



POWERGRID

Delivering Smart Grid/ Distribution Solutions

Press & Analysts' Meet 06 November, 2012

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- *Annual Accounts for FY2011-12 have been approved by the shareholders.*

30/ 31 July 2012	Grid Disturbance
Q2 & H1 FY12-13	Financial Highlights
Q2 & H1 FY12-13	Commissioning/ Capitalization Highlights
Q2 & H1 FY 12-13	Performance Highlights - Other Segments & Investment Programme
Smart Grid	A Reality
New Business Initiatives	Updates

GRID DISTURBANCE

JULY 2012

Grid Disturbance

- Two major Grid disturbances:
 - 30 July 2012: Northern Grid
 - 31 July 2012: Northern, Eastern & North-Eastern Grids
- Restoration work taken up immediately and essential services like Railways, Metro Rail, Mines and Airports restored within 3 to 4 hours.
- The Government appointed an independent committee to examine the reasons for the grid disturbances and the remedial actions to be taken to secure safe and sustainable operation of the grid.
- The Committee concluded that disturbances caused by combination of factors, such as weak inter-regional corridors due to multiple outages, high loading of some links, overdrawl by some of the NR utilities, inadequate response by SLDCs to the instructions of RLDCs to reduce overdrawl etc.

Grid Disturbance - Committee's Recommendations

- The Committee made a number of recommendations both long-term and short-term to avoid recurrence of such incidents, such as,
 - Review and audit of the protection systems
 - Frequency control through generation reserves
 - Review of present UI mechanism
 - Ensuring primary response from generators and operation of defence mechanisms, like under frequency and rate of frequency based relays & special protection schemes
 - Coordinated outage planning of transmission elements
 - Deploying Synchrophasor based Wide Area Monitoring Systems (WAMS)
 - Formulation and deployment of Islanding schemes so as to ensure power supply to essential services and faster recovery in case of grid disruptions etc.

Grid Disturbance - Actions Taken

- **Tightening of frequency:**
 - From 49.5Hz to 50.2Hz to 49.7Hz to 50.2Hz and;
 - Petition filed in CERC for further tightening to 49.9Hz-50.1Hz.
- **Independent Third Party Audit & Inspection of Protection Systems by RPCs**
- about 80 % completed in Northern Region & report submitted to CERC.
- **Restriction imposed on unscheduled drawl**
- **Islanding Schemes:**
 - Scheme finalised for Delhi.
 - Proposals received from UP, Punjab, J&K and Haryana
 - Other states being followed up.
- **Process Started for:**
 - Installation of advanced telemetry based communication systems
 - Setting up of one real-time security desk in all shifts in NLDC / RLDCs etc.

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Financial Performance: Q2 FY12-13

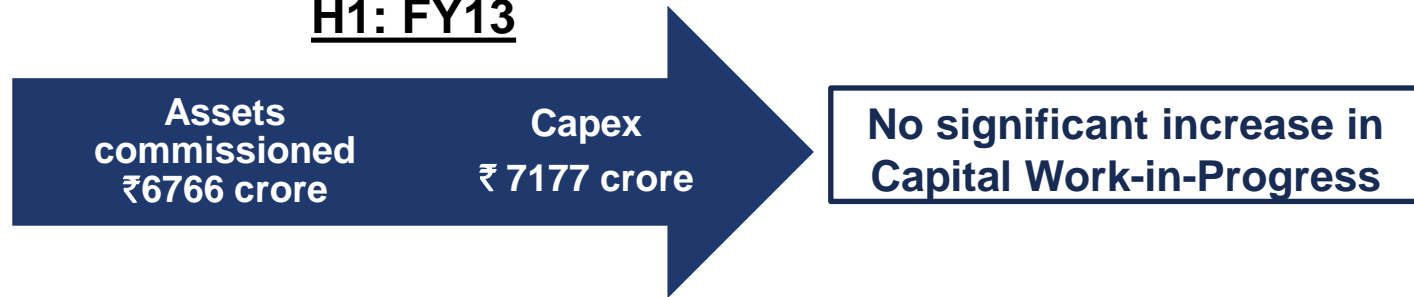
Income
up in
Q2 by
32%

PAT up
in Q2
by
59%

					(₹ in crore)
	Quarter ended		Half year ended		FY 2011-12
	30.09.2012	30.09.2011	30.09.2012	30.09.2011	
Income					
- Transmission Charges	2960	2145	5734	4246	9544
- Consultancy	68	70	128	126	290
- Telecom	58	50	112	95	201
- Other Income	157	194	249	333	750
Total Income	3243	2459	6223	4800	10785
Operating Expenses(including prior period adjustment)	403	392	826	776	1671
EBITDA-Gross Margin	2840	2067	5397	4024	9114
Depreciation	825	597	1582	1176	2573
Interest	634	459	1245	878	1859
FERV : Loss / (Gain)	(105)	69	(69)	64	84
Tax	360	233	643	492	1343
Profit after Tax	1126	709	1996	1414	3255

Financial Performance: Q2 FY 12-13

H1: FY13



	(₹ in crore)		
	As on 31.03.2012	As on 30.06.2012	As on 30.09.2012
Gross Fixed Assets	63387	68876	72598
Capital Work-in-Progress	33275	32218	33533
Debt	51752	57987	58158
Net Worth	23487	24358	25483
Earning Per Share (₹)	7.03	1.88*	4.31*
Book Value per Share (₹)	50.73	52.61	55.04
Key Financial Ratios			
Debt : Equity	69:31	70:30	70:30
Return on Net Worth	13.86%	3.57%*	7.83%*

