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# Solarisation Assessment and Mapping Guidance

# Contents

## Purpose

This guidance supports humanitarian field practitioners in conducting assessments of companies specialized in providing solarisation services. It outlines a general methodology to identify local companies offering these services in humanitarian contexts. Information will also be shared with the Logistics Capacity Assessment (LCA) team for possible inclusion in LCAs.

Conducting field inspections and physical assessments are the preferred methodology for conducting infrastructure assessments to ensure accuracy in the data collection process and it is the most effective way to validate information collected through desk reviews. However, in some cases, practitioners will need to conduct desk reviews only without performing physical assessments for various reasons (security, access constraints, etc.). When a physical assessment isn't viable, the solarisation assessment can still be useful to inform decision making and partners. In either case, it is important to highlight that the information provided serves as a guide and needs to be used as such, recognizing that some details provided might be inaccurate or outdated as vendor services and practices can change quickly, particularly during emergencies. Therefore, updates to the information are regularly required.

This guidance illustrates how to assess the local solarisation capacity in a specific location for humanitarian organizations' operational needs. For further guidance on solarisation for humanitarian agencies, please check the WREC Coalition website on decarbonisation which includes operational solarisation handbooks and case studies by the WREC Coalition and its partners.

## About the WREC Coalition

The challenges of decarbonisation are cross cutting. No single actor can solve them alone. For this reason, the Global Logistics Cluster has brought together a coalition of humanitarian actors who, together, offer a uniquely wide operational reach.

The WREC (*Waste Management and Measuring, Reverse Logistics, Environmentally Sustainable Procurement and Transport, and Circular Economy*) Coalition consists of four leading humanitarian organizations (the Danish Refugee Council (DRC), the International Federation of Red Cross and Red Crescent Societies (IFRC), Save the Children International (SCI), and the World Food Programme of the United Nations(WFP)) united by a shared vision: Enabling the community to reduce the environmental impact of humanitarian logistics.

The WREC Coalition empowers partners to integrate sustainability by facilitating connections, identifying gaps, and delivering practical, field-ready solutions. Through our collaborative approach, we help organisations embody the *"do no harm"* principle while driving meaningful and lasting change in humanitarian operations.

The WREC Coalition also understands the landscape: We connect humanitarian logisticians with a network of over 1,200 partners globally and provide access to the best available solutions that make humanitarian supply chains more sustainable so you can avoid reinventing the wheel.

Simply put, the WREC Coalition helps humanitarian partners embody the principle of do no harm, supporting them to do their work more sustainably, efficiently, and cost effectively, by providing sustainable operational solutions that last.

## About the WREC Coalition solarisation assessment and mapping

As part of the WREC Coalition's efforts to support humanitarian logisticians with information and solutions to reduce emissions along humanitarian supply chains, the WREC Coalition has developed several solarisation assessment and mapping tools:

- **Dedicated templates on solarisation vendors and country profiles** vis-à-vis solarisation (e.g., what does the solarisation market and energy infrastructure look like) have been developed, following the Logistics Capacity Assessment format.
- By leveraging on the global WREC network of partners, and in close collaboration with Solarisation steering group, the WREC Coalition is publishing **country-specific lists of solarisation providers to support humanitarian organizations in identifying suitable companies that can provide, install, and maintain solarisation equipment.**
- In addition, the Global Logistics Cluster will add a solarisation provider layer to the LogIE map available via the WREC information portal with information provided by partners. The interactive map provides partners with a visual overview of solarisation infrastructure by country of operation.

The WREC Coalition will start the solarisation provider mapping for pilot countries that will be determined by a Steering Group and coordinated with partners. All partners that are interested in mapping solarisation providers for a specific country or countries are welcome to contact the WREC Coalition at global.wrec@wfp.org

## Information mapped through the WREC Coalition template

Different solarisation needs warrant different services. **Mapping services and equipment offered is important for understanding whether services offered correspond to needs** (e.g., maintenance and training for equipment use) and whether solarisation equipment corresponds to required energy use (e.g., type of panels and energy storage options). All humanitarian partners are encouraged to collect the information on solarisation companies by utilizing the Solarisation Company Assessment form (Annex I) and share the information collected with the WREC Coalition team. This will help provide key information on country-specific solarisation services accessible to the whole humanitarian community via the WREC Coalition website.

