ENVIS CENTRE, CHANDIGARH
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Paryavaran - Patra
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Chandigarh
State of Environment

EDITORIAL

NON-CONENTIONAL ENRGY SCENARIO, CHANDIGARH

Non-conventional energy refers to the energy generated by using the natural resources such as wind, tides, solar, geothermal heat and biomass including farm-animal waste as well as human excreta, is known as non-conventional energy. All these sources are renewable or inexhaustible in the long run of time and do not cause significant environmental pollution. Moreover they also do not require heavy expenditure and after initial investment, these resources start delivering energy at negligible maintenance cost.

City beautiful Chandigarh has a well defined boundary of 114 sq. Km and almost all the area is covered under different land use patterns. Due to shortage of vacant spaces Chandigarh do not have any option for the installation of wind mills or wind turbines. Also, due to the absence of yearly river/stream; the hydro power generation can't be done in the city. Chandigarh also do not have any geothermal energy source or radioactive material site, therefore the only way out left for the city to get non-conventional energy is Solar light. The climate of Chandigarh is subtropical humid, thus high intensity solar light (more than 300 sunny days) is available during most of the period throughout the year. Therefore, taking account of the benefits of a cleaner energy, Chandigarh has adopted a well structured plan to move forward in the field of generating solar energy, using solar water heaters, solar lights, blinkers, solar cookers and electricity generation by solar panels etc.

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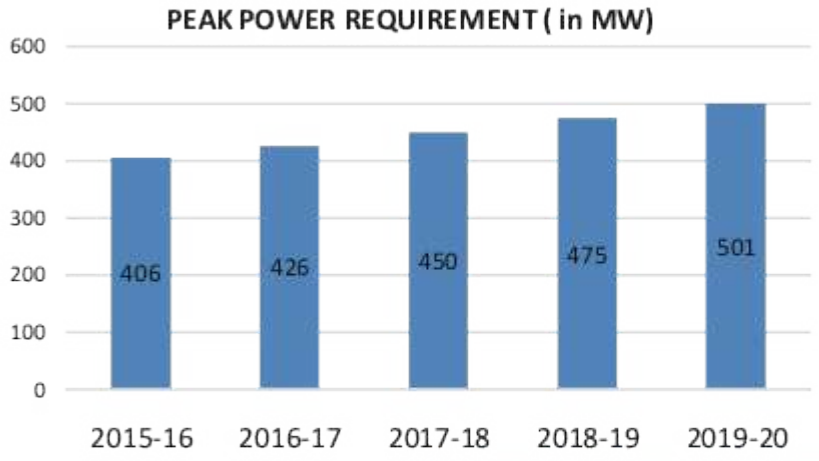
Energy Consumption Scenario in Chandigarh:-

The peak electricity demand of the Chandigarh is around 350 MW which is being met from the central/state level power utilities / generating stations. The UT Chandigarh has no generation capacity of its own.

Out of 350 MW, 43.04 % is being used by the domestic sector, 29.17 % by the commercial sector, 19.19% by the industrial sector,1.61% in public lighting, 5.99% by bulk supply, 0.1% by the agriculture and 0.89% by the others.



Source: Chandigarh Electricity Department

Power Supply Sources in Chandigarh

Generating Companies	Installed capacity (in MW)	Total Allocation inc. unallocated quota (in MW)
NTPC (13)	11942	75
NPCIL (3)	1320	28
NHPC (11)	3885	37
THDC (2)	1400	12
BBMB (3)	2356	127
SJVNL (2)	1843	14
TOTAL (34)	**22746**	**293**

Source: Chandigarh Electricity Department

Power Shortage/Surplus (-/+)

Sr. No	Months	Availability of Power (in MW)	Anticipated Demand (in MW)	Shortage(-) /Surplus (+)
1	APRIL - SEPTEMBER	220-260 MW	270-370 MW	-(50 to 110 MW)
2	OCTOBER - NOVEMBER	150-210 MW	170-230 MW	(-) 20 MW
3	DECEMBER - MARCH	130-190 MW	110-230 MW	(+)20 to (-) 40 MW

Management of the Power Shortages

- **Banking Arrangement with J&K** - 30 MW
- **Short term Power Purchase** - 40-80 MW
- **Power Exchange Platform** - Need Based

- As per guidelines issued by MNRE, Govt. Of India, 3 % of the total energy consumption is to be obtained from the RE (Renewable Energy) sources under RPO (Renewable Purchase Obligation) for UT. Chandigarh. Out of this 0.85% is to be met from solar energy. Thus, about 12.3 million units are to be produced/ obtained from the solar energy. In order to meet its RPO, UT Chandigarh has conceived Rooftop based SPV Power Projects only; as the use of other renewable sources such as wind power, Hydel Power etc. is minimal in the UT.

