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Business Algorithms Pvt. Ltd.

Proposal for
Open Access
for Small Consumers

For Maharashtra State

“Best time to change over to “Renewable Energy Sources” is when your business is booming and not when you actually strive to reduce operating costs.”



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**Proposed Open Access for
Small Consumer
for
Maharashtra**

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Suggestion in Short :

- To include Connectivity using open access of Small capacity solar generation plants from 10 KW onwards at 415 V.
- To formulate metering & certificate rules for multiple small solar generators for purpose of offsetting REC buying liabilities.

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Basic Concept:

Maharashtra is blessed with ample solar power which can be used for heating as well as power generation. Solar Power Plants have long life of 25 to 30 yrs and can generate power from 10 AM till 4 PM with natural sun light and is absolutely pollution free, silent & almost no maintenance cost. On the draw back side , Solar Power Plants are expensive and occupy large space on the earth which can otherwise have alternative use. More over storage of this power for use beyond the said period is quite expensive & almost impracticable in larger capacities.

To overcome these draw backs, following suggestions are made . In this proposal, small consumers (with over 500 Units power consumptions per month) will invest in his own power plant, generate solar power using is his own terrace (which is generally of no use) and deposit the same with Distribution Company , & draw the same when required.

There would be two categories

1. Customers who wish to generate and consume the power within the same time slot, with in the premises or out side their premises.
2. Customers who wish to generate excess power and deposit (bank) the same with distribution company and use any time during the same billing cycle, with in the premises or out side their premises.

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Proposal overview :

Small consumers who are willing to participate in this scheme, distribution company shall install a bi-directional energy meter which will register the power consumed from utility and also the power deposited in utility separately.

Banks, Small Scale Industries, Hotels, Private Hospitals, Offices in commercial complexes, Offices in rented premises may opt for category 1 and consume the generated power during the same time slot (10 AM to 4 PM where solar production is 100%).

Where as Home users consuming more than 300 Units per month, Hotel, Hospitals may opt for category 2 i.e. banking option.

Typical home users have ample terrace space & also investment capacities along with an urge to save money & resources for long term. These consumers shall install Solar Plants as per feasibility and deposit power in day time & withdraw the same in the evening / night hours.

MSSIDCL will provide free power equal to the power deposited but charge a deposit amount per unit which is equal to their own profits on transmission / distribution. This will result in reduced production load on thermal power stations and they can save precious fossil fuel during the day time by lowering the production during day time & use the same in night hours.

This will give a "win win" situation for both end customers as well as electricity companies without any losses to anyone.

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Why Solar Energy :

Fosters Energy Independence

Harnessing solar power enables users to become self reliant and liberates them from depending on grid power thereby promoting energy independence.

Prudent Investment Option

- Investment in solar promises to offer better returns in the long run.
- Offers Insulation against Rising Energy Costs: With energy costs escalating periodically and threatening to move northwards owing to a combination of factors, solar energy will be the perfect insulator. Once installed the solar energy price gets locked at a pre-determined rate.

Environment Friendly

We have an obligation to conserve natural resources for future generations. Globally also, there is a big push for clean and green energy. This means looking for alternatives to fossil fuels. Importantly, owing to safety concerns, there is rethinking on nuclear energy. In this scenario the best possible solution is Solar energy and no doubt policy planners across the globe are chalking ambitious programmes to tap sun power, which is renewable, abundant and endless. India is blessed with this abundant solar energy & we must make the best of this.

Solar Energy Becomes Affordable

Over the last few years several technological innovations owing to focused R & D initiatives have resulted in Solar Energy generation cost dropping dramatically and this trend is expected to continue. Coupled with this, imaginative fiscal incentives offered by Government across the globe have lessened the burden of upfront costs of owning Solar Systems. With solar energy becoming more affordable now than before, solar domain could witness economies of scale and this could further trigger a cascading effect, making Solar Energy the preferred source.

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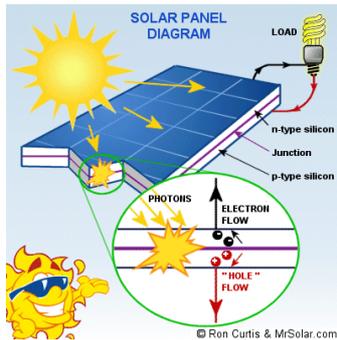
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How Solar Power Generation works: Basics

There are three basic components on Solar Power generation.

