتنی وینهیهک له تهندهر و مه رجه کانی به لینهدرایهتی پرۆژهی ناوبراو له سهروهه به مه رجیک بۆ ئه و کۆمپانیایهکی که به (هارد) تهندهرکان دهگه رینهوه دهبن له ناو زهرفیککی مۆرکراو دا بئ وه ناویشانی به لینهدر یان کۆمپانیا له گه ل ناویشانی پرۆژهی له سه ر نوسرا بیت وه پیشکesh به سکرتهیری لیزنه ی کردنه وهی تهندهرکان بکریت له دیوانی پاریزگای ههولیر وه دوا کاتیش بۆ وهرگرتنه وهی تهندهرکان کاتژمبیر (١١) به یانی رۆژی سئ شه مه ی ٢٠٢١/٤/٢٠ ده بیت. وه بۆ ئه وانهی به ئیمیل (email) تهندهرکان دهگه رینهوه بۆ ئه م ناو نیشانه بنیرن (solarproject@hawlergov.org) تهندهرکانیان له پیش کاتی دیاریکراو بنیرن . وه مه رج نیه فه رمانگه که مان به نزمترین نرخه تهندهر رازی بیت . وه کرئی بلاو کردنه وهی راگه یانندن ده که وینه ته ستۆی ئه و که سه ی که کهم کردنه وهی له سه ر دهگیرسیتنه وه.

مه رجه کانی وهرگرتنی تهندهر :

- ❖ کۆمپانیا تاییه تمه ند بیت به بواری کاره با وه به ره مه یینانی کاره با به وزه ی خۆر .
- ❖ تهندهر که بئ به رامبه ره .
- ❖ ماوه ی پرۆژه که (١٨٠) رۆژی ته قویمیه .
- ❖ بۆ کۆمپانیا خۆمالیه کان ده بیت ته ستۆیاکی باجی ده رامه تی نوئ کراوه بیت .
- ❖ ده بیت له ماوه ی سئ سالی رابردوو دا بای (\$ ٥٠٠,٠٠٠) پینچ سه د هه زار دۆلار کاری ئه نجامداییت .
- ❖ بۆ هه ر پرسپار و روونکردنه وه یه ک ده توانن په یوهندی به م ئیمه یله وه بکهن (solarproject-info@hawlergov.org).

ئومید خوشناو

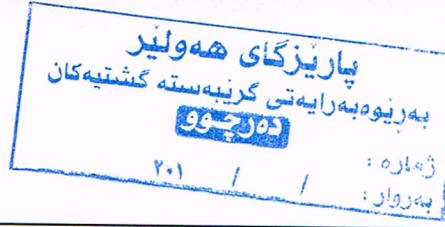
پاریزگاری ههولیر

١٧ / ٣ / ٢٠٢١

وینهیهک بۆ :-

- ✓ ریکخراوی (UNDP) / بۆ ئاگاداریتان / تکایه
- ✓ بهریوه بهرایهتی تهندهرکان
- ✓ بهریوه بهرایهتی ژمبیریاری
- ✓ بهریوه بهرایهتی پلان دانان.
- ✓ بهریوه بهرایهتی (I.T)
- ✓ رۆژنامه ی خه بات / تکایه ئاگاداریه که بلاو بکریتنه وه به پیتی ئاسایی , له گه ل ریزماندا
- ✓ رۆژنامه ی ههولیر / تکایه ئاگاداریه که بلاو بکریتنه وه به پیتی ئاسایی , له گه ل ریزماندا
- ✓ په کیه تی به لینهدرانی کوردستان/ لقی ههولیر بۆ ئاگاداریتان .
- ✓ هۆبه ی فرۆشتنی تهندهرات / بۆ کاری پتویست
- ✓ پرسگه / بۆ هه لواسینی ئاگاداریه که .
- ✓ خولاو

MINISTRY OF INTERIOR
ERBIL GOVERNORATE
General directorate of Contracts



No: ۴۲

۱۷ / 3/2021 A.D

Announcement

Subject/ tender (reducing secret)/ No (9) for second time

Erbil Governorate/general directorate of contracts/announcing reducing secret for project (installing solar energy system for (40) agricultural well with (5) drinking water well around Erbil) which is implemented by (general directorate of Erbil electricity with cooperation with Erbil governorate and (UNDP) organization). So each contractor and company whom are willing to participate should visit general directorate of contracts in governorate council or to visit the Erbil governorate website (www.hawlergov.org) to have a copy of tender and contracting requirement for mentioned project, in a condition if the company will return the tenders in (hard) must be in sealed envelope with contractor title or company title with address of project to be written on it to be presented to secretary of opening tenders committee in governorate council . And deadline for taking tenders is at (11) am on Tuesday 20/4/2021. For those who will send the tenders by (email) must send it to this email:(solarproject@hawlergov.org) the tenders should be send before the deadline. It is not a rule that our office to accept the tenders in lowest price. The rent of publishing the advertisement will be on the person who will get the tender.

Requirements of getting tender:

- *- The Company must be specialized with in electricity field and producing electricity in solar energy.
- *- Tender is free of charge.
- *- Project period is (180) days
- *- For local companies income tax clearance should be renewed.
- *- In last three years must implement works by (500,000\$) five hundred thousand dollar
- *- For any questions or concerns contact this email (solarproject-info@hawlergov.org).

OMEED KHOSHNAW

ERBIL GOVERNOR

۱۶/3/2021

COPY TO:

- *- (UNDP) organization /For your information, please.
- *- Tendering directorate.
- *- Accounts directorate.
- *-Planning directorate.
- *- (I.T) directorate.
- *-Khabat newspaper, please legally post the advertisement.
- *-Hawler newspaper, please legally post the advertisement.
- *- Kurdistan contractor's union/Erbil branch, for your info.
- *- Tenders selling department.
- *- Information for publishing the advertisement.

Note :-

All companies can apply for this project by online (as one package) before the deadline of the applying on the following website :

WWW.hawlergov.org

And send your tender on the following e-mail :

solarproject@hawlergov.org

For your kind information:

- The applying for this project is free.
- The analysis of the bids will be according to the following weights and ratios :
 1. Financial 40%
 2. Technical 50%
 3. Design 10%

For any more information or clarification do not hesitate to contact us on the following e-mail :

solarproject-info@hawlergov.org

All companies should fill in this form:

Summary:

Project name	Amount /USD \$
1-Engineering, procurement,Implementation and Maintenance contract For Upgrading Existing Water Pumping Stations to Operate on Solar photovoltaic Directorate of Water supply at Rural Area - Erbil	
2-Engineering, procurement,Implementation and Maintenance contract For Upgrading Existing Water Pumping Stations to Operate on Solar photovoltaic in Preselected Farmers by Governorate of Erbil	
Total	

Project period : (180) calander days

Company name:

Signetaure:

Adress:

More Information About Farmers Wells

No	Area/Donam	Directorate/Department	Part & county No	depth of well/m	padded tube diameter/in	diameter of testing tube/in	length of testing tube/m	water production G/M	pump's power in HP	panel position from the pump/m	earth position; flat or not flat	pump' age from instulation date	existing of generator or not
1	50	qushtapa	1/1loans 141/hamza kor	244	8	4	186	135	25	15	flat	4- year	exist
2	45	qushtapa	1/1loans 171/elinjagh	290	8	4	200	33	20	20	not flat	4-year	exist
3	54	qushtapa	1/1loans 145/gara sheikhan	252	8.6	4	174	158	30	10	not flat	7-year	not exist
4	31	qushtapa	1/1loans 138/kardiz	302	8	4	167.5	111	30	20	flat	5-year	not exist
5	65	qushtapa	1/1loans 175/sheikhanan	220		4			20	20	semi flat	9-year	not exist
6	58	qushtapa	1/1loans 173/bashtapa	275	8.6	4	180	192	30	50	not flat	5-year	exist
7	46	qushtapa	1/1loans 149/borija	253	8	4	158	74	30	27	flat	8-year	not exist
8	85	qushtapa	1/1loans 112/qazikhana	250	8	4	120	60	30	18	flat	2-year	exist
9	60	qushtapa	1/1loans 147/omerawa	200	8	4	145	120	25	20	flat	5-year	exist
10	100	qushtapa	1/1loans 138/kardiz	320	8	4	81	121	25	25	flat	5-year	not exist

11	74	qushtapa	1/1loans 102/brayim lak	200	8	4	165	26	25	15	flat	6-year	not exist
12	35	shamamk	1/1loans 105/pirdawood	252	8	4	162	170	30	30	flat	10-year	exist
13	65	ankawa	1/1loans 48/baherka talmusk	200	8	4	170	220	25	5	flat	5-year	not exist
14	40	ankawa	1/1loans 74/bard hushter	239	8	4	156	90	30	40	flat	5-year	exist
15	40	ankawa	1/1loans 74/bard hushter	210	8.6	4	158		30	5	not flat	10-year	exist
16	52	ankawa	1/1loans 3/qalachogan	245	8.6	4	200	270	25	10	flat	1,5-year	exist
17	67	dashti hawler	1/1loans 170/omarasor	305	8	4	164	350	20	15	semi flat	7-year	not exist
18	60	dashti hawler	1/1loans 84/shok malaomar	214	8	2.5	126	75	30	20	flat	14-year	not exist
19	71	dashti hawler	1/1loans 97/baghamra shihab	240	8	4	200	135	30	15	flat	5-year	exist
20	60	dashti hawler	1/1loans 135/murtga ali	172	6.6/8.6	3		7/5 L/S	30	10	flat	24-year	not exist
21	70	dashti hawler	1/1loans 137/palani	230	8	4	172	115	25	10	flat	9-year	not exist
22	70	dashti hawler	1/1loans 86/binlawai gawra	200	8	4	174	22.5	25	30	flat	8-year	exist
23	70	dashti hawler	1/1loans 97/baghamra shihab	251	8	2.5	147.5	55	25	5	flat	8-year	not exist
24	50	dashti hawler	1/1loans 165/sardasht	120	14	4	125	35	30	10	flat	20-year	not exist

25	70	dashti hawler	1/1loans 97/baghamra shihab	240	8	2.5	200	75	25	10	flat	4-year	not exist
26	70	dashti hawler	1/1loans 97/baghamra shihab	230	8	3	150	135	25	10	flat	8-year	exist
27	50	dashti hawler	1/1loans 137/palani	308	8	2.5	160	54	25	20	flat	4-year	not exist
28	65	dashti hawler	1/1loans 137/palani	233	10	3	130	135	20	10	flat	10-year	not exist
29	65	dashti hawler	1/1loans 167/bistanai bhook	220	8	1.25	163	45	20	10	flat	12-year	not exist
30	91	dashti hawler	1/1loans 135/murtga ali	300	6	4	252	192	30	20	flat	4-year	not exist
31	70	dashti hawler	1/1loans 97/baghamra shihab	236	8	4	155	190	30	30	flat	7-year	not exist
32	50	dashti hawler	1/1loans 137/palani	305	8	4	174	128	30	20	flat	9-year	not exist
33	64	dashti hawler	1/1loans 135/halajai gawra	252	8	4	180	90	25	20	flat	2-year	not exist
34	70	dashti hawler	1/1loans 137/palani	250	8	4	152	105	30	10	flat	9-year	not exist
35	25	salahadin	1/1loans 75/darband gomaspam	193	8	4	180	45	20	15	flat	7-year	exist
36	20	koya	1/1loans 66/smaquli saruchawa	104	open hole	3	95	122	20	15	flat	4-year	not exist
37	66	koya	1/1loans 67/smaquli saruchawa	90	6	4	60	40	10	30	flat	7-year	not exist
38	23	koya	1/1loans 68/smaquli saruchawa	211	8.6	3	175	56	30	30	flat	8-year	not exist
39	58	koya	1/1loans 66/smaquli saruchawa	129	8	3	85	163	25	35	flat	8-year	not exist
40	50	khawat	1/1loans 55/grda sheir	200	8.6	4	186	220	25	50	flat	2-year	exist

Coordinate					Farmers Wells			
Y	X	Elevation	Longitude	Latitude	كوند	مدیرية / قسم	الاسم الفلاح	ت
44.068696	35.974181	428 m	44° 4' 7.26" E	35° 58' 27.08" N	هه مزه كوز	قوشتهپه	مامز حمد سليمان	1
44.109933	35.959437	453 m	44° 6' 35.75" E	35° 57' 33.99" N	نيلنجاغ	قوشتهپه	خالص عزيز احمد	2
44.094602	35.920254	392 m	44° 5' 40.56" E	35° 55' 12.93" N	گه ره شيخان	قوشتهپه	ابراهيم عثمان قادر	3
44.116953	36.000225	461 m	44° 7' 1.05" E	36° 0' 0.81" N	كه ريز	قوشتهپه	قادر قهار مصطفى	4
44.073033	35.817599	324 m	44° 4' 22.92" E	35° 49' 3.36" N	شيخانان	قوشتهپه	عبدالله عزيز حسين	5
43.976272	35.858224	376 m	43° 58' 34.59" E	35° 51' 29.61" N	به شنهپه	قوشتهپه	اسماعيل احمد شيخه	6
44.14027	35.919843	422 m	44° 8' 25.14" E	35° 55' 11.45" N	پؤريجه	قوشتهپه	غفور احمد عبدالعزیز	7
43.959353	35.875178	368 m	43° 57' 33.62" E	35° 52' 30.69" N	قازيخانه	قوشتهپه	عمر رسول قادر	8
44.1067	35.848501	334 m	44° 6' 24.13" E	35° 50' 54.6" N	نؤمه راوه	قوشتهپه	خديعه خچر باوه	9
44.109856	36.000014	459 m	44° 6' 35.47" E	36° 0' 0.05" N	كه ريز	قوشتهپه	محمد اسماعيل رحمن	10
44.024037	36.027488	397 m	44° 1' 26.52" E	36° 1' 38.93" N	برايه لك	قوشتهپه	سامع جوهر جلال	11
43.937078	36.047262	364 m	43° 56' 13.5" E	36° 2' 50.13" N	پيرداوا	شه مامك	عبدالرزاق محمد عيمان	12
44.051548	36.353115	496 m	44° 3' 5.57" E	36° 21' 11.21" N	به حركه تلموسك	عنكاوه	ظاهر رشيد حمد	13
43.903104	36.371565	404 m	43° 54' 11.26" E	36° 22' 17.59" N	به رحوشتر	عنكاوه	ميرايذ فارس عمر	14
43.906639	36.368372	407 m	43° 54' 23.78 E	36° 22' 6.24" N	به رحوشتر	عنكاوه	محمد خضر يونس	15
43.900401	36.281943	373 m	43° 54' 1.39" E	36° 16' 54.94" N	قه لاجوغان	عنكاوه	هاشم كمال عبدالله	16
44.142573	36.022647	521 m	44° 8' 33.26" E	36° 1' 21.53" N	نؤمه ره سؤر	دهشتي ههوليز	نازاد كاگل على	17
44.11842	36.279347	611 m	44° 7' 6.25" E	36° 16' 45.72" N	شؤك مه لائق مه ر	دهشتي ههوليز	كاكه نه مين مصطفى امين	18
44.162793	36.10865	601 m	44° 9' 46.11" E	36° 6' 31.2" N	باغمه مره شه هاب	دهشتي ههوليز	جمال جواد حمد شريف	19

44.058638	36.060735	458 m	44° 3' 31.09" E	36° 3' 38.51" N	مورتکه علی	دهشتی ههولیر	دلیر خلیل خالانی	20
44.104654	36.026897	467 m	44° 6' 16.76" E	36° 1' 36.84" N	پالانی	دهشتی ههولیر	حسن همزه علی	21
44.140289	36.13732	562 m	44° 8' 25.05" E	36° 8' 16.13" N	بنه سلاوه ی گه وره	دهشتی ههولیر	معروف پیربان مام سعدالله	22
44.139408	36.106648	566 m	44° 8' 21.87" E	36° 6' 23.93" N	باغه مره شه هاب	دهشتی ههولیر	ملا سمایل عثمان	23
44.104585	36.038477	482 m	44° 6' 16.4" E	36° 2' 18.56" N	سه رده شت	دهشتی ههولیر	ابو بکر صدیق مولود	24
44.14866	36.108533	570 m	44° 8' 55.19" E	36° 6' 30.74" N	باغه مره شه هاب	دهشتی ههولیر	حیدر ابو بکر عبدالله	25
44.154496	36.111234	577 m	44° 9' 16.18" E	36° 6' 40.44" N	باغه مره شه هاب	دهشتی ههولیر	فسرۆ طاهر احمد	26
44.122381	36.018301	480 m	44° 7' 20.65" E	36° 1' 5.93" N	پالانی	دهشتی ههولیر	فاطمه یوسف میرزا	27
44.101767	36.022578	463 m	44° 6' 6.36" E	36° 1' 21.3" N	پالانی	دهشتی ههولیر	رئیاز ستار احمد	28
44.154235	36.006605	518 m	44° 9' 15.24" E	36° 0' 23.75" N	بیتستانه ی بچوک	دهشتی ههولیر	فاخر عثمان میرزا	29
44.045859	36.03678	440 m	44° 2' 45.11" E	36° 2' 10.96" N	مورتکه علی	دهشتی ههولیر	مناف فارس فارس	30
44.14313	36.111005	569 m	44° 8' 35.27" E	36° 6' 39.62" N	باغه مره شه هاب	دهشتی ههولیر	ناصر کریم محمد	31
44.124737	36.014034	490 m	44° 7' 29.06" E	36° 0' 50.52" N	پالانی	دهشتی ههولیر	کمال عثمان توفیق	32
44.161289	36.044694	582 m	44° 9' 40.62" E	36° 2' 40.88" N	هه له جه ی گه وره	دهشتی ههولیر	کریم وسو علی	33
44.09267	36.019318	454 m	44° 5' 33.57" E	36° 1' 9.39" N	پالانی	دهشتی ههولیر	حریبه احمد مولود	34
44.333539	36.269343	867 m	44° 20' 0.79" E	36° 16' 9.63" N	دهریه ند گۆمه سپان	سه لادین	مهدی جوهر قادر	35
44.493141	36.207275	812 m	44° 29' 35.31" E	36° 12' 26.19" N	سماقولی سه روچاوه	کۆیه	حمد عزیز امین	36
44.464359	36.26745	1099 m	44° 27' 51.68" E	36° 16' 2.81" N	سماقولی سه روچاوه	کۆیه	انور حویز عثمان	37
44.567713	36.179903	802 m	44° 34' 3.8" E	36° 10' 47.69" N	سماقولی گلی	کۆیه	عمر مصطفی معروف	38
44.509703	36.227968	640 m	44° 30' 34.93" E	36° 13' 40.7" N	سماقولی سه روچاوه	کۆیه	خالد عزیز عبدالله	39
43.850715	36.285316	353 m	43° 51' 2.42" E	36° 17' 7.11" N	گرده شتیر	خببات	جبرائیل احمد عبدالله	40

Drinking water wells

No.	Village name	Subdistrict	N	E	Elevation	X	Y
1	Darbandok	Harer	36° 35' 31.3"	44° 19' 06.4"	662m	36.592028	44.318444
2	Rkawa/Barazan	Harer	36° 35' 17.1"	44° 19' 16.5"	653m	36.588083	44.321111
3	Shekhan	Qushtaba	35° 49' 25.81"	44° 04' 18.23"	310m	35.830725	44.071731
4	Omarawy Bchok	Qushtaba	35° 49' 50.61"	44° 05' 11.91"	296m	35.830725	44.086642
5	Keshka	Degala	36° 16' 24.9"	44° 22' 17.0"	863m	36.273583	44.371389



Funded by the European Union
بتمويل من الاتحاد الأوروبي



INVITATION TO BID

Engineering, Procurement, Implementation and Maintenance contract for Upgrading
Existing Water Pumping Stations to Operate on Solar Photovoltaic
In preselected farmers by Governorate of Erbil

ITB No.:

Project: Engineering, Procurement, Implementation and Maintenance contract for
Upgrading Existing Water Pumping Stations to Operate on Solar Photovoltaic
Directorate of Water Supply at Rural Area-Erbil

Country: **Iraq**

Issued on: **16 / 02 / 2021**

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Section I. Letter of Invitation

The **United Nations Development Programme (UNDP)** and **Governorate of Erbil (GoE)** hereby invites you to submit a Bid to this Invitation to Bid (ITB) for the above-referenced subject.

This ITB includes the following documents and the General Terms and Conditions of Contract which is inserted in the Bid Data Sheet:

- Section 1: This Letter of Invitation
- Section 2: Instruction to Bidders
- Section 3: Bid Data Sheet (BDS)
- Section 4: Evaluation Criteria
- Section 5: Schedule of Requirements and Technical Specifications
- Section 6: Returnable Bidding Forms
 - Form A: Bid Submission Form
 - Form B: Bidder Information Form
 - Form C: Joint Venture/Consortium/Association Information Form
 - Form D: Qualification Form
 - Form E: Format of Technical Bid
 - Form F: Price Schedule
 - Form G: Form of Bid Security

If you are interested in submitting a Bid in response to this ITB, please prepare your Bid in accordance with the requirements and procedure as set out in this ITB and submit it by the Deadline for Submission of Bids set out in Bid Data Sheet.

Please acknowledge receipt of this ITB by sending an email to [_____], indicating whether you intend to submit a Bid or otherwise. You may also utilize the "Accept Invitation" function in e-Tendering system, where applicable. This will enable you to receive amendments or updates to the ITB. Should you require further clarifications, kindly communicate with the contact person/s identified in the attached Data Sheet as the focal point for queries on this ITB.

UNDP/GoE looks forward to receiving your Bid and thank you in advance for your interest in **UNDP/GoE** procurement opportunities.

Issued by

Approved by:

Name: **Hussain Hamad Qadir**
Title: **General Director of Erbil Electricity**
Date: **16 / 02 / 2021**

Name: **Hemin Qadr**
Title: **Acting Governor of Erbil**
Date: **16 / 02 / 2021**

Section 2. Instruction to Bidders

GENERAL PROVISIONS

1. Introduction	<p>1.1 Bidders shall adhere to all the requirements of this ITB, including any amendments made in writing by UNDP/GoE.</p> <p>1.2 Any Bid submitted will be regarded as an offer by the Bidder and does not constitute or imply the acceptance of the Bid by GoE. GoE is under no obligation to award a contract to any Bidder as a result of this ITB.</p> <p>1.3 GoE reserves the right to cancel the procurement process at any stage without any liability of any kind for GoE, upon notice to the bidders or publication of cancellation notice on UNDP website.</p>
2. Fraud & Corruption, Gifts and Hospitality	<p>2.1 Bidders/vendors shall not offer gifts or hospitality of any kind to GoE staff members including recreational trips to sporting or cultural events, theme parks or offers of holidays, transportation, or invitations to extravagant lunches or dinners.</p> <p>2.2 In pursuance of this policy, GoE:</p> <ul style="list-style-type: none">(a) Shall reject a bid if it determines that the selected bidder has engaged in any corrupt or fraudulent practices in competing for the contract in question;(b) Shall declare a vendor ineligible, either indefinitely or for a stated period, to be awarded a contract if at any time it determines that the vendor has engaged in any corrupt or fraudulent practices in competing for, or in executing a GoE contract.
3. Eligibility	<p>3.1 A vendor should not be suspended, debarred, or otherwise identified as ineligible by any UN Organization or the World Bank Group or any other international Organization. Vendors are therefore required to disclose to GoE whether they are subject to any sanction or temporary suspension imposed by these organizations.</p> <p>3.2 It is the Bidder's responsibility to ensure that its employees, joint venture members, sub-contractors, service providers, suppliers and/or their employees meet the eligibility requirements as established by GoE .</p>
4. Conflict of Interests	<p>4.1 Bidders must strictly avoid conflicts with other assignments or their own interests, and act without consideration for future work. Bidders found to have a conflict of interest shall be disqualified. Without limitation on the generality of the above, Bidders, and any of their affiliates, shall be considered to have a conflict of interest with one or more parties in this solicitation process, if they:</p> <ul style="list-style-type: none">a) Are or have been associated in the past, with a firm or any of its affiliates which have been engaged by GoE to provide services for the preparation of the design, specifications, Terms of Reference, cost analysis/estimation, and other documents to be used for the procurement of the goods and services in this selection process;b) Were involved in the preparation and/or design of the programme/project related to the goods and/or services requested under this ITB; orc) Are found to be in conflict for any other reason, as may be established by, or at the discretion of GoE. <p>4.2 In the event of any uncertainty in the interpretation of a potential conflict of interest, Bidders must disclose to GoE, and seek GoEs confirmation on whether</p>

	<p>or not such conflict exists.</p> <p>4.3 The eligibility of Bidders that are wholly or partly owned by the Government shall be subject to UNDP's further evaluation and review of various factors such as being registered, operated and managed as an independent business entity, the extent of Government ownership/share, receipt of subsidies, mandate and access to information in relation to this ITB, among others. Conditions that may lead to undue advantage against other Bidders may result in the eventual rejection of the Bid.</p>
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A. PREPARATION OF BIDS

<p>5. General Considerations</p>	<p>5.1 In preparing the Bid, the Bidder is expected to examine the ITB in detail. Material deficiencies in providing the information requested in the ITB may result in rejection of the Bid.</p> <p>5.2 The Bidder will not be permitted to take advantage of any errors or omissions in the ITB. Should such errors or omissions be discovered, the Bidder must notify the GoE accordingly.</p>
<p>6. Cost of Preparation of Bid</p>	<p>6.1 The Bidder shall bear all costs related to the preparation and/or submission of the Bid, regardless of whether its Bid is selected or not. GoE shall not be responsible or liable for those costs, regardless of the conduct or outcome of the procurement process.</p>
<p>7. Language</p>	<p>7.1 The Bid, as well as any and all related correspondence exchanged by the Bidder and GoE, shall be written in the language (s) specified in the BDS.</p>
<p>8. Documents Comprising the Bid</p>	<p>8.1 The Bid shall comprise of the following documents and related forms which details are provided in the BDS:</p> <ul style="list-style-type: none"> a) Documents Establishing the Eligibility and Qualifications of the Bidder; b) Technical Bid; c) Price Schedule; d) Bid Security, if required by BDS; e) Any attachments and/or appendices to the Bid. f) Detailed design –To be added
<p>9. Documents Establishing the Eligibility and Qualifications of the Bidder</p>	<p>9.1 The Bidder shall furnish documentary evidence of its status as an eligible and qualified vendor, using the Forms provided under Section 6 and providing documents required in those forms. In order to award a contract to a Bidder, its qualifications must be documented to GoE's satisfaction.</p>
<p>10. Technical Bid Format and Content</p>	<p>10.1 The Bidder is required to submit a Technical Bid using the Standard Forms and templates provided in Section 6 of the ITB.</p> <p>10.2 Samples of items, when required as per Section 5, shall be provided within the time specified and unless otherwise specified by the Purchaser, at no expense to the GoE. If not destroyed by testing, samples will be returned at Bidder's request and expense, unless otherwise specified.</p> <p>10.3 When applicable and required as per Section 5, the Bidder shall describe the necessary training programme available for the maintenance and operation of the equipment offered as well as the cost to the GoE. Unless otherwise specified, such training as well as training materials shall be provided in the language of the Bid as specified in the BDS.</p> <p>10.4 When applicable and required as per Section 5, the Bidder shall certify the availability of spare parts for a period of at least ten (10) years from date of delivery, or as otherwise specified in this ITB.</p>

<p>11. Price Schedule</p>	<p>11.1 The Price Schedule shall be prepared using the Form provided in Section 6 of the ITB and taking into consideration the requirements in the ITB.</p> <p>11.2 Any requirement described in the Technical Bid but not priced in the Price Schedule, shall be assumed to be included in the prices of other activities or items, as well as in the final total price.</p>
<p>12. Bid Security</p>	<p>12.1 A Bid Security, if required by BDS, shall be provided in the amount and form indicated in the BDS. The Bid Security shall be valid for a minimum of thirty (30) days after the final date of validity of the Bid.</p> <p>12.2 The Bid Security shall be included along with the Bid. If Bid Security is required by the ITB but is not found in the Bid, the offer shall be rejected.</p> <p>12.3 If the Bid Security amount or its validity period is found to be less than what is required by GoE, GoE shall reject the Bid.</p> <p>12.4 In the event an electronic submission is allowed in the BDS, Bidders shall include a copy of the Bid Security in their bid and the original of the Bid Security must be sent via courier or hand delivery as per the instructions in BDS.</p> <p>12.5 The Bid Security may be forfeited by GoE, and the Bid rejected, in the event of any, or combination, of the following conditions:</p> <ul style="list-style-type: none"> a) If the Bidder withdraws its offer during the period of the Bid Validity specified in the BDS, or; b) In the event the successful Bidder fails: <ul style="list-style-type: none"> i. to sign the Contract after GoE has issued an award; or ii. to furnish the Performance Security, insurances, or other documents that GoE may require as a condition precedent to the effectivity of the contract that may be awarded to the Bidder.
	<p>a)</p>
<p>13. Joint Venture, Consortium or Association</p>	<p>13.1 If the Bidder is a group of legal entities that will form or have formed a Joint Venture (JV), Consortium or Association for the Bid, they shall confirm in their Bid that : (i) they have designated one party to act as a lead entity, duly vested with authority to legally bind the members of the JV, Consortium or Association jointly and severally, which shall be evidenced by a duly notarized Agreement among the legal entities, and submitted with the Bid; and (ii) if they are awarded the contract, the contract shall be entered into, by and between GoE and the designated lead entity, who shall be acting for and on behalf of all the member entities comprising the joint venture.</p> <p>13.2 After the Deadline for Submission of Bid, the lead entity identified to represent the JV, Consortium or Association shall not be altered without the prior written consent of GoE. The lead entity and the member entities of the JV, Consortium or Association shall abide by the provisions of Clause 9 herein in respect of submitting only one Bid.</p> <p>13.3 The description of the organization of the JV, Consortium or Association must clearly define the expected role of each of the entities in the joint venture in delivering the requirements of the ITB, both in the Bid and the JV, Consortium or Association Agreement. All entities that comprise the JV, Consortium or Association shall be subject to the eligibility and qualification assessment by GoE.</p> <p>13.4 A JV, Consortium or Association in presenting its track record and experience should clearly differentiate between:</p> <ul style="list-style-type: none"> a) Those that were undertaken together by the JV, Consortium or Association; and

	<p>b) Those that were undertaken by the individual entities of the JV, Consortium or Association.</p> <p>13.5 Previous contracts completed by individual experts working privately but who are permanently or were temporarily associated with any of the member firms cannot be claimed as the experience of the JV, Consortium or Association or those of its members, but should only be claimed by the individual experts themselves in their presentation of their individual credentials</p> <p>13.6 JV, Consortium or Associations are encouraged for high value, multi-sectoral requirements when the spectrum of expertise and resources required may not be available within one firm.</p>
14. Only One Bid	<p>14.1 The Bidder (including the individual members of any Joint Venture) shall submit only one Bid, either in its own name or as part of a Joint Venture.</p> <p>14.2 Bids submitted by two (2) or more Bidders shall all be rejected if they are found to have any of the following:</p> <ol style="list-style-type: none"> a) they have at least one controlling partner, director or shareholder in common; or b) any one of them receive or have received any direct or indirect subsidy from the other/s; or c) they have the same legal representative for purposes of this ITB; or d) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about, or influence on the Bid of another Bidder regarding this ITB process; e) they are subcontractors to each other's Bid, or a subcontractor to one Bid also submits another Bid under its name as lead Bidder; or some key personnel proposed to be in the team of one Bidder participates in more than one Bid received for this ITB process. This condition relating to the personnel, does not apply to subcontractors being included in more than one Bid.
15. Bid Validity Period	<p>15.1 Bids shall remain valid for the period specified in the BDS, commencing on the Deadline for Submission of Bids. A Bid valid for a shorter period may be rejected by GoE and rendered non-responsive.</p> <p>15.2 During the Bid validity period, the Bidder shall maintain its original Bid without any change, including the availability of the Key Personnel, the proposed rates and the total price.</p>
16. Extension of Bid Validity Period	<p>16.1 In exceptional circumstances, prior to the expiration of the Bid validity period, GoE may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing, and shall be considered integral to the Bid.</p> <p>16.2 If the Bidder agrees to extend the validity of its Bid, it shall be done without any change to the original Bid.</p> <p>16.3 The Bidder has the right to refuse to extend the validity of its Bid, in which case, the Bid shall not be further evaluated.</p>
17. Clarification of Bid (from the Bidders)	<p>17.1 Bidders may request clarifications on any of the ITB documents no later than the date indicated in the BDS. Any request for clarification must be sent in writing in the manner indicated in the BDS. If inquiries are sent other than specified channel, even if they are sent to a GoE staff member, GoE shall have no obligation to respond or confirm that the query was officially received.</p> <p>17.2 GoE will provide the responses to clarifications through the method specified in the BDS.</p> <p>17.3 GoE shall endeavour to provide responses to clarifications in an expeditious manner, but any delay in such response shall not cause an obligation on the</p>

	part of GoE to extend the submission date of the Bids, unless GoE deems that such an extension is justified and necessary.
18. Amendment of Bids	<p>18.1 At any time prior to the deadline of Bid submission, GoE may for any reason, such as in response to a clarification requested by a Bidder, modify the ITB in the form of an amendment to the ITB. Amendments will be made available to all prospective bidders.</p> <p>18.2 If the amendment is substantial, GoE may extend the Deadline for submission of Bid to give the Bidders reasonable time to incorporate the amendment into their Bids.</p>
19. Alternative Bids	<p>19.1 Unless otherwise specified in the BDS, alternative Bids shall not be considered. If submission of alternative Bid is allowed by BDS, a Bidder may submit an alternative Bid, but only if it also submits a Bid conforming to the ITB requirements. Where the conditions for its acceptance are met, or justifications are clearly established, GoE reserves the right to award a contract based on an alternative Bid.</p> <p>19.2 If multiple/alternative bids are being submitted, they must be clearly marked as "Main Bid" and "Alternative Bid"</p>
20. Pre-Bid Conference	20.1 When appropriate, a pre-bid conference will be conducted at the date, time and location specified in the BDS. All Bidders are encouraged to attend. Non-attendance, however, shall not result in disqualification of an interested Bidder. Minutes of the Bidder's conference will be disseminated on the procurement website and shared by email or on the e-Tendering platform as specified in the BDS. No verbal statement made during the conference shall modify the terms and conditions of the ITB, unless specifically incorporated in the Minutes of the Bidder's Conference or issued/posted as an amendment to ITB.

