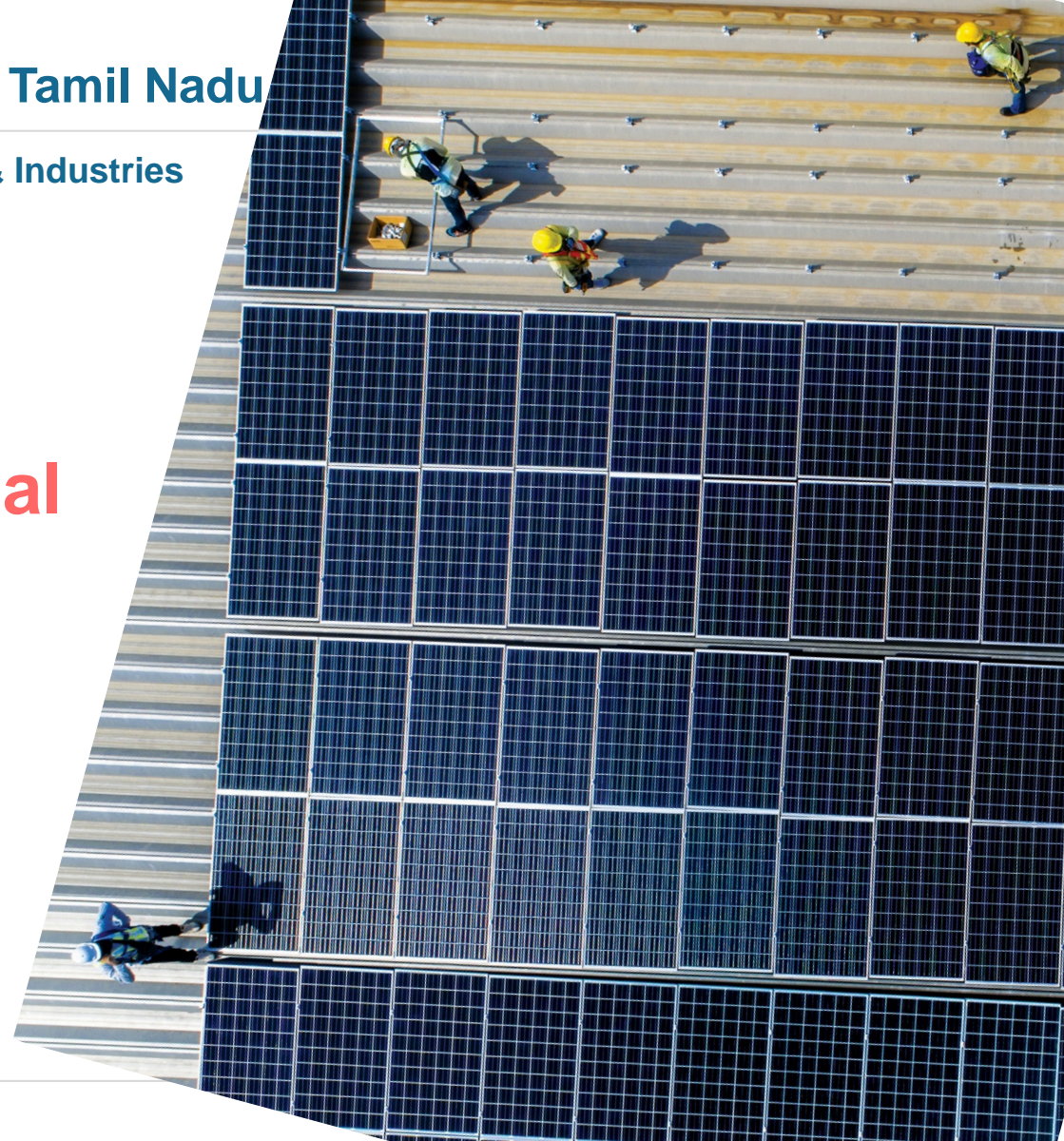


# Rooftop Solar for C&I Consumer Tamil Nadu

South Indian Chamber of Commerce & Industries

17th September 2021

## Case Studies: Financial viability of Rooftop Solar for C&I consumer



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- ❖ Last tariff revision was in FY 2016-17; an increase in tariff rates can be expected soon
- ❖ Rooftop solar energy is below the cost of grid supply for C&I consumers in Tamil Nadu

## Scope

Case studies on the financial feasibility of optimally sized rooftop solar systems for C&I consumers.

