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Training on

Grid Connected Rooftop PV Systems Technical & Economic Fundamentals

2018-Ahmadabad, Jammu, Shimla, Dehradun

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Rooftop Solar BOM

BOM: Definition

- ❖ A bill of materials (BOM) is an extensive list of raw materials, components, and assemblies required to construct, manufacture, or repair a product or service.
- ❖ A bill of materials usually appears in a hierarchical format, with the highest level displaying the finished product and the bottom level showing individual components and materials.
- ❖ A bill of materials explosion displays an assembly at the highest level broken down into its individual components and parts at the lowest level

BOM: Why is it required?

- Material estimate of project
- Cost estimate of the project
- Useful to give estimated cost in tender
- Useful for budgeting and planning solar
- Considers material as per specific site requirement
- Considers latest tax regime of the site location
- Uses realistic assumptions
- Final figure usually very close to real market cost
- For installer, it is as good as transparent quotation

Solar Rooftop RCC 100 kW

Bill of Materials Calculation (2018)

Equipment	Sub Part	Unit Price (Rs.)	Units	Quantity Unit	Quantity /No	Total (Rs.)
Solar Modules	Modules 300 Wp	25.25	/Wp		334	2,530,050
Solar Inverters	Inverters 30 kW	200,000	/piece		3	600,000
Remote Monitoring		0	/piece		0	0
Structures						
	Mounting Structure, Columns / Purlins / Rafter (Hot Dipped Galvanized/ Cold Rolled Iron	80	/kg	60kg/kW	6000	480,000
	Mid Clamps	45	/piece	5Nos/kW	500	22,500
	End Clamps	40	/piece	5Nos/kW	500	20,000
	J Bolts (M12 150 mm	55	/piece	8Nos/kW	800	44,000
	Fasteners (M8 25 mm and 75 mm)	15	/piece	20Nos/kW	2000	30,000

Solar Rooftop RCC 100 kW

Bill of Materials Calculation (2018)

DC Cables	4 sqmm Cu	30/mtr	20mtr/kW	2000	60,000
AC Cables	10 sqmm Cu 4 Core	260/mtr	1.5mtr/kW	150	39,000
Junction Boxes		80,000/piece	1No/kW	1	80,000
Electrical Accessories	MC 4 Connectors	60/pair	0.6pairs/kW	60	3,600
	PVC Conduits	20/mtr	7mtr/kW	700	14,000
Protection Equipment	Lightning Arrestors (Conventional)	2,000/piece	Note(*)	3	6,000
	Earthing Pits with BFC (3m 50mm dia)	3,000/piece	Note(**)	5	15,000
	Earthing Strips (25 x 3 mm)	45/mtr	7mtr/kW	700	31,500
	Earthing Cable (6 sqmm Cu)	55/mtr	1mtr/kW	100	5,500

Solar Rooftop RCC 100 kW

Bill of Materials Calculation (2018)

Civil & Electrical Work		5	/Wp			1	500,000
Services	Designing	1	/Wp			1	100,000
	Supervision	1.5	/Wp			1	150,000
Total							4,731,150

1. To get final cost, Tax and Freight to be added for each item
2. Roughly add 15% of this cost to get final estimated cost
3. Thus the final estimated cost of 100 kW is Rs. 54,40,822 /-
i.e. Rs. 54.40 per watt

Assumptions for BoM Calculations

- Module Cost: Small systems Rs. 27/W Lager systems Rs.25/W
- Inverter Cost: Small systems Rs. 6.5/W Lager systems Rs.4.5/W
- Junction Box: Small systems Rs. 1500/kW Lager systems Rs.750/kW

Assumptions for BoM Calculations

- (*) Conventional Lightning Arrestor Requirement: 1-100 kW (2nos.), 100-200 kW (4 nos.), 200-500 kW (6nos.), 500-1000 kW (8 nos.)
- (**) Earthing Pit with BFC 3mx50mm Dia:1-25 kW (2 nos.), 25-50 kW (4 nos.), 50-100 kW (6 nos.), 100-200 kW (8 kW), 200-500 kW (10 nos.), 500-1000 kW (15 nos.)
- (***) GST: SPV Modules (5%), Solar Inverter (5%), Cables (28%), Structures (18%), Electrical Equipments (18%), Services (18%)
- Freight: Approximately 5% of the cost before tax

Exercise for Participants

Prepare BoM for a 50 kW Solar Rooftop Photovoltaic Plant on RCC Flat Roof

- Site Location: SNA office
- Equipments Make : Generic
- Available Roof Area: More than 500 sqm

TEMPLATE

Thank you