B. SUBMISSION AND OPENING OF BIDS

21. Submission	<p>21.1 The Bidder shall submit a duly signed and complete Bid comprising the documents and forms in accordance with requirements in the BDS. The Price Schedule shall be submitted together with the Technical Bid. Bid can be delivered either personally, by courier, or by electronic method of transmission as specified in the BDS.</p> <p>21.2 The Bid shall be signed by the Bidder or person(s) duly authorized to commit the Bidder. The authorization shall be communicated through a document evidencing such authorization issued by the legal representative of the bidding entity, or a Power of Attorney, accompanying the Bid.</p> <p>21.3 Bidders must be aware that the mere act of submission of a Bid, in and of itself, implies that the Bidder fully accepts the GoE General Contract Terms and Conditions.</p>
Hard copy (manual) submission	<p>21.4 Hard copy (manual) submission by courier or hand delivery allowed or specified in the BDS shall be governed as follows:</p> <p>a) The signed Bid shall be marked "Original", and its copies marked "Copy" as appropriate. The number of copies is indicated in the BDS. All copies shall be made from the signed original only. If there are discrepancies between the original and the copies, the original shall prevail.</p> <p>(b) The Technical Bid and Price Schedule must be sealed and submitted together in an envelope, which shall:</p> <ol style="list-style-type: none"> i. Bear the name of the Bidder; ii. Be addressed to UNDP as specified in the BDS; and iii. Bear a warning not to open before the time and date for Bid opening as specified in the BDS.

	<p>If the envelope with the Bid is not sealed and marked as required, GoE shall assume no responsibility for the misplacement, loss, or premature opening of the Bid.</p>
<p>Email and eTendering submissions</p>	<p>21.5 Electronic submission through email or e-Tendering, if allowed as specified in the BDS, shall be governed as follows:</p> <ul style="list-style-type: none"> a) Electronic files that form part of the Bid must be in accordance with the format and requirements indicated in BDS; b) Documents which are required to be in original form (e.g. Bid Security, etc.) must be sent via courier or hand delivered as per the instructions in BDS.
<p>22. Deadline for Submission of Bids and Late Bids</p>	<p>22.1 Complete Bids must be received by GoE in the manner, and no later than the date and time, specified in the BDS. GoE shall only recognise the actual date and time that the bid was received by GoE.</p> <p>22.2 GoE shall not consider any Bid that is received after the deadline for the submission of Bids.</p>
<p>23. Withdrawal, Substitution, and Modification of Bids</p>	<p>23.1 A Bidder may withdraw, substitute or modify its Bid after it has been submitted at any time prior to the deadline for submission.</p> <p>23.2 Manual and Email submissions: A bidder may withdraw, substitute or modify its Bid by sending a written notice to, duly signed by an authorized representative, and shall include a copy of the authorization (or a Power of Attorney). The corresponding substitution or modification of the Bid, if any, must accompany the respective written notice. All notices must be submitted in the same manner as specified for submission of Bids, by clearly marking them as "WITHDRAWAL" "SUBSTITUTION," or "MODIFICATION"</p> <p>23.3 eTendering: A Bidder may withdraw, substitute or modify its Bid by Cancelling, Editing, and re-submitting the Bid directly in the system. It is the responsibility of the Bidder to properly follow the system instructions, duly edit and submit a substitution or modification of the Bid as needed. Detailed instructions on how to cancel or modify a Bid directly in the system are provided in the Bidder User Guide and Instructional videos.</p> <p>23.4 Bids requested to be withdrawn shall be returned unopened to the Bidders (only for manual submissions), except if the bid is withdrawn after the bid has been opened.</p>
<p>24. Bid Opening</p>	<p>24.1 GoE will open the Bid in the presence of an ad-hoc committee formed by GoE of at least two (2) members.</p> <p>24.2 The Bidders' names, modifications, withdrawals, the condition of the envelope labels/seals, the number of folders/files and all other such other details as GoE may consider appropriate, will be announced at the opening. No Bid shall be rejected at the opening stage, except for late submissions, in which case, the Bid shall be returned unopened to the Bidders.</p> <p>24.3 In the case of e-Tendering submission, bidders will receive an automatic notification once the Bid is opened.</p>
<p>c. EVALUATION OF BIDS</p>	
<p>25. Confidentiality</p>	<p>25.1 Information relating to the examination, evaluation, and comparison of Bids, and the recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process, even after publication of the contract award.</p>

	<p>25.2 Any effort by a Bidder or anyone on behalf of the Bidder to influence GoE in the examination, evaluation and comparison of the Bids or contract award decisions may, at GoE's decision, result in the rejection of its Bid and may subsequently be subject to the application of prevailing GoE's vendor sanctions procedures.</p>
26. Evaluation of Bids	<p>26.1 GoE will conduct the evaluation solely on the basis of the Bids received.</p> <p>26.2 Evaluation of Bids shall be undertaken in the following steps:</p> <ol style="list-style-type: none"> a) Preliminary Examination including Eligibility b) Arithmetical check and ranking of bidders who passed preliminary examination by price. c) Qualification assessment (if pre-qualification was not done) d) Evaluation of Technical Bids e) Evaluation of prices f) Evaluation of the proposed design to be Added <p>Detailed evaluation will be focussed on the 3 - 5 lowest priced bids. Further higher priced bids shall be added for evaluation if necessary</p>
27. Preliminary Examination	<p>GoE shall examine the Bids to determine whether they are complete with respect to minimum documentary requirements, whether the documents have been properly signed, and whether the Bids are generally in order, among other indicators that may be used at this stage. GoE reserves the right to reject any Bid at this stage.</p>
28. Evaluation of Eligibility and Qualification	<p>Eligibility and Qualification of the Bidder will be evaluated against the Minimum Eligibility/Qualification requirements specified in the Section 4 (Evaluation Criteria).</p>
29. Evaluation of Technical Bid and prices	<p>29.1 The evaluation team shall review and evaluate the Technical Bids on the basis of their responsiveness to the Schedule of Requirements and Technical Specifications and other documentation provided, applying the procedure indicated in the BDS and other ITB documents. When necessary, and if stated in the BDS, GoE may invite technically responsive bidders for a presentation related to their technical Bids. The conditions for the presentation shall be provided in the bid document where required.</p>
30. Due diligence	<p>30.1 GoE reserves the right to undertake a due diligence exercise, aimed at determining to its satisfaction, the validity of the information provided by the Bidder. Such exercise shall be fully documented and may include, but need not be limited to, all or any combination of the following:</p> <ol style="list-style-type: none"> a) Verification of accuracy, correctness and authenticity of information provided by the Bidder; b) Validation of extent of compliance to the ITB requirements and evaluation criteria based on what has so far been found by the evaluation team; c) Inquiry and reference checking with Government entities with jurisdiction on the Bidder, or with previous clients, or any other entity that may have done business with the Bidder; d) Inquiry and reference checking with previous clients on the performance on on-going or completed contracts, including physical inspections of previous works, as deemed necessary; e) Physical inspection of the Bidder's offices, branches or other places where business transpires, with or without notice to the Bidder; f) Other means that GoE may deem appropriate, at any stage within the selection process, prior to awarding the contract.
31. Clarification of Bids	<p>31.1 To assist in the examination, evaluation and comparison of Bids, GoE may, at its discretion, request any Bidder for a clarification of its Bid.</p>

	<p>31.2 GoE's request for clarification and the response shall be in writing and no change in the prices or substance of the Bid shall be sought, offered, or permitted, except to provide clarification, and confirm the correction of any arithmetic errors discovered by GoE in the evaluation of the Bids, in accordance with the ITB.</p> <p>31.3 Any unsolicited clarification submitted by a Bidder in respect to its Bid, which is not a response to a request by GoE, shall not be considered during the review and evaluation of the Bids.</p>
32. Responsiveness of Bid	<p>32.1 GoE's determination of a Bid's responsiveness will be based on the contents of the bid itself. A substantially responsive Bid is one that conforms to all the terms, conditions, specifications and other requirements of the ITB without material deviation, reservation, or omission.</p> <p>32.2 If a bid is not substantially responsive, it shall be rejected by GoE and may not subsequently be made responsive by the Bidder by correction of the material deviation, reservation, or omission.</p>
33. Nonconformities, Repairable Errors and Omissions	<p>33.1 Provided that a Bid is substantially responsive, GoE may waive any non-conformities or omissions in the Bid that, in the opinion of UNDP, do not constitute a material deviation.</p> <p>33.2 GoE may request the Bidder to submit the necessary information or documentation, within a reasonable period, to rectify nonmaterial nonconformities or omissions in the Bid related to documentation requirements. Such omission shall not be related to any aspect of the price of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.</p> <p>33.3 For the bids that have passed the preliminary examination, GoE shall check and correct arithmetical errors as follows:</p> <ul style="list-style-type: none"> a) if there is a discrepancy between the unit price and the line item total that is obtained by multiplying the unit price by the quantity, the unit price shall prevail and the line item total shall be corrected, unless in the opinion of GoE there is an obvious misplacement of the decimal point in the unit price; in which case, the line item total as quoted shall govern and the unit price shall be corrected; b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and c) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail. <p>33.4 If the Bidder does not accept the correction of errors made by GoE, its Bid shall be rejected.</p>
A. AWARD OF CONTRACT	
34. Right to Accept, Reject, Any or All Bids	<p>34.1 GoE reserves the right to accept or reject any bid, to render any or all of the bids as non-responsive, and to reject all Bids at any time prior to award of contract, without incurring any liability, or obligation to inform the affected Bidder(s) of the grounds for GoE's action. GoE shall not be obliged to award the contract to the lowest priced offer.</p>
35. Award Criteria	<p>35.1 Prior to expiration of the period of Bid validity, GoE shall award the contract to the qualified and eligible Bidder that is found to be responsive to the requirements of the Schedule of Requirements and Technical Specification, and has offered the lowest price.</p>

36. Debriefing	36.1 In the event that a Bidder is unsuccessful, the Bidder may request for a debriefing from GoE. The purpose of the debriefing is to discuss the strengths and weaknesses of the Bidder's submission, in order to assist the Bidder in improving its future Bids for GoE procurement opportunities. The content of other Bids and how they compare to the Bidder's submission shall not be discussed.
37. Right to Vary Requirements at the Time of Award	37.1 At the time of award of Contract, GoE reserves the right to vary the quantity of goods and/or services, by up to a maximum twenty-five per cent (25%) of the total offer, without any change in the unit price or other terms and conditions.
38. Contract Signature	38.1 Within thirty (30) days from the date of receipt of the Contract, the successful Bidder shall sign and date the Contract and return it to GoE. Failure to do so may constitute sufficient grounds for the annulment of the award, and forfeiture of the Bid Security, if any, and on which event, GoE may award the Contract to the Second highest rated or call for new Bids.
39. Liquidated Damages	If specified in the BDS, GoE shall apply Liquidated Damages for the damages and/or risks caused to GoE resulting from the Contractor's delays or breach of its obligations as per Contract.
40. Payment Provisions	Payment will be made only upon GoE's acceptance of the goods and/or services performed. The terms of payment shall be within thirty (30) days, after receipt of invoice and certification of acceptance of goods and/or services issued by the proper authority in GoE with direct supervision of the Contractor. Payment will be effected by bank transfer in the currency of the contract.

Section 3. Bid Data Sheet

The following data for the goods and/or services to be procured shall complement, supplement, or amend the provisions in the Invitation to Bid In the case of a conflict between the Instructions to Bidders, the Bid Data Sheet, and other annexes or references attached to the Bid Data Sheet, the provisions in the Bid Data Sheet shall prevail.

BDS No.	Ref. to Section.2	Data	Specific Instructions / Requirements
1	7	Language of the Bid	English
2		Submitting Bids for Parts or sub-parts of the Schedule of Requirements (partial bids)	
3	20	Alternative Bids	Shall not be considered
4	21	Pre-Bid conference	Will not be conducted
5	16	Bid Validity Period	180 days
6	13	Bid Security	Required in the amount of 2% of bid value in USD Acceptable Forms of Bid Security <ul style="list-style-type: none"> ▪ Bank Guarantee (See Section 8 for template) ▪ Any Bank-issued Check / Cashier's Check / Certified Check
7	41	Advanced Payment upon signing of contract	Allowed up to a maximum of 10% of contract value
8	42	Liquidated Damages	Will be imposed as follows: Percentage of contract price per day of delay: 1/1000% of contract value Max. number of days of delay 60, after which GoE may terminate the contract.
9	40	Performance Security	Required in the amount of 10% of contract value in USD
10	12	Currency of Bid	United States Dollar
11	31	Deadline for submitting requests for clarifications/ questions	7 days before the submission deadline
12	31	Contact Details for submitting clarifications/questions	Focal Person in GoE: Address: E-mail address:

13	18, 19 and 21	Manner of Disseminating Supplemental Information to the ITB and responses/clarifications to queries	Direct communication to prospective Proposers by email
14	23	Deadline for Submission	20 / 4 / 2021
14	22	Allowable Manner of Submitting Bids	<input checked="" type="checkbox"/> Courier/Hand Delivery <input checked="" type="checkbox"/> Submission by email <input type="checkbox"/> e-Tendering
15	22	Bid Submission Address	
16	22	Electronic submission (email or e-Tendering) requirements	Not applicable <ul style="list-style-type: none"> ▪ Format: PDF files only ▪ File names must be maximum 60 characters long and must not contain any letter or special character other than from Latin alphabet/keyboard. ▪ All files must be free of viruses and not corrupted. ▪ Max. File Size per transmission: ▪ Mandatory subject of email: ▪ Documents which are required in original (e.g. Bid Security) should be sent to the below address with a PDF copy submitted as part of the electronic submission:
17	25	Date, time and venue for the opening of bid	Date and Time: Venue: In the case of e-Tendering submission, bidders will receive an automatic notification once their Bids are opened.
18	27, 36	Evaluation Method for the Award of Contract	Lowest priced technically responsive, eligible and qualified bid.
19		Expected date for commencement of Contract	
20		Maximum expected duration of contract	24 months
21	35	GoE will award the contract to:	One Proposer Only
22		Other Information Related to the ITB	<i>[All other instructions and information not yet mentioned so far in this Data Sheet but are relevant to the ITB must be cited here, and any further entries that may be added below this table row]</i>

Section 4. Evaluation Criteria

Preliminary Examination Criteria

Bids will be examined to determine whether they are complete and submitted in accordance with ITB requirements as per below criteria on a Yes/No basis:

- Appropriate signatures
- Power of Attorney
- Minimum Bid documents provided
- Bid Validity
- Bid Security (if required) submitted as per ITB requirements with compliant validity period

Minimum Eligibility and Qualification Criteria

Eligibility and Qualification will be evaluated on a Pass/Fail basis.

If the Bid is submitted as a Joint Venture/Consortium/Association, each member should meet the minimum criteria, unless otherwise specified.

Subject	Criteria	Document Submission requirement
ELIGIBILITY		
Legal Status	Vendor is a legally registered entity.	Form B: Bidder Information Form
Conflict of Interest	No conflicts of interest in accordance with ITB clause 4.	Form A: Bid Submission Form
Bankruptcy	Has not declared bankruptcy, is not involved in bankruptcy or receivership proceedings, and there is no judgment or pending legal action against the vendor that could impair its operations in the foreseeable future.	Form A: Bid Submission Form
Certificates and Licenses	<ul style="list-style-type: none"> ▪ Duly authorized to act as Agent on behalf of the Manufacturer, or Power of Attorney, if bidder is not a manufacturer ▪ Official appointment as local representative, if Bidder is submitting a Bid on behalf of an entity located outside the country ▪ Patent Registration Certificates, if any of technologies submitted in the Bid is patented by the Bidder ▪ Export/Import Licenses, if applicable ▪ Any additional criteria if required 	Form B: Bidder Information Form
QUALIFICATION		
History of Non-Performing Contracts¹	Non-performance of a contract did not occur as a result of contractor default for the last 3 years.	Form D: Qualification Form
Litigation History	No consistent history of court/arbitral award decisions against the	Form D: Qualification

¹ Non-performance, as decided by UNDP, shall include all contracts where (a) non-performance was not challenged by the contractor, including through referral to the dispute resolution mechanism under the respective contract, and (b) contracts that were so challenged but fully settled against the contractor. Non-performance shall not include contracts where Employers decision was overruled by the dispute resolution mechanism. Non-performance must be based on all information on fully settled disputes or litigation, i.e. dispute or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract and where all appeal instances available to the Bidder have been exhausted.

	Bidder for the last 3 years.	Form
Previous Experience	Minimum 5 years of relevant experience.	Form D: Qualification Form
	Minimum 2 contracts of similar value, nature and complexity implemented over the last 5 years. <i>(For JV/Consortium/Association, all Parties cumulatively should meet requirement).</i>	Form D: Qualification Form
Financial Standing	Minimum average annual turnover of USD 500000 \$ for the last 3 years. <i>(For JV/Consortium/Association, all Parties cumulatively should meet requirement).</i>	Form D: Qualification Form
	Bidder must demonstrate the current soundness of its financial standing and indicate its prospective long-term profitability. <i>(For JV/Consortium/Association, all Parties cumulatively should meet requirement).</i>	Form D: Qualification Form
Technical Evaluation	The technical bids shall be evaluated on a pass/fail basis for compliance or non-compliance with the technical specifications identified in the bid document.	Form E: Technical Bid Form
Financial Evaluation	Detailed analysis of the price schedule based on requirements listed in Section 5 and quoted for by the bidders in Form F. Price comparison shall be based on the landed price, including transportation, insurance and the total cost of ownership (including spare parts, consumption, installation, commissioning, training, special packaging, etc., where applicable) Comparison with budget/internal estimates.	Form F: Price Schedule Form
	Any additional criteria if required	

Section 5a: Schedule of Requirements and Technical Specifications/Bill of Quantities

The following sites with information obtained from the Governorate of Erbil with support from Directorate of Agriculture- Erbil, where more details can be obtained by the contractor for proper costing.

- The contractor is free to submit an offer for one site only or for several sites.
- The Governorate is free to distribute the sites to each contractor according to the technical and financial evaluation.
- The bill of quantities listed below represents one location and the bidder must submit a quantitative table for each site he chooses, specifying the location number.

Details of Submersible pump	Horsepower
Site type 1	20
Site type 2	25
Site type 3	30
Site type 4	10

Further details can be obtained from following table

NO	District /dept.	Well depth in meter	Well diameter in inch	water steel pipe size in Inch	Depth of submersible pump in meter	Water flow in m3/h	Horsepower (hp)	Kilowatt (kw)	Install PV (kw)	Pump voltage (v,fr,ph, p.f)
١	قوشنە	٢٤٤	٨	٤	١٨٦	١٣٥	٢٥	18.65	28	V=380v Fr=50hz Ph=3 p.f=0.8
٢	قوشنە	٢٩٠	٨	٤	٢٠٠	٣٣	٢٠	14.92	22.5	
٣	قوشنە	٢٥٢	٨,٦	٤	١٧٤	١٥٨	٣٠	22.38	33.6	
٤	قوشنە	٣٠٢	٨	٤	١٦٧,٥	١١١	٣٠	22.38	33.6	
٥	قوشنە	٢٢٠		٤			٢٠	14.92	22.5	
٦	قوشنە	٢٧٥	٨,٦	٤	١٨٠	١٩٢	٣٠	22.38	33.6	
٧	قوشنە	٢٥٣	٨	٤	١٥٨	٧٤	٣٠	22.38	33.6	
٨	قوشنە	٢٥٠	٨	٤	١٢٠	٦٠	٣٠	22.38	33.6	
٩	قوشنە	٢٠٠	٨	٤	١٤٥	١٢٠	٢٥	18.65	28	
١٠	قوشنە	٣٢٠	٨	٤	٨١	١٢١	٢٥	18.65	28	
١١	قوشنە	٢٠٠	٨	٤	١٦٥	٢٦	٢٥	18.65	28	
١٢	شەمامك	٢٥٢	٨	٤	١٦٢	١٧٠	٣٠	22.38	33.6	
١٣	عناو	٢٠٠	٨	٤	١٧٠	٢٢٠	٢٥	18.65	28	
١٤	عناو	٢٣٩	٨	٤	١٥٦	٩٠	٣٠	22.38	33.6	
١٥	عناو	٢١٠	٨,٦	٤	١٥٨		٣٠	22.38	33.6	
١٦	عناو	٢٤٥	٨,٦	٤	٢٠٠	٢٧٠	٢٥	18.65	28	
١٧	دەشتي هەولير	٣٠٥	٨	٤	١٦٤	٣٥٠	٢٠	14.92	22.5	
١٨	دەشتي هەولير	٢١٤	٨	٢,٥	١٢٦	٧٥	٣٠	22.38	33.6	
١٩	دەشتي هەولير	٢٤٠	٨	٤	٢٠٠	١٣٥	٣٠	22.38	33.6	
٢٠	دەشتي هەولير	١٧٢	٦,٦ ٨,٦	٣		٥/٧ لتر/ث	٣٠	22.38	33.6	
٢١	دەشتي هەولير	٢٣٠	٨	٤	١٧٢	١١٥	٢٥	18.65	28	
٢٢	دەشتي هەولير	٢٠٠	٨	٤	١٧٤	٢٢,٥	٢٥	18.65	28	
٢٣	دەشتي هەولير	٢٥١	٨	٢,٥	١٤٧,٥	٥٥	٢٥	18.65	28	
٢٤	دەشتي هەولير	١٢٠	١٤	٤	١٢٥	٣٥	٣٠	22.38	33.6	
٢٥	دەشتي هەولير	٢٤٠	٨	٢,٥	٢٠٠	٧٥	٢٥	18.65	28	
٢٦	دەشتي هەولير	٢٣٠	٨	٣	١٥٠	١٣٥	٢٥	18.65	28	
٢٧	دەشتي هەولير	٣٠٨	٨	٢,٥	١٦٠	٥٤	٢٥	18.65	28	

٢٨	دەشتي ھۆلير	٢٣٣	١٠	٣	١٣٠	١٣٥	٢٠	14.92	22.5
٢٩	دەشتي ھۆلير	٢٢٠	٨	١,٢٥	١٦٣	٤٥	٢٠	14.92	22.5
٣٠	دەشتي ھۆلير	٣٠٠	٦	٤	٢٥٢	١٩٢	٣٠	22.38	33.6
٣١	دەشتي ھۆلير	٢٣٦	٨	٤	١٥٥	١٩٠	٣٠	22.38	33.6
٣٢	دەشتي ھۆلير	٣٠٥	٨	٤	١٧٤	١٢٨	٣٠	22.38	33.6
٣٣	دەشتي ھۆلير	٢٥٢	٨	٤	١٨٠	٩٠	٢٥	18.65	28
٣٤	دەشتي ھۆلير	٢٥٠	٨	٤	١٥٢	١٠٥	٣٠	22.38	33.6
٣٥	سەلاھدين	١٩٣	٨	٤	١٨٠	٤٥	٢٠	14.92	22.5
٣٦	كۆيە	١٠٤	open hole	٣	٩٥	١٢٢	٢٠	14.92	22.5
٣٧	كۆيە	٩٠	٦	٤	٦٠	٤٠	١٠	7.46	11.3
٣٨	كۆيە	٢١١	٨,٦	٣	١٧٥	٥٦	٣٠	22.38	33.6
٣٩	كۆيە	١٢٩	٨	٣	٨٥	١٦٣	٢٥	18.65	28
٤٠	خەبات	٢٠٠	٨,٦	٤	١٨٦	٢٢٠	٢٥	18.65	28

SCHEDULE OF REQUIREMENTS FOR EACH SITE

Item	Description	Unit
1	The solar power plant consists of a PV plant, Combined Box, Pump management system (PMS), inverter and Panel Distribution Board.	
	The PMS shall be based on a variable speed drive principle by a Solar Variable Frequency Driver (SVFD). It shall be connected directly to the existing pump (.. KW) depth ...m without the need of batteries. The inverter shall be capable of forming an electric grid and running the existing pump in a pure solar operation mode. The power control system shall preview as well the connection of additional power sources such as diesel genset and utility power. Electrical installations and equipment shall be confirming to I.E.C. standards or equivalent.	
	General requirement of system documentation.	
	The following documentation (s) are required:	
	System data: Basic nameplate information and details should be finding on the cover page of a PV plan set or the system commissioning package. It shall include rated system power, manufacturer, model and quantities of PV modules and inverter system data.	
	Wiring diagram: It shall include at minimum a single-line wiring diagram. Details need to be provided regarding conductor sizes and over current protection devices ratings. Data sheets: It shall include modules and inverter datasheets. The provision of datasheets for other significant system components should also be considered.	
	Mechanical design information: Datasheet for the array mounting system needs to be provided, at a minimum. where applicable, structural engineering documents, soil testing results and so forth are to be provided too.	
	Copy of Test results and commissioning data	
2	Photovoltaique Panels	Lump sum
	Supply and install of PV panel Mono N-type IBC solar cells 370W 72 cell, efficiency >20% /> 18 Tiers 1, Class A, IEC,CE ,TUV, ISO 9001,14000 Certification, Salt Mist	

	Corrosion Test & Ammonia Corrosion Test).	
	The Tenderer shall specify the required number of panels to obtain the necessary electrical power kw.	
	Supply and install of PV panels with earth clamps	
3	Foundation	Lump sum
	Concrete foundation under PV Panels to support Environmental Climate Change especially wind resistance, Snow (including excavation and back filling). The concrete shall be type I not less than 35 MPA. Concrete Mix design is needed in addition to concrete tests on site.	
	Concrete foundation	
4	Mounting Structure	Lump sum
	Supply and install of Mounting structure with all related accessories all as specified, shown on the drawings and to the satisfaction of the Engineer.	
	calculation of wind resistance and snow load shall be submitted	
	Complete set of shop drawings, Submittal of material shall be submitted Steel structure	
5	DC Cabling	Lump sum
	The cables must be extremely resistant to solar exposure and harsh weather conditions (TUV certified or equivalent). The cable section shall be sized as to keep cabling losses below 1%.	
	Supply and install of DC cables between solar panel and between Solar Plant and the Motor Starter in duct bank and manholes including excavation and backfilling with all related accessories all as specified, shown on the drawings and to the satisfaction of the Engineer.	
6	AC Cabling	Lump sum
	Supply and install of AC cables with all related accessories all as specified, shown on the drawings and to the satisfaction of the Engineer.	
	The cable section shall be sized as to keep cabling losses below 3%.	
7	Pump Management system	Lump sum

	Supply and install PMS complete with Solar inverter for Pump power Inverter .../...kW, .../...A, 3 Phase 380Vac or DC Supply, IP21, Solar pump Application with MPPT, with integrated input noise filter and AC Chokes, Modbus Communication all as specified, shown on the drawings and to the satisfaction of the Engineer. the PMS shall insure the proper functioning and protection of pump (Pump depth is around m).	
	Full protection and diagnostic mechanism against short circuit, overheating and over voltages.	
	Perfect Mute control to ensure a reasonable torque output while reducing noise and heat of pump motor	
	Complete protection against lightning, soft-start & soft stop	
	over-voltage, under-voltage, over-current, short-circuit, earthing, over frequency protection, Speed-loss protection.	
	Built-in MPPT (Max. Power Point Tracking) at efficiency 99% to increase solar.	
	Built-in DC Reactor brings high input power factor to reduce interference	
	Pump shall be protected against dry-running. High temperature, High pressure and High or low Flow.	
	PMS shall be installed inside metallic enclosure IP 68 complete with ventilation system.	
	Surge Protection Class B+C	
	output chock	
8	Main distribution Panel	Lump sum
	Supply and install of MDB complete with Transfer switch between AC and DC with all related accessories and protection system all as specified, shown on the drawings and to the satisfaction of the Engineer.	
	The Bidder shall submit complete load calculation and selection report for component.	
9	Earthing and Lightning protection	Lump sum
	Supply and install of Earthing system for solar plant and equipotential bonding.	
	Lightning system is active Type the radius of protection shall cover all the Plant.	
	The Resistance shall be less than 5 Ohm	
	The Bidder shall submit earthing result report	
10	System Accessories	Lump sum

	Supply and install of Combiner boxes as per below specification in addition to all related accessories for proper installation of cables. such cable tray, PVC pipes etc.	
	Box of GRP Polyester IP66/IK10 or equivalent	
	Current measurement Module	
	Class II surge Arresters	
	gPV Cylindrical fuses for positive and negative protection	
	IP 68 MC4 connectors	
	The combined boxes shall be previewed to combine PV strings onto a DC buses where the DC side is electrically protected against most risks.	
11	Fences	Lump sum
	Supply and install of Fence and gate as indicated in the drawings with all related civil works, accessories to the satisfaction of engineer.	
	Central Remote Monitoring:	
	Data logging and remote monitoring including: HMI	
	Sun Meter with built in Panel Temperature	
	Temperature Probe for PV modules	
	Temperature Sensor for ambient temperature	
	Energy meters	
	Submersible pressure sensor	
	Cable For PTL 110	
	Analog Input - Adam 4055	
	Colored Touch Screen	
	Transistor Out/In	
	RTD modules with Modbus	
	Activation Card for remote monitoring Board for inverter	
12	UPS system	Lump sum
	Supply and install of UPS System with 8 hours capacity to handle data logging and monitoring devices in case of power absence DOD 80%	
13	Operation and Maintenance Manual	Lump sum
	Preparation of operation and maintenance manuals defining all equipment and particularly PV modules, solar inverter and all components of the solar system equipment and showing all necessary instructions for the control and maintenance of these equipment. Operation and Maintenance manuals shall be supplied written in English and Arabic languages. All parts and equipment listings shall be in English.	

14	Training: Training shall be provided for 2 trainees who will run and maintain and troubleshoot minor problems of the system. The training should be carried out from one trainer that is experienced and certified by the production factory or his authorized representative. The training will last for at least 2 (two) days, the place of training will be on the site and on Owner permises	Lump sum
15	Maintenance: maintain the system for two years from the date of handing over to the end users.	Lump sum
16	Spare parts: list of recommended spare parts for maintaining the system for 5 years.	Lump sum
17	miscellaneous	Lump sum

Provide Notes on Scope/Specification (if in a separate document) or delete if not applicable

Section 5b: Other Related Requirements

Inspection upon delivery	applied
Installation Requirements	applied
Testing Requirements	applied
Scope of Training on Operation and Maintenance	applied
Commissioning	applied
Warranty Period	Five years
Local Service Support	Two year
Technical Support Requirements	Two years
After-sale services Requirements	<input checked="" type="checkbox"/> Warranty on Parts and Labor for minimum period of two years <input checked="" type="checkbox"/> Technical Support
Payment Terms <i>(max. advanced payment is 20% as per UNDP policy)</i>	100% within 30 days upon owner's acceptance of the goods delivered as specified and receipt of invoice
Conditions for Release of Payment	<input checked="" type="checkbox"/> Inspection upon arrival at destination <input checked="" type="checkbox"/> Installation <input checked="" type="checkbox"/> Testing <input checked="" type="checkbox"/> Training on Operation and Maintenance <input checked="" type="checkbox"/> Written Acceptance of Goods based on full compliance with ITB requirements
All documentations, including catalogues, instructions and operating manuals, shall be in this language	English

Section 6: Returnable Bidding Forms / Checklist

This form serves as a checklist for preparation of your Bid. Please complete the Returnable Bidding Forms in accordance with the instructions in the forms and return them as part of your Bid submission. No alteration to format of forms shall be permitted and no substitution shall be accepted.

Before submitting your Bid, please ensure compliance with the Bid Submission instructions of the BDS 22.

Technical Bid:

Have you duly completed all the Returnable Bidding Forms?	
▪ Form A: Bid Submission Form	<input type="checkbox"/>
▪ Form B: Bidder Information Form	<input type="checkbox"/>
▪ Form C: Joint Venture/Consortium/ Association Information Form	<input type="checkbox"/>
▪ Form D: Qualification Form	<input type="checkbox"/>
▪ Form E: Format of Technical Bid/Bill of Quantities	<input type="checkbox"/>
▪ Form G: Form of Bid Security	
▪ [Add other forms as necessary]	<input type="checkbox"/>
Have you provided the required documents to establish compliance with the evaluation criteria in Section 4?	<input type="checkbox"/>

Price Schedule:

▪ Form F: Price Schedule Form	<input type="checkbox"/>
-------------------------------	--------------------------

Form A: Bid Submission Form

Name of Bidder:		Date:	
ITB reference:			

We, the undersigned, offer to supply the goods and related services required for [] in accordance with your Invitation to Bid No. [] and our Bid. We hereby submit our Bid, which includes this Technical Bid and Price Schedule.

Our attached Price Schedule is for the sum of [].

We hereby declare that our firm, its affiliates or subsidiaries or employees, including any JV/Consortium /Association members or subcontractors or suppliers for any part of the contract:

- a) is not under procurement prohibition by the United Nations, including but not limited to prohibitions derived from the Compendium of United Nations Security Council Sanctions Lists;
- b) have not been suspended, debarred, sanctioned or otherwise identified as ineligible by any UN Organization or the World Bank Group or any other international Organization;
- c) have no conflict of interest in accordance with Instruction to Bidders Clause 4;
- d) do not employ, or anticipate employing, any person(s) who is, or has been a UN staff member within the last year, if said UN staff member has or had prior professional dealings with our firm in his/her capacity as UN staff member within the last three years of service with the UN (in accordance with UN post-employment restrictions published in ST/SGB/2006/15);
- e) have not declared bankruptcy, are not involved in bankruptcy or receivership proceedings, and there is no judgment or pending legal action against them that could impair their operations in the foreseeable future;
- f) undertake not to engage in proscribed practices, including but not limited to corruption, fraud, coercion, collusion, obstruction, or any other unethical practice, with the UN or any other party, and to conduct business in a manner that averts any financial, operational, reputational or other undue risk to the UN and we embrace the principles of the United Nations Supplier Code of Conduct and adhere to the principles of the United Nations Global Compact.

