

Solar grid-tied site survey form

Version 3, 14 February 2023

Note to surveyor: Please take as many photographs as possible, GPS location tagging and videos of the project location specific to the sections in the form below (for example, solar array location, powerhouse, power evacuation location etc.)



means, take photos



means, record the GPS point(s)



means, use measuring tape

Tools required during survey	Checklist
GPS device	<input type="checkbox"/>
Measuring Tape (>50 meters)	<input type="checkbox"/>
Power analyzer	<input type="checkbox"/>
Mobile phones with Camera, Calculator, Angle meter	<input type="checkbox"/>
Pen and notebook	<input type="checkbox"/>
A3 printout of Google map/Field papers with positions of the facility etc., (for easy layout of site details)	<input type="checkbox"/>
Civil and architecture drawings of the facility	<input type="checkbox"/>
Suitable mobile application to find and record sun path diagram for 12 months	<input type="checkbox"/>



Documents to be collected from the site	Checklist
NEA electricity bills for the last 3 years	<input type="checkbox"/>
Diesel generator set log sheet for at least 1 year (3 years preferred)	<input type="checkbox"/>
Distributor side statutory requirements, limitation, capacity	<input type="checkbox"/>
Single line diagram/Electrical as-built diagram of the whole facility	<input type="checkbox"/>
Site load list (list of all the electrical equipment with ratings)	<input type="checkbox"/>

The following section gathers data about the selected site, and related information which will be helpful in planning and designing the system and operational modality.

Location information					
Name of the Organization/Customer					
Key contact person	Name:	Contact no.:	Email:		
Tole name				Ward no.:	
Village/Town					
Rural municipality/municipality/Metro-Sub metro					
District					
Province					
Nature of business					
Facility expansion plans	Yes <input type="checkbox"/>		No <input type="checkbox"/>		
	If yes, mention details:				
Which mobile network works best?	<input type="checkbox"/> NTC <input type="checkbox"/> Ncell <input type="checkbox"/> Others: _____				
Geographical coordinates of the site	Latitude		Longitude		Elevation
Temperature range	Minimum (⁰ C)			Maximum (⁰ C)	
Preferred model	<input type="checkbox"/> CAPEX			<input type="checkbox"/> OPEX/ESCO	
	<input type="checkbox"/> Others (mention):				



General information				
Study team				
S.N.	Name	Designation	Phone no.	Signature
1				
2				
3				
Ownership (Information from the Commercial/Industrial facility)				
Probable ownership of the SGT (tick all that apply)		<input type="checkbox"/> Self-owned <input type="checkbox"/> Installer <input type="checkbox"/> Third party(mention):		
Probable management of the SGT (tick all that apply)		<input type="checkbox"/> Self-managed <input type="checkbox"/> Installer <input type="checkbox"/> Third party(mention):		
Source of project funds (estimated)		Contribution (NPR)	Remarks (if % share is applicable, indicate here)	
Subsidy (mention the donor agency) e.g., AEPC				
Contribution from the beneficiary				
PG/LG contribution				
Third party contribution				
For OPEX/ESCO, contribution from developer				
Financial institutions-FIs (loan/equity)				
In case of loan from financial institutions (FI)		Interest rate per annum	Term period (years)	
Name of FI-1				
Name of FI-2				
Loan/credit experience				
Does the organization have prior loan/credit experience? For purchase of Diesel generator, Online UPS, solar PV system etc.		<input type="checkbox"/> Yes <input type="checkbox"/> No		
If yes, for what purposes was the loan taken?		1. _____ 2. _____ 3. _____ 4. _____		

Site Accessibility						
Name of the road up to the facility						
Is the road motorable (From road-head to the project site)?	<input type="checkbox"/> Yes <input type="checkbox"/> No					
	If yes, road type: <input type="checkbox"/> Asphalt coated <input type="checkbox"/> Gravel <input type="checkbox"/> Earthen					
	If no, mention the means of access (E.g., Walking, two-wheeler only etc.):					
If access to the site is NOT motorable	Name of the nearest motorable road from the site:					

