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# Accelerating Adoption of Rooftop Solar PV in India Through Project Aggregation and Financing

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# Renewable Energy Is Being Supported By A Large Number of Policy Mechanisms

## Renewable Purchase Obligations (RPO)

- Mandated by Electricity Act and Tariff Policy
- Supported by Renewable Energy Certificate (REC) mechanism

## Tariffs and Incentives

- Feed in Tariffs, Generation Based Incentives
- Power Bundling, Priority Dispatch, Gross and Net Metering

## Tax Exemptions

- Accelerated Depreciation
- Excise and Customs Exemptions, Tax Holidays

## State Level Policies

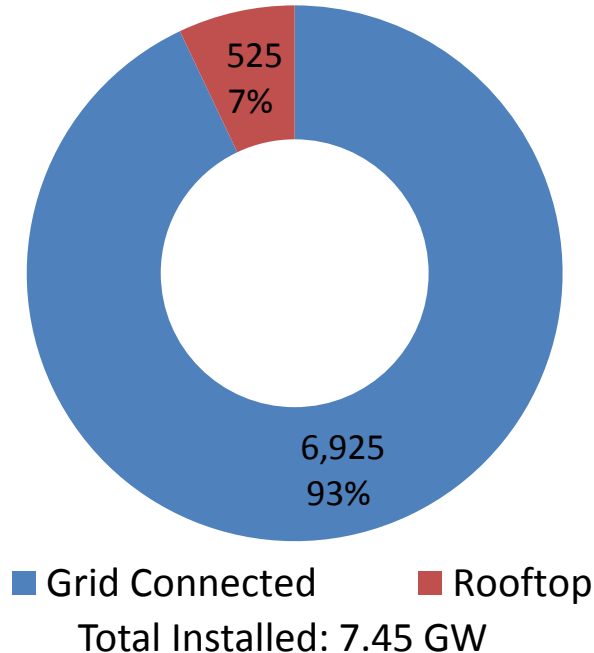
- Over 12 states announced state policies with provisions for grid connected, rooftop, and off-grid solar
- Most states have announced net metering policies

## Credit

- Priority Sector Lending
- Credit Enhancement
- Infrastructure Debt Funds, Securitization, Green Bonds

# But Deployment Is Lopsided: Over 90% Capacity Addition Is In Utility Scale Projects; Rooftop < 10%

## Installed PV Capacity in MW Mid-2016



## Highlights

- Megawatt scale solar projects are coming up rapidly, driven by favorable policies, state initiatives, and robust demand from public and private sector
- Barriers remain for rooftop solar PV to reach a rapid scale of adoption
- India risks undershooting 40 GW rooftop target unless policy and market interventions address gaps

# Globally, Two Approaches Have Helped Scale Rooftop Solar; But The Indian Market Is Still Evolving

## Utility driven Rooftop Solar

- System owned/financed by utility
- Installed on utility or customers' premises
- Generated electricity fed into grid or consumed by end consumer
- E.g. Gandhinagar, Gujarat

## Consumer-Driven Rooftop Solar

- System owned by third-party or by customer
- Installed on customers' premises
- Generated electricity fed into grid or consumed by end consumer
- Prominent model in India; several variants possible
- E.g. Tata Power in New Delhi



Financing is a major factor restricting development of rooftop solar for both the approaches above

# Solving Finance Will Address Several Challenges Facing Rooftop Solar In India

## Challenges

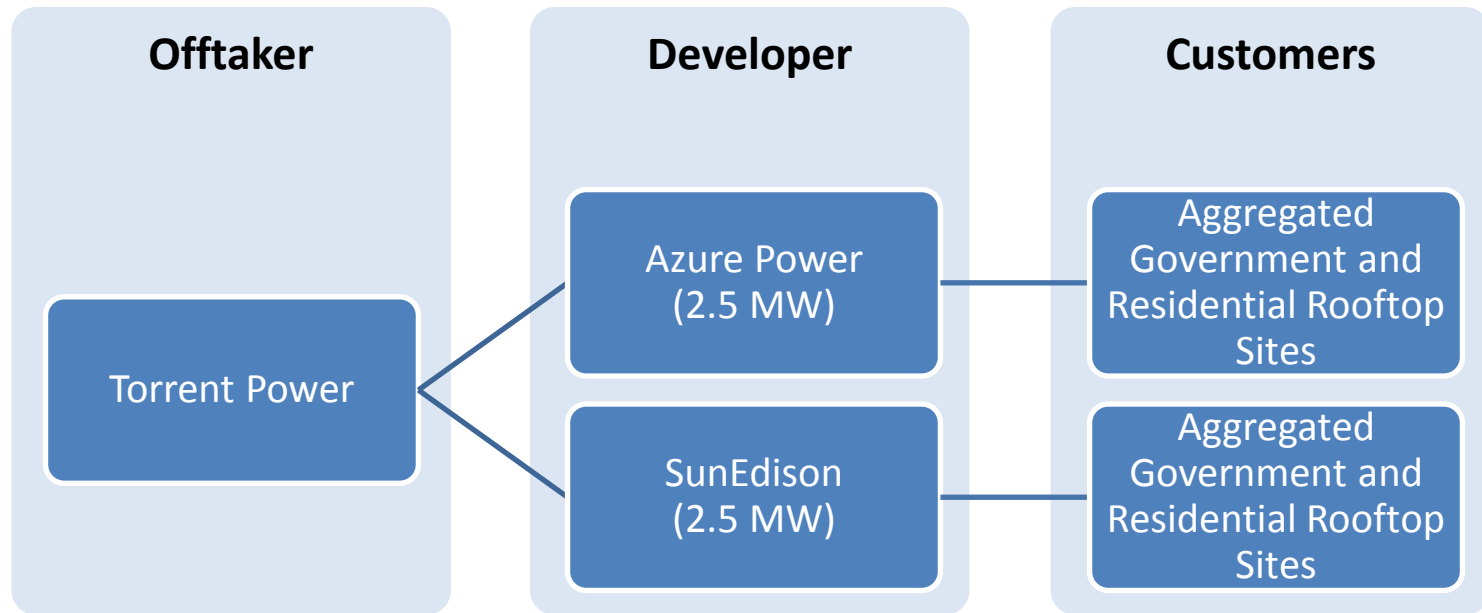
- Uncertain financial viability of solar PV system
- Lack of financing options
- High capital costs
- Third party off-taker risk under PPA agreements
- Long payback periods
- Regulatory uncertainty