We declare that all the information and statements made in this Bid are true and we accept that any misinterpretation or misrepresentation contained in this Bid may lead to our disqualification and/or sanctioning by the GoE.

We offer to supply the goods and related services in conformity with the Bidding documents, including the GoE General Conditions of Contract and in accordance with the Schedule of Requirements and Technical Specifications.

Our Bid shall be valid and remain binding upon us for the period specified in the Bid Data Sheet.

We understand and recognize that you are not bound to accept any Bid you receive.

I, the undersigned, certify that I am duly authorized by [] to sign this Bid and bind it should GoE accept this Bid.

Name: _____

Title: _____

Date: _____

Signature: _____

[Stamp with official stamp of the Bidder]

Form B: Bidder Information Form

Legal name of Bidder	
Legal address	
Year of registration	
Bidder's Authorized Representative Information	Name and Title: Telephone numbers: Email:
Are you a UNGM registered vendor?	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes,
Are you a GoE vendor?	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes,
Countries of operation	
No. of full-time employees	
Quality Assurance Certification (e.g. ISO 9000 or Equivalent) (If yes, provide a Copy of the valid Certificate):	
Does your Company hold any accreditation such as ISO 14001 or ISO 14064 or equivalent related to the environment? (If yes, provide a Copy of the valid Certificate):	
Does your Company have a written Statement of its Environmental Policy? (If yes, provide a Copy)	
Does your organization demonstrates significant commitment to sustainability through some other means, for example internal company policy documents on women empowerment, renewable energies or membership of trade institutions promoting such issues	
Is your company a member of the UN Global Compact	
Contact person that GoE may contact for requests for clarifications during Bid evaluation	Name and Title: Telephone numbers: Email:
Please attach the following documents:	<ul style="list-style-type: none"> ▪ Company Profile, which should <u>not</u> exceed fifteen (15) pages, including printed brochures and product catalogues

relevant to the goods and/or services being procured

- Certificate of Incorporation/ Business Registration
- Tax Registration/Payment Certificate issued by the Internal Revenue Authority evidencing that the Bidder is updated with its tax payment obligations, or Certificate of Tax exemption, if any such privilege is enjoyed by the Bidder
- Trade name registration papers, if applicable
- Quality Certificate (e.g., ISO, etc.) and/or other similar certificates, accreditations, awards and citations received by the Bidder, if any
- Environmental Compliance Certificates, Accreditations, Markings/Labels, and other evidences of the Bidder's practices which contributes to the ecological sustainability and reduction of adverse environmental impact (e.g., use of non-toxic substances, recycled raw materials, energy-efficient equipment, reduced carbon emission, etc.), either in its business practices or in the goods it manufactures
- Patent Registration Certificates, if any of technologies submitted in the Bid is patented by the Bidder
- Certification or authorization to act as Agent on behalf of the Manufacturer, or Power of Attorney.
- Export Licenses, if applicable
- Local Government permit to locate and operate in assignment location, if applicable
- Official Letter of Appointment as local representative, if Bidder is submitting a Bid on behalf of an entity located outside the country

Form C: Joint Venture/Consortium/Association Information Form

Name of Bidder:		Date:	
ITB reference:			

To be completed and returned with your Bid if the Bid is submitted as a Joint Venture/Consortium/Association.

No	Name of Partner and contact information <i>(address, telephone numbers, fax numbers, e-mail address)</i>	Proposed proportion of responsibilities (in %) and type of goods and/or services to be performed
1		
2		
3		

Name of leading partner (with authority to bind the JV, Consortium, Association during the ITB process and, in the event a Contract is awarded, during contract execution)	
--	--

We have attached a copy of the below referenced document signed by every partner, which details the likely legal structure of and the confirmation of joint and severable liability of the members of the said joint venture:

Letter of intent to form a joint venture **OR** JV/Consortium/Association agreement

We hereby confirm that if the contract is awarded, all parties of the Joint Venture/Consortium/Association shall be jointly and severally liable to GoE for the fulfillment of the provisions of the Contract.

Name of partner: _____ Name of partner: _____

Signature: _____ Signature: _____

Date: _____ Date: _____

Name of partner: _____ Name of partner: _____

Signature: _____ Signature: _____

Date: _____ Date: _____

Form D: Eligibility and Qualification Form

Name of Bidder:		Date:	
ITB reference:			

If JV/Consortium/Association, to be completed by each partner.

History of Non- Performing Contracts

<input type="checkbox"/> Non-performing contracts did not occur during the last 3 years			
<input type="checkbox"/> Contract(s) not performed in the last 3 years			
Year	Non- performed portion of contract	Contract Identification	Total Contract Amount (current value in US\$)
		Name of Client: Address of Client: Reason(s) for non-performance:	

Litigation History (including pending litigation)

<input type="checkbox"/> No litigation history for the last 3 years			
<input type="checkbox"/> Litigation History as indicated below			
Year of dispute	Amount in dispute (in US\$)	Contract Identification	Total Contract Amount (current value in US\$)
		Name of Client: Address of Client: Matter in dispute: Party who initiated the dispute: Status of dispute: Party awarded if resolved:	

Previous Relevant Experience

Please list only previous similar assignments successfully completed in the last 3 years.

List only those assignments for which the Bidder was legally contracted or sub-contracted by the Client as a company or was one of the Consortium/JV partners. Assignments completed by the Bidder's individual experts working privately or through other firms cannot be claimed as the relevant experience of the Bidder, or that of the Bidder's partners or sub-consultants, but can be claimed by the Experts themselves in their CVs. The Bidder should be prepared to substantiate the claimed experience by presenting copies of relevant documents and references if so requested by GoE.

Project name & Country of Assignment	Client & Reference Contact Details	Contract Value	Period of activity and status	Types of activities undertaken

Bidders may also attach their own Project Data Sheets with more details for assignments above.

- Attached are the Statements of Satisfactory Performance from the Top 3 (three) Clients or more.

Financial Standing

Annual Turnover for the last 3 years	Year	USD
	Year	USD
	Year	USD
Latest Credit Rating (if any), indicate the source		

Financial information (in US\$ equivalent)	Historic information for the last 3 years		
	Year 1	Year 2	Year 3
	<i>Information from Balance Sheet</i>		
Total Assets (TA)			
Total Liabilities (TL)			
Current Assets (CA)			
Current Liabilities (CL)			
	<i>Information from Income Statement</i>		
Total / Gross Revenue (TR)			
Profits Before Taxes (PBT)			
Net Profit			
Current Ratio			

- Attached are copies of the audited financial statements (balance sheets, including all related notes, and income statements) for the years required above complying with the following condition:
- a) Must reflect the financial situation of the Bidder or party to a JV, and not sister or parent companies;
 - b) Historic financial statements must be audited by a certified public accountant;
 - c) Historic financial statements must correspond to accounting periods already completed and audited. No statements for partial periods shall be accepted.

Form E: Format of Technical Bid

Name of Bidder:		Date:	
ITB reference:			

The Bidder's Bid should be organized to follow this format of the Technical Bid. Where the bidder is presented with a requirement or asked to use a specific approach, the bidder must not only state its acceptance, but also describe how it intends to comply with the requirements. Where a descriptive response is requested, failure to provide the same will be viewed as non-responsive.

SECTION 1: Bidder's qualification, capacity and expertise

- 1.1 General organizational capability which is likely to affect implementation: management structure, financial stability and project financing capacity, project management controls, extent to which any work would be subcontracted (if so, provide details).
- 1.2 Relevance of specialized knowledge and experience on similar engagements done in the region/country.
- 1.3 Quality assurance procedures and risk mitigation measures.
- 1.4 Organization's commitment to sustainability.

SECTION 2: Scope of Supply, Technical Specifications, and Related Services

This section should demonstrate the Bidder's responsiveness to the specification by identifying the specific components proposed, addressing the requirements, as specified, point by point; providing a detailed description of the essential performance characteristics proposed; and demonstrating how the proposed bid meets or exceeds the requirements/specifications. All important aspects should be addressed in sufficient detail.

- 2.1 A detailed description of how the Bidder will deliver the required goods and services, keeping in mind the appropriateness to local conditions and project environment. Details how the different service elements shall be organized, controlled and delivered.
- 2.2 Explain whether any work would be subcontracted, to whom, how much percentage of the requirements, the rationale for such, and the roles of the proposed sub-contractors and how everyone will function as a team.
- 2.3 The bid shall also include details of the Bidder's internal technical and quality assurance review mechanisms.
- 2.4 Implementation plan including a Gantt Chart or Project Schedule indicating the detailed sequence of activities that will be undertaken and their corresponding timing.
- 2.5 Demonstrate how you plan to integrate sustainability measures in the execution of the contract.

Technical specification should be repeated for each site

Solar Pumping				
Technical Specifications				
No	Item	Unit	Value	Tenderer Offer
1	Solar Photovoltaic (PV) Modules			
1.1	Type used		Mono N-type IBC Technology	

1.2a	Total PV Capacity at STC (Greater or equal to): For Submersible Pump	kWp	According to site specification	
1.3b	Power temp. coefficient	Deg C	-0.29 to 0.31 %	
1.2c	PV panels match the standard weather & ambient temp. specification for KRG/IRAQ		1.temp. coefficient of Isc ≥0,050 %/k	
	Low temp. coefficient for high temp. regions		2.temp. coefficient of Voc ≥0,0290%/k	
1.3	Rated Power of each module (Greater or equal to)	Wp	P ≥ 370	
1.4	PV- panel type		N-type IBC Tech.	
1.5	Vmp (@STC greater or equal to)	V	30 (36)	
1.6	Voc (@STC Less than or equal to)	V	40 (47.5)	
1.7	Module conversion efficiency (greater or equal to)	%	≥ 20	
1.8	Positive power tolerance (greater or equal to)	%	≥ 3	
1.9	Cell Protection		Cells should be protected by anti-reflective coated tempered glass	
1.10	Module shall withstand load up to and above	Pascal	5400	
1.11	I-V Curve is Supplied		Yes	
1.12	PV Modules Compliance		IEC 61730-1/2: 2004 and IEC 61215-2: 2005 Guidelines	
1.13	Minimum Warranty	Years	10 years on material and manufacturing	
1.14	Output Warranty	Years	10 years with 90% power output and 25 years 80% power output warranty	
1.15	PV Modules should include measures against Potential Induced Degradation (anti PID).		yes	
2	AC 3-Phase Solar Pump Inverter			
2.1a	Rated Power: For Submersible Pump Inverter (Greater or equal to)	kW	≥ rated power specification	
2.2	Minimum Protection Class of Solar Pump Inverter as per datasheet of manufacturer		IP54	
2.3	Solar Pump Application Software with Integrated MPPT Functionality		yes	
2.4	With Integrated Input Noise Filter		yes	
2.5	Pump Operation selection through either DC Input or 3-Phase Input of Inverter.		yes	
2.6	Inverter Efficiency (Greater or equal to)	%	97	
2.7	Communication: MODBUS/RS485, allowing monitoring and control of inverter operation		yes	

2.8	Proper external protection measures on AC and DC sides including surge protection.		yes	
2.9	Maximum Operating Temperature (Greater or equal to) as per manufacturer	Deg C	60	
2.10	Minimum Warranty	years	10	
3	Metallic Support Structures			
3.1	All structures shall be made of corrosion resistant materials e.g. aluminum, galvanized steel		yes	
3.2	Can withstand wind loads on PV generators up to:	km/h	140	
3.3	Tilt and orientation of PV have to be optimized for yearly best performance operation		yes	
3.4	Metallic Support Structures should be properly grounded and Bonding is required between PV module chassis and steel structure support		yes	
4	Sinusoidal Filter: For Submersible Pump			
4.1	Properly sized and selected for Solar Pump Inverter installed on Submersible Pump in accordance to Manufacturer of Inverter requirements and application requirements.		yes	
4.2	Minimum Warranty	years	5	
5	Water Meter at Output of Submersible Pump			
5.1	Installed at output of Submersible Pump to measure the quantity of water transferred.		yes	
5.2	Communicate with Transfer Pump controller in Electrical Room to data log and save quantities of water extracted per day/month/year.		yes	
5.3	Minimum Warranty	years	5	
7	Tank Level Sensor and Floating Level Switch on water Tank			
7.1	Submersible Tank Level Sensor installed on tank above Electrical Room and display amount of water in the tank.		yes	
7.2	Communicate with Transfer Pressure Pump controller in Electrical Room to data log and save level of water in tank.		yes	
7.3	Below a programmable lower safety level of water in tank, Transfer Pressure pump should not operate		yes	
7.4	Above a programmable upper safety level of water in tank, Submersible Pump should not operate		yes	

7.5	Minimum Warranty	years	5	
8	Monitoring and Control Setup			
8.1	Municipality Operator should be able to shift between Generator Supply, Normal Electrical Supply or PV supply.		yes	
8.2	There should be an independent controller for Submersible Pump, monitoring and saving vital parameters.		yes	
8.4	At least one Irradiation sensor and PV temperature sensor should be installed per direction of each PV array. Communication and power supply cables for Irradiation and PV temperature sensors should run down to Electrical Room and logged with the other critical values.		yes	
8.5	A Graphic user interface with display unit will display and datalog Values of interest (Voltage, Current, Speed of pump, tank level, water meter, Irradiation, Temperature...etc) both local and possibility to data transmit via internet.		yes	
8.6	Controller should be ready to remotely relay site info through regular (monthly) emails in addition to live monitoring and faults through internet connection when supplied by Municipality.		yes	
8.7	The main power panel board should have an automatic change over switch to switch between the DC and the AC source at the inverter input from graphical user interface of upper controller.		yes	
8.8	Because of dusty environment minimum IP rating of all Electrical Panel Boards in Electrical Room.		IP54	
8.9	Control Setup should have the possibility to add digital and analog Inputs units if need be in the future.		yes	
8.10	UPS system to ensure power to all sensors and controllers, and an autonomy of at least 24hrs for these without power in case of power cut. UPS charging time will be 7 hours/day (Utility Supply or GENSET). (supporting calculations to be presented)		yes	
9	Protection Circuit and Cables			
9.1	Circuit Breakers should be provided for short-circuit conditions		Yes	
9.2	All electronic components must take into consideration temperature compensation issues		Yes	

9.3	Full Protection		Against open circuit, accidental short circuit and reverse polarity by blocking diode should be provided	
9.4	Earthing and lightning protection systems shall be added to installation, with a resistance value (as tested in dry season) that shall be less than 5 ohms. Proper Handhole ground should be set in place with a metal cover for routine and periodic measurements / maintenance procedure.		Yes	
9.5	Earthing and Lightning protection should cover all installation including both areas PV area and Electrical Room.		Yes	
9.6	Solar cables (a.k.a. photovoltaic cable) specifically manufactured for solar applications shall be used.		Yes	
9.7	Solar cables should be manufactured according to the international standard EN 50618 - H1Z2Z2-K.		Yes	
9.8	Electrical junction boxes shall be UV resistant, IP65, weatherproof and installed at high level to eliminate any risk of water submersion.		Yes	
9.9	All circuit breakers, fuses and disconnects must be listed or recognized for use in DC circuits where applicable. Equipment only rated for use in AC circuits will not be permitted for use in DC circuits.		Yes	
9.10	Provide at least one AC Disconnect located adjacent to the inverter.		Yes	
9.11	Provide at least one DC Disconnect located adjacent to the inverter.		Yes	
9.12	Surge suppression on the DC and AC side of the inverter must be provided		Yes	
9.13	All cables and items that are exposed to the sun should be UV-resistant		Yes	
9.14	When Power and Control Cables are running in parallel, a separator will be provided between them.		Yes	
9.15	All running cables that are not underground should be placed in cable trays that should be properly grounded if metallic and should be protected from rodents or rats.		Yes	
9.16	Manholes should be placed for ease of access and maintenance of underground cables.		Yes	
10	Supporting Documents			

10.1	Provide Software Simulation case study showing irradiation simulation in addition to the system power generation forecast for 12 months period for the designated location.		Yes	
10.2	Simulation should also show variation of pump's flow and operating speed according to the available solar irradiation throughout the day and throughout the different seasons. Variation impact on power consumption should also be indicated.		Yes	
10.3	Indicate the configuration of the PV modules layout and the required space.		Yes	
10.4	Single Line diagram of power connections		Yes	
10.5	To provide schematic drawings showing Power and Control cables' routing between Electrical Room, Submersible Pump, Local Tank, all sensors and meters, and PV Panels.		Yes	
10.6	Calculations notes (such as cable sizing, panel board's equipment sizing, bus-bars sizing, short circuit current ratings, etc.) are to be specified in detail.		Yes	
10.7	All system's components datasheets and certificates shall be submitted highlighting the specific models and selections of parts that will be used in project, with quantities if need be.		Yes	
10.8	Wind Load calculation study for PV array should be presented, with a safety factor of 2.		Yes	
10.9	Contractor: List of Solar Pumping Applications installed including at least a single solar pump above 20 kW.		Yes	
PLEASE NOTE THAT EACH OF THE VALUES OR REQUESTED INFORMATION PLUGGED INTO THE TABLE ABOVE AS PER TENDER OFFER SHOULD BE HIGHLIGHTED IN THE RESPECTIVE SUPPORTING DOCUMENTS THAT SHOULD BE ENCLOSED IN HARDCOPY FORMAT WITH OFFER.				

SECTION 3: Management Structure and Key Personnel

- 3.1 Describe the overall management approach toward planning and implementing the project. Include an organization chart for the management of the project describing the relationship of key positions and designations. Provide a spreadsheet to show the activities of each personnel and the time allocated for his/her involvement.
- 3.2 Provide CVs for key personnel that will be provided to support the implementation of this project using the format below. CVs should demonstrate qualifications in areas relevant to the scope of goods and/or services.

Format for CV of Proposed Key Personnel

Name of Personnel	
Position for this assignment	
Nationality	
Language proficiency	
Education/Qualifications	<i>[Summarize college/university and other specialized education of personnel member, giving names of schools, dates attended, and degrees/qualifications obtained.]</i>
Professional certifications	<i>[Provide details of professional certifications relevant to the scope of goods and/or services]</i> <ul style="list-style-type: none"> ▪ Name of institution: ▪ Date of certification:
Employment Record/Experience	<i>[List all positions held by personnel (starting with present position, list in reverse order), giving dates, names of employing organization, title of position held and location of employment. For experience in last five years, detail the type of activities performed, degree of responsibilities, location of assignments and any other information or professional experience considered pertinent for this assignment.]</i>
References	<i>[Provide names, addresses, phone and email contact information for two (2) references]</i> Reference 1: Reference 2:

I, the undersigned, certify that to the best of my knowledge and belief, the data provided above correctly describes my qualifications, my experiences, and other relevant information about myself.

Signature of Personnel

Date (Day/Month/Year)

FORM F: Price Schedule Form

Name of Bidder:		Date:	
ITB reference:			

The Bidder is required to prepare the Price Schedule following the below format. The Price Schedule must include a detailed cost breakdown of all goods and related services to be provided. Separate figures must be provided for each functional grouping or category, if any.

Currency of the Bid: USD

The following sites with information obtained from the Governorate of Erbil with support from Directorate of Agriculture in Erbil, where more details can be obtained by the contractor for proper costing.

- The contractor is free to submit an offer for one site only or for several sites.
- The Governorate is free to distribute the sites to each contractor according to the technical and financial evaluation.
- The bill of quantities listed below represents one location and the bidder must submit a quantitative table for each site he chooses, specifying the location number.

Details of Submersible pump	Horsepower
Site type 1	20
Site type 2	25
Site type 3	30
Site type 4	10

Further details can be obtained from following table

NO.	District ./dept	Well depth in meter	Well diameter in inch	water steel pipe size in Inch	Depth of submersible pump in meter	Water flow in m3/h	Horsepower (hp)	Kilowatt (kw)	Install PV (kw)	Pump voltage (v,fr,ph, p.f)
١	قوشنقنة	٢٤٤	٨	٤	١٨٦	١٣٥	٢٥	18.65	28	V=380v Fr=50hz Ph=3 p.f=0.8
٢	قوشنقنة	٢٩٠	٨	٤	٢٠٠	٣٣	٢٠	14.92	22.5	
٣	قوشنقنة	٢٥٢	٨,٦	٤	١٧٤	١٥٨	٣٠	22.38	33.6	
٤	قوشنقنة	٣٠٢	٨	٤	١٦٧,٥	١١١	٣٠	22.38	33.6	
٥	قوشنقنة	٢٢٠		٤			٢٠	14.92	22.5	
٦	قوشنقنة	٢٧٥	٨,٦	٤	١٨٠	١٩٢	٣٠	22.38	33.6	
٧	قوشنقنة	٢٥٣	٨	٤	١٥٨	٧٤	٣٠	22.38	33.6	
٨	قوشنقنة	٢٥٠	٨	٤	١٢٠	٦٠	٣٠	22.38	33.6	
٩	قوشنقنة	٢٠٠	٨	٤	١٤٥	١٢٠	٢٥	18.65	28	
١٠	قوشنقنة	٣٢٠	٨	٤	٨١	١٢١	٢٥	18.65	28	
١١	قوشنقنة	٢٠٠	٨	٤	١٦٥	٢٦	٢٥	18.65	28	
١٢	شدةمامك	٢٥٢	٨	٤	١٦٢	١٧٠	٣٠	22.38	33.6	
١٣	عنكاوة	٢٠٠	٨	٤	١٧٠	٢٢٠	٢٥	18.65	28	
١٤	عنكاوة	٢٣٩	٨	٤	١٥٦	٩٠	٣٠	22.38	33.6	
١٥	عنكاوة	٢١٠	٨,٦	٤	١٥٨		٣٠	22.38	33.6	
١٦	عنكاوة	٢٤٥	٨,٦	٤	٢٠٠	٢٧٠	٢٥	18.65	28	
١٧	دقشني هملير	٣٠٥	٨	٤	١٦٤	٣٥٠	٢٠	14.92	22.5	
١٨	دقشني هملير	٢١٤	٨	٢,٥	١٢٦	٧٥	٣٠	22.38	33.6	

١٩	دقشني هتولير	٢٤٠	٨	٤	٢٠٠	١٣٥	٣٠	22.38	33.6
٢٠	دقشني هتولير	١٧٢	٨,٦ ٦,٦	٣		٥/٧ لتر/ث	٣٠	22.38	33.6
٢١	دقشني هتولير	٢٣٠	٨	٤	١٧٢	١١٥	٢٥	18.65	28
٢٢	دقشني هتولير	٢٠٠	٨	٤	١٧٤	٢٢,٥	٢٥	18.65	28
٢٣	دقشني هتولير	٢٥١	٨	٢,٥	١٤٧,٥	٥٥	٢٥	18.65	28
٢٤	دقشني هتولير	١٢٠	١٤	٤	١٢٥	٣٥	٣٠	22.38	33.6
٢٥	دقشني هتولير	٢٤٠	٨	٢,٥	٢٠٠	٧٥	٢٥	18.65	28
٢٦	دقشني هتولير	٢٣٠	٨	٣	١٥٠	١٣٥	٢٥	18.65	28
٢٧	دقشني هتولير	٣٠٨	٨	٢,٥	١٦٠	٥٤	٢٥	18.65	28
٢٨	دقشني هتولير	٢٣٣	١٠	٣	١٣٠	١٣٥	٢٠	14.92	22.5
٢٩	دقشني هتولير	٢٢٠	٨	١,٢٥	١٦٣	٤٥	٢٠	14.92	22.5
٣٠	دقشني هتولير	٣٠٠	٦	٤	٢٥٢	١٩٢	٣٠	22.38	33.6
٣١	دقشني هتولير	٢٣٦	٨	٤	١٥٥	١٩٠	٣٠	22.38	33.6
٣٢	دقشني هتولير	٣٠٥	٨	٤	١٧٤	١٢٨	٣٠	22.38	33.6
٣٣	دقشني هتولير	٢٥٢	٨	٤	١٨٠	٩٠	٢٥	18.65	28
٣٤	دقشني هتولير	٢٥٠	٨	٤	١٥٢	١٠٥	٣٠	22.38	33.6
٣٥	سه لاجدين	١٩٣	٨	٤	١٨٠	٤٥	٢٠	14.92	22.5
٣٦	كوية	١٠٤	open hole	٣	٩٥	١٢٢	٢٠	14.92	22.5
٣٧	كوية	٩٠	٦	٤	٦٠	٤٠	١٠	7.46	11.25
٣٨	كوية	٢١١	٨,٦	٣	١٧٥	٥٦	٣٠	22.38	33.6
٣٩	كوية	١٢٩	٨	٣	٨٥	١٦٣	٢٥	18.65	28
٤٠	خقيات	٢٠٠	٨,٦	٤	١٨٦	٢٢٠	٢٥	18.65	28

Price Schedule

The below price schedule should be repeated for each quoted site

Item	Description	Unit	Estimated Quantity	Unit Rate Amount (USD) (USD)
1	The solar power plant consists of a PV plant, Combined Box, Pump management system (PMS), inverter and Panel Distribution Board.			
	The PMS shall be based on a variable speed drive principle by a Solar Variable Frequency Driver (SVFD). It shall be connected directly to the existing pump (.. KW) depth ...m without the need of batteries. The inverter shall be capable of forming an electric grid and running the existing pump in a pure solar operation mode. The power control system shall preview as well the connection of additional power sources such as diesel genset and utility power. Electrical installations and equipment shall be confirming to I.E.C. standards or equivalent.			
	General requirement of system documentation.			
	The following documentation (s) are required:			

	System data: Basic nameplate information and details should be finding on the cover page of a PV plan set or the system commissioning package. It shall include rated system power, manufacturer, model and quantities of PV modules and inverter system data.			
	Wiring diagram: It shall include at minimum a single-line wiring diagram. Details need to be provided regarding conductor sizes and over current protection devices ratings. Data sheets: It shall include modules and inverter datasheets. The provision of datasheets for other significant system components should also be considered.			
	Mechanical design information: Datasheet for the array mounting system needs to be provided, at a minimum. where applicable, structural engineering documents, soil testing results and so forth are to be provided too.			
	Copy of Test results and commissioning data			
2	Photovoltaique Panels	Lump sum		
	Supply and install of PV panel Mono N-type IBC 370W 72 cell, efficiency >20% />18 Tiers 1, Class A, IEC,CE ,TUV, ISO 9001,14000 Certification, Salt Mist Corrosion Test & Ammonia Corrosion Test).			
	The Tenderer shall specify the required number of panels to obtain the necessary electrical power kw.			
	Supply and install of PV panels with earth clamps			
	Unit Rate in Words:			
3	Foundation	Lump sum		
	Concrete foundation under PV Panels to support Environmental Climate Change especially wind resistance, Snow (including excavation and back filling). The concrete shall be type I not less than 35 MPA. Concrete Mix design is needed in addition to concrete tests on site.			
	Concrete foundation			
	Unit Rate in Words:			
4	Mounting Structure	Lump sum		
	Supply and install of Mounting structure with all related accessories all as specified, shown on the drawings and to the satisfaction of the Engineer.			
	calculation of wind resistance and snow load shall be submitted			
	Complete set of shop drawings, Submittal of material shall			

	be submitted Steel structure			
	Unit Rate in Words:			
5	DC Cabling	Lump sum		
	The cables must be extremely resistant to solar exposure and harsh weather conditions (TUV certified or equivalent). The cable section shall be sized as to keep cabling losses below 1%.			
	Supply and install of DC cables between solar panel and between Solar Plant and the Motor Starter in duct bank and manholes including excavation and backfilling with all related accessories all as specified, shown on the drawings and to the satisfaction of the Engineer.			
	Unit Rate in Words:			
6	AC Cabling	Lump sum		
	Supply and install of AC cables with all related accessories all as specified, shown on the drawings and to the satisfaction of the Engineer.			
	The cable section shall be sized as to keep cabling losses below 3%.			
	Unit Rate in Words:			
7	Pump Management system	Lump sum		
	Supply and install PMS complete with Solar inverter for Pump power Inverter .../...kW, .../...A, 3 Phase 380Vac or DC Supply, IP21, Solar pump Application with MPPT, with integrated input noise filter and AC Chokes, Modbus Communication all as specified, shown on the drawings and to the satisfaction of the Engineer. the PMS shall insure the proper functioning and protection of pump (Pump depth is around m).			
	Full protection and diagnostic mechanism against short circuit, overheating and over voltages.			
	Perfect Mute control to ensure a reasonable torque output while reducing noise and heat of pump motor			
	Complete protection against lightning, soft-start & soft stop			

	over-voltage, under-voltage, over-current, short-circuit, earthing, over frequency protection, Speed-loss protection.			
	Built-in MPPT (Max. Power Point Tracking) at efficiency 99% to increase solar.			
	Built-in DC Reactor brings high input power factor to reduce interference			
	Pump shall be protected against dry-running. High temperature, High pressure and High or low Flow.			
	PMS shall be installed inside metallic enclosure IP 68 complete with ventilation system.			
	Surge Protection Class B+C			
	output chock			
	Unit Rate in Words:			
8	Main distribution Panel	Lump sum		
	Supply and install of MDB complete with Transfer switch between AC and DC with all related accessories and protection system all as specified, shown on the drawings and to the satisfaction of the Engineer.			
	The Bidder shall submit complete load calculation and selection report for component.			
	Unit Rate in Words:			
9	Earthing and Lightning protection	Lump sum		
	Supply and install of Earthing system for solar plant and equipotential bonding.			
	Lightning system is active Type the radius of protection shall cover all the Plant.			
	The Resistance shall be less than 5 Ohm			
	The Bidder shall submit earthing result report			
	Unit Rate in Words:			
10	System Accessories	Lump sum		
	Supply and install of Combiner boxes as per below specification in addition to all related accessories for proper installation of cables. such cable tray, PVC pipes etc.			
	Box of GRP Polyester IP66/IK10 or equivalent			

	Current measurement Module			
	Class II surge Arresters			
	gPV Cylindrical fuses for positive and negative protection			
	IP 68 MC4 connectors			
	The combined boxes shall be previewed to combine PV strings onto a DC buses where the DC side is electrically protected against most risks.			
	Unit Rate in Words:			
11	Fences	Lump sum		
	Supply and install of Fence and gate as indicated in the drawings with all related civil works, accessories to the satisfaction of engineer.			
	Central Remote Monitoring:			
	Data logging and remote monitoring including: HMI			
	Sun Meter with built in Panel Temperature			
	Temperature Probe for PV modules			
	Temperature Sensor for ambient temperature			
	Energy meters			
	Submersible pressure sensor			
	Cable For PTL 110			
	Analog Input - Adam 4055			
	Colored Touch Screen			
	Transistor Out/In			
	RTD modules with Modbus			
	Activation Card for remote monitoring Board for inverter			
	Unit Rate in Words:			
12	UPS system	Lump sum		
	Supply and install of UPS System with 8 hours capacity to handle data logging and monitoring devices in case of power absence DOD 80%			
	Unit Rate in Words:			
13	Operation and Maintenance Manual	Lump sum		
	Preparation of operation and maintenance manuals defining all equipment and particularly PV modules, solar inverter and all components of the solar system equipment and showing all necessary instructions for the control and maintenance of these equipment. Operation and Maintenance manuals shall be supplied written in			

	English and Arabic languages. All parts and equipment listings shall be in English.			
14	Training: Training shall be provided for 2 trainees who will run and maintain and troubleshoot minor problems of the system. The training should be carried out from one trainer that is experienced and certified by the production factory or his authorized representative. The training will last for at least 2 (two) days, the place of training will be on the site and on Owner permises	Lump sum		
15	Maintenance: maintain the system for two years from the date of handing over to the end users.	Lump sum		
16	Spare parts: list of recommended spare parts for maintaining the system for 5 years.	Lump sum		
17	miscellaneous	Lump sum		
	Collection			
	Page Nº		Amount (USD)	
	Site 1			
	Site 2			
	Site 3			
	Site 4			
	Site 5			
	Site 6			
	Total Carried to General			
	Summary			

Name of Bidder: _____

Authorised signature: _____
Name of authorised signatory: _____
Functional Title: _____

FORM G: Form of Bid Security

**Bid Security must be issued using the official letterhead of the Issuing Bank.
Except for indicated fields, no changes may be made on this template.**

To: GoE *[Insert contact information as provided in Data Sheet]*

WHEREAS [] (hereinafter called "the Bidder") has submitted a Bid to GoE dated to execute goods and/or services [] (hereinafter called "the Bid"):

AND WHEREAS it has been stipulated by you that the Bidder shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security if the Bidder:

- a) Fails to sign the Contract after GoE has awarded it;
- b) Withdraws its Bid after the date of the opening of the Bids;
- c) Fails to comply with GoE's variation of requirement, as per ITB instructions; or
- d) Fails to furnish Performance Security, insurances, or other documents that GoE may require as a condition to rendering the contract effective.

AND WHEREAS we have agreed to give the Bidder such Bank Guarantee:

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Bidder, up to a total of *[amount of guarantee] [in words and numbers]*, such sum being payable in the types and proportions of currencies in which the Price Bid is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of *[amount of guarantee as aforesaid]* without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

This guarantee shall be valid up to 30 days after the final date of validity of bids.

SIGNATURE AND SEAL OF THE GUARANTOR BANK

Signature: _____

Name: _____

Title: _____

Date: _____

Name of Bank _____

Address _____

[Stamp with official stamp of the Bank]

[insert: address and email address]

**Engineering, Procurement, Implementation and Maintenance contract for
Upgrading Existing Water Pumping Stations to Operate on Solar Photovoltaic
In preselected farmers by Governorate of Erbil**

TECHNICAL SPECIFICATIONS

ABBREVIATIONS AND ACRONYMS

AC	Alternating Current
BEE	Bureau of Energy Efficiency
BEP	Best Operating Point
DC	Direct Current
DHI	Direct Horizontal Irradiance
DNI	Direct Normal Irradiance
DSM	Demand-Side Management
GHI	Global Horizontal Irradiance
Gov	Government
GWh	Gigawatt-Hour
hp	Horsepower
kW	Kilowatt
kWp	Peak Kilowatt
kWh	Kilowatt-Hour
MPPT	Maximum Power Point Tracking
m	Meter
MJ	Megajoule
mm	Millimeter
MW	Megawatt
MWh	Megawatt-Hour
PV	Photovoltaic and Present Value
RE	Renewable Energy
TA	Technical Assistance
VF	Variable Frequency
VSD	Variable Speed Drive
Wp	Peak Watt

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A. Introduction

The Governorate of Erbil (GoE) seeks to implement and promote renewable energy solutions in support farmers in reduce their energy bill. Integrating Solar Pumping as a solution would constitute an important step in that direction to the benefit of the community, since the GoE is facing long electricity cut-off periods.