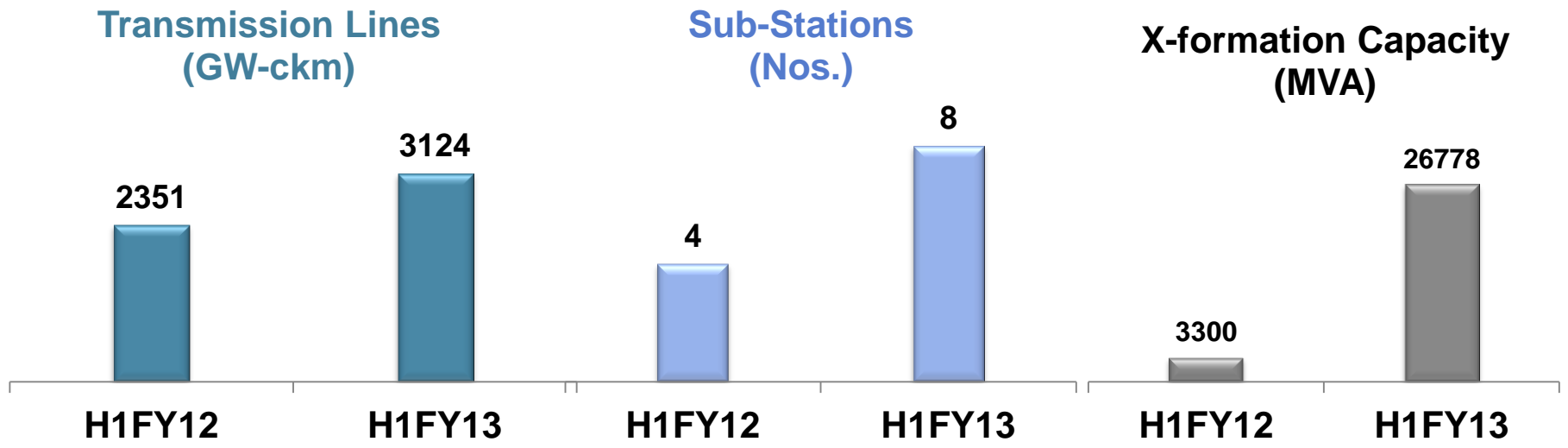
* Not Annualized

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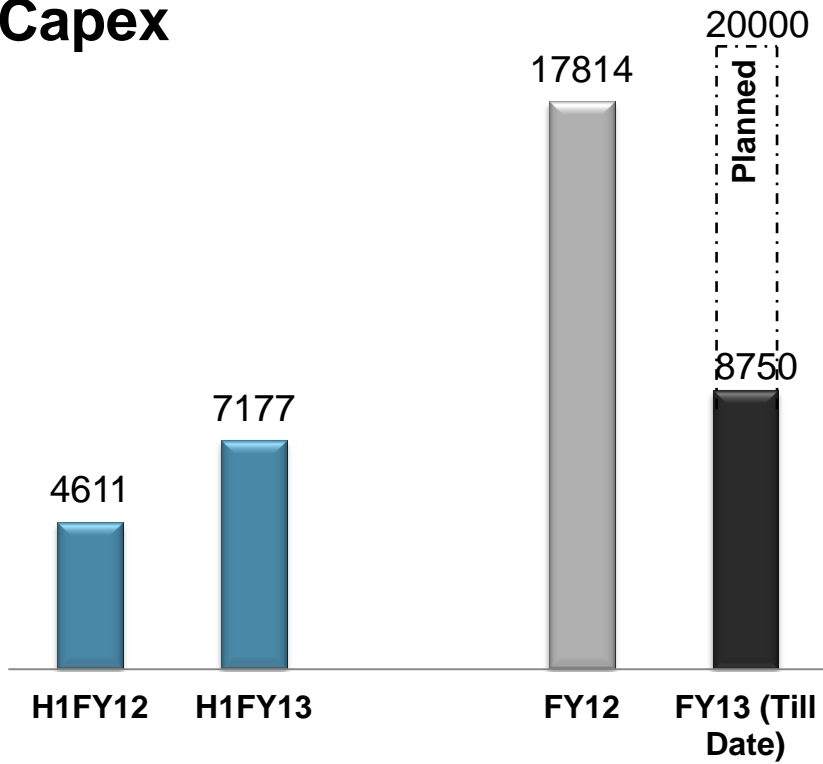
Project Execution: H1 FY 12-13



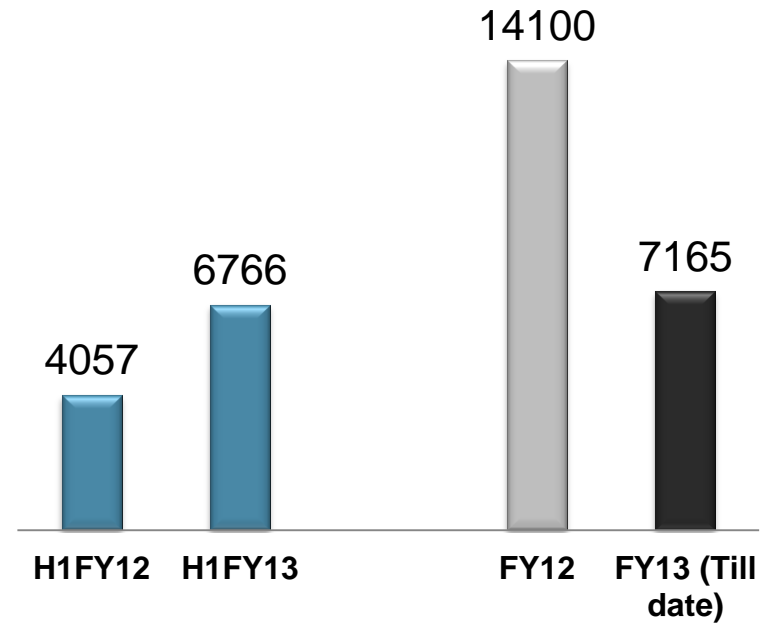
Project Execution: H1 FY12-13

(₹ in crore)

Capex



Commissioning



Major Projects to be Commissioned during balance period of FY 12-13



UMPP

- Sasan
- Mundra (Last leg)

Generation Linked

- DVC & Maithon Right Bank
- Pallatana GBPP
- Chamera-III HEP
- Parbati-III HEP

System Strengthening

- In Western Region
- 765kV System for National Capital Region
- In Northern Region for Mundra & Sasan
- Krishnapatnam

Tr. Line: 7000 ckm

Transformation Capacity: 15,000 MVA

Sub-Stations: New (5) & Augmentation (3)

