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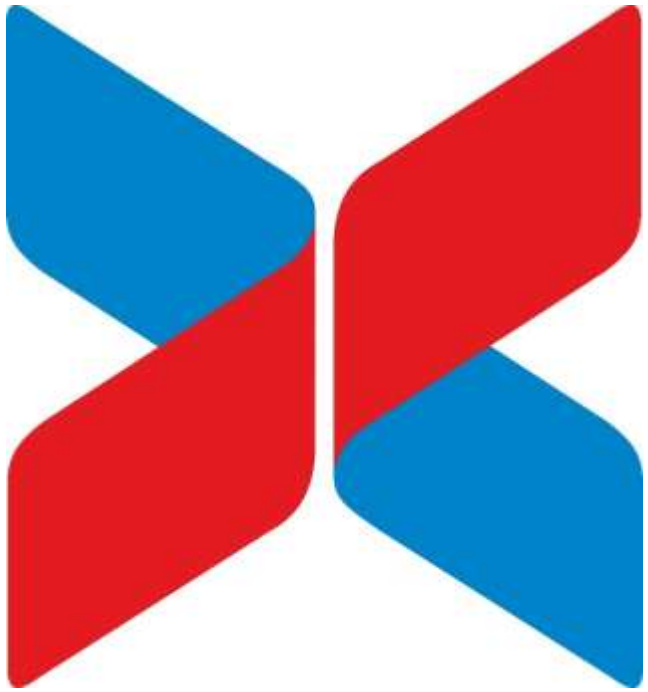
13th World Renewable Energy Technology Congress 2022