B. Location of Project and Present Situation

This water pumping station consists of a water-well equipped with a 20, 25 & 30 HP Submersible Pump that feeds a site water tanks or use directly for irrigation.

C. Site visit

The bidder is required at his own risk to visit and examine the Site of Works and its surroundings and obtain for himself on his own responsibility all information that may be necessary for preparing the bid and entering into a contract for construction of works. The cost of visiting the site shall be at the bidder's own expense.

D. Scope of Works

Engineering, Procurement, Implementation and Maintenance contract for Upgrading Existing Water Pumping Stations to Operate on Solar Photovoltaic with preselected farmers.

The works under this project consist of designing, supplying all the systems' components, complete installation, testing and commissioning, before handing over the operation to end users and the Governorate of Erbil.

The construction of the solar plant at each location includes but is not limited to the following:

1. Site Assessment by a qualified team to locate the array;
2. Design, study and analysis of support structures in compliance with all applicable codes, safety standards, array location and safety.
3. Design the system with a minimum of electrical losses due to wiring, fuses, switches and inverters;
4. Site clearance and preparation, leveling the ground, cleaning the perimeter and protect it from dry herbs.
5. Civil works required for the implementation of the fens and Photovoltaicproject;
6. Supply and installation of support structures for photovoltaic panels;
7. Array location, maximize solar energy production depends on panel location and orientation with panel tilt predetermined based on latitude and local weather;
8. Supply and installation of all electrical equipment's (solar panels, Variable frequency drive, Combiner Boxes, DC switches, surge arrestors, contactors, thermal protections, overload current protection, AC & DC Reactors or sinusoidal filter etc.) according to manufacturer's specifications, using installation requirement and procedures;
9. Connection of the electrical equipment according to approved electrical drawings;
10. Supply and installation of a lightning protection system with proper grounding;
11. Properly ground the system parts to reduce the risk of shock hazards and induced surges;
12. Supply, installation and connection of remote monitoring system;
13. Connection to the existing pumps with all necessary protection equipment;
14. Provide relevant documentation, including datasheets and user manuals for supplied items;
15. Provide Operation and maintenance manual for the system;
16. Testing and commissioning;
17. Training of Operators;
18. Maintaining the system for two years.

E. Design consideration

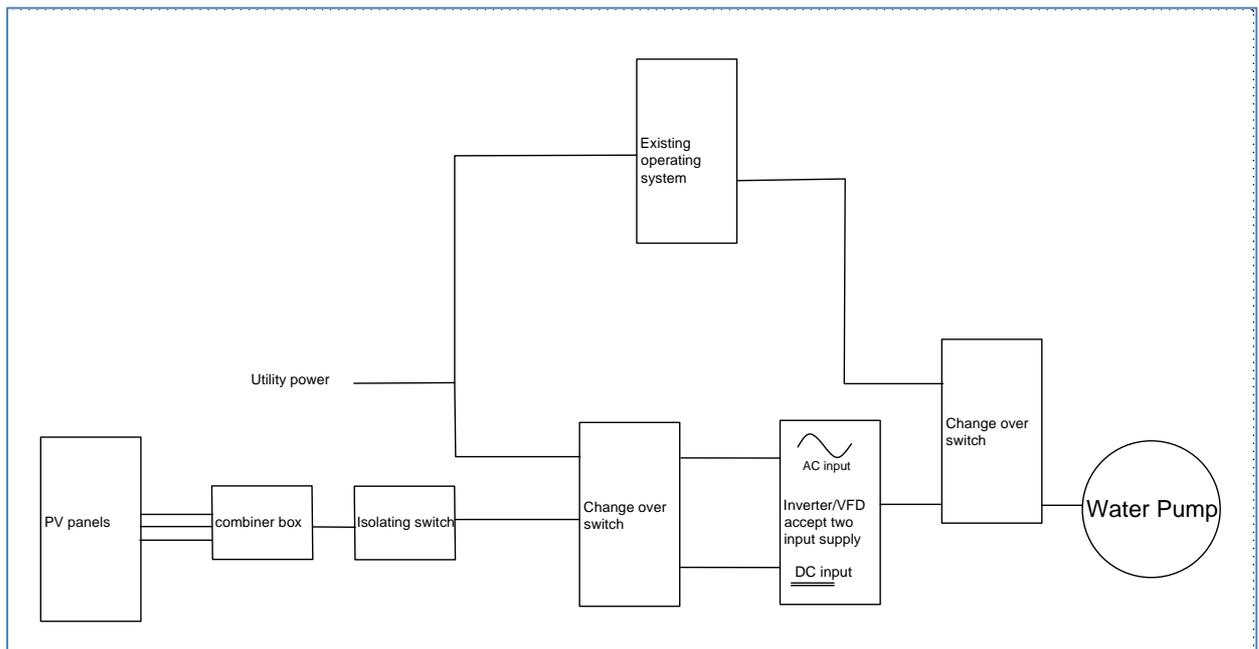
The risk of vandalism and theft can be significant: The panels should not be easily accessible by the public. Measures to curb this risk include: Build community ownership, Locate the solar array in a populated area with regular foot

traffic, fence the array to make access more difficult, arrange for security guards, install motion-detecting sensors and alarms whenever possible, spot-weld bolts or use tamper-proof bolts, screws, and fasteners, use anti-theft array mounting frames.

Metallic structures: Should hold the panels and should be designed to withstand strong winds. There are three types of frames: ground, roof, and post and all are accepted according to site conditions

Safety standards: PV systems present a unique combination of hazards and risks, which must be addressed by sound design and specifications followed by proper installation, operation, and maintenance of the system.

Equipment protection: Protecting equipment against faults on both the DC and AC sides requires careful attention to Grounding design and protective components addressed by grounding (giving electrical lightning surges a direct path to the ground that bypasses valuable equipment) and by installing lightning arrestors and surge protectors.



F. Site Information

Details of Submersible pump	Horsepower
Site type 1	20
Site type 2	25
Site type 3	30
Site type 4	10

Further details can be obtained from following table

NO.	District /dept.	Well depth in meter	Well diameter in inch	water steel pipe size in Inch	Depth of submersible pump in meter	Water flow in m3/h	Horsepower (hp)	Kilowatt (kw)	Install PV (kw)	Pump Voltage (v,fr,ph,p.f)
١	قوشنقنة	٢٤٤	٨	٤	١٨٦	١٣٥	٢٥	١٨,٦٥	28	V=380v Ph=3 Fr=50hz p.f=0.8
٢	قوشنقنة	٢٩٠	٨	٤	٢٠٠	٣٣	٢٠	١٤,٩٢	22.5	
٣	قوشنقنة	٢٥٢	٨,٦	٤	١٧٤	١٥٨	٣٠	٢٢,٣٨	33.6	
٤	قوشنقنة	٣٠٢	٨	٤	١٦٧,٥	١١١	٣٠	٢٢,٣٨	33.6	
٥	قوشنقنة	٢٢٠		٤			٢٠	١٤,٩٢	22.5	
٦	قوشنقنة	٢٧٥	٨,٦	٤	١٨٠	١٩٢	٣٠	٢٢,٣٨	33.6	
٧	قوشنقنة	٢٥٣	٨	٤	١٥٨	٧٤	٣٠	٢٢,٣٨	33.6	
٨	قوشنقنة	٢٥٠	٨	٤	١٢٠	٦٠	٣٠	٢٢,٣٨	33.6	
٩	قوشنقنة	٢٠٠	٨	٤	١٤٥	١٢٠	٢٥	١٨,٦٥	28	
١٠	قوشنقنة	٣٢٠	٨	٤	٨١	١٢١	٢٥	١٨,٦٥	28	
١١	قوشنقنة	٢٠٠	٨	٤	١٦٥	٢٦	٢٥	١٨,٦٥	28	
١٢	شامامك	٢٥٢	٨	٤	١٦٢	١٧٠	٣٠	٢٢,٣٨	33.6	
١٣	عنكاوة	٢٠٠	٨	٤	١٧٠	٢٢٠	٢٥	١٨,٦٥	28	
١٤	عنكاوة	٢٣٩	٨	٤	١٥٦	٩٠	٣٠	٢٢,٣٨	33.6	
١٥	عنكاوة	٢١٠	٨,٦	٤	١٥٨		٣٠	٢٢,٣٨	33.6	
١٦	عنكاوة	٢٤٥	٨,٦	٤	٢٠٠	٢٧٠	٢٥	١٨,٦٥	28	
١٧	دمشقي هاولير	٣٠٥	٨	٤	١٦٤	٣٥٠	٢٠	١٤,٩٢	22.5	
١٨	دمشقي هاولير	٢١٤	٨	٢,٥	١٢٦	٧٥	٣٠	٢٢,٣٨	33.6	
١٩	دمشقي هاولير	٢٤٠	٨	٤	٢٠٠	١٣٥	٣٠	٢٢,٣٨	33.6	
٢٠	دمشقي هاولير	١٧٢	٨,٦ ٦,٦	٣		٥/٧ لتر/ث	٣٠	٢٢,٣٨	33.6	
٢١	دمشقي هاولير	٢٣٠	٨	٤	١٧٢	١١٥	٢٥	١٨,٦٥	28	
٢٢	دمشقي هاولير	٢٠٠	٨	٤	١٧٤	٢٢,٥	٢٥	١٨,٦٥	28	
٢٣	دمشقي هاولير	٢٥١	٨	٢,٥	١٤٧,٥	٥٥	٢٥	١٨,٦٥	28	
٢٤	دمشقي هاولير	١٢٠	١٤	٤	١٢٥	٣٥	٣٠	٢٢,٣٨	33.6	
٢٥	دمشقي هاولير	٢٤٠	٨	٢,٥	٢٠٠	٧٥	٢٥	١٨,٦٥	28	
٢٦	دمشقي هاولير	٢٣٠	٨	٣	١٥٠	١٣٥	٢٥	١٨,٦٥	28	
٢٧	دمشقي هاولير	٣٠٨	٨	٢,٥	١٦٠	٥٤	٢٥	١٨,٦٥	28	
٢٨	دمشقي هاولير	٢٣٣	١٠	٣	١٣٠	١٣٥	٢٠	١٤,٩٢	22.5	
٢٩	دمشقي هاولير	٢٢٠	٨	١,٢٥	١٦٣	٤٥	٢٠	١٤,٩٢	22.5	
٣٠	دمشقي هاولير	٣٠٠	٦	٤	٢٥٢	١٩٢	٣٠	٢٢,٣٨	33.6	
٣١	دمشقي هاولير	٢٣٦	٨	٤	١٥٥	١٩٠	٣٠	٢٢,٣٨	33.6	
٣٢	دمشقي هاولير	٣٠٥	٨	٤	١٧٤	١٢٨	٣٠	٢٢,٣٨	33.6	
٣٣	دمشقي هاولير	٢٥٢	٨	٤	١٨٠	٩٠	٢٥	١٨,٦٥	28	
٣٤	دمشقي هاولير	٢٥٠	٨	٤	١٥٢	١٠٥	٣٠	٢٢,٣٨	33.6	
٣٥	سلاحدين	١٩٣	٨	٤	١٨٠	٤٥	٢٠	١٤,٩٢	22.5	
٣٦	كوية	١٠٤	open hole	٣	٩٥	١٢٢	٢٠	١٤,٩٢	22.5	
٣٧	كوية	٩٠	٦	٤	٦٠	٤٠	١٠	٧,٤٦	11.25	
٣٨	كوية	٢١١	٨,٦	٣	١٧٥	٥٦	٣٠	٢٢,٣٨	33.6	
٣٩	كوية	١٢٩	٨	٣	٨٥	١٦٣	٢٥	١٨,٦٥	28	
٤٠	خقيات	٢٠٠	٨,٦	٤	١٨٦	٢٢٠	٢٥	١٨,٦٥	28	

Coordinate							
Latitude	Longitude	Elevation	x	y	گونڊ	مديرية / قسم	ت
35° 58' 27.08" N	44° 4' 7.26" E	428 m	35.974181	44.068696	همزه كور	قوشنة به	۱
35° 57' 33.99" N	44° 6' 35.75" E	453 m	35.959437	44.109933	نيلجاغ	قوشنة به	۲
35° 55' 12.93" N	44° 5' 40.56" E	392 m	35.920254	44.094602	گمر شيوخان	قوشنة به	۳
36° 0' 0.81" N	44° 7' 1.05" E	461 m	36.000225	44.116953	كمرز	قوشنة به	۴
35° 49' 3.36" N	44° 4' 27.92" E	324 m	35.817599	44.073033	شيخانان	قوشنة به	۵
35° 51' 29.61" N	43° 58' 34.59" E	379 m	35.858224	43.976272	بمشنپه	قوشنة به	۶
35° 55' 11.45" N	44° 8' 25.14" E	422 m	35.919843	44.14027	پورجيه	قوشنة به	۷
35° 52' 30.69" N	43° 57' 33.62" E	368 m	35.875178	43.959353	فازيخانه	قوشنة به	۸
35° 50' 54.6" N	44° 6' 24.13" E	334 m	35.848501	44.1067	نومر اوه	قوشنة به	۹
36° 0' 0.05" N	44° 6' 35.47" E	459 m	36.000014	44.109856	كمرز	قوشنة به	۱۰
36° 1' 38.93" N	44° 1' 26.52" E	397 m	36.027488	44.024037	برايه لك	قوشنة به	۱۱
36° 2' 50.13" N	43° 56' 13.5" E	364 m	36.047262	43.937078	پيرداوا	شمامامك	۱۲
36° 21' 11.21" N	44° 3' 5.57" E	496 m	36.353115	44.051548	بمحرکه تلموسك	عنكاوة	۱۳
36° 22' 17.59" N	43° 54' 11.26" E	404 m	36.371565	43.903104	بم حوشتر	عنكاوة	۱۴
36° 22' 6.24" N	43° 54' 23.78" E	407 m	36.368372	43.906639	بم حوشتر	عنكاوة	۱۵
36° 16' 54.94" N	43° 54' 1.39" E	373 m	36.281943	43.900401	قه لاجوڭ	عنكاوة	۱۶
36° 1' 21.53" N	44° 8' 33.26" E	521 m	36.022647	44.142573	نومر مسور	دهشتي هتولير	۱۷
36° 16' 45.72" N	44° 7' 6.25" E	611 m	36.279347	44.11842	شوك مه لائومر	دهشتي هتولير	۱۸
36° 6' 31.2" N	44° 9' 46.11" E	601 m	36.10865	44.162793	باغمره شههاب	دهشتي هتولير	۱۹
36° 3' 38.51" N	44° 3' 31.09" E	458 m	36.060735	44.058638	مورته علي	دهشتي هتولير	۲۰

36° 1' 36.84" N	44° 6' 16.76" E	467 m	36.026897	44.104654	پالانی	دەشتی ھۆلیر	۲۱
36° 8' 16.13" N	44° 8' 25.05" E	562 m	36.13732	44.140289	بنسلووی گھورہ	دەشتی ھۆلیر	۲۲
36° 6' 23.93" N	44° 8' 21.87" E	566 m	36.106648	44.139408	باغمرہ شہاب	دەشتی ھۆلیر	۲۳
36° 2' 18.56" N	44° 6' 16.4" E	482 m	36.038477	44.104585	سەردەشت	دەشتی ھۆلیر	۲۴
36° 6' 30.74" N	44° 8' 55.19" E	570 m	36.108533	44.14866	باغمرہ شہاب	دەشتی ھۆلیر	۲۵
36° 6' 40.44" N	44° 9' 16.18" E	577 m	36.111234	44.154496	باغمرہ شہاب	دەشتی ھۆلیر	۲۶
36° 1' 5.93" N	44° 7' 20.65" E	480 m	36.018301	44.122381	پالانی	دەشتی ھۆلیر	۲۷
36° 1' 21.3" N	44° 6' 6.36" E	463 m	36.022578	44.101767	پالانی	دەشتی ھۆلیر	۲۸
36° 0' 23.75" N	44° 9' 15.24" E	518 m	36.006605	44.154235	بیسٹانہی بچوک	دەشتی ھۆلیر	۲۹
36° 2' 10.96" N	44° 2' 45.11" E	440 m	36.03678	44.045859	مورتکە علی	دەشتی ھۆلیر	۳۰
36° 6' 39.62" N	44° 8' 35.27" E	569 m	36.111005	44.14313	باغمرہ شہاب	دەشتی ھۆلیر	۳۱
36° 0' 50.52" N	44° 7' 29.86" E	490 m	36.014034	44.124737	پالانی	دەشتی ھۆلیر	۳۲
36° 2' 40.88" N	44° 9' 40.62" E	582 m	36.044694	44.161289	ھەلمجەہی گھورہ	دەشتی ھۆلیر	۳۳
36° 1' 9.39" N	44° 5' 33.57" E	454 m	36.019318	44.09267	پالانی	دەشتی ھۆلیر	۳۴
36° 16' 9.63" N	44° 20' 0.79" E	867 m	36.269343	44.333539	دەر بھند گومەسپان	سەلاحدین	۳۵
36° 12' 26.19" N	44° 29' 35.31" E	812 m	36.207275	44.493141	سماقولی سەر وچاوە	کۆبە	۳۶
36° 16' 2.81" N	44° 27' 51.68" E	1099 m	36.26745	44.464359	سماقولی سەر وچاوە	کۆبە	۳۷
36° 10' 47.69" N	44° 34' 3.8" E	802 m	36.179903	44.567713	سماقولی گلی	کۆبە	۳۸
36° 13' 40.7" N	44° 30' 34.93" E	640 m	36.227968	44.509703	سماقولی سەر وچاوە	کۆبە	۳۹
36° 17' 7.11" N	43° 51' 2.42" E	353 m	36.285316	43.850715	گرددھشیر	خەبات	۴۰

G. Material and Equipment

The PV solar pumping project consists of solar modules and solar drives along with data logger and sensors, electrical cables, as well as all protection equipment described in the technical drawings. This section details the required specifications for the components that will be used in the project. Failure to conform to these specifications may result in the disqualification of the bidder.

1. General Instructions

Equipment shall be the latest standard product of the manufacturer and comply with the specifications, regulations and international standards.

Equipment generally is to be supplied in complete factory assembled units ready for installation on site.

Equipment and material are to be stored in an approved location, under cover, free from humidity, dust, debris and rodents. Equipment sensitive to heat and humidity is to be kept in climatically conditioned areas until installed and handed over.

All equipment supplied shall carry original manufacturer's warranty.

2. PV Modules

The contractor will be responsible for using high efficiency photovoltaic modules with the following minimum requirement:

1. Compliance to IEC 61215
2. Compliance to IEC 61730
3. Certified for high snow 5400 Pa
4. Certified for wind load 2400 Pa.
5. Conforms to CE
6. Mono N-type IBC solar cells.
7. Rated output power: $\geq 370\text{Wp}$
8. Efficiency: $\geq 20\%$.
9. IP rating: IP65 for junction box and IP67 for connectors.
10. The Warranty shall include the following at the least
 - 10 years on material and manufacturing
 - 25 years on performance
 - With 80% output after 25 years
11. Reports of flash testing of modules to be provided before installation

3. Solar Pump Inverter

Solar variable frequency drive with a built-in pump system controller, the choice of the VFD is critical to the success and performance of the solar water pump.

The proposed VFD must meet the following requirement:

1. Support for synchronous and asynchronous three phase induction motors;
2. MPPT technology;
3. Support remote monitoring online;
4. Auto sleep function;
5. Low-frequency protection function;
6. Dry run protection;
7. Over-current protection;
8. Minimum power protection;
9. Full water protection;
10. Alarm recovery mode programming;
11. Generated harmonics measured at the point of connection, when operating at the rated power shall not exceed a total harmonic distortion of 3%
12. 10 years' minimum warranty.
13. Efficiency $\geq 97\%$

a. Specification of Solar Pump Inverter

Solar Pump Inverter/Driver should be able to drive a three-phase motor under variable speed control with high-performance and excel high demanding load applications that require high starting torque and accurate control.

Solar Pump Inverter/Driver should:

- Support both DC & AC source power inputs, switching to three-phase AC input when solar power is not available.
- Support dual working range 150% overload at 50°C in heavy duty mode and 120% overload at 40°C in normal duty mode.
- With built in integral fault detectors, motor soft start, speed control.
- With dedicated functions for the correct motor operation under these special conditions:
 - 1) Solar Panel voltage set point calculation at every start (depending on current irradiance and panel temperature)
 - 2) True Maximum Power Point Tracking (MPPT) function
 - 3) Detection of sudden changes of conditions (irradiance)
 - 4) Stop criteria selectable (frequency and/or power)
 - 5) Start criteria by solar panel voltage and time (to limit the number of starts)
 - 6) Dry pump detection function
 - 7) Water tank maximum level detection function
 - 8) Low power detection function
 - 9) Two sets of PID gains.

Two sets of PID gains: The Inverter/Driver should have integrated PID sets of gains (Proportional, Integral and Differential) control function as standard with optimal gain factors to obtain:

- 1) Stable performance
- 2) Quick response
- 3) Small steady-state deviation

Low power detection: Inverter should allow to optimize motor functions even in adverse environments, resulting in considerable energy savings.

The inverter should have the following programmable functions to set:

- 1) the power level to determine the low power condition;

- 2) the low power signal ON delay time

Dry pump detection function: The inverter should be able to monitor the output frequency and the power consumption of the motor (pump), this function includes setting the

- 1) output frequency level and hysteresis width,
- 2) the motor power level and hysteresis width,
- 3) with possibility to set the time delay for detection.

This function should have two options allow to deactivate the pump after certain time or stop the inverter with alarm till someone come and reset the alarm.

If the dry pump conditions continue after starting again, the inverter eventually should detect this state again.

b. Automatic Restart:

- Drive should start automatically without any manual intervention, if it has tripped because of under voltage (during cloudy conditions) then it should start automatically.

c. Pump Flow indication (Flow calculation (with PQ-curve of pump))

- The pump driver should be able to calculate the flow of water with power vs flow data from the pump catalogue.

d. Remote monitoring System:

- The Driver should allow Communicates with third party GPRS to enable remote monitoring device using Modbus protocol.

e. Blockage Clearing:

- The driver should have Startup mode momentarily to reverse the rotation to clear a pump blockage.

f. External braking resistor

The inverter must have terminals for connection of an external braking resistor

- 1) Control circuit for the Safe Brake Relay for controlling a holding brake
- 2) The integrated braking unit (braking chopper) is rated with the capability to continuously utilize the external braking resistor.
- 3) The temperature of the external braking resistor must be monitored to provide protection against thermal overloading.

g. Power supply

Protection of Motor from the stress of rise of reflected voltage, overvoltage and common mode current

The following solution should be verified and applied when needed and according to project circumstances:

- 1) Line reactor (output chokes)
- 2) dV/dT filter
- 3) Sine wave filter

h. Tuning the driver/inverter

Each inverter has a max recommended cable length, when the cable length is greater than the recommended you should use an output chock to decrease the effect of long cable There are six factors that come into play when tuning a system.

These factors will provide positive and negative effects in many cases, and must be balanced to achieve the desired outcome.

- 1) Common mode current, check the existing cable size and length
- 2) Carrier frequency, identify the suitable carrier frequency
- 3) System voltage
- 4) Load size

- 5) Lead length
- 6) Cable diameter

i. Common mode current

is created mostly by capacitance due to oversized cables combined with increased lead length. One way to control this effect is to take care not to oversize the cables to the AFD. Depending on the lead length, a dV/dT filter may not be the best choice, and a sine wave filter may need to be used. An effect of lead length is that as the cable becomes longer, common mode current is bled off across the length of the wire, making the common mode current at the motor less than a shorter cable.

Shorter cables will have less common mode current; however, the current at both ends of the cable will be very similar because less current is bled off, which will lead to higher common mode currents at the motor and increased current across the bearings. When the current across the bearings is high it can lead to premature bearing failure, which is why some motors are designed with insulated bearings.

j. Carrier frequency,

as well, controls dV/dT filter heating, because dV/dT filters are designed to operate between 2 kHz and 4 kHz. Most AFDs come out of the box at 12 kHz, so it is important that the carrier frequency is set to the recommendation of the dV/dT filter for the given size.

k. System voltage

greatly affects the reflected wave, because the reflected wave can reach about twice the system voltage. Due to this effect, a 480 V or 575 V system will be much more susceptible to the effects of the reflected wave, while a 230–380 V system will have maximum reflected waves far below the insulation rating of the wire and motor windings.

l. Load size

affects the length as well. Small hp loads are more susceptible to common mode current, because the motor itself has more capacitance. Therefore, small hp loads will have to move to a dV/dT filter or a sine wave filter before larger hp loads will.

m. Lead length

affects filter performance. The shorter the lead, less common mode current is generated, and less core heating occurs.

n. Cable diameter

Has an effect on the amount of capacitance and resistance that the cable produces.

A larger diameter cable will have more surface area and more capacitance, leading to higher common mode currents, and less resistance, leading to reduced dampening of the reflected wave.

o. Cable types

There are many types of cables that can be used to connect to the motor. The most common are AFD cables and standard stranded cables. When a standard stranded cable is used (such as THWN or THHN), all of the cables are loose (not bundled or twisted) and there is a significant amount of cross talk due to EMI/RFI.

In essence, each wire is an antenna that broadcasts all switching frequencies to adjacent wires. To solve the issue of cross talk, AFD rated cables were created. AFD rated cable twists the leads and then inserts a ground per lead to space out the cables from one another to control EMI/RFI. With this type of cable, the cross talk is eliminated or at least greatly reduced. However, all of the added ground wires can add more capacitance, and this will add some common additional mode current.

In today's applications, most motors that are connected to AFDs are inverter duty rated, as are the motor cables.

An inverter rated motor is designed with higher voltage insulation on the windings to counter the reflected wave, and is also designed to operate at lower frequencies without overheating.

p. Cable splices

If at all possible, splicing of the cable between the dV/dT filter and the motor should be avoided. If a large cable is used going to the motor, first look at upsizing the dV/dT filter to accept the cable if that is the reason for the splice. A splice in the cable will introduce an impedance change, causing an impedance bump that is an additional reflection point for the reflected wave. Also, even though the shield may be carried through, it is not protecting the conductors and intrudes a place where EMI and RFI can be both induced and radiated. When a splice cannot be avoided, place that splice as close to the dV/dT filter as possible to keep the leads to that splice short.

q. Shielding and grounding

A typical AFD cable has three conductors, three grounds, and a shield that runs the length of the cable. The cable ground should be tied to the motor ground lug, then tied to the ground lug of the AFD unit or MCC structure on the other end. Placing the ground as close as possible to the AFD helps reduce the impedance of the ground path, thereby reducing system common mode voltages. The shield should only be tied to the ground at one location to eliminate ground loops, either at the motor or at the AFD.

4. Temperature, Cooling and Condensation

Thermostat:

Suitable for controlling fan units, heaters and heat exchangers.

This thermostat can also be used as a signal generator for monitoring the internal enclosure temperature.

Benefits: Time-saving connection technique using a terminal strip with a screw connection from the outside.

Flexible mounting on a vertical or horizontal 35 mm support rail to EN 50 022, snap fastening in the enclosure section or on the mounting plate using the supplied adapter.

Technical specifications: Bi-metal controller as a temperature-sensitive element with thermal feedback

Contact population: Single-pole change-over contact as a quick-break contact

Permissible contact load: Category 5 – 3 (heating): AC 10 (4) A (inductive load at $\cos \phi = 0.6$) / category 5- 4 (cooling): AC 5 (4) A (inductive load at $\cos \phi = 0.6$) / DC = max. 30 W

Switching difference: approx. 1 K \pm 0.8 K.

Two type of cooling methods required, one with integrated fan built in the inverter, second with fan fixed with the enclosure which contained the inverter to keep the inverter in normal operation temperature.

The enclosure should be equipped with internal temperature sensor to activate the operation of fan for precise temperature control inside the control cabinet, the control cabinet internal thermostat or the digital control cabinet internal temperature display and thermostat is recommended In order to prevent condensation on assemblies, hygostat is recommended to regulate heating In larger enclosures, even heat distribution is best achieved by installing several low-output heaters.

The installation of heaters is generally advisable, in order to prevent condensation.

5. Line filter

Power module

Radio interference suppression according to EN 61800-3

Recharging frequency of DC link, max 1 x every 30 S

DC link voltage 1.35 of line voltage

Inverter size and selection

The inverter should have dual working range 150% overload at 50°C in heavy duty mode and 120% overload at 40°C in normal duty mode.

When sizing the inverter to convert the DC power to AC power it is better to select an inverter that deliver the needed current to the pump.

For example, for a pump 18.5 KW (25 HP) with a nominal current 38 Ampere it is enough that you install an 18.5 KW system that deliver 38 Amperes to the Pump.

When you go with a bigger size inverter the pump will run, but the efficiency of the converter will decrease that mean that the power loses will increase and when we are working in solar Pumping each watt is count.

The efficiency of converter and power loses will be part of technical evaluation criteria of the IP20 ensures compatibility in normal-load applications.

Our IP66/NEMA4X models offer guaranteed operation even under the most adverse conditions.

6. Mounting structure

Mounting structure shall comply with applicable building codes, regulation and standards. The contractor will be responsible for the supply and installation of PV modules mounting structure that comply with the following:

1. Hot Dip galvanized steel;
2. All the accessories shall be corrosion resistant. The same applies to all bolts, nuts and guy wires;
3. Site constraint shall be considered, and pre-installation site visits are required to collate space available, shading, etc....;
4. Withstand winds of up to 140 Km/Hr. (Must be supported by calculation notes);
5. All components of the structure must be accessible for inspection and maintenance;
6. All adjacent mounting structures shall be aligned on the horizontal plane and the vertical plane to a tolerance not exceeding 10mm in any direction;
7. Warranty: ≥ 10 years;
8. The minimum yield strength of steel is S235 or equivalent.

7. Reinforced Concrete Foundation

All concrete foundation shall be completely or partially buried under ground. The contractor is responsible for all works necessary including excavation to meet desired specification.

Foundation for the mounting structure and the fence shall comply with the following minimum specification

1. Reinforced concrete with a steel cage shall be used for all footings.
2. Concrete shall be suitable to withstand compression of 35 Mpa on 28 days.
3. Anchor bolts ("J" or "L"), 2 or 4 bolts per base for mounting structure bases.
4. The fence pole can be embedded in the concrete footing, without the need to use a flange.
5. The contractor is responsible of conducting the foundation design and determine the required reinforcing steel and the required embedment length of the 4 bolts and that the provided foundation dimensions are adequate.
6. Concrete base shall be troweled, brushed, edged, and finished in a neat manner.
7. Concrete shall be promptly cleaned from anchor bolts after placement.
8. All structures shall be installed on leveling nuts secured to the anchor bolts and with locking nuts on the top of the base flange.
9. The space between the concrete base and the bottom of the structure mounting flange shall be filled with dry pack mortar to completely fill the space under the flange and around the anchor bolts and be neatly troweled to the contour of flange.

8. DC Combiner Box

The Contractor will be responsible for the supply and installation of DC combiner boxes (DCB) that comply with the following specifications:

1. Class II boxes suitable for outdoor use (minimum IP65 protection if implemented outdoor, in accordance with DIN 40050 and IEC 529)
2. Includes suitable DC fuses on each (+) and (-) polarities.
3. Includes Protective devices against surge overvoltage suitable for photovoltaic systems. Using Type, I plus II SPD (Surge Protective Devices) with fault signal
4. Overvoltage protection devices to comply with IEC 61643-11.
5. Includes DC disconnect switch for load breaking
6. Physical separation of positive and negative terminal blocks
7. Junction Boxes

The Contractor will be responsible for the supply and installation of junction boxes (JB) that comply with the following specifications:

1. Class II boxes suitable for outdoor use (minimum IP65 protection if implemented outdoor, in accordance with DIN 40050 and IEC 529)
2. Physical separation of positive and negative terminals blocks.

9. Cables

Sizes of cables between array interconnections, array to junction boxes, junction boxes to inverter etc. is selected carefully to keep the voltage drop of the entire solar system to the minimum.

The maximum allowed AC Voltage drop between Inverter and Pump is below 3% The maximum allowed DC Voltage drop is below 1%

a. DC Cables

The DC cables are selected to comply with PV1-F requirement profile for PV cables, with the following minimum specification:

1. Temperature rating higher than 40°C above ambient temperature
2. Ozone resistant acc. to EN 50396
3. Weather and UV resistant acc. to HD 605/A1
4. Halogen-free acc. to EN 50267-2-1, EN 60684-2
5. Resistant to acid and bases acc. To EN 60811-2-1
6. Abrasion-resistant sheath acc. to DIN EN 53516
7. Flame-resistant acc. to VDE 0482-332-1-2, DIN EN 60332-1-2, IEC 60332-1
8. Flexible
9. Double insulated (Class II)
10. Voltage rating of at least 1000 Vdc

b. AC Cables

The contractor will be responsible for the supply and installation of AC Cables between VFD and main distribution board, the cables must be multipolar with double insulation (Class II). Routing the electrical connections of AC circuit shall be in covered hot-dip galvanized cable trays where needed.

10. Reactors / Chokes

Reactors can protect both motors and variable frequency drive from harmful current and voltage spikes. Line Reactors also help reduce power line distortion, known as harmonics, by adding impedance to the power unit.