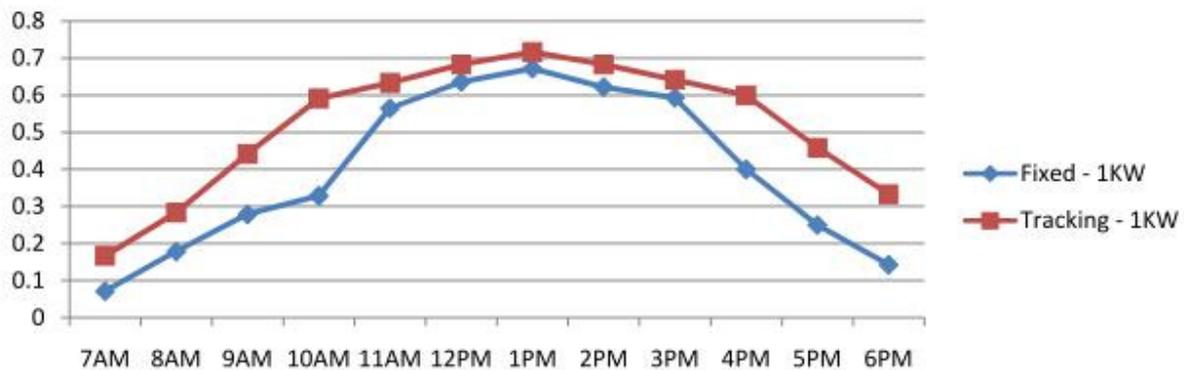
- Solar Panels
- Solar UPS
- Batteries



Solar Cells are sandwiched in toughened glass and put in frame for the convenience for transportation, installation & maintenance. It generates electricity when exposed to sunlight.

The production completely depends on availability of sun light and is typically supposed to generate full power for 300 days a year. In case of cloudy atmosphere, the production will drop according to the atmosphere.

Typical production chart of solar module is enclosed to give you clarity.



Efficiency of Solar PV in a Typical day (1KW)

This is DC current and is fed to UPS to convert it to standard power required power say 230 V AC.

Excess energy is stored in batteries for use in night hours. Batteries provide DC current to UPS after the solar power drops and power supply continues. Hybrid UPS intellectually controls the logic & gives optimum solar power in combination of batteries & Mains Supply.

- It is advisable to put all the loads which consume constant current form 10 AM to 4 PM on solar generator to make the best use of the plant.
- Lower the night loads, less would be battery requirement.
- It is always advisable to resize the loads & reduce the wasteful power consumption.

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How much Solar Power:

Extract of installed capacity is given bellow for your ready reference MAHGENCO web site is as under.

Installed Capacity

Mahagenco has an installed capacity of 10237 MW, of which nearly 75% comprises of Thermal capacity (6980 MW), one gas based generating station at Uran installed capacity of 672 MW. The Hydro Electric Projects in the State of Maharashtra were designed, erected and commissioned through the Water Resource Department (WRD) of GoM. After commissioning, the hydro projects were handed over on long term lease to Mahagenco for purpose of Operation and Maintenance. Presently there are 27 hydel projects having a capacity of 2585 MW.

Mahagenco also is implementing capacity additions programmes of about 17040 MW. Project execution works of 4230 MW projects are in full swing and 8850 MW project are in advanced stages of planning. Further Mahagenco identified land for 3960 MW projects in various location of Maharashtra.

Mahagenco is aware of next green power scenario of power generation from nonconventional energy resources and have clear vision for Green Power for the people in Maharashtra. Accordingly to fulfill Renewable Power Obligation of distribution companies in Maharashtra, Mahagenco has planned to setup about 650 MWp solar power projects in various locations of Maharashtra.

INSTALLED CAPACITY OF MAHAGENCO:

SR. NO.	POWER STATION	UNITS & SIZE(MW)	INSTALLED CAP.(MW)
A	THERMAL POWER STATIONS		
1	KORADI 5 TO 7	1x200 + 2x210	620
2	NASIK 3 TO 5	3x210	630
3	BHUSAWAL 2 & 3	2x210	420
4	PARAS 3 & 4	2x250	500
5	PARLI 3 TO 7	3x210+ 2x250	1130
6	K'KHEDA 1 to 5	4x210 + 1x500 MW	1340
7	CHANDRAPUR 1 TO 7	4x210 + 3x500	2340
	MAHAGENCO THERMAL		6980
B	GAS TURBINE POWER STATION		
	URAN G.T.	4x108	432
	W.H.R. 1&2	2x120	240
	MAHAGENCO GAS		672

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C	HYDRO POWER STATIONS		
	KOYNA HYDRO	St I&II- 4x70 + 4x80, St III- 4x80, St. IV-4x250 & Koyna Dam foot- 2x18	1956
	SMALL HYDRO		379
	GHATGHAR PUMP STORAGE	2x125	250
	MAHAGENCO HYDRO		2585

As per the generation figures available from MAHAGENCO web site, Maharashtra is running short of 7 MW power – screen shot enclosed.