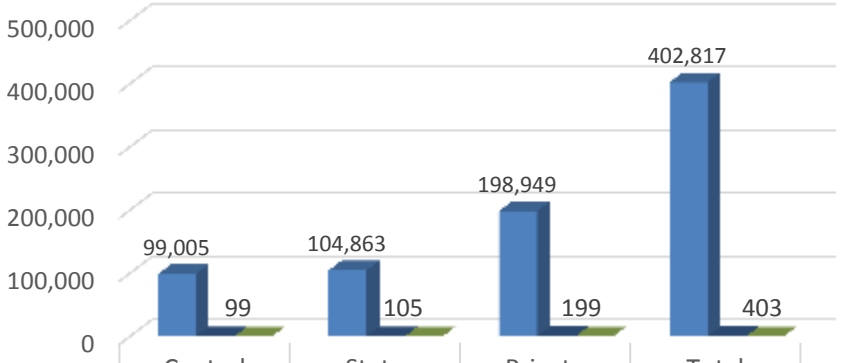


By : Vikas Arya

Date : 25th August 2022

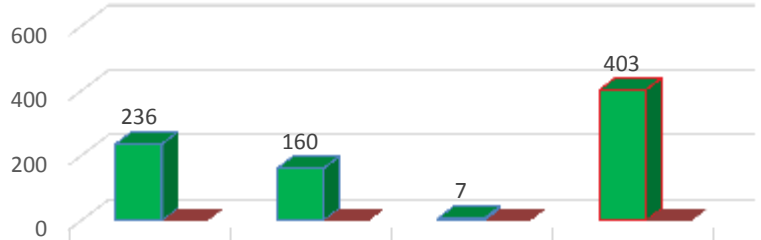
Power Generation vs Demand Trend -India

Total Installed Generation Capacity till May 2022



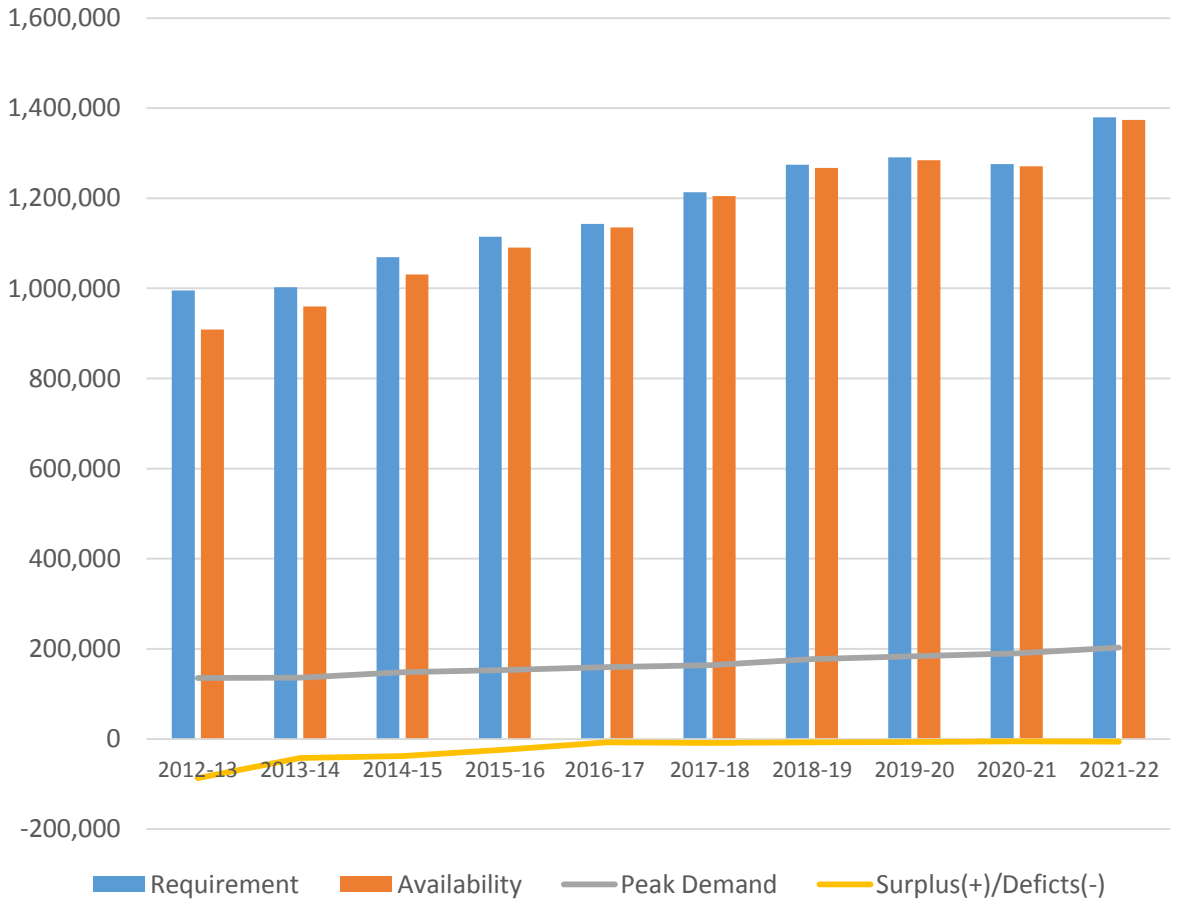
	Central Sector	State Sector	Private Sector	Total
MW	99,005	104,863	198,949	402,817
Capacity in GW	99	105	199	403
% share	24.60%	26.00%	49.40%	100.00%

Segmentwise Generation Capacity May 2022



	Fossil Fuel	Renewable Energy	Nuclear	Total
Capacity in GW	236	160	7	403
% share	58.56%	39.70%	1.74%	100.00%

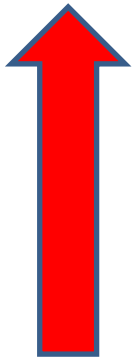
Last 10 Year Power Generation Vs Demand



Increase in Demand from 995BU to 1380BU in last 10 years

Change in Power Demand & Gap during Last 10 Years (2012-13 to 2021-22)

- **Demand of Power** –Increased by 38.6% from 995BU to 1380 BU.
- **Peak Demand** –Increased by 49.8 % from 135GW to 203GW.
- **Power Generation** –Increased by 51.2% from 908BU to 1374BU.



- **Power Deficit** – Reduced by 8.3% from 8.7% to 0.42%.

