TATA POWER-DDL

TATA POWER DELHI DISTRIBUTION LIMITED

A Tata Power and Delhi Government Joint Venture

Solar Project Initiative
Tata Power Delhi Distribution Ltd

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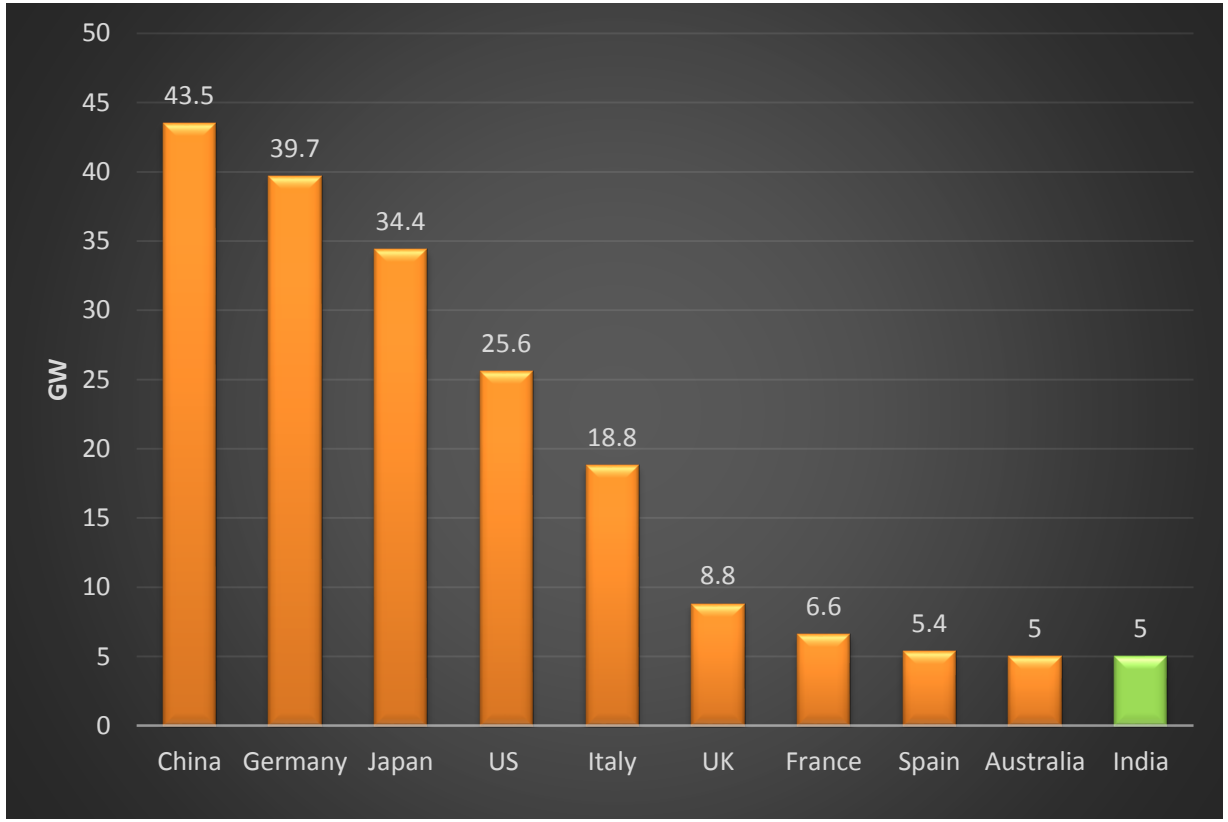
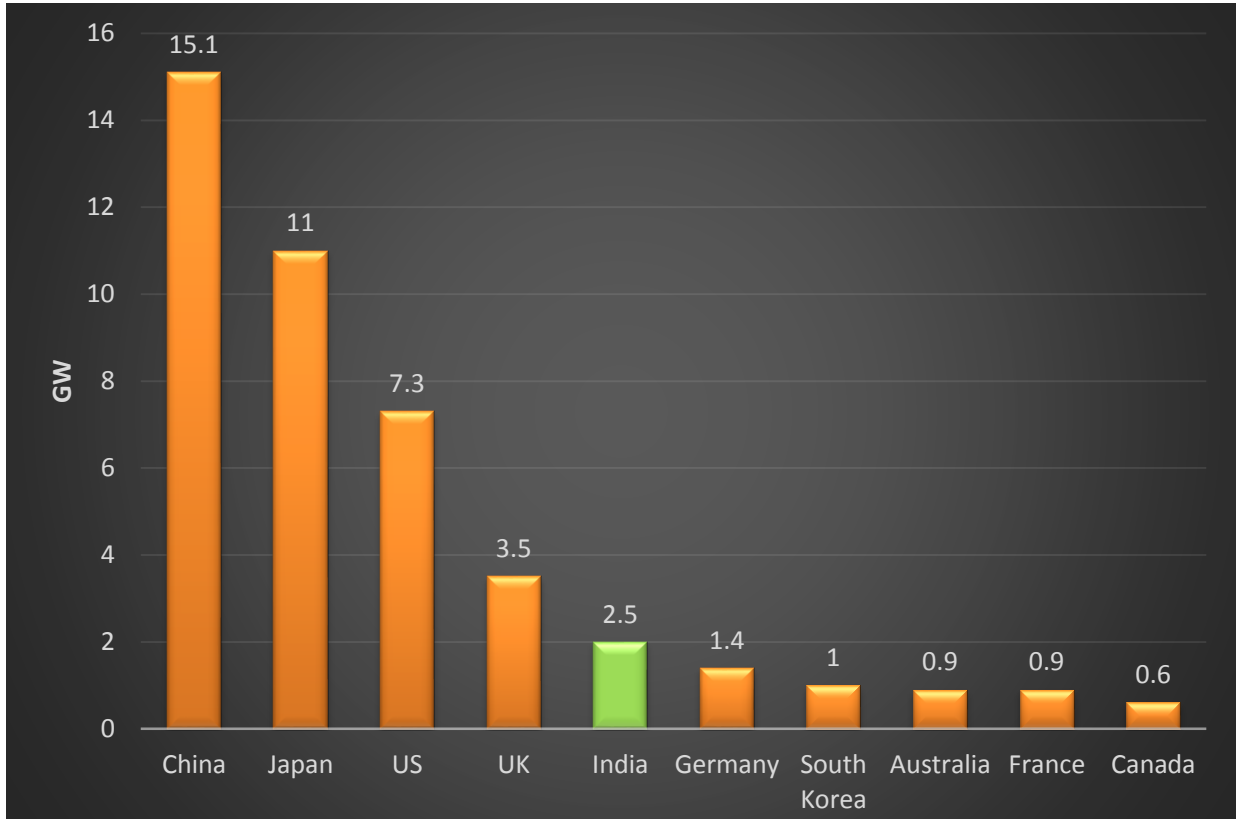
Setting the Context - Policies to Support Solar

- Solar is receiving high visibility and support at all levels
- India has momentum with National Solar Mission (NSM)
  - National level goal is set at 40 GW in 2022 for rooftop
  - Recent announcement to increase goal for Solar to 100 GW in 2022
- India and France have launched an International Solar Alliance to boost solar energy in 121 developing countries.
- "Green Energy Corridor" being set up to strengthen Transmission of Renewable Energy

Solar Capacity : International Scenario



Top 10 countries in 2015 based on total PV installed capacity (GW)



Country Wise Solar Capacity Addition in 2015 (GW)

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International Experience – Facilitating Measures for Rooftop Solar PV

Key Aspects	Germany	California
Regulation of Grid Interconnection	-The Renewable Resources Act **mandates the connection of renewable systems on priority basis.** -VDE 4105 Code of Practice **mandatory from January 2012 for interconnection with the low-voltage grid**	-Interconnection, operating and metering guidelines were framed
Financial Incentives structures	- Attractive Feed in Tariff (FIT) - FIT updated on periodic basis wrt prevailing market scenario	-Tax credits -Solar incentives - Two options available for disbursement :- a. **Expected Performance based buy down (EPBB)-**One time entire incentive payment at the time of system installation Payment based on expected energy generation b. **Performance Based Incentive (PBI) –** Monthly payment of incentive over the period of 5 years based on actual metered generation
Sustainable Business Models	- Long Term FIT Guarantee - Soft Financing - Streamlined interconnection and administrative approval processes	-Emergency of third party service providers (to cover risks associated with development and performance of system) -Savings in Electricity bills -Lease payments and tax benefits to owners/project developers
Metering Arrangements	- Gross metering	- Net metering to facilitate the development of decentralized solar systems