Total Installed Generation capacity of the state is 10237 MW where as the generation is 8845 MW and state demand is 15390 MW as per the screen shot above .

From the data mentioned above, it can be concluded that if we can add 7000 MW from PDSC, day time load on the generation will be reduced.

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How much Power to produce?

If govt decides to generate 7000 MW from solar approx. 35,000 acer of land will be required with an investment of 56,000 cr. This is cruel waste of land and investment.

How much one individual can produce?

Home Segment : 1 KW production required 150 sft space on roof. As such 5 KW + power production from each home can be safely considered from home segment.

Factories, Commercial Establishments, Schools, Colleges : They can use their roof tops, cycle stand & open space which otherwise is of no use to them.

How many consumers are required to participate?

To generate 7000 MW solar power, we shall require 7 Lack consumers opting for this scheme to generate 10 KW +. This averages to 22,200 consumers over 33 districts of Maharashtra. This figure sounds high but if some supporting schemes are given, individual consumers who have capacity to invest more but do not have their own shadow free roof top can be motivated to invest.

How will the loss of revenue to the distribution co. be covered?

Loss of revenue can be covered by charging wheeling charges in category 1 & banking charges per unit to the consumer for the no of units he has actually banked & consumed latter in case of category 2. These charges shall be equal to the profit they make per unit on generation / distribution.

How should the consumers be motivated ?

The consumer having higher power consumption in night & is capable of investing in the project but do not have shadow free roof top at the point of consumption can also be motivated to participate in this scheme.

Other benefits ?

The consumer will save of electricity cost to the extent of 4 units per day on the account of electricity consumed per a/c for the top floors as the temperature difference to the extent of 10 to 15 deg. Can be achieved due to shadow on the roof . (Detailed calculation can be provided if required).

How Distribution Company will be benefitted ?

1. As per the data available on web site, distribution loss in LT is to the tune of 40%. So to feed 100 units to home users, distribution company buys 160 units. If generation is available in LT (415 V) and distributed losses will be minimised & infact transmission & distribution companies will be

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most happy to achieve it as the Load” would be near to distribution. Distribution company may not even charge wheeling charges in category 1.

2. In case of category 2, distribution company may charge banking charges equivalent to the average rate difference of the peak & off peak electricity rate for last quarter per unit to the consumer opting for this scheme.
3. As per web site, govt has target to complete rural electrification. Co operative societies in rural areas can jointly float “*Sour Urja Vidyut Kendra*” & fulfil the power requirements during the day time which other wise is not feasible today due to load shading pattern. This will promote agriculture in Maharashtra & provide employment to thousands. If this is implemented, farmers can take crops through out the year and cases of bad debts to banks, farmer suicides, theft & crime rate will also go down automatically.

Who can opt for this arrangement?

To achieve the magical figure of 7000 MW solar power production we need to present / promote this scheme with the proper education to the solar power equipment manufacturers. With this Maharashtra State will create record. It will be one of the largest solar power producer in India and may appear in Guinness Book of World record in respect of “No of private solar power plants installed” .

Typical consumers like private hospitals, hotels, banks, offices in commercial complexes who do not have separate terraces, individual owners in the flat schemes etc. This category of customers who consume more than 500 units average per month also have the capacity to invest & would be motivated to use alternative roofs / land or hire roof /land and generate power to consume at the main location.

Please note that most of the consumers in this category except home users will be consuming the power simultaneously and the liability to deliver free power in night will be very less.

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Summary:

This is the concept & experts can formulate details on

- How much total production can be allowed for Open Access, banking etc.
- Rules about the safety standards to be followed for generation & connectivity.
- Procedure for getting sanction for banking, validity of sanction, minimum production guarantee etc

Advantages:

To summarise the advantages,

- Generation will be near the Load & hence heavy transmission & distribution losses shall be reduced.
 - Increase in production capacity without investment , maintenance & manpower cost.
 - Control the further increase of pollution & carbon foot print.
 - This will help the state to become self reliant in power without loosing the revenue.
 - State would appear as one of the top Solar Power Producer, may appear in Gunnies Book of World Records for largest no of Private power Plants.
 - Make use of renewable energy sources & conserve fossil fuels for future.
 - Provide power to 3000+ villages in Maharastra which are still deprived of power.
 - Provide power to agriculture which currently suffers during day time & agriculture in Maharastra will get a boost which will automatically have multiple better results as a chain reaction as discussed above .
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