

# ROOFTOP & FLOATING SOLAR-

Sudhir Pathak



RENEWABLE ENERGY ARM OF HERO GROUP

# COMMONALITIES (RTS VS FLOATING)

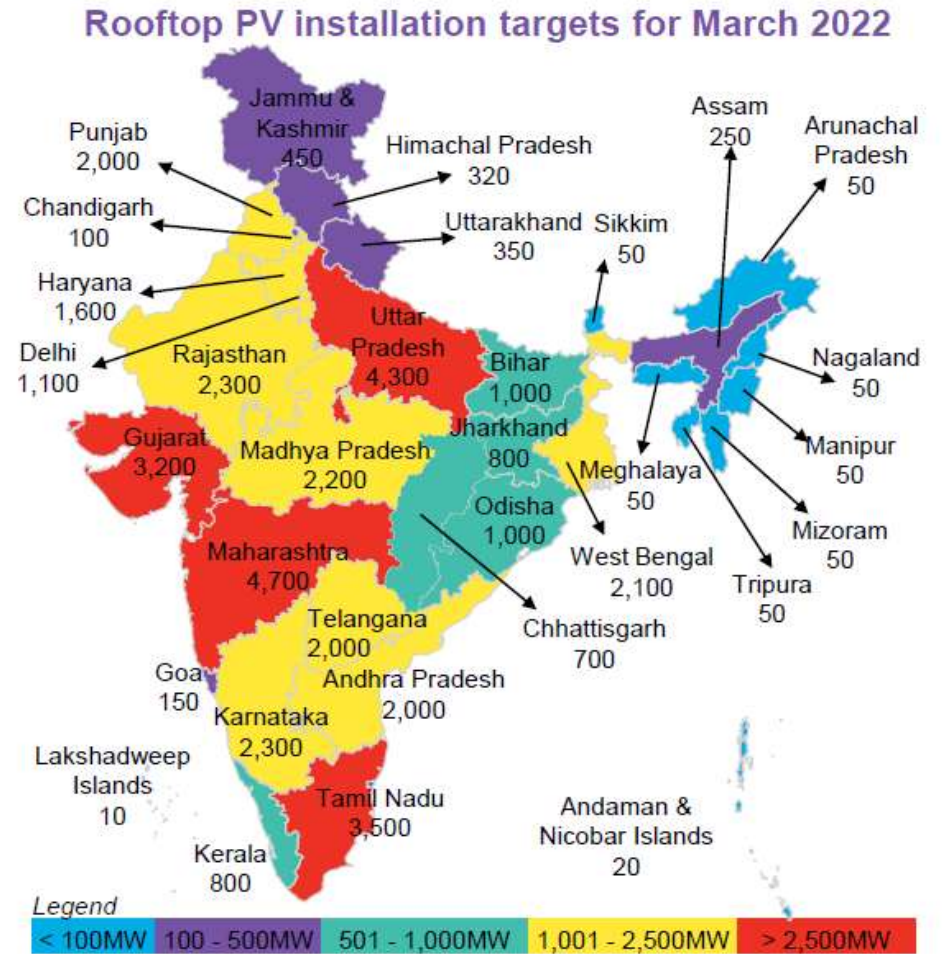
1. No Need for Land
2. Top of the facility
3. Surface Utilisation.
4. Surface Additional protection.
5. Difficult to access and maintain.
6. Highly Under-utilised Potential.

# ROOFTOP SOLAR



# GOVT. TARGET VS ACTUAL (2022)

S No	Solar	Target (GW)	Actual (GW)
1	Utility	60 (2022)	52 (Q1-22)
2	RTS	40 (2022)	7.6 (Q1-22)



Source: Bloomberg Energy Finance

# TYPES OF ROOFTOP INSTALLATION

1. Shed
2. RCC Roof
3. RCC Shed
4. Car parking
5. BIPV
6. Containers



# CATEGORIES OF ROOFTOP SOLAR

## 1. C&I

- Textile
- FMCG
- Cement
- Pharma
- IT
- Steel
- Auto & ancillaries

## 2. Railways & DMRCs

## 3. Education Institution

## 4. Hospitals

## 5. Govt. Buildings



# INHERENT BENEFITS

1. No Upfront cost to Customer ( PPA Model)
2. Scalable Model/ Partial Installation
3. Net Metering / Gross Metering
4. Cheapest source of Electricity
5. No T&D Loss & No T&D Infrastructure needed
6. No Dependency of state Distribution Company.
7. No Land Required

