مناقصة عمومية ٢٤٠٤٥ لتركيب، تشغيل وصيانة نظام طاقة شمسية ومكملات Installation, Operations and maintenance of Solar Power System and accessories.	
مُلخّص عن التلزيم	
إسم الجهة الشارية	هيئة اوجيرو.
عنوان الجهة الشارية	مركز اوجيرو الرئيسي في بئر حسن– مقابل المدينة الرياضية.
رقم وتاريخ التسجيل	٢٤٠٤٥
عنوان الصفقة	تركيب، تشغيل وصيانة نظام طاقة شمسية ومكملات Installation, Operations and maintenance of Solar Power System and accessories..
موضوع الصفقة	تخضع هذه المناقصة لأحكام وشروط قانون الشراء العام، ودفتر الشروط الخاصة العائد لهذه المناقصة. إن الغاية منها تركيب، تشغيل وصيانة نظام طاقة شمسية ومكملات Installation, Operations and maintenance of Solar Power System and accessories ووفقاً للشروط المرفقة بدفتر الشروط الخاص والتي تعتبر جزءاً لا يتجزأ منه.
طريقة التلزيم	مناقصة عمومية على اساس تقديم اسعار لكل مجموعة.
نوع التلزيم	تركيب، تشغيل وصيانة.
مدة صلاحية العرض	لا تقل عن /٣٠/ يوم من التاريخ النهائي لتقديم العروض.
ضمان العرض	يُحدد ضمان العرض بقيمة /١٠،٠٠٠/$ (فقط عشرة آلاف دولار اميركي لا غير).
مدة صلاحية ضمان العرض	تُحدد مدة صلاحية ضمان العرض بإضافة /٢٨/ يوم على مدة صلاحية العرض.
ضمان حسن التنفيذ	١٠% من قيمة العقد.
الإرساء	السعر الأدنى الإجمالي لكل مجموعة.
مكان استلام دفتر الشروط	مركز اوجيرو الرئيسي في بئر حسن– مقابل المدينة الرياضية، الطابق الأول–قطاع المناقصات والعقود– الغرفة ١١٨.
مكان تقديم العروض	مركز اوجيرو الرئيسي في بئر حسن – مقابل المدينة الرياضية، أمانة سر الهيئة في الطابق الثاني – الغرفة رقم ٢١٩.
مكان تقييم العروض	مركز اوجيرو الرئيسي في بئر حسن– مقابل المدينة الرياضية، الطابق الأول– الغرفة ١١٨
مدة التنفيذ	عشرة أشهر لأعمال التركيب وأربع سنوات لأعمال الصيانة والدعم والتشغيل.
عملة العقد	الدولار الاميركي.
دفع قيمة العقد	تدفع مستحقات الملتزم، بعملة الدولار الاميركي او ما يعادلها بالليرة اللبنانية وفقاً للقيمة الفعلية للحصول على العملة الاجنبية عند الدفع.

أوجيرو
من عنّا

دفتر الشروط الخاصة

مناقصة عمومية رقم ٢٤٠٤٥

تركيب، تشغيل وصيانة نظام طاقة شمسية ومكملات

Installation, Operations and maintenance of Solar

Power System and accessories

لزوم المراكز الهاتفية

٢٣ آب

أوجيرو، بئر حسن • ص.ب. ١١-١٢٢٦ • لبنان ١١٠٧٢٠٧٠ • ت. ٠٠٠ ٨٤٠٠ ٩٦١ ١+ • ف. ٨٢٣ ٨٢٦ ١ ٩٦١+
www.ogero.gov.lb • TVA. 601-122958

المادة ١: النصوص القانونية التي ترعى المناقصة العمومية

بالإضافة الى الشروط المنصوص عنها في المواد أدناه، تطبق على الفريقين النصوص الواردة في قانون الشراء العام رقم ٢٤٤ تاريخ ٢٠٢١/٧/٢٩، لذلك يقتضي على العارض الاطلاع عليه والتقيد به على المنصّة الالكترونية المركزية لدى هيئة الشراء العام www.ppa.gov.lb وعلى صفحة هيئة أوجيرو www.ogero.gov.lb.

في حال تعارض مواد دفتر الشروط هذا مع شروط قانون الشراء العام، يتم تطبيق أحكام قانون الشراء العام.

المادة ٢: غاية التلزيم

إن الغاية من هذا الشراء هو القيام بالتالي:

تركيب، تشغيل وصيانة نظام طاقة شمسية ومكملات Installation, Operations and maintenance of Solar Power System and accessories وفقاً للشروط والمواصفات الفنية المرفقة بهذا الدفتر.

ان المواد العائدة لنظام الطاقة الشمسية سيتم توريدها من قبل هيئة اوجيرو وفقاً للكميات الواردة في جداول الكميات والاسعار المرفقة بهذا الدفتر.

على العارض تقديم عرض أسعار واحد لكل مجموعة لتركيب وتشغيل وصيانة النظام وفقاً لجداول الكميات والاسعار المرفقة.

ان مدة التركيب هي عشرة اشهر ، تليها اربع سنوات، بعد الاستلام المؤقت، لاعمال تشغيل ودعم وصيانة النظام، وتشمل سنتا الضمان وسنتا تشغيل ودعم وصيانته النظام.

ويكون تنفيذ اعمال الدعم والصيانة والتشغيل على عاتق الملتزم، سواء كانت الاعطال ناتجة عن اعطال في التجهيزات (على ان تقدم هيئة اوجيرو التجهيزات) خلال التشغيل او عن اضرار من طرف ثالث او سرقة.

تتألف هذه المناقصة من اربع مجموعات.

يجري التلزيم بطريقة المناقصة العمومية وذلك على أساس تقديم أسعار بواسطة الظرف المختوم، ويسند التلزيم مؤقتًا الى العارض المقبول شكلاً من الناحية الإدارية والفنية والذي قدم السعر الأدنى لكل مجموعة.

المادة ٣: مهلة التنفيذ

ان فترة الالتزام هي:

- للتركيب عشرة اشهر كحد اقصى تبدأ اعتباراً من تاريخ نفاذ العقد، واصدار امر مباشرة عمل. تليها سنتا ضمان متضمنة اعمال الصيانة والدعم والتشغيل.
- للتشغيل والدعم والصيانة سنتان اعتباراً من انتهاء فترة الضمان.

المادة ٤: المحاسبة والدفع

يتم تسديد مستحقات الملتزم، بعملة الدولار الاميركي او ما يعادله بالليرة اللبنانية وفقاً للقيمة الفعلية للحصول على العملة الاجنبية عند الدفع، على النحو التالي:

لأعمال التركيب:

-٩٠% من قيمة اعمال التركيب بناءً على محضر الاستلام المؤقت الخاص بها الصادر عن اللجنة المشكّلة لهذه الغاية لكل جزء.

-١٠% المتبقية من قيمة اعمال التركيب بناءً على محضر الاستلام النهائي الخاص بها الصادر عن اللجنة المشكّلة لهذه الغاية لكل جزء.

لأعمال التشغيل والدعم والصيانة:

-شهرياً ٩٠% من قيمة اعمال التشغيل والصيانة بناءً على محضر الاستلام المؤقت الصادر عن اللجنة المشكّلة لهذه الغاية.

-١٠% المتبقية من قيمة اعمال التشغيل والصيانة بناءً على محضر الاستلام النهائي الصادر عن اللجنة المشكّلة لهذه الغاية.

المادة ٥: الإستلام

يجري الاستلام على مرحلتين مؤقّتاً ونهائياً، ويمكن أن يجري مرة واحدة أو على مراحل تتناول كلّ مرحلة منها جزءاً من التلزيم.

تَستَلِم الاعمال لجنة الاستلام المحددة لهذه الغاية، وتُقدِّم تقريرها خلال مدة زمنية أقصاها ثلاثين يوماً تَبدأ من تاريخ تقديم طلب الاستلام من قِبَل الملتزم.

في حال تَطلَّبَت طبيعة المشروع وحجمه مدة تتجاوز الثلاثين يوماً، على اللجنة تبرير أسباب ذلك خطّياً ووضع اقتراحاتها بهذا الشأن خلال مهلة الثلاثين يوماً، على ألاّ تتجاوز المهلة في جميع الأحوال الستين يوماً تَبدأ من تاريخ تقديم طلب الاستلام من قِبَل الملتزم.

يتوجب على الملتزم تقديم طلب خطي قبل موعد التسليم يُحَدد فيه مختلف البنود المطلوب استلامها:

- مرفقاً بكشف مصدق من المديرية المعنية اذا كانت عملية الشراء تتعلق بتنفيذ اعمال او اشغال.
- بموجب كشف مصدق من مستودعات اوجيرو عند وجوب تسليم مواد، على ان يتم توريدها الى مستودعات هيئة اوجيرو في بئر حسن او الدكوانة.

الاستلام المؤقت:

لأعمال التركيب: تقوم لجنة الاستلام بعد التأكد من مطابقة الاعمال للمواصفات الفنية المطلوبة، وذلك بعد أن يقوم الملتزم بتركيب وتشغيل التجهيزات والبطاريات المطلوبة في مواقع العمل، ويتم بعد ذلك إصدار محضر استلام مؤقت خاص بها مرفقاً بكشف مصدق من مديرية التخطيط الاستراتيجي وادارة المشاريع.

لأعمال التشغيل والصيانة: تقوم لجنة الاستلام بعد التأكد من مطابقة الاعمال للمواصفات الفنية المطلوبة، شهرياً بعد أن يقوم الملتزم بتشغيل وصيانة نظام الطاقة الشمسية، بإصدار محضر استلام مؤقت خاص بها مرفقاً بكشف مصدق من المديرية المعنية.

الاستلام النهائي:

لاعمال التركيب: بعد انتهاء فترة الضمان، والتأكد من حسن عمل الاجهزة المركّبة، تقوم لجنة الاستلام بإصدار محضر استلام نهائي مرفقاً بكشف مصدق من المديرية التخطيط الاستراتيجي وادارة المشاريع، وذلك كل شهرين من تاريخ نفاذ العقد واصدار امر المباشرة.

لاعمال التشغيل والصيانة: بعد انتهاء فترة الضمان، والتأكد من حسن عمل الاجهزة المركّبة، تقوم لجنة الاستلام بإصدار محضر استلام نهائي مرفقاً بإفادة من المديرية المعنية.

المادة ٦: معايير شروط العارضين

إضافة إلى ما نصت عليه المادتين ٧ و٥٢ من قانون الشراء العام على العارض تقديم ما يلي:

- **ضمن المغلف رقم ١ (المستندات الادارية والفنية):**

يوقّع على العرض الشخص الذي لديه الصفة القانونية للتوقيع، على أن يكون مخوّلاً بذلك وفقاً للإذاعة التجارية أو توكيل رسمي مصدّق من كاتب عدل.

يتوجب على العارض الذي يرغب بالإشتراك في هذا التلزيم أن يقدم المستندات (**أصلية أو صورة طبق الأصل عنها**)، لا يعود تاريخها لأكثر من ستة أشهر من تاريخ جلسة فض العروض. وهذه المستندات هي التالية:

١. عنوان العارض بحسب الملحق رقم (١).
٢. كتاب التعهد (التصريح) بحسب الملحق رقم (٢) موقّعًا وممهورًا من العارض مع طوابع مالية بقيمة/١،٠٠٠،٠٠٠/ل.ل. (فقط مليون ليرة لبنانية لا غير).
٣. إذاعة تجارية يُبيَّن فيها صاحب الحق المفّوض بالتوقيع عن العارض ونموذج توقيعه.
٤. التفويض القانوني إذا وقع العرض شخص غير الشخص الذي يملك حق التوقيع عن العارض بحسب الإذاعة التجارية، مصدّق لدى الكاتب العدل.
٥. سجل عدلي للمفوض بالتوقيع أو "من يمثله قانوناً" لا يتعدى تاريخه الثلاثة أشهر من تاريخ جلسة فض العروض.
٦. عقد الشراكة مصدق لدى الكاتب العدل في حال توجبه.

٧. شهادة تسجيل العارض لدى مديرية الضريبة على القيمة المضافة إذا كان خاضعاً لها، أو شهادة عدم التسجيل اذا لم يكن خاضعًا، وفي هذه الحالة يلتزم العارض بسعره وان أصبح مسجلاً في الضريبة على القيمة المضافة خلال فترة التنفيذ.

٨. شهادة تسجيل العارض لدى وزارة المالية – مديرية الواردات.

٩. إفادة صادرة عن وزارة المالية تثبت إيفاء العارض بالإلتزامات الضريبية المتوجبة عليه.

١٠. براءة ذمة من الصندوق الوطني للضمان الإجتماعي "شاملة أو صالحة لإشتراك في الصفقات العمومية" صالحة بتاريخ جلسة فض العروض، تفيد بأن العارض سدد جميع اشتراكاته) يجب أن يكون العارض مسجلاً في الصندوق الوطني للضمان الإجتماعي وترفض كل إفادة يُذكر عليها عبارة "مؤسسة غير مسجلة.

١١. إفادة صادرة عن البلدية التي يقع المركز الرئيسي للعارض ضمن نطاقها بحسب شهادة التسجيل في السجل التجاري، تفيد أنه سدد كامل الرسوم البلدية المتوجبة عليه.

١٢. إفادة شاملة صادرة عن السجل التجاري تبيّن المؤسسين والأعضاء والمساهمين أو الشركاء، المفوضين بالتوقيع، المدير، رأس المال، نشاط العارض والوقوعات الجارية.

١٣. افادة صادرة عن المرجع المختص تُثبت ان العارض ليس في حالة إفلاس.

١٤. افادة صادرة عن المرجع المختص تُثبت ان العارض ليس في حالة تصفية قضائية.

١٥. إفادة من غرفة التجارة والصناعة والزراعة تُثبت أن العارض يتعاطى تجارة أو صناعة المواد موضوع الصفقة، صالحة بتاريخ جلسة التلزيم وصالحة لتقديمها في المناقصات الرسمية.

١٦. ضمان العرض المطلوب وفقاً لأحكام المادة السابعة أدناه.

١٧. تصريح من العارض يبيّن فيه صاحب الحق الاقتصادي حتى آخر درجة ملكية بحسب النموذج م١٨ الصادر عن وزارة المالية. (كل شخص طبيعي يملك او يسيطر فعليا في المحصلة النهائية على النشاط الذي يمارسه العارض، بصورة مباشرة او غير مباشرة، سواء كان هذا العارض شخص طبيعي او معنوي).

١٨. نسخ عن بطاقات التعريف (هوية / جواز سفر) لصاحب (أصحاب) الحق الاقتصادي.

١٩. نسخ عن بطاقات التعريف (هوية / جواز سفر) لكل شخص يمثل العارض (من ينوب عن العارض في علاقته مع سلطة التعاقد: وكيل قانوني، ممثل الشخص المعنوي أو المفوّض بالتوقيع عنه).

٢٠. مستند تصريح النزاهة موقع من العارض وفقًا للأصول بحسب النموذج المرفق.

٢١. إيصال صادر عن هيئة أوجيرو بإسم العارض ومُعنون بإسم الصفقة، يُثبت أن العارض دفع بدل دفتر الشروط الخاصة.

٢٢. **وثائق (عقود او افادات مرفقة بفواتير) تثبت ان العارض نفذ مشاريع تركيب طاقة شمسية او طاقة بديلة او احتياطية (نظام الواح و/او بطاريات ومقومات/شواحن) لمؤسسات صناعية او زراعية او مؤسسات تجارية (لا يقل عن KW٢٠ لكل مشروع) او مؤسسات حكومية، وبحجم اجمالي لا يقل عن KW٢٠٠٠ لكل مجموعة معتمداً على سعة الألواح، و٥٠٠٠KWh لكل مجموعة معتمداً على سعة البطاريات، بالاضافة الى التزامه اعمال صيانة وتشغيل لأنظمة طاقة شمسية او طاقة بديلة او احتياطية (نظام الواح و/او بطاريات ومقومات/شواحن) بحجم لا يقل عن KW١٠٠٠ لكل مجموعة معتمداً على سعة الألواح.**

٢٣. **لائحة المشاريع والزبائن (على أن لا تقل عن خمس مشاريع وخمس زبائن) الذين تمّ معهم صفقات مشابهة لتوريد و/او تركيب مشاريع طاقة بديلة (نظام الواح و/او بطاريات) لا تقل عن KW٢٠ لكل مشروع خلال الأعوام العشرة الأخيرة مع وضع التاريخ وكمية الإلتزام والعنوان الكامل والأرقام الهاتفية والبريد الإلكتروني لهؤلاء الزبائن.**

٢٤. **لائحة بالعاملين لدى العارض واللذين سيعملون لتنفيذ المشروع على ان تتضمن على الاقل:**

- **مهندس كهرباء (خبرة لا تقل عن خمس سنوات)**
- **فنيين من حملة الشهادات الفنية (BT و/او TS) عدد ١٠ كهرباء، وعدد ٢ تبريد لكل مجموعة، على ان يكون نصفهم على الاقل مسجلين في الضمان الاجتماعي على اسم الشركة.**
- **على الملتزم التعهد بوجود مهندس مدني (خبرة لا تقل عن خمس سنوات) ومهندس تدفئة وتبريد (خبرة لا تقل عن ثلاث سنوات) ضمن فريق العمل.**

٢٥. يعتبر العارض فور تقديمه العرض ملتزماً بمطابقة كافة الشروط والمواصفات الفنية المطلوبة في الملحق رقم ٤.

٢٦. كافة المستندات والكاتالوجات الفنية ولوائح مطابقة المواصفات.

٢٧. لائحة تفصيلية للأعمال المطلوبة "لائحة الكميات والاسعار" مع الكميات، دون وضع الاسعار.

٢٨. الالتزام بالحفاظ على سرية المعلومات التي يحصل عليها العارض والملتزم من خلال تلك الواردة في دفتر الشروط الخاصة وملحقه (RFP) وتوقيع NDA، بما لا يتعارض مع أحكام قانون الشراء العام.

٢٩. يُعتبر العارض فور تقديمه العرض مُلتزمًا برفع السرية المصرفية عن الحساب المصرفي الذي يودع فيه أو ينتقل إليه أي مبلغ من المال العام المتعلق بهذا التلزيم، سندًا للقرار رقم ١٧ تاريخ ٢٠٢٠/٥/١٢ الصادر عن مجلس الوزراء.

٣٠. **في حال إشتراك عارض أجنبي يتوجب على هذا العارض أن يُراعي احد الشروط التالية:**

أ- أن يكون من ضمن إئتلاف يضم شركة لبنانية على الأقل تتوفر فيها الشروط المطلوبة بموجب دفتر الشروط الخاص بالصفقة.

ب- الحضور الشخصي للممثل القانوني عن الشركة للمشاركة في إجراءات الشراء.

ت- أن يكون لها وكيل أو ممثل في لبنان مكلف توقيع العقد عنها.

إضافة إلى الشروط أعلاه، يتوجب على العارض الأجنبي تقديم ما يلي:

أ- شهادة تسجيل الشركة أو المؤسسة لدى المراجع المختصة في بلده.

ب- إفادة من وزارة الاقتصاد والتجارة اللبنانية تُثبت انطباق أحكام قانون مقاطعة العدو الاسرائيلي على العارض.

ت- الإفادات المطلوبة أعلاه بحسب قوانين البلد الذي يوجد فيه العارض، على أن تكون هذه الإفادات مصدقة وفقاً للأصول من المراجع المختصة.

ضمن المغلف رقم ٢ (الاسعار):

يقدّم العارض بياناً بالأسعار لكل صنف/بند على حدة بحسب لائحة الكميات المطلوبة، ضمن ظرف مقفل وموقّع من قبل العارض، ويتضمن السعر الافرادي والاجمالي (بالدولار الاميركي) مدوناً بالأرقام والأحرف دون حك أو شطب أو تطريس أو زيادة كلمات غير موقّع تجاهها.

في حال الإختلاف بين الأرقام والأحرف يؤخذ بالسعر الإفرادي المدون بالأحرف، ويرفض السعر غير المدون بالأحرف الكاملة والأرقام معاً.

يشمل السعر كافة الضرائب والرسوم والمصاريف مهما كان نوعها بما في ذلك أجرة اليد العاملة، وكلفة فك ونقل الاجهزة القديمة الى مراكز اخرى او مستودعات هيئة اوجيرو.

إذا تساوت الأسعار بين العارضين بعد إعطاء السلع اللبنانية أفضلية ١٠% المذكورة في المادة ٢٠ أدناه أعيدت الصفقة بطريقة الظرف المختوم بين أصحابها دون سواهم في الجلسة نفسها، فإذا رفضوا تقديم عروض أسعار جديدة أو إذا ظلت أسعارهم متساوية عين الملتزم المؤقت بطريقة القرعة بين أصحاب العروض المتساوية.

على العارض التقدّم بعرض أسعار بحسب جداول الكميات والاسعار ونماذج التسعير (Commercial Template) للمجموعات الأربعة الواردة في الملحق رقم ٧. على العارض تضمين العرض كلفة تدريب ٨ فنيين في كل مجموعة وفقاً لما هو مطلوب في الشروط الفنية.

ان الكميات الواردة في جداول الكميات في الملحق رقم ٧ مبنية على حجم تقديري للاستهلاك في كل مركز. يتم تسديد مستحقات الملتزم وفقاً للكميات الفعلية المنفذة بناءً للدراسات الموافق عليها من قبل هيئة اوجيرو. كما يتم احتساب كلفة اعمال الدعم والصيانة والتشغيل كنسبة مئوية من السعر المقدم من قبل العارض الرابح لأعمال الدعم والصيانة والتشغيل، وذلك بمقارنة السعة المقدرة في الجداول مع السعة الفعلية التي يتم تقديم الدراسة والتنفيذ على اساسها.

تأكيدات حول العرض

- يُستلم من قطاع المناقصات والعقود في هيئة اوجيرو مغلّف واحد معدّ لهذه الغاية، والذي يحمل موضوع التلزيم فقط دون ذكر أي شيء آخر مميز لهوية صاحب العرض وذلك تحت طائلة رفض العرض.

- وضع المغلّف الإداري/الفني ومغلّف الأسعار ضمن الغلاف الموحد، ويدون على ظاهر كل غلاف اسم العارض وختمه، موضوع محتوياته، وموضوع التلزيم وتاريخ جلسة التلزيم.
- تقدّم العروض إلى أمانة السر في مركز هيئة اوجيرو الرئيسي الكائن في بئر حسن في الطابق الثاني- الغرفة رقم ٢١٩، على أن تصل قبل الوقت النهائي لتقديم العروض والمحدد في الاعلان عن عملية الشراء. وكل عرض لا يقدم ضمن الغلاف الموحد، وفقاً لما هو مذكور أعلاه، أو يصل بعد التاريخ والوقت المحددين تعتبره اللجنة مرفوضاً ولا تقوم بفتحه بل يعاد مختوماً الى العارض الذي قدمه.
- يجب أن تكون كافة المستندات المقدّمة صالحة بتاريخ جلسة فضّ العروض.
- تحديد مدة صلاحية العرض بإضافة ٣٠ يوماً كحد أدنى من التاريخ النهائي لتقديم العروض.
- لا يحقّ للعارض أن يقدّم أكثر من عرض او خيار واحد تحت طائلة رفض كل عروضه.