## Solutions

- Financial incentives, e.g. Accelerated Depreciation
- Innovative products with aggregation and securitization
- Concessional lending e.g. World Bank - SBI loan for solar rooftop
- Standardization of contracts
- Detailed risk assessment and credit enhancement

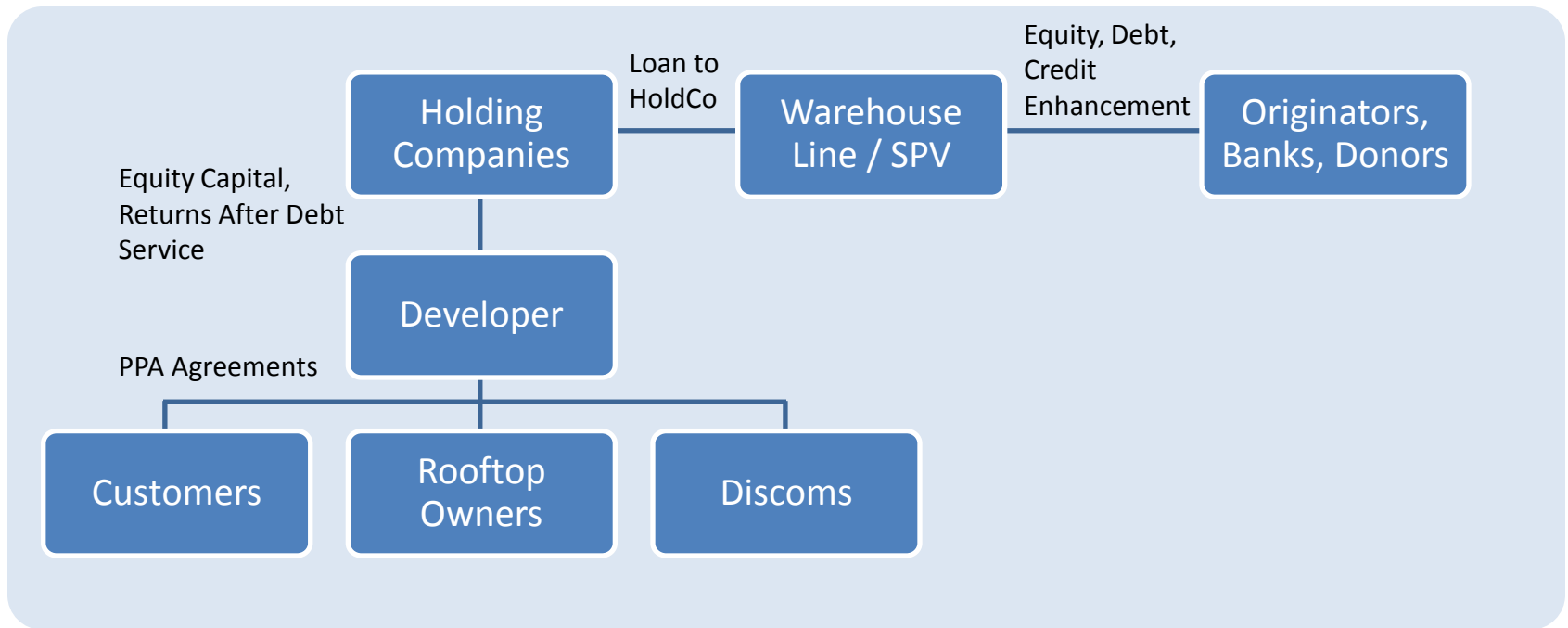
# Aggregation and Third Party Finance May Prove To Be Successful Models For Scaling Rooftop Solar (1/2)

## Example of Utility Driven Aggregation Model – Gandhinagar Example



# Aggregation and Third Party Finance May Prove To Be Successful Models For Scaling Rooftop Solar (2/2)

## Example of Third Party Driven Aggregation Model Under Development





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