	Type of vehicle access: <input type="checkbox"/> 22ft truck <input type="checkbox"/> Tractor <input type="checkbox"/> Pickup trucks <input type="checkbox"/> Hand-held tractors					
	Distance from the site to the nearest accessible road: _____ Km					
	Time taken to reach the nearest motorable road (From the site): _____ hours					
Indicate the months when the site is accessible/not accessible	January	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>	February	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>
	March	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>	April	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>
	May	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>	June	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>
	July	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>	August	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>
	September	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>	October	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>
	November	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>	December	Accessible <input type="checkbox"/>	Not accessible <input type="checkbox"/>
What is the nearest airport?	Name of the airport: _____					
	Walking distance from the airport to the site: _____ Km					
	Estimated time for porter to reach the site: _____ hrs.					
Describe directions to the facility (for example, landmarks, key directions)	(The purpose of collection of this data is to provide guidance to anyone who wants to reach to the site by enquiring with the dwellers)					

The following section gathers information on the electricity demand of the facility, existing energy sources scenario etc., vital information for designing the type and size of the system.

Electricity demand, plant operation and current energy source information					
Current source of electricity (Please use extra sheets, if required)					
S.N.	Type of energy Source				
1.	Primary source (E.g., national grid)	Transformer (kVA)		<input type="checkbox"/> 1- phase	<input type="checkbox"/> 3-phase
		Load (Ampere)			
2.	Secondary source (E.g., diesel generator)	Capacity (kVA)		<input type="checkbox"/> 1-phase	<input type="checkbox"/> 3-phase
3.	Non-utility generation (If any- e.g., biomass gasifier)	Capacity (kVA)		<input type="checkbox"/> 1-phase	<input type="checkbox"/> 3-phase
	If solar PV system	System size(kW)		PV inverter size(kW/Phase)	
		Battery size (kWh)		Battery inverter size (kW/Phase)	
4.	Other sources (E.g., UPS battery backup)	Capacity (kVA/kWh)		<input type="checkbox"/> 1-phase	<input type="checkbox"/> 3-phase
5.	Does power cut exist	<input type="checkbox"/> No	<input type="checkbox"/> Yes	If yes, mention the schedule:	
				Average outage time (Hrs.):	
6.	Diesel generator (DG)	Capacity(kVA)	Fuel consumption/hour	Usage (hours)	
				Per day	Per week
	DG 1				
	DG 2				
	DG 3				
7.	Changeover type	Automatic <input type="checkbox"/> Manual <input type="checkbox"/>			
Operation hours/days					
Is the plant operational for 365 days		<input type="checkbox"/> Yes	<input type="checkbox"/> No (provide details):		
Days	Sunday	<input type="checkbox"/> 24 hours	<input type="checkbox"/> 12 hours	<input type="checkbox"/> Others (mention):	
	Monday	<input type="checkbox"/> 24 hours	<input type="checkbox"/> 12 hours	<input type="checkbox"/> Others (mention):	
	Tuesday	<input type="checkbox"/> 24 hours	<input type="checkbox"/> 12 hours	<input type="checkbox"/> Others (mention):	
	Wednesday	<input type="checkbox"/> 24 hours	<input type="checkbox"/> 12 hours	<input type="checkbox"/> Others (mention):	
	Thursday	<input type="checkbox"/> 24 hours	<input type="checkbox"/> 12 hours	<input type="checkbox"/> Others (mention):	
	Friday	<input type="checkbox"/> 24 hours	<input type="checkbox"/> 12 hours	<input type="checkbox"/> Others (mention):	
	Saturday	<input type="checkbox"/> 24 hours	<input type="checkbox"/> 12 hours	<input type="checkbox"/> Others (mention):	

The following section gathers information to access solar PV potential and assessment of location used for designing and installation of solar mini grid at the given location.

Assessment for Solar Grid tied design				
Solar Photovoltaic energy assessment				
S.N.	Parameters	Value		Remarks
1.	Average hours of sunshine/day	Winter _____	Summer _____	
2.	Are there any obstacles in the	Yes <input type="checkbox"/>	No <input type="checkbox"/>	