PV-Market Segments in Germany – Dominant Rooftop Sector

Building integrated

Rooftop

Ground-mounted

Source: Bundesnetzagentur, BSW-Solar

Private buildings: 1-10 kWp

Social, commercial, agricultural buidlings: 10-100 kWp

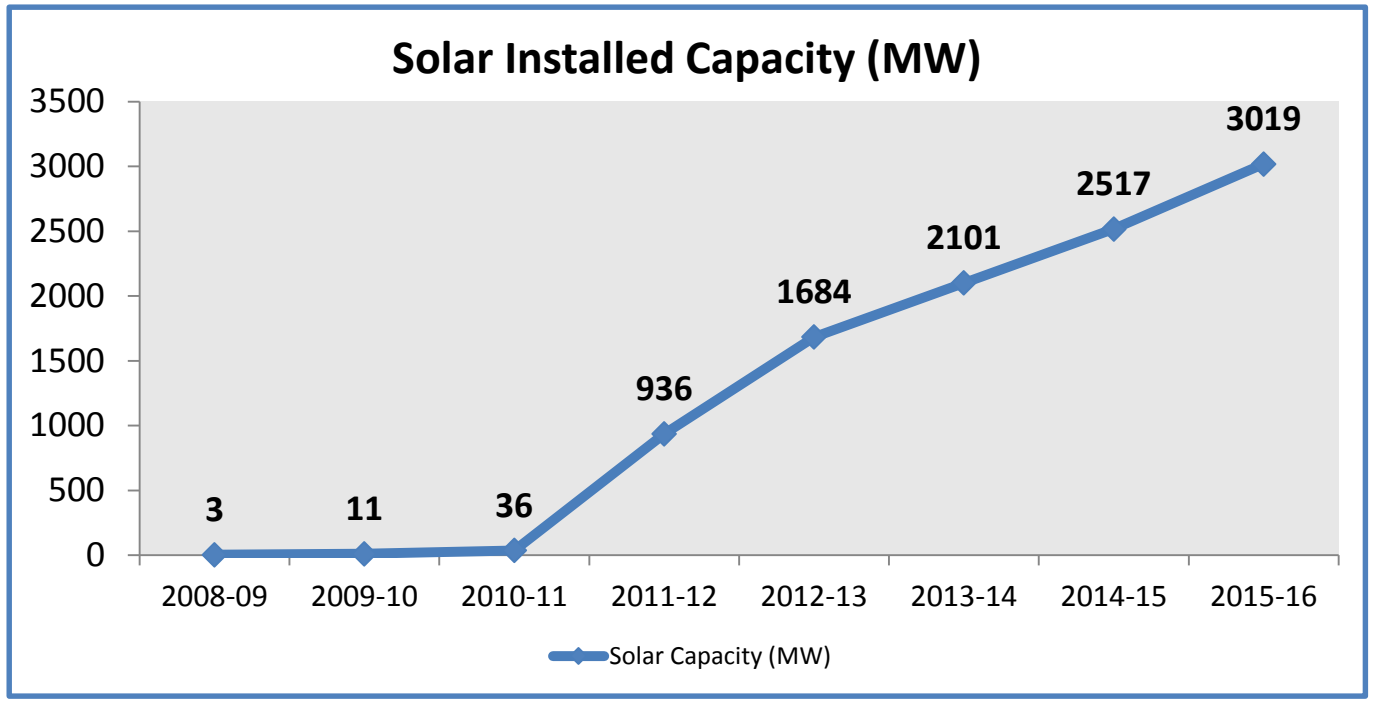
Large commercial buildings: > 100 kWp

Market share in % of Capacity installed

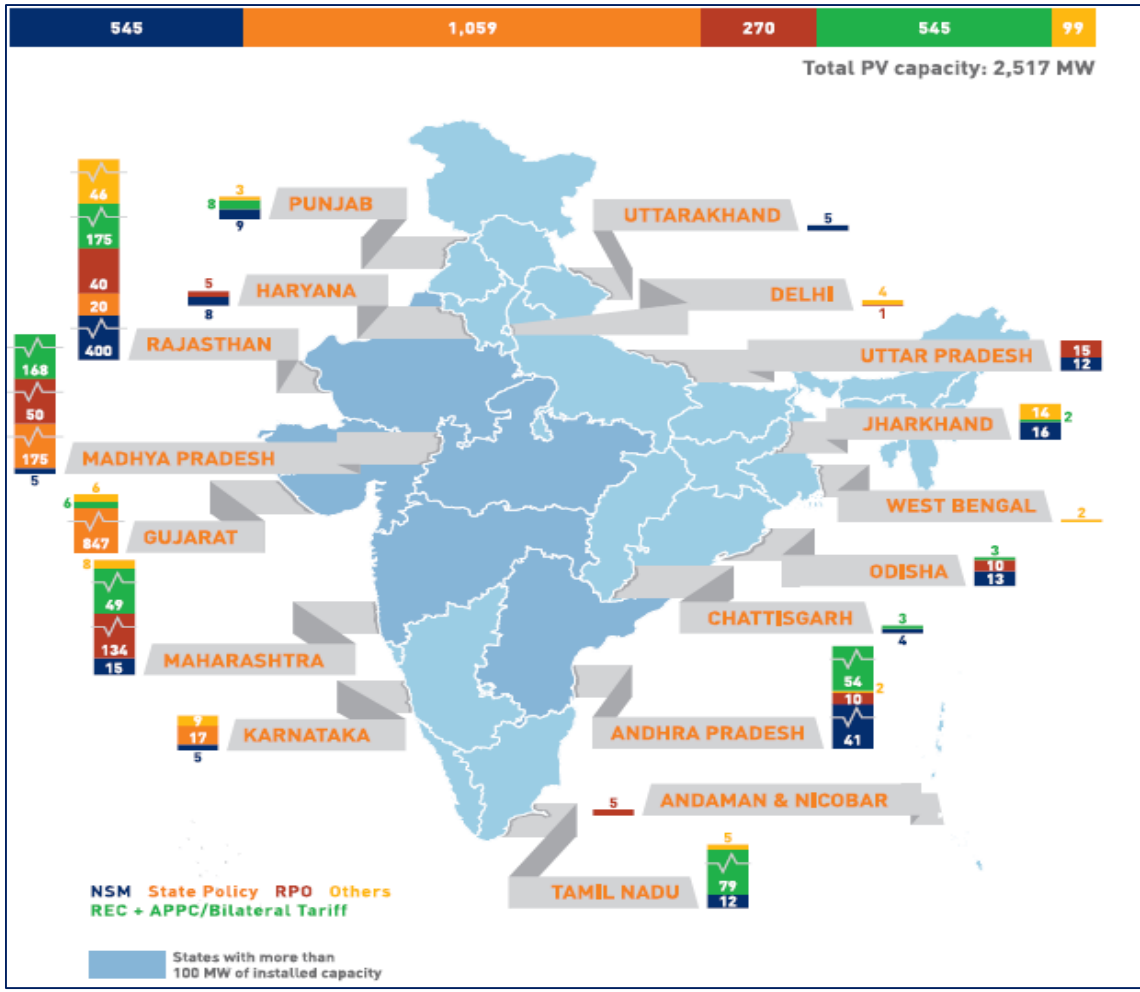
International Scenario – Metro Cities

	New York	San Francisco	Berlin	Beijing
Installed capacity (2013)	14 MW	23 MW	98 MW	15 MW
Initiatives	• Renewable Portfolio Standard • New York PV incentive program • New York solar map	• Renewable Portfolio Standard • California Solar Initiative (CSI) incentive program • California solar map • Mayor's solar Founder circle • GoSolar SF subsidy program	• Nationwide feed-in tariff • Solar Atlas Berlin	• Beijing sunshine schools program supported by the World bank • Golden sunlight demonstration projects

Setting the Context – Growth in India



Source : SECI and MNRE website and Bridge to India Report



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Why Grid Connected Roof Top

Nation & State

- Reduces requirement of land for addition of capacities
- Tap Solar Potential ; cleaner source

Consumer

- Reduces the dependency on grid power, Long term reliable power source
- The ease of connectivity with the consumer premises particularly in net-metered arrangement
- Financial benefit as one time investment provides 25 years' solar generation
- Income Tax benefit on Accelerated Depreciation (80% of Project Cost)
- Levelized cost of generation vis-à-vis increasing fossil fuel cost makes economically viable project

Discom

- Manage Demand
- Reduces T&D Losses:
- RPO obligation

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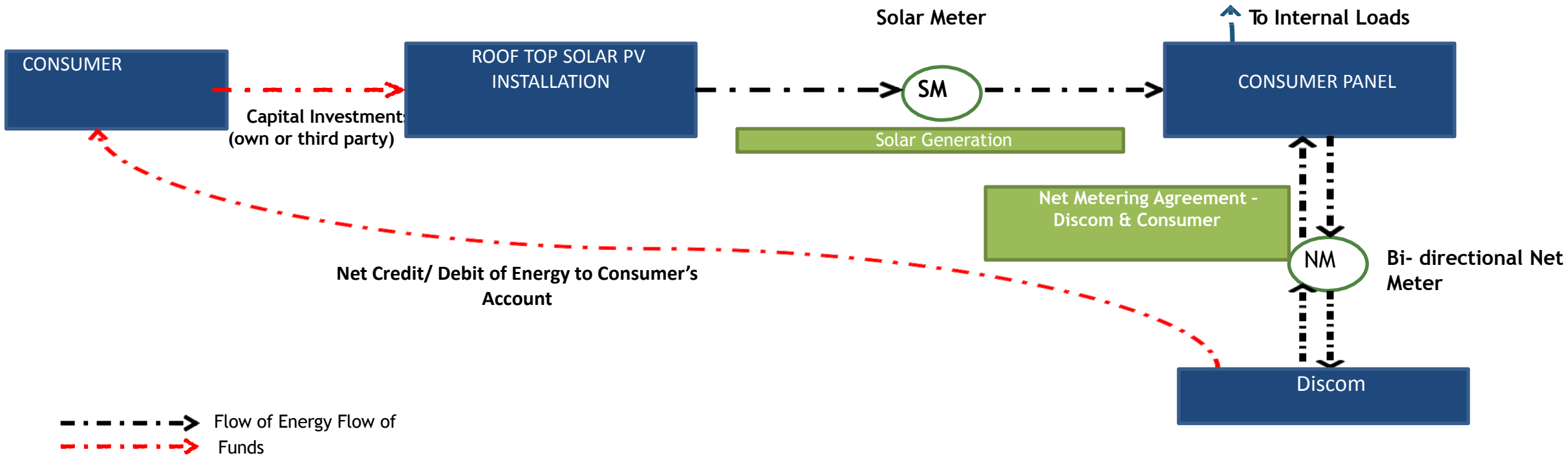
Net Metering based Solar System



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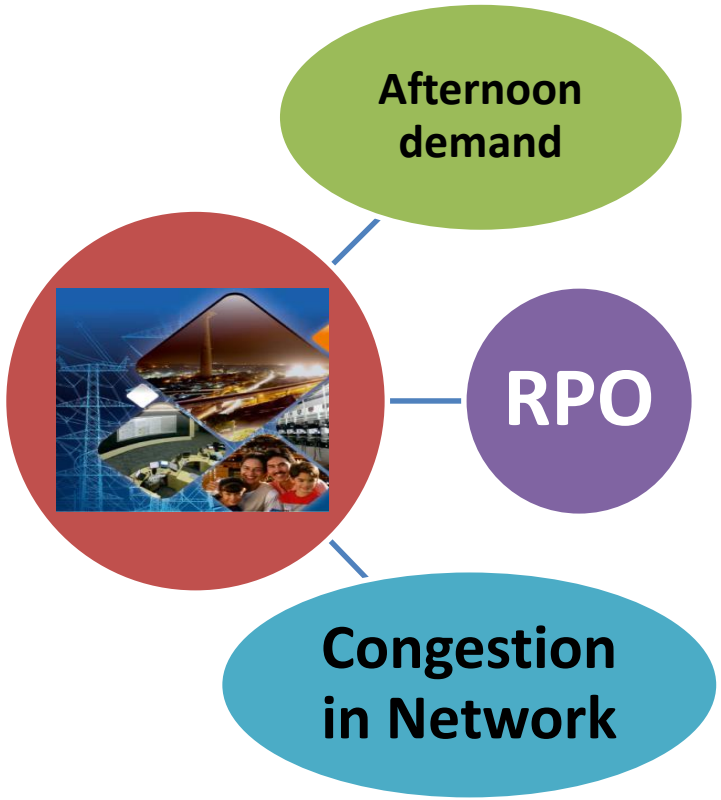
Why Discoms need Solar



Demand increase

Transmission constraint

Space for transformers and pole in many area

Option of sourcing solar power locally.