العروض المشتركة

- يجوز أن يشترك في تنفيذ المشروع هذا عدة شركات ممن تتوفّر فيهم الشروط الفنيّة والقانونية شرط أن يعيّنوا، بموجب عقد شراكة أو اتفاقية مشتركة (joint venture) ، مصدق لدى الكاتب بالعدل شريكاً رئيسياً مفوضًا يمثّلهم مجتمعين بالتكافل والتضامن ويوقّع باسمهم وتنصرف أعمالُه إليهم، على أن يكون جميع الشركاء مسؤولين دون استثناء تجاه هيئة أوجيرو بالتكافل والتضامن في موضوع تنفيذ دفتر الشروط هذا.
- ينطبق على الشركاء في التحالف نفس الشروط المطلوبة للعارض الوحيد وفقاً لما ورد في المادة السادسة من دفتر الشروط هذا، بحيث يقدّم جميع الشركاء جميع المستندات الادارية المطلوبة في المادة السادسة من هذا الدفتر.

المادة ٧: الضمانات

تكون الضمانات بحسب المواد ٣٤-٣٥-٣٦ وتراعى أحكام المادة ٣٩ (الإقتطاع من الضمان) من قانون الشراء العام، ولا يقبل الإستعاضة عن الضمانات بشيك مصرفي أو بإيصال عائد لضمان صفقة سابقة حتى لو كان قد تقرر رد قيمته.

يكون ضمان العرض كما ضمان حسن التنفيذ إما نقدياً يُدفع الى الصندوق المركزي لهيئة اوجيرو لقاء إيصال يضم الى مستندات العرض، وإما بموجب كتاب ضمان مصرفي غير قابل للرجوع عنه، صادر عن مصرف مقبول من مصرف لبنان يبين انه قابل للدفع غب الطلب.

أ- **ضمان العرض:**

حددت قيمة ضمان العرض بمبلغ وقدره: /١٠،٠٠٠/$ (فقط عشرة الاف دولار اميركي لا غير)، تحدد مدة صلاحية ضمان العرض بإضافة /٢٨/ يوماً على مدة صلاحية العرض.

يقدّم ضمان العرض بإسم هذا التلزيم ولصالح هيئة أوجيرو.

يجدد مفعول ضمان العرض تلقائيًا إلى أن يقرر إعادته إلى العارض.

يعاد ضمان العرض إلى الملتزم عند تقديمه ضمان حسن التنفيذ بعد إبلاغه تصديق الالتزام، وإلى العارضين الذين لم يرسُ عليهم التلزيم في مهلة أقصاها بدء نفاذ العقد.

ب- ضمان حسن التنفيذ:

- يتقدّم العارض الرابح عند نفاذ العقد بكفالة مصرفية لضمان حسن التنفيذ بنسبة (١٠%) عشرة بالمائة من قيمة الالتزام الإجمالية، وعلى الملتزم أن يقدمها خلال مهلة أقصاها /١٥/ خمسة عشر يوماً من تاريخ نفاذ العقد. وفي حال التخلف عن تقديم ضمان حسن التنفيذ، يصادر ضمان العرض وتُطبق بحق الملتزم أحكام النكول المنصوص عليها في المادة ٣٣ من قانون الشراء العام .
- يبقى ضمان حسن التنفيذ مجمدًا طوال مدة التلزيم، ويُحسم منه مباشرةً وبدون سابق إنذار ما قد يترتب من غرامات أو مخالفات أو عطل أو ضرر يحدثه الملتزم إلى حين إيفائه بكامل الموجبات.
- يعاد ضمان حسن التنفيذ إلى الملتزم بعد انتهاء فترة الضمان وبناءً على إفادة حسن اداء صادرة عن المديرية المعنية (طالبة العمل او المواد).

المادة ٨: فترة الضمان

حدّدت مدة الضمان:

- **للتركيب: سنة واحدة تبدأ اعتباراً من تاريخ صدور محضر الاستلام المؤقت لكل جزء.**
- **لاعمال الصيانة والتشغيل: شهراً واحداً تبدأ من تاريخ صدور محضر الاستلام المؤقت الأخير لكل سنة على حدة لكل جزء.**

وتشمل الأعطال الناتجة عن سوء في التنفيذ او التشغيل. وعلى الملتزم تصحيح كافة الشوائب واستبدال جميع التجهيزات والبطاريات والمواد التي قد تعطلت **بسبب اخطاء في التنفيذ والتركيب** وذلك خلال مدة ثلاثة أيام، أو تقديم بدائل مؤقتة بانتظار تأمين تصحيح الشوائب او استبدال المواد التي تعطلت بسبب ذلك، تحت طائلة تطبيق أحكام المادة ٩.

المادة ٩: الغرامات (المادة ٣٨ من قانون الشراء العام)

يتوجب على الملتزم التقيد بالمهل المحددة في العقد تحت طائلة دفع الغرامات المحددة فيه.

تفرض الغرامات بشكل حكمي على الملتزم بمجرد مخالفته أحكام العقد دون حاجة لاثبات الضرر.

إذا عجز الملتزم عن إنجاز او تنفيذ أي من الأعمال المطلوبة ضمن الوقت المحدد، ولأسباب غير ناتجة عن هيئة أوجيرو، يتم احتساب غرامة قدرها ٥‰ (خمسة بالألف) من قيمة الاعمال غير المنفذة والمسلمة عن كل يوم تأخير عن المدة المحددة في المادة الثالثة أعلاه، ويعتبر كسر النهار نهاراً كاملاً، وهذه الغرامة غير قابلة للتعديل ولا رجوع عنها وتطبق دون الحاجة إلى توجيه كتاب أو إنذار على أن لا تتعدى هذه الغرامة نسبة ١٠% من الالتزام.

إذا ترتّب على الملتزم في سياق التنفيذ مبلغ ما، تطبيقاً لأحكام وشروط العقد، حقّ لسلطة التعاقد اقتطاع هذا المبلغ من ضمان حسن التنفيذ ودعوة الملتزم إلى إكمال المبلغ ضمن مدّة معيَّنة، فإذا لم يفعل اعتُبِر ناكلاً وفقاً لأحكام الفقرة (أولا) من المادة ٣٣ من قانون الشراء العام.

المادة ١٠: طلبات الاستيضاح – (المادة ٢١ من قانون الشراء العام)

يحق للعارض تقديم طلب استيضاح خطي حول ملفات التلزيم خلال مهلة تنتهي قبل عشرة أيام من تاريخ تقديم العروض؛ على هيئة أوجيرو الإجابة خلال مهلة تنتهي قبل ستة أيام من الموعد النهائي لتقديم العروض.

المادة ١١: فتح العروض

تُفتَح العروض بحسب الآلية التالية:

- يتم فض الغلاف الخارجي الموحّد لكل عارض على حدة واعلان اسمه ضمن المشاركين في الصفقة، وذلك وفق ترتيب الأرقام التسلسلية المُسجلة على الغلافات الخارجية والمسلّمة للعارضين.
- يتم فض الغلاف رقم (١) (الوثائق والمستندات الإدارية والفنية المنصوص عنها في المادة السادسة اعلاه) وفرز المستندات المطلوبة والتدقيق فيها تمهيداً لتحديد وإعلان أسماء العارضين المقبولين شكلاً والمؤهلين للاشتراك في بيان مقارنة الأسعار.
- يجري فض الغلاف رقم (٢) (بيان الأسعار) للعارضين المقبولين شكلاً كلّ على حدة واجراء العمليات الحسابية اللازمة، وتدوين السعر الإجمالي لكل عارض بما فيه الضريبة على القيمة المضافة، تمهيدًا لإجراء مقارنة واعلان اسم الملتزم المؤقت.
- تُصحّح لجنة التلزيم أيّ أخطاء حسابية محضة تكتشفها أثناء فحصها العروض المقدَّمة وفقاً لأحكام دفتر الشروط، وتبلّغ التصحيحات إلى العارض المعني بشكل فوري.
- يمكن للجنة التلزيم، في أيّ مرحلة من مراحل إجراءات التلزيم، أن تطلب **خطياً** من العارض إيضاحات بشأن المعلومات المتعلّقة بمؤهلاته أو بشأن عروضه، لمساعدتها في التأكُّد من المؤهّلات أو فحص العروض المقدَّمة وتقييمها.

- تُسجَّل وقائع فتح العروض خطياً في محضر يوقّع عليه رئيس وأعضاء لجنة التلزيم، كما توضع لائحة بالحضور يوقّع عليها المشاركون من ممثّلي هيئة أوجيرو وهيئة الشراء العام، والعارضين وممثليهم على أن يشكّل ذلك إثباتاً على حضورهم. تُدرَج كل المعلومات والوثائق المتعلّقة بوقائع الجلسة في سجلّ إجراءات الشراء.
- لا يمكن طلب إجراء أو السماح بإجراء أيّ تغيير جوهري في المعلومات المتعلّقة بالمؤهلات أو بالعرض المقدَّم، بما في ذلك التغييرات الرامية إلى جعل مَن ليس مؤهَّلاً من العارضين مؤهَّلاً أو جعل عرض غير مستوفٍ للمتطلبات مستوفياً لها.
- لا يمكن إجراءُ أيّ مفاوضات بين هيئة أوجيرو أو لجنة التلزيم والعارِض بخصوص المعلومات المتعلّقة بالمؤهلات أو بخصوص العروض المقدَّمة، ولا يجوز إجراء أيّ تغيير في السعر إثر طلب استيضاح من أي عارض.
- تُدرَج جميع المراسلات التي تجري بموجب هذه المادة في سجل إجراءات الشراء بحسب المادة ٩ من قانون الشراء العام.
- في حال كانت المعلومات أو المستندات المقدَّمة في العرض ناقصة أو خاطئة أو في حال غياب وثيقة معيَّنة، يَجوز للجنة التلزيم الطلب خطّياً من العارض المعني توضيحات حول عرضه، أو طلب تقديم أو استكمال المعلومات أو الوثائق ذات الصلة خلال فترة زمنية محدَّدة، شرط أن تكون كافة المراسلات خطية واحترام مبادىء الشفافية والمساواة في المعاملة بين العارضين في طلبات التوضيح أو الاستكمال الخطية، ومع مراعاة أحكام الفقرة ٣ من البند الثاني من المادة ٢١ من قانون الشراء العام.
- تُحظَّر المفاوضات بين هيئة أوجيرو أو لجنة التلزيم وأيّ من العارضين بشأن العرض الذي قدَّمه ذلك العارض.

المادة ١٢: قواعد قبول العرض الفائز (او التلزيم المؤقت) وبدء تنفيذ العقد

بعد التأكد من العرض الفائز تبلغ هيئة أوجيرو العارض الذي قدّم ذلك العرض، كما تنشر بالتزامن قرارها بشأن قبول العرض الفائز (التلزيم المؤقت) والذي يدخل حيز التنفيذ عند انتهاء فترة التجميد البالغة عشرة أيام عمل تبدأ من تاريخ النشر، تقوم بعدها هيئة أوجيرو بإبلاغ الملتزم المؤقت بوجوب توقيع العقد خلال مهلة لا تتعدى /١٥/ يوما على ان يوقع المرجع الصالح لدى هيئة أوجيرو العقد خلال /٣٠/ يوما.

يبدأ نفاذ العقد عندما يوقع الملتزم المؤقت والمرجع الصالح لدى هيئة أوجيرو عليه.

لا يعتبر التلزيم مكتسباً الصفة القانونية النهائية ولا يعمل به إلا بعد اقترانه بتصديق المراجع المختصة عليه وإبلاغه خطياً إلى الملتزم ، ولا يحق للملتزم أن يطالب بأي تعويض في حال عدم إبلاغه تصديق الالتزام أو عدم السير الجزئي أو الكامل بهذا الالتزام.

المادة ١٣: اجراءات الاعتراض (الفصل السابع من قانون الشراء):

يحق لكل ذي صفة ومصلحة ، بما في ذلك هيئة الشراء العام، الاعتراض على اي اجراء أو قرار صريح أو ضمني تتخذه أو تعتمده أو تطبقه أي من الجهات المعنية بالشراء في المرحلة السابقة لنفاذ العقد، وذلك خلال فترة التجميد البالغة عشرة أيام عمل، والتي تبدأ من تاريخ تبليغ العارض الفائز، وفي الفترة التي تسبق نفاذ العقد.

على أن تتبع اجراءات الاعتراض المعمول بها لدى مجلس شورى الدولة لحين تشكيل هيئة الاعتراضات المنصوص عنها في قانون الشراء العام.

تعتبر المحاكم اللبنانية المرجع القضائي الوحيد للبت في كل خلاف يمكن ان يحصل من جراء تنفيذ هذا الالتزام.

المادة ١٤: دفع الطوابع والرسوم

إن كافة الطوابع والرسوم التي تتوجّب وفقاً للأنظمة والقوانين المرعية الاجراء الناتجة عن هذا الالتزام هي على عاتق الملتزم، بما فيها قيمة الضريبة على القيمة المضافة.

المادة ١٥: مسؤولية العارض عن عرضه

ان العارض مسؤول عن عرضه بكافة التفاصيل والمندرجات.

المادة ١٦: التعاقد الثانوي

١- يجب على الملتزِم الأساسي أن يتولّى بنفسه تنفيذ العقد ويبقى مسؤولاً تجاه سلطة التعاقد عن تنفيذ جميع بنوده وشروطه، ويُمنع عليه تلزيم كامل موجباته التعاقدية لغيره.

٢- يُمكن أن يَعهد الملتزم إلى مُتعاقد ثانوي تنفيذ جزءٍ من العقد على ألاّ يتخطّى ٥٠% من قيمة العقد. على الملتزم أَخذ الموافقة المُسبقة على التعاقد الثانوي التي يجب عليها اتّخاذ قرارها بالموافقة أو الرفض المعلَّل خلال مهلة لا تزيد عن شهر من تاريخ تقديم الطلب، ويُعَدّ عدم الافصاح بعد انقضاء هذه المهلة قراراً ضمنياً بالقبول.

تُطبَّق على المتعاقد الثانوي أحكام دفتر الشروط هذا.

المادة ١٧: الغاء الشراء

يحقّ لهيئة أوجيرو الغاء الشراء و/او أي من اجراءاته وفقاً للمادة ٢٥ من قانون الشراء العام.

المادة ١٨: انتهاء العقد ونتائجه

يحقّ لهيئة أوجيرو إنهاء العقد ونتائجه وفقا للمادة ٣٣ من قانون الشراء العام، وذلك في حالات النكول، الانهاء، الفسخ مع ما يترتب عن نتائج انتهاء العقد بحسب البند الرابع من المادة ٢٢ أدناه.

المادة ١٩: استبعاد العارض

تستبعد هيئة أوجيرو العارض من إجراءات التلزيم بسبب عرضه منافع أو من جرّاء ميزة تنافسية غير منصفة أو بسبب تضارب المصالح وذلك في احدى الحالتين المنصوص عنهما في المادة ٨ من قانون الشراء العام.

المادة ٢٠: الانظمة التفضيلية

خلافاً لأي نص آخر، يمكن إعطاء العروض المتضمنة سلعاً أو خدمات ذات منشأ وطني أفضلية بنسبة /١٠/ عشرة بالمئة عن العروض المقدّمة لسلع أو خدمات أجنبية. تُعطى الأفضلية لمكوّنات العرض ذات المنشأ الوطني.

المادة ٢١: قواعد بشأن العروض المنخفضة الأسعار انخفاضاً غير عادياً

يجوز لهيئة اوجيرو أن ترفض أيّ عرض إذا قرّرَت أنّ السعر، مُقترناً بسائر العناصر المكوّنة لذلك العرض المقدَّم، مُنخفض انخفاضاً غير عاديّ قياساً إلى موضوع الشراء وقيمته التقديرية وتُطبق أحكام المادة ٢٧ من قانون الشراء العام في هذا الشأن.

المادة ٢٢: قيمة العقد وشروط تعديلها

تكون البدلات المتّفق عليها في العقد ثابتة ولا تَقبل التعديل والمراجعة إلا عند إجازة ذلك أثناء تنفيذه ضمن ضوابط محدَّدة وفقاً لشروط التعديل والمراجعة في الحالات الاستثنائية التي نصّت عليها المادة ٢٩ من قانون الشراء العام.

تُراعى شروط الإعلان المنصوص عليها في المادة ٢٦ من قانون الشراء العام عند تعديل قيمة العقد.

المادة ٢٣: أسباب انتهاء العقد ونتائجه

أولاً: النكول

يُعتبر الملتزِم ناكلاً إذا خالَف شروط تنفيذ العقد أو أحكام دفتر الشروط هذا، وبعد إنذاره رسمياً بوجوب التقيُّد بكافّة موجباته من قبل سلطة التعاقد، وذلك ضمن مهلة تتراوح بين خمسة أيام كحدٍّ أدنى وخمسة عشر يوماً كحدٍّ أقصى، وانقضاء المهلة هذه دون أن يَقوم المُلتزم بما طُلب إليه. وإذا اعتُبر الملتزم ناكلاً، يُفسخ العقد حكماً دون الحاجة إلى أيّ إنذار وتطبق الإجراءات المنصوص عليها في البند (أولاً) من الفقرة الرابعة من المادة ٣٣ من قانون الشراء العام.

لا يجوز اعتبار الملتزم ناكلاً الا بموجب قرار معلّل يصدر عن سلطة التعاقد بناءً على موافقة هيئة الشراء العام.

ثانيًا: الإنهاء

١- ينتهي العقد حكماً دون الحاجة إلى أيّ إنذار في الحالتين التاليتين:

أ- عند وفاة الملتزم إذا كان شخصاً طبيعياً، إلاّ إذا وافقت سلطة التعاقد على طلب مواصلة التنفيذ من قبل الورثة.

ب- إذا أصبَح المُلتزم مُفلساً أو مُعسَراً أو حُلَّت الشركة، وتُطبَق عندئذ الإجراءات المنصوص عليها في الفقرة الثانية من البند الرابع من المادة ٣٣ من قانون الشراء العام.

٢- يَجوز لسلطة التعاقد إنهاء العقد إذا تعذّر على الملتزم القيام بأيّ من إلتزاماته التعاقدية بنتيجة القوة القاهرة.

ثالثاً: الفسخ

١. يُفسخ العقد حكماً دون الحاجة إلى أيّ إنذار في أيٍّ من الحالات التالية:

٢. إذا صدَرَ بحقّ المُلتزم حكمٌ نهائيّ بارتكاب أيّ جرم من جرائم الفساد أو التواطؤ أو الإحتيال أو الغش أو تبييض الأموال أو تمويل الإرهاب أو تضارب المصالح أو التزوير أو الإفلاس الإحتيالي، وفقاً للقوانين المرعية الاجراء؛

٣. إذا تحقَّقَت أيّ حالة من الحالات المذكورة في المادة ٨ من قانون الشراء العام.

٤. في حال فُقدان أهلية الملتزم.

٥. إذا فُسِخ العقد لأحد الأسباب المذكورة في الفقرة الأولى من هذا البند تُطبَّق الإجراءات المنصوص عليها في الفقرة الأولى من البند الرابع من هذه المادة.

رابعاً: نتائج إنتهاء العقد:

١. في حال تطبيق إحدى حالات النكول أو الفسخ المحدَّدة في المادة ٣٣ من قانون الشراء العام، أو في حال تحقَّقَت حالة إفلاس الملتزم أو إعساره، أو في حال وفاة الملتزم وعدم متابعة التنفيذ من قبل الورثة، تُتَّبع فوراً، خلافاً لأيّ نص آخر أحكام الفقرة رابعًا من المادة ٣٣ من قانون الشراء العام.

٢. لا يترتَّب أيّ تعويض عن الخدمات المُقدَّمة أو الأشغال المنفَّذة من قبل من يثبت قيامه بأيٍّ من الجرائم المنصوص عليها في الفقرة الفرعية "أ" من الفقرة الأولى من «ثالثاً» من المادة ٣٣ من قانون الشراء العام.

٣. يُنشر قرار انتهاء العقد وأسبابه على الموقع الالكتروني لهيئة أوجيرو إن وُجِد وعلى المنصة الإلكترونيّة المركزيّة لدى هيئة الشراء العام.

المادة ٢٤: زيارة موقع العمل

على العارض أن يقوم بزيارة موقع العمل قبل تقديم عرضه وذلك ليتمكن من أخذ القياسات ومعاينة المكان الذي سيتم فيها التركيب، وعليه التقيد بالتعليمات والشروط الفنية واتخاذ جميع الترتيبات اللازمة أثناء التنفيذ من أجل المحافظة على نظافة المركز وعدم تعطيل سير العمل فيها.

المادة ٢٥: الحوادث والمسؤوليات

يبقى الملتزم المسؤول الوحيد عن الحوادث التي تحصل للغير أو للعاملين تحت إمرته كما عن الأضرار التي تلحق بالإدارة (وزارة الاتصالات و/أو هيئة اوجيرو) من جراء تنفيذ الأشغال، وذلك بواسطة بوليصة تأمين يؤمنها العارض على نفقته.

المادة ٢٦: شروط خاصة

١. يحق للهيئة تعديل الكميات بنسبة أقصاها ١٥% (خمسة عشر بالمئة) من قيمة الالتزام بنفس أسعار وشروط التلزيم وفقا للمادة ٢٩من قانون الشراء العام ، وذلك ضمن المراكز الواردة في دفتر الشروط او مراكز اخرى، وباتفاق الطرفين على مهل تسليم وتركيب هذه التجهيزات والبطاريات وفقاً لحاجة الهيئة، دون ان يحق للملتزم المطالبة بأي تعويض اضافي من أي نوع كان.
٢. على الملتزم القيام بكافة الدراسات المطلوبة واعداد تصاميم وكميات تفصيلية لكل مركز وفقاً للاستهلاك الفعلي في كل مركز، وتقديمها للجهة الشارية للموافقة عليها قبل البدء بتنفيذ الأشغال في أي مركز.
٣. إن دراسة مكونات النظام المطلوب وتحديد كافة المواد والأكسسوارات من مسؤولية الملتزم حصراً، وأي معدات أو مواد أو أكسسوارات ضرورية لحسن التنفيذ لم يتم لحظها من ضمن المواد التي سيتم تقديمها من قبل هيئة اوجيرو، بحسب لوائح الكميات التي ستقدمها هيئة اوجيرو والواردة ضمن الملحق رقم ٧ من دفتر الشروط هذا، على الملتزم تقديمها من دون أي كلفة إضافية.
٤. على الملتزم التأكد من مطابقة كافة المواد المستعملة للمواصفات والشروط الفنية المطلوبة والشروط الفضلى للتنفيذ (Implementation Best Practices)، وعلى الملتزم تقديم كافة نتائج الفحوص التي تؤكد جودة التنفيذ والمواد المستعملة ومطابقتها للمواصفات إذا طلب منه ذلك.
٥. على الملتزم تأمين العدد الكافي من العاملين لديه لتنفيذ المشروع دون اي تأخير تحت طائلة تطبيق بند غرامات التأخير وتحميله مسؤولية الأكلاف التي قد تتكبدها هيئة اوجيرو لتوليد الطاقة بسبب التأخير في التنفيذ.
٦. يمكن لهيئة اوجيرو ان تطلب من الملتزم تأمين استمرار العمل لمدة تصل الى ١٦ ساعة يومياً والعمل ايام السبت والاحد من كل اسبوع وايام العطل في حال ارتأت ذلك لتسريع وتيرة التنفيذ، حتى لو كانت اعمال التنفيذ ستنتهي قبل انتهاء عن مدة الالتزام.
٧. على العارض الالتزام باعمال الصيانة ضمن فترة كفالة التجهيزات والمواد، والمحددة بسنتين من تاريخ وصول التجهيزات الى مرفأ بيروت، والقيام بفك واستبدال التجهيزات التي تتعطل خلال هذه المدة وشحن التجهيزات القابلة للتصليح الى المُصَنِع لاصلاحها على ان تقوم هيئة اوجيرو بتأمين التجهيزات البديلة لتركيبها مكان المعطلة خلال هذه المدة. تتحمل هيئة اوجيرو كلفة الشحن والرسوم الجمركية والتخليص عن هذه الاعمال بناءً لفواتير الشحن والرسوم الجمركية والتخليص الصادرة من الشركات والمراجع المعنية والعائدة لهذه الاعمال.