With increase in Manufacturing Capacities (Make in India) , increase per capita Electric Demand of Consumers alongwith EV Policy, Demand for Power is expected to grow at much faster rate year on year.

To meet this demand without increase in CO2 emission-

Increase in Renewable Generation Capacities provide right solution.

Renewable Energy Installed Capacity
Indian States with >500MW as on 30th June 2022

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S. No.	States/ UTs	Small Hydro Power	Wind Power	Bio Power	Solar Power	Cumulative Installed RE Capacity (MW)
1	Rajasthan	23.85	4495.82	125.08	14454.7	19099.45
2	Gujarat	89.39	9419.42	109.26	7806.8	17424.87
3	Tamil Nadu	123.05	9866.37	1042.7	5690.79	16722.91
4	Karnataka	1280.73	5182.15	1902.15	7597.92	15962.95
5	Maharashtra	381.08	5012.83	2632.15	2753.3	10779.36
6	Andhra Pradesh	162.11	4096.65	566.04	4390.48	9215.28
7	Madhya Pradesh	99.71	2519.89	131.33	2746.27	5497.2
8	Telangana	90.87	128.1	219.74	4621.07	5059.78
9	Uttar Pradesh	49.1		2189.99	2244.56	4483.65
10	Punjab	176.1		491.65	1117.99	1785.74
11	Haryana	73.5		258	943.61	1275.11
12	Himachal Pradesh	954.11		10.2	80.56	1044.87
13	Uttarakhand	218.82		139.44	573.54	931.8
14	Chhatisgarh	76		275	529.32	880.32
15	Kerala	266.52	62.5	2.5	539.6	871.12
16	Odisha	115.63		59.22	452.13	626.98
17	West Bengal	98.5		322.45	176	596.95

Solar Installation as on 31st July
Ground Based- 48 GW
Roof Top- 7GW
Hybrid/OffGrid- 3GW

Total Solar – 58 GW

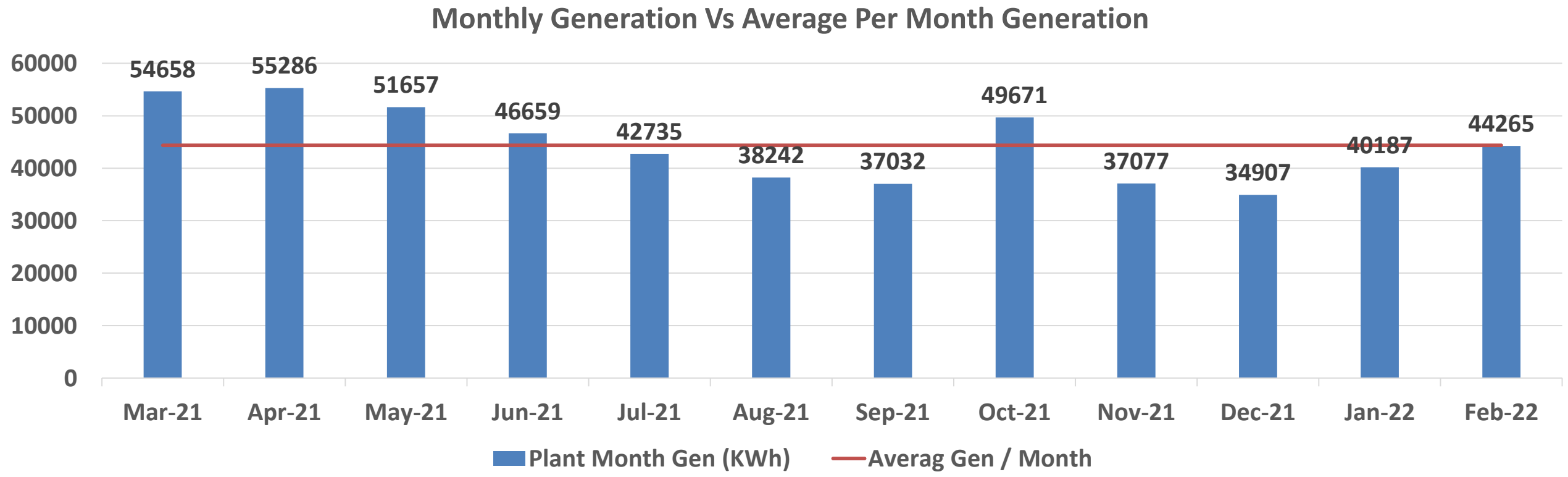
4GW Solar Capacity added in April-July 2022