The contractor shall be responsible for the supply and installation of the following items at each power plant:

1. DC Reactors at the DC input line from Photovoltaic array to the Drive.
2. AC Output Reactors or load reactor immediately after the inverter at the 3-phase output line to the pump, between the drive and the output ATS to the drive.

Reactors shall be enclosed in a cabinet along with the drive or separately with other electrical equipment with door lock and warning signs to comply with safety standards.

When placed inside electric enclosures, all bus bars, or exposed conductors shall be covered by protective surfaces to avoid direct contact by personnel, per international standards.

Reactors shall be properly grounded.

11. Output Reactor

Output Reactors shall carry the following minimum specification

- Copper material
- 2% max voltage drop
- Insulation class F
- Rated Voltage 520VAC
- Rated Power, and rated current shall be equivalent to inverter rated power on drawing

12. DC Reactor

The DC reactor shall carry the following minimum specification

1. Copper material
2. 3% max voltage drop
3. Insulation Class F
4. Rated for 750 VDC
5. Rated power to be equivalent to rated power of the VFD on electrical drawing.

13. Cable Trays

1. Cable trays to be used for cable routing above ground
2. Cable conduits to be used for cable routing buried under soil
3. Cable trays shall be made of galvanized steel, and include proper
 - a) turns,
 - b) supports
 - c) necessary covers.
 - d) Cable clamps where needed
 - e) grounding
4. Sizing cable trays shall respect international practices, with enough room for cables to dissipate heat.

14. Outdoor Housing

Free stand housing systems, one-door or two-door with low power dissipation in outdoor areas and Roof concept with all-round louvered grilles with following specification:

- Roof projection to increase the proportion of shading
- Air exchange with all-round louvered grilles



- Fan for active climate control is covered in an IP-compatible manner with Enclosure Heater without fan PTC heater without fan, continuous thermal output, with quick-connection terminal.
- Eyebolts on the inner roof, concealed by the rain canopy for transporting the fully loaded unit by crane
- with Extensive range of system-compatible accessories for individual installations

with following specification:

Description:	Outdoor housing with 100 mm transport base/plinth and rain canopy projecting on all sides.
Material:	Aluminium AlMg3
Surface finish:	Powder-coated UV-resistant pure polyester
Colour:	RAL 7035
Protection category IP to IEC 60 529:	IP 55
Protection category NEMA:	NEMA 3R
IK code:	IK07
Supply includes:	Single-walled outdoor enclosure, fully preconfigured Basic enclosure with gland plate, three-part 25 mm system punching in the roof, base, front and in the enclosure depth Front door(s) with door stay, swing lever handle and semi-cylinder, lock BJ20027 Transport plinth with screw-fastened trim panels front and rear Rain canopy
Base material:	Aluminium
Dimensions:	To accommodate system components and control
Rain canopy:	According to enclosure size
Number of doors:	2 or 1
Centre bar:	With removable centre bar, 2 lockable doors

15. Earthing

The contractor shall be responsible for the installation of proper earth connections, and grounding of all electrical items accessible to personnel including but not limited to:

1. Solar modules frames
2. Mounting Structure,
3. Fence,
4. Solar VFD,
5. Electrical Cabinets
6. Cable trays, combiner & junction boxes
7. Control, Data Monitoring Equipment

Earth resistance shall be less than 5 ohms.

Earth resistance shall be tested prior to startup or commissioning activities.

16. Security and Site Protection Measures

Fence: The bidder shall supply and install galvanized steel perimeter fencing to surround and secure the complete solar power plant. All associated equipment within the scope of supply shall be enclosed within the fence, except for items installed in already secured electrical or mechanical rooms.

The Fence shall include all necessary foundation, fixing, supports and access gates to facilitate the operation and maintenance of the plant.

The bidder shall provide working drawings for the proposed fencing installation.

17. Lightning protection

Each solar power plant shall be provided with lightning protection. The purpose of which is to protect the Solar PV plant and existing equipment on site from lightning strikes, and overvoltage hazards. The source of over voltage can be lightning, atmosphere disturbance etc. Lightning protection should be provided as per IEC 62305 standard.

For more details about lightning protection location and specifications refer to the layout drawings.

18. Safety signs

The contractor shall supply and install the following safety signs which shall be treated against oxidation, and supplied with the descriptions below:

1. Danger High Voltage
2. Warning do not touch

The minimum dimensions of the safety signs must be 20 cm height and 50cm length.

7.11.4 Fire Fighting Equipment

Each electrical room shall be provided with portable dioxide (CO₂) fire extinguishers minimum weight 5Kg, complete with a gauge and wall bracket.

19. General

In addition to the above equipment, the site should be equipped with at least the following items:

1. Portable Power Emergency lights
2. Electrical sockets for maintenance,
3. Portable 50m hose with reel, and spray nozzle, used for manual cleaning of solar modules
4. Telescopic cleaning soft brush, used for cleaning modules surface.

20. Day/Night Controller

The controller responsible for the switch between solar and AC operation, shall have the ability to make the switch to run the pump on solar in the morning, and back to grid mode late afternoon. The controller must carry the following minimum specification

- 1- Analog input reading, suitable for the irradiation sensor output
- 2- Accuracy +5%
- 3- Multiple input thresholds
- 4- Dry contacts

5- Timers

6- Conforms to CE

21. Data Acquisition System DAS

Data Acquisition system shall be provided for each of the solar PV plant. The purpose of data Logging is to Log and Monitor the performance of the solar system A DSL or 3G modem is required to allow a continuous connection to the internet for the data logger to ensure remote monitoring of the installation can occur in real-time. The data logger shall be able to collect data indefinitely, for review at a later stage, also remotely. The DAS shall be able to issue reports previously configured (daily, monthly, yearly) that can be exported in CSV and MS excel format.

The data to be collected shall include the following at the least:

1. Actual Input and Output voltage
2. Current (A), power (kW) and frequency (Hz) reading from the solar drive.
3. Actual Ambient Temperature measured by the temperature sensor
4. Actual Array Irradiation measured by Irradiation sensor
5. Actual Module Temperature measured by a module Temperature sensor
6. Archive data to include stored averages of all measured parameters. Averages for every 5, 10, or 15 minutes - programmable interval.

22. PV Station Sensors

Each PV station shall be equipped with a minimum set of the following sensors: 1- One Ambient Temperature

2- One Module temperature

3- Two Irradiation sensors

All sensors must be able to connect seamlessly with data logger on site.

23. UPS - Backup Power

The UPS is essential to keep the data logger and control circuits online when no power is available.

The bidder must provide a UPS with enough power to provide for the control circuit and the data logger/monitoring equipment for a period no less than 6 hours without charging.

The UPS should be able to re-charge its batteries from available electricity on site, Utility power or Generator, whichever is available and carry the following minimum features:

1. Online
2. 12/24 DC voltage
3. Replaceable battery, preferably external to allow adding batteries
4. Lead acid or lithium battery
5. Protection for Overload, discharge/overcharge and short circuit protection
6. Compliance to: EN 50091-1-1/EN 69050 (RD), IEC 60950.

24. Water access

The contractor is responsible for providing access to water near the PV modules to facilitate cleaning.

Standard Polyethylene or PEX piping can be used underground protected from the sun, with designated access points using vertically installed galvanized steel piping and fittings, fixed in the ground with concrete ballast.

Ball valves and fittings to be made from brass with anti-rust properties, fitted with push fit accessories for easier

plug in of flexible hose used for cleaning.

Proper connection to existing water network inside or outside mechanical room shall be coordinated with project manager.

A main supply valve shall be installed near the take off point, and a drain valve shall be installed at the lowest point to allow the pipe to be drained from water during the winter seasons to prevent damage to piping during overnight freeze.

25. Datasheets and Certifications

Bidders are requested to provide equipment datasheets, catalog pages, and certificates of compliance to standards that clearly show the specification of the material to be supplied.

All documentation shall be arranged in a folder with a clear table of contents for easy lookup of references.

The documentation shall be provided in two hard copies, and one soft copy.

26. Safety Issues

Planning & Construction works shall observe the personnel and equipment safety on site especially:

Safety of workers

- I. Safety for users
- II. Safety for the equipment of the plant
- III. Safety for existing structures and systems

The Contractor shall be responsible for the safety of all activities on the Site.

27. Electrical Installation

Final design and installation of electrical systems shall comply with National and international standards especially related to personnel safety.

28. Layout Drawings

The contractor shall provide detailed layout plans and wiring diagrams along with his proposal.

The drawings shall consider the following:

- Dimensions of arrays, including tilt and orientation
- The total number of modules
- Access roads for equipment and maintenance
- DC and AC cables routing
- Electrical room showing Location of the VFD's, junction boxes, fire extinguishers, etc. inside the room

29. Documentation and Training

- The contractor must provide as-built drawings and technical documentation in English.
- The contractor shall provide operation and maintenance manuals in English and Kurdish.
- The contractor shall provide training for the technical staff on the operation of the PV System.

Solar Pumping				
Technical Specifications				
No	Item	Unit	Value	Tenderer Offer
1	Solar Photovoltaic (PV) Modules			
1.1	Type used		Mono N-type IBC Technology	
1.2a	Total PV Capacity at STC (Greater or equal to): For Submersible Pump	kWp	According to site specification	
1.2b	Power temp. coefficient	Deg C	-0.29 to 0.31 %	
1.2c	PV panels match the standard weather & ambient temp. specification for KRG/IRAQ		temp. coefficient of Isc $\geq 0,050$ %/k	
	Low temp. coefficient for high temp. regions		2.temp. coefficient of Voc $\geq 0,0290$ %/k	
1.3	Rated Power of each module (Greater or equal to)	Wp	$P \geq 370$	
1.4	PV- panel type		N-type IBC Tech.	
1.5	Vmp (@STC greater or equal to)	V	30 (36)	
1.6	Voc (@STC Less than or equal to)	V	40 (47.5)	
1.7	Module conversion efficiency (greater or equal to)	%	≥ 20	
1.8	Positive power tolerance (greater or equal to)	%	≥ 3	
1.9	Cell Protection		Cells should be protected by anti-reflective coated tempered glass	
1.10	Module shall withstand load up to and above	Pascal	5400	
1.11	I-V Curve is Supplied		Yes	
1.12	PV Modules Compliance		IEC 61730-1/2: 2004 and IEC 61215-2: 2005 Guidelines	
1.13	Minimum Warranty	Years	10 years on material and manufacturing	
1.14	Output Warranty	Years	10 years with 90% power output and 25 years 80% power output warranty	
1.15	PV Modules should include measures against Potential Induced Degradation (anti PID).		yes	
2	AC 3-Phase Solar Pump Inverter			
2.1a	Rated Power: For Submersible Pump Inverter (Greater or equal to)	kW	\geq rated power specification	

2.2	Minimum Protection Class of Solar Pump Inverter as per datasheet of manufacturer		IP54	
2.3	Solar Pump Application Software with Integrated MPPT Functionality		yes	
2.4	With Integrated Input Noise Filter		yes	
2.5	Pump Operation selection through either DC Input or 3-Phase Input of Inverter.		yes	
2.6	Inverter Efficiency (Greater or equal to)	%	97	
2.7	Communication: MODBUS/RS485, allowing monitoring and control of inverter operation		yes	
2.8	Proper external protection measures on AC and DC sides including surge protection.		yes	
2.9	Maximum Operating Temperature (Greater or equal to) as per manufacturer	Deg C	60	
2.10	Minimum Warranty	years	10	
3	Metallic Support Structures			
3.1	All structures shall be made of corrosion resistant materials e.g. aluminum, galvanized steel		yes	
3.2	Can withstand wind loads on PV generators up to:	km/h	140	
3.3	Tilt and orientation of PV have to be optimized for yearly best performance operation		yes	
3.4	Metallic Support Structures should be properly grounded and Bonding is required between PV module chassis and steel structure support		yes	
4	Sinusoidal Filter: For Submersible Pump			
4.1	Properly sized and selected for Solar Pump Inverter installed on Submersible Pump in accordance to Manufacturer of Inverter requirements and application requirements.		yes	
4.2	Minimum Warranty	years	5	
5	Water Meter at Output of Submersible Pump			
5.1	Installed at output of Submersible Pump to measure the quantity of water transferred.		yes	
5.2	Communicate with Transfer Pump controller in Electrical Room to data log and save quantities of water extracted per day/month/year.		yes	
5.3	Minimum Warranty	years	5	
7	Tank Level Sensor and Floating Level Switch on water Tank			

7.1	Submersible Tank Level Sensor installed on tank above Electrical Room and display amount of water in the tank.		yes	
7.2	Communicate with Transfer Pressure Pump controller in Electrical Room to data log and save level of water in tank.		yes	
7.3	Below a programmable lower safety level of water in tank, Transfer Pressure pump should not operate		yes	
7.4	Above a programmable upper safety level of water in tank, Submersible Pump should not operate		yes	
7.5	Minimum Warranty	years	5	
8	Monitoring and Control Setup			
8.1	Municipality Operator should be able to shift between Generator Supply, Normal Electrical Supply or PV supply.		yes	
8.2	There should be an independent controller for Submersible Pump, monitoring and saving vital parameters.		yes	
8.4	At least one Irradiation sensor and PV temperature sensor should be installed per direction of each PV array. Communication and power supply cables for Irradiation and PV temperature sensors should run down to Electrical Room and logged with the other critical values.		yes	
8.5	A Graphic user interface with display unit will display and datalog Values of interest (Voltage, Current, Speed of pump, tank level, water meter, Irradiation, Temperature...etc) both local and possibility to data transmit via internet.		yes	
8.6	Controller should be ready to remotely relay site info through regular (monthly) emails in addition to live monitoring and faults through internet connection when supplied by Municipality.		yes	
8.7	The main power panel board should have an automatic change over switch to switch between the DC and the AC source at the inverter input from graphical user interface of upper controller.		yes	
8.8	Because of dusty environment minimum IP rating of all Electrical Panel Boards in Electrical Room.		IP54	
8.9	Control Setup should have the possibility to add digital and analog Inputs units if need		yes	

	be in the future.			
8.10	UPS system to ensure power to all sensors and controllers, and an autonomy of at least 24hrs for these without power in case of power cut. UPS charging time will be 7 hours/day (Utility Supply or GENSET). (supporting calculations to be presented)		yes	
9	Protection Circuit and Cables			
9.1	Circuit Breakers should be provided for short-circuit conditions		Yes	
9.2	All electronic components must take into consideration temperature compensation issues		Yes	
9.3	Full Protection		Against open circuit, accidental short circuit and reverse polarity by blocking diode should be provided	
9.4	Earthing and lightning protection systems shall be added to installation, with a resistance value (as tested in dry season) that shall be less than 5 ohms. Proper Handhole ground should be set in place with a metal cover for routine and periodic measurements / maintenance procedure.		Yes	
9.5	Earthing and Lightning protection should cover all installation including both areas PV area and Electrical Room.		Yes	
9.6	Solar cables (a.k.a. photovoltaic cable) specifically manufactured for solar applications shall be used.		Yes	
9.7	Solar cables should be manufactured according to the international standard EN 50618 - H1Z2Z2-K.		Yes	
9.8	Electrical junction boxes shall be UV resistant, IP65, weatherproof and installed at high level to eliminate any risk of water submersion.		Yes	
9.9	All circuit breakers, fuses and disconnects must be listed or recognized for use in DC circuits where applicable. Equipment only rated for use in AC circuits will not be permitted for use in DC circuits.		Yes	
9.10	Provide at least one AC Disconnect located adjacent to the inverter.		Yes	
9.11	Provide at least one DC Disconnect located adjacent to the inverter.		Yes	

9.12	Surge suppression on the DC and AC side of the inverter must be provided		Yes	
9.13	All cables and items that are exposed to the sun should be UV-resistant		Yes	
9.14	When Power and Control Cables are running in parallel, a separator will be provided between them.		Yes	
9.15	All running cables that are not underground should be placed in cable trays that should be properly grounded if metallic and should be protected from rodents or rats.		Yes	
9.16	Manholes should be placed for ease of access and maintenance of underground cables.		Yes	
10	Supporting Documents			
10.1	Provide Software Simulation case study showing irradiation simulation in addition to the system power generation forecast for 12 months period for the designated location.		Yes	
10.2	Simulation should also show variation of pump's flow and operating speed according to the available solar irradiation throughout the day and throughout the different seasons. Variation impact on power consumption should also be indicated.		Yes	
10.3	Indicate the configuration of the PV modules layout and the required space.		Yes	
10.4	Single Line diagram of power connections		Yes	
10.5	To provide schematic drawings showing Power and Control cables' routing between Electrical Room, Submersible Pump, Local Tank, all sensors and meters, and PV Panels.		Yes	
10.6	Calculations notes (such as cable sizing, panel board's equipment sizing, bus-bars sizing, short circuit current ratings, etc.) are to be specified in detail.		Yes	
10.7	All system's components datasheets and certificates shall be submitted highlighting the specific models and selections of parts that will be used in project, with quantities if need be.		Yes	
10.8	Wind Load calculation study for PV array should be presented, with a safety factor of 2.		Yes	

10.9	Contractor: List of Solar Pumping Applications installed including at least a single solar pump above 20 kW.		Yes	
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PLEASE NOTE THAT EACH OF THE VALUES OR REQUESTED INFORMATION PLUGGED INTO THE TABLE ABOVE AS PER TENDER OFFER SHOULD BE HIGHLIGHTED IN THE RESPECTIVE SUPPORTING DOCUMENTS THAT SHOULD BE ENCLOSED IN HARDCOPY FORMAT WITH OFFER.

**Engineering, Procurement, Implementation and Maintenance contract for
Upgrading Existing Water Pumping Stations to Operate on Solar Photovoltaic
Directorate of Water Supply at Rural Area-Erbil**

TECHNICAL SPECIFICATIONS

ABBREVIATIONS AND ACRONYMS

AC	Alternating Current
BEE	Bureau of Energy Efficiency
BEP	Best Operating Point
DC	Direct Current
DHI	Direct Horizontal Irradiance
DNI	Direct Normal Irradiance
DSM	Demand-Side Management
GHI	Global Horizontal Irradiance
Gov	Government
GWh	Gigawatt-Hour
hp	Horsepower
kW	Kilowatt
kWp	Peak Kilowatt
kWh	Kilowatt-Hour
MPPT	Maximum Power Point Tracking
m	Meter
MJ	Megajoule
mm	Millimeter
MW	Megawatt
MWh	Megawatt-Hour
PV	Photovoltaic and Present Value
RE	Renewable Energy
TA	Technical Assistance
VF	Variable Frequency
VSD	Variable Speed Drive
Wp	Peak Watt

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A. Introduction

The Governorate of Erbil (GoE) seeks to implement and promote renewable energy solutions in order to reduce its energy bill in general and in particular its generator fuel cost. Integrating Solar Pumping as a solution would constitute an important step in that direction to the benefit of the community, since the GoE is facing long electricity cut-off periods.

B. Location of Project and Present Situation

This pumping station consists of a water-well equipped with a 7.5 to 30 HP Submersible Pump that feeds a site water tanks and feed rural villages with drinking water.

C. Site visit

The bidder is required at his own risk to visit and examine the Site of Works and its surroundings and obtain for himself on his own responsibility all information that may be necessary for preparing the bid and entering into a contract for construction of works. The cost of visiting the site shall be at the bidder's own expense.

D. Scope of Works

Engineering, Procurement, Implementation and Maintenance contract for Upgrading Existing Water Pumping Stations to Operate on Solar Photovoltaic with the Directorate of Water Supply at Rural Area-Erbil.

The works under this project consist of designing, supplying all the systems' components, complete installation, testing and commissioning, before handing over the operation to Directorate of Water Supply at Rural Area-Erbil.

The construction of the solar plant at each location includes but is not limited to the following:

1. Site Assessment by a qualified team to locate the array;
2. Design, study and analysis of support structures in compliance with all applicable codes, safety standards, array location and safety.
3. Design the system with a minimum of electrical losses due to wiring, fuses, switches and inverters;
4. Site clearance and preparation, leveling the ground, cleaning the perimeter and protect it from dry herbs.
5. Civil works required for the implementation of the pens and Photovoltaic project;
6. Supply and installation of support structures for photovoltaic panels;
7. Array location, maximize solar energy production depends on panel location and orientation with panel tilt predetermined based on latitude and local weather;
8. Supply and installation of all electrical equipment's (solar panels, Variable frequency drive, Combiner Boxes, DC switches, surge arrestors, contactors, thermal protections, overload current protection, AC & DC Reactors or sinusoidal filter etc.) according to manufacturer's specifications, using installation requirement and procedures;
9. Connection of the electrical equipment according to approved electrical drawings;
10. Supply and installation of a lightning protection system with proper grounding;
11. Properly ground the system parts to reduce the risk of shock hazards and induced surges;
12. Supply, installation and connection of remote monitoring system;
13. Connection to the existing pumps with all necessary protection equipment;
14. Provide relevant documentation, including datasheets and user manuals for supplied items;
15. Provide Operation and maintenance manual for the system;
16. Testing and commissioning;
17. Training of Operators;
18. Maintaining the system for two years.

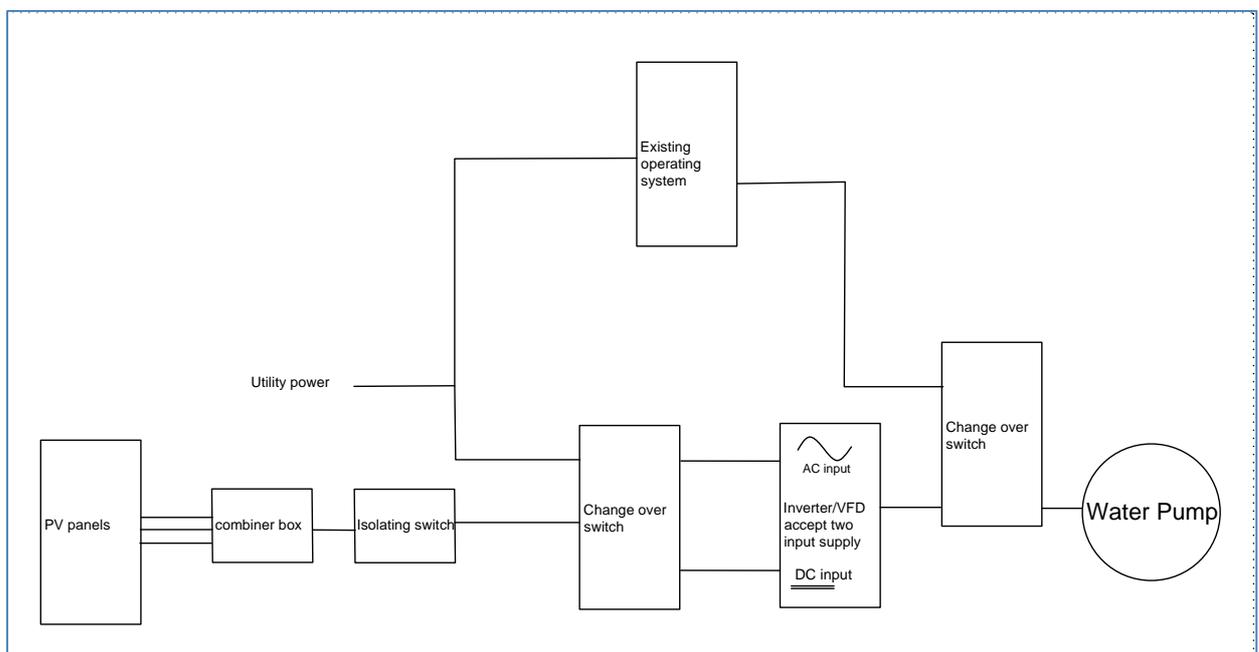
E. Design consideration

The risk of vandalism and theft can be significant: The panels should not be easily accessible by the public. Measures to curb this risk include: Build community ownership, Locate the solar array in a populated area with regular foot traffic, fence the array to make access more difficult, arrange for security guards, install motion-detecting sensors and alarms whenever possible, spot-weld bolts or use tamper-proof bolts, screws, and fasteners, use anti-theft array mounting frames.

Metallic structures: Should hold the panels and should be designed to withstand strong winds. There are three types of frames: ground, roof, and post and all are accepted according to site conditions

Safety standards: PV systems present a unique combination of hazards and risks, which must be addressed by sound design and specifications followed by proper installation, operation, and maintenance of the system.

Equipment protection: Protecting equipment against faults on both the DC and AC sides requires careful attention to Grounding design and protective components addressed by grounding (giving electrical lightning surges a direct path to the ground that bypasses valuable equipment) and by installing lightning arrestors and surge protectors.



F. **Site Information**

1. Site 1

Governorate	Erbil Governorate		
Beneficiary state	Directorate of Water Supply for Rural Area - Erbil		
Site name	Water pumping station		
District		Sub district	Hariar
Village	دهريه نندوك	Road	HariarSpeelk road
Altitude and longitude	(N=363531.3),(E=4419096.4),(Elevation =662m)		
Google Map	https://maps.app.goo.gl/2GriMeP1QwAw4asV8		
Identified location for PV Solar Panels	On the ground, near to the Water Pump station on figure 2.		

The Capacity of Submersible water pump							
Well depth in meter	Well diameter in inch	Depth of submersible pump in meter	water steel pipe size in Inch	Water flow in l/s	Water flow in m3/h	Water Tank capacity in m3	Water Tank level from ground/ static head
235 m	8"	120m	2"		8	21	
Hour of operation per day	Hour of operation per week	Name the manufacturer for the submersible pump	the model number of submersible pump	Horsepower HP	Kilowatt KW	years in operation for the pump	Install PV KW
8	56			7.5 hp	5.5 kw	2 years	8.25

Water Pump Room with Water Tank	North
	
Figure 1 Proposed location for PV solar Panels	Figure 2 proposed location for PV solar panels
Pump room with electrical Board	Google plan South direction



Figure 3 Pump room and proposed location for PV control system



Figure 4 Google map for the site the approximate direction of south shown in the above arrow

2. Site 2

Governorate	Erbil Governorate		
Beneficiary state	Directorate of Water Supply for Rural Area - Erbil		
Site name	Water pumping station		
District		Sub district	Hariar
Village	رکاوہ بہرازان جمہ سور	Road	HariarSpeelk road
Altitude and longitude	(N=363517.1),(E=441916.5),(Elevation =653m)		
Google Map	https://maps.app.goo.gl/jZS8qeBgEjj4XnxRA		
Identified location for PV Solar Panels	On open area on the left of the pumping room, near to the Water Pump station on figure 2.		

The Capacity of Submersible water pump								
Well depth in meter	Well diameter in inch	Depth of submersible pump in meter	water steel pipe size in Inch	Water flow in l/s	Water flow in m3/h	Water Tank capacity in m3	Water Tank level from ground/ static head	
150 m	8"	108 m	3"		30	40		
Hour of operation per day	Hour of operation per week	Name the manufacturer for the submersible pump	the model number of submersible pump	Horsepower HP	Kilowatt KW	years in operation for the pump		Install PV KW
10	70			20	15	2005		22.5

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Water Pump Room



Figure 1 Water Pump room

North Area



Figure 2 proposed location for PV solar panels

Electrical Board



Figure 4 Pump room and proposed location for PV control system

Google plan
South direction



Figure 3 Google map for the site the approximate direction of south shown in the above arrow

3. Site 3

Governorate	Erbil Governorate		
Beneficiary state	Directorate of Water Supply for Rural Area - Erbil		
Site name	Water pumping station-1		
District	شیخان She khan	Sub district	
Village		Road	Qushtapa
Altitude and longitude	(N=354925.81),(E=440418.23),(Elevation =310m)		
Google Map			
Identified location for PV Solar Panels			

The Capacity of Submersible water pump							
Well depth in meter	Well diameter in inch	Depth of submersible pump in meter	water steel pipe size in Inch	Water flow in l/s	Water flow in m3/h	Water Tank capacity in m3	Water Tank level from ground/ static head
163	8"	150	3"		30		
Hour of operation per day	Hour of operation per week	Name the manufacturer for the submersible pump	the model number of submersible pump	Horsepower HP	Kilowatt KW	years in operation for the pump	Install PV KW
5	35			20	15	1989	22.5

Water Pump Room	North Area
 <p>Figure 1 Water Pump room</p>	
Electrical Board	Google plan South direction



4. Site 4

Governorate	Erbil Governorate		
Beneficiary state	Directorate of Water Supply for Rural Area - Erbil		
Site name	Water pumping station-1		
District		Sub district	
Village	نۆمهراوهی بچووک	Road	
Altitude and longitude	(N=354950.61),(E=440511.91),(Elevation =296m)		
Google Map			
Identified location for PV Solar Panels			

The Capacity of Submersible water pump							
Well depth in meter	Well diameter in inch	Depth of submersible pump in meter	water steel pipe size in Inch	Water flow in l/s	Water flow in m3/h	Water Tank capacity in m3	Water Tank level from ground/ static head
140m	8"	90	2.5"		17	21	9m
Hour of operation per day	Hour of operation per week	Name the manufacturer for the submersible pump	the model number of submersible pump	Horsepower HP	Kilowatt KW	years in operation for the pump	Install PV KW
6	42			15	11	1996	16.5

Water Pump Room	North Area
	
Figure 1 Water Pump room	
Electrical Board	Google plan South direction



5. Site 5

Governorate	Erbil Governorate		
Beneficiary state	Directorate of Water Supply for Rural Area - Erbil		
Site name	Water pumping station-1		
District		Sub district	
Village	كيشكه	Road	
Altitude and longitude	(N=361624.9),(E=442217.0),(Elevation =863m)		
Google Map			
Identified location for PV Solar Panels			

The Capacity of Submersible water pump								
Well depth in meter	Well diameter in inch	Depth of submersible pump in meter	water steel pipe size in Inch	Water flow in l/s	Water flow in m3/h	Water Tank capacity in m3	Water Tank level from ground/ static head	
200m	8"	90	2.5"		17	21	9	
Hour of operation per day	Hour of operation per week	Name the manufacturer for the submersible pump	the model number of submersible pump	Horsepower HP	Kilowatt KW	years in operation for the pump		Install PV KW
7	56			25	18.5	2005		27.75

Water Pump Room	North Area
 <p>Figure 1 Water Pump room</p>	
Electrical Board	Google plan South direction



G. Material and Equipment

The PV solar pumping project consists of solar modules and solar drives along with data logger and sensors, electrical cables, as well as all protection equipment described in the technical drawings.

This section details the required specifications for the components that will be used in the project. Failure to conform to these specifications may result in the disqualification of the bidder.

6. General Instructions

Equipment shall be the latest standard product of the manufacturer and comply with the specifications, regulations and international standards.

Equipment generally is to be supplied in complete factory assembled units ready for installation on site.

Equipment and material are to be stored in an approved location, under cover, free from humidity, dust, debris and rodents. Equipment sensitive to heat and humidity is to be kept in climatically conditioned areas until installed and handed over.

All equipment supplied shall carry original manufacturer's warranty.

7. PV Modules

The contractor will be responsible for using high efficiency photovoltaic modules with the following minimum requirement:

1. Compliance to IEC 61215
2. Compliance to IEC 61730
3. Certified for high snow 5400 Pa
4. Certified for wind load 2400 Pa.
5. Conforms to CE
6. Mono N-type IBC solar cells.
7. Rated output power: $\geq 370\text{Wp}$
8. Efficiency: $\geq 20\%$.
9. IP rating: IP65 for junction box and IP67 for connectors.
10. The Warranty shall include the following at the least
 - 10 years on material and manufacturing
 - 25 years on performance
 - With 80% output after 25 years
11. Reports of flash testing of modules to be provided before installation

8. Solar Pump Inverter

Solar variable frequency drive with a built-in pump system controller, the choice of the VFD is critical to the success and performance of the solar water pump.

The proposed VFD must meet the following requirement:

1. Support for synchronous and asynchronous three phase induction motors;
2. MPPT technology;
3. Support remote monitoring online;
4. Auto sleep function;
5. Low-frequency protection function;

6. Dry run protection;
7. Over-current protection;
8. Minimum power protection;
9. Full water protection;
10. Alarm recovery mode programming;
11. Generated harmonics measured at the point of connection, when operating at the rated power shall not exceed a total harmonic distortion of 3%
12. 10 years' minimum warranty.
13. Efficiency $\geq 97\%$

a. Specification of Solar Pump Inverter

Solar Pump Inverter/Driver should be able to drive a three-phase motor under variable speed control with high-performance and excel high demanding load applications that require high starting torque and accurate control.

Solar Pump Inverter/Driver should:

- Support both DC & AC source power inputs, switching to three-phase AC input when solar power is not available.
- Support dual working range 150% overload at 50°C in heavy duty mode and 120% overload at 40°C in normal duty mode.
- With built in integral fault detectors, motor soft start, speed control.
- With dedicated functions for the correct motor operation under these special conditions:
 - 1) Solar Panel voltage set point calculation at every start (depending on current irradiance and panel temperature)
 - 2) True Maximum Power Point Tracking (MPPT) function
 - 3) Detection of sudden changes of conditions (irradiance)
 - 4) Stop criteria selectable (frequency and/or power)
 - 5) Start criteria by solar panel voltage and time (to limit the number of starts)
 - 6) Dry pump detection function
 - 7) Water tank maximum level detection function
 - 8) Low power detection function
 - 9) Two sets of PID gains.

Two sets of PID gains: The Inverter/Driver should have integrated PID sets of gains (Proportional, Integral and Differential) control function as standard with optimal gain factors to obtain:

- 1) Stable performance
- 2) Quick response
- 3) Small steady-state deviation

Low power detection: Inverter should allow to optimize motor functions even in adverse environments, resulting in considerable energy savings.

The inverter should have the following programmable functions to set:

- 1) the power level to determine the low power condition;
- 2) the low power signal ON delay time

Dry pump detection function: The inverter should be able to monitors the output frequency and the power consumption of the motor (pump), this function includes setting the

- 1) output frequency level and hysteresis width,
- 2) the motor power level and hysteresis width,
- 3) with possibility to set the time delay for detection.

This function should have two options allow to deactivate the pump after certain time or stop the inverter with alarm till someone come and reset the alarm.

If the dry pump conditions continue after starting again, the inverter eventually should detect this state again.