٨. يمكن لهيئة اوجيرو ان تطلب من الملتزم عند الضرورة تأمين تجهيزات لأعمال الصيانة على ان يتم التوافق على السعر بين الطرفين ووفقاً للاسعار الرائجة في السوق.

بيروت في ٢٣ آب ٢٠١٤

الرئيس_المدير العام هيئة أوجيرو

عماد كريديه

المرفقات:

- المستندات الواجب على العارض تقديمها .
- الغلاف الموّحد .

ملحق رقم ١

عنوان العارض

إسم الشركـة : _____

_____

العنـوان : _____

_____

الهاتـف : _____

الفـاكـس : _____

صندوق بريـد : _____

البريد الالكتروني: _____

بيروت في

التوقيع والختم

ملحق رقم ٢

تصريح / تعهد

طلب إشتراك بالمناقصة العمومية

أناالموقع ادناه.....

الممثل بالتوقيع عن مؤسسة/شركة.....

المتخذ لي محل اقامة.....منطقة.....

حي.....شارع.....ملك.....

رقم الهاتف.....مكتب ..... فاكس .....

البريد الاكتروني: .....

اعترف بانني اطلعت على دفتر الشروط المتضمن التعهد، الشروط الادارية والفنية الخاصة للاشتراك في هذا التلزيم التي تسلمت نسخة عنها.

واصرح انني وبعد الاطلاع على دفتر الشروط وهذه الملاحق التي لا يمكن بأي حال الادعاء بتجاهلها وعلى تفاصيل الاعمال المطلوبة وشروط تنفيذها، وانني اتعهد بقبول كافة الشروط المبينة فيها وبمدة صلاحية العرض المحددة في دفتر الشروط هذا وبالتقيد بها وتنفيذها كاملة دون اي نوع من انواع التحفظ او الاستدراك.

كما اصرح بأنني وضعت الاسعار وقبلت الاحكام المدرجة في دفتر الشروط هذا آخذاً بعين الاعتبار كل شروط التلزيم ومصاعب تنفيذه في حال وجوده.

كما نلتزم برفع السرية المصرفية عن الحساب المصرفي الذي يودع فيه أو ينتقل إليه أي مبلغ من المال العام، وذلك لمصلحة الإدارة في كل عقد من أيٍ نوعٍ كان، يتناول مالاً عامًا.

وعليه يكون السيد:_____هو المفوض بالتوقيع عن شركتنا وهو يوقع هكذا :

التوقيع

بيروت في

التوقيع والختم

طوابع بقيمة مليون ليرة

ملحق رقم ٣

ضمان العرض

نحن الشركة : _____

نرفق طيه

- ❑ كتاب ضمان مصرفي غير قابل للرجوع عنه بقيمة /١٠،٠٠٠/$ (فقط عشرة الاف دولار اميركي لا غير)، صادر عن مصرف مقبول من مصرف لبنان يبين انه قابل للدفع غب الطلب .
- ❑ دفع المبلغ نقدا إلى الصندوق المركزي لهيئة اوجيرو لقاء إيصال يضم الى مستندات العرض.

كضمان عرض بحسب المادة السابعة من دفتر الشروط الخاصة العائد للمناقصة العمومية رقم ٢٤٠٤٥.

بيروت في

التوقيع والختم

ملحق رقم ٤

كتاب ضمان العرض

مصرف .....

لجانب هيئة أوجيرو

الموضوع: كتاب ضمان العرض لصالحكم بقيمة / / فقط، بناء للأمر السيد.....

وذلك للإشتراك في (عنوان الصفقة)

ان مصرف .....مركزه.....، الممثل بالسيد .....

الموقع عنه أدناه وذلك بصفته .....، وبناء للأمر السيد ..... (او السادة ..... أو الشركة .....)،

يتعهد بصورة شخصية غير قابلة للنقض او للرجوع عنها بأن يدفع نقداً وفوراً دون أي قيد او شرط أي مبلغ تطالبونه به حتى حدود (تحديد العقيمة والعملة بالارقام والاحرف) نقداً وذلك عند اول طلب منكم بموجب كتاب صادر وموقع منكم دون أي موجب لبيان اسباب هذه المطالبة.

وعليه يقر مصرفنا صراحة بأن كتاب الضمان هذا قائم بذاته ومستقل كليًا عن أي ارتباط او عقد بينكم وبين الآمر السيد ..... (او السادة ..... او الشركة .....) وبانه لا يحق لمصرفنا في أي حال من الاحوال ولا في أي وقت كان الامتناع او تأجيل تأدية أي مبلغ قد تطالبوننا به بالاستناد الى كتاب الضمان هذا . كما يتنازل مصرفنا مسبقاً عن أي حق في المناقشة او في الاعتراض على طلب الدفع الذي يصدر عنكم او عن أي مسؤول لديكم ، او حتى ان يقبل أي اعتراض قد يصدر عن السيد ..... (او السادة ..... او الشركة .....) او عن غيره (او غيرهم او غيرها) بشأن دفع المبلغ اليكم بناء لطلبكم.

يبقى كتاب الضمان هذا معمولاً به لغاية ..... وبنهاية هذه المهلة يتجدد مفعوله تلقائيًا الى ان تعيدوه الينا او الى ان تبلغونا اعفاءنا منه.

ان كل قيمة تدفع من مصرفنا بالاستناد الى كتاب الضمان هذا بناء لطلبكم، يخفض المبلغ الاقصى المحدد فيه بذات المقدار.

يخضع كتاب الضمان هذا للقوانين اللبنانية ولصلاحيات المحاكم المختصة في لبنان.

وتنفيذاً منا لهذا الموجب نتخذ لنا محل اقامة في مركز مؤسستنا في .....

المكان :

الصفة :

الاسم :

التوقيع:

ملحق رقم ٥

تصريح النزاهة [١]

عنوان الصفقة:_____

الجهة المتعاقدة:_____

اسم العارض / المفوض بالتوقيع عن الشركة: _____

إسم الشركة: _____

نحن الموقعون أدناه نؤكد ما يلي:

١.ليس لنا، أو لموظفينا، أو شركائنا، أو وكلائنا، أو المساهمين، أو المستشارين، أو أقاربهم، أي علاقات قد تؤدي إلى تضارب في المصالح بموضوع هذه الصفقة.

٢.سنقوم بإبلاغ هيئة الشراء العام والجهة المتعاقدة في حال حصول أو اكتشاف تضارب في المصالح.

٣. لم ولن نقوم، ولا أيّ من موظفينا، أو شركائنا، أو وكلائنا، أو المساهمين، أو المستشارين، أو أقاربهم، بممارسات احتيالية أو فاسدة، أو قسرية أو مُعرقلة في ما يخص عرضنا أو اقتراحنا.

٤.لم نقدم، ولا أيّ من شركائنا، أو وكلائنا، أو المساهمين، أو المستشارين، أو أقاربهم، على دفع أي مبالغ للعاملين، أو الشركاء، أو للموظفين المشاركين بعملية الشراء بالنيابة عن الجهة المتعاقدة، أو لأي كان.

٥.في حال مخالفتنا لهذا التصريح والتعهد، لن نكون مؤهلين للمشاركة في أي صفقة عمومية أياً كان موضوعها ونقبل سلفاً بأي تدبير إقصاء يُؤخذ بحقنا ونتعهد بملء إرادتنا بعدم المنازعة بشأنه.

إن أي معلومات كاذبة تُعرضنا للملاحقة القضائية من قبل المراجع المختصة.

التاريخ: _____

الختم والتوقيع

---

[١] - يُرفق هذا التصريح بالعرض

ملحق رقم ٦

المواصفات الفنية المطلوبة

1. SCOPE OF WORK

The project scope of work includes but not limited to:

1.1. Site survey, design, detail engineering, transportation, installation, testing & commissioning of fixed tilt type Solar Power Plants of 48 V DC, for 350 Ogero Telecommunication Sites ± 10%, to meet AC & DC power requirements with one year warrantee period, that include O&M (same as stated for OMC), followed by 3 year Operations, Maintenance and Managed Services contract (OMC).

1.2. The Contractor is required to fulfill the following tasks

1.2.1. Planning and Design, site survey, preparation of drawings and reports in all respect including assessment of building stability study. Planning of solar power systems installation.

1.2.2. Installation and commissioning, including Structures, Panels, Batteries, cabling, Distribution Boards, Protection Devices, Inverters/rectifiers, Cabinets, HVAC(DC)-Cooling equipment and System in addition to Monitoring & Control system.

1.2.3. The tenderer shall bear all costs associated with the preparation and submission of his tender and Ogero will in no case be responsible for such costs, regardless of the conduct or outcome of the tendering process.

1.2.4. The bidder is responsible for arranging all the accessories (that are needed for proper installation and might be not listed in the BoQ) and measuring instruments required to smoothly install, commission, operate and maintain of the power plants.

1.2.4.1. The plant shall be commissioned in the presence of Ogero authorized personnel or its nominated representative.

1.2.4.2. An acceptance technical report shall be prepared by the contractor and signed by nominated representative of both parties.

1.2.4.3. The work shall be performed in accordance with related international standards and specifications and requirements stated herein the RFP documents.

1.3. The tenderer shall provide, when required by Ogero, an analysis of all prices contained in the Bills of Quantities, including a breakdown of all unit rates and prices contained in the priced Bill of Quantities showing the cost of labor, materials and other charges, in accordance with an agreed format which is part of the supplementary information to tender.

1.4. Delivery:

1.4.1. The material is to be supplied by Ogero, and delivery from Ogero Stocks to the sites shall be performed by the vendor.

1.4.2. It is crucial to note that the vendor will be responsible for the received material from the moment of pickup at Ogero warehouse to the moment of PAC issuance after installation.

1.4.3. The Vendor is responsible for all those who works under his management, and Ogero will hold no responsibility for any accidents might occur during the implementation of this project.

1.4.4. The vendor is requested to have an insurance for the project (People, Material, Equipment and premises).

1.5. The vendor shall submit a PIP, installation manual, and O&M manual within 10 days of the project initiation date.

2. Design and Planning:

Good communication and timely adjustments of the engineering design along the way are strongly requested to ensure quality throughout the entire process. The engineering stage of the project is divided into sub-phases, which are considered the common flow for PV project development. However, some of these phases (and milestones) may differ. Starting off as a basic technical concept, it evolves into a detailed execution design maps issued for construction. Once construction and commissioning are completed, a detailed set of "as built" documents is handed over to Ogero for O&M.

2.1. The design concept includes an initial layout for the plant, showing the components of the system, for instance: PV modules, power consumption and power production estimation, Rectifiers, cables and structure, etc. The contractor shall compare different sets of mounting structures and different plant layouts to have the beneficial in choosing the optimal design in terms of predicted energy production. The design shall include details about the total installed quantity of equipment and capacity estimated of power production, indicative layout design and single line diagram (SLD).

2.2. The contractor shall issue the design using PV system designer software, and is responsible for gathering and updating relevant site-specific information, such that the PV system designer can design a PV system appropriate for the application of Ogero Sites. The Provider should ensure that system design and feasibility estimates are made using reliable data. Gathering data shall address many of the key factors and current industry best practices regarding PV system design.

2.3. The contractor shall demonstrate a strong commitment to building quality PV systems, and to encourage the culture of QA/QC assurance among the teams executing the project.

2.4. The Detailed Design shall contain but not limited to the following details:

2.4.1. Site survey and Layout Planning to be carried out by the Vendor after tender award.

2.4.2. Determine the size of the PV system based on actual power consumption, and available mounting area for the system.

2.4.3. Building Stability Assessment

2.4.4. The building Stability Assessment shall be approved by civil engineer with 10 years of relevant experience.

2.4.5. The Contractor shall carry out Shadow Analysis at the site and accordingly design strings and arrays layout considering optimal usage of space, material and labor.

2.4.6. The Contractor should submit layout drawings along with Shadow Analysis Report to Ogero for approval.

2.4.7. Indicate the suitable area for installation of solar plant, dimension, north-south direction and any other relevant information for each site.

2.4.8. All technical particulars along with Single Line Diagram (SLD).

2.4.9. The design shall show the length and size of cables, which shall be selected carefully to keep the voltage drop of the entire solar system to the minimum.

2.4.10. Module Mounting Structure Details with Design Drawings.

2.4.11. The Detailed Designs & building Stability Assessments along with all necessary documents has to be verified and approved by Third party if required by Ogero, at no extra cost.

2.4.12. Ogero may require third party (consultant approved by Ogero) to approve the mechanical, technical and physical requirements of used prototypes typical designs.

2.4.13. Ogero reserves the right to modify the design, layout and requirements of installation at any stage as per local site specific conditions or requirements.

2.4.14. The bidder shall submit two paper sets and soft copy of approved final design to proceed with implementation work.

2.5. The Contractor shall submit design drawings for approval within 15 days of project initiation order.

2.5.1. Installation shall be performed only after the approval of design.

2.6. The Contractor shall submit the following drawings and obtain **approval:**

2.6.1. General arrangement and dimensioned layout showing the details of PV array layout and ancillary equipment, and technical room layout along with the design.

2.6.2. Schematic drawing showing the requirement of SV panel, Rectifier, Junction Boxes, AC and DC Distribution Boards, cabinets, meters etc.

2.6.3. Structural drawing along with foundation details for the structure.

2.6.4. Itemized bill of material for complete SV plant covering all the components and associated accessories.

2.6.5. The design shall include 3D drawings of the CO building, the Structure, The panels, the equipment, etc. in appropriate format, applicable to be imported to gdb file, approved by Ogero (Revit for example).

2.6.6. The vendor will be responsible to provide geographic coordination as gdb file for all equipped sites.

2.6.7. Shop drawings showing the exact routing of conduits including any trenching, cable trays, boxes and accessories with their types and dimensions.

2.6.8. Provide the following electrical wiring diagrams:

2.6.8.1. Diagram showing the number of modules in series in a string.

2.6.8.2. Diagram showing the number of strings in parallel in PV array.

2.6.9. Audit Central Office building or site to determine what can be done to reduce electricity usage (report shall be prepared for each site).

2.7. Note that Ogero building sites are divided into categories. Some sites are typical (repetitive) sites of the same design, which contain three types EML, EMH and EMG. Therefore, the vendor will be requested to submit 4 design drawing for each type according to the direction and condition of sites.

Some building Sites are not typical sites, may require design per each site rather than use the typical approved drawings. In addition to LTE or Nodes sites where the vendor will be requested to submit design for each type accordingly.

2.8. The Contractor is responsible for basic system information including system rating and component ratings, commissioning date and equipment location.

2.9. The Contractor is responsible for detailed standard of system documentation, which is necessary, so that safe operation and maintenance can be carried out throughout the life of the system.

3. Array Foundation Base

3.1. The vendor shall submit a design proposal for structures installation for various scenarios and types taking into consideration roof or ground installation. The proposal shall be accompanied with the related stability assessment studies that shows the reliability and rigidity of the design. While making foundation design, due consideration shall be given to weight of module assembly, maximum wind speed 150km/h and seismic factors for the site as per European norms. Bidder shall design foundation (RCC and PCC) and structure considering the wind loads and structural load bearing capacity of the building.

3.2. The Vendor shall specify installation details of the solar PV modules and the support structures with lay-out drawings and array connection diagrams. The work shall be carried out as per the designs approved by Ogero and as per OEM recommendations.

3.3. After installation, Vendor has to carry out waterproofing for any drilling of the building and red tile roof if the work was performed on the roof.

4. Labelling

4.1. Any element installed in the scope of this project should be clearly referenced and Labeled. Panels labels shall be engraved label in Arabic and English References are to be clearly shown on As-Built drawings and to the approval of the engineer.

4.2. The labelling shall include all signage at all disconnecting means including switches and circuit breakers in accordance.

4.3. Safety signs to be installed as per technical specifications. Label shall be UV.

5. Installation Requirements

5.1. Site Preperation:

Construction site organization refers to the preparation of the site for the start of civil, mechanical, and electrical works. Preliminary site preparation and executive engineering shall begin immediately after signing the contract. In the mobilization phase, contractors will begin to mobilise direct and indirect labour, equipment and means so that all planned activities can start as per agreed PIP.

5.2. Site preparation main activities are:

5.2.1. Civil works:

5.2.1.1. Civil works refers to excavation for the construction of cable ducts where required, including wall openings.

5.2.1.2. preparation of the areas where the cabinet for rectifier and Batteries will be installed,

5.2.1.3. Preparation of the area where DC boxes will be installed.

5.2.1.4. The planning and implementation must prevent the interference and overlap with telecom cables the interference and the overlap with the electromechanical works.

5.2.1.5. Removal of vegetation removal and the superficial part of soil where foreseen (this kind of activity is for ground installation and should be minimal and in accordance with environmental rules).

5.2.2. Electro-mechanical works:

5.2.2.1. Mechanical activities mainly consist of:

5.2.2.1.1. Withdrawal of materials from Ogero's warehouse.

5.2.2.1.2. Assembly of metal structures.

5.2.2.1.3. Installation of PV equipment / panels.
5.2.2.1.4. Array / Boxes assembly.
5.2.2.1.5. Installation of Cabinet for rectifier and batteries.
5.2.2.1.6. Tests and inspections.

5.2.2.2. Electrical activities mainly consist of:

5.2.2.2.1. Installation of DC (LV) solar cabling and related components for connecting PV module strings to rectifiers using tools certified/qualified by the OEM for PV cable-connectors assembly.
5.2.2.2.2. Installation of DC cabling is a key element of the electrical works.
5.2.2.2.3. Installation of LV auxiliary cables (Connection to grid and Generator).
5.2.2.2.4. Installation of Boxes and field connections.
5.2.2.2.5. Installation of rectifier and batteries.
5.2.2.2.6. Installation of HVAC (DC).
5.2.2.2.7. Installation of applicable sensors.
5.2.2.2.8. Tests and inspections.

5.3.Installation Procedures.

5.3.1. Installation procedures should include detailed instructions on each phase of the installation process. Some basic guidelines that may help in reviewing installation procedures are:

5.3.1.1. Prepare structure for mounting of PV array. If roof-mounted, use roofing equipment and tools to install roof mounts according to manufacturer's directions.

5.3.1.2. Check modules visually and check the open circuit voltage and short circuit current of each module before hauling onto the structure to verify proper operation—based on checklist.

5.3.1.3. Use plug connectors to connect panels together available products.

5.3.1.4. Use only as many attachment points and roof penetrations as necessary for structural loading concerns. The number of attachment points and structural requirements of the roof must be specifically identified in the drawings.

5.3.1.5. Mount PV array to support structure.

5.3.2. Install PV combiner, inverter/rectifier, and associated equipment to prepare for system wiring.

5.3.3. Connect properly sized wire to each circuit of modules and run wire for each circuit to the circuit combiner(s). (WARNING: It is advisable to terminate the circuits in the circuit combiner prior to completing the final connection for each string at the PV array end of the circuit).

5.3.4. Install properly circuit combiner, rectifier overcurrent/disconnect switch

5.3.5. Verify that all PV circuits are operating properly and the system is performing as expected. Fill up The PV System Installation Checklist from the installation guide that shall provide detailed performance testing procedure for entitled System Acceptance Test.

5.3.6. Testing and Commissioning

5.3.6.1. After completion of installation work, the whole system shall be on trial runs for 7 continuous clear sunny days to test smooth functioning of power plant in every aspect.

5.3.6.2. If the functioning is satisfactory, the system will officially be commissioned. And the contractor shall submit a PAT file for approval.

5.3.7. One set of operation manuals complete with as-built drawings, parts list (with part codes) circuit diagrams with list ratings of components and list of do's and don'ts for the main equipment as well as the sub-systems should be submitted.

5.3.8. One set of maintenance manuals with full information on drawings, circuit diagrams, troubleshooting charts, programs of built in controllers etc. for the main equipment as well as for the sub-system.

5.3.9. These manuals should be in the form of soft and paper copy in English Language

5.4. Installation works

5.4.1. Installation works shall be performed in accordance with approved standards, as per manufacturer's recommendations, and to the satisfaction of the supervision entity at Ogero.

5.4.2. The work shall be carried out by qualified and certified personnel in respect with the designs approved by Ogero.

5.4.3. Where multiple parallel PV strings exist, there may be a requirement to install overcurrent protection (e.g. string fusing).

5.4.4. Contractor should ensure array configuration is compatible with the rectifier/inverter specification.

5.4.5. Based on approved design and supplied equipment the contractor should ensure all equipment is fit for purpose and correctly rated.

5.4.6. The Contractor shall be responsible for all transportation and off loading and handling of module on site and shall ensure that module is delivered to site on drums properly protected against mechanical damage.

5.4.7. The Contractor shall be responsible for open circuit voltage test on each PV string and on the total array.

5.4.8. Wires between PV arrays and other system components (rectifier, junction box, etc.) must protected by UV PVC tubes or ducts.

5.4.9. Sizes of cables between array interconnections, array to junction boxes, junction boxes to rectifier etc. is selected and installed carefully to keep the voltage drop of the entire solar system to the minimum. The maximum allowed AC and DC Voltage drop between Inverter and equipment is 3%.

5.4.10. Breakers, Protective devices and Isolators shall not be fixed on any portion of the panel, and shall all be labeled with printed heavy duty stickers.

5.4.11. Cable trays and ladders are to be earthen at maximum spacing of 30m, by a cable of 16mm² section.

5.4.12. Additional protection of fireproof barriers should be provided where cable trays pass through walls and partitions.