- **Current Status of Renewable Power Obligation (RPO) : Solar Energy**

Sr. No	Financial Year	Max Demand (MW)	Units Billed (MU)	Solar Obligation to be met		Actual Solar Obligation Met (MUs)			%age RPO met in that year	Cumulative RPO met in %age	Remarks
				%	MUs	By purchasing RECs (MUs)	By Purchasing Solar Power (MUs) from M/S CREST	Total Obligation Met (MUs)			
1	FY 2010-11	323	1285	0.25	3	-	-	-	-		JERC Regulation came into force wef 30.11.2010 and copy of the regulation received from Hon'ble JERC on 6.1.2011.
2	FY 2011-12	315	1301	0.30	4	-	-	-	-		
3	FY 2012-13	363	1365	0.40	5	2	-	2	43%	16.66%	
4	FY 2013-14	353	1420	0.40	6	16	-	16	275%	88.88%	Backlog of 2010-11 to 2012-13 achieved.
5	FY 2014-15	395	1423	0.60	9	7	2	9	110%	100%	

Source: Chandigarh Electricity Department

- **Solar Renewable Power Obligation (RPO): Future Targets**

Sr. No.	Financial Year	Solar RPOs to be purchased in % as per regulation	Projected Energy to be sold (MUs)	Energy to be procured from solar plants/ RPO in MUs	Equivalent Power in MW by taking 16% CUF
1.	**FY 2015-16**	**0.85**	**1556**	**13.23**	**9.44**
2.	FY 2016-17	1.15	1615	18.57	13.25
3.	FY 2017-18	1.50	1676	25.14	17.94
4.	FY 2018-19	1.85	1738	32.15	22.94
5.	FY 2019-20	2.20	1790	39.38	28.09
6.	FY 2020-21	2.60	1884	47.94	34.20
7.	FY 2021-22	3.00	1899	56.97	40.65

Source: Chandigarh Electricity Department

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Chandigarh: The model Solar City

- MNRE has identified 60 cities in the country to be developed as solar city by 2012 as part of the National Mission of Solar Energy with Chandigarh being one of them in the northern region.
- Chandigarh is among one of the 4 Model Solar Cities chosen by MNRE, GoI.
- Chandigarh Renewable Energy, Science and Technology Promotion Society (CREST) under the aegis of Department of Science & Technology, Chandigarh Administration, has been appointed as the executing agency for MNRE (GoI) schemes & Renewable Energy projects in Chandigarh.
- Master Plan for 10 years for Model Solar City was prepared by " The Energy and Resource Institute (TERI)", New Delhi.
- Approved Master plan of 'Chandigarh Solar' City envisaged mid term target of 5 MWp Rooftop Solar (by 2017) and long term target of 10 MWp rooftop solar plants installation by 2022 to be achieved.
- **However, in view of enhanced target of 100 GW to be achieved by 2022 as recently announced by MNRE (GoI), Government of India, has set 100 MW as SPV target for Chandigarh Administration to be achieved by 2022.**

This concept will prove to be extremely beneficial for Chandigarh, which is located in the sunny belt of the country and receives a good amount of solar radiation over the year. The Chandigarh Administration has got a DPR (Master plan for implementation of solar city program) prepared from TERI. The underlying philosophy of the concept of the Solar City is to ensure that the energy demand in will be met in affordable, technologically advanced, and environmentally friendly manner. It means that after cost effective efficiency and demand response, the city relies on renewable sources of power and distributed generation, to the extent possible.

It is proposed that Chandigarh will generate its own power by harnessing solar energy for which the following targets has been anticipated:

- 10 MW solar PV based roof top power plant
- 5 MW solar PV based power plants in landfill site of the city (this has of late has been ruled out due to capping of site

Journey So far to Achieve Solar Targets:

Chandigarh is leading towards a complete solar city and the administration has installed solar panels over the roofs of houses, commercial buildings, schools, colleges, universities, hospitals and government offices etc. Solar lights has been installed at various places including parks, street lights at road sides and blinkers on the roads interconnecting different sectors of the city. The total number of various solar appliances installed throughout the city is given in the Table below:

Year	Solar Water Heating	Solar Cookers	Solar Street Light	Blinkers	Battery Operated Vehicles	Solar Green House
	Cumulative value in LPD	Cumulative value in No.	Cumulative value in No.	Cumulative value in No.	Cumulative value in No.	Cumulative value in No.
2014 - 15	(209200 + 13000) = 222200	105	(898 + 125) = 1023	14	593	32

- CREST commissioned its **100th rooftop solar plant** on World Environment Day (**5th June, 2015**) with overall installed capacity of 5.3 MWp
- These 100 solar plants include followings:

- Installation& commissioning of **Rooftop solar plants in 35 Govt schools** of UT Chandigarh of overall **capacity of 1480 kWp**.
- Chandigarh has **120 Govt schools** & CREST plan to install Solar plants on all schools by March, 2016.
- Installation & commissioning of Rooftop solar plants on **all 7 Govt colleges** in Chandigarh leading to overall **capacity of 2.58 MWp**.
- One of the **largest rooftop Solar PV Plant of 1 MW** capacity installed & commissioned at Punjab Engineering College, Sec 12.
- Installation of rooftop Solar plants on **24 Govt residential Houses** for Demonstration purposes.
- Installation of rooftop Solar plants on **34 other Govt Offices/ Institutions.**

Future Strategies:

1. Covering all rooftop of UT government office as well as residential buildings

2. Encouraging & facilitating other Govt. Offices like Central Govt. offices, Punjab Govt. Offices & Haryana Govt. offices to go for solar installation

3. Encouraging Private/third party solar installation mode on buildings

Targets to be Achieved

S. No	Agency	Target
1.	UT Administration's intervention	30 MW
2.	Central Govt Establishment's located in Chandigarh	20 MW
3.	Private Sector/ Industries/Institutions/ Residential Houses/ RESCO Mode	50 MW

Promotion of Solar Energy in Residential/Industrial /Commercial sector

- **Joint Electricity Regulatory Commission for Goa & UTs (JERC) has notified the Solar Tariff & Net metering Regulation 2015 on 8th May, 2015 which is offering a very attractive rate which shall definitely lead to installation of Solar Plants on private houses/Industrial/commercial establishments**
- **As per the Regulation, any electricity consumer/resident can opt for 'Gross Metering' billing arrangement or for 'Net Metering'.**
- **Gross Metering : Gross meters measure all the electricity generated by your system and all the electricity is exported to the grid. At the time of high feed in tariffs (2009 to 2012), Gross meters were the preferred metering option.**
- **Net Metering : In this situation, the solar power system generates electricity and this "solar electricity" then supplies your home/businesses' electricity needs. What you do not use is exported to the power grid. Your local solar installer might be able to recommend the electricity retailer offering the highest feed in tariff.**
- **Any electricity consumer/resident can install & sell Solar power @ Rs 8.51 per unit(kW hr) from solar plant without subsidy and @Rs 7.42 per unit with capital subsidy of 15%**

Response Centre
Feedback Form

YES I I WANT TO KNOW
ABOUT ENVIS CHANDIGARH
Chandigarhenvis

Dear Information Seeker,

ENVIS CENTRE, Chandigarh furnishes you with the services to collect and disseminate information related to environment of Chandigarh. To share information with us you are requested to fill up the form given below.

Your feedback is valuable to us and will be highly appreciated

- Name _____
- Designation _____
- Department _____
- Address _____

_____ City _____

- State _____ Country _____ Pin |_|_|_|_|_|_|
- Phone _____ Fax _____
- Email _____

Your views on scope of improvement :

- Interest Area _____

I would like to have information on following :

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Paryavaran - Patra

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(I.T. Assistant)

-: Initiatives by the Administration for Residents :-

- To promote solar energy, Chandigarh Administration has recently announced that the resident welfare association that would install maximum solar plants in its area from August 2015 to August 2016, would get an award of Rs 1 lakh.
- A subsidy of 30% has also been announced by the Minstry of New & Renewable Energy, GoI for the residents willing to install the SPV's from any of the empaneled agencies of CREST.
- The subsidy will be paid to the applicant/consumer after the commissioning of the project (http://www.crestchd.org.in/Agencies.pdf).
- For information and support related to the installation of SPV's please log on to the website: www.crestchd.org.in or contact CREST, Sector 19B, Chandigarh.

-: Special achievements of the City :-

- The Conference of the Parties (196 countries) to the United Nations Framework Convention on Climate Change (**COP21**), was held in Paris, France from November 30 to December 11, 2015 to make a bounded consent for the control over Global Warming and reduce environmental emissions (CO_2).
- The Chandigarh Administration's '**Model Solar City Project**' has been selected as **India's solar theme** at the COP-21.
- Chandigarh administration has bagged the 2nd position in the country for achieving highest capacity addition in grid connected solar rooftop power generation during the 2014-15 financial year.
- As per the latest report released by MNRE, the Chandigarh Administration stands first in the country for the installation of solar rooftop projects under the government category.
- UT stands first in the installation of rooftop SPV plants of 4.6 million watt peak (mWp) under projects sanctioned by the MNRE. Under this category, Tamil Nadu stands second with 4.40 mWp followed by Andhra Pradesh with 2.37 mWp.

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