The assessment form collects information on **type of solarisation business** (consultancy, distributor, manufacture, or installer), **solarisation company location, experience and expertise, types of services and equipment offered, purchasing options** (e.g., purchasing the equipment upfront or purchasing the energy produced on a monthly basis), **quality assurance** (e.g., whether equipment is certified and/or tested for local climate suitability), and **contact information.**

The following services, equipment types, and purchasing options are mapped (see Table 1; for further explanations, see glossary in annex II; additional information is collected in the template, see Annex I).

### Solarisation provider information collected[1]

| Solarisation services | Solarisation equipment | Purchasing options |
|---|---|---|
| Initial on-site assessment | Monocrystalline panels | Power Purchasing Agreement (PPA) |
| Structural assessment via structural engineer | Polycrystalline panels | Purchasing product (solar equipment) |

[1] For further information on terms used, see Glossary in Annex II.

| | | |
|---|---|---|
| Energy needs assessment/audit | Passivated Emitter and Rear Contact (PERC) | Engineering, Procurement and Construction (EPC) |
| Return on investment and/or avoided emissions estimation | Solar thermal panels | Leasing |
| Project designing | Batteries-lead acid | All possible |
| Installation | Batteries-lithium | NA |
| Equipment provider | Batteries-sodium | |
| Maintenance | Multi-mode inverter | |
| Utilisation & trouble shooting training | Load management switchgear | |
| Management of legal formalities / permits | Surge overvoltage protection equipment | |
| Financing agent | All | |
| Solar panel capacity calculation over time (e.g., after 10 years, capacity will be reduced to 90%) | NA | |
| Take-back/recycling service (e.g., for batteries) | | |
| Security installations/theft protection | | |
| Equipment warranty | | |
| Availability of spare parts in case of breakdown | | |
| Technical manuals | | |
| Safety labelling | | |
| All | | |
| Other | | |

*Table 1: Solarisation provider information collected.*

The WREC Coalition website features a dedicated LogIE map which allows to capture the geographical dimension associated with each provider identified through the assessment, where the geographical coordinates are available.

## How to compile the solarisation assessment

Conducting a solarisation provider assessment can lead to the identification of **private sector solarisation suppliers, manufacturers, local contractors, government entities, or even civil society groups and cooperatives** with adequate capacity to provider/install/maintain different types of solarisation equipment. The solarisation assessments therefore help to inform humanitarian organizations on the available solarisation capacity in a specific country and to identify gaps.

1. **Before starting the assessment, it is advisable to reach out local NGOs, Clusters (if activated), civil society groups, government bodies, and UN Agencies operating in the area**, seeking collaborative opportunities to undertake assessments jointly, (or, if implementation is envisaged, even to explore joint solarisation efforts of facilities. For example, coordination and consolidation of solarisation efforts may be needed if solarising single facilities of individual organisations results in too small a request to spark interest of solarisation providers).
2. **It is advisable to ensure engagement and coordination with the local procurement unit** to avoid duplication of efforts in identifying the most adequate solarisation provider.

3. **An assessment can be conducted in-person (scenario 1) or remotely via desk assessment** (scenario 2) based on the assessor's geographical location vs. the assessment location:
    - **Scenario 1: Conducting an in-person assessment** (the assessor **is located** in the same country of the solarisation providers to be assessed).
    - **Scenario 2: Conducting a remote desk assessment** (the assessor **is NOT located** in the same country of the solarisation providers to be assessed).

In both cases, **some fields are mandatory (marked with an asterisk*),** while others can be left blank if the information is not available. Mandatory fields include:

- Company name.
- Company address and location.
- Company contact details.
- Type of solarisation business (whether the company a solarisation consultancy, distributor, manufacturer, or installer).
- Types of solarisation services offered.
- For distributors, manufacturers, or installers: Types of solarisation equipment available (leave blank for consultancies).
- For distributors, manufacturers, or installers: Financing options (leave blank for consultancies).