5.4.13. 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:

5.4.14. Solar modules frames.

5.4.15. Mounting Structure.

5.4.16. Rectifiers/inverters.

5.4.17. Electrical Cabinets.

5.4.18. Cable trays, combiner & junction boxes.

5.4.19. Control, Data Monitoring Equipment.

5.4.20. The Earth resistance shall be tested by the contractor prior to startup or commissioning activities, to verify that it doesn't exceed 5 Ohms and reported to Ogero.

5.4.21. The Contractor is responsible for shutdown and isolation procedure for emergency and maintenance.

5.4.22. Overvoltage Protections includes DC protection breakers shall also be adequately rated to break the full load current, or potential fault currents from the array.

5.4.23. Installation requirements also include Maintainability requirements such as:

5.4.23.1. The support structure should allow grass cutting, panel cleaning, and preserve a sustainable ecosystem.

5.4.23.2. The installation should consider to avoid blocking the drainage system to prevent flooding

5.5.All Cable Laying

5.5.1. Outside building and on walls or terrace shall be laid on industrial cable tray secured firmly with wall or terrace. The trays shall be secured at applicable interval, as recommended by the OEM and approved by Ogero, throughout tray length, to handle the current load and future expansion. Cables shall be tied to the tray at an interval of 25cm using proper cable ties. The cable ends shall be provided with cable tags, and on route cable markers will be provided at each turning points.

5.5.2. For ground mounting panels, all cables from modules to Array Junction Box AJB shall be through UV stabilized PVC rigid pipe of minimum wall thickness 3mm. The PVC pipe shall be buried underground at a depth of minimum 60 cm. All pipe connectors like T, bend, elbow shall be secured properly for its long life.

5.5.3. Bidder has to make necessary holes in walls to enter cables coming from AJB.

5.5.4. Cables and conduits that have to pass through walls or ceilings shall be taken through a PVC pipe sleeve.

5.5.5. Bidder has to make industry grade soft PCC of 1:2:4 proportions, for wall openings made for cable laying and grant water proofing.

5.5.6. Bidder has to close all holes made in internal walls for cable laying with proper metal covers filled with fire and water resistant material.

5.5.7. All cables and conduit pipes shall be clamped to the rooftop/ walls/parapet with thermo-plastic clamps at intervals not exceeding 30 cm.

5.5.8. Cable conductors shall be terminated with DC cable glands & tinned copper lugs to prevent fraying and breaking of individual wire strands. The termination of the DC and AC cables at the Inverter shall be done as per instructions of the manufacturer, which in most cases will include the use of special connectors & cross ferrules.

5.5.9. All connections should be properly terminated, and sealed from outdoor and indoor elements. Relevant codes and operating manuals must be followed.

5.5.10. Only terminal cable joints shall be accepted. No cable joint to join two cable ends shall be accepted. All cable/wires shall be marked with good quality letter and number ferrules of proper sizes so that the cables can be identified easily.

5.5.11. All cables shall be used in the most proper largest length to restricting the straight through joints.

5.5.12. Minimum two number loop must be provided at the start and end each span of cable laying. Loop length shall be as per relevant OEM recommendations.

5.5.13. The Contractor must ensure that all DC cables specified are rated to handle the PV array maximum voltage.

5.5.14. Cable routing/ marking: All cable/wires are to be routed in pipes and suitably tagged and marked with proper manner so that the cable easily identified and not subject to damage.

5.5.15. The Contractor must ensure that all DC cables specified are rated to handle the PV array maximum voltage. For cables installed near, or in contact with PV modules, the contractor shall ensure that cables operating temperature should be considered to be equal to 60°C.

5.5.16. When installing plugs to the ends of wires, it must use heat shrink tubes instead of commercial tape. Excellent resistance to heat, cold, water, oil, abrasion.

5.5.17. The contractor must submit detailed shop drawings for approval. Sizes of cables between array interconnections, array to junction boxes, junction boxes to inverter etc. is selected.

5.5.18. The Vendor must indicate size and length as per system design requirement.

5.5.19. The installation and capacity of the conduits shall be in accordance with the IEE Wiring Regulations.

5.5.20. Standard circular or looping in boxes shall be installed at intersections.

5.5.21. Small circular channel type inspection fittings will not be approved.

5.5.22. Cables connected to different category circuits shall not be run thru common conduits.

5.5.23. Conduit shall be installed at least 100 mm clear of, and preferably above, pipes and any other services.

5.5.24. Not more than two right angle bends shall be allowed in any surface mounted conduit run without provision of an inspection fitting for drawing in purposes between them.

5.5.25. Surface mounted Conduits shall not be dismantled for wiring, and must be capable of being wired complete without draw wires being installed during erection.

5.5.26. Sleeves for cable must be filled with a fire retardant compound to prevent fire spread from one compartment to another.

5.5.27. Conduits specified to run on the surface shall be fixed by means of heavy duty PVC distance clips or saddles to allow a 5mm space between the surface and the conduit.

5.6.Mounting Structure:

5.6.1. Tilt angle shall be facing true south or southeast if the latter option is plausible for aesthetic reasons.

5.6.2. The elevated structure has to be securely anchored to the supporting surface.

5.6.3. Concrete foundations of appropriate weight and depth for elevated structures mounted directly on the ground, bolted with anchor bolts of appropriate strength for elevated structures.

5.6.4. Access for panel cleaning and clearance for maintenance must be available from the top for cleaning and from the bottom for access to the module's junction box.

5.6.5. The structure to be installed on concrete pads to minimize drilling and damaging the water proofing where applicable.

5.6.6. Wind load analysis to be submitted to confirm adequacy.

5.6.7. On site welding is not permitted, however built-up sections for mounting to be the only acceptable option.

5.6.8. The structure shall be thoroughly grounded to ensure safety of the personal and power plant.

5.7.Cable Trays and Ladders:

5.7.1. Trays shall be jointed with flange coupling strops that virtually make the flanges continuous. These shall be secured in place with nuts and bolts, according to OEM recommendations.

5.7.2. All cable tray runs shall be continuous and constructed of bends, tees and other accessories that are purpose made by OEM of cable tray.

5.7.3. Cable tray installation shall have adequate mechanical strength for the load to be carried and shall have provision for the additional future cables and/or load. The deflection shall not exceed that recommended by the manufacturers.

5.7.4. All sizes of cable trays shall be attached to the building framework at intervals not more than that recommended by the manufacturer.

5.7.5. Screws and bolts securing trays to brackets and joining trays shall be arranged so as to prevent damage to cables.

5.7.6. Cutting and modification of straight tray, ladder will not be permitted without prior approval.

5.7.7. Additional protection of fireproof barriers should be provided where cable trays pass through walls and partitions.

5.7.8. Cable trays and ladders are to be earthen at maximum spacing of 30m, by a cable of 16mm^2 section.

5.8.Earthing

5.8.1. Bidder has to make earthing connections of the panels and all equipment to the existing earthing grid and bus bars. These connections should be confirming to recent edition of European Norms for example IEC/BS EN 62305:2011 and EN60079-14. For rooftop PV Panel array structure lightning protection, bidder has to make arrangements for earth strip connections to existing earthing grid.

5.8.2. Earth resistance shall be tested prior to startup or commissioning activities (Earth resistance of CO would not exceed 5 ohms).

5.8.3. Resistance to earth of complete system measured at any point shall not to exceed 10Ohms, or the difference between the recorded resistance of CO's resistance and the system's shall not exceed 5Ohms.

5.8.4. The contractor shall be responsible for reporting to Ogero any unconformity, especially if the resistance of CO exceeds 10Ohms.

5.9.PV System Monitoring & Sensors

5.9.1. The vendor is responsible for the installation and commissioning of online monitoring and control system with all supplied sensors and accessories.

5.9.2. The following physical requirements should be considered:

5.9.2.1. Network access (network port provided by Ogero).

5.9.2.2. Physical network connection.

5.9.2.3. Power supply requirements for monitoring devices.

5.9.2.4. Physical wiring to sensor devices (e.g. temperature, humidity, smoke, panel monitoring).

5.10. As-built:

5.10.1. Contractor is responsible for submitting list of equipment installed with model, description and serial numbers.

5.10.2. Contractor is responsible for providing system information including system rating and component ratings, commissioning date and equipment location.

5.10.3. dimensionally and geospatially accurate 'as-built' model of the asset shall be generated and submitted to Ogero

5.10.4. construction monitoring data, which can be used to update the digital twin.

5.10.5. It is also required to generate a 3D model of the building showing the new asset installed as gdb file.

5.10.6. Such data capture and modelling shall be provided as part of the As-built documentation and to be used by the O&M teams.

5.10.7. As-built documentation set accompanying the solar PV power plant should, as a best practice, contain the documents described in the IEC 62446 standard that covers the minimum requirements for as-built documentation.

6. Special Conditions

6.1. During O&M Period, the Contractor must visit each Site at least once every 4 months, for checking and confirming the proper operation of the PV system in coordination with Ogero.

6.2. The Contractor shall submit an Outcome report regarding the result to Ogero within one week of the completion of the visit and the report must be endorsed by Ogero's representative.

6.3. In outdoor installation Battery storage cabinet must be kept out of the sun and in as cool a place as practical.

6.4. Battery storage cabinet must be placed in a way to grant proper ventilation.

7. Quality Assurance

7.1. O&M Manual Preparation:

7.1.1. The O&M Manuals or guidelines preparation shall be based on European and national norms and recommendations, in addition to manufacturer recommendation to perform the O&M work of each and every part of the system.

7.1.2. System-Level O&M Manuals for mechanical and electrical systems shall be developed specifically for this Project. Compilation of equipment vendor catalogues and O&M Manuals is not acceptable.

7.1.3. The contractor shall use qualified personnel thoroughly trained and experienced in operation and maintenance of equipment or system involved. In addition, the personnel shall be skilled in technical writing where necessary for communication of essential data.

7.1.4. The Contractor is required to use drawing operators capable of preparing drawings in a clear, understandable industry standard geo-database (gdb) format

7.1.5. Recommendation for Ogero: The contractor is responsible to include in his monthly or quarterly reports recommendation to enhance the KPI of the system based on analytical data acquired from the monitoring system or from sites.

8. Training of Ogero's Personnel

8.1. The contractor shall provide training for the technical staff on the installation, commissioning and the in operation, adjustment, and maintenance of products, equipment, and systems. of the PV System. The training shall include onsite training and include the following subjects as a minimum:

8.1.1. Solar PV system operation.
8.1.2. System monitoring.
8.1.3. Fault diagnosis.
8.1.4. Safety and emergency shutdown procedure.

8.2. Use O&M Manual sections for each piece of equipment or system as the basis of training and instruction. Use contents in detail to explain all aspects of operation and maintenance.

9. Safety, Health and Protection of the Works & Workpeople.

9.1. Solar PV power plants are electricity generating power stations and have significant hazards present which can result in injury or death. Risks should be reduced through proper hazard identification, careful planning of works, briefing of procedures to be followed, regular documented inspection, and maintenance.

9.2. The contractor shall during the contract period take all precaution & safety measures to ensure a safe environment for workers and to do all the necessary safety support for the works. the contractor shall always take safety measures on the site for better work environment.

9.3. The contractor shall strictly abide by the rules and laws related to the welfare & safety of all personal, personal protective equipment on site. Moreover, the contractor shall implement any temporary work or facility related to safety or protection of works, and make sure to use personal protective equipment without any claim for extra cost.

9.4. Vendor shall have safety requirements such as fall protection for work at heights and electrical arc-flash, lock-out tag-out, and general electrical safety for electrical work, eye, and ear protection for ground maintenance. Power plant security systems should form an integrated part of health & safety by ensuring that trespassers or members of the public shall be warned (by using warning plates) of accessing to plants or its hazardous areas.

9.5. The contractor shall take immediately any action to ensure a fast medical help or transportation to the hospital at his own cost without any claim for extra cost.

9.6. The Contractor should have and maintain reporting health and safety problems, injuries, and unsafe conditions; risk assessment; and first aid and emergency response.

9.7. The Vendor will solely be responsible for the behavior and actions of his personnel and according to the Lebanese laws.

10. Operations &Maintenance

The Vendor shall provide Operations and maintenance of the solar power system that is a systematic process of planning, operating, maintaining, upgrading, and replacing assets effectively with minimum risk and at the expected levels of service over the contract life cycle

10.1. Operation and Maintenance Requirements

10.1.1. The contractor and installer shall submit for approval an O&M Manual that includes all operations and maintenance actions that are required by the equipment manufacturers, and ensure any site specific maintenance actions are included, to grant the best system performance, covering the Operations, care, preservation, and maintenance of engineered components, systems, architectural products and execution.

10.2. The Three years OMC for solar plant including all equipment will start after One year warranty period. If there is any failure in the plant or parts against the equipment, then the supplier shall either repair or replace the failed part within a set period as per SLA requirements, at no extra cost to Ogero. All functions related to MMC including on-site service, travel and expenses related to such services will be at vendor's expense. Spare parts will be provided by Ogero.

10.3. The contractor shall provide operation and maintenance manuals in English.

10.4. Contractor responsible for detailed standard of system documentation which is necessary, so that safe operation and maintenance can be carried out throughout the life of the system. Operation and Maintenance manuals shall include information such as the following:

10.4.1.1. The location of all array isolators and applicable arrays/sub-arrays they serve.

10.4.1.2. Identifying all distribution boards or sub-boards that exist on the site of PV system, and their location.

10.4.1.3. Full site-specific single-line schematic diagrams for the PV system installation.

10.4.1.4. Site plans to show the location of the site meter, main switchboard and distribution boards which are connected to the solar PV installation.

10.5. Maintenance Procedures includes the following:

10.5.1. Includes the following four types of maintenance procedures:

10.5.1.1. Administration of Maintenance: Ensures effective implementation, control, and documentation of maintenance activities and results.

Administration includes: securing preventive maintenance, corrective maintenance, planning activities to avoid conflict with system operation or operations of Ogero technical teams at the site, correspondence with Ogero, selection and contracting with service suppliers and equipment manufacturers, record keeping, enforcement of warranties, providing feedback to owner of the system, and reporting on system performance and the efficacy of the O&M program.

10.5.1.2. Preventative Maintenance: Scheduling and frequency of preventative maintenance is set by the operations function and is influenced by a number of factors, such as equipment type, environmental conditions (marine, snow, pollen, humidity, dust, wildlife, etc.) of the site, and quality terms.

Scheduled maintenance is carried out at intervals to conform to the manufacturer recommendations as required by the equipment warranties and QoS.

10.5.1.3. Corrective Maintenance: Required to repair damage or replace failed components. It is possible to perform some corrective maintenance such as inverter resets or communications resets remotely; also, less urgent corrective maintenance tasks can be combined with scheduled, preventative maintenance tasks.

10.5.1.4. Condition-based Maintenance: Condition-based maintenance is the practice of using real-time information from data loggers to schedule preventative measures such as cleaning, or to head off corrective maintenance problems by anticipating failures or catching them early. Because the measures triggered by condition are the same as preventative and corrective measures, they are not listed separately. Rather, condition based maintenance affects when these measures occur, with the promise of lowering the frequency of preventative measures and reducing the impacts of corrective measures.

10.5.2. The preventive and scheduled maintenance scope of work shall include all tasks that ensure proper functioning of the system including, but not limited to:

10.5.2.1. Carry out PV cell modules washing and cleaning of foreign materials, dust, grease, bird droppings, etc.

10.5.2.2. Carry out re-orientation and re-fixing of disoriented solar panels or structures and accessories as per original position.

10.5.2.3. Servicing and Maintaining of Multi Contacts connector and tightening of contacts.

10.5.2.4. Opening of individual module terminal box and connection tightening, diode testing and cleaning.

10.5.2.5. Inspect Module mounting structure for rusting and possible touch using appropriate paint.

10.5.2.6. Carry out earth testing and inspect the earthing of modules are properly tightened and connected with earth pit.

10.5.2.7. Recording of individual solar modules parameters like open circuit voltage (incase of faulty or abnormal behavior).

10.5.2.8. String voltage and current shall be recorded during visit to ensure that the solar panels are producing proper power (read from the system remotely or on site in case of fault or service degradation).

10.5.2.9. Check the functioning of charge controller & power conditioning unit.

10.5.2.10. Clean the ventilation/filters and ensure the functioning of fans and/or turbines of equipment, including the free cooling unit and the HVAC unit.

10.5.2.11. Ensuring all cable terminations and individual wiring connections are tight.

10.5.2.12. Cleaning of Heat sink and enclosure panel where required.

10.5.2.13. Checking for deformity, gaps, gaskets, locking arrangement, etc. in the enclosure and provide correction measures.

10.5.2.14. Conditions of Isolators, SPDs, Diodes, MCBs, Charge Controller, power indicating meters etc. and connections to be checked.

10.5.2.15. Note down the functioning of all meters and parameters and record the readings up to management system.
10.5.2.16. Check the connections, tightness of all terminations in ACDB and DCDB are proper.
10.5.2.17. On completion of maintenance, energize the AJB.
10.5.2.18. Condition of foundation to be checked and repaired if required.
10.5.2.19. All missing, broken nuts and bolts to be fixed, existing nut and bolts to be checked for rusting and tightness.

10.6. The semester intervention:

10.6.1. Semester maintenance is carried out every 4 months and aims to check the proper functioning of the equipment and to take measures to ensure its proper functioning. This maintenance consists mainly of visual checks and light measures if there is no exceptional breakdown.

10.6.2. Some of the actions and provisions are as follows:
10.6.2.1. Visual inspection Checking the cleanliness of the modules : cleaning the modules early in the morning or late in the evening;
10.6.3. The precautions to be taken are:
10.6.3.1. Do the cleaning in the evening or early morning when the panels are not exposed to strong sunlight;
10.6.3.2. Use a soft, clean cloth that is recommended for solar panel cleaning;
10.6.3.3. Gently wipe the surface of the panels from top to bottom using proper tools and materials;
10.6.3.4. Ensure that there is no trace of dust, scale or bird droppings;
10.6.3.5. Avoid walking on or leaning on the panels;
10.6.3.6. Check the junction boxes for water or insects, check the tightness of the boxes and connections and if necessary tighten the cable glands or replace them.
10.6.3.7. Battery: Visual check of the cleanliness of the battery room;
10.6.3.8. Visual inspection of the batteries: deformation, sediment deposits, etc.;
10.6.3.9. Check the connections of the components;
10.6.3.10. Check the insulation of the terminals.
10.6.3.11. Control of the presence of shadowing on the modules;
10.6.3.12. Checks on module fixings; check the anti-theft screws; in the event of corrosion or infringement: tighten if possible and coat them with degreaser if necessary.
10.6.3.13. Check the junction boxes: presence of water or insects; check the tightness of the boxes, if necessary tighten the cable glands or replace them.
10.6.3.14. On a sunny day near noon twice a year, review the output of the system (after the array is cleaned) to see if the performance of the system is close to the previous year's reading. Maintain a log of these readings so you can identify if the system is performance is staying consistent, or declining too rapidly, signifying any system problem.
10.6.3.15. Prevent water from entering junction or protection boxes during cleaning.
10.6.3.16. In case of corrosion of the connections, perform the following operations:
a. Completely isolate the battery from all connections: field connection, inverter connection;
b. Insulate the element(s) concerned;
c. Clean the corroded connection or terminal with a wire brush;
d. Apply a thin layer of high temperature anti-corrosion grease;
e. Connect the element and tighten the connections;

f. Reconnect the battery to the inverter circuit.

10.6.3.17. Maintenance of the rectifier:

The following checks should be carried out every semester:

a. Check the cleanliness of the rectifier:
b. presence of dust;
c. Check the ventilation of the rectifier.
d. Inspection of electrical cables that connect the modules to the rectifier, the batteries to the rectifier and the rectifier to the arrays.
e. These cables should be inspected at each maintenance visit to ensure that they are in good condition:
   - Checking the connections to the battery terminals;
   - Follow the cable from end to end looking for the following damage: cut, worn or corroded insulation stripping the core of the conductors;
   - Any damaged cables should be replaced. If cables are found to be chewed by animals, consideration should be given to protecting them with a sheath.

10.7. The annual intervention:

10.7.1. The annual maintenance consists of a more in-depth intervention. It covers the actions carried out during the quarterly maintenance, but also in-depth measurements to assess the operating condition of the equipment more precisely (electrical parameters, efficiency, etc.). The annual maintenance is the 3-d maintenance. It is important to note that technical actions described below shall be carried out by technicians with proven experience in solar installations, in order to be able to interpret the results of the measurements made and implement the necessary measures.

10.7.2. Electrical performance check:

10.7.2.1. Measure the open circuit voltage of the photovoltaic field;
10.7.2.2. Measuring the charging current of the batteries;
10.7.2.3. Measure the charging voltage of the batteries;
10.7.2.4. Report on the updated performance of equipment.

10.8. Troubleshooting and possible repairs:

10.8.1. Troubleshooting and repairs can be carried out at any time when needed.

10.8.2. In the event of an emergency power issues, the successful bidder must respond quickly to avoid damage that may be caused by the breakdown. After each visit, a visit report containing the work carried out, the condition of the equipment and the various statements signed by the successful bidder representative must sent to Ogero in the PAC files.

10.9. Operations Procedures includes the following:

10.9.1. The contractor is responsible for all Operations that encompasses remote monitoring, control, and support activities to ensure the best operation of a solar power plant or a portfolio, i.e., to maximize energy production, minimize downtime and reduce costs. The O&M service provider shall perform the tasks based on Key Performance Indicators (KPIs), and shall perform close coordination and information sharing with Ogero. Tasks also includes ensuring that the operation of the solar PV power plant complies with national and local regulations and laws, and advising the Asset Owner on technical asset optimization.

10.9.2. The vendor shall ensure trouble free plant operation and shall carry out preventive/ routine maintenance according to the set schedule that included in SLA or as per the recommendations of the OEMs.

10.9.2.1. Qualified and trained engineers and technicians shall perform the work.

10.9.2.2. In case of fault incidents, service engineer should be delegated at site for troubleshooting and to restore the solar system in minimum time. Vendor shall resolve the fault within the shortest possible time that do not exceed the SLA requirements.

10.9.2.3. Vendor shall recommend the critical/ recommended spares inventory, to reduce MTTR. (Mean Time To Restore).

10.9.2.4. If spare parts will be stocked at vendor's premise, then it shall not be used for any other party in any case.

10.9.2.5. Quantities replaced during maintenance work shall be returned to Ogero stock.

10.9.2.6. Successful Bidder will carry out OMC through OEM agreement (The bidder shall be manage an agreement with the OEM for back to back support, operations and Maintenance, during installation and warranty periods, and for spare parts delivery when needed and requested by Ogero. OEM agreement might be provided after bid winning).

10.9.2.7. In the event of supplier showing lack of attendance to the work or negligence or unfair performance in the opinion of the Engineer, then Ogero will be forcing discounts equal to the unfulfilled tasks and the deterioration caused by these actions. If this behavior continues Ogero will terminate the OMC contract at any stage without prejudice to the right by action under any other relevant clause of the contract by giving suitable notice to the vendor and at his risk and cost by forfeiting security deposit /cashing Performance Bank Guarantee PBG.