# CHALLENGES

1. Low Quality Installations by RTS EPCs
2. Module Price Increase due BCD
3. Commodity Price Increase
4. Several regulatory Issues and challenges
5. GST Increase on Solar component from 5% to 12%
6. Load Balancing challenge to Discoms.
7. Lack of Digitalisation across this sector



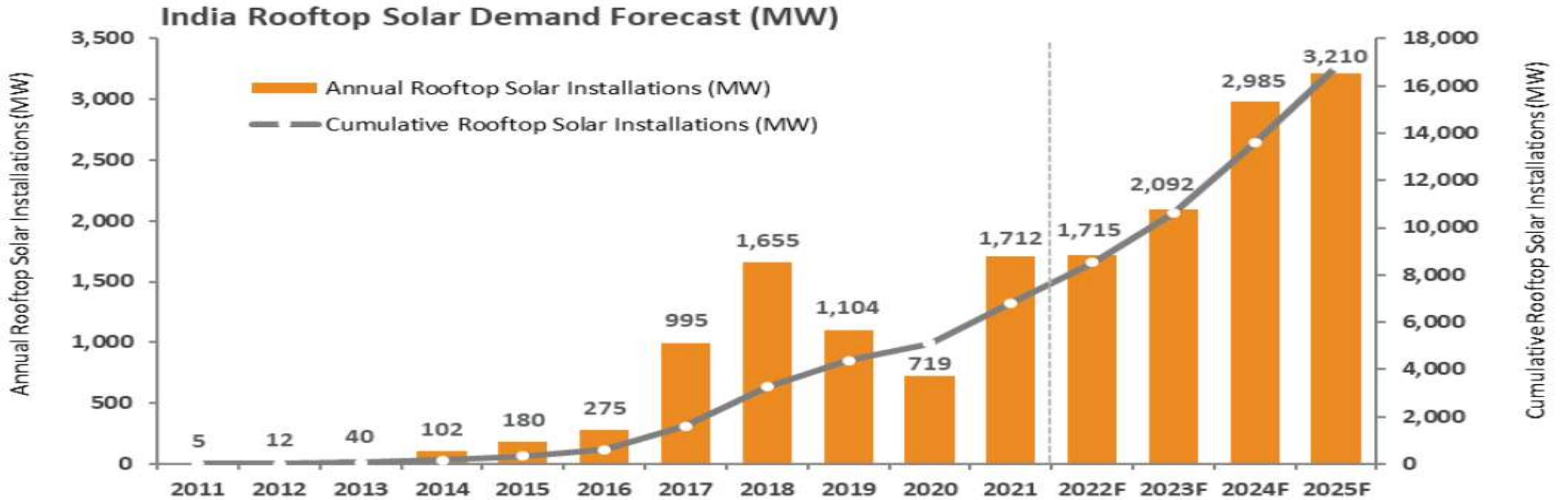
# REGULATORY CHALLENGES

1. Non-Consistent Policy -Central as well as State
2. No Static Policy with in State in all Discoms
3. Frequent changes in eligibility limits in Policy
4. No Specific Direction for Net Metering, Net billing & Gross Metering
5. Different Evacuation Policies for states ( DT Capacity, Sanction Load)
6. Different Protection & Metering Scheme in Discoms.
7. Delay in Approvals (CEIG & Discoms).
8. Component Make approval- CT/PT & Metering

# WAY FORWARD.....

1. One Guideline across all state for Net Metering, Eligibility, Evacuation, Safety.
2. Clear Roadmap for at least 5 Year.
3. Deemed approval for CEIG below 500KW
4. Special energy meter/Smart shall be allowed for Existing Meter replacement
5. Virtual PPAs
6. Block chain Incentivisation
7. Distributed Storage
8. Discom Clusters Digitalisation and Automated EMS

# FUTURE OF ROOFTOP SOLAR



Source: Mercom India Research (Mar 22)

**WITH EXPECTED EXPONENTIAL GROWTH IN MANUFACTURING SECTOR (MAKE IN INDIA), ROOFTOP POTENTIAL IS EXPECTED TO ACCELERATE FURTHER.**



# FLOATING...



The floating solar array built by Huaneng.