Case Study – Industrial Roof Top Plant

COD	: Oct, 2020	**Cost/Unit(KWH)**	: 10.00 Rs/Unit
Location	: Pune, Maharashtra	**Contract Demand**	: 650 KVA
Installation Type	: Roof Mounted (Industrial Shed)	**Energy Production (Annual)**	: 532.00 MWH
PV Panels	: Jakson Make, 380 Wp, 1054 Nos	**Electricity Offset**	: 31% of Demand (Approx.)
Technology	: Mono-Perc	**CO2 Saving (Annual)**	: >425 Mt. Tonne
Capacity	: 400 kWp	**Savings in Energy Bill**	: >50 Lacs per year

About the Plant

- One of the US based Reputed Manufacturing Company
- Installed 400 KWp on Industrial Tin Shed at the Tilt angle of 8%
- Reduces power consumption from Grid by over 31%
- Remote Monitoring System with O&M by Jakson Team



Solar is for 25 Year Purchase, proper Maintenance and After-Sales Service is Critical…

1. **Preventive Maintenance** – Regular System checkup by Solar Engineer– Quarterly or 4 times/ Year.

2. **Corrective Maintenance** – replacement of dysfunctional components -Service becomes extremely important during such a case.

3. **Module Cleaning** – Critical for solar system performance – Fortnightly /Monthly/Weekly .

Choose Vendors with Reliable Product ,Good Installation with After-Sales Network & Experience of Providing O&M services.

Benefits from Solar /Renewable Power

1. 

Reduce Your Cost of Power (Electricity Bill)

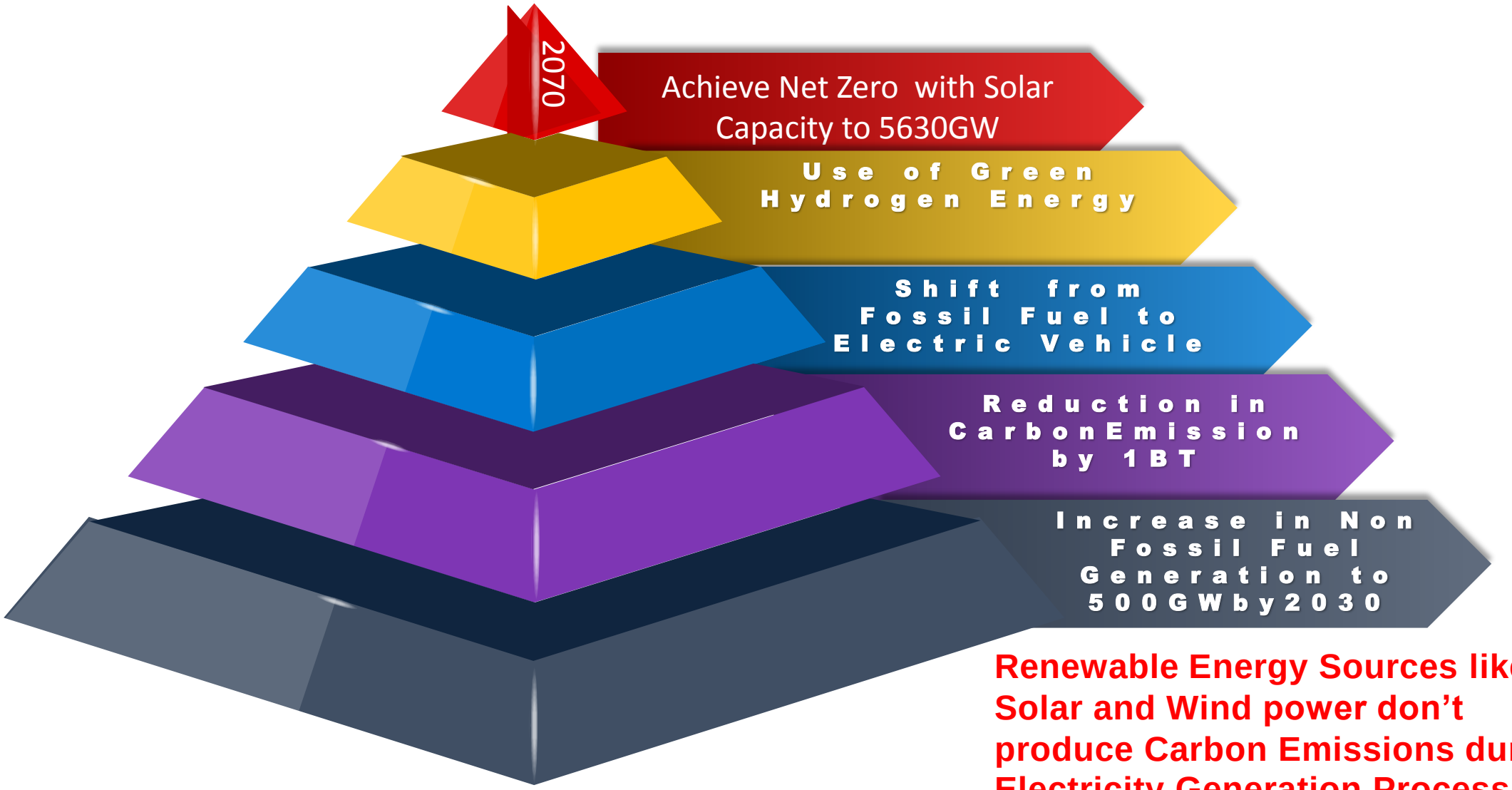
2. 