**If an assessment doesn't contain the above information, the WREC Coalition won't be able to publish the form**, due to the following reasons:

- **A partner would not be able to understand whether the company is located close enough** to provide solarisation services and have no means of contacting them.
- If a partner needs to access **specific solarisation services** (e.g. installation, maintenance of equipment, energy audits, or trouble shoot and use trainings) or (for distributors, manufacturers, or installers) **equipment** (e.g., monocrystalline panels and sodium batteries), by opening the assessment, they need to be able to **spot the relevant companies** by filtering the spreadsheet by service/equipment type.
- (For mapping distributors, manufacturers, or installers) **Different purchasing options come with different types of costs** (e.g., purchasing equipment generally has high upfronts costs, while purchasing the energy can come with low or even no upfront costs, but incurs monthly expenses) which can be an essential consideration for a humanitarian agency when considering solarisation providers.

### Scenario 1: In-person assessment

In this case, the assessor is likely to have more or less direct access regarding information on solarisation providers, being able to retrieve the information needed for the assessment with a relatively high level of accuracy. This can be achieved through the following steps:

- **Contact local authorities** (e.g. National Environmental Agencies, Ministry of Environment) and request access to any lists of licensed solarisation providers registered at the Local Chamber of Commerce.
- **Contact in-country humanitarian actors** (Clusters, NGOs, civil society, UN agencies, etc.) and request information on existing solarisation providers used by partners.
- **Fill-in the sheet based on any recent solarisation exercise** you or a partner may have conducted, e.g., a recent national tender to solarise facilities.

- **Call/email the providers' focal points to schedule a physical visit** to the company and conduct an on-site interview with the company manager, or any other relevant function, filling in the template as you conduct the interview. As part of the visit try to verify if the information provided online by the company matches the actual situation on-site: if a company declares that they provide panels as well as energy storage equipment (e.g., batteries), but these aren't on site or are not mentioned when interviewing the focal point, it is worthwhile specially asking about this. As far as possible, the WREC Coalition template in Annex I should be filled in entirely during the field visit, with priority given to the mandatory information (see list above).
- **If an interview on-site isn't possible, conduct a short interview online/by phone**, following the WREC Coalition template's structure. Make sure to request the participation of the company's Head of Office or Head of Operations.
- **Register the answers in the WREC template in Annex I and online** - and share it with the WREC Coalition team for validation and publication (global.WREC@wfp.org).

***Note:*** *It is important to verify the accuracy of the information provided by partner organizations by contacting the individual companies, since company profiles information registered at some point in the past may be outdated. Information needs to be updated to ensure services and quality standards assessed are still accurate. Note also, that local regulations may be context-specific and it's worth asking companies if they have any geographical or logistics constraint (see relevant parts in the templates).*

### Scenario 2: Remote assessment

When an entity doesn't have the opportunity to conduct an in-person assessment due to physical constraints (e.g. lack of resources, travel restrictions, safety measures or reasons of force majeure), a remote assessment can be conducted and shared with the WREC Coalition team for validation. The information provided in the assessment can be amended and updated, in case a physical assessment can be performed at a later stage. Recommended steps to conduct a remote assessment are outlined as follows:

- **Liaise with the team within your organization which has a local presence,** asking to possibly contact the local authorities and get access to the list of licensed solarisation providers registered at the local Chamber of Commerce.
- **If colleagues can't provide support or if your organization doesn't have an office in the country of interest, try to access the Local Authorities websites** – such as the Chamber of Commerce or the local Environmental National Agency – and see if any list of licensed solarisation companies is available online.
- **Identify the providers' contact details available in-country and call/email their focal points** to conduct a short interview – following the WREC template's.
- **Contact the WREC Coalition team (global.WREC@wfp.org ) to check if any WREC Coalition partner can provide support**, possibly organizations with a local presence. Register the answers in the WREC Coalition template in Annex I and online and share it with the WREC Coalition team for validation and publication (global.WREC@wfp.org).

