Solar Rooftop – A Promising Story

Global Scenario :

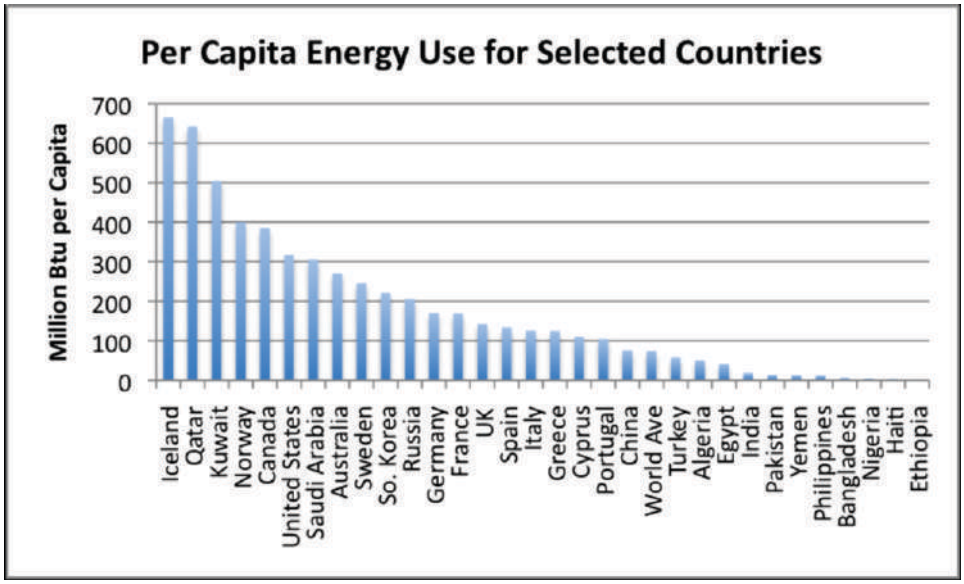
Power sector has a significant opportunity in India, if we look at world average and also compare per capita power consumption we are still quite behind many countries!

Well, it is a problem and also a big opportunity for rise of power sector in India that a lot of ground to cover, with youngest country in Top 10 power consuming countries of world, with rise in demand as future will be electrical vehicles, digitalized transactions and large population to cover..

Rank – By highest power consumption per annum by a country

Rank	Country / Region	As of	Average Electrical Energy Per Capita (kWh per person per year)	Median Age Population (Years)
-	World	2018	3081	31.08
1	China	2019	4,617	38.4
2	United States	2019	12,154	38.5
3	India	2019	935	28.7
4	Russia	2019	6,685	40.3
5	Japan	2019	7,150	48.6
6	Brazil	2019	2,830	42.7
7	Canada	2019	14,612	41.8
9	Korea, South	2019	10,192	33.2
9	Germany	2019	6,306	47.8
10	France	2019	6,702	41.7

*Source : EIA & CIA



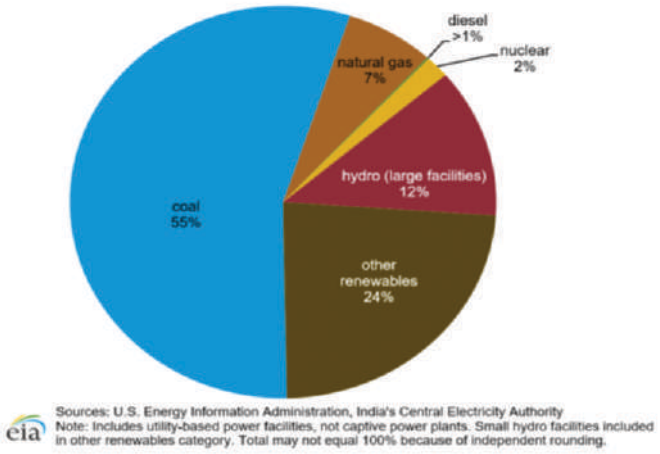
Conclusion:

India has a very promising future for Energy Sector, Renewable is the way to go!

Indian Power Situation :

As of 2020, total installed capacity of India is 375 GW out of which 231 GW is thermal, 45 GW is Hydro, 67 GW Neuclear and 91 GW of Renewable power.

Figure 9. India's installed power capacity by fuel, June 2020



India being a tropical country, there is higher consumption of electricity during afternoon, also all offices, schools, commercial buildings, cinemas, production manufacturing units, educational institutes etc. would be consuming power during the day time and hence, there is a huge fluctuation between demand during day time and night time, PLF are between 42% to 59% amongst state, private and central thermal power plants in country they are also aging.

Peak demand of India is 185 GW, the consumer of power are Industries 41%, Agriculture 17%, Commercial 8%, Residential 25% and balance Traction and Others.

There has been a steady increase of Renewable Share and Solar Power is the fastest growing power generating technology by far, it has reached almost 39 GWp capacity, out of which 34.5 GWp is through Utility Scale and 4.2 GWp from Solar Rooftop.

