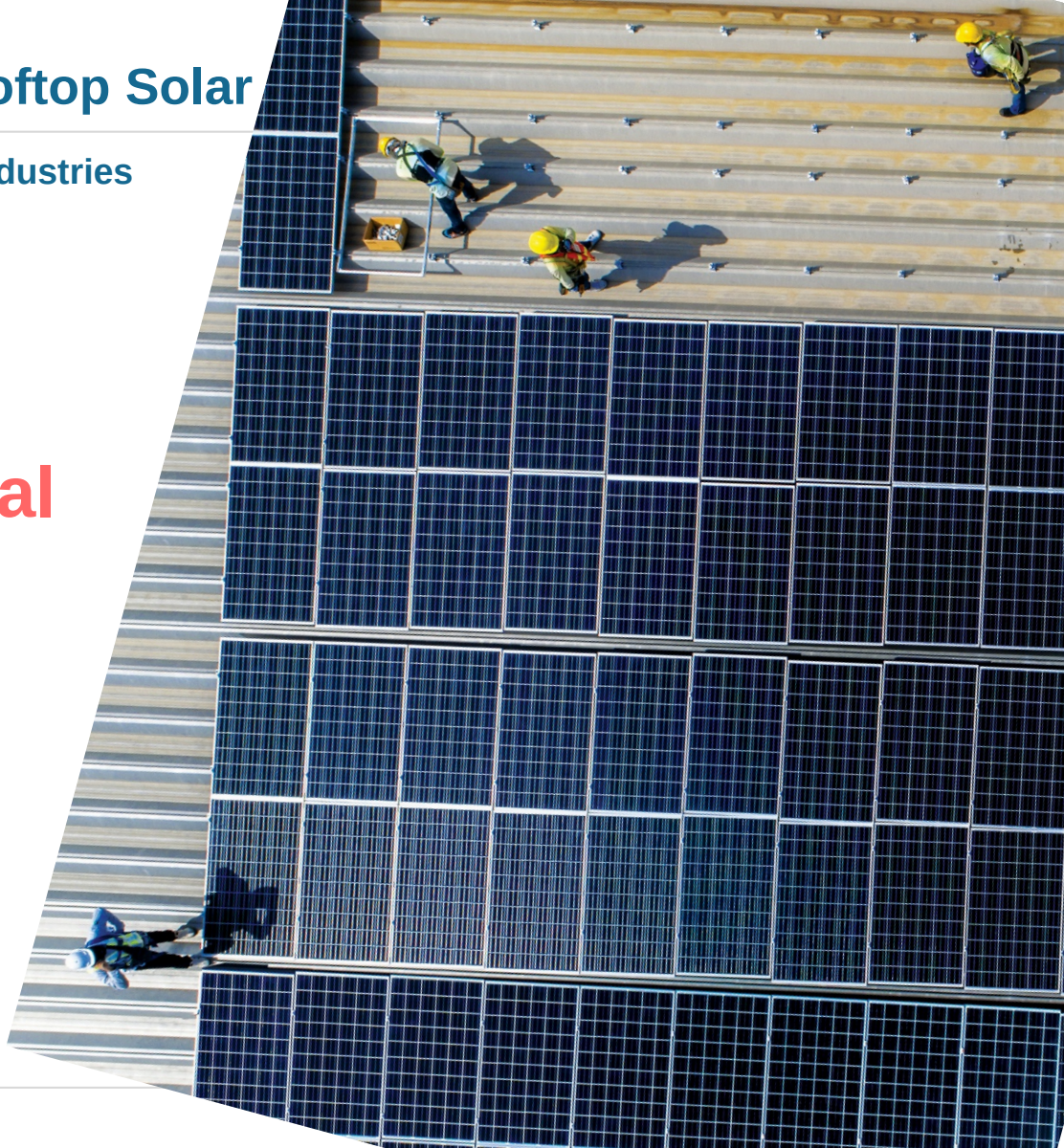
Dispelling the Myths about Rooftop Solar

Madras Chamber of Commerce & Industries

14th July 2021

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



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Context

- 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.