10.9.2.8. Particular care shall be taken for outdoor equipment to prevent corrosion during OMC. The OMC related tasks and means will be on vendor's expense.

10.9.2.9. The vendor shall ensure trouble free plant operation and shall carry out preventive/ routine maintenance at least once every 4 months by qualified and trained engineers and technicians.

10.9.2.10. On notification of fault or break down, service engineer shall be assigned to visit the site for troubleshooting and to restore the solar system in minimum time. Vendor shall respond immediately (24/7) and problem shall be solved within 24 hours of notification.

10.9.2.11. Bidder shall note that Ogero reserves the right to award or not award MMC Tenders immediately or later date.

10.9.2.12. The vendor shall provide the number of teams that will be dedicated for installation part of this project, and the number that will work on O&M including managed services.

10.9.3. **PV System Operations includes the following five areas**:

10.9.3.1. Administration of Operations: Ensures effective implementation and control of O&M activities including archival of as-built drawings, equipment inventories, operating manuals, and PIPs. It also includes keeping records of (KPIs) performance and O&M measures, preparing scopes of work and selection criteria for subcontractors, service providers, suppliers, contingency plans for O&M activities.

10.9.3.2. Conducting Operations: Ensures efficient, safe, and reliable process operations including making decisions about maintenance actions based on cost/benefit analysis. This includes serving as a point of contact for personnel regarding operation of the PV system; coordinating with others regarding system operation; inspecting work. Meanwhile, operations include any day to day operation of the system to maximize power delivery, manage curtailments, or adjust settings such as power factor.

10.9.3.3. Directions for the Performance of Work: Specifies the rules and provisions to ensure that maintenance is performed safely and efficiently. Including the formalization and enforcement of: safety policy (including training for DC and AC safety, rooftop safety, minimum staffing requirements, arc flash, lockout tag-out, etc.; work hours, site access, laydown areas, and any other stipulations under which work is performed. This includes confirming and enforcing qualifications of provided service. This also includes compliance with any environmental or facility-level policies.

10.9.3.4. Monitoring: Maintains monitoring system and analysis of resulting data to remain informed on system status. Includes comparing results of system monitoring to benchmark expectation and providing reports to facility Owner.

10.9.3.5. Operator Knowledge, Protocols, Documentation: Ensures that operator knowledge, training, and performance will support safe and reliable plant operation. Information such as electrical drawings, part specifications, manuals, performance information, and records must be deliberately maintained.

10.10. The PV System O&M Plan

The PV O&M plan shall be prepared by the vendor and approved by Ogero.
The O&M manager retains in the plan archive all the initial planning, warranty, design, and other system specification documents, and also revises the plan as the system is constructed, maintained, and modified over time. The O&M plan provides the specific measures to achieve the level of performance specified by the Key Performance Indicators and SLA.

10.11. Data and monitoring system

10.11.1. The successful tenderers shall operate the monitoring system to perform supervision of the performance of a solar PV power plant. Requirements for effective monitoring include dataloggers capable of collecting data (provided by the monitoring system, such as energy generated, irradiance, module temperature, etc.) of all relevant components (such as rectifiers, Batteries, temperature sensors, etc.) and storing at least one year of data with a recording of reasonable granularity, as well as a reliable Monitoring Portal (interface) for the visualization of the collected data and the calculation of KPIs.

10.11.2. The successful tenderers should be able, based on the supplied monitoring system, to ensure open data accessibility to enable an easy transition between monitoring platforms and interoperability of different applications. As remotely monitored and controlled systems, solar PV power plants are exposed to cybersecurity risks. It is therefore vital that operations undertake a cybersecurity analysis and perform cybersecurity measures.

10.11.3. **Data and monitoring requirements.**

10.11.3.1. Normally, in Fault Management (Incident Management) several roles and support levels interact:

10.11.3.2. With the help of monitoring and its alarms the Operations Center (Control Room that will take place in Ogero NOC, Bir Hassan) detects a fault. It is responsible for opening a "ticket" and coordinating troubleshooting actions. It collects as much information and diagnostics as possible to try to categorize the issue and, where possible, to resolve it instantly. This is known as 1st Level Support. Then it tracks the incidents until their resolution.

10.11.3.3. If the fault cannot be sufficiently categorized, Vendors' Operations Center shall call out a maintenance team, That should analyse and try to resolve the fault on-site (1st Level Support). Their knowledge and access rights may be not sufficient in some situations, but they can fix most faults to an adequate level. If 1st Level Support is not able to resolve the incident right away, it will escalate it to 2nd Level Support. This consists of solar PV engineers or Project/Account Managers who have greater technical skills, higher access permissions, and enough time to analyze the fault in depth.

10.11.3.4. If an incident requires special expertise, engineers might need to contact experts, based on their seniority and experience.

10.11.3.5. When the fault is solved, the Operations Center closes the ticket.

10.11.3.6. The O&M service provider is responsible for being the main interface over the lifetime of the O&M contract.

10.11.3.7. Ogero should be able to contact the Operations team via a hotline during daytime, when the system is expected to generate electricity.

10.11.3.8. The O&M service provider ensures that the performance monitoring is done correctly. In general, the data, provided by the monitoring system, should be analyzed at the following levels:

- Portfolio level (group of plants) under control of the O&M service provider.
- Plant level.
- Rectifier level.
- String level if needed.

10.11.3.9. The O&M service provider shall perform analysis to show the required data on the levels listed above and for different time aggregation periods from the actual recording interval up to monthly and quarterly levels.

10.11.3.10. The analysis should also include the option for having custom alarms based on client specific thresholds such as business plan data or real-time deviations between inverters on-site. In particular, the agreed KPIs should be calculated and reported.

10.11.3.11. An essential part of Operations is the analysis of all the information generated throughout O&M, such as Response Time, and how this correlates to the various classifications of events and root causes to optimize the O&M. Another vital part of Operations is the analysis of various interventions, categorized into materials and labor.

10.11.3.12. Having such information helps to further optimize the asset by reducing production losses and the cost of O&M itself.

10.11.3.13. The Operations team shall control the plant remotely and may, at his own cost, use smart objects to operate breakers/controls on site to minimize the intervention of maintenance personnel on site.

10.11.3.14. The O&M service provider is responsible for the remote plants controls or emergency shutdown of the plant and in accordance with the respect requirements.

10.12. Key Performance Indicators

Based on the monitoring system, the vendor shall be able to provide Solar PV power plant KPIs that include important indicators such as:

10.12.1. Performance Ratio (PR), which is the energy generated divided by the energy obtainable under ideal conditions expressed as a percentage,

10.12.2. Uptime (or Technical Availability) which are parameters that represent, as a percentage, the time during which the plant operates over the total possible time it is able to operate.

10.12.3. Solar PV power plant KPIs, directly reflecting the performance of the solar PV power plant;

10.12.4. O&M service provider KPIs, assessing the performance of the O&M service provided, and solar PV power plant/O&M service provider KPIs, which reflect power plant performance and O&M service quality at the same time.

10.12.5. The vendor shall develop preventive or corrective actions to enhance the KPI parameters

10.12.6. **O&M KPIs include:**

- Acknowledgement Time (the time between the alarm and the acknowledgement).
- Intervention Time (the time between acknowledgement and reaching the plant by a technician).
- Resolution Time (the time to resolve the fault starting from the moment of reaching the solar PV power plant).
- Acknowledgement Time plus Intervention Time are called Response Time, an indicator that reflects vendors' performance.
- The most important KPI which reflects solar PV power plant performance and O&M service quality at the same time is the Contractual Availability.'
- While Uptime (or Technical Availability) reflects all downtimes regardless of the cause, Contractual Availability involves certain exclusion factors to account for downtimes not attributable to the O&M service provider (such as force majeure), a difference important for contractual purposes.

10.13. Relevant Norms and recommendations

General O&M activities EN 13306 IEC 62446 - 1: 2016 IEC 62446 - 2 IEC 63049: 2017 IEC 60364 - 7 - 712: 2017 IEC 62548

System performance and monitoring IEC 61724 - 1: 2017 IEC 61724 - 2: 2016 IEC 61724 - 3: 2016 IEC 61724 - 4 IEC 63019: 2019 ISO 6847: 1992

Specialized technical inspections IEC TS 62446 - 3: 2017 IEC 61829: 2015 IEC TS 60904 - 13: 2018

Other supporting standards IEC TS 61836 IEC TS 62738: 2018 IEC TR 63149: 2018 IEC TS 62548 IEC 60891: 2009 IEC 61853 - 1: 2011 IEC 61853 - 2: 2016 IEC 61853 - 3: 2018 IEC 61853 - 4: 2018 IEC 60904 - 5: 2011 IEC 60904

10.14. Service Level Agreement (SLA):

Successful tenderer shall manage the following service level agreement:

Description of case priorities

Priority
Critical – System faulty Outage, Service degradation for more than 40%.
High - Service faulty degradation more than 20%.
Medium - Service faulty degradation of less than 20%.
Low - Technical Query

SLA Requirement:

Response times are listed below in relation to the corresponding priority and O&M plan

Priority - Support Window - Response Time	**Restoration Time**
Critical - 24x7 - 15 Mins	4 hrs, 98%
High - 24x7 - 30 Mins	10 hrs, 98%
Medium - 24x7 - 1 hour	18 hours 90%
Low - 5x8, On Call OOB - 4 hour	2 CD, 90%
Business Hours are from 8:00 AM to 5:00 PM Monday through Friday excluding holidays.	
OOB – Out Of Business Hours	
Response time indicates the interval from the time when the fault is monitored/registered/raised to the latest time when MSP confirms the support request with the customer.	
Restoration Time indicates time interval when Service Provider acknowledge the Service Request/ Incident Ticket to the time the service mentioned is restored	
The O&M system needs to comply with the above SLA.	
Spare Part Management Service	
Vendor shall manage operational flow of spare parts, including storage, warehouse coordination, and distribution of the critical service parts within agreed short lead-time. It mainly includes the followings:	
Spare parts pool location setup	
Replenishment of Faulty Spares replaced from Premises, do RMA with OEM vendor	
Replacement of hardware as per WO created by Monitoring Team in given time frame to comply with SLA.	
Categories - Fulfillment Rates	**Service Availability - Lead-time**
Critical Parts - 95%	7*24 - 4 hours
Non-critical parts - 95%	5*8 - Next Business Day
	(09:00 - 17:00, business days)
Repair and Return Parts	The Vendor shall be able to repair and return parts within 3 month. If required by Ogero, the contractor shall be able to have in stock enough spare parts to keep the system in Service and the services active, based on agreed prices by both parties.

ملحق رقم ٧

جدول الكميات والاسعار والمراكز للمجموعات الأربعة

List of Sites and BoQ for four areas:

Site	CO	Region LOT1	PV Required or Not	Power (4/6/10KW)	Installation (Ground/Flat Roof/Slope Roof)
Aboudieh	CO	AAKAR	PV Required	4	Slope Roof
Akkar El Atika	CO	AAKAR	PV Required	4	Slope Roof
Akroum	CO	AAKAR	PV Required	4	Slope Roof
Arida	CO	AAKAR	PV Required	4	Slope Roof
Deir Jannine	CO	AAKAR	PV Required	4	Slope Roof
Fneideck	CO	AAKAR	PV Required	4	Slope Roof
Rahbe	CO	AAKAR	PV Required	4	Slope Roof
Wadi Khaled	CO	AAKAR	PV Required	4	Slope Roof
Hrar	CO	NORTH	PV Required	4	Slope Roof
Kahf El Malloul	CO	NORTH	PV Required	4	Slope Roof
Minie	CO	NORTH	PV Required	4	Slope Roof
Boustan	Active Cab	NORTH	PV not Required	4	Flat Roof
Btourrmaz	Active Cab	NORTH	PV not Required	4	Flat Roof
Danbo	Active Cab	NORTH	PV not Required	4	Flat Roof
Izal	Active Cab	NORTH	PV not Required	4	Flat Roof
Mar elias	CO	NORTH	PV not Required	4	
Sawaqi	CO	NORTH	PV not Required	4	
Sfire	CO	NORTH	PV not Required	4	
Andkit	CO	AAKAR	PV Required	6	Slope Roof
Beino	CO	AAKAR	PV Required	6	Slope Roof
Chadra	CO	AAKAR	PV Required	6	Slope Roof
Dahr Lassini	CO	AAKAR	PV Required	6	Flat Roof
Hissah	CO	AAKAR	PV Required	6	Slope Roof
Machta Hammoud	CO	AAKAR	PV Required	6	Slope Roof
Mounjez	CO	AAKAR	PV Required	6	Slope Roof
Tleil	CO	AAKAR	PV Required	6	Slope Roof
Abdelleh	CO	NORTH	PV Required	6	Flat Roof
Abdine	CO	NORTH	PV Required	6	Slope Roof
Abrine	CO	NORTH	PV Required	6	Slope Roof

Alma	CO	NORTH	PV Required	6	Slope Roof
Arjess	CO	NORTH	PV Required	6	Slope Roof
Arz	CO	NORTH	PV Required	6	Slope Roof
Assia	CO	NORTH	PV Required	6	Slope Roof
Berkayel	CO	NORTH	PV Required	6	Slope Roof
Bkorzla	CO	NORTH	PV Required	6	Slope Roof
Boqsmaya	CO	NORTH	PV Required	6	Slope Roof
Btourram	CO	NORTH	PV Required	6	Slope Roof
Chabtine	CO	NORTH	PV Required	6	Flat Roof
Deddeh	CO	NORTH	PV Required	6	Slope Roof
Hadchit	CO	NORTH	PV Required	6	Flat Roof
Hamat	CO	NORTH	PV Required	6	Slope Roof
Hardine	CO	NORTH	PV Required	6	Slope Roof
Hasroun	CO	NORTH	PV Required	6	Flat Roof
Hossnieh	CO	NORTH	PV Required	6	Slope Roof
Ijbaa	CO	NORTH	PV Required	6	Slope Roof
Kalamoun	CO	NORTH	PV Required	6	Slope Roof
Kfar Habou	CO	NORTH	PV Required	6	Slope Roof
Kfar Hilda	CO	NORTH	PV Required	6	Slope Roof
Kfarhatta	CO	NORTH	PV Required	6	Slope Roof
Kfer Zeina	CO	NORTH	PV Required	6	Slope Roof
Kfour El Arabi	CO	NORTH	PV Required	6	Slope Roof
Kousba	CO	NORTH	PV Required	6	Flat Roof
Miriata	CO	NORTH	PV Required	6	Slope Roof
Miziara	CO	NORTH	PV Required	6	Slope Roof
Nimrine	CO	NORTH	PV Required	6	Slope Roof
Sahel Akkar	CO	NORTH	PV Required	6	Slope Roof
Sebaal	CO	NORTH	PV Required	6	Flat Roof
Seraal	CO	NORTH	PV Required	6	Slope Roof
Smar Jbeil	CO	NORTH	PV Required	6	Slope Roof
Tannourine	CO	NORTH	PV Required	6	Slope Roof
Kour	CO	NORTH	PV not Required	6	
Sourat	CO	NORTH	PV not Required	6	
Biri	CO	AAKAR	PV Required	10	Slope Roof
Kobayat	CO	AAKAR	PV Required	10	Flat Roof
Bakhoun	CO	NORTH	PV Required	10	Slope Roof
Bchaale	CO	NORTH	PV Required	10	Flat Roof
Bebnine	CO	NORTH	PV Required	10	Slope Roof
Becharre	CO	NORTH	PV Required	10	Flat Roof
Douma	CO	NORTH	PV Required	10	Slope Roof
Ehden	CO	NORTH	PV Required	10	Slope Roof
Samrieh	CO	NORTH	PV Required	10	Slope Roof
Sir Ed Dannyeh	CO	NORTH	PV Required	10	Flat Roof

		#1A: 4 KW NO Solar system	North Area					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	7		
					Total Quantity	Unit Price	Total Price	Wording
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	0	0			
2	DCS.0001	DC SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	7			
3	ESS.0001	Energy Storage System - 40 KWH - 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, total size of 40 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD, 35 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1	7			
4	ACS.0001	AC Switch panel (Main Switch Panel)	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories.	1	7			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	7			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	7			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	1	7			
8	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	2	14			
9	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -	1	7			
10		Efficient cooling system including the following:						
10.1	CU.0001		Active 48VDC Cooling unit, split type, made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	14			
10.2	FCU.0001		FREE Cooling unit complete with all its parts/units, as defined in the project specifications	1	7			
10.3	CCS.001		Cooling control system, complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	7			
		Civil Works and cabling:						
C1 1.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	3	42			
C1 1.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	4	24			
C1 1.3	CIV.0003							

11		DC power Cable						
11.1	CAB.0001	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,171A ,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	280			
11.2	CAB.0002	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Black,171 A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	280			
12		AC Cable						
12.1	CAB.0003	Power Cable,300V,UL2464,4x20A WG,Black(4Cores:Yellow,G reen,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, double AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	140			
13		Steel Structure Installation including Conrete bases and/or wall fixings.						
13.1		Hollow Rectangular Steel Shafts - 10 cm x 5cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey, anti corrosion coated. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0	0			
13.2		Hollow Rectangular Steel Shafts - 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey, anti corrosion coated. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0	0			
13.3		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	0	0			
14		Accessories	Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years	1	7			
14.1			Irradiation monitor & accessories	1	7			
15		General Provisions						
15.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	7			
15.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	7			
	1A 2/2	TOTAL US Dollars						

		VAT						
		TOTAL+VAT US Dollars						

		#2A: 6 KW NO Solar system	**North Area**					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	2		
					Total Quantity	Unit Price	Total Price	
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	0	0			
2	DCS.0001	DC SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	2			
3	ESS.0001	Energy Storage System - 60 KWh 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank. size 60 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD, 25 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1	2			
4	ACS.0001	ACSwitch panel Main Switch Panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories.	1	2			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	2			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	2			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	1	2			
8	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	1	2			
9	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -					
10.1	CU.0001	Efficient cooling system including the following:	Active 48VDC Cooling unit, split type, made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	4			
10.2	FCU.0001		FREE Cooling unit complete with all its parts/units, as defined in the project specfications	1	2			
10.3	CCS.001		Cooling control system, complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	2			
		Civil Works and cabling:						
C11.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	1	14			

CI 1.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	2	6			
CI 1.3	CIV.0003							
11		DC Cable						
11.1	CAB.0001	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,171A ,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	80			
11.2	CAB.0002	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Black,171 A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	80			
12		AC Cable						
12.1	CAB.0003	Power Cable,300V,UL2464,4x20A WG,Black(4Cores:Yellow,G reen,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, double AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	40			
13		Steel Structure Installation including Conrete bases and/or wall fixings.						
13.1		Hollow Rectangular Steel Shafts - 10 cm x 5 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0	0			
13.2		Hollow Rectangular Steel Shafts - 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0	0			
13.3		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	0	0			
14		Accessories	Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years	1	2			
14.1			Irradiation monitor & accessories	1	2			
15		General Provisions						
15.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	2			
15.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including	1	2			

			but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.					
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

		#3A: 4 KW Photovoltaic System	**North Area**					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	11		
					Total Quantity	Unit Price	Total Price	Wording
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	16	176			
2	DCS.0001	DC HYBRID SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	11			
3	ESS.0001	Energy Storage System - 40 KWh 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, total size 40 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD @25 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1	11			
4	ACS.0001	ACSwitch panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories. As per site power requirements	1	11			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	11			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	11			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	1	11			
8	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	1	11			
9	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -	1	11			
10.1	CU.0001	Efficient cooling system including the following:	Active 48VDC Cooling unit, split type, made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	22			
10.2	FCU.0001		FREE Cooling unit complete with all its parts/units, as defined in the project specfications	1	11			
10.3	CCS.001		Cooling control system, complete with connection and sensors as defined in the specifications.	1	11			

			Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design					
		Civil Works and cabling:						
C10.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	5	70			
C10.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	5	30			
C10.3	CIV.0003							
10		DC Cable						
10.1	CAB.0001	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,171A ,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	440			
10.2	CAB.0002	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Black,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	440			
11		AC Cable						
11.1	CAB.0003	Power Cable,300V,UL2464,4x20AWG,Black(4Cores:Yellow,Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, 4 poles AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	220			
12		Steel Structure Installation including Conrete bases and/or wall fixings. Installation including Conrete bases and/or wall fixings.						
12.1		Hollow Rectangular Steel Shafts 10 cm x 5 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading. lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	18	198			
12.2		Hollow Rectangular Steel Shafts 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	30	330			
12.3		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	72	792			
13		Accessories						
13.1			Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years	1	11			
13.2			Irradiation monitor & accessories	1	11			

14		General Provisions						
14.1		Design Drawing, PAT, and As-Built Drawings.	The rate of drawings shall include the preparation of design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	11			
14.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	11			
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

		#4A: 6 KW Photovoltaic System	**North Area**					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	42		
					Total Quantity	Unit Price	Total Price	Wording
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	24	1008			
2	DCS.0001	DC SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	42			
3	ESS.0001	Energy Storage System - 60 KWh 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, size 60 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD @25 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1	42			
4	ACS.0001	ACSwitch panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories. As per site power requirements	1	42			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	42			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	42			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type. 65 A DC	1	42			
8	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	1	42			
9	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD					

			according to IEC 61643-11 -						
10.1	CU.0001	Efficient cooling system including the following:	Active 48VDC Cooling unit, split type, made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	84				
10.2	FCU.0001		FREE Cooling unit complete with all its parts/units, as defined in the project specfications	1	42				
10.3	CCS.001		Cooling control system, complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	42				
		Civil Works and Cabling:							
C10.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	20	280				
C10.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	20	120				
C10.3	CIV.0003								
10		DC Cable							
10.1	CAB.0001	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	1680				
10.2	CAB.0002	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Black,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	1680				
11		AC Cable							
11.1	CAB.0003	Power Cable,300V,UL2464,4x20AWG,Black(4Cores:Yellow,Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, 4 poles AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	840				
12		Steel Structure Installation including Conrete bases and/or wall fixings.							
12.1		Hollow Rectangular Steel Shafts - 10 cm x 5 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	30	1260				
		Hollow Rectangular Steel Shafts 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure	42	1764				

			needs to be designed to withstand wind loads as per NL 137:2020.					
		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	96	4032			
13		Accessories Installation						
13.1		Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years		1	1			
13.2		Irradiation monitor & accessories		1	1			
14		General Provisions						
14.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	42			
14.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	42			
	IA 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

		#5A: 10 KW Photovoltaic System	**North Area**					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	10		
					Total Quantity	Unit Price	Total Price	Wording
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	24	240			
2	DCS.0001	DC SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	10			
3	ESS.0001	Energy Storage System - 100 KWh 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, size 100 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD @25 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1	10			
4	ACS.0001	ACSwitch panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories. As per site power requirements	1	10			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	10			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	10			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	1	10			
8	SPD000	Surge protective device	AC, surge protective devices SPD type 2 protect	1	10			