***Note:*** *It is important to verify the accuracy of the information provided by partner organizations by contacting the individual companies, since company profiles information registered at some point in the past may be outdated. Information needs to be updated to ensure services and quality standards assessed are still accurate. Note also, that local regulations may be context-specific and it's worth asking companies if they have any geographical or logistics constraint (see relevant parts in the templates).*

## Annex I: The WREC Coalition template for assessing solarisation companies

How to fill in the form:

1. Download the workbook on your device (no macros) or contact the WREC Coalition at global.wrec@wfp.org for a macro-enabled version.
2. Begin by completing the columns in grey. For dropdown menus, include as many rows as options chosen (e.g., if a company is both a consultancy and an installer, include two rows, one selecting consultancy, and one selecting installer). Columns with an asterisk (*) are mandatory. Other columns can be left blank if data is not available.
3. Depending on the type of solarisation businesses chosen in column K (consultancy, distributor, manufacturer, installer, or several), proceed to filling in the columns in orange (for all types of solar businesses); light blue (for distributors, manufacturers, and installers); and/or dark blue (for installers). For the respective type of company (consultancy, distributor, manufacturer, installer), columns with an asterisk (*) are mandatory. Other columns can be left blank if data is not available.
4. If you need to list multiple types of solar services and/or equipment, please include one row per service and/or equipment.
5. If you need to register information for multiple companies, use a separate row for each company.

***Disclaimer:*** *Assessment/mapping, and/or publication does not imply any business relationship between the company/ies mapped and WFP/Logistics Cluster and/or the partners undertaking the assessment. Mapping is used solely as a determinant of services, and capacities. Similarly, assessment/mapping, and/or publication does not imply endorsement of the company/ies or their services on behalf of the WFP/Logistics Cluster and/or the partners undertaking the assessment.*

| Basic information. Fill-in for ALL business types | | | | | | | | | | | | | Services. Fill-in for ALL business types | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Company name* | Physical Address* | Latitude* | Longitude* | Focal Person* | Telephone Number* | Email Address* | Website *(If available)* | Business License Validity Dates | Years of experience | Type of solar business* | List types of experts forming part of the company's team (e.g., structural engineers) | Languages spoken | Types of solarisation services offered* | If 'other', please specify | Geographical regions where the company can work (divide counties in line with the country administrative boundaries) | List any other countries the company can work in | Ability to provide services to last-mile locations (remote/high risk areas)? |
| | | | | | | | | | | | | | | | | | |

| Equipment & Finance. Fill-in for MANUFACTURER/DISTRIBUTOR/INSTALLER | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Types of solar equipment available* | Does equipment offered have relevant certifications in place (e.g., IEC 61215 edition 2, and classified by class according to IEC 61730 or equivalent as Class A for PV modules; IEC62619 / IEC61000, UL1973, CE, UN38.3 for batteries; IEC 62109-1 and IEC 62109-2 for inverters) (list all available)? | Are data sheets available for each available equipment? Y/N | Do support structures and module mounting arrangements comply with applicable building codes, regulations and standards, e.g., BS EN 1990 or ANSI/AISC 360? | Are essential safety measures observed for protection against electric shock (IEC 61730 & IEC 60364-4-41), fire, over current, lighting, surge over-surcharge? | If equipment warranty is provided, specify length and type of warranty (performance or product warranty) | If take-back/recycling is available, list waste treatment partners | List average lifespan of equipment offered | Financing options offered (e.g., purchasing equipment upfront or leasing)?* | Is solar equipment tested and/or approved for local climate/conditions? (Y/N) | Is local representation available for service and technical support? | If equipment is imported, is it imported to order or stockpiled? |
| | | | | | | | | | | | |

| **Installation capacity. Fill-in for INSTALLER ONLY** | | **OTHER** | | | |
|---|---|---|---|---|---|
| **Total solar capacity that the company has installed in kilowatt peak (KWP) or megawatt peak (MWP)** | **Kilowatt capacity of the company (e.g., company can install solar equipment delivering up to 35 KW)** | **Comments** *(include here if e.g., solar equipment life cycle analysis information is available)* | **Verification test for the plants undertaken in the presence of a qualified inspector of the purchaser?** | **Updated*** *Data collection date* | **Information source*** *Organization who compiled the information* |
| | | | | | |