Fast Return on Renewable Investment – 4-5 Years

3. 
Save Money in long term for Business Expansion

Contribute to Climate Change Initiatives while meeting your Renewable Commitment

5 BIG GOALS TO NET ZERO BY 2070

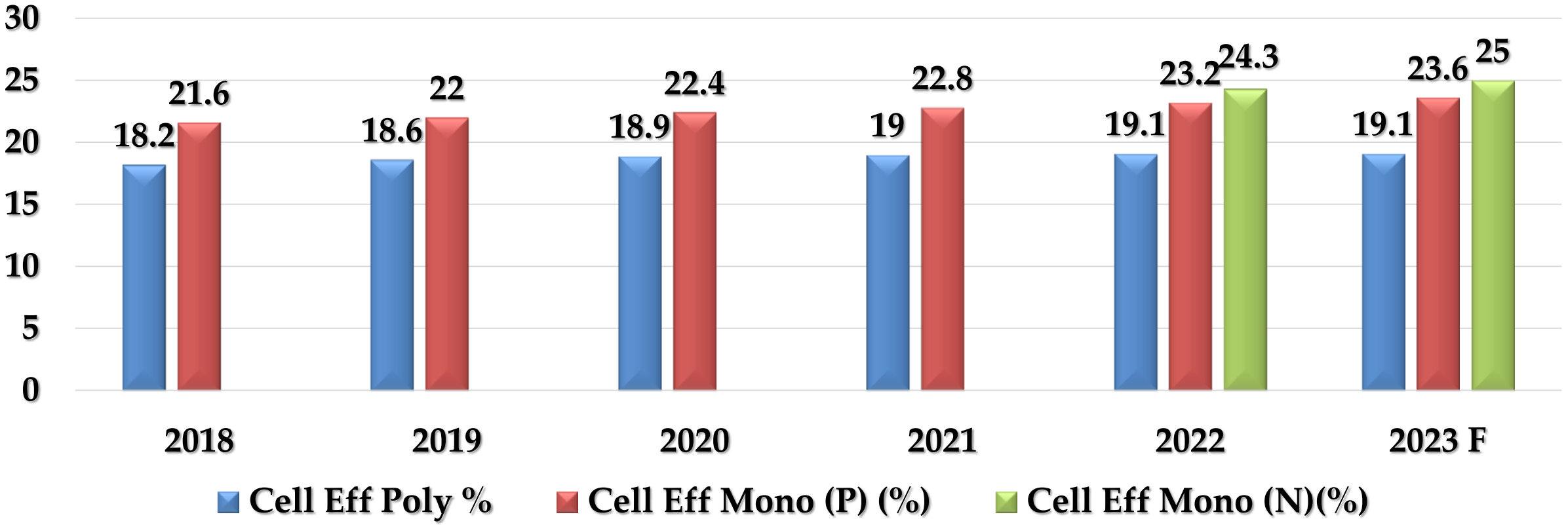


Renewable Energy Sources like Solar and Wind power don't produce Carbon Emissions during Electricity Generation Process

New Module Technologies

- Shift from Poly to Monoperc – Higher Efficiency
- Solar Modules using Half Cut Cell Technology
- Bi Facial Modules
- Higher Module Ratings- > 500Wp-600Wp-700Wp

Cell Efficiency Improvement Trend



Module Rating increased from 300 Wp to 335 Wp (Poly) & 380Wp to 405 Wp(Monoperc),with MBB upto 660Wp (Monoperc Half Cut)

In last 3 years Cell Efficiency Improved by 27% from 18.2% to 23% which will further improve by another 9% by 2023 end to >25%

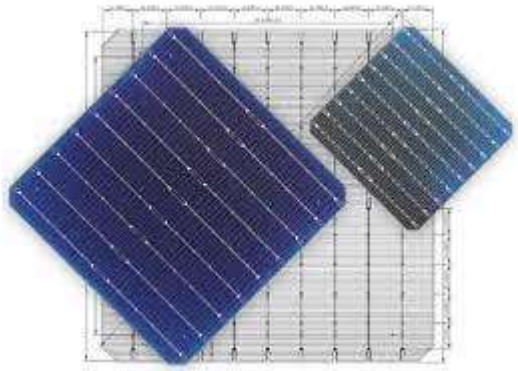
Cell Size increased from 156 to 158.75-166-182 &210mm