Need Govt Support

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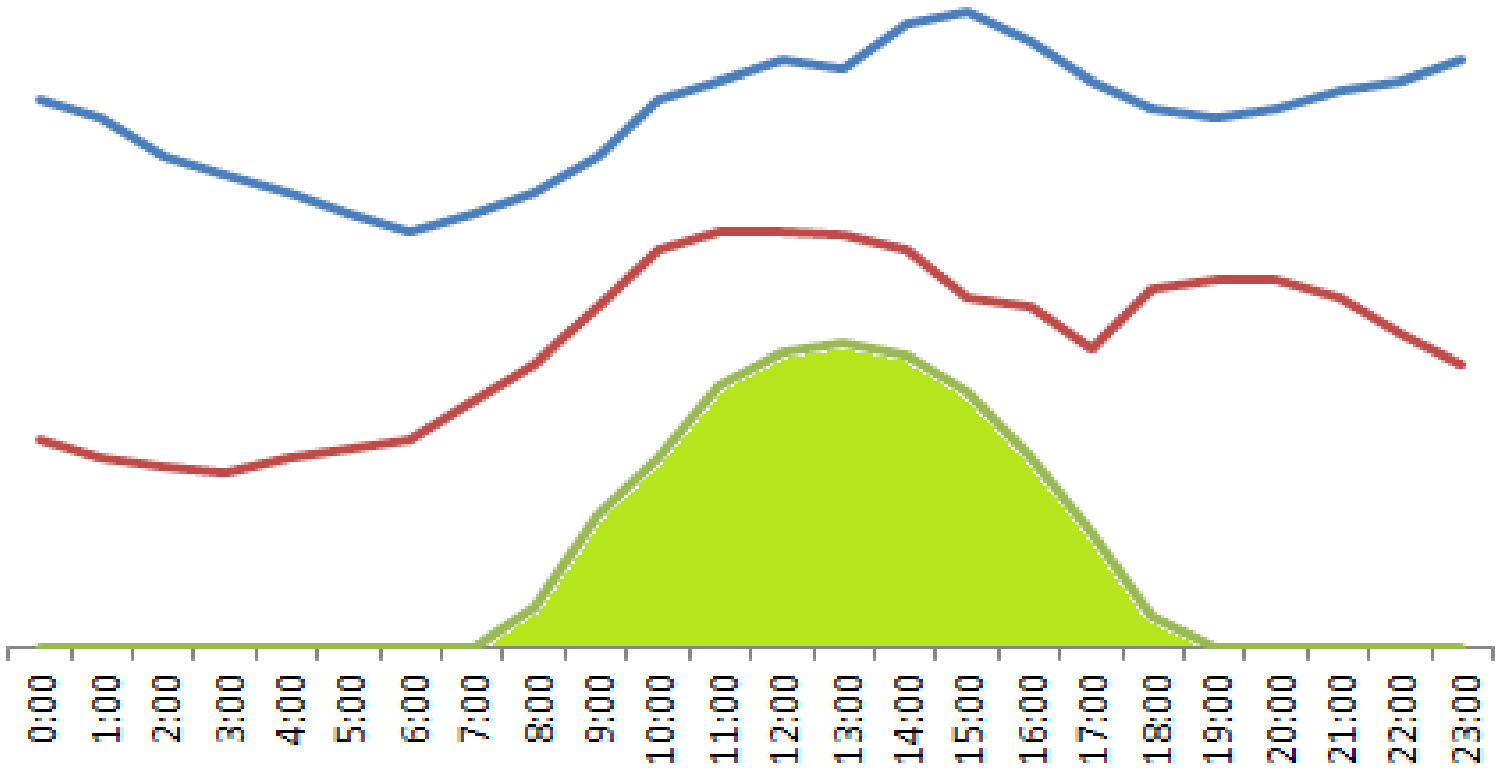
Impact on System Peak Load

80% Solar Generation Off-sets Normal Hours & 20% Off-sets Peak Hour Load for ToD Consumers



Summer Peak Periods
Afternoon - 3pm to 4:30pm
Evening – 11pm to 1am

Summer Load curve
Winter Load curve
Solar Generation

Winter Peak Periods
Morning- 9am to 11am
Evening – 6pm to 8pm

Peaking of Rooftop Solar Generation is partly co-existent with Peak Demand of Discom

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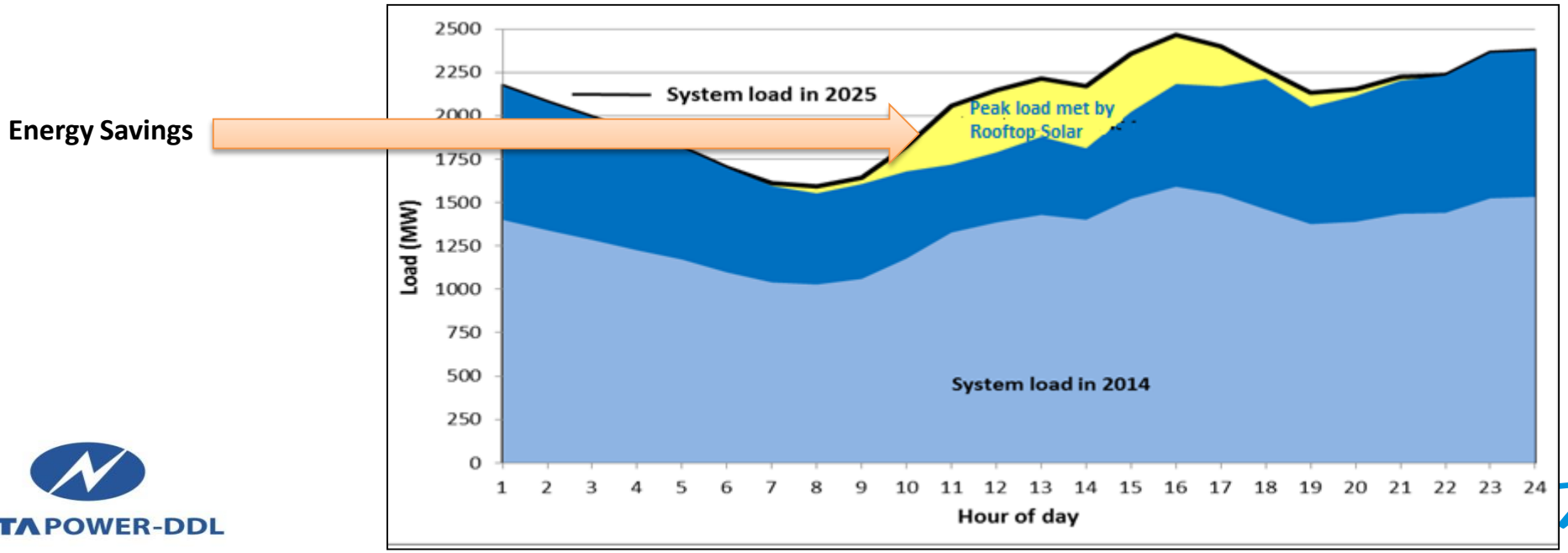
Utility Energy Savings by Rooftop Solar

- There are two main classifications of benefits that distributed solar may generate:
  - Avoided energy or variable costs: fuel, losses
  - Avoided capacity or fixed costs: power plant fixed charges, new transmission and distribution capacity costs
- **Example day (Summer)** Energy savings during the day
- Capacity savings in early evening



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Leveraging other Distributed Energy Resources with Solar

Other DER provide greater capacity value and should be incorporated into Utility programs to lower overall costs and integrate solar resources

- Due to high nighttime peak loads, energy efficiency is very valuable and helps reduce the need for both energy and capacity resources.

- Customers can be targeted simultaneously **for solar, demand response, energy efficiency, energy storage and peaking power.**

- Commercial & Industrial customer types are the types of customers that are more likely to be able to adopt these and reap benefits.

TPDDL Solar Journey

- TPDDL till date has set up 15 Grid Connected Solar Plants, with a cumulative capacity of **1.78 MW**, in its own premises.
- Spearheading the Solar Initiatives, TPDDL pioneered in the 'Demonstration Programme on Tail End Grid Connected Solar Power Plants', an initiative of Ministry of New and Renewable Energy (MNRE), Govt. of India. TPDDL has commissioned eight (8) Solar Plants under this prestigious program
- The most significant in TPDDL Solar Projects is the Mega Watt Class of Grid connected Solar Plant at its Central Stores at Keshavpuram, which is a unique project where dual utilization of land has been achieved by creating a roof top solar plant over a fully functioning open material store.
- TPDDL has set up twelve (12) no. of 1 KW capacity standalone Solar lighting system in RWA Porta Cabins in New Delhi Municipal Corporation area under "My Delhi I Care" scheme of Govt. of Delhi.