Due to focus on solar technology, worldwide and in India, there has been economy of scale achieved, large scale, medium scale and many small scale industries have built competencies over last 5 years in manufacturing, design, execution, services for Solar Power Plants.

Conclusion :

Very Big opportunity for Solar Rooftop Segment, long way to go!

Transmission & Distribution (T&D) Losses :

For Rooftop, there are challenges regarding state level regulations changes and policy related interpretations sometime otherwise it is the easiest and smartest way to generate power. Global Transmission & Distribution (T&D) losses are well below 10% whereas India it is about 21% (more than double), the consumers who install rooftop for captive use, a straight 21% of efforts and costs are saved as using same infrastructure we can save 21%!

Save the Land !

Land is an issue for a highly dense country like India and Rooftops which are idle can serve as power generating areas (free of cost, that too all Non Agricultural!) – Best out of Waste as no Industry utilizes Roof for any productive purpose.

There would be some challenges regarding infrastructure point of view for Power Distribution Companies who have been serving the country for many years, there would be challenges to manage exported power, transformer capacities, cable capacities etc.

however, it can be well planned as growth of power infrastructure is always associated with growth of country or economy!

Conclusion :

Captive power generation at consumption point – the most efficient way to do!

Change is the only Constant :

Sometimes, there are fears what will happen to the traditional sources and infrastructure of power but that is the way change happens, we used to use post cards, telegrams, desk letters, then e mails, social media, Whatsapp, video calls, all new gadgets have camera inside, don't remember when did we go for developing a photograph, it's all soft versions from hard versions with changing times…

We shall see change in automotive segment as well, 15 years down the line we shall see Electric Charging Stations and may not find or rarely find some Petrol pumps which we lived with for 50+ years but it is changing and will change, so as the power generation mix with a lot of innovation on battery storage to ensure cheaper, clean and stable power using renewable sources round the clock!

Conclusion:

New Era, New Technology, New Philosophy, New Generation, New Demands – What we need ?
New Solutions!

Complement and not compete :

In coming times, there is going to be a significant rise in power demand in India and it would not be possible to install so many conventional Power Plants, hence to meet peak demand Solar would be a source to complement rise in demand.

Solar generation is almost during the peak demand, which can complement traditional units to run more efficiently!

Discoms, Get RPO (Renewable Power Obligations) benefits from Residential and majority commercial & Industrial Solar rooftops !

Conclusion :

Sometimes Solution is in our perceived Problems!

Environmental Benefits :

It is high time, that we look beyond only commercial aspect of life. There are challenges globally we are facing and we all have to be part of journey to look at natural resources of power, a right mix to ensure we don't further degrade mother earth and try our best to preserve for future generations.

Adoption of Renewable (Solar / Wind / Geothermal / Hydro / Biomass) and look beyond always commercial aspect is essential for all of us.

Conclusion :

Everyone thinks Saving Environment is other mans' job, in fact Everyone needs to contribute as Earth is for All!

Table below shows a great opportunity in C&I (Commercial & Industrial) as well Residential Solar Rooftop for Captive Use

Solar PV Capacity	China	India	USA	Japan	Australia	Germany	Overall
UOM - GWp	**2020**	**2020**	**2020**	**2020**	**2020**	**2020**	**2020**
Utility Scale	26.6	5.0	12.0	3.8	1.3	1.1	**49.8**
%	66%	82%	71%	59%	36%	25%	**64%**
C & I (Commercial & Industrial)	4.7	0.6	2.0	2.1	0.6	2.4	**12.4**
%	12%	10%	12%	33%	17%	55%	**16%**
Residential	9.0	0.5	3.0	0.5	1.7	0.9	**15.6**
%	22%	8%	18%	8%	47%	20%	**20%**
Total	**40.3**	**6.1**	**17.0**	**6.4**	**3.6**	**4.4**	**77.8**
%	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Conclusion :

India has a big opportunity for C&I (Commercial & Industrial) and Residential Segments using Solar Energy.

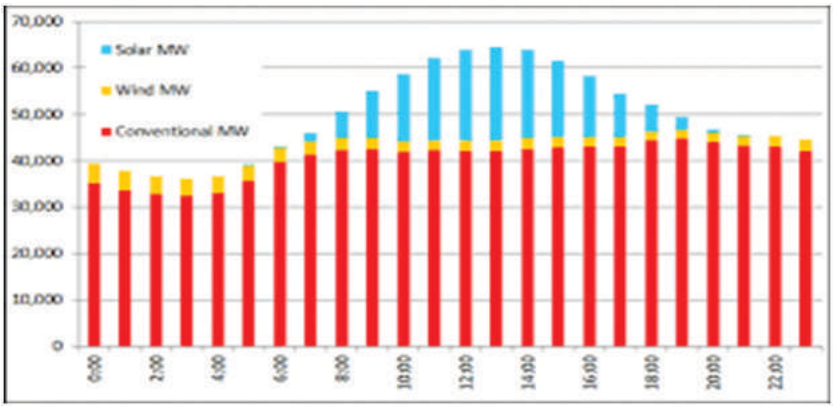
Gujarat Situation :

Image - Charnka Solar Power Park (Gujarat)

Gujarat is a power surplus state, however like other places fluctuation in demand between 17.5 GW during day and 5.5 GW during night remains a challenge for an efficient working of generating or managing power.