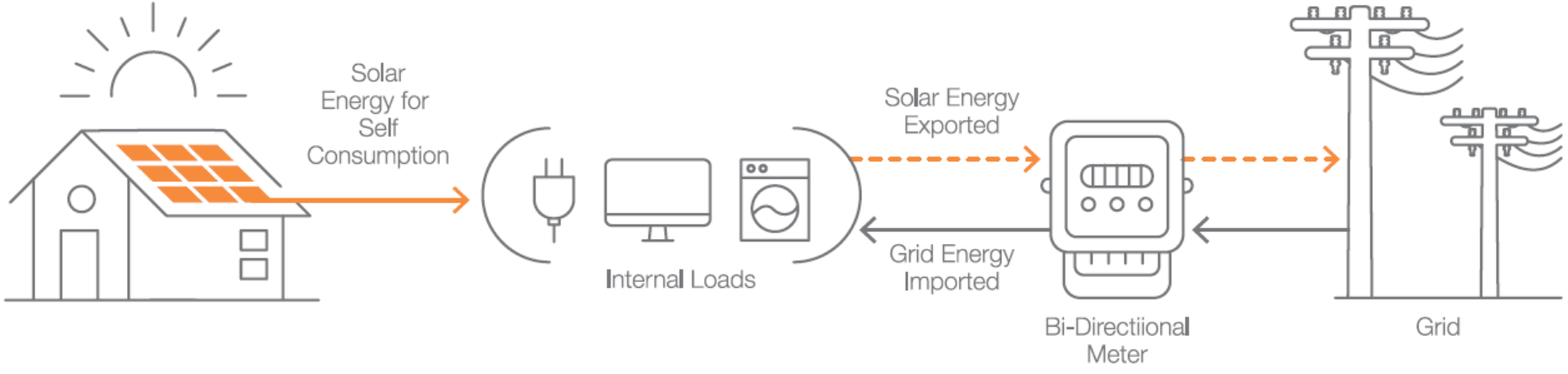
LT Consumer

- 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)

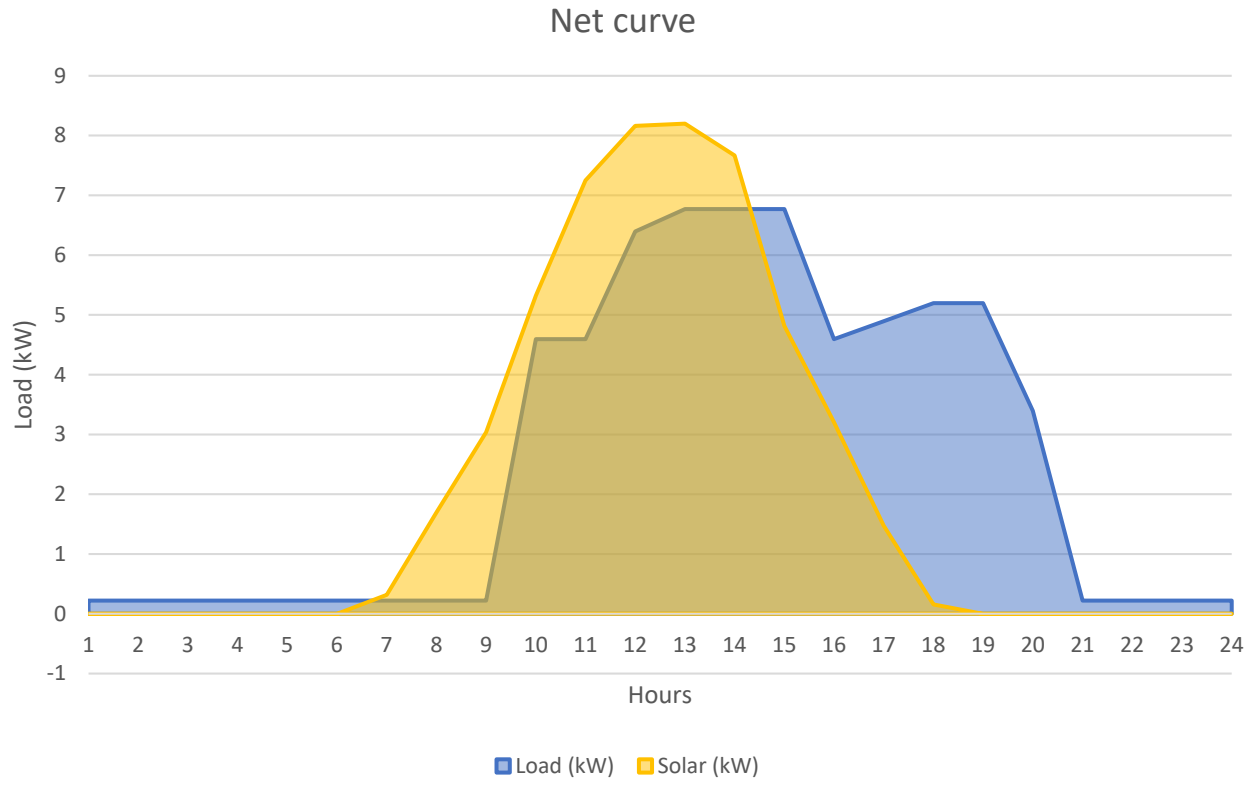
₹ **Billing:** (A x consumer tariff) - (B x feed-in tariff)