TPDDL's Solar Journey – Study on potential

- TPDDL obtained a grant of USD 450,000 from USTDA for a study to provide TPDDL with an implementable plan for using Distributed Energy Resource technologies including Solar Technology. Study with E3 is nearly concluded. Key highlights:

  - **Develop the business case for Distributed Energy Resources (DER), with focus on rooftop solar**
  - **Identify the regulatory roadmap and implementation strategies for DER and solar**
  - **Assess the tradeoffs between different solar policies (NEM and alternatives)**
  - **Cost effectiveness of Solar on lifecycle**
  - **TPDDL is in a good position to encourage the rooftop solar market and transition to a solar future**
  - **Packaging EE and DR with Solar**

- TPDDL is exploring possibility of Rooftop Solar Generation in Delhi as per Net Metering policy of Regulatory Commission. As per recent study conducted with "Bridge to India" approximately 1.6% of Delhi's entire land base has potential to generate approx.. 2.5 GW Solar capacity

Solar Potential in TPDDL

S. No.	Category	Probable Locations (Nos.) (A)	Avg Available Roof Size (in sq ft) (B)	Solar Potential (in MWp) (C) = (A)*(B) / (120*10^3)
1	School*	350	2000	5.8
2	Hospital*	250	1500	3.1
3	Govt. Offices*	1200	1500	
4	DJB*	200	1000	
5	Delhi University	20	6000	
6	DMRC	20	4000	
7	Industries	30000	1500	375
GRAND TOTAL		**32040**		**402**

Potential of 402 MW within Licensed Area

**Installations with Sanctioned Load 5 KW & above. And it includes only Industrial and large commercial establishments*

TPDDL's Initiatives

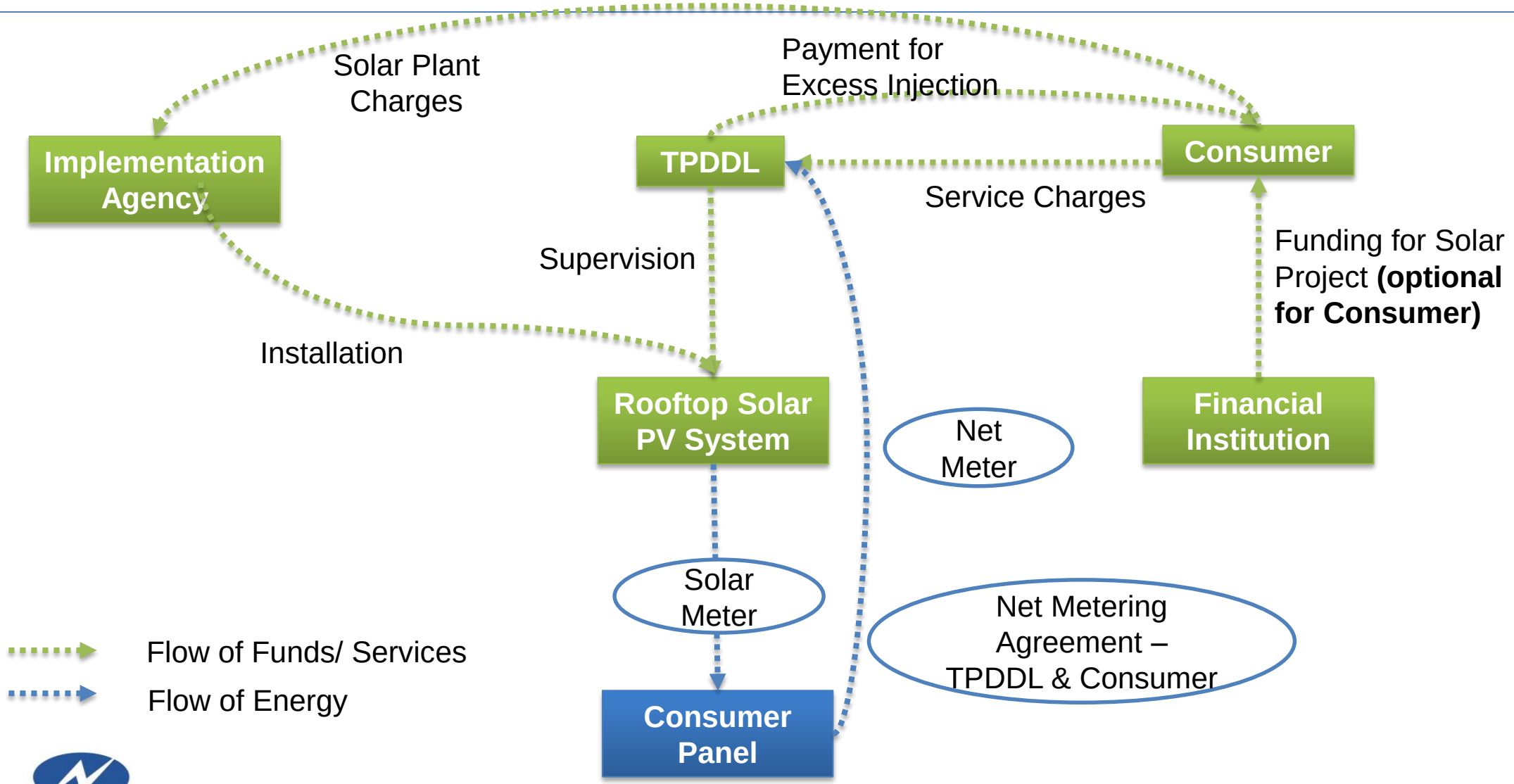
- **Highest Solar Grading** as System Integrator and Project Developer received from ICRA.
- Empanelled as **first Utility Channel Partner** with Ministry of New & Renewable Energy, GoI
- TPDDL Initiative for providing Value Added Services to consumers on Solar Project received **DERC Approval**
- Three Turnkey Solar Project Installation Agencies with **Highest Grading** have been empanelled
- Association for framing BIS Standard for smart meter(whole current) to be used in Solar Projects. Smart Net Meter Specification has been finalized
- TPDDL has won the award "Rooftop Solar Enabler of the Year – Utility" under the aegis of the Indian Rooftop Solar Leadership Awards, 2016

ICRA Limited

Please refer to your mandate letter for assigning System Integrator (SI) grading of your organization (for solar PV technology) under the aegis of The Ministry of New and Renewable Energy (MNRE).

ICRA has, after due consideration, assigned an **SP 1A** (pronounced Solar Power One A) grading to Tata Power Delhi Distribution Limited. The grading indicates the 'Highest Performance Capability' and 'Highest Financial Strength' of the channel partner to undertake solar projects.

TPDDL Transaction Model



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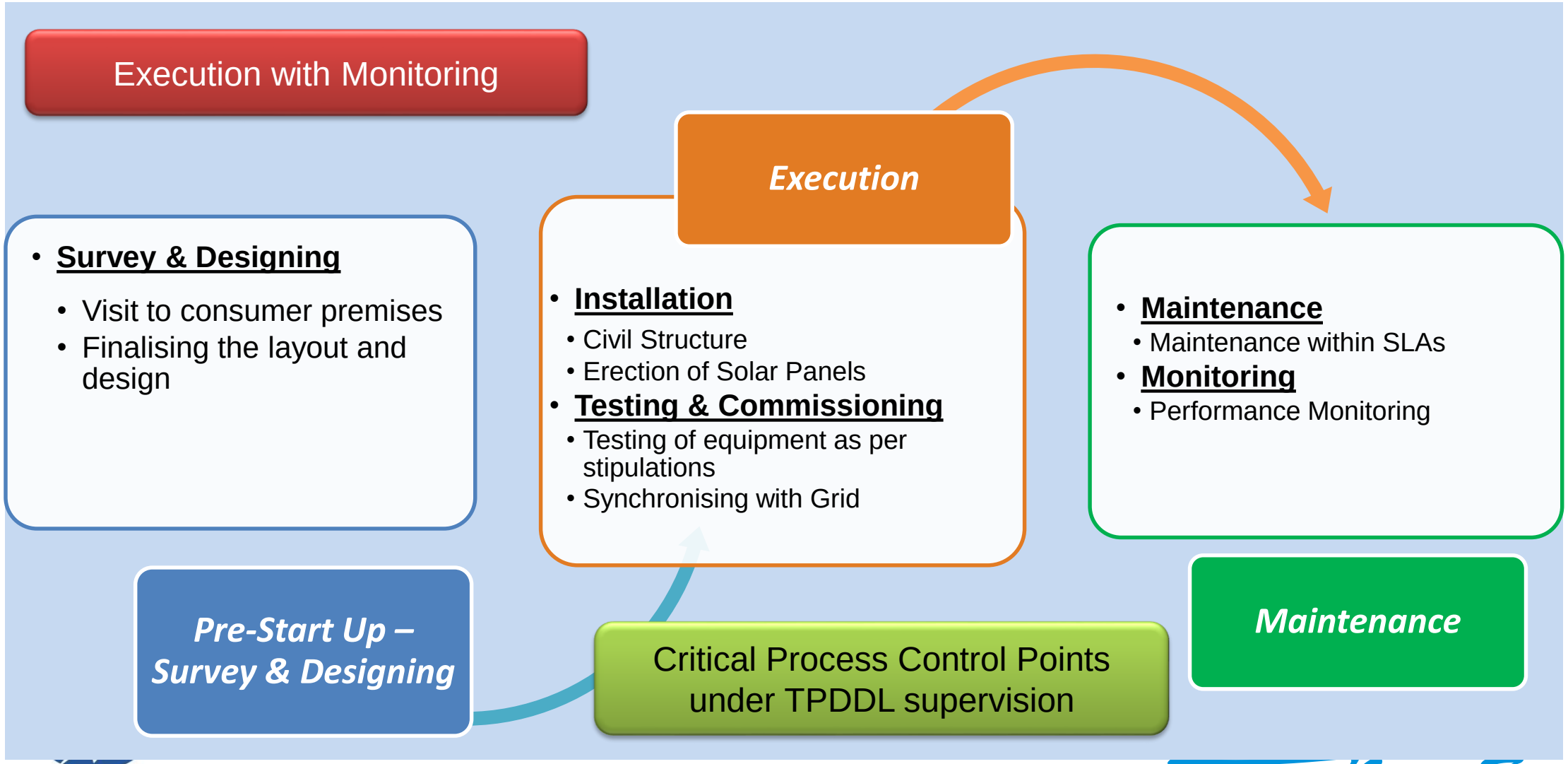
Project Cycle