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Operations

Asset Management



Lines

- 754 Nos.
- 96,216 ckm



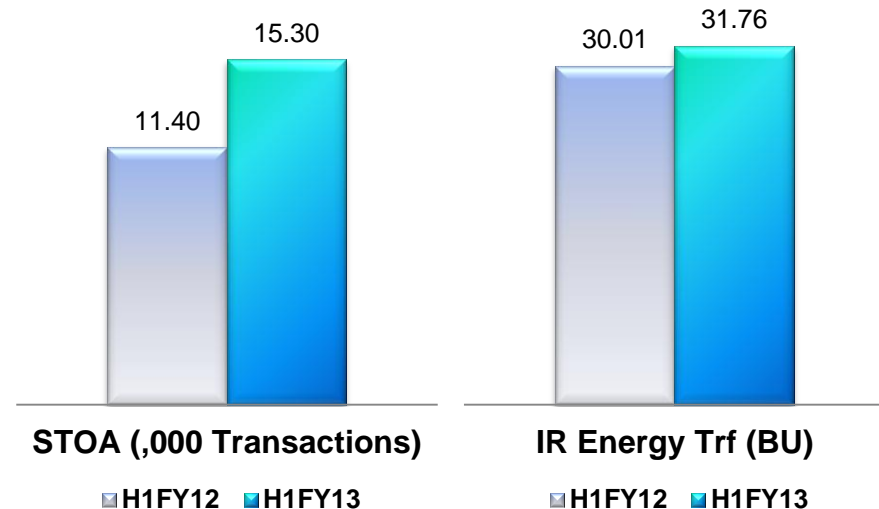
Sub-Stations

- 158 Nos.
- 151,303 MVA
- ~ 1100 Nos. Transformers & Reactors

Availability 99.92%
Reliability 0.32 trippings/ line

Grid Management¹ (POSOCO)

Consistent increase in STOA Transactions and Inter-Regional Energy Transfer



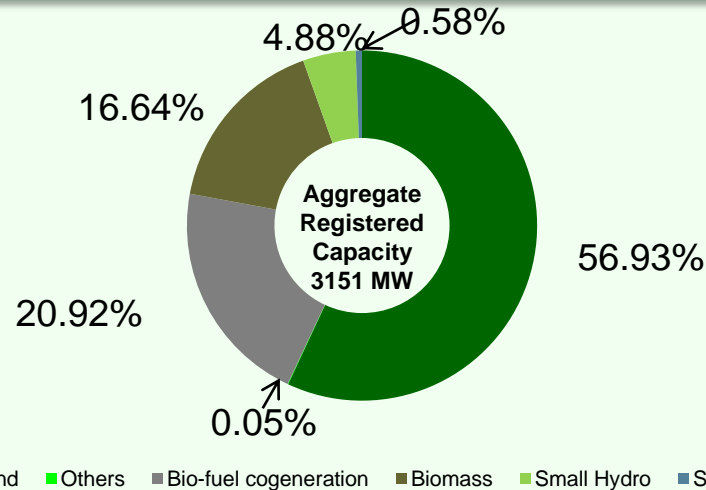
1- carried out through Power System Operation Corporation Limited, a wholly owned subsidiary of POWERGRID,

Operations (REC Mechanism¹)

REC Mechanism: Highlights

	H1FY12	H1FY13	Growth
Registered Capacity (MW)	900	934	4%
REC Issued (Nos.)	1,96,512	20,39,254	~10x
REC Traded (₹ in crore)	23.31	230.91	~ 10x

Cumulative RECs traded: ₹ 517 crore



•Solar RECs worth ₹ 2.18 crore traded in 5 sessions

¹- carried out through Power System Operation Corporation Limited, a wholly owned subsidiary of POWERGRID

Highlights



Q2: New Clients

3

National Knowledge Network (NKN)

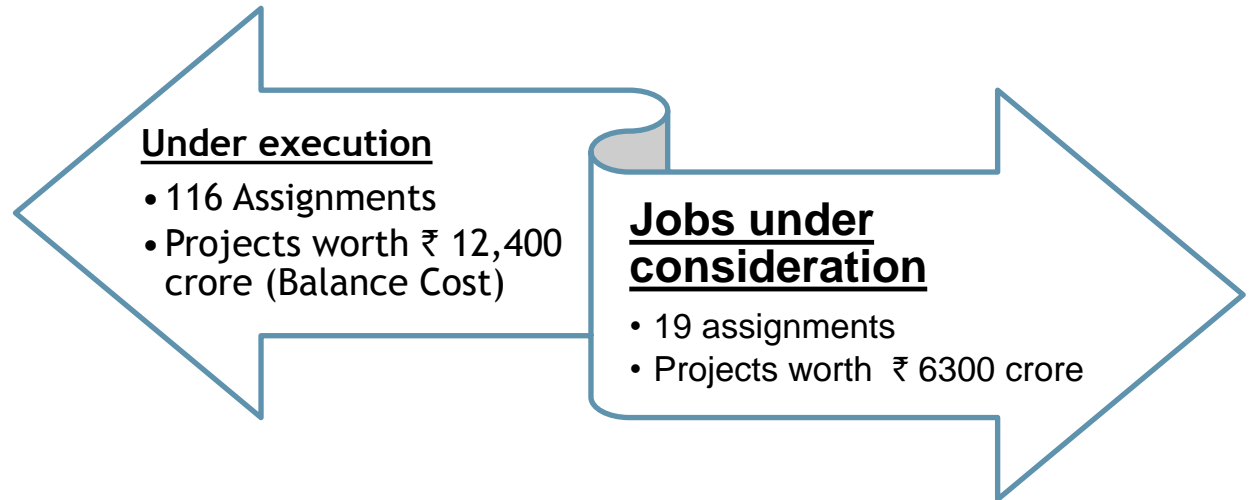
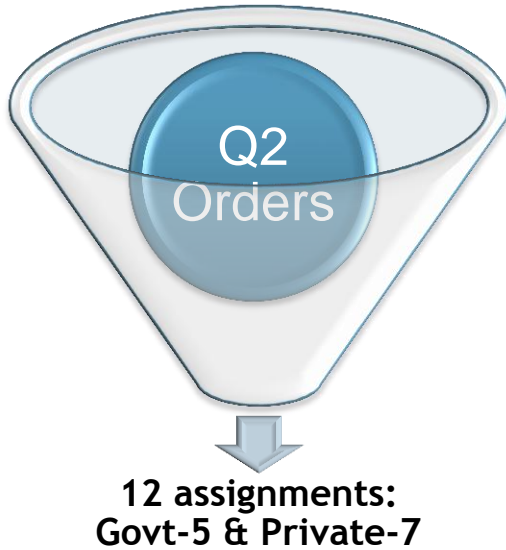
- Allocation received for connectivity to additional 70 Nos. of DHQs (Value for 7 years as ~ ₹ 100 crore)
- Total value of allocations received for NKN ~ ₹ 900 crore for 10 year period starting Oct, 2010.