*Table 2: Solarisation provider template.*

## Annex II: Glossary

*(in alphabetical order)*

| Term | Explanation |
|---|---|
| Avoided emissions estimation | Calculation regarding amount of emissions no longer emitted thanks to solarisation (in kilos, kgCO2, or tons, tCO2). |
| Batteries-lead acid | Type of battery used for storing solar energy, older model that contains lead and therefore can result in toxic waste upon breakdown/disposal. |
| Batteries-lithium | Type of battery used for storing solar energy, newer model that contains lithium and tends to be more effective. |
| Batteries-sodium | Type of battery used for storing solar energy, newer model that contains sodium and can be an interesting alternative to lead acid batteries if lithium batters aren't an option. |
| Energy needs assessment/audit | Assessment of the amount of energy the facility requires, e.g., is continuous mechanical cooling needed; how many buildings require electricity provision, etc. |
| Engineering, Procurement and Construction (EPC) | Process where one company manages the entire process from site assessment, to design, procurement, and installation. |
| Financing agent | Does the company provide advice/services on financing solarisation. |
| Leasing | Type of agreement where the client leases the equipment, resulting in lower or zero upfront costs. Monthly/annual payment for the equipment (not the energy consumed) are made. |
| Load management switchgear | Specialized electrical switching and control equipment used to monitor, control, and manage electrical loads in systems powered by solar energy. |
| Monocrystalline panels | Type of solar panel, typically with a 10-15% efficiency which is higher than for polycrystalline panels; performs better in low light and with high heat, compared to polycrystalline panels. |
| Multi-mode inverter | Inverter allowing the solar power to be used instantly, stored for later use in batteries, or fed back to the electric grid. |
| On-site assessment | Visit to the facility that requires solarisation to assess solarisation needs. |
| Passivated Emitter and Rear Contact (PERC) | Highly efficient newer type of solar panel, tends to be more expensive than monocrystalline or polycrystalline solar panels. |
| Polycrystalline panels | Type of solar panel, generally cheaper compared to monocrystalline panels, but with lower efficiency and worse performance in high heat or low light. |
| Power Purchasing Agreement (PPA) | Type of agreement where the client purchases the solar energy rather than the solar equipment. This often results in lower or zero upfront costs but generates monthly/annual costs that can be at a fixed or flexible (e.g., energy-consumption-base) rate. Equipment can sometimes be purchased at the end of the contract, at a discounted rate. |
| Purchasing product (solar equipment) | Type of agreement where the client purchases the solar equipment upfront. This usually results in higher upfront costs, but monthly/annual energy costs are very low, as energy produced belongs to the client. |

| | |
|---|---|
| Return on investment (ROI) | Calculation of amount of money saved or gained, in this case thanks to solarisation, e.g., upfront costs are US$ 50,000, and annual return on investment is US$ 10,000 thanks to savings in generator fuel expenses. |
| Solar panel capacity calculation over time | Calculation on how solarisation capacity decreases over time, as equipment ages, e.g., after 10 years, capacity will be reduced to 90%. |
| Technical manuals | Any manuals on how to operate and maintain solar equipment. |
| Safety labelling | Safety information e.g., regarding maintenance, handling, and storage of solar equipment provided via a label. |
| Solar thermal panels | Panels allowing for water heating |
| Structural assessment via structural engineer | Assessment of building or other structures on which solar equipment will be installed by a qualified expert to make sure the weight of solar equipment does not exceed any carrying capacity or pose any safety risk. |
| Surge overvoltage protection equipment | Protection of electronic components from surge overvoltage coming from the utility side |
| Utilisation & trouble shooting training | Is training provided on how to properly use solarisation equipment and what to do in case of malfunction. |

*Table 3: Glossary.*