Consumer Benefits from TPDDL Solar Projects

Stakeholder	Services	Benefit to Customer
TPDDL	Empanelment of Implementing Agency with open competitive bidding	• Optimum price with superior technology • Benefit of Economy of Scale
	Standardization of Equipment Specification & Technology	Ensuring Quality of Solar Plant
	Verification of Engineering Design and Array Layout for each consumer after joint site survey	Customized design of optimum solar capacity for Consumer
	Facilitation to finalize terms & conditions for supply, installation and AMC	Ensuring smooth transaction and proper execution for solar project
	Dedicated technical team to monitor & facilitate installation, testing and commissioning of the Solar Plants	Ensuring Quality and Safety for Solar Plant Execution
Implementing Agency empanelled with TPDDL	Supply of material as per TPDDL Benchmark, modules with 25 years warranty and Solar Plants with 5, 7 or 10 years' warranty	Ensuring Quality of material
	Installation of project within timeline with adherence to TPDDL Safety & Quality Guidelines	Ensuring standard of quality and safety
	Committing Performance Ratio for Solar Plant for 25 years	Ensuring proper generation of Solar Plant
	AMC including cleaning and comprehensive warranty for 5, 7 or 10 years	Ensuring hassle free service and Performance Warranty

SOLAR PROJECT STATUS

- Total **82 cases with cumulative solar capacity of 5.6 MWp** are connected with Tata Power Delhi Distribution Grid/ under progress for connection.
- TPDDL till date has set up 15 Grid Connected Solar Plants, with a cumulative capacity of **1.78 MW**, in its own premises.
- 40 Awareness Campaigns done covering 1200 nos. of Potential consumers.
- Proposals under consideration by Consumers – **59 cases with 3.2 MW**

Quality Check for Solar Projects

Joint Inspection by TPDDL Team & Empanelled Agency for solar projects at three stages –

1) During Construction of Foundations

2) Module Mounting on structures

3) After completion of project and before net metering (for checking of Earthing of solar Plant & wiring)

Solar Plants commissioned and connected with Distribution System for –

- **ISBT Kashmiri Gate**
- **Maharaja Agrasen Institute of Technology**
- **DTC Bus Depot**
- **DMRC Depot**

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Future Power Quality Challenges due to Rooftop Solar

Voltage & Current distortion increases with increase in no. of Solar Power Inverters

Further complication of distribution feeder protection and control mechanism due to heavy inrush current

Inability of the Grid connected PV system inverter to control the reactive current drawn from Non linear loads

Power Conversion losses : From DC to AC supply

Monitoring Solar Projects

Area	TPDDL initiative
Integration with GIS, OMS & Advanced DMS	Solar consumers are flagged in GIS Upgraded version of GIS and ADMS will cater to online integration of data
Online Monitoring of Generation	As on date AMR has been installed at Solar meter and Net Meter Smart Meter installation at both Net Meter (for system load monitoring) and Solar Meter (for Forecasting) is proposed
System Protection	Periodic inspection by TPDDL Team for Harmonics and VAR injection
Safety	HT System to be isolated for HT consumer at the time of Fault repair LT system – Safety Zone to be created by earthing isolated LT network

Awareness Campaigns

- More than 1000 Industrialists & Domestic consumers participated
- Presentations have been made to Key Consumers like DJB, DMRC and NDMC.

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Awareness Campaigns

Unleashing Solar Journey, with TPDDL...

Introduction

TPDDL plays a leadership role in climate change by being knowledgeable, responsive and trustworthy organization. By adopting environment friendly technologies, business practices and innovation, while pursuing new technologies and enhancing the lives of our consumers.

With over 300 clear sunny days available in Delhi and declining cost of solar technology, the generation cost from a rooftop solar PV plant is competitive with conventional power generation technologies.

In keeping with the consumer centricity spirit, TPDDL brings energy solutions that are:

- ✓ Cost effective - Zero cost of fuel for over 25 years
- ✓ Highest quality, standards and benchmark services
- ✓ Significant savings on your energy bill
- ✓ Provides clean and green energy

TPDDL Initiative

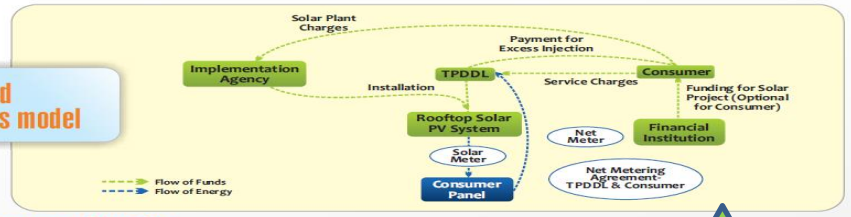
To facilitate consumers for installation of rooftop solar projects, TPDDL has undertaken open competitive techno-commercial bidding procedure to empanel implementation agencies which will install solar projects on turnkey basis with optional comprehensive AMC for solar plants for a period of 5, 7or 10 years.

Delhi Electricity Regulatory Commission has approved TPDDL proposal for facilitation of installation of rooftop solar plant by providing single window service to consumers for supply, installation, testing and commissioning with maintenance agreement as opted by consumers.

Three Agencies, that are empanelled with Ministry of New & Renewable Energy, Govt. of India as channel partner with highest Grading of "SP 1A", have been shortlisted as empanelled associate for TPDDL Consumers–

M/s Tata Power Solar	M/s Su-Kam Power Systems Limited	M/s Jakson Engineers Limited

Proposed Business model



How the consumer benefits

TPDDL SERVICES	BENEFIT TO CUSTOMERS
Empanelment of implementing Agency with open competitive bidding	Optimum price with sup… of Economy of Scale
Standardization of Equipment Specification & Technology	Ensuring Quality of Solar …
Verification of engineering Design and Array layout for each consumer after joint site survey	Customized design of opti… for customer
Facilitation to finalize terms & conditions for supply, installation and AMC	Ensuring smooth transactio… for solar project
Dedicated technical team to monitor & facilitate installation, testing and commissioning of the Solar Plants	Ensuring highest Quality … Plant execution
TPDDL EMPANELLED IMPLEMENTATION AGENCY SERVICES	**BENEFIT TO CUSTOMERS**
Supply of material as per TPDDL Benchmark, modules with 25 years warranty and Solar Plants with 5, 7 or 10 years' warranty	Ensuring Quality of material/Best qua… aterials
Installation of project within timeline* with adherence to TPDDL Safety & Quality Guidelines	Ensuring standard of quality and safety
Committing Performance Ratio for Solar Plant for 25 years	Ensuring proper generation of Solar Plant
Optional AMC including cleaning and comprehensive warranty for Solar Plant - for 5, 7 or 10 years	Ensuring hassle free service and Performance Warranty

Solar Leaflet

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Session to IWA with Brand Ambassador

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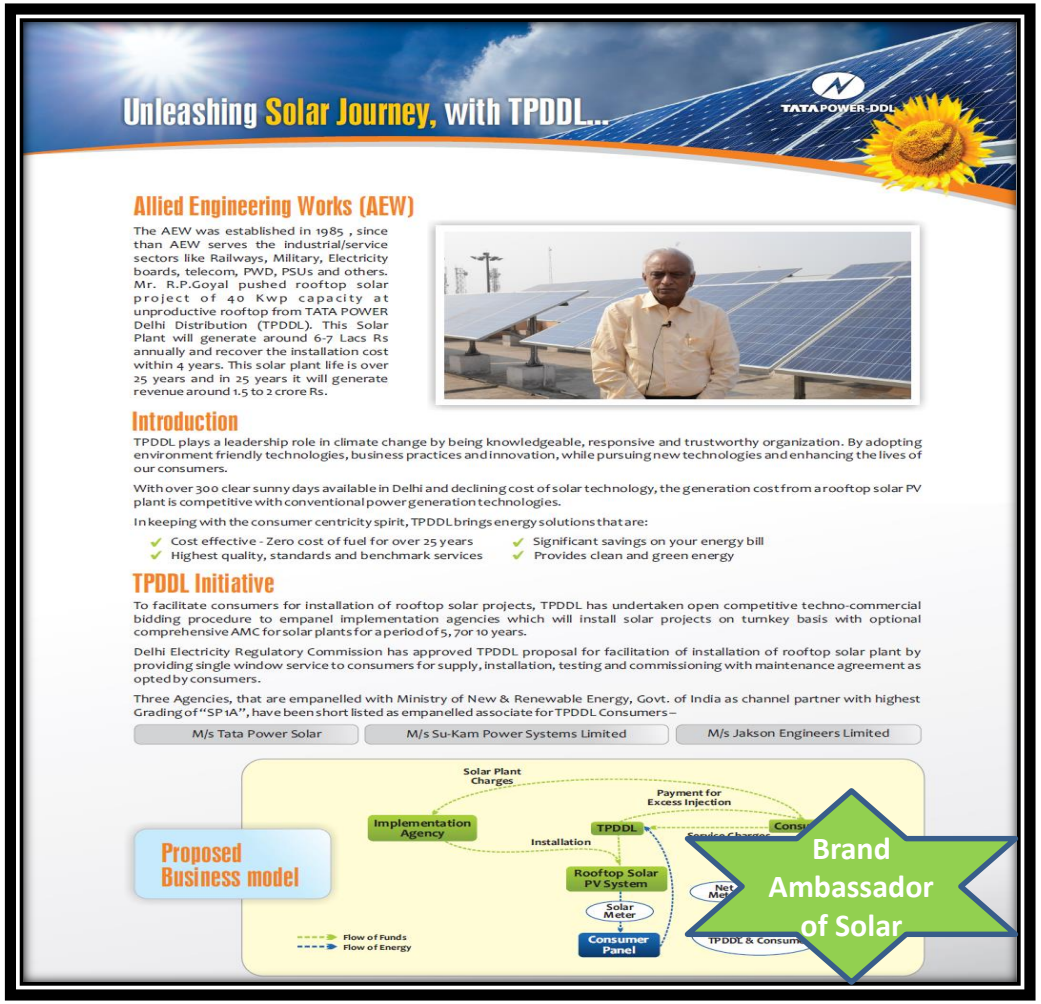
Awareness Campaigns



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Interaction & Awareness – Other Stakeholders