- b. Automatic Restart:
 - Drive should start automatically without any manual intervention, if it has tripped because of under voltage (during cloudy conditions) then it should start automatically.
- c. Pump Flow indication (Flow calculation (with PQ-curve of pump))
 - The pump driver should be able to calculate the flow of water with power vs flow data from the pump catalogue.
- d. Remote monitoring System:
 - The Driver should allow Communicates with third party GPRS to enable remote monitoring device using Modbus protocol.
- e. Blockage Clearing:
 - The driver should have Startup mode momentarily to reverse the rotation to clear a pump blockage.
- f. External braking resistor

The inverter must have terminals for connection of an external braking resistor

 - 1) Control circuit for the Safe Brake Relay for controlling a holding brake
 - 2) The integrated braking unit (braking chopper) is rated with the capability to continuously utilize the external braking resistor.
 - 3) The temperature of the external braking resistor must be monitored to provide protection against thermal overloading.
- g. Power supply

Protection of Motor from the stress of rise of reflected voltage, overvoltage and common mode current

The following solution should be verified and applied when needed and according to project circumstances:

 - 1) Line reactor (output chokes)
 - 2) dV/dT filter
 - 3) Sine wave filter
- h. Tuning the driver/inverter

Each inverter has a max recommended cable length, when the cable length is greater than the recommended you should use an output chock to decrease the effect of long cable There are six factors that come into play when tuning a system.

These factors will provide positive and negative effects in many cases, and must be balanced to achieve the desired outcome.

 - 1) Common mode current, check the existing cable size and length
 - 2) Carrier frequency, identify the suitable carrier frequency
 - 3) System voltage
 - 4) Load size
 - 5) Lead length
 - 6) Cable diameter
- i. Common mode current

is created mostly by capacitance due to oversized cables combined with increased lead length. One way to control this effect is to take care not to oversize the cables to the AFD. Depending on the lead length, a dV/dT filter may not be the best choice, and a sine wave filter may need to be used. An effect of lead length is that as the cable becomes longer, common mode current is bled off across the length of the wire, making the common mode current at the motor less than a shorter cable.

Shorter cables will have less common mode current; however, the current at both ends of the cable will be very similar because less current is bled off, which will lead to higher common mode currents at the motor and increased current across the bearings. When the current across the bearings is high it can lead to premature bearing failure, which is why some motors are designed with insulated bearings.

- j. Carrier frequency,
as well, controls dV/dT filter heating, because dV/dT filters are designed to operate between 2 kHz and 4 kHz. Most AFDs come out of the box at 12 kHz, so it is important that the carrier frequency is set to the recommendation of the dV/dT filter for the given size.
- k. System voltage
greatly affects the reflected wave, because the reflected wave can reach about twice the system voltage. Due to this effect, a 480 V or 575 V system will be much more susceptible to the effects of the reflected wave, while a 230–380 V system will have maximum reflected waves far below the insulation rating of the wire and motor windings.
- l. Load size
affects the length as well. Small hp loads are more susceptible to common mode current, because the motor itself has more capacitance. Therefore, small hp loads will have to move to a dV/dT filter or a sine wave filter before larger hp loads will.
- m. Lead length
affects filter performance. The shorter the lead, less common mode current is generated, and less core heating occurs.
- n. Cable diameter
Has an effect on the amount of capacitance and resistance that the cable produces.
A larger diameter cable will have more surface area and more capacitance, leading to higher common mode currents, and less resistance, leading to reduced dampening of the reflected wave.
- o. Cable types
There are many types of cables that can be used to connect to the motor. The most common are AFD cables and standard stranded cables. When a standard stranded cable is used (such as THWN or THHN), all of the cables are loose (not bundled or twisted) and there is a significant amount of cross talk due to EMI/RFI.
In essence, each wire is an antenna that broadcasts all switching frequencies to adjacent wires. To solve the issue of cross talk, AFD rated cables were created. AFD rated cable twists the leads and then inserts a ground per lead to space out the cables from one another to control EMI/RFI. With this type of cable, the cross talk is eliminated or at least greatly reduced. However, all of the added ground wires can add more capacitance, and this will add some common additional mode current.
In today's applications, most motors that are connected to AFDs are inverter duty rated, as are the motor cables.
An inverter rated motor is designed with higher voltage insulation on the windings to counter the reflected wave, and is also designed to operate at lower frequencies without overheating.
- p. Cable splices
If at all possible, splicing of the cable between the dV/dT filter and the motor should be avoided. If a large cable is used going to the motor, first look at upsizing the dV/dT filter to accept the cable if that is the reason for the splice. A splice in the cable will introduce an impedance change, causing an impedance bump that is an additional reflection point for the reflected wave. Also, even though the shield may be carried through, it is not protecting the conductors and intrudes a place where EMI and RFI can be both induced and radiated. When a splice cannot be avoided, place that splice as close to the dV/dT filter as possible to keep the leads to that splice short.

q. Shielding and grounding

A typical AFD cable has three conductors, three grounds, and a shield that runs the length of the cable. The cable ground should be tied to the motor ground lug, then tied to the ground lug of the AFD unit or MCC structure on the other end. Placing the ground as close as possible to the AFD helps reduce the impedance of the ground path, thereby reducing system common mode voltages. The shield should only be tied to the ground at one location to eliminate ground loops, either at the motor or at the AFD.

9. Temperature, Cooling and Condensation

Thermostat:

Suitable for controlling fan units, heaters and heat exchangers.

This thermostat can also be used as a signal generator for monitoring the internal enclosure temperature.

Benefits: Time-saving connection technique using a terminal strip with a screw connection from the outside.

Flexible mounting on a vertical or horizontal 35 mm support rail to EN 50 022, snap fastening in the enclosure section or on the mounting plate using the supplied adapter.

Technical specifications: Bi-metal controller as a temperature-sensitive element with thermal feedback

Contact population: Single-pole change-over contact as a quick-break contact

Permissible contact load: Category 5 – 3 (heating): AC 10 (4) A (inductive load at $\cos \phi = 0.6$) / category 5- 4 (cooling): AC 5 (4) A (inductive load at $\cos \phi = 0.6$) / DC = max. 30 W

Switching difference: approx. 1 K \pm 0.8 K.

Two type of cooling methods required, one with integrated fan built in the inverter, second with fan fixed with the enclosure which contained the inverter to keep the inverter in normal operation temperature.

The enclosure should be equipped with internal temperature sensor to activate the operation of fan for precise temperature control inside the control cabinet, the control cabinet internal thermostat or the digital control cabinet internal temperature display and thermostat is recommended In order to prevent condensation on assemblies, hygostat is recommended to regulate heating In larger enclosures, even heat distribution is best achieved by installing several low-output heaters.

The installation of heaters is generally advisable, in order to prevent condensation.

10. Line filter

Power module

Radio interference suppression according to EN 61800-3

Recharging frequency of DC link, max 1 x every 30 S

DC link voltage 1.35 of line voltage

Inverter size and selection

The inverter should have dual working range 150% overload at 50°C in heavy duty mode and 120% overload at 40°C in normal duty mode.

When sizing the inverter to converter the DC power to AC power it is better to select an inverter that deliver the needed current to the pump.

For example, for a pump 18.5 KW (25 HP) with a nominal current 38 Ampere it is enough that you install an 18.5 KW system that deliver 38 Amperes to the Pump.

When you go with a bigger size inverter the pump will run, but the efficiency of the converter will decrease that mean that the power loses will increase and when we are working in solar Pumping each watt is count.

The efficiency of converter and power loses will be part of technical evaluation criteria of the IP20 ensures compatibility in normal-load applications.

Our IP66/NEMA4X models offer guaranteed operation even under the most adverse conditions.

11. Mounting structure

Mounting structure shall comply with applicable building codes, regulation and standards. The contractor will be responsible for the supply and installation of PV modules mounting structure that comply with the following:

1. Hot Dip galvanized steel;
2. All the accessories shall be corrosion resistant. The same applies to all bolts, nuts and guy wires;
3. Site constraint shall be considered, and pre-installation site visits are required to collate space available, shading, etc....;
4. Withstand winds of up to 140 Km/Hr. (Must be supported by calculation notes);
5. All components of the structure must be accessible for inspection and maintenance;
6. All adjacent mounting structures shall be aligned on the horizontal plane and the vertical plane to a tolerance not exceeding 10mm in any direction;
7. Warranty: \geq 10 years;
8. The minimum yield strength of steel is S235 or equivalent.

12. Reinforced Concrete Foundation

All concrete foundation shall be completely or partially buried under ground. The contractor is responsible for all works necessary including excavation to meet desired specification.

Foundation for the mounting structure and the fence shall comply with the following minimum specification

1. Reinforced concrete with a steel cage shall be used for all footings.
2. Concrete shall be suitable to withstand compression of 35 Mpa on 28 days.
3. Anchor bolts ("J" or "L"), 2 or 4 bolts per base for mounting structure bases.
4. The fence pole can be embedded in the concrete footing, without the need to use a flange.
5. The contractor is responsible of conducting the foundation design and determine the required reinforcing steel and the required embedment length of the 4 bolts and that the provided foundation dimensions are adequate.
6. Concrete base shall be troweled, brushed, edged, and finished in a neat manner.
7. Concrete shall be promptly cleaned from anchor bolts after placement.
8. All structures shall be installed on leveling nuts secured to the anchor bolts and with locking nuts on the top of the base flange.
9. The space between the concrete base and the bottom of the structure mounting flange shall be filled with dry pack mortar to completely fill the space under the flange and around the anchor bolts and be neatly troweled to the contour of flange.

13. DC Combiner Box

The Contractor will be responsible for the supply and installation of DC combiner boxes (DCB) that comply with the following specifications:

1. Class II boxes suitable for outdoor use (minimum IP65 protection if implemented outdoor, in accordance with DIN 40050 and IEC 529)
2. Includes suitable DC fuses on each (+) and (-) polarities.
3. Includes Protective devices against surge overvoltage suitable for photovoltaic systems. Using Type, I plus II SPD (Surge Protective Devices) with fault signal
4. Overvoltage protection devices to comply with IEC 61643-11.
5. Includes DC disconnect switch for load breaking
6. Physical separation of positive and negative terminal blocks
7. Junction Boxes

The Contractor will be responsible for the supply and installation of junction boxes (JB) that comply with the following specifications:

1. Class II boxes suitable for outdoor use (minimum IP65 protection if implemented outdoor, in accordance with DIN 40050 and IEC 529)
2. Physical separation of positive and negative terminals blocks.

14. Cables

Sizes of cables between array interconnections, array to junction boxes, junction boxes to inverter etc. is selected carefully to keep the voltage drop of the entire solar system to the minimum.

The maximum allowed AC Voltage drop between Inverter and Pump is below 3% The maximum allowed DC Voltage drop is below 1%

a. DC Cables

The DC cables are selected to comply with PV1-F requirement profile for PV cables, with the following minimum specification:

1. Temperature rating higher than 40°C above ambient temperature
2. Ozone resistant acc. to EN 50396
3. Weather and UV resistant acc. to HD 605/A1
4. Halogen-free acc. to EN 50267-2-1, EN 60684-2
5. Resistant to acid and bases acc. To EN 60811-2-1
6. Abrasion-resistant sheath acc. to DIN EN 53516
7. Flame-resistant acc. to VDE 0482-332-1-2, DIN EN 60332-1-2, IEC 60332-1
8. Flexible
9. Double insulated (Class II)
10. Voltage rating of at least 1000 Vdc

b. AC Cables

The contractor will be responsible for the supply and installation of AC Cables between VFD and main distribution board, the cables must be multipolar with double insulation (Class II). Routing the electrical connections of AC circuit shall be in covered hot-dip galvanized cable trays where needed.

15. Reactors / Chokes

Reactors can protect both motors and variable frequency drive from harmful current and voltage spikes. Line Reactors also help reduce power line distortion, known as harmonics, by adding impedance to the power unit.

The contractor shall be responsible for the supply and installation of the following items at each power plant:

1. DC Reactors at the DC input line from Photovoltaic array to the Drive.
2. AC Output Reactors or load reactor immediately after the inverter at the 3-phase output line to the pump, between the drive and the output ATS to the drive.

Reactors shall be enclosed in a cabinet along with the drive or separately with other electrical equipment with door lock and warning signs to comply with safety standards.

When placed inside electric enclosures, all bus bars, or exposed conductors shall be covered by protective surfaces to avoid direct contact by personnel, per international standards.

Reactors shall be properly grounded.

16. Output Reactor

Output Reactors shall carry the following minimum specification

- Copper material
- 2% max voltage drop
- Insulation class F
- Rated Voltage 520VAC
- Rated Power, and rated current shall be equivalent to inverter rated power on drawing

17. DC Reactor

The DC reactor shall carry the following minimum specification

1. Copper material
2. 3% max voltage drop
3. Insulation Class F
4. Rated for 750 VDC
5. Rated power to be equivalent to rated power of the VFD on electrical drawing.

18. Cable Trays

1. Cable trays to be used for cable routing above ground
2. Cable conduits to be used for cable routing buried under soil
3. Cable trays shall be made of galvanized steel, and include proper
 - a) turns,
 - b) supports
 - c) necessary covers.
 - d) Cable clamps where needed
 - e) grounding
4. Sizing cable trays shall respect international practices, with enough room for cables to dissipate heat.

19. Outdoor Housing

Free stand housing systems, one-door or two-door with low power dissipation in outdoor areas and Roof concept with all-round louvered grilles with following specification:

- Roof projection to increase the proportion of shading
- Air exchange with all-round louvered grilles
- Fan for active climate control is covered in an IP-compatible manner with Enclosure Heater without fan PTC heater without fan, continuous thermal output, with quick-connection terminal.
- Eyebolts on the inner roof, concealed by the rain canopy for transporting the fully loaded unit by crane
- with Extensive range of system-compatible accessories for individual installations

with following specification:



Description:	Outdoor housing with 100 mm transport base/plinth and rain canopy projecting on all sides.
Material:	Aluminium AlMg3
Surface finish:	Powder-coated UV-resistant pure polyester
Colour:	RAL 7035
Protection category IP to IEC 60 529:	IP 55
Protection category NEMA:	NEMA 3R
IK code:	IK07
Supply includes:	Single-walled outdoor enclosure, fully preconfigured Basic enclosure with gland plate, three-part 25 mm system punching in the roof, base, front and in the enclosure depth Front door(s) with door stay, swing lever handle and semi-cylinder, lock BJ20027 Transport plinth with screw-fastened trim panels front and rear Rain canopy
Base material:	Aluminium
Dimensions:	To accommodate system components and control
Rain canopy:	According to enclosure size
Number of doors:	2 or 1
Centre bar:	With removable centre bar, 2 lockable doors

20. Earthing

The contractor shall be responsible for the installation of proper earth connections, and grounding of all electrical items accessible to personnel including but not limited to:

1. Solar modules frames
2. Mounting Structure,
3. Fence,
4. Solar VFD,
5. Electrical Cabinets
6. Cable trays, combiner & junction boxes
7. Control, Data Monitoring Equipment

Earth resistance shall be less than 5 ohms.

Earth resistance shall be tested prior to startup or commissioning activities.

21. Security and Site Protection Measures

Fence: The bidder shall supply and install galvanized steel perimeter fencing to surround and secure the complete solar power plant. All associated equipment within the scope of supply shall be enclosed within the fence, except for items installed in already secured electrical or mechanical rooms.

The Fence shall include all necessary foundation, fixing, supports and access gates to facilitate the operation and maintenance of the plant.

The bidder shall provide working drawings for the proposed fencing installation.

22. Lightning protection

Each solar power plant shall be provided with lightning protection. The purpose of which is to protect the Solar PV plant and existing equipment on site from lightning strikes, and overvoltage hazards. The source of over voltage can be lightning, atmosphere disturbance etc. Lightning protection should be provided as per IEC 62305 standard.

For more details about lightning protection location and specifications refer to the layout drawings.

23. Safety signs

The contractor shall supply and install the following safety signs which shall be treated against oxidation, and supplied with the descriptions below:

1. Danger High Voltage
2. Warning do not touch

The minimum dimensions of the safety signs must be 20 cm height and 50cm length.

7.11.4 Fire Fighting Equipment

Each electrical room shall be provided with portable dioxide (CO₂) fire extinguishers minimum weight 5Kg, complete with a gauge and wall bracket.

24. General

In addition to the above equipment, the site should be equipped with at least the following items:

1. Portable Power Emergency lights
2. Electrical sockets for maintenance,
3. Portable 50m hose with reel, and spray nozzle, used for manual cleaning of solar modules
4. Telescopic cleaning soft brush, used for cleaning modules surface.

25. Day/Night Controller

The controller responsible for the switch between solar and AC operation, shall have the ability to make the switch to run the pump on solar in the morning, and back to grid mode late afternoon. The controller must carry the following minimum specification

- 1- Analog input reading, suitable for the irradiation sensor output
- 2- Accuracy +-5%
- 3- Multiple input thresholds
- 4- Dry contacts
- 5- Timers
- 6- Conforms to CE

26. Data Acquisition System DAS

Data Acquisition system shall be provided for each of the solar PV plant. The purpose of data Logging is to Log and Monitor the performance of the solar system A DSL or 3G modem is required to allow a continuous connection to the internet for the data logger to ensure remote monitoring of the installation can occur in real-time. The data logger shall be able to collect data indefinitely, for review at a later stage, also remotely. The DAS shall be able to issue reports previously configured (daily, monthly, yearly) that can be exported in CSV and MS excel format.

The data to be collected shall include the following at the least:

1. Actual Input and Output voltage
2. Current (A), power (kW) and frequency (Hz) reading from the solar drive.
3. Actual Ambient Temperature measured by the temperature sensor
4. Actual Array Irradiation measured by Irradiation sensor
5. Actual Module Temperature measured by a module Temperature sensor
6. Archive data to include stored averages of all measured parameters. Averages for every 5, 10, or 15 minutes - programmable interval.

27. PV Station Sensors

Each PV station shall be equipped with a minimum set of the following sensors: 1- One Ambient Temperature

2- One Module temperature

3- Two Irradiation sensors

All sensors must be able to connect seamlessly with data logger on site.

28. UPS - Backup Power

The UPS is essential to keep the data logger and control circuits online when no power is available.

The bidder must provide a UPS with enough power to provide for the control circuit and the data logger/monitoring equipment for a period no less than 6 hours without charging.

The UPS should be able to re-charge its batteries from available electricity on site, Utility power or Generator, whichever is available and carry the following minimum features:

1. Online
2. 12/24 DC voltage
3. Replaceable battery, preferably external to allow adding batteries
4. Lead acid or lithium battery
5. Protection for Overload, discharge/overcharge and short circuit protection
6. Compliance to: EN 50091-1-1/EN 69050 (RD), IEC 60950.

29. Water access

The contractor is responsible for providing access to water near the PV modules to facilitate cleaning.

Standard Polyethylene or PEX piping can be used underground protected from the sun, with designated access points using vertically installed galvanized steel piping and fittings, fixed in the ground with concrete ballast.

Ball valves and fittings to be made from brass with anti-rust properties, fitted with push fit accessories for easier plug in of flexible hose used for cleaning.

Proper connection to existing water network inside or outside mechanical room shall be coordinated with project manager.

A main supply valve shall be installed near the take off point, and a drain valve shall be installed at the lowest point to allow the pipe to be drained from water during the winter seasons to prevent damage to piping during overnight freeze.

30. Datasheets and Certifications

Bidders are requested to provide equipment datasheets, catalog pages, and certificates of compliance to standards that clearly show the specification of the material to be supplied.

All documentation shall be arranged in a folder with a clear table of contents for easy lookup of references.

The documentation shall be provided in two hard copies, and one soft copy.

31. Safety Issues

Planning & Construction works shall observe the personnel and equipment safety on site especially:

Safety of workers

- I. Safety for users
- II. Safety for the equipment of the plant
- III. Safety for existing structures and systems

The Contractor shall be responsible for the safety of all activities on the Site.

32. Electrical Installation

Final design and installation of electrical systems shall comply with National and international standards especially related to personnel safety.

33. Layout Drawings

The contractor shall provide detailed layout plans and wiring diagrams along with his proposal.

The drawings shall consider the following:

- Dimensions of arrays, including tilt and orientation
- The total number of modules
- Access roads for equipment and maintenance
- DC and AC cables routing
- Electrical room showing Location of the VFD's, junction boxes, fire extinguishers, etc. inside the room

34. Documentation and Training

- The contractor must provide as-built drawings and technical documentation in English.
- The contractor shall provide operation and maintenance manuals in English and Kurdish.
- The contractor shall provide training for the technical staff on the operation of the PV System.

Solar Pumping				
Technical Specifications				
No	Item	Unit	Value	Tenderer Offer
1	Solar Photovoltaic (PV) Modules			
1.1	Type used		Mono N-type IBC Technology	
1.2a	Total PV Capacity at STC (Greater or equal to): For Submersible Pump	kWp	According to site specification	
1.2b	Power temp. coefficient	Deg C	-0.29 to 0.31 %	
1.2c	PV panels match the standard weather & ambient temp. specification for KRG/IRAQ		1.temp. coefficient of Isc $\geq 0,050 \%/k$	
	Low temp. coefficient for high temp. regions		2.temp. coefficient of Voc $\geq 0,0290\%/k$	
1.3	Rated Power of each module (Greater or equal to)	Wp	$P \geq 370$	
1.4	PV- panel type		N-type IBC Tech.	
1.5	Vmp (@STC greater or equal to)	V	30 (36)	
1.6	Voc (@STC Less than or equal to)	V	40 (47.5)	
1.7	Module conversion efficiency (greater or equal to)	%	≥ 20	
1.8	Positive power tolerance (greater or equal to)	%	≥ 3	
1.9	Cell Protection		Cells should be protected by anti-reflective coated tempered glass	
1.10	Module shall withstand load up to and above	Pasca l	5400	
1.11	I-V Curve is Supplied		Yes	
1.12	PV Modules Compliance		IEC 61730-1/2: 2004 and IEC 61215-2: 2005 Guidelines	
1.13	Minimum Warranty	Years	10 years on material and manufacturing	
1.14	Output Warranty	Years	10 years with 90% power output and 25 years 80% power output warranty	
1.15	PV Modules should include measures against Potential Induced Degradation (anti PID).		yes	
2	AC 3-Phase Solar Pump Inverter			
2.1a	Rated Power: For Submersible Pump Inverter (Greater or equal to)	Wk	\geq rated power specification	
2.2	Minimum Protection Class of Solar Pump Inverter as per datasheet of manufacturer		IP54	
2.3	Solar Pump Application Software with Integrated MPPT Functionality		yes	
2.4	With Integrated Input Noise Filter		yes	

2.5	Pump Operation selection through either DC Input or 3-Phase Input of Inverter.		yes	
2.6	Inverter Efficiency (Greater or equal to)	%	97	
2.7	Communication: MODBUS/RS485, allowing monitoring and control of inverter operation		yes	
2.8	Proper external protection measures on AC and DC sides including surge protection.		yes	
2.9	Maximum Operating Temperature (Greater or equal to) as per manufacturer	Deg C	60	
2.10	Minimum Warranty	years	10	
3	Metallic Support Structures			
3.1	All structures shall be made of corrosion resistant materials e.g. aluminum, galvanized steel		yes	
3.2	Can withstand wind loads on PV generators up to:	km/h	140	
3.3	Tilt and orientation of PV have to be optimized for yearly best performance operation		yes	
3.4	Metallic Support Structures should be properly grounded and Bonding is required between PV module chassis and steel structure support		yes	
4	Sinusoidal Filter: For Submersible Pump			
4.1	Properly sized and selected for Solar Pump Inverter installed on Submersible Pump in accordance to Manufacturer of Inverter requirements and application requirements.		yes	
4.2	Minimum Warranty	years	5	
5	Water Meter at Output of Submersible Pump			
5.1	Installed at output of Submersible Pump to measure the quantity of water transferred.		yes	
5.2	Communicate with Transfer Pump controller in Electrical Room to data log and save quantities of water extracted per day/month/year.		yes	
5.3	Minimum Warranty	years	5	
7	Tank Level Sensor and Floating Level Switch on water Tank			
7.1	Submersible Tank Level Sensor installed on tank above Electrical Room and display amount of water in the tank.		yes	
7.2	Communicate with Transfer Pressure Pump controller in Electrical Room to data log and save level of water in tank.		yes	

7.3	Below a programmable lower safety level of water in tank, Transfer Pressure pump should not operate		yes	
7.4	Above a programmable upper safety level of water in tank, Submersible Pump should not operate		yes	
7.5	Minimum Warranty	years	5	
8	Monitoring and Control Setup			
8.1	Municipality Operator should be able to shift between Generator Supply, Normal Electrical Supply or PV supply.		yes	
8.2	There should be an independent controller for Submersible Pump, monitoring and saving vital parameters.		yes	
8.4	At least one Irradiation sensor and PV temperature sensor should be installed per direction of each PV array. Communication and power supply cables for Irradiation and PV temperature sensors should run down to Electrical Room and logged with the other critical values.		yes	
8.5	A Graphic user interface with display unit will display and datalog Values of interest (Voltage, Current, Speed of pump, tank level, water meter, Irradiation, Temperature...etc) both local and possibility to data transmit via internet.		yes	
8.6	Controller should be ready to remotely relay site info through regular (monthly) emails in addition to live monitoring and faults through internet connection when supplied by Municipality.		yes	
8.7	The main power panel board should have an automatic change over switch to switch between the DC and the AC source at the inverter input from graphical user interface of upper controller.		yes	
8.8	Because of dusty environment minimum IP rating of all Electrical Panel Boards in Electrical Room.		IP54	
8.9	Control Setup should have the possibility to add digital and analog Inputs units if need be in the future.		yes	
8.10	UPS system to ensure power to all sensors and controllers, and an autonomy of at least 24hrs for these without power in case of power cut. UPS charging time will be 7 hours/day (Utility Supply or GENSET).		yes	

	(supporting calculations to be presented)			
9	Protection Circuit and Cables			
9.1	Circuit Breakers should be provided for short-circuit conditions		Yes	
9.2	All electronic components must take into consideration temperature compensation issues		Yes	
9.3	Full Protection		Against open circuit, accidental short circuit and reverse polarity by blocking diode should be provided	
9.4	Earthing and lightning protection systems shall be added to installation, with a resistance value (as tested in dry season) that shall be less than 5 ohms. Proper Handhole ground should be set in place with a metal cover for routine and periodic measurements / maintenance procedure.		Yes	
9.5	Earthing and Lightning protection should cover all installation including both areas PV area and Electrical Room.		Yes	
9.6	Solar cables (a.k.a. photovoltaic cable) specifically manufactured for solar applications shall be used.		Yes	
9.7	Solar cables should be manufactured according to the international standard EN 50618 - H1Z2Z2-K.		Yes	
9.8	Electrical junction boxes shall be UV resistant, IP65, weatherproof and installed at high level to eliminate any risk of water submersion.		Yes	
9.9	All circuit breakers, fuses and disconnects must be listed or recognized for use in DC circuits where applicable. Equipment only rated for use in AC circuits will not be permitted for use in DC circuits.		Yes	
9.10	Provide at least one AC Disconnect located adjacent to the inverter.		Yes	
9.11	Provide at least one DC Disconnect located adjacent to the inverter.		Yes	
9.12	Surge suppression on the DC and AC side of the inverter must be provided		Yes	

9.13	All cables and items that are exposed to the sun should be UV-resistant		Yes	
9.14	When Power and Control Cables are running in parallel, a separator will be provided between them.		Yes	
9.15	All running cables that are not underground should be placed in cable trays that should be properly grounded if metallic and should be protected from rodents or rats.		Yes	
9.16	Manholes should be placed for ease of access and maintenance of underground cables.		Yes	
10	Supporting Documents			
10.1	Provide Software Simulation case study showing irradiation simulation in addition to the system power generation forecast for 12 months period for the designated location.		Yes	
10.2	Simulation should also show variation of pump's flow and operating speed according to the available solar irradiation throughout the day and throughout the different seasons. Variation impact on power consumption should also be indicated.		Yes	
10.3	Indicate the configuration of the PV modules layout and the required space.		Yes	
10.4	Single Line diagram of power connections		Yes	
10.5	To provide schematic drawings showing Power and Control cables' routing between Electrical Room, Submersible Pump, Local Tank, all sensors and meters, and PV Panels.		Yes	
10.6	Calculations notes (such as cable sizing, panel board's equipment sizing, bus-bars sizing, short circuit current ratings, etc.) are to be specified in detail.		Yes	
10.7	All system's components datasheets and certificates shall be submitted highlighting the specific models and selections of parts that will be used in project, with quantities if need be.		Yes	
10.8	Wind Load calculation study for PV array should be presented, with a safety factor of 2.		Yes	
10.9	Contractor: List of Solar Pumping Applications installed including at least a single solar pump above 20 kW.		Yes	

PLEASE NOTE THAT EACH OF THE VALUES OR REQUESTED INFORMATION PLUGGED INTO THE TABLE ABOVE AS PER TENDER OFFER SHOULD BE HIGHLIGHTED IN THE RESPECTIVE SUPPORTING DOCUMENTS THAT SHOULD BE ENCLOSED IN HARDCOPY FORMAT WITH OFFER.



Funded by the European Union
بتمويل من الاتحاد الأوروبي



INVITATION TO BID

Engineering, Procurement, Implementation and Maintenance contract for Upgrading Existing Water Pumping Stations to Operate on Solar Photovoltaic
Directorate of Water Supply at Rural Area-Erbil

ITB No.:

Project: Engineering, Procurement, Implementation and Maintenance contract for Upgrading Existing Water Pumping Stations to Operate on Solar Photovoltaic
Directorate of Water Supply at Rural Area-Erbil

Country: **Iraq**

Issued on: **16 / 02 /2021**

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Section I. Letter of Invitation

The **United Nations Development Programme (UNDP)** and **Governorate of Erbil (GoE)** hereby invites you to submit a Bid to this Invitation to Bid (ITB) for the above-referenced subject.

This ITB includes the following documents and the General Terms and Conditions of Contract which is inserted in the Bid Data Sheet:

- Section 1: This Letter of Invitation
- Section 2: Instruction to Bidders
- Section 3: Bid Data Sheet (BDS)
- Section 4: Evaluation Criteria
- Section 5: Schedule of Requirements and Technical Specifications
- Section 6: Returnable Bidding Forms
 - o Form A: Bid Submission Form
 - o Form B: Bidder Information Form
 - o Form C: Joint Venture/Consortium/Association Information Form
 - o Form D: Qualification Form
 - o Form E: Format of Technical Bid
 - o Form F: Price Schedule
 - o Form G: Form of Bid Security

If you are interested in submitting a Bid in response to this ITB, please prepare your Bid in accordance with the requirements and procedure as set out in this ITB and submit it by the Deadline for Submission of Bids set out in Bid Data Sheet.

Please acknowledge receipt of this ITB by sending an email to _____, indicating whether you intend to submit a Bid or otherwise. You may also utilize the "Accept Invitation" function in e-Tendering system, where applicable. This will enable you to receive amendments or updates to the ITB. Should you require further clarifications, kindly communicate with the contact person/s identified in the attached Data Sheet as the focal point for queries on this ITB.

UNDP/GoE looks forward to receiving your Bid and thank you in advance for your interest in **UNDP/GoE** procurement opportunities.