National Optic Fiber Backbone (NOFN)

- POWERGRID Share: ₹ 4000 crore to connect 50,000 GPs out of total 2,50,000 GPs
- Received 'Allotment Letter' for NOFN network in 4 States viz. AP, HP, Jharkhand & Orissa for 36,000 GPs.
 - 89 districts covering 1769 blocks
 - Estimated cost: ~ ₹ 3000 crore
- Pilot Project of 15 Gram Panchayats in Parvada Block at Vizag Dist. successfully implemented
- Tri-partite MOU between DoT, BBNL and State Govts. signed with 16 states.
- Commercial MoU being finalised by BBNL

Consultancy

Domestic



New Clients

11 Nos. in Q2

Consultancy: International



Focus Geographies

- SAARC
- Africa
- Gulf countries

Focus Businesses

- Consultancy
- Asset Management
- EPC
- JV/ Acquisition

Footprints in 11 countries



Q2 Orders

- 2 Nos. (Nepal & Bhutan)

Under execution

- 17 Assignments
- Projects worth ₹ 2,600 crore (Balance Cost)

• **Shortlisted for:**

- Owner's Engineer, Tanzania
- Detail Engg. & Supervision of Construction for HVDC Interconnection between Kenya & Ethiopia

Proposals/ EOI submitted

- 11 assignments
- 5 new countries

- Montenegro
- Ghana
- Ukraine
- Rwanda
- Mozambique

Consultant finalized to advise on setting up of a separate company for overseas operations

Revenue Collection Efficiency



(₹ in crore)

Outstanding as on date

Monthly Billing	940
Outstanding > 60 days	478
Being paid in installments	162
Balance Outstanding > 60 days	316

**Equivalent to
10 days of
billing**

Stranded Assets: Nil

Revenue Collection Efficiency



Methods for pursuing better implementation of Debtor Recovery Measures

Rigorous follow-Up with Designated ISTS Customers (DICs) to make timely payment

Regulation of Power Supply of defaulting entities as per CERC Regulations

Denial of Short Term Open Access to consistent defaulting entities being pursued with CERC

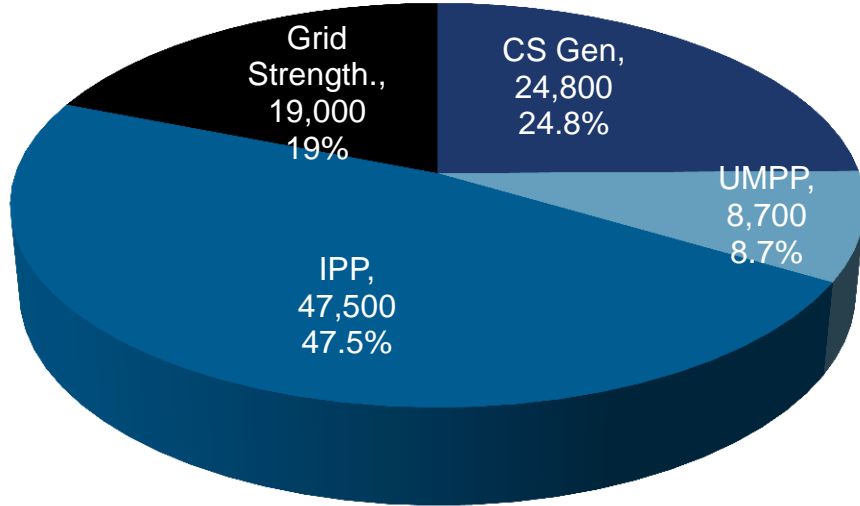
Notice to CEOs of defaulting entities by CERC under section 142 of Electricity Act-2003

Disconnection of feeders being contemplated for the entities who neglect to pay the transmission charges (under Section 56 of Electricity Act-2003)

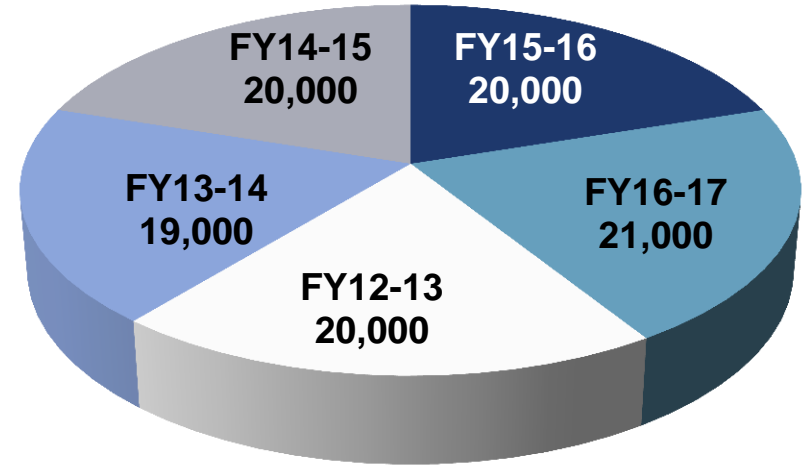


Investment Programme

(₹ in crore)