Stakeholders	Focus Area
Delhi Dialogue Committee	Finalization of Draft Solar Policy
MNRE	Facilitation of Implementation & Empanelment
World Bank	Facilitation for Funding
TERI	Facilitation in Impact Study
MSME	Participation in Exhibition and Awareness Drive to Medium & Small Scale Industries
ASSOCHAM	Awareness Drive to Industries
CII	Awareness Drive to Industries
School Workshop	Solar Energy work shop with Educational Institutes
RE Expo	Awareness Drive to Industry
Urban Thinkers Campus	Solar integration with Smart City

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Solar Implementation Roadmap for Discoms

- **Identify key markets for solar** Utility can begin offering Commercial & Industrial customers quality and financially attractive rooftop solar systems

- **Standardize and improve quality** Streamline the interconnection process for customer Solar Plant

- **Develop standards to ensure quality of solar installations**; monitor and track system performance and costs

- **Manage Utility Portfolio:** Further develop complementary programs: Demand Side Management /Energy Efficiency, Demand Response to maximize utility value from the solar

- **Manage Supply portfolio:** As the installed solar increases, manage the conventional supply portfolio in a complementary manner

Access to Electricity: Rural Solar Micro-Grid: 3 focus areas

Improved storage	• Improve battery performance and longevity (vs. conventional lead-acid): high ambient temperatures, deep discharge, and extended partial charge • **TPDDL is exploring different Battery Technology and Inverter Technology in 100 KWp Solar Test Bed**
Integrated "utility-in-a-box"	• Improve overall micro-grid performance through better standardization and integration of components and enhanced functionality. • **Integrated Energy Management System leading to "Smart Micro-Grid" to be tested in Bihar Micro-Grids**
Affordable energy-efficient appliances	• Increase impact of and demand for electricity by developing a new family of affordable, energy-efficient appliances (e.g., refrigerator, fan, TV) • **TPDDL is explore opportunities for financing and other business-model innovations of Energy Efficient Appliance**

Commercially viable, large-scale rural electrification **"Model Smart Villages – an initiative with the President's Office"**

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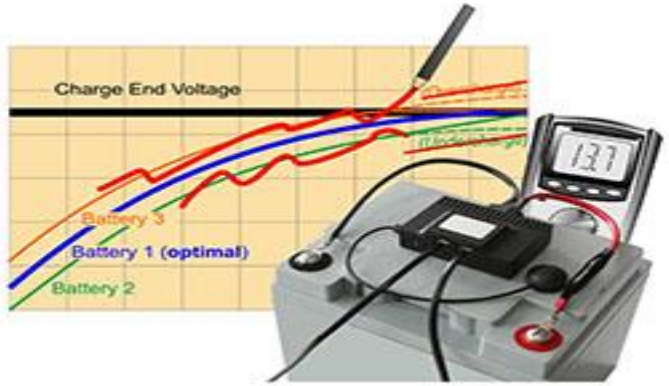
Battery Monitoring System in TPDDL Solar Test Bed

Impedance Tester

Infra red camera



Data Acquisition System

Data Analytics

Bihar Solar Micro-Grid Project

Description	Site 1- Tayabpur	Site 2- Behlolpur
Geography	Ward No. 9 is un-electrified but adjoining ward are electrified	Island is completely un-electrified and learnt that no plan of electrification through Grid
No. of Hutments	190	225
Estimated No. of **Domestic** Hutments, gets supply from 5 PM to 11 PM	180	200
Estimated No. of **Commercial*** Hutments, gets supply from 9 AM to 5 PM	10	25
Capacity of Solar Plant for Installation	15 KWp (extendable upto 25 KWp)	15 KWp (extendable upto 30KWp)
Diesel Genset for Emergency	10 KVA	10 KVA

- TPDDL in partnership with Massachusetts Institute of Technology, General Electric and Tata Trust
- Solar Micro-Grid with a Decision Support Tool & Integrated Energy Management System
- Developing a model affordable, sustainable with universal applicability.

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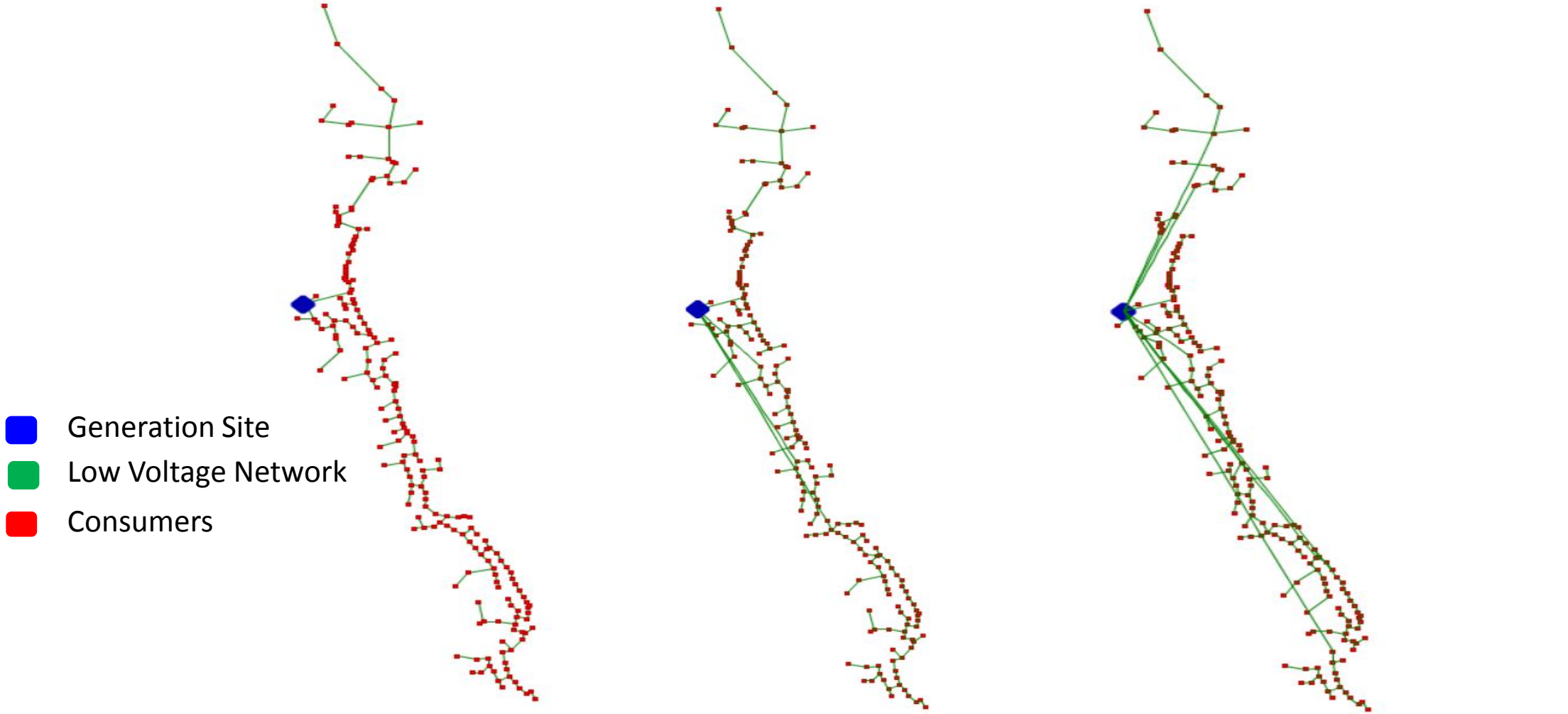
Sensitivity of the Network Layout to the Demand Level