Issued by

Approved by:

Name: **Hussain Hamad Qadir**
Title: **General Director of Erbil Electricity**
Date: **16 / 02 /2021**

Name: **Herisn Qadir**
Title: **Acting Governor of Erbil**
Date: **16/12/2020**

Section 2. Instruction to Bidders

GENERAL PROVISIONS

<p>1. Introduction</p>	<p>1.1 Bidders shall adhere to all the requirements of this ITB, including any amendments made in writing by UNDP/GoE.</p> <p>1.2 Any Bid submitted will be regarded as an offer by the Bidder and does not constitute or imply the acceptance of the Bid by GoE. GoE is under no obligation to award a contract to any Bidder as a result of this ITB.</p> <p>1.3 GoE reserves the right to cancel the procurement process at any stage without any liability of any kind for GoE, upon notice to the bidders or publication of cancellation notice on GoE website.</p>
<p>2. Fraud & Corruption, Gifts and Hospitality</p>	<p>2.1 Bidders/vendors shall not offer gifts or hospitality of any kind to GoE staff members including recreational trips to sporting or cultural events, theme parks or offers of holidays, transportation, or invitations to extravagant lunches or dinners.</p> <p>2.2 In pursuance of this policy, GoE:</p> <p>(a) Shall reject a bid if it determines that the selected bidder has engaged in any corrupt or fraudulent practices in competing for the contract in question;</p> <p>(b) Shall declare a vendor ineligible, either indefinitely or for a stated period, to be awarded a contract if at any time it determines that the vendor has engaged in any corrupt or fraudulent practices in competing for, or in executing a GoE contract.</p>
<p>3. Eligibility</p>	<p>3.1 A vendor should not be suspended, debarred, or otherwise identified as ineligible by any UN Organization or the World Bank Group or any other international Organization. Vendors are therefore required to disclose to GoE whether they are subject to any sanction or temporary suspension imposed by these organizations.</p> <p>3.2 It is the Bidder's responsibility to ensure that its employees, joint venture members, sub-contractors, service providers, suppliers and/or their employees meet the eligibility requirements as established by GoE.</p>
<p>4. Conflict of Interests</p>	<p>4.1 Bidders must strictly avoid conflicts with other assignments or their own interests, and act without consideration for future work. Bidders found to have a conflict of interest shall be disqualified. Without limitation on the generality of the above, Bidders, and any of their affiliates, shall be considered to have a conflict of interest with one or more parties in this solicitation process, if they:</p> <p>a) Are or have been associated in the past, with a firm or any of its affiliates which have been engaged by GoE to provide services for the preparation of the design, specifications, Terms of Reference, cost analysis/estimation, and other documents to be used for the procurement of the goods and services in this selection process;</p> <p>b) Were involved in the preparation and/or design of the programme/project related to the goods and/or services requested under this ITB; or</p> <p>c) Are found to be in conflict for any other reason, as may be established by, or at the discretion of GoE.</p> <p>4.2 In the event of any uncertainty in the interpretation of a potential conflict of interest, Bidders must disclose to GoE, and seek GoE's confirmation on whether</p>

	<p>or not such conflict exists.</p> <p>4.3 The eligibility of Bidders that are wholly or partly owned by the Government shall be subject to UNDP's further evaluation and review of various factors such as being registered, operated and managed as an independent business entity, the extent of Government ownership/share, receipt of subsidies, mandate and access to information in relation to this ITB, among others. Conditions that may lead to undue advantage against other Bidders may result in the eventual rejection of the Bid.</p>
A. PREPARATION OF BIDS	
5. General Considerations	<p>5.1 In preparing the Bid, the Bidder is expected to examine the ITB in detail. Material deficiencies in providing the information requested in the ITB may result in rejection of the Bid.</p> <p>5.2 The Bidder will not be permitted to take advantage of any errors or omissions in the ITB. Should such errors or omissions be discovered, the Bidder must notify the GoE accordingly.</p>
6. Cost of Preparation of Bid	<p>6.1 The Bidder shall bear all costs related to the preparation and/or submission of the Bid, regardless of whether its Bid is selected or not. GoE shall not be responsible or liable for those costs, regardless of the conduct or outcome of the procurement process.</p>
7. Language	<p>7.1 The Bid, as well as any and all related correspondence exchanged by the Bidder and GoE, shall be written in the language (s) specified in the BDS.</p>
8. Documents Comprising the Bid	<p>8.1 The Bid shall comprise of the following documents and related forms which details are provided in the BDS:</p> <ul style="list-style-type: none"> a) Documents Establishing the Eligibility and Qualifications of the Bidder; b) Technical Bid; c) Price Schedule; d) Bid Security, if required by BDS; e) Any attachments and/or appendices to the Bid. f) Detailed design –To be added
9. Documents Establishing the Eligibility and Qualifications of the Bidder	<p>9.1 The Bidder shall furnish documentary evidence of its status as an eligible and qualified vendor, using the Forms provided under Section 6 and providing documents required in those forms. In order to award a contract to a Bidder, its qualifications must be documented to GoE's satisfaction.</p>
10. Technical Bid Format and Content	<p>10.1 The Bidder is required to submit a Technical Bid using the Standard Forms and templates provided in Section 6 of the ITB.</p> <p>10.2 Samples of items, when required as per Section 5, shall be provided within the time specified and unless otherwise specified by the Purchaser, at no expense to the GoE. If not destroyed by testing, samples will be returned at Bidder's request and expense, unless otherwise specified.</p> <p>10.3 When applicable and required as per Section 5, the Bidder shall describe the necessary training programme available for the maintenance and operation of the equipment offered as well as the cost to the GoE. Unless otherwise specified, such training as well as training materials shall be provided in the language of the Bid as specified in the BDS.</p> <p>10.4 When applicable and required as per Section 5, the Bidder shall certify the availability of spare parts for a period of at least ten (10) years from date of delivery, or as otherwise specified in this ITB.</p>

11. Price Schedule	<p>11.1 The Price Schedule shall be prepared using the Form provided in Section 6 of the ITB and taking into consideration the requirements in the ITB.</p> <p>11.2 Any requirement described in the Technical Bid but not priced in the Price Schedule, shall be assumed to be included in the prices of other activities or items, as well as in the final total price.</p>
12. Bid Security	<p>12.1 A Bid Security, if required by BDS, shall be provided in the amount and form indicated in the BDS. The Bid Security shall be valid for a minimum of thirty (30) days after the final date of validity of the Bid.</p> <p>12.2 The Bid Security shall be included along with the Bid. If Bid Security is required by the ITB but is not found in the Bid, the offer shall be rejected.</p> <p>12.3 If the Bid Security amount or its validity period is found to be less than what is required by GoE, GoE shall reject the Bid.</p> <p>12.4 In the event an electronic submission is allowed in the BDS, Bidders shall include a copy of the Bid Security in their bid and the original of the Bid Security must be sent via courier or hand delivery as per the instructions in BDS.</p> <p>12.5 The Bid Security may be forfeited by GoE, and the Bid rejected, in the event of any, or combination, of the following conditions:</p> <ul style="list-style-type: none"> a) If the Bidder withdraws its offer during the period of the Bid Validity specified in the BDS, or; b) In the event the successful Bidder fails: <ul style="list-style-type: none"> i. to sign the Contract after GoE has issued an award; or ii. to furnish the Performance Security, insurances, or other documents that GoE may require as a condition precedent to the effectivity of the contract that may be awarded to the Bidder.
13. Joint Venture, Consortium or Association	<p>13.1 If the Bidder is a group of legal entities that will form or have formed a Joint Venture (JV), Consortium or Association for the Bid, they shall confirm in their Bid that : (i) they have designated one party to act as a lead entity, duly vested with authority to legally bind the members of the JV, Consortium or Association jointly and severally, which shall be evidenced by a duly notarized Agreement among the legal entities, and submitted with the Bid; and (ii) if they are awarded the contract, the contract shall be entered into, by and between GoE and the designated lead entity, who shall be acting for and on behalf of all the member entities comprising the joint venture.</p> <p>13.2 After the Deadline for Submission of Bid, the lead entity identified to represent the JV, Consortium or Association shall not be altered without the prior written consent of GoE.</p> <p>13.3 The lead entity and the member entities of the JV, Consortium or Association shall abide by the provisions of Clause 9 herein in respect of submitting only one Bid.</p> <p>13.4 The description of the organization of the JV, Consortium or Association must clearly define the expected role of each of the entities in the joint venture in delivering the requirements of the ITB, both in the Bid and the JV, Consortium or Association Agreement. All entities that comprise the JV, Consortium or Association shall be subject to the eligibility and qualification assessment by GoE.</p> <p>13.5 A JV, Consortium or Association in presenting its track record and experience should clearly differentiate between:</p> <ul style="list-style-type: none"> a) Those that were undertaken together by the JV, Consortium or Association; and b) Those that were undertaken by the individual entities of the JV,

	<p>Consortium or Association.</p> <p>13.6 Previous contracts completed by individual experts working privately but who are permanently or were temporarily associated with any of the member firms cannot be claimed as the experience of the JV, Consortium or Association or those of its members, but should only be claimed by the individual experts themselves in their presentation of their individual credentials</p> <p>13.7 JV, Consortium or Associations are encouraged for high value, multi-sectoral requirements when the spectrum of expertise and resources required may not be available within one firm.</p>
14. Only One Bid	<p>14.1 The Bidder (including the individual members of any Joint Venture) shall submit only one Bid, either in its own name or as part of a Joint Venture.</p> <p>14.2 Bids submitted by two (2) or more Bidders shall all be rejected if they are found to have any of the following:</p> <ol style="list-style-type: none"> a) they have at least one controlling partner, director or shareholder in common; or b) any one of them receive or have received any direct or indirect subsidy from the other/s; or c) they have the same legal representative for purposes of this ITB; or d) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about, or influence on the Bid of another Bidder regarding this ITB process; e) they are subcontractors to each other's Bid, or a subcontractor to one Bid also submits another Bid under its name as lead Bidder; or some key personnel proposed to be in the team of one Bidder participates in more than one Bid received for this ITB process. This condition relating to the personnel, does not apply to subcontractors being included in more than one Bid.
15. Bid Validity Period	<p>15.1 Bids shall remain valid for the period specified in the BDS, commencing on the Deadline for Submission of Bids. A Bid valid for a shorter period may be rejected by GoE and rendered non-responsive.</p> <p>15.2 During the Bid validity period, the Bidder shall maintain its original Bid without any change, including the availability of the Key Personnel, the proposed rates and the total price.</p>
16. Extension of Bid Validity Period	<p>16.1 In exceptional circumstances, prior to the expiration of the Bid validity period, GoE may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing, and shall be considered integral to the Bid.</p> <p>16.2 If the Bidder agrees to extend the validity of its Bid, it shall be done without any change to the original Bid.</p> <p>16.3 The Bidder has the right to refuse to extend the validity of its Bid, in which case, the Bid shall not be further evaluated.</p>
17. Clarification of Bid (from the Bidders)	<p>17.1 Bidders may request clarifications on any of the ITB documents no later than the date indicated in the BDS. Any request for clarification must be sent in writing in the manner indicated in the BDS. If inquiries are sent other than specified channel, even if they are sent to a GoE staff member, GoE shall have no obligation to respond or confirm that the query was officially received.</p> <p>17.2 GoE will provide the responses to clarifications through the method specified in the BDS.</p> <p>17.3 GoE shall endeavour to provide responses to clarifications in an expeditious manner, but any delay in such response shall not cause an obligation on the part of GoE to extend the submission date of the Bids, unless GoE deems that</p>

	such an extension is justified and necessary.
18. Amendment of Bids	<p>18.1 At any time prior to the deadline of Bid submission, GoE may for any reason, such as in response to a clarification requested by a Bidder, modify the ITB in the form of an amendment to the ITB. Amendments will be made available to all prospective bidders.</p> <p>18.2 If the amendment is substantial, GoE may extend the Deadline for submission of Bid to give the Bidders reasonable time to incorporate the amendment into their Bids.</p>
19. Alternative Bids	<p>19.1 Unless otherwise specified in the BDS, alternative Bids shall not be considered. If submission of alternative Bid is allowed by BDS, a Bidder may submit an alternative Bid, but only if it also submits a Bid conforming to the ITB requirements. Where the conditions for its acceptance are met, or justifications are clearly established, GoE reserves the right to award a contract based on an alternative Bid.</p> <p>19.2 If multiple/alternative bids are being submitted, they must be clearly marked as "Main Bid" and "Alternative Bid"</p>
20. Pre-Bid Conference	<p>20.1 When appropriate, a pre-bid conference will be conducted at the date, time and location specified in the BDS. All Bidders are encouraged to attend. Non-attendance, however, shall not result in disqualification of an interested Bidder. Minutes of the Bidder's conference will be disseminated on the procurement website and shared by email or on the e-Tendering platform as specified in the BDS. No verbal statement made during the conference shall modify the terms and conditions of the ITB, unless specifically incorporated in the Minutes of the Bidder's Conference or issued/posted as an amendment to ITB.</p>

B. SUBMISSION AND OPENING OF BIDS

21. Submission	<p>21.1 The Bidder shall submit a duly signed and complete Bid comprising the documents and forms in accordance with requirements in the BDS. The Price Schedule shall be submitted together with the Technical Bid. Bid can be delivered either personally, by courier, or by electronic method of transmission as specified in the BDS.</p> <p>21.2 The Bid shall be signed by the Bidder or person(s) duly authorized to commit the Bidder. The authorization shall be communicated through a document evidencing such authorization issued by the legal representative of the bidding entity, or a Power of Attorney, accompanying the Bid.</p> <p>21.3 Bidders must be aware that the mere act of submission of a Bid, in and of itself, implies that the Bidder fully accepts the GoE General Contract Terms and Conditions.</p>
Hard copy (manual) submission	<p>21.4 Hard copy (manual) submission by courier or hand delivery allowed or specified in the BDS shall be governed as follows:</p> <p>a) The signed Bid shall be marked "Original", and its copies marked "Copy" as appropriate. The number of copies is indicated in the BDS. All copies shall be made from the signed original only. If there are discrepancies between the original and the copies, the original shall prevail.</p> <p>(b) The Technical Bid and Price Schedule must be sealed and submitted together in an envelope, which shall:</p> <ol style="list-style-type: none"> i. Bear the name of the Bidder; ii. Be addressed to GoE as specified in the BDS; and iii. Bear a warning not to open before the time and date for Bid opening as specified in the BDS.

	<p>If the envelope with the Bid is not sealed and marked as required, GoE shall assume no responsibility for the misplacement, loss, or premature opening of the Bid.</p>
<p>Email eTendering submissions and</p>	<p>21.5 Electronic submission through email or eTendering, if allowed as specified in the BDS, shall be governed as follows:</p> <ul style="list-style-type: none"> a) Electronic files that form part of the Bid must be in accordance with the format and requirements indicated in BDS; b) Documents which are required to be in original form (e.g. Bid Security, etc.) must be sent via courier or hand delivered as per the instructions in BDS.
<p>22. Deadline for Submission of Bids and Late Bids</p>	<p>22.1 Complete Bids must be received by GoE in the manner, and no later than the date and time, specified in the BDS. GoE shall only recognise the actual date and time that the bid was received by GoE</p> <p>22.2 GoE shall not consider any Bid that is received after the deadline for the submission of Bids.</p>
<p>23. Withdrawal, Substitution, and Modification of Bids</p>	<p>23.1 A Bidder may withdraw, substitute or modify its Bid after it has been submitted at any time prior to the deadline for submission.</p> <p>23.2 Manual and Email submissions: A bidder may withdraw, substitute or modify its Bid by sending a written notice to GoE, duly signed by an authorized representative, and shall include a copy of the authorization (or a Power of Attorney). The corresponding substitution or modification of the Bid, if any, must accompany the respective written notice. All notices must be submitted in the same manner as specified for submission of Bids, by clearly marking them as "WITHDRAWAL" "SUBSTITUTION," or "MODIFICATION"</p> <p>23.3 E-Tendering: A Bidder may withdraw, substitute or modify its Bid by Cancelling, Editing, and re-submitting the Bid directly in the system. It is the responsibility of the Bidder to properly follow the system instructions, duly edit and submit a substitution or modification of the Bid as needed. Detailed instructions on how to cancel or modify a Bid directly in the system are provided in the Bidder User Guide and Instructional videos.</p> <p>23.4 Bids requested to be withdrawn shall be returned unopened to the Bidders (only for manual submissions), except if the bid is withdrawn after the bid has been opened.</p>
<p>24. Bid Opening</p>	<p>24.1 GoE will open the Bid in the presence of an ad-hoc committee formed by GoE of at least two (2) members.</p> <p>24.2 The Bidders' names, modifications, withdrawals, the condition of the envelope labels/seals, the number of folders/files and all other such other details as GoE may consider appropriate, will be announced at the opening. No Bid shall be rejected at the opening stage, except for late submissions, in which case, the Bid shall be returned unopened to the Bidders.</p> <p>24.3 In the case of e-Tendering submission, bidders will receive an automatic notification once the Bid is opened.</p>
<p>c. EVALUATION OF BIDS</p>	
<p>25. Confidentiality</p>	<p>25.1 Information relating to the examination, evaluation, and comparison of Bids, and the recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process, even after publication of the contract award.</p>

	<p>25.2 Any effort by a Bidder or anyone on behalf of the Bidder to influence GoE in the examination, evaluation and comparison of the Bids or contract award decisions may, at GoE's decision, result in the rejection of its Bid and may subsequently be subject to the application of prevailing GoE's vendor sanctions procedures.</p>
26. Evaluation of Bids	<p>26.1 GoE will conduct the evaluation solely on the basis of the Bids received.</p> <p>26.2 Evaluation of Bids shall be undertaken in the following steps:</p> <ol style="list-style-type: none"> a. Preliminary Examination including Eligibility b. Arithmetical check and ranking of bidders who passed preliminary examination by price. c. Qualification assessment (if pre-qualification was not done) d. Evaluation of Technical Bids e. Evaluation of prices f. Evaluation of the proposed design to be Added <p>Detailed evaluation will be focussed on the 3 - 5 lowest priced bids. Further higher priced bids shall be added for evaluation if necessary</p>
27. Preliminary Examination	<p>27.1 GoE shall examine the Bids to determine whether they are complete with respect to minimum documentary requirements, whether the documents have been properly signed, and whether the Bids are generally in order, among other indicators that may be used at this stage. GoE reserves the right to reject any Bid at this stage.</p>
28. Evaluation of Eligibility and Qualification	<p>28.1 Eligibility and Qualification of the Bidder will be evaluated against the Minimum Eligibility/Qualification requirements specified in the Section 4 (Evaluation Criteria).</p>
29. Evaluation of Technical Bid and prices	<p>29.1 The evaluation team shall review and evaluate the Technical Bids on the basis of their responsiveness to the Schedule of Requirements and Technical Specifications and other documentation provided, applying the procedure indicated in the BDS and other ITB documents. When necessary, and if stated in the BDS, GoE may invite technically responsive bidders for a presentation related to their technical Bids. The conditions for the presentation shall be provided in the bid document where required.</p>
30. Due diligence	<p>30.1 GoE reserves the right to undertake a due diligence exercise, aimed at determining to its satisfaction, the validity of the information provided by the Bidder. Such exercise shall be fully documented and may include, but need not be limited to, all or any combination of the following:</p> <ol style="list-style-type: none"> a) Verification of accuracy, correctness and authenticity of information provided by the Bidder; b) Validation of extent of compliance to the ITB requirements and evaluation criteria based on what has so far been found by the evaluation team; c) Inquiry and reference checking with Government entities with jurisdiction on the Bidder, or with previous clients, or any other entity that may have done business with the Bidder; d) Inquiry and reference checking with previous clients on the performance on on-going or completed contracts, including physical inspections of previous works, as deemed necessary; e) Physical inspection of the Bidder's offices, branches or other places where business transpires, with or without notice to the Bidder; f) Other means that GoE may deem appropriate, at any stage within the selection process, prior to awarding the contract.

31. Clarification of Bids	<p>31.1 To assist in the examination, evaluation and comparison of Bids, GoE may, at its discretion, request any Bidder for a clarification of its Bid.</p> <p>31.2 GoE's request for clarification and the response shall be in writing and no change in the prices or substance of the Bid shall be sought, offered, or permitted, except to provide clarification, and confirm the correction of any arithmetic errors discovered by GoE in the evaluation of the Bids, in accordance with the ITB.</p> <p>31.3 Any unsolicited clarification submitted by a Bidder in respect to its Bid, which is not a response to a request by GoE, shall not be considered during the review and evaluation of the Bids.</p>
32. Responsiveness of Bid	<p>32.1 GoE's determination of a Bid's responsiveness will be based on the contents of the bid itself. A substantially responsive Bid is one that conforms to all the terms, conditions, specifications and other requirements of the ITB without material deviation, reservation, or omission.</p> <p>32.2 If a bid is not substantially responsive, it shall be rejected by GoE and may not subsequently be made responsive by the Bidder by correction of the material deviation, reservation, or omission.</p>
33. Nonconformities, Repairable Errors and Omissions	<p>33.1 Provided that a Bid is substantially responsive, GoE may waive any non-conformities or omissions in the Bid that, in the opinion of GoE, do not constitute a material deviation.</p> <p>33.2 GoE may request the Bidder to submit the necessary information or documentation, within a reasonable period, to rectify nonmaterial nonconformities or omissions in the Bid related to documentation requirements. Such omission shall not be related to any aspect of the price of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.</p> <p>33.3 For the bids that have passed the preliminary examination, GoE shall check and correct arithmetical errors as follows:</p> <ul style="list-style-type: none"> a) if there is a discrepancy between the unit price and the line item total that is obtained by multiplying the unit price by the quantity, the unit price shall prevail and the line item total shall be corrected, unless in the opinion of GoE there is an obvious misplacement of the decimal point in the unit price; in which case, the line item total as quoted shall govern and the unit price shall be corrected; b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and c) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail. <p>33.4 If the Bidder does not accept the correction of errors made by GoE, its Bid shall be rejected.</p>
A. AWARD OF CONTRACT	
34. Right to Accept, Reject, Any or All Bids	<p>34.1 GoE reserves the right to accept or reject any bid, to render any or all of the bids as non-responsive, and to reject all Bids at any time prior to award of contract, without incurring any liability, or obligation to inform the affected Bidder(s) of the grounds for GoE's action. GoE shall not be obliged to award the contract to the lowest priced offer.</p>
35. Award Criteria	<p>35.1 Prior to expiration of the period of Bid validity, GoE shall award the contract to</p>

	the qualified and eligible Bidder that is found to be responsive to the requirements of the Schedule of Requirements and Technical Specification, and has offered the lowest price.
36. Debriefing	36.1 In the event that a Bidder is unsuccessful, the Bidder may request for a debriefing from GoE. The purpose of the debriefing is to discuss the strengths and weaknesses of the Bidder's submission, in order to assist the Bidder in improving its future Bids for GoE procurement opportunities. The content of other Bids and how they compare to the Bidder's submission shall not be discussed.
37. Right to Vary Requirements at the Time of Award	37.1 At the time of award of Contract, GoE reserves the right to vary the quantity of goods and/or services, by up to a maximum twenty-five per cent (25%) of the total offer, without any change in the unit price or other terms and conditions.
38. Contract Signature	38.1 Within thirty (30) days from the date of receipt of the Contract, the successful Bidder shall sign and date the Contract and return it to GoE. Failure to do so may constitute sufficient grounds for the annulment of the award, and forfeiture of the Bid Security, if any, and on which event, GoE may award the Contract to the Second highest rated or call for new Bids.
39. Liquidated Damages	39.1 If specified in the BDS, GoE shall apply Liquidated Damages for the damages and/or risks caused to GoE resulting from the Contractor's delays or breach of its obligations as per Contract.
40. Payment Provisions	40.1 Payment will be made only upon GoE 's acceptance of the goods and/or services performed. The terms of payment shall be within thirty (30) days, after receipt of invoice and certification of acceptance of goods and/or services issued by the proper authority in GoE with direct supervision of the Contractor. Payment will be effected by bank transfer in the currency of the contract.

Section 3. Bid Data Sheet

The following data for the goods and/or services to be procured shall complement, supplement, or amend the provisions in the Invitation to Bid In the case of a conflict between the Instructions to Bidders, the Bid Data Sheet, and other annexes or references attached to the Bid Data Sheet, the provisions in the Bid Data Sheet shall prevail.

BDS No.	Ref. to Section.2	Data	Specific Instructions / Requirements
1	7	Language of the Bid	English
2		Submitting Bids for Parts or sub-parts of the Schedule of Requirements (partial bids)	
3	20	Alternative Bids	Shall not be considered
4	21	Pre-Bid conference	Will not be conducted
5	16	Bid Validity Period	180 days
6	13	Bid Security	Required in the amount of 2% of bid value in USD Acceptable Forms of Bid Security <ul style="list-style-type: none"> ▪ Bank Guarantee (See Section 8 for template) ▪ Any Bank-issued Check / Cashier's Check / Certified Check
7	41	Advanced Payment upon signing of contract	Allowed up to a maximum of 10% of contract value
8	42	Liquidated Damages	Will be imposed as follows: Percentage of contract price per day of delay: 1/1000% of contract value Max. number of days of delay 60, after which GoE may terminate the contract.
9	40	Performance Security	Required in the amount of 10% of contract value in USD
10	12	Currency of Bid	United States Dollar
11	31	Deadline for submitting requests for clarifications/ questions	7 days before the submission deadline
12	31	Contact Details for submitting clarifications/questions	Focal Person in GoE: Address: E-mail address:

13	18, 19 and 21	Manner of Disseminating Supplemental Information to the ITB and responses/clarifications to queries	Direct communication to prospective Proposers by email
14	23	Deadline for Submission	20 / 4 / 2021
14	22	Allowable Manner of Submitting Bids	<input checked="" type="checkbox"/> Courier/Hand Delivery <input checked="" type="checkbox"/> Submission by email <input type="checkbox"/> e-Tendering
15	22	Bid Submission Address	
16	22	Electronic submission (email or eTendering) requirements	Not applicable <ul style="list-style-type: none"> ▪ Format: PDF files only ▪ File names must be maximum 60 characters long and must not contain any letter or special character other than from Latin alphabet/keyboard. ▪ All files must be free of viruses and not corrupted. ▪ Max. File Size per transmission: ▪ Mandatory subject of email: ▪ Documents which are required in original (e.g. Bid Security) should be sent to the below address with a PDF copy submitted as part of the electronic submission:
17	25	Date, time and venue for the opening of bid	Date and Time: Venue: In the case of e-Tendering submission, bidders will receive an automatic notification once their Bids are opened.
18	27, 36	Evaluation Method for the Award of Contract	Lowest priced technically responsive, eligible and qualified bid.
19		Expected date for commencement of Contract	
20		Maximum expected duration of contract	24 months
21	35	GoE will award the contract to:	One Proposer Only
24		Other Information Related to the ITB	<i>[All other instructions and information not yet mentioned so far in this Data Sheet but are relevant to the ITB must be cited here, and any further entries that may be added below this table row]</i>

Section 4. Evaluation Criteria

Preliminary Examination Criteria

Bids will be examined to determine whether they are complete and submitted in accordance with ITB requirements as per below criteria on a Yes/No basis:

- Appropriate signatures
- Power of Attorney
- Minimum Bid documents provided
- Bid Validity
- Bid Security (if required) submitted as per ITB requirements with compliant validity period

Minimum Eligibility and Qualification Criteria

Eligibility and Qualification will be evaluated on a Pass/Fail basis.

If the Bid is submitted as a Joint Venture/Consortium/Association, each member should meet the minimum criteria, unless otherwise specified.

Subject	Criteria	Document Submission requirement
ELIGIBILITY		
Legal Status	Vendor is a legally registered entity.	Form B: Bidder Information Form
Conflict of Interest	No conflicts of interest in accordance with ITB clause 4.	Form A: Bid Submission Form
Bankruptcy	Has not declared bankruptcy, is not involved in bankruptcy or receivership proceedings, and there is no judgment or pending legal action against the vendor that could impair its operations in the foreseeable future.	Form A: Bid Submission Form
Certificates and Licenses	<ul style="list-style-type: none"> ▪ Duly authorized to act as Agent on behalf of the Manufacturer, or Power of Attorney, if bidder is not a manufacturer ▪ Official appointment as local representative, if Bidder is submitting a Bid on behalf of an entity located outside the country ▪ Patent Registration Certificates, if any of technologies submitted in the Bid is patented by the Bidder ▪ Export/Import Licenses, if applicable ▪ Any additional criteria if required 	Form B: Bidder Information Form
QUALIFICATION		
History of Non-Performing Contracts¹	Non-performance of a contract did not occur as a result of contractor default for the last 3 years.	Form D: Qualification Form
Litigation History	No consistent history of court/arbitral award decisions against the	Form D: Qualification

¹ Non-performance, as decided by UNDP, shall include all contracts where (a) non-performance was not challenged by the contractor, including through referral to the dispute resolution mechanism under the respective contract, and (b) contracts that were so challenged but fully settled against the contractor. Non-performance shall not include contracts where Employers decision was overruled by the dispute resolution mechanism. Non-performance must be based on all information on fully settled disputes or litigation, i.e. dispute or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract and where all appeal instances available to the Bidder have been exhausted.

	Bidder for the last 3 years.	Form
Previous Experience	Minimum 5 years of relevant experience.	Form D: Qualification Form
	Minimum 2 contracts of similar value, nature and complexity implemented over the last 5 years. <i>(For JV/Consortium/Association, all Parties cumulatively should meet requirement).</i>	Form D: Qualification Form
Financial Standing	Minimum average annual turnover of USD 500000\$ for the last 3 years. <i>(For JV/Consortium/Association, all Parties cumulatively should meet requirement).</i>	Form D: Qualification Form
	Bidder must demonstrate the current soundness of its financial standing and indicate its prospective long-term profitability. <i>(For JV/Consortium/Association, all Parties cumulatively should meet requirement).</i>	Form D: Qualification Form
Technical Evaluation	The technical bids shall be evaluated on a pass/fail basis for compliance or non-compliance with the technical specifications identified in the bid document.	Form E: Technical Bid Form
Financial Evaluation	Detailed analysis of the price schedule based on requirements listed in Section 5 and quoted for by the bidders in Form F. Price comparison shall be based on the landed price, including transportation, insurance and the total cost of ownership (including spare parts, consumption, installation, commissioning, training, special packaging, etc., where applicable) Comparison with budget/internal estimates.	Form F: Price Schedule Form
	Any additional criteria if required	

Section 5a: Schedule of Requirements and Technical Specifications/Bill of Quantities

The following five sites with information obtained from the Directorate of water supply of rural area- Erbil, where more details can be obtained by the contractor for proper costing.

- The contractor is free to submit an offer for one site only or for several sites.
- The Governorate is free to distribute the sites to each contractor according to the technical and financial evaluation.
- The bill of quantities listed below represents one location and the bidder must submit a quantitative table for each site he chooses, specifying the location number.

	Location number				
	Site 1	Site 2	Site 3	Site 4	Site 5
Horsepower	7.5 hp	20 hp	20 hp	15 hp	25 hp
Kilowatt	5 kw	15 kw	15 kw	11 kw	18.5 kw
Pump Details (v,fr,ph,p.f)	V=380v	Fr=50hz	Ph=3	p.f=0.8	
Well depth in meter	235 m	150 m	163	140	200
Well diameter in inch	8"	8"	8"	8"	8"
Depth of submersible pump in	120m	108	150	90	90
water steel pipe size in Inch	2"	3"	3"	2.5"	2.5"
Water flow in m3/h	8	30	30	17	17
Water Tank capacity in m3	21	40		21	21
Hour of operation per day	8	10	5	6	7
years in operation for the pump	Two years	2005	1989	1996	2005
Install PV (kw)	7.5	22.5	22.5	16.5	27.75

Item	Description	Unit
1	The solar power plant consists of a PV plant, Combined Box, Pump management system (PMS), invertor and Panel Distribution Board.	
	The PMS shall be based on a variable speed drive principle by a Solar Variable Frequency Driver (SVFD). It shall be connected directly to the existing pump (.. KW) depth ...m without the need of batteries. The inverter shall be capable of forming an electric grid and running the existing pump in a pure solar operation mode. The power control system shall preview as well the connection of additional power sources such as diesel genset and utility power. Electrical installations and equipment shall be confirming to I.E.C. standards or equivalent.	
	General requirement of system documentation.	
	The following documentation (s) are required:	

	System data: Basic nameplate information and details should be finding on the cover page of a PV plan set or the system commissioning package. It shall include rated system power, manufacturer, model and quantities of PV modules and inverter system data.	
	Wiring diagram: It shall include at minimum a single-line wiring diagram. Details need to be provided regarding conductor sizes and over current protection devices ratings. Data sheets: It shall include modules and inverter datasheets. The provision of datasheets for other significant system components should also be considered.	
	Mechanical design information: Datasheet for the array mounting system needs to be provided, at a minimum. where applicable, structural engineering documents, soil testing results and so forth are to be provided too.	
	Copy of Test results and commissioning data	
2	Photovoltaique Panels	Lump sum
	Supply and install of PV panel Mono N-type IBC solar cells 370W 72 cell, efficiency >20% /> 18 Tiers 1, Class A, IEC,CE ,TUV, ISO 9001,14000 Certification, Salt Mist Corrosion Test & Ammonia Corrosion Test).	
	The Tenderer shall specify the required number of panels to obtain the necessary electrical power kw.	
	Supply and install of PV panels with earth clamps	
3	Foundation	Lump sum
	Concrete foundation under PV Panels to support Environmental Climate Change especially wind resistance, Snow (including excavation and back filling). The concrete shall be type I not less than 35 MPA. Concrete Mix design is needed in addition to concrete tests on site.	
	Concrete foundation	
4	Mounting Structure	Lump sum
	Supply and install of Mounting structure with all related accessories all as specified, shown on the drawings and to the satisfaction of the Engineer.	
	calculation of wind resistance and snow load shall be submitted	
	Complete set of shop drawings, Submittal of material shall be submitted Steel structure	
5	DC Cabling	Lump sum
	The cables must be extremely resistant to solar exposure and harsh weather conditions (TUV certified or equivalent). The cable section shall be sized as to keep cabling losses below 1%.	

	Supply and install of DC cables between solar panel and between Solar Plant and the Motor Starter in duct bank and manholes including excavation and backfilling with all related accessories all as specified, shown on the drawings and to the satisfaction of the Engineer.	
6	AC Cabling	Lump sum
	Supply and install of AC cables with all related accessories all as specified, shown on the drawings and to the satisfaction of the Engineer.	
	The cable section shall be sized as to keep cabling losses below 3%.	
7	Pump Management system	Lump sum
	Supply and install PMS complete with Solar inverter for Pump power Inverter .../...kW, .../...A, 3 Phase 380Vac or DC Supply, IP21, Solar pump Application with MPPT, with integrated input noise filter and AC Chokes, Modbus Communication all as specified, shown on the drawings and to the satisfaction of the Engineer. the PMS shall insure the proper functioning and protection of pump (Pump depth is around m).	
	Full protection and diagnostic mechanism against short circuit, overheating and over voltages.	
	Perfect Mute control to ensure a reasonable torque output while reducing noise and heat of pump motor	
	Complete protection against lightning, soft-start & soft stop	
	over-voltage, under-voltage, over-current, short-circuit, earthing, over frequency protection, Speed-loss protection.	
	Built-in MPPT (Max. Power Point Tracking) at efficiency 99% to increase solar.	
	Built-in DC Reactor brings high input power factor to reduce interference	
	Pump shall be protected against dry-running. High temperature, High pressure and High or low Flow.	
	PMS shall be installed inside metallic enclosure IP 68 complete with ventilation system.	
	Surge Protection Class B+C	
	output chock	
8	Main distribution Panel	Lump sum
	Supply and install of MDB complete with Transfer switch between AC and DC with all related accessories and protection system all as specified, shown on the drawings and to the satisfaction of the Engineer.	
	The Bidder shall submit complete load calculation and selection report for component.	