	1		low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA					
9	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -	1	10			
10.1	CU.0001	Efficient cooling system including the following:	Active 48VDC Cooling unit, split type, made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	20			
10.2	FCU.0001		FREE Cooling unit complete with all its parts/units, as defined in the project specfications	1	10			
10.3	CCS.001		Cooling control system, complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	10			
		Civil Works and Cabling:						
C10.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	10	140			
C10.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	10	60			
C10.3	CIV.0003							
10		DC Cable						
10.1	CAB.0001	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,171A ,LSZH Cable.VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	400			
10.2	CAB.0002	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Black,171 A,LSZH Cable.VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	400			
11		AC Cable						
11.1	CAB.0003	Power Cable,300V,UL2464,4x20AWG,Black(4Cores:Yellow,Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, 4 poles AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	200			
12		Steel Structure Installation including Conrete bases and/or wall fixings.						
12.		Hollow Rectangular Steel	Steel for high structure support for PV panels, for	30	300			

1		Shafts - 10 cm x 5 cm	applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on each site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.					
		Hollow Rectangular Steel Shafts 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on each site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	42	420			
		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	96	960			
13		Accessories Installation						
13.1		Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years		1	10			
13.2		Irradiation monitor & accessories		1	10			
14		General Provisions						
14.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	10			
14.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	10			
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

		#6A: 4 KW Remote Outdoor LTE (Optional)	**North Area**					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	5		
					Total Quantity	**Unit Price**	**Total Price**	Wording
		Electrical Components:						
1.0	MOD.0001	Outdoor cabinet	Capable to host the inverter and new ESS system. Should have a heat exchanger and/or DC cooling system to maintain the temperature below 35 Celsius	1.00	5.00			
2.0	INV.0001	AC Hybrid System	Hybrid Controller / Hybrid Off-Grid Inverte, Max generator Power (DC) 35000 Wp solar generator, max input voltage 1000 V, AC rated power (at 230 V 50 Hz) 25000 W, AC nominal voltage 3/N/PE: 220 V / 380 V, Efficieny 95% ~ 99%, Operating temperature range – 25°C to +60°C, Max output current/ rated output current >36 A / Phase,three phase output with power factor = 1 at rated power. Degree of protection (as per IEC 60529) IP65, Interface: Ethernet / WLAN / RS485	1.00	5.00			

			Data interface: SMA Modbus / SunSpec / Modbus / Speedwire, Webconnect. Off-grid capable / Fuel Save Controller compatible. Input-side disconnection device Ground fault monitoring / grid monitoring DC reverse polarity protection / AC short-circuit current capability / galvanically isolated All-pole sensitive residual-current monitoring unit Protection class (according to IEC 62109-1) /overvoltage category (according to IEC 62109-1) AC/DC surge arrester. Reverse Power Protection with Diesel Generator. And all needed control accessories including RG45 cables, connection to Diesel generator...					
3.0	ESS.0001	Energy Storage System - 40 KWh 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, size 40 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD @35 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1.00	0.00			
4.0	ACS.0001	ACSwitch panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories. As per site power requirements	1.00	5.00			
5.0	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1.00	5.00			
6.0	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	2.00	10.00			
7.0	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	2.00	10.00			
8.0	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	2.00	10.00			
9.0	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -	0.00	0.00			
		Civil Works and Cabling:						
C10.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	2	28			
C10.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	2	12			
C10.3	CIV.0003							
10.0		**DC Cable**	-					
10.1	CAB.0001	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,171A ,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	10.00	50.00			
10.2	CAB.0002	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Black,171	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that	10.00	50.00			

		A,LSZH Cable,VDE,UL (Unit:meter)	might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.					
11.0		**AC Cable**	-					
11.1	CAB.0003	Power Cable,300V,UL2464,4x20AWG,Black(4Cores:Yellow,Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, 4 poles AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20.00	100.00			
12.0		Steel Structure Installation including Conrete bases and/or wall fixings.	-					
12.1		Hollow Rectangular Steel Shafts - 10 cm x 5 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on each site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0.00	0.00			
		Hollow Rectangular Steel Shafts 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on each site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0.00	0.00			
		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	0.00	0.00			
13.0		**Accessories**						
13.1		Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years		1.00	5.00			
13.2		Irradiation monitor & accessories		1.00	5.00			
14.0		**General Provisions**						
14.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1.00	5.00			
14.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1.00	5.00			
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

Description: Install and O&M of Solar system in North area	ity	Within the first year of Warranty	Second year of Warranty	For first year After Warranty	For second year after Warranty	
Total cost of installation, copy from tables above (1A 2/2)						
Operate, Support and Maintenance for 4KW with PV Panels	**11**					
Operate, Support and Maintenance for 4KW without PV Panels	**7**					
Operate, Support and Maintenance for 6KW with PV Panels)	**42**					
Operate, Support and Maintenance for 6KW without PV Panels	**2**					
Operate, Support and Maintenance for 10KW with PV Panels	**10**					
Operate, Support and Maintenance for 4KW Remote LTE Sites without PV Panels	**5**					
Supply and install concrete shelter (1.5m*1.5*2.3)to enclose outdoor battery cabinets. Walls thickness (12mm reinforced concrete grade 340kg/m3) with reinforced double sheet metal door and ventilation windows with metal net.	**5**					
Total Cost for Lot1 (sum of above)						
VAT						
Grand Total for Lot1						

Site	Type	Region LOT2	PV Required or Not	Power (4/6/10KW)	Installation (Ground/Flat Roof/Slope Roof)
Ain Hazir	CO	BEKAA	PV Required	4	Slope Roof
Cheikh Abdallah	CO	BEKAA	PV Required	4	Flat Roof
Shaat	CO	BEKAA	PV Required	4	Flat Roof
Sultan Yaacoub	CO	BEKAA	PV Required	4	Flat Roof
Labwe	CO, LTE	BEKAA	PV Required	4	Slope Roof
Aarsal - Remote	LTE	BEKAA	PV Required	4	Ground
Labwe - Remote 1	LTE	BEKAA	PV Required	4	Ground
Rachaya El wadi - Remote	LTE	BEKAA	PV Required	4	Ground
Aarsal - Repeater	LTE	BEKAA	PV not Required	4	Ground
Ain Aarab	LTE	BEKAA	PV not Required	4	Ground
Aita al fokhar	LTE	BEKAA	PV not Required	4	Ground
Baalbek - Hadath	LTE	BEKAA	PV not Required	4	Ground
Baalbek - Nahle	LTE	BEKAA	PV not Required	4	Ground
Bechwat	LTE	BEKAA	PV not Required	4	Ground

Btedehi	LTE	BEKAA	PV not Required	4	Ground
Bwadi	LTE	BEKAA	PV not Required	4	Ground
Bwerej	LTE	BEKAA	PV not Required	4	Ground
Chtaura - Aammiq	LTE	BEKAA	PV not Required	4	Ground
Daher el Ahmar	LTE	BEKAA	PV not Required	4	Ground
Haouch tal safiya	LTE	BEKAA	PV not Required	4	Ground
Hrebta	LTE	BEKAA	PV not Required	4	Ground
Iaat	LTE	BEKAA	PV not Required	4	Ground
Jdeidet el Fakiha	LTE	BEKAA	PV not Required	4	Ground
Kfar danis	LTE	BEKAA	PV not Required	4	Ground
Khoraibe	LTE	BEKAA	PV not Required	4	Ground
Knaisseh	LTE	BEKAA	PV not Required	4	Ground
Labwe - Remote 2	LTE	BEKAA	PV not Required	4	Ground
Lebaya	LTE	BEKAA	PV not Required	4	Ground
Madoukha	LTE	BEKAA	PV not Required	4	Ground
Mrah semaan	LTE	BEKAA	PV not Required	4	Ground
Mreijat	LTE	BEKAA	PV not Required	4	Ground
Nabi Osman	LTE	BEKAA	PV not Required	4	Ground
Qornet beit lattouf	LTE	BEKAA	PV not Required	4	Ground
Shlifa	LTE	BEKAA	PV not Required	4	Ground
Souayri	LTE	BEKAA	PV not Required	4	Ground
Srire	LTE	BEKAA	PV not Required	4	Ground
Sultan Yaacoub - Rafid	LTE	BEKAA	PV not Required	4	Ground
Tallet el Hadath	LTE	BEKAA	PV not Required	4	Ground
Tallet Karha	LTE	BEKAA	PV not Required	4	Ground
Tallet Makneh	LTE	BEKAA	PV not Required	4	Ground
Younin	LTE	BEKAA	PV not Required	4	Ground
Baalbek - Ras el Ain	LTE	BEKAA	PV not Required	4	Ground
Chmistar - Rayak	LTE	BEKAA	PV not Required	4	Ground
Dar al wessaa	LTE	BEKAA	PV not Required	4	Ground
Dora el nahel	LTE	BEKAA	PV not Required	4	Ground
Joub Jannine - Army	LTE	BEKAA	PV not Required	4	Ground
Joub Jannine - Saray	LTE	BEKAA	PV not Required	4	Ground
Kamed el laouz	LTE	BEKAA	PV not Required	4	Ground
Kefraya	LTE	BEKAA	PV not Required	4	Ground
Khoder	LTE	BEKAA	PV not Required	4	Ground
Lala	LTE	BEKAA	PV not Required	4	Ground
Rachaya El Wadi - GSM	LTE	BEKAA	PV not Required	4	Ground
Tallet Kalil	LTE	BEKAA	PV not Required	4	Ground
Beit Lahia	Shelter	BEKAA	PV not Required	4	Ground
Chmistar - Remote	Shelter	BEKAA	PV not Required	4	Ground
Deir el aashayer	Shelter	BEKAA	PV not Required	4	Ground
Kasser	Shelter	BEKAA	PV not Required	4	Ground
Kfar kouk	Shelter	BEKAA	PV not Required	4	Ground
Maidoun	Shelter	BEKAA	PV not Required	4	Ground
Ain Ata	CO	BEKAA	PV Required	6	Slope Roof

Anjar	Co	BEKAA	PV Required	6	Slope Roof
Annabi Chit	CO	BEKAA	PV Required	6	Slope Roof
Arsal	CO	BEKAA	PV Required	6	Slope Roof
Brital	CO	BEKAA	PV Required	6	Slope Roof
Chlifa	CO	BEKAA	PV Required	6	Slope Roof
Chmistar	CO	BEKAA	PV Required	6	Flat Roof
El Kaah	CO	BEKAA	PV Required	6	Slope Roof
El Labwi	CO	BEKAA	PV Required	6	Slope Roof
Fissane	CO	BEKAA	PV Required	6	Slope Roof
Ghazze	CO	BEKAA	PV Required	6	Slope Roof
Hermel	CO	BEKAA	PV Required	6	Flat Roof
Kawakaba-Bekaa	CO	BEKAA	PV Required	6	Slope Roof
Khorbet Kanafar	CO	BEKAA	PV Required	6	Slope Roof
Koussaya	CO	BEKAA	PV Required	6	Slope Roof
Machghara	CO	BEKAA	PV Required	6	Flat Roof
Rachaya El Wadi	CO	BEKAA	PV Required	6	Flat Roof
Ras baalbek	CO	BEKAA	PV Required	6	Flat Roof
Rayak	CO	BEKAA	PV Required	6	Flat Roof
Saadnayel	CO	BEKAA	PV Required	6	Slope Roof
Saghbine	CO	BEKAA	PV Required	6	Slope Roof
Sohmor/Yohmor	CO	BEKAA	PV Required	6	Slope Roof
Talia	CO	BEKAA	PV Required	6	Slope Roof
Terboul	CO	BEKAA	PV Required	6	Slope Roof
Yanta	CO	BEKAA	PV Required	6	Slope Roof
Bednayel	CO, LTE	BEKAA	PV Required	6	Slope Roof
Chaat	CO, LTE	BEKAA	PV Required	6	Flat Roof
Jdeidet Bekaa	CO, LTE	BEKAA	PV Required	6	Flat Roof
Yammouneh	CO, LTE	BEKAA	PV Required	6	Slope Roof
Zboud	CO, LTE	BEKAA	PV Required	6	Slope Roof
Jdeidet el Bekaa	LTE	BEKAA	PV Required	6	Ground
Qaah	LTE	BEKAA	PV Required	6	Ground
Aarsal - Municipality	LTE	BEKAA	PV not Required	6	Ground
Ali el Nahri	CO	BEKAA	PV Required	10	Slope Roof
Deir El Ahmar	CO	BEKAA	PV Required	10	Slope Roof
Fourzol	CO	BEKAA	PV Required	10	Slope Roof
Kab Elias	CO	BEKAA	PV Required	10	Slope Roof
karaaoun	CO	BEKAA	PV Required	10	Slope Roof
Joub Jannine	CO	BEKAA	PV Required	10	Slope Roof
Aynata	CO, LTE	BEKAA	PV Required	10	Slope Roof
Maalka	CO, LTE	BEKAA	PV Required	10	Flat Roof

		#1A: 4 KW NO Solar system	Beqaa Area					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	6		
					Total Quantity	Unit Price	Total Price	Wording
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	0	0			
2	DCS.0001	DC SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	6			
3	ESS.0001	Energy Storage System - 40 KWH - 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, total size of 40 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD, 35 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1	6			
4	ACS.0001	AC Switch panel (Main Switch Panel)	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories.	1	6			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	6			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	6			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	1	6			
8	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	2	12			

9	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -	1	6			
10		Efficient cooling system including the following:						
10.1	CU.0001		Active 48VDC Cooling unit, split type, made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	12			
10.2	FCU.0001		FREE Cooling unit complete with all its parts/units, as defined in the project specfications	1	6			
10.3	CCS.001		Cooling control system, complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	6			
		Civil Works and cabling:						
C1 1.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	6	42			
C1 1.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	6	18			
C1 1.3	CIV.0003							
11		DC power Cable						
11.1	CAB.0001	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	240			
11.2	CAB.0002	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Black,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	240			
12		AC Cable						

12.1	CAB.000 3	Power Cable,300V,UL2464, 4x20AWG,Black(4Cores:Yellow,Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, double AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	120				
13		Steel Structure Installation including Conrete bases and/or wall fixings.							
13.1		Hollow Rectangular Steel Shafts - 10 cm x 5cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey, anti corrosion coated. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0	0				
13.2		Hollow Rectangular Steel Shafts - 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey, anti corrosion coated. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0	0				
13.3		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	0	0				
14		Accessories	Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years	1	6				
14.1			Irradiation monitor & accessories	1	6				
15		General Provisions							
15.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	6				
15.2		Testing & Commissioning	The rate of testing and commissioning shall include labor, tools, works,	1	6				

		including software installation	materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.					
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

		#2A: 6 KW NO Solar system	**Beqaa Area**					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	1		
					Total Quantity	Unit Price	Total Price	Wording
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	0	0			
2	DCS.0001	DC SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	1			
3	ESS.0001	Energy Storage System - 60 KWh 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, size 60 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD, 25 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1	1			
4	ACS.0001	ACSwitch panel Main Switch Panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories.	1	1			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	1			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	1			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	1	1			
8	SPD0001	Surge protective	AC, surge protective devices SPD type	1	1			

		device	2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA					
9	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -					
10.1	CU.0001	Efficient cooling system including the following:	Active 48VDC Cooling unit, split type, made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	2			
10.2	FCU.0001		FREE Cooling unit complete with all its parts/units, as defined in the project specfications	1	1			
10.3	CCS.001		Cooling control system, complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	1			
		Civil Works and Cabling:						
C1 1.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	1	14			
C1 1.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	1	6			
C1 1.3	CIV.0003							
11		DC Cable						
11.1	CAB.0001	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	40			
11.2	CAB.0002	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Bla	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder	40	40			

		ck,171A,LSZH Cable,VDE,UL (Unit:meter)	that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.						
12		AC Cable							
12.1	CAB.000 3	Power Cable,300V,UL2464, 4x20AWG,Black(4Cores:Yellow,Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, double AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	20				
13		Steel Structure Installation including Conrete bases and/or wall fixings.							
13.1		Hollow Rectangular Steel Shafts - 10 cm x 5 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0	0				
13.2		Hollow Rectangular Steel Shafts - 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0	0				
13.3		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	0	0				
14		Accessories	Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years	1	1				
14.1			Irradiation monitor & accessories	1	1				
15		General Provisions							
15.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings,	1	1				

			required modifications, equipments selection, and supporting documents and calculations.					
15.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	1			
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

		#3A: 4 KW Photovoltaic System	**Beqaa Area**					
Ord. Nr.	TARIFF	Item	Description		Nbr of Sites	8		
				Quantity	Total Quantity	Unit Price	Total Price	Wording
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	16	128			
2	DCS.0001	DC HYBRID SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	8			
3	ESS.0001	Energy Storage System - 40 KWh 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, total size 40 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD @25 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1	8			
4	ACS.0001	ACSwitch panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories. As per site power requirements	1	8			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site	1	8			

			requirement.					
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	8			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	1	8			
8	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	1	8			
9	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -	1	8			
10.1	CU.0001	Efficient cooling system including the following:	Active 48VDC Cooling unit, split type, made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	16			
10.2	FCU.0001		FREE Cooling unit complete with all its parts/units, as defined in the project specfications	1	8			
10.3	CCS.001		Cooling control system, complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	8			
		Civil Works and Cabling:						
C1 1.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	8	56			
C1 1.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness). buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	8	32			
C1 1.3	CIV.0003							
10		DC Cable						
10.1	CAB.0001	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blu	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder	40	320			

		e,171A,LSZH Cable,VDE,UL (Unit:meter)	that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.					
10.2	CAB.0002	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Black,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	320			
11		AC Cable						
11.1	CAB.0003	Power Cable,300V,UL2464, 4x20AWG,Black(4Cores:Yellow,Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, 4 poles AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	160			
12		Steel Structure Installation including Conrete bases and/or wall fixings.						
12.1		Hollow Rectangular Steel Shafts 10 cm x 5 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	18	144			
12.2		Hollow Rectangular Steel Shafts 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	30	240			
12.3		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating	72	576			

			of the steel.					
13		Accessories						
13.1			Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years	1	8			
13.2			Irradiation monitor & accessories	1	8			
14		General Provisions						
14.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	8			
14.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	8			
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

		#4A: 6 KW Photovoltaic System	**Beqaa Area**					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	32		
					Total Quantity	Unit Price	Total Price	Wordi ng
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	24	768			
2	DCS.0001	DC SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	32			
3	ESS.0001	Energy Storage	Li-ion cyclic battery bank, size 60	6	192			

		System - 60 KWh 48V & Cabinet/Rack/Accessories/Sensors	KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD @25 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.					
4	ACS.0001	ACSwitch panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories. As per site power requirements	1	32			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	32			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	32			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	1	32			
8	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	1	32			
9	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -					
10.1	CU.0001	Efficient cooling system including the following:	Active 48VDC Cooling unit, split type, made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	64			
10.2	FCU.0001		FREE Cooling unit complete with all its parts/units, as defined in the project specfications	1	32			
10.3	CCS.001		Cooling control system, complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	32			
		Civil Works and Cabling:						

C1 1.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	32	220			
C1 1.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	32	96			
C1 1.3	CIV.0003							
10		DC Cable						
10.1	CAB.0001	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	1280			
10.2	CAB.0002	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Black,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	1280			
11		AC Cable						
11.1	CAB.0003	Power Cable,300V,UL2464, 4x20AWG,Black(4Cores:Yellow,Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, 4 poles AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	640			
12		Steel Structure Installation including Conrete bases and/or wall fixings.						
12.1		Hollow Rectangular Steel Shafts - 10 cm x 5 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	30	960			
		Hollow Rectangular	Steel for high structure support for PV	42	1344			

		Steel Shafts 6 cm x 3 cm	panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.					
		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	96	3072			
13		Accessories						
13.1		Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years						
13.2		Irradiation monitor & accessories						
14		General Provisions						
14.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	32			
14.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	32			
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

		#5A: 10 KW Photovoltaic System	**Beqaa Area**					
Ord. Nr.	TARIFF	Item	Description	Quanti ty	Nbr of Sites	8		
					Total	Un	Tot	Wo

					Quantity	it Price	al Price	rding
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	24	192			
2	DCS.0001	DC SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	8			
3	ESS.0001	Energy Storage System - 100 KWh 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, size 100 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD @25 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1	8			
4	ACS.0001	ACSwitch panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories. As per site power requirements	1	8			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	8			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	8			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	1	8			
8	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	1	8			
9	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -	1	8			
10.1	CU.0001	Efficient cooling	Active 48VDC Cooling unit, split type,	2	16			

		system including the following:	made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications					
10.2	FCU.0001		FREE Cooling unit complete with all its parts/units, as defined in the project specfications	1	8			
10.3	CCS.001		Cooling control system, complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	8			
		Civil Works and Cabling:						
C1 1.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	8	56			
C1 1.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	8	24			
C1 1.3	CIV.0003							
10		DC Cable						
10.1	CAB.0001	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	320			
10.2	CAB.0002	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Black,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	320			
11		AC Cable						
11.1	CAB.0003	Power Cable,300V,UL2464, 4x20AWG,Black(4Cores:Yellow,Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, 4 poles AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length	20	160			

			to be determined from the remeasured site survey.					
12		Steel Structure Installation including Conrete bases and/or wall fixings.						
12.1		Hollow Rectangular Steel Shafts - 10 cm x 5 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on each site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	30	240			
		Hollow Rectangular Steel Shafts 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on each site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	42	336			
		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	96	768			
13		Accessories						
13.1		Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years		1	8			
13.2		Irradiation monitor & accessories		1	8			
14		General Provisions						
14.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	8			
14.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	8			

	IA 2/2	TOTAL US Dollars		Carried To Collection	2448	0	0	
		VAT						
		TOTAL+VAT US Dollars						

		#6A: 4 KW Remote Outdoor LTE	**Beqaa Area**					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	51		
					Total Quantity	Unit Price	Total Price	Wording
		Electrical Components:						
1	MOD.0001	Outdoor cabinet	Capable to host the inverter and new ESS system. Should have a heat exchanger and/or DC cooling system to maintain the temperature below 35 Celsius	1	51			
2	INV.0001	AC Hybrid System	Hybrid Controller / Hybrid Off-Grid Inverte, Max generator Power (DC) 35000 Wp solar generator, max input voltage 1000 V, AC rated power (at 230 V 50 Hz) 25000 W, AC nominal voltage 3/N/PE: 220 V / 380 V, Efficieny 95% ~ 99%, Operating temperature range – 25°C to +60°C, Max output current/ rated output current >36 A / Phase,three phase output with power factor = 1 at rated power. Degree of protection (as per IEC 60529) IP65, Interface: Ethernet / WLAN / RS485 Data interface: SMA Modbus / SunSpec / Modbus / Speedwire, Webconnect. Off-grid capable / Fuel Save Controller compatible. Input-side disconnection device Ground fault monitoring / grid monitoring DC reverse polarity protection / AC short-circuit current capability / galvanically isolated All-pole sensitive residual-current monitoring unit	1	51			