Gujarat has been leading its way on Solar plant as well, with 3.2 GWp installed capacity it is almost 8.2% of India capacity within the state, thanks to drive from 2009 (Honourable Prime Minister and then Honourable Chief Minister of Gujarat took initiative very early), there was another policy rolled out in 2015 very conducive for consumers, entrepreneurs, start-ups, generating a lot of employment for engineering, construction and maintenance staff.

Solar plants typically generates power in parabola curve, means between morning 7 am to evening 7 pm there is a steady rise (most of the days of year) and it reaches peak between 11 am to 2 pm and then gradually goes down. If we study the pattern of consumption which is highest during the peak hours of solar, and it can help stabilize the spike in demand to thermal plants!



Consumer Benefits :

Gujarat consumers' psychology is valued based, there has been a great support from Government in terms of Subsidy for Residence segment, conducive net metering policy for Commercial & Industrial Segment, support for Utility Scale projects, ease of doing business and Distribution Companies proficiency in execution and adaption of the change. All these factors have helped Gujarat to grow significantly in Solar Segment.

Radiation Advantage :

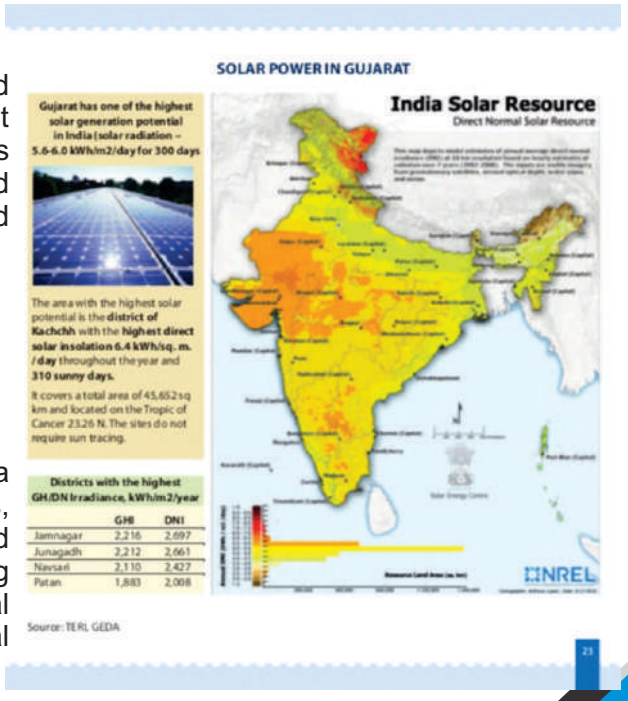
Gujarat is blessed with very good radiation and hence, solar generation/efficiency/PUF would be one of the best in India. Gujarat is the state having one of the most promising radiation levels which is very conducive for Solar Power Plants in State.

Micro, Small & Medium Enterprises Growth :

Solar segment is proving a value add to a lot of MSME and Large consumers from financial perspective to reduce their cost of product after pay back (3 to 4 years max), the cash flow remains neutral or positive with reduced rate of interest, accelerated depreciation tax benefits, lower solar capital cost and fixed estimated maintenance cost.

MSME
MICRO, SMALL & MEDIUM ENTERPRISES
सूक्ष्म, लघु एवं मध्यम उद्यम

Solar EPC companies are also mostly start-ups who are a team of qualified engineers, designers, executers, installers, project teams, maintenance teams and generate good employment opportunities locally. This segment is also growing and in true sense MSME development is key to economical growth of any region or country and Solar EPC is playing a vital role in this sunrise industry.



There will be some temporary challenges linked with interpretations and policy directives, as there are various stake holders and there would be problem for one becoming an opportunity for other, however as the targets are defined and chased from willingness of Government, we are looking forward to a great future for solar rooftop in Gujarat & India.

Approvals & Authorities :

Gujarat is blessed with very knowledgeable and driven authorities, GEDA, CEIG, Discom. All are very professional and have deep understanding of subject hence, execution of projects and compliance are almost 100%. It is a great state to work with wherein Authorities have very clear guidelines, regulations and conduct (Testimony is the Gujarat Solar Growth Story).

What is required ?

Clear policy frame work, guidelines and interpretations for Ease of Doing Business and Grow multi folds in coming years, Solar Power is a promising industry and shall be helping Environment, Efficiency and Economics.

Metering for solar with one month banking is very easy, there is no need to fix timing as generation is between 7 am to 6 pm mostly, putting daily time frame for energy accounting can create complications on metering, billing etc. which can be avoided and a lot of time of Discoms, Consumers and Integrators can be saved by continuing simple monthly banking mechanism.

Conclusion :

Solar Rooftop has significant potential in high radiation state of Gujarat, financials are favorable, technology is proven, policy frame work is conducive, knowledgeable EPC companies and committed service providers are in nearby – Go for it!

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