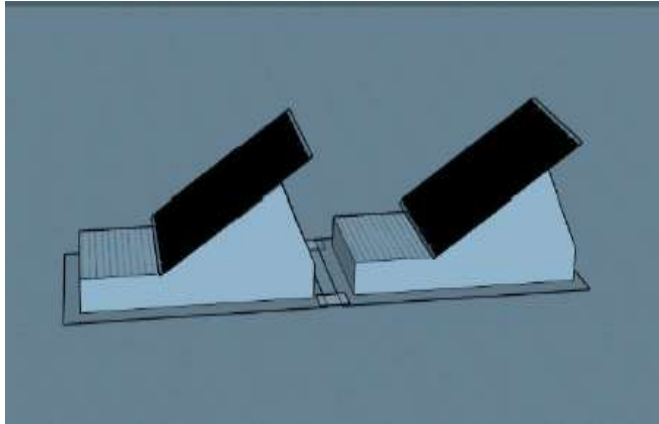


# POTENTIAL

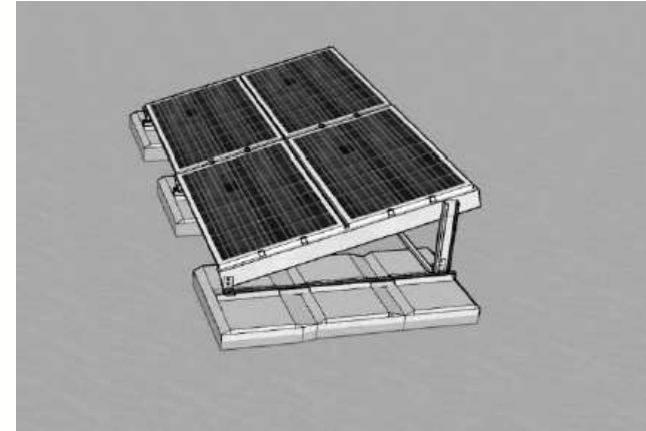
1. Global: With only 10% Coverage, Potential capacity: 15000-20,000GW!!
2. Installed till date around 5GW .....
3. India: With only 10% Coverage, Potential capacity: 100 GW!!
4. Installed till date: less than 1GW
5. Further, once explored in Sea (Like Floating Wind), can lead to Floating Hybrid!!!!!! Unlimited!!!!!!!