Projects/ Schemes



Capital Outlay

Investment Approved - ₹ 88,000 crore

Contracts awarded for Project Cost: ₹ 73,000 crore

Tariff Based
Competitive
Bidding

Consultancy
assignment/ Sub-
Transmission

Transnational
interconnections

**Additional
projects**

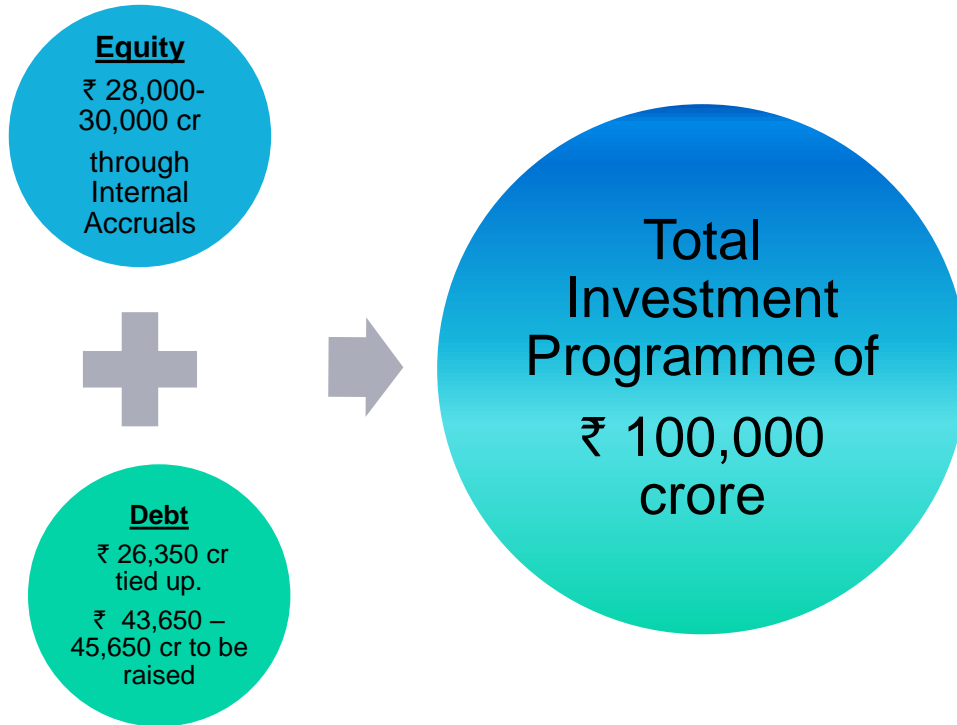
Projects
assigned by
Gol

Green
Energy
Corridors

Funding Programme

Investment planned in Debt-Equity ratio of 70:30

Requirement



Sources

Domestic Market

- Bonds
- Line of Credit from SBI

Foreign Currency

- Govt. guaranteed funds from IFIs like World Bank & ADB
- ECB including loans from ADB, IFC, Supplier's Credit, Foreign Currency Bonds

Mobilized during FY13

- Bonds from Domestic Market: ₹ 6,850 crore
(Jul-12: ₹ 4,000 crore @9.3%; Oct-12: ₹ 2,850 crore @ 8.85%)
- Foreign Currency Commercial Loan from IFC: US\$ 270 million

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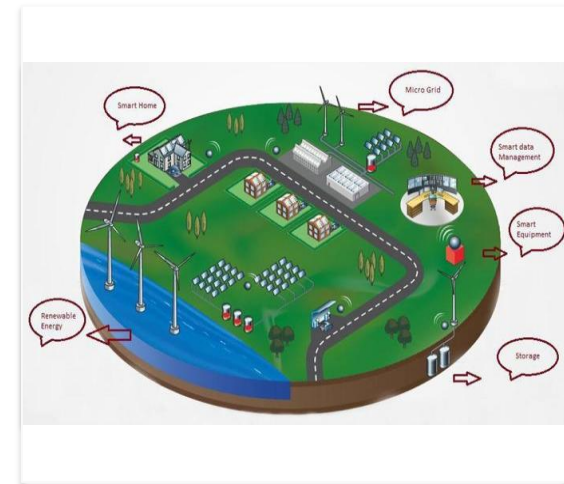
Puducherry Pilot Smart Grid / City

Attributes

- Advanced Metering Infrastructure (AMI)
- Outage Management System (OMS)
- Power Quality Management (PQM)
- Integration of Renewables, Micro Grid
- Energy Storage, Electric Vehicles

AMI Functionality - Operational

- Smart Meter Deployed For 195 Consumers
- Data Concentrators Unit (DCU), Meter Data Acquisition System (MDAS), and Meter Data Management System (MDM) deployed
- Smart Grid Control Center inaugurated by Chief Minister, Puducherry on 19th Oct., 2012