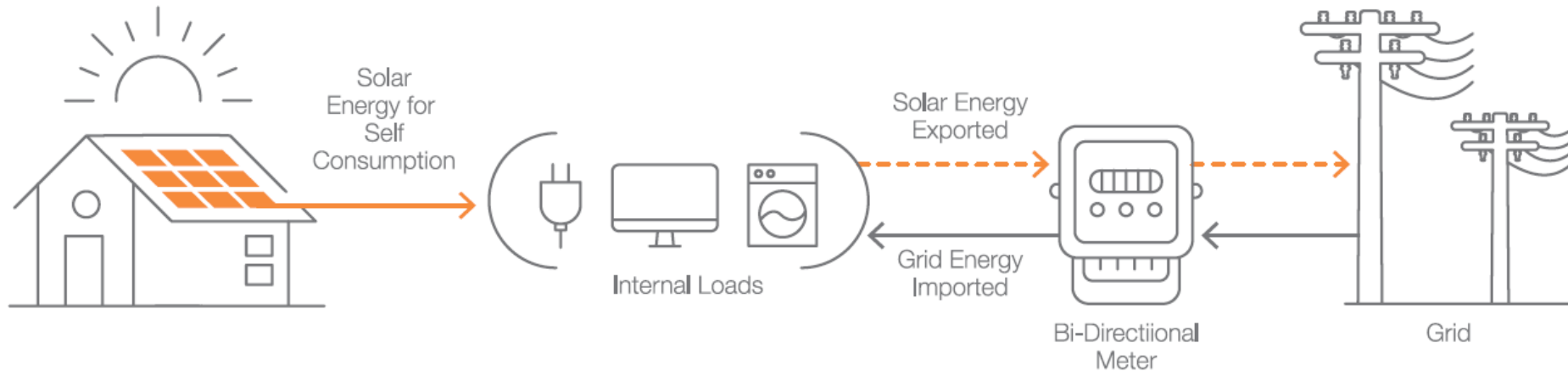
### LT Consumer

- ❖ Net feed-in mechanism
- ❖ Tariff: 2.08 INR/kWh

### HT Consumer

- ❖ Paralleling operations (up to 1MW)
- ❖ Open access – captive (connected load >1MW, exception wind energy)
- ❖ Open access – third party (connected load >1MW)

# Net Feed-in Mechanism



→ **Grid Energy Imported:** As per meter import register from grid (A)

--> **Solar Energy Exported:** As per meter export register to grid (B)

₹ **Billing:**  $(A \times \text{consumer tariff}) - (B \times \text{feed-in tariff})$