horizon during sunshine hours throughout the year or on seasons? (use PV application for sun path diagrams)			
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Solar Array and Powerhouse location						
<p>Identify the location for solar panel considering the following criteria: -</p> <ul style="list-style-type: none"> ▪ South facing roof/land with maximum sunlight ▪ Free from tall trees, buildings, and obstacles (no shading) ▪ Safe from exposure to chemicals, industrial waste, not falling on the right of way ▪ Permanent structures with the capacity to lodge distributed static loads ▪ Near the powerhouse ▪ The powerhouse must be chosen in such a way that it lies close to the solar PV array location (Advocate the beneficiary on benefits and risk of having powerhouse at farther end) ▪ Structure analysis of the roof designated for installation of solar PV modules (Visual inspection as well as analysis report) 						
S.N.	Parameters	Value		Remarks		
Solar PV array location						
For ground mount type installation						
1.	Is the feasible land area available	Yes <input type="checkbox"/>	No <input type="checkbox"/>			
2.	Type of land	Own <input type="checkbox"/>	lease <input type="checkbox"/>			
3.	Total land area available (m ²)					
4.	land facing direction (if applicable)	E <input type="checkbox"/>	W <input type="checkbox"/>	N <input type="checkbox"/>	S <input type="checkbox"/>	
	Azimuth angle	_____°				
5.	In case of lease, land lease agreement tenure?	Yes <input type="checkbox"/>	No <input type="checkbox"/>			
	If yes, agreement timeline (in years)	_____ Years				
	Land lease amount/ Year	_____ NPR/Year				
6.	Exact PV array location	Pictures				
		Taken <input type="checkbox"/>	Not taken <input type="checkbox"/>			
7.	GPS coordinates of the exact array location	_____ N	_____ E			
8.	Free from shading from all directions	Yes <input type="checkbox"/>	No <input type="checkbox"/>			
9.	Type of land available	Flat <input type="checkbox"/> inclined land <input type="checkbox"/> Damp area <input type="checkbox"/> Rocky area <input type="checkbox"/> Others (Mention): _____				
10.	Any noticeable wind blowing observed? Describe, if any mishaps occurred due to extreme wind in the past.	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Mention (if any): _____		
For roof mount type installation (use extra sheets if required)						
		Roof 1	Roof 2	Roof 3	Roof 4	
	Height of the roof from the ground (meters)					
	Ownership of the roof (self/rental)					
	In case of lease, lease agreement tenure (years)					
	Land lease amount/ Year (NPR/Year)					
	Age of the roof and relevant structure (years)					
	~Slope (degrees)					
	Accessibility to the roof	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	

Free from shading from all direction			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
Planned future expansion of the roof			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
This roof is considered for installation purpose?			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
Will roof penetration be allowed (with proper sealants for water proofing)			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
In case of more than 1 roof						
Roof 1	Type:	Orientation:	Total Area (m ²):	*Use extra sheet to draw the perimeter and shape		
Roof 2	Type:	Orientation:	Total Area (m ²):	*Use extra sheet to draw the perimeter and shape		
Roof 3	Type:	Orientation:	Total Area (m ²):	*Use extra sheet to draw the perimeter and shape		
Roof 4	Type:	Orientation:	Total Area (m ²):	*Use extra sheet to draw the perimeter and shape		
Roof 5	Type:	Orientation:	Total Area (m ²):	*Use extra sheet to draw the perimeter and shape		
Roof 6	Type:	Orientation:	Total Area (m ²):	*Use extra sheet to draw the perimeter and shape		
Roof 7	Type:	Orientation:	Total Area (m ²):	*Use extra sheet to draw the perimeter and shape		
Powerhouse location						
1.	Should the powerhouse be constructed		Yes <input type="checkbox"/> (Space for construction will be availed)		No <input type="checkbox"/>	
2.	Distance of powerhouse from the solar array location		_____ Meters			
3.	Total area allocated for powerhouse		_____ m ²			
4.	Allocated powerhouse area		Open ground <input type="checkbox"/>		Inside the facility <input type="checkbox"/> Allocated area (e.g., basement/warehouse):	
5.	In case of Lease, land lease agreement done?		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
	If yes, for how many years? (mention)		_____ Years			
	Land lease amount/ Year		_____ NPR/Year			
6.	Exact powerhouse location		Pictures Taken <input type="checkbox"/> Not taken <input type="checkbox"/>			
7.	GPS coordinates of the proposed powerhouse location		_____ N	_____ E		
8.	Cable route plan (from PV array to PH)		Underground via		a. existing cable trench <input type="checkbox"/> b. new cable trench <input type="checkbox"/>	
			Overhead via existing poles <input type="checkbox"/>		using new cable trays in the buildings <input type="checkbox"/>	
			Overhead using existing cable trays on the exterior part of the building <input type="checkbox"/>			
			Overhead using existing cable trays on the interior part of the building <input type="checkbox"/>			
			Both underground and overhead OR others (explain):			
Power evacuation plan and others						
S.N.	Items					
1.	Existing transformer size		_____ kVA	I/P voltage(kV):	O/P voltage(kV):	
2.	Metering		Type of meter used:		Rating:	
3.	Existing Earthing		Nos. of earthing pits:	Termination point 1:		Value: _____ ohm
				Termination point 2:		Value: _____ ohm
				Termination point 3:		Value: _____ ohm
				Termination point 4:		Value: _____ ohm
				Termination point 5:		Value: _____ ohm
				Termination point 6:		Value: _____ ohm
				Termination point 7:		Value: _____ ohm
4.	Lightning arrestors		Nos. of lightning Arrestors:		Type:	