DPR on Smart Grid Solutions submitted

Katra Gulmarg Kanpur Firozabad Bidhuna Shikohabad Muzaffarpur Puri

Green Energy Corridors

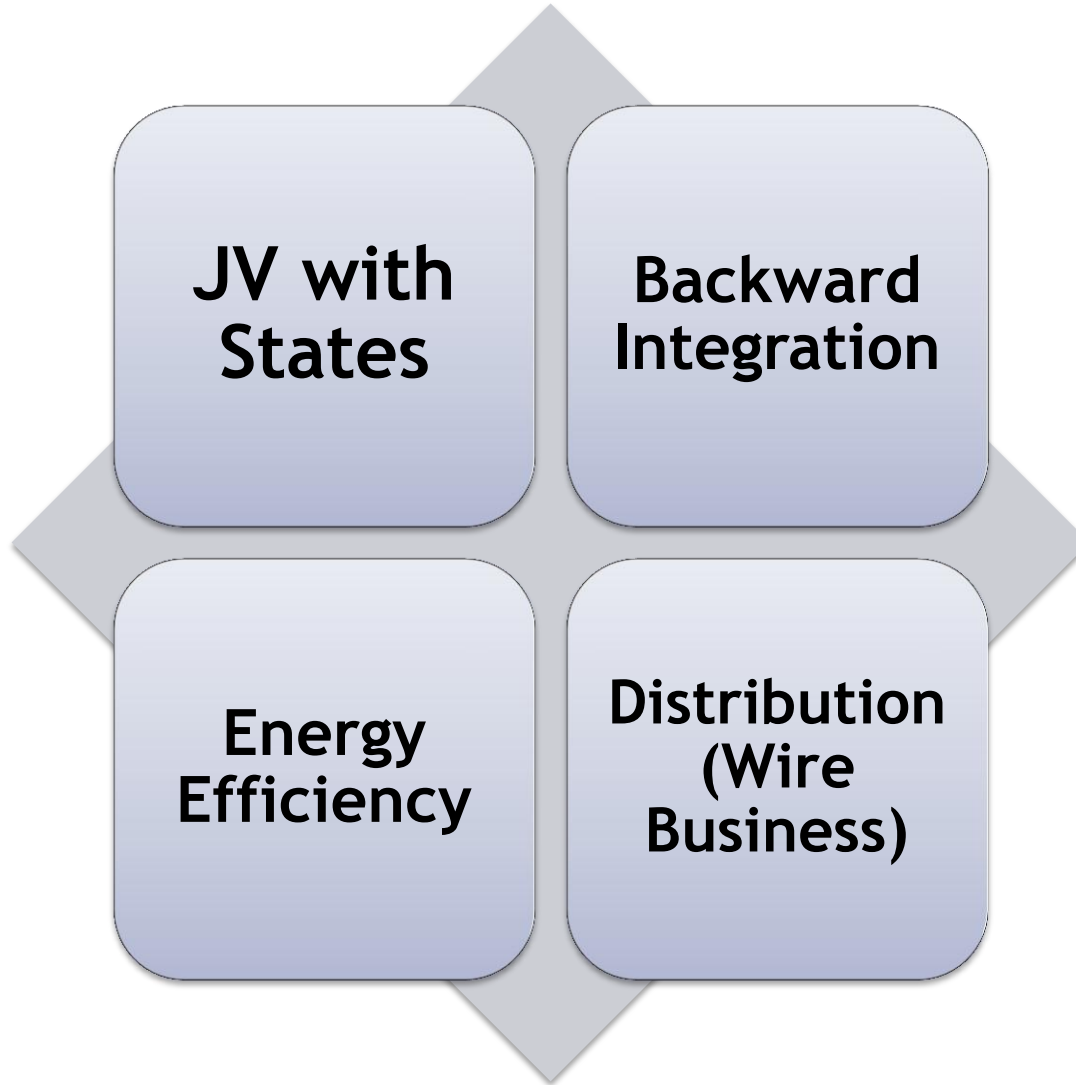


- Green Energy Corridors Report jointly released by Hon'ble Union Minister of Power and Minister of New and Renewable Energy on 14 Sept'2012
- Investment of ₹ 43,000 crore envisaged in development of Green Corridors for 42GW RE Generation (₹ 20,600 crore for intra-state and ₹22,400 crore for inter-state)
- Investment includes other associated works like Dynamic Reactive Compensation, Energy Storage, Establishment of RE Management Centres, forecasting tools etc.
- Approval process in progress

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New Business Initiatives: Updates



JV with States

- XII Plan - intra-State Transmission: ₹ 55,000 crore
- Agreements with Bihar & Odisha finalized
- Discussions under way with Jharkhand, UP, J&K, Haryana, Manipur



Backward Integration

- DPR for conductor/ tower parts manufacturing under finalization stage
- JV for manufacturing transformer and insulators being pursued

New Business Initiatives: Updates



Energy Efficiency

- Utilizing existing pool of Qualified EA & EMs
- Offers received for auditing Sub-stations, Steel Mills & Office Buildings



Distribution (Wire Business)

- Applied for Wire Business license for identified Districts in Odisha



Thank You

The Electricity Act, 2003

company or other association or any other person who is responsible for its default.

Section 56. (Disconnection of supply in default of payment): -- (1) Where any person neglects to pay any charge for electricity or any sum other than a charge for electricity due from him to a licensee or the generating company in respect of supply, transmission or distribution or wheeling of electricity to him, the licensee or the generating company may, after giving not less than fifteen clear days' notice in writing, to such person and without prejudice to his rights to recover such charge or other sum by suit, cut off the supply of electricity and for that purpose cut or disconnect any electric supply line or other works being the property of such licensee or the generating company through which electricity may have been supplied, transmitted, distributed or wheeled and may discontinue the supply until such charge or other sum, together with any expenses incurred by him in cutting off and reconnecting the supply, are paid, but no longer:



Energy Efficiency

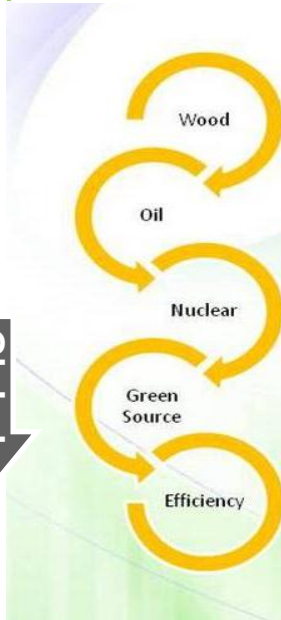
Energy Efficiency – Need of Hour

Energy Intensity (EI)- Energy Input per unit of GDP (kgoe/ US\$)

India

0.62 (2012) | 0.31 (2009)

Global



Global Energy Shortage

Coal will not last more than 120 Years
Oil will not last more than 40 Years
Gas will not last more than 60 Years



Will we allow our next generation to blame us for the wastage?

“Each unit of Electricity saved is ≈ to generation of 2 units”

***“Energy Efficiency is the fifth fuel, which is not a hardware fuel in the conventional sense”
Dr. APJ Abdul Kalam***

Government of India launched Perform Achieve and Trade (PAT) scheme to promote Energy Efficiency

- 478 Energy Intensive units identified in Phase-I
- Target and evaluation based on Energy Audit