			Protection class (according to IEC 62109-1) /overvoltage category (according to IEC 62109-1) AC/DC surge arrester. Reverse Power Protection with Diesel Generator. And all needed control accessories including RG45 cables, connection to Diesel generator,..					
3	ESS.0001	Energy Storage System - 40 KWh 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, size 40 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD @35 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1	51			
4	ACS.0001	ACSwitch panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories. As per site power requirements	1	51			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	51			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	2	102			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	2	102			
8	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	2	102			
9	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -	0	0			
		Civil Works and Cabling:						
C1 1.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	51	357			
C1 1.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	51	153			

C1 I.3	CIV.0003							
10		DC Cable						
10.1	CAB.0001	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	10	510			
10.2	CAB.0002	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Black,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	10	510			
11		AC Cable						
11.1	CAB.0003	Power Cable,300V,UL2464, 4x20AWG,Black(4Cores:Yellow,Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, 4 poles AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	1020			
12		Steel Structure Installation including Conrete bases and/or wall fixings.					
12.1		Hollow Rectangular Steel Shafts - 10 cm x 5 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on each site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0	0			
		Hollow Rectangular Steel Shafts 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on each site survey. The structure needs to be designed to withstand wind loads as per	0	0			

			NL 137:2020.					
		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	0	0			
13		Accessories						
13.1		Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years		1	51			
13.2		Irradiation monitor & accessories		1	51			
14		General Provisions						
14.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	51			
14.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	51			
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

Commercial Template: Lot1 Description: Install and O&M of Solar system in Bekaa area	Quantity	Price $ Within the first year of Warranty	Within the Second year of Warranty	Price $ For first year After Warranty	Price $ For second year after Warranty	Wording
Total cost of installation, copy from tables above (1A 2/2)						
Operate, Support and Maintenance for 4KW with PV Panels	**8**					
Operate, Support and Maintenance for 4KW without PV Panels	**6**					
Operate, Support and Maintenance for 6KW with PV Panels)	**32**					

Operate, Support and Maintenance for 6KW without PV Panels	**1**					
Operate, Support and Maintenance for 10KW with PV Panels	**8**					
Operate, Support and Maintenance for 4KW Remote LTE Sites without PV Panels	**51**					
Supply and install concrete shelter (1.5m*1.5*2.3)to enclose outdoor battery cabinets. Walls thickness (12mm reinforced concrete grade 340kg/m3) with reinforced double sheet metal door and ventilation windows with metal net.	**51**					
Total Cost for Lot1 (sum of above)						
VAT						
Grand Total for Lot1						

Site	Type	Region **LOT3**	PV Required or Not	Power (4/6/10KW)	Installation (Ground/Flat Roof/Slope Roof)
Tarchich	Active Cabinet	ML2	PV not Required	4	Flat Roof
Faqra	CO	ML1	PV Required	4	Ground
Laklouk	CO	ML1	PV Required	4	Ground
Baskinta	CO	ML2	PV Required	4	Ground
Dbaiyeh	CO	ML2	PV Required	4	Ground
Kfar Akab	CO	ML2	PV Required	4	Flat Roof
Zaarour	CO	ML2	PV Required	4	Slope Roof
Salima	CO	ML2	PV not Required	4	Slope Roof
Amrousieh	CO	BEIRUT A	PV Required	4	Slope Roof
Btater	CO	ML3	PV Required	4	Ground
Deir couche	CO	ML3	PV Required	4	Slope Roof
Deir El Kamar	CO	ML3	PV Required	4	Ground
Kabr Chmoun	CO	ML3	PV Required	4	Ground
Kfar Aamay	CO	ML3	PV Required	4	Ground
Maaser Ech Chouf	CO	ML3	PV Required	4	Ground
Rechmaya	CO	ML3	PV Required	4	Ground
Hrajel Hill	LTE	ML1	PV Required	4	Ground
Meyrouba Water Tank	LTE	ML1	PV Required	4	Ground
Laklouk - Remote	LTE	ML1	PV not Required	4	Ground
Bentaail	LTE	ML1	PV not Required	4	Ground
Eddeh	LTE	ML1	PV not Required	4	Ground

Site	Type	Region **LOT3**	PV Required or Not	Power (4/6/10KW)	Installation (Ground/Flat Roof/Slope Roof)
Ain el Delbe	LTE	ML1	PV not Required	4	Ground
Ayoun Es simane - Slopes	LTE	ML1	PV not Required	4	Ground
Berket hjoula	LTE	ML1	PV not Required	4	Ground
Dahr el Hussein	LTE	ML1	PV not Required	4	Ground
Don Bosco	LTE	ML1	PV not Required	4	Ground
Kfar Baal	LTE	ML1	PV not Required	4	Ground
Taliet Hrajil	LTE	ML1	PV not Required	4	Ground
Wata el Joz	LTE	ML1	PV not Required	4	Ground
Dahr El Baidar	LTE	ML3	PV not Required	4	Ground
Kafar	not working old WLL	ML1	PV not Required	4	Ground
Araya	O=M/N	BEIRUT B	PV Required	4	Flat Roof
Beqaata	Shelter	ML1	PV not Required	4	Ground
Blat	Shelter	ML1	PV not Required	4	Ground
Bqaatouta	Shelter	ML1	PV not Required	4	Ground
Ehmez	Shelter	ML1	PV not Required	4	Ground
Feghal	Shelter	ML1	PV not Required	4	Ground
Hessarat	Shelter	ML1	PV not Required	4	Ground
Raachine	Shelter	ML1	PV not Required	4	Ground
Airport	Shelter	BEIRUT A	PV Required	4	Slope Roof
Aintoura-keserwan	Shelter	ML1	PV Required	4	Ground
Ghazir Shelter	Shelter	ML1	PV not Required	4	Ground
Aintoura	CO	ML2	PV Required	6	Ground
Bois de Boulogne	CO	ML2	PV Required	6	Slope Roof
Broumana	CO	ML2	PV Required	6	Ground
Bteghrine	CO	ML2	PV Required	6	Ground
Mansourieh	CO	ML2	PV Required	6	Ground
Ras El Metn	CO	ML2	PV Required	6	Slope Roof
Wadi Chahrour	CO	BEIRUT B	PV Required	6	Flat Roof
Aabey	CO	ML3	PV Required	6	Slope Roof
Ain Dara	CO	ML3	PV Required	6	Slope Roof
Ain Zhalta	CO	ML3	PV Required	6	Slope Roof
Bayssour	CO	ML3	PV Required	6	Flat Roof
Bhamdoun	CO	ML3	PV Required	6	Flat Roof
Chbanieh	CO	ML3	PV Required	6	Ground

Site	Type	Region **LOT3**	PV Required or Not	Power (4/6/10KW)	Installation (Ground/Flat Roof/Slope Roof)
Damour	CO	ML3	PV Required	6	Ground
Deir Koubel	CO	ML3	PV Required	6	Ground
Dibbiye	CO	ML3	PV Required	6	Slope Roof
Kornayel	CO	ML3	PV Required	6	Slope Roof
Mazraat Ech Chouf	CO	ML3	PV Required	6	Ground
Moukhtara	CO	ML3	PV Required	6	Flat Roof
Niha	CO	ML3	PV Required	6	Ground
Saofar	CO	ML3	PV Required	6	Ground
Aakoura	CO	ML1	PV Required	10	Flat Roof
Almat	CO	ML1	PV Required	10	Slope Roof
Annaya	CO	ML1	PV Required	10	Slope Roof
Ayoun Es simane	CO	ML1	PV Required	10	Slope Roof
Bejje	CO	ML1	PV Required	10	Flat Roof
Ehmej	CO	ML1	PV Required	10	Slope Roof
Fatka	CO	ML1	PV Required	10	Flat Roof
Fatri	CO	ML1	PV Required	10	Flat Roof
Ghabat	CO	ML1	PV Required	10	Slope Roof
Ghine	CO	ML1	PV Required	10	Flat Roof
Ghosta	CO	ML1	PV Required	10	Flat Roof
Halate	CO	ML1	PV Required	10	Slope Roof
Hrajel	CO	ML1	PV Required	10	Slope Roof
Jeita	CO	ML1	PV Required	10	Slope Roof
Kfar Yassine	CO	ML1	PV Required	10	Flat Roof
Kfarzebyan	CO	ML1	PV Required	10	Flat Roof
Lehfed	CO	ML1	PV Required	10	Slope Roof
Mastita	CO	ML1	PV Required	10	Slope Roof
Mayfouk	CO	ML1	PV Required	10	Slope Roof
Meyrouba	CO	ML1	PV Required	10	Flat Roof
Mounsef	CO	ML1	PV Required	10	Flat Roof
Mradiyeh	CO	ML1	PV Required	10	Flat Roof
Obeidate	CO	ML1	PV Required	10	Slope Roof
Qartaba	CO	ML1	PV Required	10	Flat Roof
Yahchouch	CO	ML1	PV Required	10	Flat Roof
Dekouane	CO	ML2	PV Required	10	Flat Roof
Dhour choueir	CO	ML2	PV Required	10	Slope Roof
Jal Ed Dib	CO	ML2	PV Required	10	Flat Roof
Jouret Ballout	CO	ML2	PV Required	10	Flat Roof
Haddath	CO	BEIRUT B	PV Required	10	Flat Roof
Souk El Gharb	CO	BEIRUT	PV Required	10	Flat Roof

Site	Type	Region **LOT3**	PV Required or Not	Power (4/6/10KW)	Installation (Ground/Flat Roof/Slope Roof)
		B			
Baakline	CO	ML3	PV Required	10	Ground
Hammana	CO	ML3	PV Required	10	Slope Roof
Kfarhim	CO	ML3	PV Required	10	Flat Roof
Majdal Meouch	CO	ML3	PV Required	10	Ground
Kfarzebiyan Entrance	LTE	ML1	PV Required	10	Ground

		#1A: 4 KW NO Solar system	**Mount Lebanon Area**					
Ord. Nr.	**TARIFF**	**Item**	**Description**	**Quantity**	**Nbr of Sites**	**11**		
					Total Quantity	**Unit Price**	**Total Price**	**Wording**
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	0	0			
2	DCS.0001	DC SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	11			
3	ESS.0001	Energy Storage System - 40 KWH - 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, total size of 40 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD, 35 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1	11			
4	ACS.0001	AC Switch panel (Main Switch Panel)	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories.	1	11			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	11			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	11			
7	PRT.0	Thermal-magnetic	Installation of thermal - magnetic circuit	1	11			

	005	circuit breaker M1-DC	breaker and required fuses as per site requirement. M-type, 65 A DC					
8	SPD0 001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	2	22			
9	SPD0 002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -	1	11			
10		Efficient cooling system including the following:						
10 .1	CU.00 01		Active 48VDC Cooling unit, split type, made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	22			
10 .2	FCU.0 001		FREE Cooling unit complete with all its parts/units, as defined in the project specfications	1	11			
10 .3	CCS.0 01		Cooling control system, complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	11			
		Civil Works and cabling:						
C1 1.1	CIV.00 01	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	1	144			
C1 1.2	CIV.00 02	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	1	60			
C1 1.3	CIV.00 03							
11		DC power Cable						
11 .1	CAB. 0001	Power Cable,450V/750V, H07Z-K UL3386,35mm^2, Blue,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	440			

11.2	CAB.0002	Power Cable,450V/750V, H07Z-K UL3386,35mm^2, Black,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	440			
12		AC Cable						
12.1	CAB.0003	Power Cable,300V,UL2464,4x20AWG,Black(4Cores:Yellow, Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, double AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	220			
13		Steel Structure Installation including Conrete bases and/or wall fixings.						
13.1		Hollow Rectangular Steel Shafts - 10 cm x 5cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey, anti corrosion coated. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0	0			
13.2		Hollow Rectangular Steel Shafts - 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey, anti corrosion coated. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0	0			
13.3		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	0	0			
14		Accessories	Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years	1	11			
14.1			Irradiation monitor & accessories	1	11			
15		General Provisions						
15.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	1			

15.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	1			
	1A 2/2	TOTAL US Dollars						
		VAT						
		Total+VAT US Dollars						

		#3A: 4 KW Photovoltaic System	**Mount Lebanon Area**					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	19		
					Total Quantity	Unit Price	Total Price	Wording
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	16	304			
2	DCS.0001	DC HYBRID SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	19			
3	ESS.0001	Energy Storage System - 40 KWh 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, total size 40 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD @25 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1	19			
4	ACS.0001	ACSwitch panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories. As per site power requirements	1	19			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	19			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	19			
7	PRT.0	Thermal-magnetic	Installation of thermal - magnetic circuit	1	19			

	005	circuit breaker M1-DC	breaker and required fuses as per site requirement. M-type, 65 A DC					
8	SPD0 001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	1	19			
9	SPD0 002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -	1	19			
10 .1	CU.00 01	Efficient cooling system including the following:	Active 48VDC Cooling unit, split type, made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	38			
10 .2	FCU.0 001		FREE Cooling unit complete with all its parts/units, as defined in the project specfications	1	19			
10 .3	CCS.0 01		Cooling control system, complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	19			
		Civil Works and Cabling:						
10		DC Cable						
C1 1.1	CIV.00 01	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	17	112			
C1 1.2	CIV.00 02	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	17	51			
C1 1.3	CIV.00 03							
10 .1	CAB. 0001	Power Cable,450V/750V, H07Z-K UL3386,35mm^2, Blue,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	760			
10 .2	CAB. 0002	Power Cable,450V/750V, H07Z-K	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and	40	760			

		UL3386,35mm^2, Black,171A,LSZH Cable,VDE,UL (Unit:meter)	Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.					
11		AC Cable						
11.1	CAB.0003	Power Cable,300V,UL2464,4x20AWG,Black(4Cores:Yellow, Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, 4 poles AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	380			
12		Steel Structure Installation including Conrete bases and/or wall fixings.						
		-						
12.1		Hollow Rectangular Steel Shafts 10 cm x 5 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	18	342			
12.2		Hollow Rectangular Steel Shafts 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	30	570			
12.3		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	72	1368			
13		Accessories						
13.1			Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years	1	19			
13.2			Irradiation monitor & accessories	1	19			
14		General Provisions						
14.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	19			
14		Testing &	The rate of testing and commissioning shall	1	19			

.2		Commissioning including software installation	include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.					
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

		#4A: 6 KW Photovoltaic System	**Mount Lebanon Area**					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	21		
					Total Quantity	Unit Price	Total Price	wording
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	24	504			
2	DCS.0001	DC SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	21			
3	ESS.0001	Energy Storage System - 60 KWh 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, size 60 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD @25 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	6	126			
4	ACS.0001	ACSwitch panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories. As per site power requirements	1	21			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	21			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	21			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	1	21			

8	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	1	21				
9	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -						
10 .1	CU.0001	Efficient cooling system including the following:	Active 48VDC Cooling unit, split type, made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	42				
10 .2	FCU.0001		FREE Cooling unit complete with all its parts/units, as defined in the project specfications	1	21				
10 .3	CCS.001		Cooling control system, complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	21				
		Civil Works and Cabling:							
C10.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	21	147				
C10.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	21	63				
C10.3	CIV.0003								
10		DC Cable							
10 .1	CAB. 0001	Power Cable,450V/750V, H07Z-K UL3386,35mm^2, Blue,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	840				
10 .2	CAB. 0002	Power Cable,450V/750V, H07Z-K UL3386,35mm^2,	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from	40	840				

		Black,171A,LSZH Cable,VDE,UL (Unit:meter)	the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.					
11		AC Cable						
11.1	CAB.0003	Power Cable,300V,UL2464,4x20AWG,Black(4Cores:Yellow, Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, 4 poles AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	420			
12		Steel Structure Installation including Conrete bases and/or wall fixings.						
12.1		Hollow Rectangular Steel Shafts - 10 cm x 5 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	30	630			
		Hollow Rectangular Steel Shafts 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	42	882			
		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	96	2016			
13		Accessories						
13.1		Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years						
13.2		Irradiation monitor & accessories						
14		General Provisions						
14.1		Design Drawing, PAT file and As-	The rate of drawings shall include the preparation of Design and as built drawings	1	21			

		Built Drawings.	according to design drawings, required modifications, equipments selection, and supporting documents and calculations.					
14.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	21			
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

		#5A: 10 KW Photovoltaic System	**Mount Lebanon Area**					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	36		
					Total Quantity	Unit Price	Total Price	Wording
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	24	864			
2	DCS.0001	DC SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	36			
3	ESS.0001	Energy Storage System - 100 KWh 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, size 100 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD @25 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1	36			
4	ACS.0001	ACSwitch panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories. As per site power requirements	1	36			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	36			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating	1	36			

			240VAC, 50/60 Hz					
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	1	36			
8	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	1	36			
9	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -	1	36			
10.1	CU.0001	Efficient cooling system including the following:	Active 48VDC Cooling unit, split type, made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	72			
10.2	FCU.0001		FREE Cooling unit complete with all its parts/units, as defined in the project specfications	1	36			
10.3	CCS.001		Cooling control system, complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	36			
		Civil Works and Cabling:						
C10.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	36	252			
C10.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	36	108			
C10.3	CIV.0003							
10		DC Cable						
10.1	CAB.0001	Power Cable,450V/750V, H07Z-K UL3386,35mm^2, Blue,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	1440			

10.2	CAB.0002	Power Cable,450V/750V, H07Z-K UL3386,35mm^2, Black,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	1440			
11		AC Cable						
11.1	CAB.0003	Power Cable,300V,UL2464,4x20AWG,Black(4Cores:Yellow, Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, 4 poles AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	720			
12		Steel Structure Installation including Conrete bases and/or wall fixings.						
12.1		Hollow Rectangular Steel Shafts - 10 cm x 5 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on each site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	30	1080			
		Hollow Rectangular Steel Shafts 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on each site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	42	1512			
		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	96	3456			
13		Accessories						
13.1		Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years		1	36			
13.2		Irradiation monitor & accessories		1	36			
14		General Provisions						

14.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	36			
14.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	36			
15		Central Monitoring system Installation	Central Monitoring system Installation and commissioning.	1	1			
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

		#6A: 4 KW Remote Outdoor LTE	**ML & Beirut Area**					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	13		
					Total Quantity	Unit Price	Total Price	Wording
		Electrical Components:						
1	MOD.0001	Outdoor cabinet	Capable to host the inverter and new ESS system. Should have a heat exchanger and/or DC cooling system to maintain the temperature below 35 Celsius	1	13			
2	INV.0001	AC Hybrid System	Hybrid Controller / Hybrid Off-Grid Inverte, Max generator Power (DC) 35000 Wp solar generator, max input voltage 1000 V, AC rated power (at 230 V 50 Hz) 25000 W, AC nominal voltage 3/N/PE: 220 V / 380 V, Efficieny 95% ~ 99%, Operating temperature range – 25°C to +60°C, Max output current/ rated output current >36 A / Phase,three phase output with power factor = 1 at rated power. Degree of protection (as per IEC 60529) IP65, Interface: Ethernet / WLAN / RS485 Data interface: SMA Modbus / SunSpec / Modbus / Speedwire,	1	13			

			Webconnect. Off-grid capable / Fuel Save Controller compatible. Input-side disconnection device Ground fault monitoring / grid monitoring DC reverse polarity protection / AC short-circuit current capability / galvanically isolated All-pole sensitive residual-current monitoring unit Protection class (according to IEC 62109-1) /overvoltage category (according to IEC 62109-1) AC/DC surge arrester. Reverse Power Protection with Diesel Generator. And all needed control accessories including RG45 cables, connection to Diesel generator,..					
3	ESS.0001	Energy Storage System - 40 KWh 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, size 40 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD @35 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1	13			
4	ACS.0001	ACSwitch panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories. As per site power requirements	1	13			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	13			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	2	26			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	2	26			
8	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	2	26			
9	SPD0002	Surge protective	DC, surge protective devices SPD	0	0			

		device	protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -					
		Civil Works and Cabling:						
C1 1.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	13	62			
C1 1.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	13	50			
C1 1.3	CIV.0003							
10		DC Cable						
10.1	CAB.0001	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	10	130			
10.2	CAB.0002	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Black,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	10	130			
11		AC Cable						
11.1	CAB.0003	Power Cable,300V,UL2464, 4x20AWG,Black(4Cores:Yellow,Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, 4 poles AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	260			
12		Steel Structure Installation including Conrete bases and/or wall fixings.						
12.1		Hollow Rectangular Steel Shafts - 10 cm x	Steel for high structure support for PV panels, for applications requiring high	0	0			

		5 cm	rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on each site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.					
		Hollow Rectangular Steel Shafts 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on each site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0	0			
		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	0	0			
13		Accessories						
13.1		Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years		1	13			
13.2		Irradiation monitor & accessories		1	13			
14		General Provisions						
14.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	13			
14.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	13			
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

Commercial Template: Lot1 Description: Install and O&M of Solar system in LOT3 Mount Lebanon and Beirut area	Quantity	Price $ Within the first year of Warranty	Within the Second year of Warranty	Price $ For first year After Warranty	Price $ For second year after Warranty	Wording
Cost of Management system Installation and commissioning	**1**					
Total cost of installation, copy from tables above (1A 2/2)						
Operate, Support and Maintenance for 4KW with PV Panels	**19**					
Operate, Support and Maintenance for 4KW without PV Panels	**11**					
Operate, Support and Maintenance for 6KW with PV Panels)	**21**					
Operate, Support and Maintenance for 6KW without PV Panels	**0**					
Operate, Support and Maintenance for 10KW with PV Panels	**36**					
Operate, Support and Maintenance for 4KW Remote LTE Sites without PV Panels	**13**					
Supply and install concrete shelter (1.5m*1.5*2.3)to enclose outdoor battery cabinets. Walls thickness (12mm reinforced concrete grade 340kg/m3) with reinforced double sheet metal door and ventilation windows with metal net.	**13**					
Total Cost for Lot1 (sum of above)						
VAT						
Grand Total for Lot1						

Site	**Type**	**Region LOT4**	**PV Required or Not**	**Power**	**Installation**
				(4/6/10KW)	**(Ground/Flat Roof/Slope Roof)**
Kaakaeiet El Jisir-kosyba	Active cabinet	NABATIEH	PV Required	4	Ground
Nabatieh faw2a	Active cabinet	NABATIEH	PV Required	4	Flat Roof
zefta-nmereya	Active cabinet	NABATIEH	PV not Required	4	Flat Roof
bintjbeil-kounin	Active cabinet	NABATIEH	PV not Required	4	Flat Roof
Klaiaa	CO	NABATIEH	PV Required	4	Slope Roof
Zaoutar	CO	NABATIEH	PV Required	4	Slope Roof
Ankoun	CO	SOUTH	PV Required	4	Ground
Berti	CO	SOUTH	PV Required	4	Ground
Bissarieh	CO	SOUTH	PV Required	4	Ground