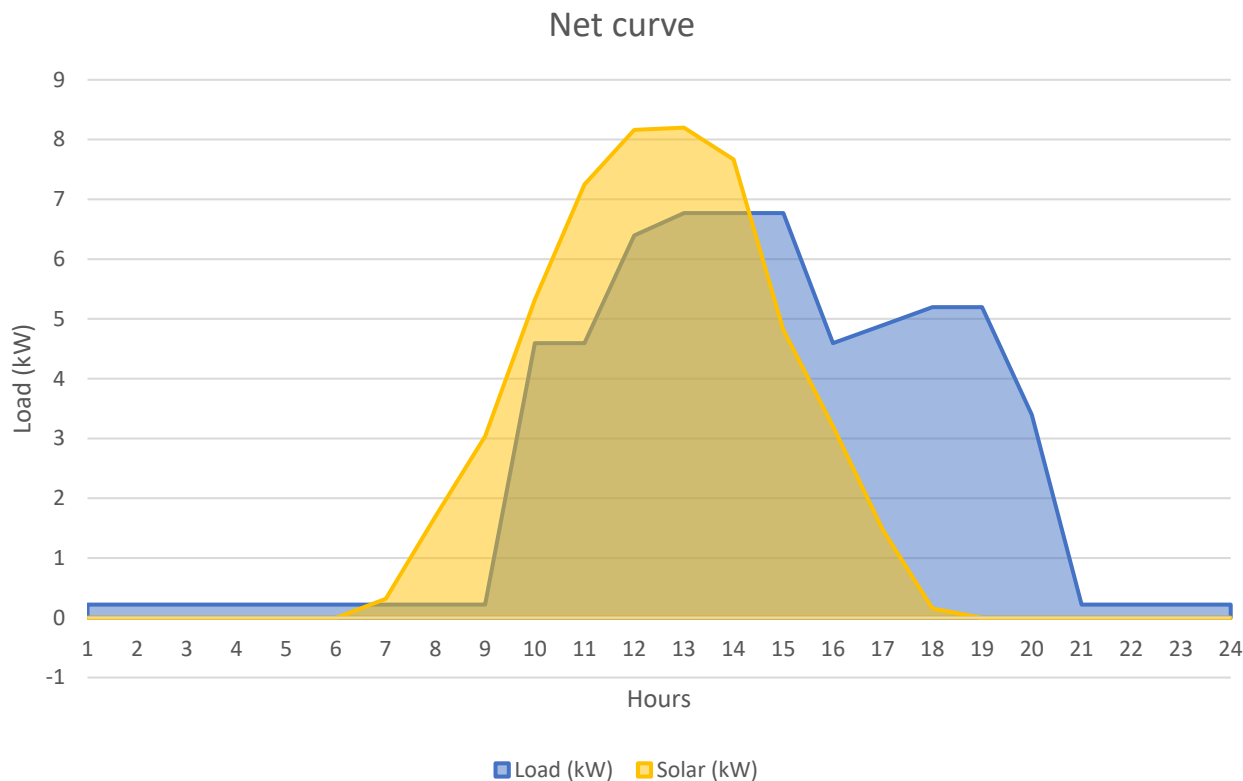


# Comparison

	PARALLELING*	CAPTIVE*	THIRD PARTY*
Cost of generation	4.15 INR/kWh	3.04 INR/kWh	3.04 INR/kWh
Cross Subsidy charge	NA	NA	1.17 INR/kWh
Paralleling/ Open Access Charges	0.11 INR/kWh	0.97 INR/kWh	0.97 INR/kWh
<b>Total</b>	<b>4.26 INR/kWh</b>	<b>4.01 INR/kWh</b>	<b>5.18 INR/kWh</b>
Investment	CAPEX/OPEX	26% ownership & 51% of elec. consump	No investment