- Incentive for achievement
- Penalty for Wastage of Energy

Energy Efficiency Initiatives by POWERGRID

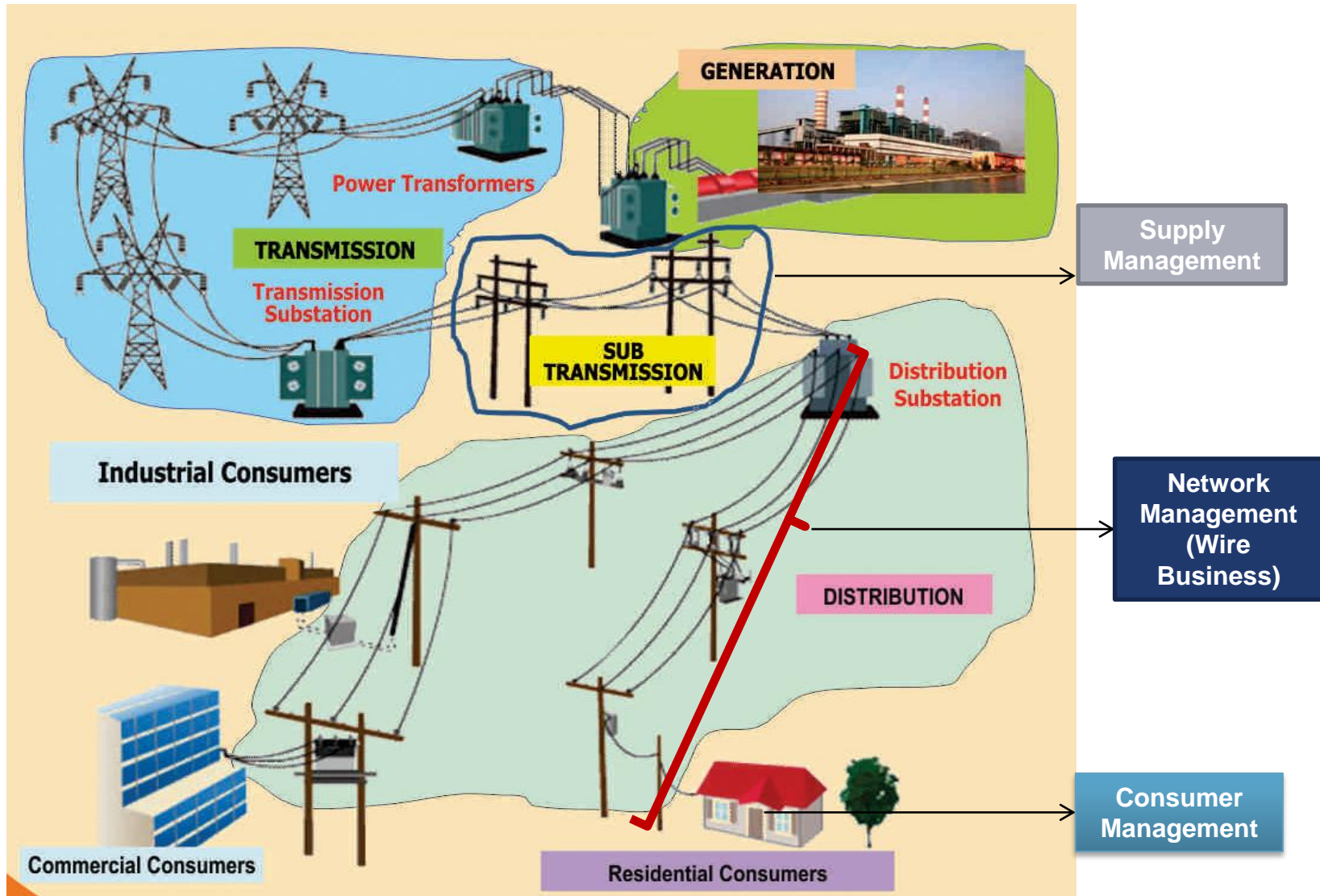
- ✓ Consultancy in Energy Efficiency
- ✓ Systematic Energy Audit by Experts
- ✓ Cost effective solutions for Energy Saving
- ✓ Development of green building
- ✓ Water and Paper Recycling
- ✓ Payback period calculations for the investments

Intend to set up Energy Efficiency Service Company (ESCO) to provide energy efficiency solutions from concept to commissioning including financing

Exploring Collaboration with Technology Innovators in manufacturing State-of-the-art quality product to provide total Smart Grid solutions including Energy Efficiency



Wire Business: Power Supply Delivery Chain



Distribution (Wire Business)



Wire Business



Power Supply Management

- Long term power purchase to meet base load demands
- Medium and short term power purchase to meet short term demands
- Power sale during surplus periods
- Management of renewable power purchase
- Regulatory and tariff filing

Network Management

- **Optimal operation of distribution system**
- **Loss reduction strategies**
- **Maintenance of existing network (substation, transformer and lines)**
- **Network strengthening and network addition (Capex)**