Site	Type	Region LOT4	PV Required or Not	Power	Installation
				(4/6/10KW)	(Ground/Flat Roof/Slope Roof)
Jabal Safi	LTE	NABATIEH	PV not Required	4	Ground
El Kfeer	Shelter	NABATIEH	PV not Required	4	Ground
El Khalwat	Shelter	NABATIEH	PV not Required	4	Ground
El Mari	Shelter	NABATIEH	PV not Required	4	Ground
El Tiri	Shelter	NABATIEH	PV not Required	4	Ground
Fardiss	Shelter	NABATIEH	PV not Required	4	Ground
Maymess	Shelter	NABATIEH	PV not Required	4	Ground
Kantara	Shelter	NABATIEH	PV not Required	4	Ground
Ain arab	Shelter	NABATIEH	PV not Required	4	Ground
cheba	Active cabinet	NABATIEH	PV Required	6	Flat Roof
Deir Ez Zahrani-haboush	Active cabinet	NABATIEH	PV Required	6	Flat Roof
jibcht	Active cabinet	NABATIEH	PV Required	6	Flat Roof
kfar- kila	Active cabinet	NABATIEH	PV Required	6	Flat Roof
Koutariet Es Sayad	Active cabinet	NABATIEH	PV Required	6	Ground
Mais El Jabal-blida	Active cabinet	NABATIEH	PV Required	6	Ground
Aichieh	CO	NABATIEH	PV Required	6	Ground
Aita El Chaab	CO	NABATIEH	PV Required	6	Slope Roof
Ansar	CO	NABATIEH	PV Required	6	Ground
Arab Salim	CO	NABATIEH	PV Required	6	Slope Roof
Baraachit	CO	NABATIEH	PV Required	6	Slope Roof
Bint Jbeil	CO	NABATIEH	PV Required	6	Ground
Chahour	CO	NABATIEH	PV Required	6	Slope Roof
Chebaa	CO	NABATIEH	PV Required	6	Ground
Deir Ez Zahrani	CO	NABATIEH	PV Required	6	Slope Roof
Es Sawani	CO	NABATIEH	PV Required	6	Slope Roof
Hasbaya	CO	NABATIEH	PV Required	6	Ground
Houmine El Faouka	CO	NABATIEH	PV Required	6	Slope Roof
Jbaa	CO	NABATIEH	PV Required	6	Slope Roof
Jibchit	CO	NABATIEH	PV Required	6	Ground
Kafra	CO	NABATIEH	PV Required	6	Ground
Kawakaba-South	CO	NABATIEH	PV Required	6	Slope Roof
Kfar Kila	CO	NABATIEH	PV Required	6	Ground

Site	Type	Region LOT4	PV Required or Not	Power	Installation
				(4/6/10KW)	(Ground/Flat Roof/Slope Roof)
Khyam	CO	NABATIEH	PV Required	6	Slope Roof
Koutariet Es Sayd	CO	NABATIEH	PV Required	6	Slope Roof
Mais El Jabal	CO	NABATIEH	PV Required	6	Slope Roof
Marjayoun	CO	NABATIEH	PV Required	6	Flat Roof
Markaba	CO	NABATIEH	PV Required	6	Slope Roof
Rachaya El Fakhar	CO	NABATIEH	PV Required	6	Slope Roof
Rmaysh	CO	NABATIEH	PV Required	6	Slope Roof
Srifa	CO	NABATIEH	PV Required	6	Slope Roof
Taibih	CO	NABATIEH	PV Required	6	Slope Roof
Tibnine	CO	NABATIEH	PV Required	6	Slope Roof
Zefta	CO	NABATIEH	PV Required	6	Slope Roof
Kaakaeiet El Jisir	CO	NABATIEH	PV not Required	6	
Abbasieh	CO	SOUTH	PV Required	6	Ground
Adloun	CO	SOUTH	PV Required	6	Ground
Barja	CO	SOUTH	PV Required	6	Flat Roof
Bazourieh	CO	SOUTH	PV Required	6	Ground
Bkassine	CO	SOUTH	PV Required	6	Ground
Ghassanieh	CO	SOUTH	PV Required	6	Ground
Ghazieh	CO	SOUTH	PV Required	6	Flat Roof
Jiye	CO	SOUTH	PV Required	6	Ground
Joun	CO	SOUTH	PV Required	6	Ground
Jwaya	CO	SOUTH	PV Required	6	Flat Roof
Kaitouli	CO	SOUTH	PV Required	6	Slope Roof
Kana	CO	SOUTH	PV Required	6	Ground
Kfar Hatti	CO	SOUTH	PV Required	6	Ground
Kfarhouni	CO	SOUTH	PV Required	6	Ground
Kharayeb	CO	SOUTH	PV Required	6	Ground
Khorbet Silm	CO	SOUTH	PV Required	6	Ground
Lebaa	CO	SOUTH	PV Required	6	Ground
Maaraki	CO	SOUTH	PV Required	6	Slope Roof
Maaroub	CO	SOUTH	PV Required	6	Ground
Maghdouche	CO	SOUTH	PV Required	6	Slope Roof
Mansourih	CO	SOUTH	PV Required	6	Slope Roof
Ras El Ain	CO	SOUTH	PV Required	6	Ground
Rihan	CO	SOUTH	PV Required	6	Ground
Rmaile	CO	SOUTH	PV Required	6	Ground
Roum	CO	SOUTH	PV Required	6	Ground
Sarafand	CO	SOUTH	PV Required	6	Ground
Wadi Ez Zaini	CO	SOUTH	PV Required	6	Ground
Zaarourieh	CO	SOUTH	PV Required	6	Slope Roof

Site	Type	Region LOT4	PV Required or Not	Power	Installation
				(4/6/10KW)	(Ground/Flat Roof/Slope Roof)
Zahrani	CO	SOUTH	PV Required	6	Flat Roof
Zreirieh	CO	SOUTH	PV Required	6	Ground
Aalma Ech Chaab	CO + LTE	SOUTH	PV Required	6	Ground
Tairharfa	CO + LTE	SOUTH	PV Required	6	Ground
Choukine (Nabatieh AR)	LTE	NABATIEH	PV not Required	6	Ground
Roumine	CO	NABATIEH	PV Required	10	Slope Roof

		#1A: 4 KW NO Solar system	South Area					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	10		
					Total Quantity	Unit Price	Total Price	Wording
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	0	0			
2	DCS.0001	DC SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	10			
3	ESS.0001	Energy Storage System - 40 KWH - 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, total size of 40 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD, 35 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1	10			
4	ACS.0001	AC Switch panel (Main Switch Panel)	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories.	1	10			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	10			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	10			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type. 65 A DC	1	10			
8	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	2	20			

9	SPD0002	Surge protective device	DC. surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -	1	10			
10		Efficient cooling system including the following:						
10.1	CU.0001		Active 48VDC Cooling unit. split type. made for telecom applications. complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	20			
10.2	FCU.0001		FREE Cooling unit complete with all its parts/units. as defined in the project specfications	1	10			
10.3	CCS.001		Cooling control system. complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	10			
		Civil Works and cabling:						
C10.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size according to calculated parameters.	10	70			
C10.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	10	30			
C10.3	CIV.0003							
11		DC power Cable						
11.1	CAB.0001	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible. single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	400			
11.2	CAB.0002	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Black,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	400			
12		AC Cable						
12.1	CAB.0003	Power Cable,300V,UL2464,4x20AWG,Black(4Cores:Yellow,Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible. double AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	200			
13		Steel Structure Installation including Conrete bases and/or wall fixings.						

13.1		Hollow Rectangular Steel Shafts - 10 cm x 5cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey, anti corrosion coated. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0	0			
13.2		Hollow Rectangular Steel Shafts - 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey, anti corrosion coated. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0	0			
13.3		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	0	0			
14		Accessories	Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years	1	10			
14.1			Irradiation monitor & accessories	1	10			
15		General Provisions						
15.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	10			
15.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	10			
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

		#2A: 6 KW NO Solar system	**South Area**					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	2		
					Total Quantity	Unit Price	Total Price	
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	0	0			
2	DCS.0001	DC SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	2			
3	ESS.0001	Energy Storage System - 60 KWh 48V & Cabinet/Rack/Accessoric	Li-ion cyclic battery bank, size 60 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD, 25 DEG C, nominal voltage of the ESS	1	2			

		s/Sensors	shall be as per inverter compatibility.					
4	ACS.0001	ACSwitch panel Main Switch Panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories.	1	2			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	2			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	2			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	1	2			
8	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	1	2			
9	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -					
10.1	CU.0001	Efficient cooling system including the following:	Active 48VDC Cooling unit, split type, made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	4			
10.2	FCU.0001		FREE Cooling unit complete with all its parts/units, as defined in the project specfications	1	2			
10.3	CCS.001		Cooling control system, complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	2			
		Civil Works and Cabling:						
C10.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size Size according to calculated parameters.	2	28			
C10.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	2	6			
C10.3	CIV.0003							
11		DC Cable						
11.1	CAB.0001	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	80			
11.2	CAB.0002	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Black,1	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable	40	80			

		71A,LSZH Cable,VDE,UL (Unit:meter)	tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.					
12		AC Cable						
12.1	CAB.0003	Power Cable,300V,UL2464,4x20AWG,Black(4Cores:Yellow,Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, double AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	40			
13		Steel Structure Installation including Conrete bases and/or wall fixings.						
13.1		Hollow Rectangular Steel Shafts - 10 cm x 5 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0	0			
13.2		Hollow Rectangular Steel Shafts - 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0	0			
13.3		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	0	0			
14		Accessories	Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years	1	2			
14.1			Irradiation monitor & accessories	1	2			
15		General Provisions						
15.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	2			
15.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	2			
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

		#3A: 4 KW Photovoltaic	**South Area**					

		System						
Ord. Nr.	**TARIFF**	**Item**	**Description**	**Quantity**	**Nbr of Sites**	**7**		
					Total Quantity	**Unit Price**	**Total Price**	**Wording**
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	16	112			
2	DCS.0001	DC HYBRID SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	7			
3	ESS.0001	Energy Storage System - 40 KWh 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, total size 40 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD @25 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1	7			
4	ACS.0001	ACSwitch panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories. As per site power requirements	1	7			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	7			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	7			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	1	7			
8	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	1	7			
9	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -	1	7			
10.1	CU.0001	Efficient cooling system including the following:	Active 48VDC Cooling unit, split type, made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	14			
10.2	FCU.0001		FREE Cooling unit complete with all its parts/units, as defined in the project specfications	1	7			
10.3	CCS.001		Cooling control system, complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	7			
		Civil Works and Cabling:						
C10.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size Size according to calculated parameters.	7	98			

C1 0.2	CIV.00 02	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	7	21			
C1 0.3	CIV.00 03							
10		DC Cable						
10. 1	CAB.00 01	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	280			
10. 2	CAB.00 02	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Black,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	280			
11		AC Cable						
11. 1	CAB.00 03	Power Cable,300V,UL2464,4x20AWG,Black(4Cores:Yellow,Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, 4 poles AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	140			
12		Steel Structure Installation including Conrete bases and/or wall fixings.						
12. 1		Hollow Rectangular Steel Shafts 10 cm x 5 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	18	126			
12. 2		Hollow Rectangular Steel Shafts 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	30	210			
12. 3		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	72	504			
13		Accessories						
13. 1			Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years	1	7			
13. 2			Irradiation monitor & accessories	1	7			
14		General Provisions						
14.		Design Drawing, PAT	The rate of drawings shall include the preparation of	1	7			

1		file and As-Built Drawings.	Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.					
14.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	7			
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

		#4A: 6 KW Photovoltaic System	**South Area**					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	66		
					Total Quantity	Unit Price	Total Price	Wording
		Electrical Components:						
1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	24	1608			
2	DCS.0001	DC SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	66			
3	ESS.0001	Energy Storage System - 60 KWh 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, size 60 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD @25 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	6	396			
4	ACS.0001	ACSwitch panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories. As per site power requirements	1	66			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	66			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	66			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	1	66			

8	SPD000 1	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	1	66				
9	SPD000 2	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -						
10. 1	CU.000 1	Efficient cooling system including the following:	Active 48VDC Cooling unit, split type, made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	132				
10. 2	FCU.00 01		FREE Cooling unit complete with all its parts/units, as defined in the project specfications	1	132				
10. 3	CCS.00 1		Cooling control system, complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	132				
		Civil Works and Cabling:							
CI 0.1	CIV.00 01	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size Size according to calculated parameters.	66	924				
CI 0.2	CIV.00 02	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness). buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	66	200				
CI 0.3	CIV.00 03								
10		DC Cable							
10. 1	CAB.00 01	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,1 71A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	2640				
10. 2	CAB.00 02	Power Cable.450V/750V.H07Z-K UL3386,35mm^2,Black,1 71A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	2640				
11		AC Cable							
11. 1	CAB.00 03	Power Cable,300V,UL2464,4x20AWG,Black(4Cores:Yellow,Green,Violet,White), 9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, 4 poles AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	1320				
12		Steel Structure Installation including Conrete bases and/or wall fixings.							

12.1		Hollow Rectangular Steel Shafts - 10 cm x 5 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop: or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	30	1980			
		Hollow Rectangular Steel Shafts 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop: or carport shading, lengths shall be determined based on the site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	42	2772			
		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	96	6336			
13		Accessories						
13.1		Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years						
13.2		Irradiation monitor & accessories						
14		General Provisions						
14.1		Design Drawing, PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	66			
14.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	66			
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

		#5A: 10 KW Photovoltaic System	**South Area**					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	1		
					Total Quantity	Unit Price	Total Price	Wording
		Electrical Components:						

1	MOD.0001	Photovoltaic Module Poly / Mono - crystalline Si	Minimum power generated 500 Wp, >20% efficiency, operating temperature range –40°C to +75°C , Positive power tolerance of 0~+5% , with less than 0.6% Annual Degradation Over 25 years Dimensions: ~2000 mm x ~1000mm x ~40mm	24	24			
2	DCS.0001	DC SYSTEM with Accessories	DC SYSTEM with Accessories as per the RFP specs	1	1			
3	ESS.0001	Energy Storage System - 100 KWh 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, size 100 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD @25 DEG C. nominal voltage of the ESS shall be as per inverter compatibility.	1	1			
4	ACS.0001	ACSwitch panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories. As per site power requirements	1	1			
5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	1			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	1	1			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	1	1			
8	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V. (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA. I maximum 15 kA	1	1			
9	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -	1	1			
10.1	CU.0001	Efficient cooling system including the following:	Active 48VDC Cooling unit, split type, made for telecom applications, complete with indoor and outdoor units and all needed accessories. Based on project specifications	2	2			
10.2	FCU.0001		FREE Cooling unit complete with all its parts/units, as defined in the project specfications	1	1			
10.3	CCS.001		Cooling control system, complete with connection and sensors as defined in the specifications. Connection to existing A/C unit(s) or diesel generator to be included when necessary in the design	1	1			
		Civil Works and Cabling:						
10		DC Cable						
C10.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size Size according to calculated parameters.	1	14			
C10.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness), buried at 60cm and covered with clean soft soil with warning tape along the pipe.(m)	1	6			
C10.3	CIV.0003							

10.1	CAB.0001	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	40			
10.2	CAB.0002	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Black,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	40	40			
11		AC Cable						
11.1	CAB.0003	Power Cable,300V,UL2464,4x20AWG,Black(4Cores:Yellow,Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, 4 poles AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	20			
12		Steel Structure Installation including Conrete bases and/or wall fixings.					
12.1		Hollow Rectangular Steel Shafts - 10 cm x 5 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on each site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	30	30			
		Hollow Rectangular Steel Shafts 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on each site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	42	42			
		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	96	96			
13		Accessories						
13.1		Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years		1	1			
13.2		Irradiation monitor & accessories		1	1			
14		General Provisions						
14.1		Design Drawing. PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	1			

14.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	1			
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

		#6A: 4 KW Remote Outdoor LTE	**South Area**					
Ord. Nr.	TARIFF	Item	Description	Quantity	Nbr of Sites	1		
					Total Quantity	Unit Price	Total Price	Wording
		Electrical Components:						
1	MOD.0001	Outdoor cabinet	Capable to host the inverter and new ESS system. Should have a heat exchanger and/or DC cooling system to maintain the temperature below 35 Celsius	1	1			
2	INV.0001	AC Hybrid System	Hybrid Controller / Hybrid Off-Grid Inverte, Max generator Power (DC) 35000 Wp solar generator, max input voltage 1000 V. AC rated power (at 230 V 50 Hz) 25000 W, AC nominal voltage 3/N/PE: 220 V / 380 V, Efficieny 95% ~ 99%, Operating temperature range – 25°C to +60°C. Max output current/ rated output current >36 A / Phase,three phase output with power factor = 1 at rated power. Degree of protection (as per IEC 60529) IP65. Interface: Ethernet / WLAN / RS485 Data interface: SMA Modbus / SunSpec / Modbus / Speedwire. Webconnect. Off-grid capable / Fuel Save Controller compatible. Input-side disconnection device Ground fault monitoring / grid monitoring DC reverse polarity protection / AC short-circuit current capability / galvanically isolated All-pole sensitive residual-current monitoring unit Protection class (according to IEC 62109-1) /overvoltage category (according to IEC 62109-1) AC/DC surge arrester. Reverse Power Protection with Diesel Generator. And all needed control accessories including RG45 cables, connection to Diesel generator...	1	1			
3	ESS.0001	Energy Storage System - 40 KWh 48V & Cabinet/Rack/Accessories/Sensors	Li-ion cyclic battery bank, size 40 KWh. Charge/discharge efficiency >94% , life cycle > 6000 @85 % DOD @35 DEG C, nominal voltage of the ESS shall be as per inverter compatibility.	1	1			
4	ACS.0001	ACSwitch panel	Installation of electrical distribution box including plastic triangle key, glass cover, main bus bar, earth bar and all needed accessories. As per site power requirements	1	1			

5	DCS.0001	DC Combiner Box	Installation of DC combiner box for the solar PV panels in a string as per site requirement.	1	1			
6	PRT.0001	Thermal-magnetic circuit breaker 200A	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, voltage rating 240VAC, 50/60 Hz	2	2			
7	PRT.0005	Thermal-magnetic circuit breaker M1-DC	Installation of thermal - magnetic circuit breaker and required fuses as per site requirement. M-type, 65 A DC	2	2			
8	SPD0001	Surge protective device	AC, surge protective devices SPD type 2 protect low-voltage systems against surge voltages tested as SPD type 2 according to IEC 61643-11 - Maximum Continuous Operating Voltage (Uc): (L-PE) 275 V,(L-L) 440 V, (L-N) 275 V, (N-PE) 275 V Discharge Current: I nominal 20 kA, I maximum 40 kA & Discharge current: I nominal 5 kA, I maximum 15 kA	2	2			
9	SPD0002	Surge protective device	DC, surge protective devices SPD protect DC-voltage systems against surge voltages tested as SPD according to IEC 61643-11 -	0	0			
		Civil Works and Cabling:						
C10.1	CIV.0001	Concrete Blocks for Panel structure base	Supply and install (precast or In-situ) Concrete blocks grade 350Kg/m3. Size Size according to calculated parameters.	1	14			
C10.2	CIV.0002	Two polyethylene pipe	Supply and install 2 polyethylene pipe 60-65mm OD (5-6mm Wall thickness). buried at 60cm and covered with clean soft soil with warning tape along the pipe. (m)	1	6			
C10.3	CIV.0003							
10		DC Cable						
10.1	CAB.0001	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Blue,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	10	10			
10.2	CAB.0002	Power Cable,450V/750V,H07Z-K UL3386,35mm^2,Black,171A,LSZH Cable,VDE,UL (Unit:meter)	Installation of flexible, single DC cables acting as main supply for the Inverter mppt input. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable lengths to be confirmed from the site survey.	10	10			
11		AC Cable						
11.1	CAB.0003	Power Cable,300V,UL2464,4x20AWG,Black(4Cores:Yellow,Green,Violet,White),9A,Non-shielding Outdoor Cable,UL (Unit:meter)	Installation of flexible, 4 poles AC cables acting as main output of the Inverter to the site main power distribution box. Including all needed civil work and Cable tray/ladder that might be needed from the solar generator to the Inverter. The cable tray/ladder should be hot-dip galvanized and the outdoor cables should be UV protected. Cable length to be determined from the remeasured site survey.	20	20			
12		Steel Structure Installation including Conrete bases and/or wall fixings.						
12.1		Hollow Rectangular Steel Shafts - 10 cm x 5 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop: or carport shading. lengths shall be determined based on each site survey. The structure	0	0			

			needs to be designed to withstand wind loads as per NL 137:2020.					
		Hollow Rectangular Steel Shafts 6 cm x 3 cm	Steel for high structure support for PV panels, for applications requiring high rise structure. Maximum 2m above rooftop; or carport shading, lengths shall be determined based on each site survey. The structure needs to be designed to withstand wind loads as per NL 137:2020.	0	0			
		Hot - Dip Galvanized Right Angle bar	Hot - Dip Galvanized Right Angle bar, for supporting the PV panels. Installation. The hot dip galvanized bars shall be pre drilled and manufactured to ensure proper coating of the steel.	0	0			
13		Accessorics						
13.1		Remote data logger equipment EZ Logger. The remote access to logger should be available license-free over 25 years		1	1			
13.2		Irradiation monitor & accessories		1	1			
14		General Provisions						
14.1		Design Drawing. PAT file and As-Built Drawings.	The rate of drawings shall include the preparation of Design and as built drawings according to design drawings, required modifications, equipments selection, and supporting documents and calculations.	1	1			
14.2		Testing & Commissioning including software installation	The rate of testing and commissioning shall include labor, tools, works, materials to achieve the testing and the good running of the system. This is including but not limited to pull-out tests, coating thickness tests, earth resistance tests, insulation tests, drop voltage tests, Voc & Isc test, performance tests, etc.	1	1			
	1A 2/2	TOTAL US Dollars						
		VAT						
		TOTAL+VAT US Dollars						

Lot1 Description: Install and O&M of Solar system in LOT4 South area	Quantity	Price $ Within the first year of Warranty	Within the Second year of Warranty	Price $ For first year After Warranty	Price $ For second year after Warranty	Wording
Total cost of installation, copy from tables above (1A 2/2)						
Operate, Support and Maintenance for 4KW with PV Panels	**7**					
Operate, Support and Maintenance for 4KW without PV Panels	**10**					
Operate, Support and Maintenance for 6KW with PV Panels)	**66**					
Operate, Support and Maintenance for 6KW without PV Panels	**2**					
Operate, Support and Maintenance for 10KW with PV Panels	**1**					
Operate, Support and Maintenance for 4KW Remote LTE Sites without PV Panels	**1**					

Supply and install concrete shelter (1.5m*1.5*2.3)to enclose outdoor battery cabinets. Walls thickness (12mm reinforced concrete grade 340kg/m3) with reinforced double sheet metal door and ventilation windows with metal net.	1					
Total Cost for Lot1 (sum of above)						
VAT						
Grand Total for Lot1						