\* The costs are indicative

# How do I size my solar system for maximum financial gains?

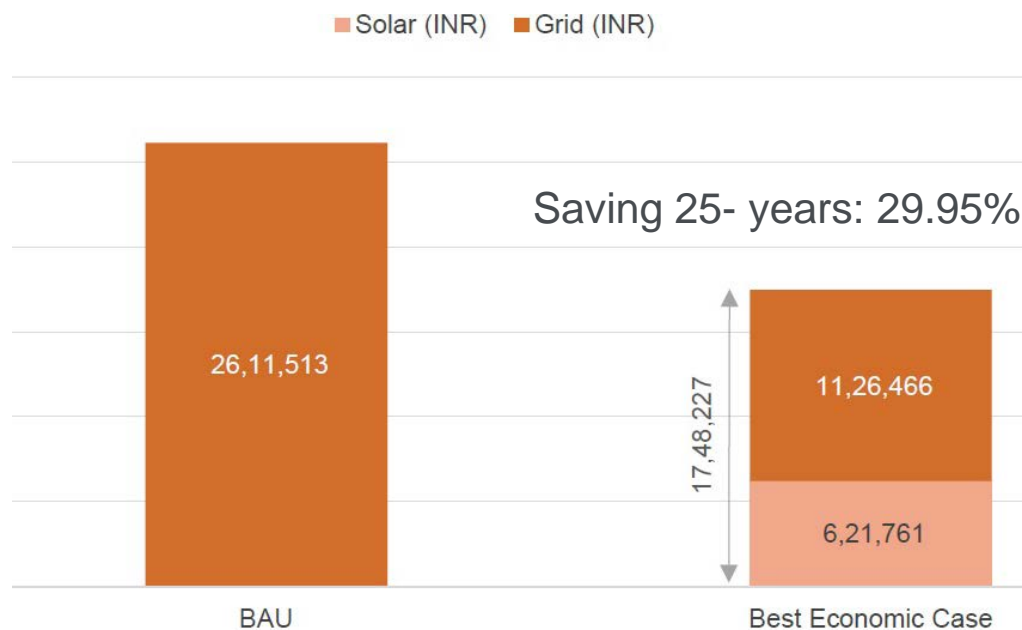


# Case study 1: LT Consumer - Commercial

## Consumer profile

Annual electricity consumption	18,126 kWh	Solar PV capacity	11.06kW
Electricity tariff	8.05 INR/kWh	Cost per kW	50,387 INR
Fixed charge	140/kW	System capital cost	5,57,482 INR
Capex model	Debt 70% Equity 30%	Rooftop space required	~110m <sup>2</sup>
Net feed-in tariff	2.08 INR/kWh	Life time	25 years

## 25 year discounted cost of electricity



### FINANCIAL BENEFITS

Simple payback: 4.46 years

IRR on equity: 31.78%

25-year net savings: 7,82,132 INR



### ENVIRONMENTAL BENEFITS

CO<sub>2</sub>e emissions avoided: 2,27,578 kg

Solar Penetration: 87.34%



## Consumer profile

Annual electricity consumption	6,58,600 kWh	Solar PV capacity	190.06 kW
Electricity tariff	6.35 INR/kWh (with ToD)	Cost per kW	41,227 INR
Demand charge	350/kVA	System capital cost	78,35,769 INR
Capex model	Debt 70% Equity 30%	Rooftop space required	~1,900 m <sup>2</sup>

## 25 year discounted cost of electricity



### FINANCIAL BENEFITS

Simple payback: 3.72 years

IRR on equity: 35.57%

25-year net savings: 56,03,143 INR



### ENVIRONMENTAL BENEFITS

CO2e emissions avoided: 52,21,334 kg

Solar Penetration: 37.34%

## Capex

- ❖ Capital Investment by consumer
- ❖ Installation, operations and maintenance by EPC
- ❖ Debt- equity : 70%-30%
- ❖ Prevalent option – 90% rooftop solar projects<sup>1</sup>

## Opex

- ❖ RESCO
  - Capital investment by developer
  - Installation, operations and maintenance by developer
  - Agreed tariff on the solar gross generation
  - Self consumption and avoided investment
- ❖ Lease
  - ❖ Customer leases the system from the developer

<sup>1</sup> Pre-Feasibility Study for a PV-Solar Leasing Programme in India KfW

- ❖ 20 Pro bono financial feasibility report for rooftop solar PV for C&I consumer in Tamil Nadu
- ❖ First come first serve basis
- ❖ Contact before 30<sup>th</sup> September 2021
- ❖ Following information are required:
  - ❖ Electricity bill for an year (preferably 2019)
  - ❖ Rooftop area
  - ❖ Connected load and tariff category

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Thank you

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