Cell Technology Development

2017- 156mm 5Bus Bar Poly Cell

2018- 158.75mm 5 Bus Bar Mono Cell

MBB- Multi Bus Bar



2020- 166m 9 Bus Bar Monoperc

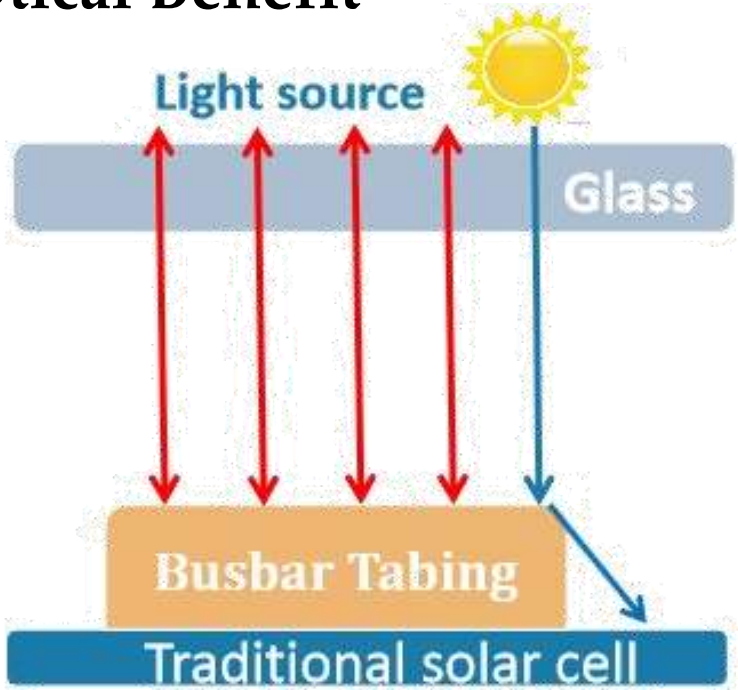
2021- 182mm 10 Bus Bar Monoperc

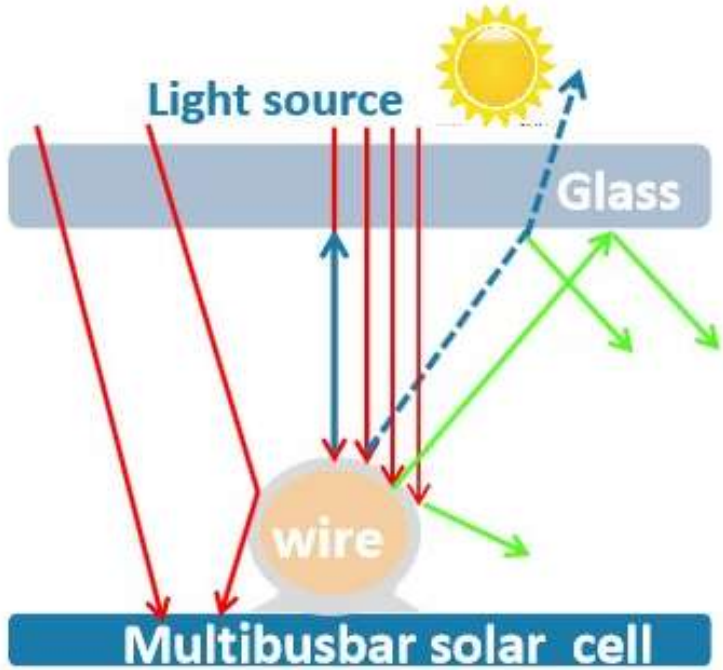
2022 is the year of shift from Full Cell Module to Half Cut Cell Modules>500Wp in India

2021- 210mm 12 Bus Bar Monoperc

Cell Technology Development – Multi Bus Bar-Advantage

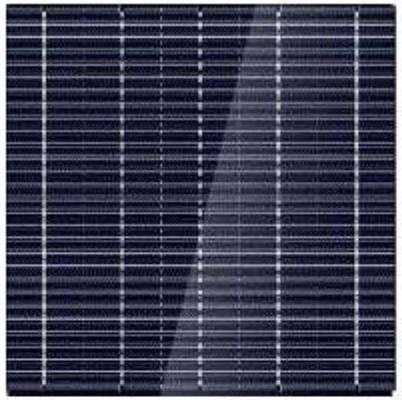
Optical Benefit

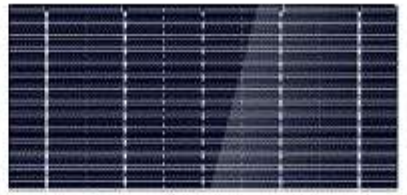




- Higher Power output per Cell
- Lower CTM/Increase in Module Wattage & Efficiency