# FLOATS TECHNOLOGY

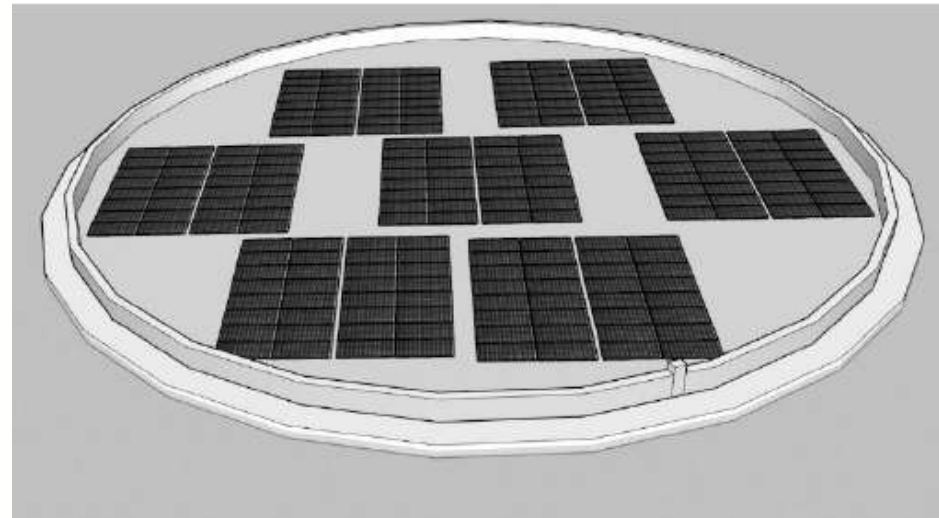
PURE FLOATS



MODULAR RAFTS

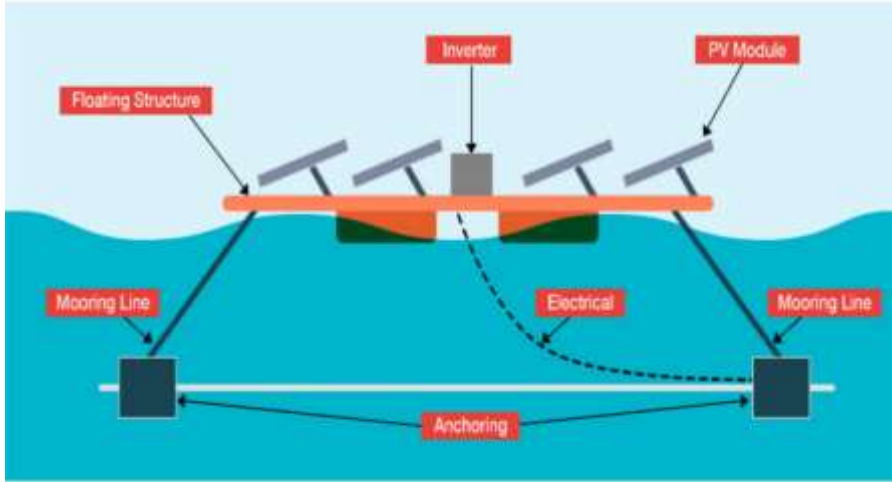


MEMBRANES

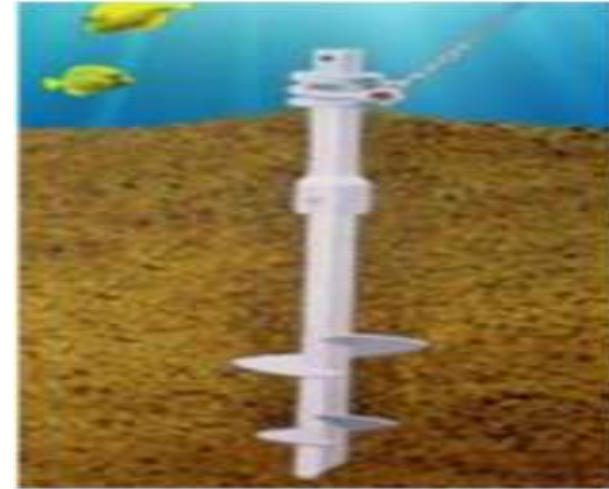


# ANCHORING TECHNOLOGY

## GRAVITY BASED



## EMBEDDED- HELICAL

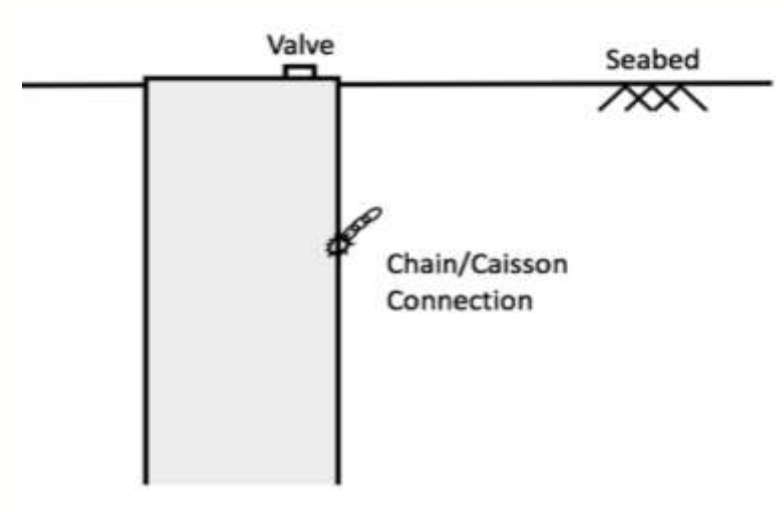


## DRAG



Figure 32. (a) Drag anchor and (b) vertical load anchor.

## EMBEDDED- DRILLED



# BENEFITS

- Land Saving
- Water Evaporation Saving upto 90 % .
- Negligible Soiling Loss
- Clear Radiation
- Better Module Cleaning
- Improved water Quality
- Reduced Algae blooming
- Reduced Civil Work



# CHALLENGES

- Bathymetry and data availability
- Water Level Variation Control
- Risk of drying / shielding ( climate change )
- Evacuation infinite constraints due to huge forest cover surrounding water bodies
- Human safety issues due to wild animals in the forest and under water
- Limited life of floaters and anchoring system .
- Wave Impact
- Corrosion

# FUTURE..

- Bound to increase due to land mass scarcity .
- C& I premises water bodies utilisation.
- Offshore floating solar through wave breakers .

# THANK YOU

For more information follow  
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[www.herofutureenergies.com](http://www.herofutureenergies.com)