Low Demand | Medium Demand | High Demand

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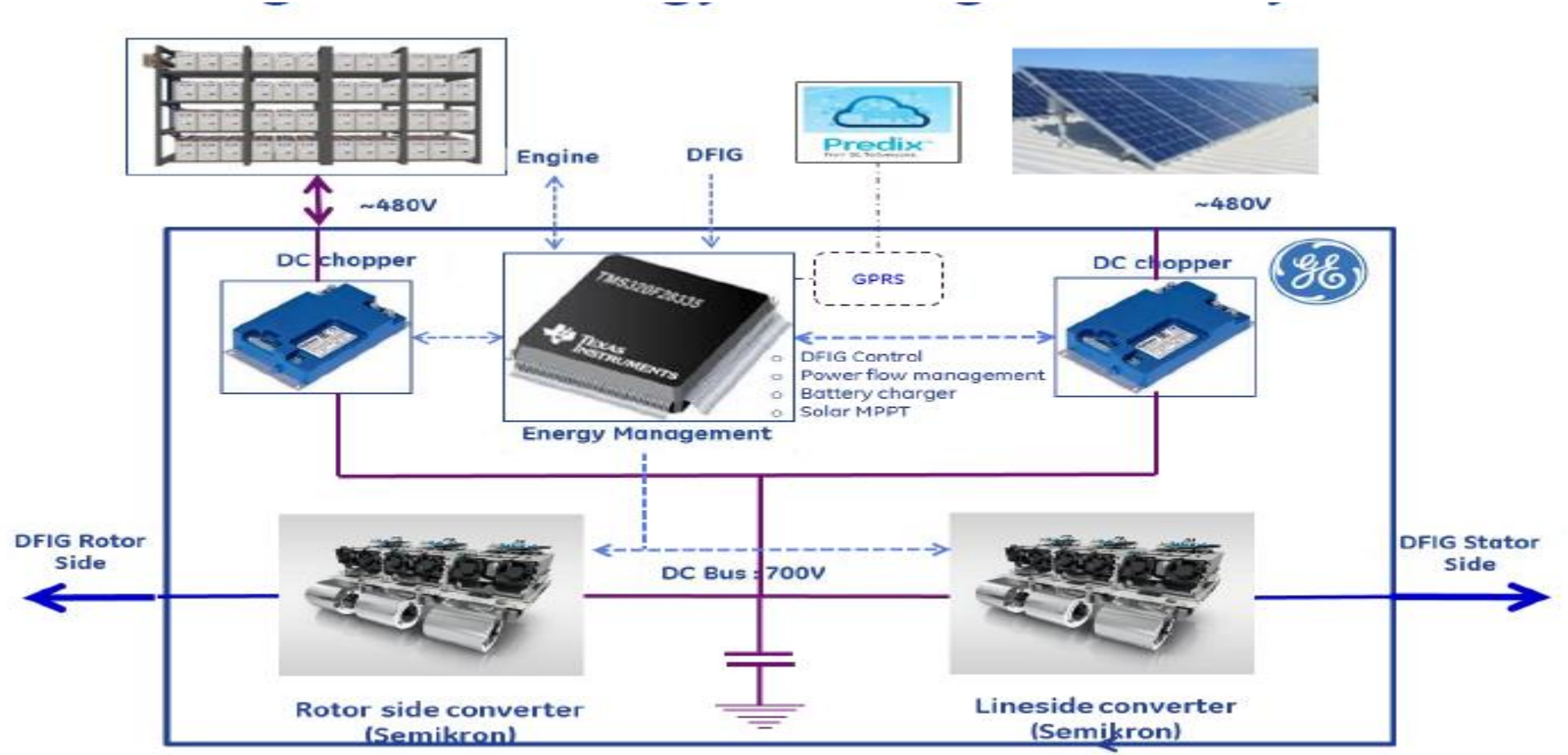
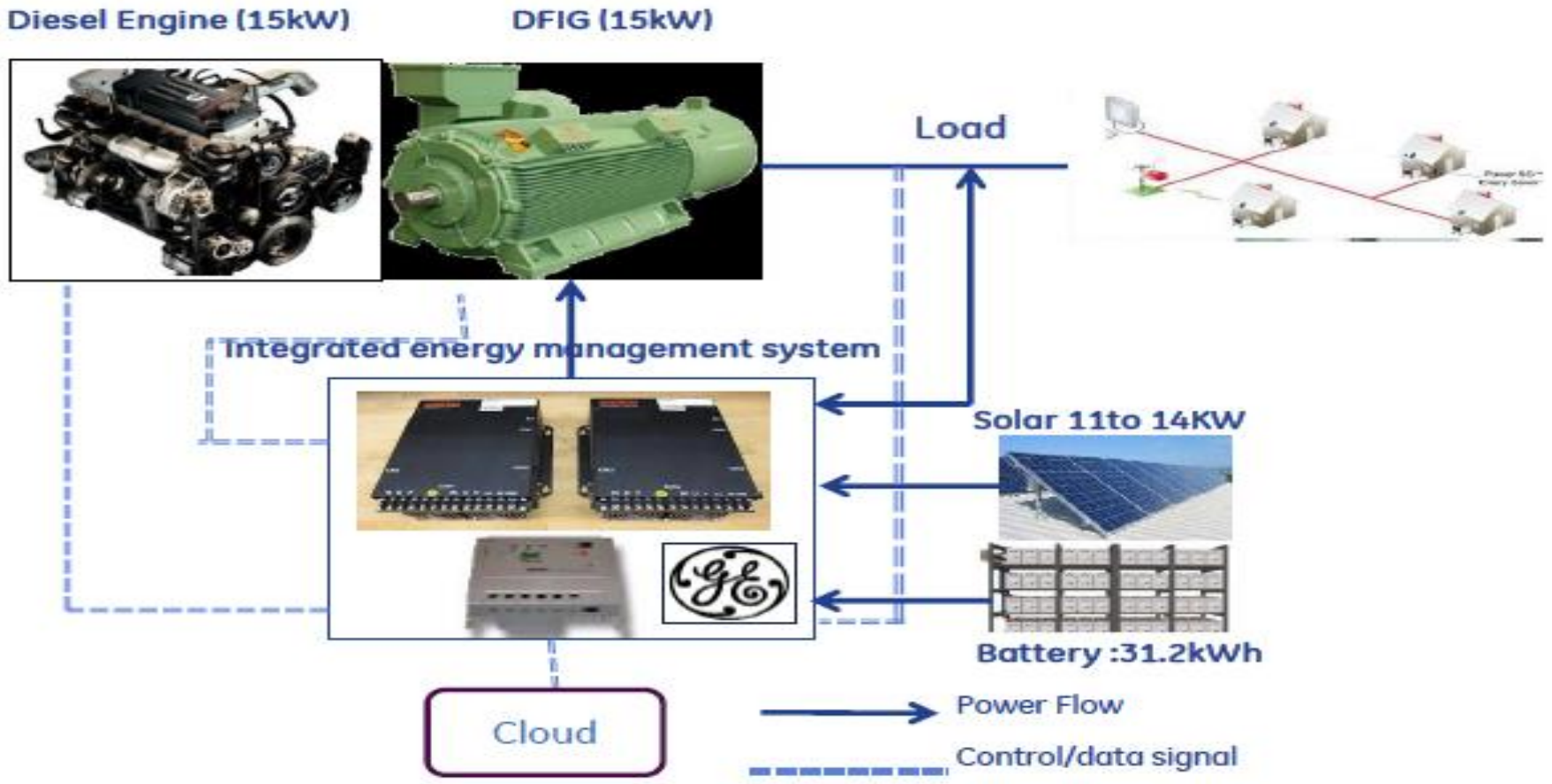
Integrated Energy Management System



Solar Diesel Hybrid System adopted for Micro-Grid



Media Bytes- Solar

North discom initiates study to gauge solar power potential in Capital

HT Correspondent
htreporters@hindustantimes.com

NEW DELHI: To tide over the ongoing power crisis in the city, Tata Power Delhi Distribution Company has started a feasibility study for rooftop solar power generation.

Praveer Sinha, CEO and executive director of TPDDL, said they are undertaking this study in association with Energy and Environmental Economics, USA.

"This is the first time such a study is being undertaken on such a large-scale. Once we complete the study, we will submit it to the power regulator for their approval," added Sinha.

According to an estimate, at present, suitable rooftop space in the TPDDL distribution network of 510 sq km is approximately 10.71 sq km (2.1% - considering sub-urban open area) which is sufficient to generate 883 MW.

The company has received a grant of $459,238 from the US Trade and Development Agency (USTDA) for conducting the study. USTDA is an independent US government foreign assistance agency funded by the US Congress. The study will be completed within a year.

The feasibility study is in line with the government's National Solar Mission, which envisages establishing India as a global leader in solar energy. "National Solar Mission also aims to promote ecologically sustainable growth across the country. Capitalising on the opportunities, a few state governments have aggressively pursued the policy and currently, Gujarat alone has 1,000 MW of installed solar capacity. Delhi too has immense potential in the field," said Sinha.

Officials further explained that Delhi witnesses peak demand twice a day - between 3 and 5 pm and 11 and 2 am. "We can use solar energy to meet this peak requirement by proper utilisation of rooftops. The study will find out the number of rooftops that are required, whether people will be able to lease out their rooftops and they can be given incentives such as a grant among others," added the spokesperson.

The peak load demand of Delhi is more than the other metro cities of Mumbai, Kolkata and Chennai. Delhi has over 45 lakh power consumers and the peak load demand is touching around 6,000 MW.

Meanwhile, the Delhi Development Authority too has signed a Memorandum of Understanding (MOU) with the Solar Energy Corporation of India (SECI) to take up various projects for tapping solar energy. Both DDA and SECI have agreed to collaborate for the development of solar photovoltaic projects (on rooftops and other area) at identified DDA locations.

"Before signing the MoU, DDA on the instructions of vice-chairman, Balvinder Kumar had conducted an energy audit of its sports complexes where consumption of energy is high. It has identified three sports complexes which have a potential to generate 2MW solar power. DDA will be providing the rooftop space whereas SECI will provide the technical expertise from project assessment stage to successful completion," said a DDA spokesperson.

Tata Power's cool solution: Solar panels on rooftops

Subhash Narayan

New Delhi, June 10: Delhi has a savior in Tata Power. The company's arm, Tata Power Delhi Distribution, plans to launch a unique rooftop solar initiative that will allow residents of north Delhi to produce solar power and even sell it to the discom at a profit if they have a surplus or do not wish to use it.

The plan, which would be voluntary, involves setting up of small capacity solar (photovoltaic) panels on rooftops. Starting with 1 kw, such installations can go up to a few megawatts.

These would then be converted into power stations that are permitted two-way flow of electricity (between consumers and discoms and back) with the use of micro controllers.

"This is a unique initiative that we are planning to launch sometime next year after completion of a US Trade and Development Agency (USTDA) funded study. The idea is to create 200 mw of this capacity in three to four years time," said TPDDL CEO and executive director Praveer Sinha.

He said that the company would facilitate the entire process by tying up with solar PV vendors and also approach the Delhi Electricity Regulatory Commission (DERC) to fix tariff for power produced from these consumer driven solar panels.

The company is also looking at some subsidy from the state government for consumers interested in participating in the scheme. The Centre currently provides 30% capital subsidy for solar installations and also investors get accelerated depreciation benefits.

A 1 kw of solar PV installation roughly costs between Rs 70,000 to 80,000 and generates 4 to 5 units a day. Such installations take up roof space of about 10 to 12 square metres. If TPDDL plans to produce 200 mw of solar power under this route, it will have to get close to 2 lakh consumers on board for the 1 kw PV panels. The numbers could be lower on bigger capacity solar PV panels.

Sinha said that all rooftop PV systems could have a single bi-directional meter to measure the import and export of electricity. Consumers could be charged on the net consumption of at the end of the billing cycle. In case a consumer is a net generator and exporter, he/she can be paid for such supplies at tariff determined by the regulator. The regulator could either have separate tariff for solar power generated by domestic and commercial consumers or could evolve a pooling tariff mechanism.

"...rooftop solar could be a stop gap solution in the short term," said Ratul Puri, chairman, Hindustan Power Projects formerly known as Moser Baer Projects.

"I feel all the state governments should notify 5 to 10% renewable energy generation by home and commercial consumers in a policy," said Sridhar Raghavendra, energy expert, Girem. Girem is a collective body working with local governments in the areas of infrastructure planning, growth and development.

Discom offers rooftop scheme

Times News Network

New Delhi: Tata Power Delhi is reaching out to its commercial and industrial consumers with a scheme to set up and maintain rooftop solar plants. The move would reduce tariff impact on consumer by 20% during TOD (time of the day) peak period—1pm-5pm. It's expected to benefit over 50,000 consumers and save up to 400 MW in the next five years.

Since October 1, TOD tariff—with 20% surcharge on peak period consumption—has been extended to north Delhi consumers with a minimum load of 25KW.