Module Technology Development-Half Cut Cell



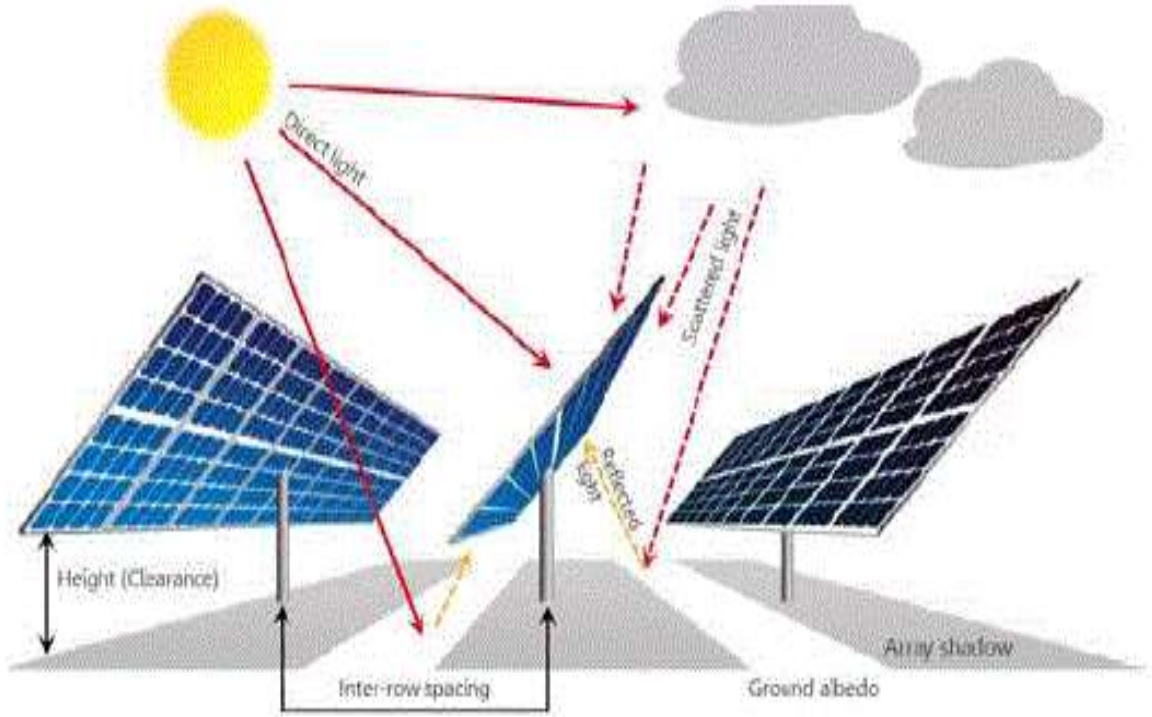


Power loss (Heat) = Resistance x Current²

This improvement in performance can increase the output of a panel by up to 2.5% over what it would be with full-size cells, which could be a good 9~10W per panel

- Increasing module efficiency/higher watt classes and larger cells result in higher currents also within the module itself
- Resistive losses lead to heating and power loss
- Half-cut cells: 75% lower losses within cell interconnects

Module Technology Development-Bifacial Module



Key factor:-

- Albedo
- Height
- GCR (Ground Coverage Ratio)
- Shading
- Spacing
- DHI (Diffuse Horizontal Irradiance)

- **POWER GAIN:-**
- 5% -20% based on design & site condition

Helia - New Technology High Efficiency Module

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Helia

600 Wp Output - 1st by an Indian Manufacturer

Best-in-class efficiency
Up to 21.39%

MBB Technology
M10 Half Cut Cells

Variants
Monofacial & Bifacial

- Enhanced Power Generation using PERC Technology
- Improved Temperature Coefficients
- Reduced Resistive Loss with MBB Technology
- Excellent performance under Partial Shading Conditions
- Lower LCOE for Faster Return on Investment

DEKRA | ISO 14001:2015 | ISO 9001:2015 | ISO 45001:2018 | MAKE IN INDIA | IEC | TÜV Rheinland CERTIFIED | POSITIVE TOLERANCE +ve | UL | R-93005959

Jakson Group- Sustainable Energy Solutions

Solar Modules & Products

- Solar Modules
- Solar Products
- Current Manufacturing – 600MW expanding to 1.1GW in 2023
  3 GW by 2025

Solar EPC

- Turnkey EPC services for Land-based & Rooftop Solar Plants
- Current Portfolio of 1.5 GW

Solar O&M

- Plant maintenance for optimal performance
- Spare parts, services & warranty claims
- Portfolio -1.6 GW

Solar IPP

- Setting up and operating solar plants to sell power to Utilities under long term PPAs
- 200 MW Portfolio

2022 - Green Hydrogen & Storage Solution

- Green Hydrogen & Ammonia
- Waste to Energy
- BESS-Energy Storage Solutions
- Zero Carbon Emission

JAKSON

75 YEARS TRUST & EXCELLENCE

OUR PURPOSE

Enhance the quality of life for all stakeholders by eating a sustainable organization

OUR VALUES

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