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
Total	**4.26 INR/kWh**	**4.01 INR/kWh**	**5.18 INR/kWh**
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?

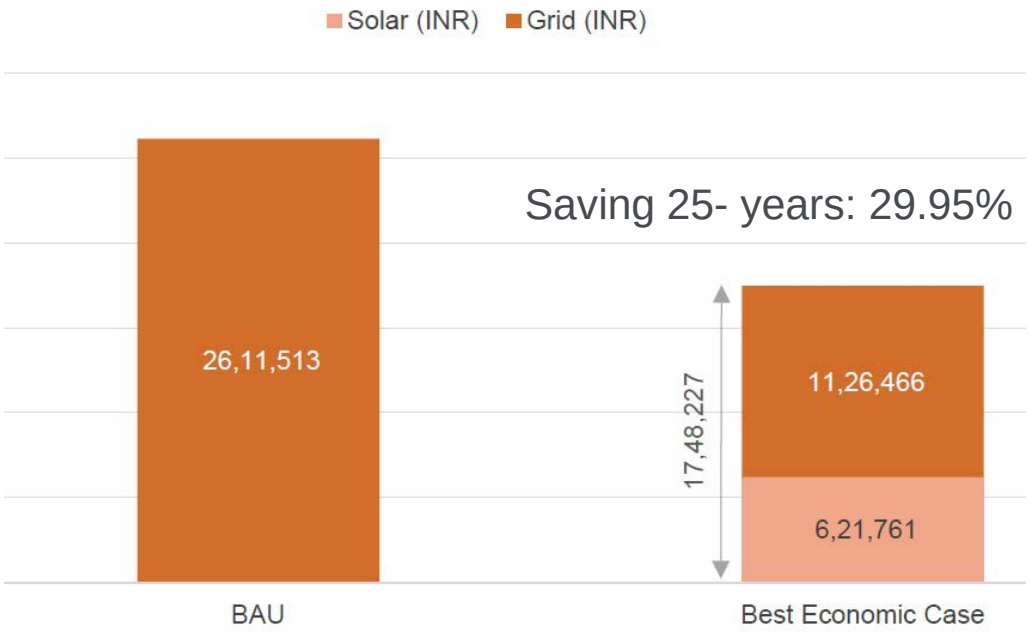


Case study 1: LT Consumer - Commercial

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 2
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

CO2e emissions avoided: 2,27,578 kg

Solar Penetration: 87.34%

Case study 2: HT Consumer - Industry

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 m2

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%

Financing Options

Capex

- Capital Investment by consumer
- Installation, operations and maintenance by EPC
- Debt- equity : 70%-30%
- Prevalent option – 90% rooftop solar projects[1]

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

[1] Pre-Feasibility Study for a PV-Solar Leasing Programme in India KfW

Opportunity

- 20 Pro bono financial feasibility report for rooftop solar PV for C&I consumer in Tamil Nadu
- First come first serve basis
- Contact before 30th July 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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