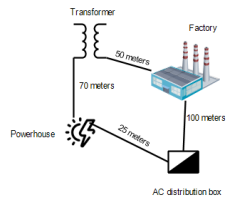


5.	Existing AC distribution boards	Distance from the powerhouse(m):		Rated Voltage(V):	
		Capacity: kVA		Type of circuit breaker used:	
		Presence of SPDs		Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Presence of extra slot for connection		Yes <input type="checkbox"/> No <input type="checkbox"/>	



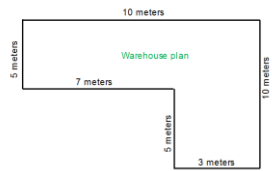
Sketch the overall project layout including solar array location, powerhouse, power evacuation points, existing relevant civil and electrical infrastructures etc.

For example



Sketch the roof layout plan, size, perimeter, and shape

For example



North

Annex-I


The following section gathers information about loads and energy demand and consumption scenario within the facility which will be used for designing the system.

Use of Power analyzers					
(Use 3-phase power analyzer to record the following, download the data from the logger in the format obtained from the logger to process for further use)					
72-hour load profile(weekdays), 48 hours (weekends or scheduled office/factory closure)			Done <input type="checkbox"/>		Not done <input type="checkbox"/>
72-hour power and energy profiles-real, apparent and reactive power consumption, power factor etc. (weekdays), 48 hours (weekends or scheduled office/factory closure)			Done <input type="checkbox"/>		Not done <input type="checkbox"/>
Major load list					
(Use extra sheets, if required)					
S.N.	Loads	Quantity (A)	Estimated power demand (kW) (B)	Total power (C=A x B)	Usage hours (Over a 24-hour period)
1.	E.g., Motor (3-phase)	2	20	40	9AM-1PM
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
Total power demand (kW)					

Annex-II

Labor cost				
S.N.	Type of Labor	Available at site (Yes/No)	Rate (NPR/day)	Remarks
1.	Unskilled			
2.	Skilled (Mason)			
3.	Solar technician/Electrician			
4.	Electrical Engineer			
5.	Porter			

Annex III

Checklist 			
SN	Description	Remarks	
1.	Pictures of the area allocated for solar PV installation (all the designated roof/total land area)	Taken <input type="checkbox"/>	Not taken <input type="checkbox"/>
2.	Pictures of area allocated for powerhouse	Taken <input type="checkbox"/>	Not taken <input type="checkbox"/>
3.	Picture of the existing main AC distribution board	Taken <input type="checkbox"/>	Not taken <input type="checkbox"/>
4.	Picture of the land/roof lease agreement (if applicable)	Taken <input type="checkbox"/>	Not taken <input type="checkbox"/>
5.	Picture of the road condition to reach the site	Taken <input type="checkbox"/>	Not taken <input type="checkbox"/>
6.	Picture of the transformer & existing meter	Taken <input type="checkbox"/>	Not taken <input type="checkbox"/>
7.	Other relevant pictures to be used for design and installation	Taken <input type="checkbox"/>	Not taken <input type="checkbox"/>

Annex- IV

Construction materials cost				
S.N.	Materials	Place of availability and distance from site (km)	Rate/unit	Comments
1.	Stone			
2.	Brick			
3.	Sand			
4.	Aggregate			
5.	Bamboo			
6.	Wood			
7.	Cement (53 grade, OPC/PPC)			
8.	Steel bar/TMT rod			
9.	Binding wire			
10.	Diesel cost			
11.	Others			

Additional information	
Remarks (any other relevant information)	

Name of the Consultant:	Name of the beneficiary representative:
Date:	Date:
Signature:	Signature:
Phone Number:	Phone Number