9	Earthing and Lightning protection	Lump sum
	Supply and install of Earthing system for solar plant and equipotential bonding.	
	Lightning system is active Type the radius of protection shall cover all the Plant.	
	The Resistance shall be less than 5 Ohm	
	The Bidder shall submit earthing result report	
10	System Accessories	Lump sum
	Supply and install of Combiner boxes as per below specification in addition to all related accessories for proper installation of cables. such cable tray, PVC pipes etc.	
	Box of GRP Polyester IP66/IK10 or equivalent	
	Current measurement Module	
	Class II surge Arresters	
	gPV Cylindrical fuses for positive and negative protection	
	IP 68 MC4 connectors	
	The combined boxes shall be previewed to combine PV strings onto a DC buses where the DC side is electrically protected against most risks.	
11	Fences	Lump sum
	Supply and install of Fence and gate as indicated in the drawings with all related civil works, accessories to the satisfaction of engineer.	
	Central Remote Monitoring:	
	Data logging and remote monitoring including: HMI	
	Sun Meter with built in Panel Temperature	
	Temperature Probe for PV modules	
	Temperature Sensor for ambient temperature	
	Energy meters	
	Submersible pressure sensor	
	Cable For PTL 110	
	Analog Input - Adam 4055	
	Colored Touch Screen	
	Transistor Out/In	
	RTD modules with Modbus	
	Activation Card for remote monitoring Board for inverter	
12	UPS system	Lump sum

	Supply and install of UPS System with 8 hours capacity to handle data logging and monitoring devices in case of power absence DOD 80%	
13	Operation and Maintenance Manual	Lump sum
	Preparation of operation and maintenance manuals defining all equipment and particularly PV modules, solar inverter and all components of the solar system equipment and showing all necessary instructions for the control and maintenance of these equipment. Operation and Maintenance manuals shall be supplied written in English and Arabic languages. All parts and equipment listings shall be in English.	
14	Training: Training shall be provided for 2 trainees who will run and maintain and troubleshoot minor problems of the system. The training should be carried out from one trainer that is experienced and certified by the production factory or his authorized representative. The training will last for at least 2 (two) days, the place of training will be on the site and on Owner permises	Lump sum
15	Maintenance: maintain the system for two years from the date of handing over to the end users.	Lump sum
16	Spare parts: list of recommended spare parts for maintaining the system for 5 years.	Lump sum
17	miscellaneous	Lump sum

Provide Notes on Scope/Specification (if in a separate document) or delete if not applicable

Section 5b: Other Related Requirements

Inspection upon delivery	applied
Installation Requirements	applied
Testing Requirements	applied
Scope of Training on Operation and Maintenance	applied
Commissioning	applied
Warranty Period	Five years
Local Service Support	Two year
Technical Support Requirements	Two years
After-sale services Requirements	<input checked="" type="checkbox"/> Warranty on Parts and Labor for minimum period of two years <input checked="" type="checkbox"/> Technical Support

Payment Terms <i>(max. advanced payment is 20% as per UNDP policy)</i>	100% within 30 days upon owner's acceptance of the goods delivered as specified and receipt of invoice
Conditions for Release of Payment	<input checked="" type="checkbox"/> Inspection upon arrival at destination <input checked="" type="checkbox"/> Installation <input checked="" type="checkbox"/> Testing <input checked="" type="checkbox"/> Training on Operation and Maintenance <input checked="" type="checkbox"/> Written Acceptance of Goods based on full compliance with ITB requirements
All documentations, including catalogues, instructions and operating manuals, shall be in this language	English

Section 6: Returnable Bidding Forms / Checklist

This form serves as a checklist for preparation of your Bid. Please complete the Returnable Bidding Forms in accordance with the instructions in the forms and return them as part of your Bid submission. No alteration to format of forms shall be permitted and no substitution shall be accepted.

Before submitting your Bid, please ensure compliance with the Bid Submission instructions of the BDS 22.

Technical Bid:

Have you duly completed all the Returnable Bidding Forms?	
▪ Form A: Bid Submission Form	<input type="checkbox"/>
▪ Form B: Bidder Information Form	<input type="checkbox"/>
▪ Form C: Joint Venture/Consortium/ Association Information Form	<input type="checkbox"/>
▪ Form D: Qualification Form	<input type="checkbox"/>
▪ Form E: Format of Technical Bid/Bill of Quantities	<input type="checkbox"/>
▪ Form G: Form of Bid Security	<input type="checkbox"/>
▪ [Add other forms as necessary]	<input type="checkbox"/>
Have you provided the required documents to establish compliance with the evaluation criteria in Section 4?	<input type="checkbox"/>

Price Schedule:

▪ Form F: Price Schedule Form	<input type="checkbox"/>
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Form A: Bid Submission Form

Name of Bidder:		Date:	
ITB reference:			

We, the undersigned, offer to supply the goods and related services required for _____ in accordance with your Invitation to Bid No. _____ and our Bid. We hereby submit our Bid, which includes this Technical Bid and Price Schedule.

Our attached Price Schedule is for the sum of.

We hereby declare that our firm, its affiliates or subsidiaries or employees, including any JV/Consortium /Association members or subcontractors or suppliers for any part of the contract:

- a) is not under procurement prohibition by the United Nations, including but not limited to prohibitions derived from the Compendium of United Nations Security Council Sanctions Lists;
- b) have not been suspended, debarred, sanctioned or otherwise identified as ineligible by any UN Organization or the World Bank Group or any other international Organization;
- c) have no conflict of interest in accordance with Instruction to Bidders Clause 4;
- d) do not employ, or anticipate employing, any person(s) who is, or has been a UN staff member within the last year, if said UN staff member has or had prior professional dealings with our firm in his/her capacity as UN staff member within the last three years of service with the UN (in accordance with UN post-employment restrictions published in ST/SGB/2006/15);
- e) have not declared bankruptcy, are not involved in bankruptcy or receivership proceedings, and there is no judgment or pending legal action against them that could impair their operations in the foreseeable future;
- f) undertake not to engage in proscribed practices, including but not limited to corruption, fraud, coercion, collusion, obstruction, or any other unethical practice, with the UN or any other party, and to conduct business in a manner that averts any financial, operational, reputational or other undue risk to the UN and we embrace the principles of the United Nations Supplier Code of Conduct and adhere to the principles of the United Nations Global Compact.

We declare that all the information and statements made in this Bid are true and we accept that any misinterpretation or misrepresentation contained in this Bid may lead to our disqualification and/or sanctioning by the GoE.

We offer to supply the goods and related services in conformity with the Bidding documents, including the GoE General Conditions of Contract and in accordance with the Schedule of Requirements and Technical Specifications.

Our Bid shall be valid and remain binding upon us for the period specified in the Bid Data Sheet.

We understand and recognize that you are not bound to accept any Bid you receive.

I, the undersigned, certify that I am duly authorized by _____ to sign this Bid and bind it should GoE accept this Bid.

Name: _____

Title: _____

Date: _____

Signature: _____

Form B: Bidder Information Form

Legal name of Bidder	
Legal address	
Year of registration	
Bidder's Authorized Representative Information	Name and Title: Telephone numbers: Email:
Are you a UNGM registered vendor?	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes,
Are you a GoE vendor?	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes,
Countries of operation	
No. of full-time employees	
Quality Assurance Certification (e.g. ISO 9000 or Equivalent) (If yes, provide a Copy of the valid Certificate):	
Does your Company hold any accreditation such as ISO 14001 or ISO 14064 or equivalent related to the environment? (If yes, provide a Copy of the valid Certificate):	
Does your Company have a written Statement of its Environmental Policy? (If yes, provide a Copy)	
Does your organization demonstrates significant commitment to sustainability through some other means, for example internal company policy documents on women empowerment, renewable energies or membership of trade institutions promoting such issues	
Is your company a member of the UN Global Compact	
Contact person that GoE may contact for requests for clarifications during Bid evaluation	Name and Title: Telephone numbers: Email:
Please attach the following documents:	<ul style="list-style-type: none"> ▪ Company Profile, which should <u>not</u> exceed fifteen (15) pages, including printed brochures and product catalogues

relevant to the goods and/or services being procured

- Certificate of Incorporation/ Business Registration
- Tax Registration/Payment Certificate issued by the Internal Revenue Authority evidencing that the Bidder is updated with its tax payment obligations, or Certificate of Tax exemption, if any such privilege is enjoyed by the Bidder
- Trade name registration papers, if applicable
- Quality Certificate (e.g., ISO, etc.) and/or other similar certificates, accreditations, awards and citations received by the Bidder, if any
- Environmental Compliance Certificates, Accreditations, Markings/Labels, and other evidences of the Bidder's practices which contributes to the ecological sustainability and reduction of adverse environmental impact (e.g., use of non-toxic substances, recycled raw materials, energy-efficient equipment, reduced carbon emission, etc.), either in its business practices or in the goods it manufactures
- Patent Registration Certificates, if any of technologies submitted in the Bid is patented by the Bidder
- Certification or authorization to act as Agent on behalf of the Manufacturer, or Power of Attorney.
- Export Licenses, if applicable
- Local Government permit to locate and operate in assignment location, if applicable
- Official Letter of Appointment as local representative, if Bidder is submitting a Bid on behalf of an entity located outside the country

Form C: Joint Venture/Consortium/Association Information Form

Name of Bidder:		Date:	
ITB reference:			

To be completed and returned with your Bid if the Bid is submitted as a Joint Venture/Consortium/Association.

No	Name of Partner and contact information <i>(address, telephone numbers, fax numbers, e-mail address)</i>	Proposed proportion of responsibilities (in %) and type of goods and/or services to be performed
1		
2		
3		

Name of leading partner (with authority to bind the JV, Consortium, Association during the ITB process and, in the event a Contract is awarded, during contract execution)	
--	--

We have attached a copy of the below referenced document signed by every partner, which details the likely legal structure of and the confirmation of joint and severable liability of the members of the said joint venture:

Letter of intent to form a joint venture **OR** JV/Consortium/Association agreement

We hereby confirm that if the contract is awarded, all parties of the Joint Venture/Consortium/Association shall be jointly and severally liable to GoE for the fulfillment of the provisions of the Contract.

Name of partner: _____ Name of partner: _____

Signature: _____ Signature: _____

Date: _____ Date: _____

Name of partner: _____ Name of partner: _____

Signature: _____ Signature: _____

Date: _____ Date: _____

Form D: Eligibility and Qualification Form

Name of Bidder:		Date:	
ITB reference:			

If JV/Consortium/Association, to be completed by each partner.

History of Non- Performing Contracts

<input type="checkbox"/> Non-performing contracts did not occur during the last 3 years			
<input type="checkbox"/> Contract(s) not performed in the last 3 years			
Year	Non- performed portion of contract	Contract Identification	Total Contract Amount (current value in US\$)
		Name of Client: Address of Client: Reason(s) for non-performance:	

Litigation History (including pending litigation)

<input type="checkbox"/> No litigation history for the last 3 years			
<input type="checkbox"/> Litigation History as indicated below			
Year of dispute	Amount in dispute (in US\$)	Contract Identification	Total Contract Amount (current value in US\$)
		Name of Client: Address of Client: Matter in dispute: Party who initiated the dispute: Status of dispute: Party awarded if resolved:	

Previous Relevant Experience

Please list only previous similar assignments successfully completed in the last 3 years.

List only those assignments for which the Bidder was legally contracted or sub-contracted by the Client as a company or was one of the Consortium/JV partners. Assignments completed by the Bidder's individual experts working privately or through other firms cannot be claimed as the relevant experience of the Bidder, or that of the Bidder's partners or sub-consultants, but can be claimed by the Experts themselves in their CVs. The Bidder should be prepared to substantiate the claimed experience by presenting copies of relevant documents and references if so requested by GoE.

Project name & Country of Assignment	Client & Reference Contact Details	Contract Value	Period of activity and status	Types of activities undertaken

Bidders may also attach their own Project Data Sheets with more details for assignments above.

- Attached are the Statements of Satisfactory Performance from the Top 3 (three) Clients or more.

Financial Standing

Annual Turnover for the last 3 years	Year	USD
	Year	USD
	Year	USD
Latest Credit Rating (if any), indicate the source		

Financial information (in US\$ equivalent)	Historic information for the last 3 years		
	Year 1	Year 2	Year 3
	<i>Information from Balance Sheet</i>		
Total Assets (TA)			
Total Liabilities (TL)			
Current Assets (CA)			
Current Liabilities (CL)			
	<i>Information from Income Statement</i>		
Total / Gross Revenue (TR)			
Profits Before Taxes (PBT)			
Net Profit			
Current Ratio			

- Attached are copies of the audited financial statements (balance sheets, including all related notes, and income statements) for the years required above complying with the following condition:
- a) Must reflect the financial situation of the Bidder or party to a JV, and not sister or parent companies;
 - b) Historic financial statements must be audited by a certified public accountant;
 - c) Historic financial statements must correspond to accounting periods already completed and audited. No statements for partial periods shall be accepted.

Form E: Format of Technical Bid

Name of Bidder:		Date:	
ITB reference:			

The Bidder's Bid should be organized to follow this format of the Technical Bid. Where the bidder is presented with a requirement or asked to use a specific approach, the bidder must not only state its acceptance, but also describe how it intends to comply with the requirements. Where a descriptive response is requested, failure to provide the same will be viewed as non-responsive.

SECTION 1: Bidder's qualification, capacity and expertise

- 1.1 General organizational capability which is likely to affect implementation: management structure, financial stability and project financing capacity, project management controls, extent to which any work would be subcontracted (if so, provide details).
- 1.2 Relevance of specialized knowledge and experience on similar engagements done in the region/country.
- 1.3 Quality assurance procedures and risk mitigation measures.
- 1.4 Organization's commitment to sustainability.

SECTION 2: Scope of Supply, Technical Specifications, and Related Services

This section should demonstrate the Bidder's responsiveness to the specification by identifying the specific components proposed, addressing the requirements, as specified, point by point; providing a detailed description of the essential performance characteristics proposed; and demonstrating how the proposed bid meets or exceeds the requirements/specifications. All important aspects should be addressed in sufficient detail.

- 2.1 A detailed description of how the Bidder will deliver the required goods and services, keeping in mind the appropriateness to local conditions and project environment. Details how the different service elements shall be organized, controlled and delivered.
- 2.2 Explain whether any work would be subcontracted, to whom, how much percentage of the requirements, the rationale for such, and the roles of the proposed sub-contractors and how everyone will function as a team.
- 2.3 The bid shall also include details of the Bidder's internal technical and quality assurance review mechanisms.
- 2.4 Implementation plan including a Gantt Chart or Project Schedule indicating the detailed sequence of activities that will be undertaken and their corresponding timing.
- 2.5 Demonstrate how you plan to integrate sustainability measures in the execution of the contract.

Solar Pumping				
Technical Specifications				
No	Item	Unit	Value	Tenderer Offer
1	Solar Photovoltaic (PV) Modules			
1.1	Type used		Mono N-type IBC Technology	
1.2a	Total PV Capacity at STC (Greater or equal to): For Submersible Pump	kWp	According to site specification	

1.2b	Power temp. coefficient	Deg C	-0.29 to 0.31 %	
1.2c	PV panels match the standard weather & ambient temp. specification for KRG/IRAQ		1.temp. coefficient of Isc ≥0,050 %/k	
	Low temp. coefficient for high temp. regions		2.temp. coefficient of Voc ≥0,0290%/k	
1.3	Rated Power of each module (Greater or equal to)	Wp	P ≥ 370	
1.4	PV- panel type		N-type IBC Tech.	
1.5	Vmp (@STC greater or equal to)	V	30 (36)	
1.6	Voc (@STC Less than or equal to)	V	40 (47.5)	
1.7	Module conversion efficiency (greater or equal to)	%	≥ 20	
1.8	Positive power tolerance (greater or equal to)	%	≥ 3	
1.9	Cell Protection		Cells should be protected by anti-reflective coated tempered glass	
1.10	Module shall withstand load up to and above	Pascal	5400	
1.11	I-V Curve is Supplied		Yes	
1.12	PV Modules Compliance		IEC 61730-1/2: 2004 and IEC 61215-2: 2005 Guidelines	
1.13	Minimum Warranty	Years	10 years on material and manufacturing	
1.14	Output Warranty	Years	10 years with 90% power output and 25 years 80% power output warranty	
1.15	PV Modules should include measures against Potential Induced Degradation (anti PID).		yes	
2	AC 3-Phase Solar Pump Inverter			
2.1a	Rated Power: For Submersible Pump Inverter (Greater or equal to)	kW	≥ rated power specification	
2.2	Minimum Protection Class of Solar Pump Inverter as per datasheet of manufacturer		IP54	
2.3	Solar Pump Application Software with Integrated MPPT Functionality		yes	
2.4	With Integrated Input Noise Filter		yes	
2.5	Pump Operation selection through either DC Input or 3-Phase Input of Inverter.		yes	
2.6	Inverter Efficiency (Greater or equal to)	%	97	
2.7	Communication: MODBUS/RS485, allowing monitoring and control of inverter operation		yes	
2.8	Proper external protection measures on AC and DC sides including surge protection.		yes	

2.9	Maximum Operating Temperature (Greater or equal to) as per manufacturer	Deg C	60	
2.10	Minimum Warranty	years	10	
3	Metallic Support Structures			
3.1	All structures shall be made of corrosion resistant materials e.g. aluminum, galvanized steel		yes	
3.2	Can withstand wind loads on PV generators up to:	km/h	140	
3.3	Tilt and orientation of PV have to be optimized for yearly best performance operation		yes	
3.4	Metallic Support Structures should be properly grounded and Bonding is required between PV module chassis and steel structure support		yes	
4	Sinusoidal Filter: For Submersible Pump			
4.1	Properly sized and selected for Solar Pump Inverter installed on Submersible Pump in accordance to Manufacturer of Inverter requirements and application requirements.		yes	
4.2	Minimum Warranty	years	5	
5	Water Meter at Output of Submersible Pump			
5.1	Installed at output of Submersible Pump to measure the quantity of water transferred.		yes	
5.2	Communicate with Transfer Pump controller in Electrical Room to data log and save quantities of water extracted per day/month/year.		yes	
5.3	Minimum Warranty	years	5	
7	Tank Level Sensor and Floating Level Switch on water Tank			
7.1	Submersible Tank Level Sensor installed on tank above Electrical Room and display amount of water in the tank.		yes	
7.2	Communicate with Transfer Pressure Pump controller in Electrical Room to data log and save level of water in tank.		yes	
7.3	Below a programmable lower safety level of water in tank, Transfer Pressure pump should not operate		yes	
7.4	Above a programmable upper safety level of water in tank, Submersible Pump should not operate		yes	
7.5	Minimum Warranty	years	5	
8	Monitoring and Control Setup			

8.1	Municipality Operator should be able to shift between Generator Supply, Normal Electrical Supply or PV supply.		yes	
8.2	There should be an independent controller for Submersible Pump, monitoring and saving vital parameters.		yes	
8.4	At least one Irradiation sensor and PV temperature sensor should be installed per direction of each PV array. Communication and power supply cables for Irradiation and PV temperature sensors should run down to Electrical Room and logged with the other critical values.		yes	
8.5	A Graphic user interface with display unit will display and datalog Values of interest (Voltage, Current, Speed of pump, tank level, water meter, Irradiation, Temperature...etc) both local and possibility to data transmit via internet.		yes	
8.6	Controller should be ready to remotely relay site info through regular (monthly) emails in addition to live monitoring and faults through internet connection when supplied by Municipality.		yes	
8.7	The main power panel board should have an automatic change over switch to switch between the DC and the AC source at the inverter input from graphical user interface of upper controller.		yes	
8.8	Because of dusty environment minimum IP rating of all Electrical Panel Boards in Electrical Room.		IP54	
8.9	Control Setup should have the possibility to add digital and analog Inputs units if need be in the future.		yes	
8.10	UPS system to ensure power to all sensors and controllers, and an autonomy of at least 24hrs for these without power in case of power cut. UPS charging time will be 7 hours/day (Utility Supply or GENSET). (supporting calculations to be presented)		yes	
9	Protection Circuit and Cables			
9.1	Circuit Breakers should be provided for short-circuit conditions		Yes	
9.2	All electronic components must take into consideration temperature compensation issues		Yes	

9.3	Full Protection		Against open circuit, accidental short circuit and reverse polarity by blocking diode should be provided	
9.4	Earthing and lightning protection systems shall be added to installation, with a resistance value (as tested in dry season) that shall be less than 5 ohms. Proper Handhole ground should be set in place with a metal cover for routine and periodic measurements / maintenance procedure.		Yes	
9.5	Earthing and Lightning protection should cover all installation including both areas PV area and Electrical Room.		Yes	
9.6	Solar cables (a.k.a. photovoltaic cable) specifically manufactured for solar applications shall be used.		Yes	
9.7	Solar cables should be manufactured according to the international standard EN 50618 - H1Z2Z2-K.		Yes	
9.8	Electrical junction boxes shall be UV resistant, IP65, weatherproof and installed at high level to eliminate any risk of water submersion.		Yes	
9.9	All circuit breakers, fuses and disconnects must be listed or recognized for use in DC circuits where applicable. Equipment only rated for use in AC circuits will not be permitted for use in DC circuits.		Yes	
9.10	Provide at least one AC Disconnect located adjacent to the inverter.		Yes	
9.11	Provide at least one DC Disconnect located adjacent to the inverter.		Yes	
9.12	Surge suppression on the DC and AC side of the inverter must be provided		Yes	
9.13	All cables and items that are exposed to the sun should be UV-resistant		Yes	
9.14	When Power and Control Cables are running in parallel, a separator will be provided between them.		Yes	
9.15	All running cables that are not underground should be placed in cable trays that should be properly grounded if metallic and should be protected from rodents or rats.		Yes	
9.16	Manholes should be placed for ease of access and maintenance of underground cables.		Yes	
10	Supporting Documents			

10.1	Provide Software Simulation case study showing irradiation simulation in addition to the system power generation forecast for 12 months period for the designated location.		Yes	
10.2	Simulation should also show variation of pump's flow and operating speed according to the available solar irradiation throughout the day and throughout the different seasons. Variation impact on power consumption should also be indicated.		Yes	
10.3	Indicate the configuration of the PV modules layout and the required space.		Yes	
10.4	Single Line diagram of power connections		Yes	
10.5	To provide schematic drawings showing Power and Control cables' routing between Electrical Room, Submersible Pump, Local Tank, all sensors and meters, and PV Panels.		Yes	
10.6	Calculations notes (such as cable sizing, panel board's equipment sizing, bus-bars sizing, short circuit current ratings, etc.) are to be specified in detail.		Yes	
10.7	All system's components datasheets and certificates shall be submitted highlighting the specific models and selections of parts that will be used in project, with quantities if need be.		Yes	
10.8	Wind Load calculation study for PV array should be presented, with a safety factor of 2.		Yes	
10.9	Contractor: List of Solar Pumping Applications installed including at least a single solar pump above 20 kW.		Yes	

PLEASE NOTE THAT EACH OF THE VALUES OR REQUESTED INFORMATION PLUGGED INTO THE TABLE ABOVE AS PER TENDER OFFER SHOULD BE HIGHLIGHTED IN THE RESPECTIVE SUPPORTING DOCUMENTS THAT SHOULD BE ENCLOSED IN HARDCOPY FORMAT WITH OFFER.

SECTION 3: Management Structure and Key Personnel

- 3.1 Describe the overall management approach toward planning and implementing the project. Include an organization chart for the management of the project describing the relationship of key positions and designations. Provide a spreadsheet to show the activities of each personnel and the time allocated for his/her involvement.
- 3.2 Provide CVs for key personnel that will be provided to support the implementation of this project using the format below. CVs should demonstrate qualifications in areas relevant to the scope of goods and/or services.

Format for CV of Proposed Key Personnel

Name of Personnel	
Position for this assignment	
Nationality	
Language proficiency	
Education/Qualifications	<i>[Summarize college/university and other specialized education of personnel member, giving names of schools, dates attended, and degrees/qualifications obtained.]</i>
Professional certifications	<i>[Provide details of professional certifications relevant to the scope of goods and/or services]</i> <ul style="list-style-type: none"> ▪ Name of institution: ▪ Date of certification:
Employment Record/Experience	<i>[List all positions held by personnel (starting with present position, list in reverse order), giving dates, names of employing organization, title of position held and location of employment. For experience in last five years, detail the type of activities performed, degree of responsibilities, location of assignments and any other information or professional experience considered pertinent for this assignment.]</i>
References	<i>[Provide names, addresses, phone and email contact information for two (2) references]</i> Reference 1: Reference 2:

I, the undersigned, certify that to the best of my knowledge and belief, the data provided above correctly describes my qualifications, my experiences, and other relevant information about myself.

Signature of Personnel

Date (Day/Month/Year)

FORM F: Price Schedule Form

Name of Bidder:		Date:	
ITB reference:			

The Bidder is required to prepare the Price Schedule following the below format. The Price Schedule must include a detailed cost breakdown of all goods and related services to be provided. Separate figures must be provided for each functional grouping or category, if any.

Currency of the Bid: USD

The following five sites with information obtained from the Directorate of water supply of rural area- Erbil, where more details can be obtained by the contractor for proper costing.

- The contractor is free to submit an offer for one site only or for several sites.
- The Governorate is free to distribute the sites to each contractor according to the technical and financial evaluation.
- The bill of quantities listed below represents one location and the bidder must submit a quantitative table for each site he chooses, specifying the location number.

	Location number				
	Site 1	Site 2	Site 3	Site 4	Site 5
Horsepower	7.5 hp	20 hp	20 hp	15 hp	25 hp
Kilowatt	5 kw	15 kw	15 kw	11 kw	18.5 kw
Pump Details (v,fr,ph,p.f)	V=380v	Fr=50Hz	Ph=3	p.f=0.8	
Well depth in meter	235 m	150 m	163	140	200
Well diameter in inch	8"	8"	8"	8"	8"
Depth of submersible pump in meter	120m	108	150	90	90
water steel pipe size in Inch	2"	3"	3"	2.5"	2.5"
Water flow in m3/h	8	30	30	17	17
Water Tank capacity in m3	21	40		21	21
Hour of operation per day	8	10	5	6	7
years in operation for the pump	Two years	2005	1989	1996	2005
Install PV (kw)	7.5	22.5	22.5	16.5	27.75

Price Schedule

The schedule of price should be repeated for each site

Item	Description	Unit	Estimated Quantity	Unit Rate Amount (USD) (USD)
1	The solar power plant consists of a PV plant, Combined Box, Pump management system (PMS), inverter and Panel Distribution Board.			
	The PMS shall be based on a variable speed drive principle by a Solar Variable Frequency Driver (SVFD). It shall be connected directly to the existing pump (.. KW) depth ...m			

	without the need of batteries. The inverter shall be capable of forming an electric grid and running the existing pump in a pure solar operation mode. The power control system shall preview as well the connection of additional power sources such as diesel genset and utility power. Electrical installations and equipment shall be confirming to I.E.C. standards or equivalent.			
	General requirement of system documentation.			
	The following documentation (s) are required:			
	System data: Basic nameplate information and details should be finding on the cover page of a PV plan set or the system commissioning package. It shall include rated system power, manufacturer, model and quantities of PV modules and inverter system data.			
	Wiring diagram: It shall include at minimum a single-line wiring diagram. Details need to be provided regarding conductor sizes and over current protection devices ratings. Data sheets: It shall include modules and inverter datasheets. The provision of datasheets for other significant system components should also be considered.			
	Mechanical design information: Datasheet for the array mounting system needs to be provided, at a minimum. where applicable, structural engineering documents, soil testing results and so forth are to be provided too.			
	Copy of Test results and commissioning data			
2	Photovoltaïque Panels	Lump sum		
	Supply and install of PV panel Mono N-type IBC 370w 72 cell, efficiency >20% />18 Tiers 1, Class A, IEC,CE ,TUV, ISO 9001,14000 Certification, Salt Mist Corrosion Test & Ammonia Corrosion Test).			
	The Tenderer shall specify the required number of panels to obtain the necessary electrical power kw.			
	Supply and install of PV panels with earth clamps			
	Unit Rate in Words:			
3	Foundation	Lump sum		
	Concrete foundation under PV Panels to support Environmental Climate Change especially wind resistance, Snow (including excavation and back filling). The concrete shall be type I not less than 35 MPA. Concrete Mix design is needed in addition to concrete tests on site.			
	Concrete foundation			

	Unit Rate in Words:			
4	Mounting Structure	Lump sum		
	Supply and install of Mounting structure with all related accessories all as specified, shown on the drawings and to the satisfaction of the Engineer.			
	calculation of wind resistance and snow load shall be submitted			
	Complete set of shop drawings, Submittal of material shall be submitted Steel structure			
	Unit Rate in Words:			
5	DC Cabling	Lump sum		
	The cables must be extremely resistant to solar exposure and harsh weather conditions (TUV certified or equivalent). The cable section shall be sized as to keep cabling losses below 1%.			
	Supply and install of DC cables between solar panel and between Solar Plant and the Motor Starter in duct bank and manholes including excavation and backfilling with all related accessories all as specified, shown on the drawings and to the satisfaction of the Engineer.			
	Unit Rate in Words:			
6	AC Cabling	Lump sum		
	Supply and install of AC cables with all related accessories all as specified, shown on the drawings and to the satisfaction of the Engineer.			
	The cable section shall be sized as to keep cabling losses below 3%.			
	Unit Rate in Words:			
7	Pump Management system	Lump sum		
	Supply and install PMS complete with Solar inverter for Pump power Inverter .../...kW, .../...A, 3 Phase 380Vac or DC Supply, IP21, Solar pump Application with MPPT, with integrated input noise filter and AC Chokes, Modbus Communication all as specified, shown on the drawings and to the satisfaction of the Engineer. the PMS shall			

	insure the proper functioning and protection of pump (Pump depth is around m).			
	Full protection and diagnostic mechanism against short circuit, overheating and over voltages.			
	Perfect Mute control to ensure a reasonable torque output while reducing noise and heat of pump motor			
	Complete protection against lightning, soft-start & soft stop			
	over-voltage, under-voltage, over-current, short-circuit, earthling, over frequency protection, Speed-loss protection.			
	Built-in MPPT (Max. Power Point Tracking) at efficiency 99% to increase solar.			
	Built-in DC Reactor brings high input power factor to reduce interference			
	Pump shall be protected against dry-running. High temperature, High pressure and High or low Flow.			
	PMS shall be installed inside metallic enclosure IP 68 complete with ventilation system.			
	Surge Protection Class B+C			
	output chock			
	Unit Rate in Words:			
8	Main distribution Panel	Lump sum		
	Supply and install of MDB complete with Transfer switch between AC and DC with all related accessories and protection system all as specified, shown on the drawings and to the satisfaction of the Engineer.			
	The Bidder shall submit complete load calculation and selection report for component.			
	Unit Rate in Words:			
9	Earthing and Lightning protection	Lump sum		
	Supply and install of Earthing system for solar plant and equipotential bonding.			
	Lightning system is active Type the radius of protection shall cover all the Plant.			
	The Resistance shall be less than 5 Ohm			

	The Bidder shall submit earthing result report			
	Unit Rate in Words:			
10	System Accessories	Lump sum		
	Supply and install of Combiner boxes as per below specification in addition to all related accessories for proper installation of cables. such cable tray, PVC pipes etc.			
	Box of GRP Polyester IP66/IK10 or equivalent			
	Current measurement Module			
	Class II surge Arresters			
	gPV Cylindrical fuses for positive and negative protection			
	IP 68 MC4 connectors			
	The combined boxes shall be previewed to combine PV strings onto a DC buses where the DC side is electrically protected against most risks.			
	Unit Rate in Words:			
11	Fences	Lump sum		
	Supply and install of Fence and gate as indicated in the drawings with all related civil works, accessories to the satisfaction of engineer.			
	Central Remote Monitoring:			
	Data logging and remote monitoring including: HMI			
	Sun Meter with built in Panel Temperature			
	Temperature Probe for PV modules			
	Temperature Sensor for ambient temperature			
	Energy meters			
	Submersible pressure sensor			
	Cable For PTL 110			
	Analog Input - Adam 4055			
	Colored Touch Screen			
	Transistor Out/In			
	RTD modules with Modbus			
	Activation Card for remote monitoring Board for inverter			
	Unit Rate in Words:			
12	UPS system	Lump sum		

	Supply and install of UPS System with 8 hours capacity to handle data logging and monitoring devices in case of power absence DOD 80%			
	Unit Rate in Words:			
13	Operation and Maintenance Manual	Lump sum		
	Preparation of operation and maintenance manuals defining all equipment and particularly PV modules, solar inverter and all components of the solar system equipment and showing all necessary instructions for the control and maintenance of these equipment. Operation and Maintenance manuals shall be supplied written in English and Arabic languages. All parts and equipment listings shall be in English.			
14	Training: Training shall be provided for 2 trainees who will run and maintain and troubleshoot minor problems of the system. The training should be carried out from one trainer that is experienced and certified by the production factory or his authorized representative. The training will last for at least 2 (two) days, the place of training will be on the site and on Owner permisses	Lump sum		
15	Maintenance: maintain the system for two years from the date of handing over to the end users.	Lump sum		
16	Spare parts: list of recommended spare parts for maintaining the system for 5 years.	Lump sum		
17	miscellaneous	Lump sum		
	Collection			
	Page Nº		Amount (USD)	
	Site 1			
	Site 2			
	Site 3			
	Site 4			
	Site 5			
	Site 6			

	Summary	Total Carried to General		

Name of Bidder: _____

Authorised signature: _____

Name of authorised signatory: _____

Functional Title: _____

FORM G: Form of Bid Security

**Bid Security must be issued using the official letterhead of the Issuing Bank.
Except for indicated fields, no changes may be made on this template.**

To: UNDP
[Insert contact information as provided in Data Sheet]

WHEREAS _____ (hereinafter called "the Bidder") has submitted a Bid to GoE dated _____ to execute goods and/or services (hereinafter called "the Bid"):

AND WHEREAS it has been stipulated by you that the Bidder shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security if the Bidder:

- a) Fails to sign the Contract after GoE has awarded it;
- b) Withdraws its Bid after the date of the opening of the Bids;
- c) Fails to comply with GoE's variation of requirement, as per ITB instructions; or
- d) Fails to furnish Performance Security, insurances, or other documents that GoE may require as a condition to rendering the contract effective.

AND WHEREAS we have agreed to give the Bidder such Bank Guarantee:

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Bidder, up to a total of *[amount of guarantee] [in words and numbers]*, such sum being payable in the types and proportions of currencies in which the Price Bid is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of *[amount of guarantee as aforesaid]* without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

This guarantee shall be valid up to 30 days after the final date of validity of bids.

SIGNATURE AND SEAL OF THE GUARANTOR BANK

Signature: _____

Name: _____

Title: _____

Date: _____

Name of Bank _____

Address _____

[Stamp with official stamp of the Bank]

[insert: address and email address]