"The photo-voltaic power plants supervised by Tata Power Delhi will have a life span of 25 years. The area requirement is 120 sq ft per KW and the project cost comes to Rs 70,000 per KW. Consumers can attain savings in their bill at Rs 11 per unit even at regular tariff rate and break even on investment in less than four years. The discom endeavours to give end-to-end service to consumers with annual maintenance contracts for five, seven and 10 years," said an official.

Earlier, TOD tariff was mandatory only for consumers having a load greater than 50 KW. Time slots for peak period have also been changed from 3pm onwards to 1-5pm when solar power generation is at the maximum.

Tata Power Delhi CEO Praveer Sinha said, "Our commercial and industrial consumers should make the most of this scheme. They can install PV power plants and save up to 20-25% power consumed, plus cushion themselves against TOD tariff and also contribute to a cleaner environment."

The discom has signed a 25 KW rooftop solar project with Aakriti Furnishing in Kirti Nagar. Rooftop solar installation is a one-time investment for 25 years as it is a renewable source of energy with a payback period of 4.5 years.

Tata Power signed a 25 KW project with Aakriti Furnishing in Kirti Nagar. Rooftop solar installation is a one-time investment for a period of 25 years

सौर ऊर्जा से 883 मेगावाट बिजली बनाने की तैयारी

मिलेगी राहत

नई दिल्ली | वरिष्ठ संवाददाता

सौर ऊर्जा की मदद से दिल्ली में 883 मेगावाट बिजली बनाने की तैयारी की जा रही है। इसके लिए अमेरिका की एक कंपनी से 4,59,238 डॉलर का अनुदान भी मिलेगा। इसके जरिए दिल्ली में बिजली की मांग को पूरा करने में मदद मिलेगी।

हाल ही में हुई बिजली कटौती से सबक लेते हुए यह पहल हो रही है। दिल्ली में मौजूद सभी छतों का क्षेत्रफल लगभग 31 वर्ग किलोमीटर है जहां गर्मियों में खुली धूप रहती है। इन छतों पर सोलर पैनल लगे तो इससे 2257 मेगावाट बिजली का उत्पादन संभव है।

दिल्ली में बिजली की मांग 10 वर्षों में दोगुनी हुई है। पीक ऑवर में कटौती दिन के वक्त दो से पांच बजे के बीच अधिक होती है। इस समय का उपयोग कर बिजली बनाई जा सके इसके लिए टीपीडीडीएल ने एनर्जी एंड एंवायरमेंटल इकनॉमिक्स के साथ मिलकर एक सर्वे करने का फैसला लिया है।

इसके तहत टाटा अपने क्षेत्र में उपलब्ध 10.71 किलो मीटर एरिया में रूफटॉप स्पेस से 883 मेगावाट बिजली का उत्पादन कर सकता है। दिल्ली में इस समय करीब एक हजार मेगावाट बिजली का ही उत्पादन कर पाते हैं।

तकनीक

- 31 वर्ग किलोमीटर छतों पर लगाए जा सकते हैं सोलर पैनल
- इनकी मदद से 2557 मेगावाट बिजली का हो सकेगा उत्पादन
- उत्तरी दिल्ली में लागू होगी व्यवस्था, हुआ समझौता
- यूएसटीडीए कंपनी से मिलेगा लाखों डॉलर का अनुदान

कैसे बढ़ी है बिजली की मांग

23 लाख उपभोक्ता थे विद्युत बोर्ड के सन् 2002 में

03 हजार मेगावाट बिजली की मांग थी पीक ऑवर में सन् 2002 में

45 लाख उपभोक्ता थे विद्युत बोर्ड के सन् 2013 में

06 हजार मेगावाट बिजली की मांग थी पीक ऑवर में सन् 2013 में

टीपीडीडीएल कंपनी के क्षेत्र में पीक लोड 1700 मेगावाट है। 2020 तक यहां पर करीब 400 मेगावाट तक मांग में इजाफा होने का अनुमान है।

स्कूलों की छतों पर पैदा करें बिजली

- स्कूल प्रबंधकों को दी जा रही है सौर ऊर्जा के महत्व की जानकारी

राज्य ब्यूरो, नई दिल्ली : स्कूलों की छतों पर सौर ऊर्जा से बिजली पैदा की जा सके इसके लिए स्कूल प्रबंधकों को प्रेरित किया जा रहा है। उन्हें सौर ऊर्जा के महत्व व इसे लगाने में आने वाले खर्च से लेकर अन्य तथ्यों की जानकारी दी जा रही है। इसके लिए टाटा पावर दिल्ली डिस्ट्रिब्यूशन लिमिटेड (टीपीडीडीएल) ने मंगलवार को कार्यशाला का आयोजन किया। जिसमें उत्तरी दिल्ली के लगभग 50 स्कूलों के प्रतिनिधि शामिल हुए।

टीपीडीडीएल ने उत्तरी दिल्ली व उत्तरी पश्चिमी दिल्ली में व्यावसायिक तथा औद्योगिक इमारतों की छतों पर सोलर पैनल लगाने की योजना शुरू की है। ये सोलर पैनल पीवी (फोटो वोलटिक) पावर प्लांट ग्रिड से जुड़े होते हैं। एक किलोवाट के पीवी पावर प्लांट द्वारा सालाना 1400 यूनिट बिजली का उत्पादन होगा। करीब 25 वर्षों के जीवन चक्र वाले इन पावर प्लांट्स की देखरेख की जिम्मेदारी टीपीडीडीएल की होगी। ये संस्थान अतिरिक्त बिजली डिस्कॉम को 11 रुपये प्रति यूनिट की दर से बेच सकते हैं। लगभग पांच साल में उनका निवेश वसूल हो जाएगा। कार्यशाला में दिल्ली विद्युत विनियामक आयोग के (डीईआरसी) के उपसचिव अभिषेक मोझा, नवीन और नवीकरणीय ऊर्जा मंत्रालय के निदेशक अरुण कुमार त्रिपाठी, सोलर एनर्जी सोसायटी ऑफ इंडिया के निदेशक राकेश शर्मा सहित कई विशेषज्ञ शामिल हुए। उन्होंने सौर ऊर्जा की उपयोगिता इससे जुड़े विषयों पर विस्तार से चर्चा की। टीपीडीडीएल के अधिकारियों ने बताया कि कंपनी इससे पहले इसी तरह की कार्यशाला बवाना, नरेला, वजीरपुर और नारायणा औद्योगिक क्षेत्रों में भी आयोजित कर चुकी है। टीपीडीडीएल के मुख्य कार्यकारी अधिकारी प्रवीर सिन्हा ने कहा कि इस कार्यशाला का मुख्य मकसद उपभोक्ताओं को सौर ऊर्जा के महत्व के बारे में जागरूक बनाना था।

उपभोक्ताओं पर प्रतिवर्ष 1500 करोड़ रुपये का पड़ रहा बोझ

संतोष कुमार सिंह, नई दिल्ली

दिल्लीवासियों को सस्ती बिजली मिले इसके लिए जरूरी है कि दिल्ली सरकार के बिजली संयंत्रों से क्षमता के अनुसार बिजली पैदा की जाए या फिर इन्हें बंद कर दिया जाए। क्योंकि, इन संयंत्रों से बिजली वितरण कंपनियों (डिस्कॉम) को महंगी बिजली मिल रही है और कंपनियां इसका बोझ उपभोक्ताओं पर डाल देती है।

डिस्कॉम का कहना है कि पिछले पांच वर्षों में दिल्ली सरकार के संयंत्रों से मिलने वाली बिजली के दाम दोगुना हो गए है। इससे उपभोक्ताओं पर प्रतिवर्ष 1500 करोड़ रुपये का बोझ पड़ रहा है। दिल्ली सरकार के चार बिजली संयंत्र हैं। जिसमें से बवाना संयंत्र, गैस टरबाइन संयंत्र व प्रगति संयंत्र में गैस से तथा राजघाट संयंत्र में कोयले से बिजली पैदा होती है। लेकिन इनमें से किसी में भी क्षमता के अनुसार बिजली पैदा नहीं हो रही है। राजघाट संयंत्र तो पिछले कई महीने से बंद है। कहने को तो इन चारों संयंत्रों की कुल उत्पादन क्षमता 2235 मेगावाट है। लेकिन इस समय इनसे मात्र 563 मेगावाट के आसपास बिजली का उत्पादन हो रहा है। इस कारण इनसे मिलने वाली बिजली औसतन 7.12 रुपये प्रति यूनिट पड़ रही है। डिस्कॉम अधिकारियों का कहना है कि यदि गैस टरबाइन और प्रगति संयंत्र को बंद कर इसकी गैस बवाना टरबाइन संयंत्र को स्थानांतरित कर दी जाए तो इसकी उत्पादन क्षमता बढ़ जाएगी। इसी तरह से राजघाट संयंत्र को भी बंद करने से इसके कर्मचारियों के वेतन व अन्य खर्च का बोझ दिल्लीवासियों को नहीं उठाना होगा। टाटा पावर दिल्ली डिस्ट्रिब्यूशन लिमिटेड (टीपीडीडीएल) ने इस संबंध में दिल्ली सरकार को पत्र भी लिखा है। भाजपा ने बिजली संयंत्रों से उत्पादन बढ़ाने की मांग की है। विधानसभा में नेता प्रतिपक्ष विजेंद्र गुप्ता का कहना है कि कुप्रबंधन की वजह से दिल्ली सरकार की बिजली कंपनियों की वित्तीय स्थिति खराब हो गई है। बिजली संयंत्रों का आधुनिकीकरण नहीं होने से इनसे काफी कम बिजली पैदा होती है।

- सरकार के संयंत्रों से मिल रही है महंगी बिजली

बिजली संयंत्र	बिजली की कीमत	उत्पादन (कुल क्षमता की तुलना में)
बवाना	9.31 रुपये	16 फीसद
गैस टरबाइन	6.43 रुपये	36 फीसद
प्रगति	5.32 रुपये	64 फीसद
राजघाट	6.91	30 फीसद

(वर्ष 2014-15) का विवरण

टाटा पावर भारत में सौर परियोजनाओं के क्रियान्वयन के लिए बनी पहली कंपनी

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