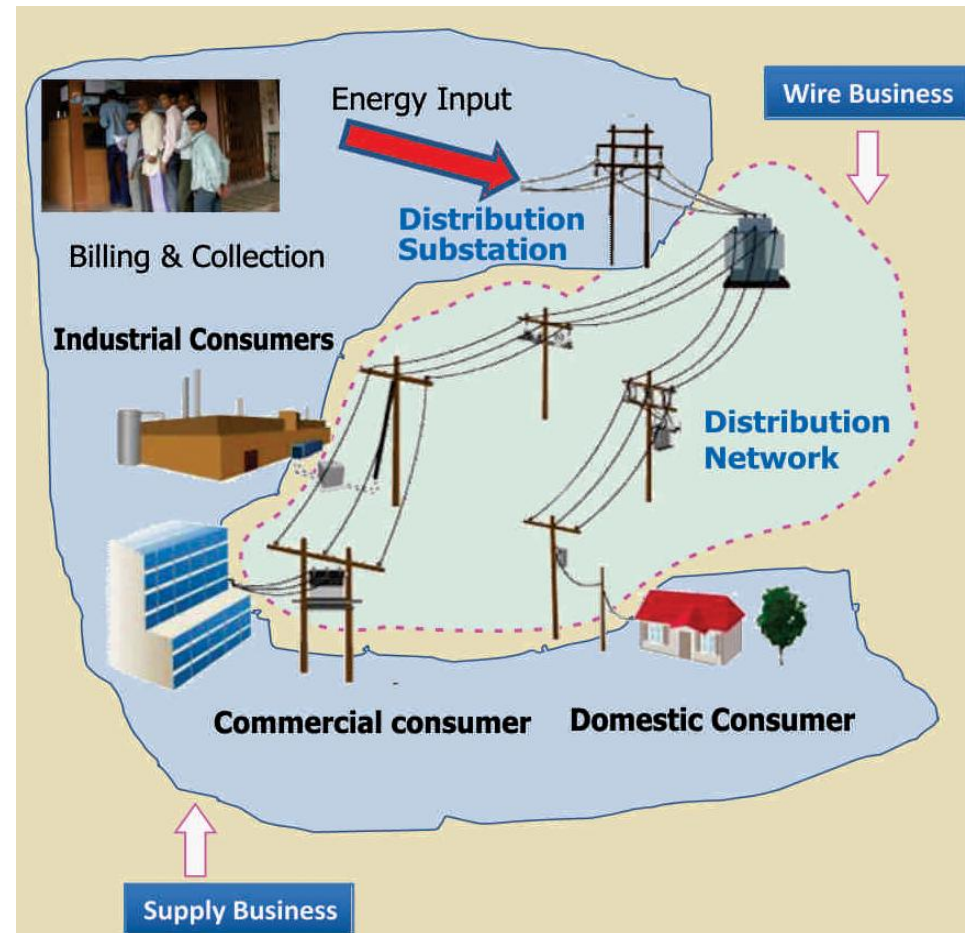
Customer Management

- New connection and disconnection
- Fault response and coordination
- Meter reading and billing
- Collection of bills
- Customer Relationship Management

Separation of wheeling and retail is an internationally tested methodology of introducing competition at the retail end of the power sector value chain

Wire Business: Improvement in Distribution

- “Wire business” needs to be separated from “Supply ”
- System Strengthening shall be ensured with separate wire business
- Enable reliable distribution network
 - Risk Sharing and bringing commercial viability of both the segments
 - Make Open Access in Distribution a reality
- Model shall ensure the system development, Smart Grid implementation and bringing efficiency in distribution sector
- Investment planned in Electricity Sector: ₹ 13.72 lakh crore (XII Plan)
 - Investment in Distribution: ₹3.06 lakh crore



Smart Grid Control Center at Puducherry



Location of Smart Meters Installations at Puducherry



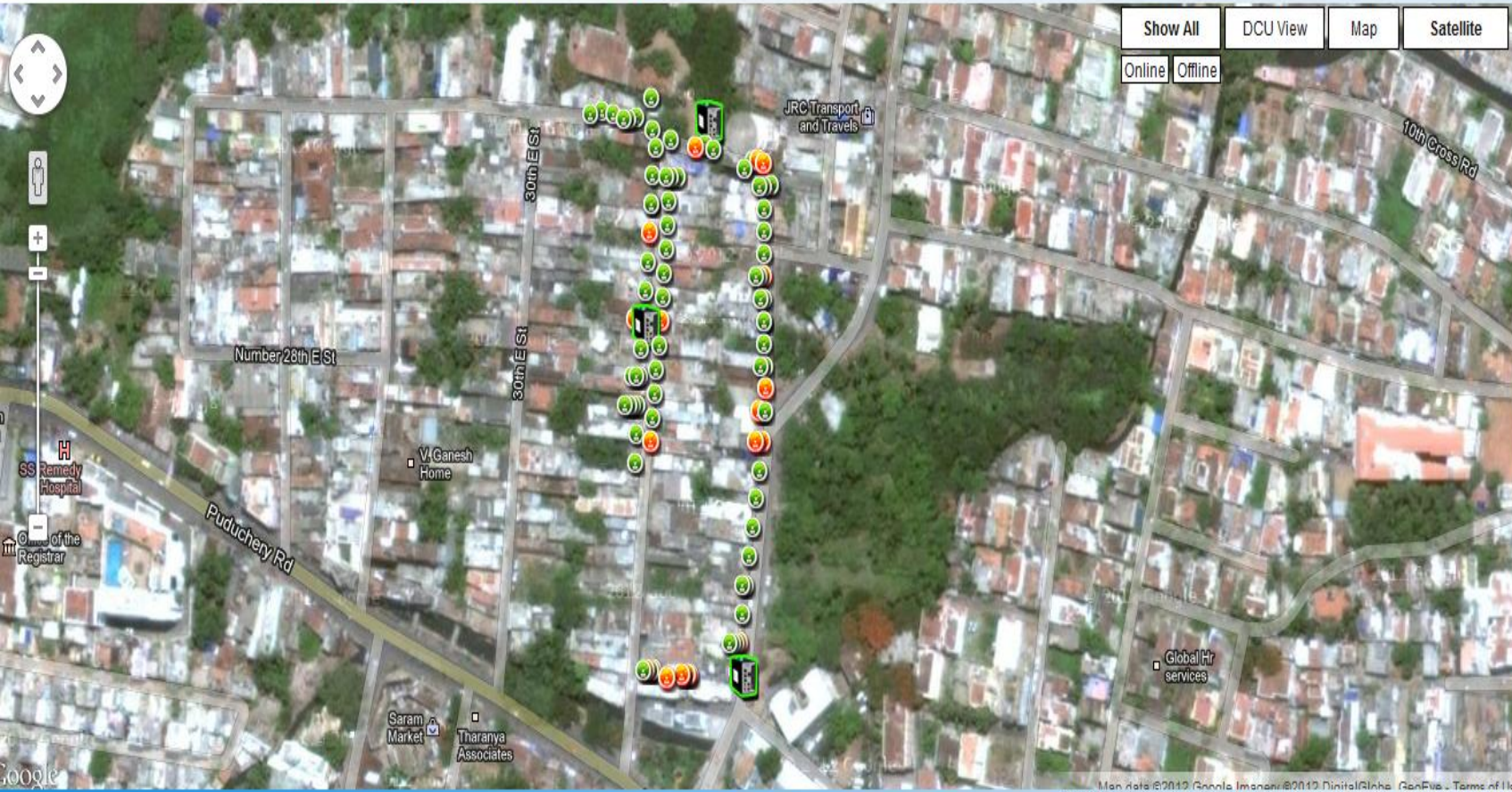
You are logged in as: [pgc/](#) | [Logout](#) | Last login at: 04:02 PM 05-Nov-12

Puducherry Smart Grid Meter Data Acquisition System

- Dashboard
- Administration
- Configuration
- HMI Viewer
- Data Reports


Section access rights: ● Full-Access

- Alarms
- Event Logs
- Data Viewer
- Network Map**



Map data ©2012 Google, Imagery ©2012 DigitalGlobe, GeoEye, Terms of Use
All rights reserved. Powered by Kalkitech SYNC5000 www.kalkitech.com

Real Time Smart Meter Data- Instant/ Hourly/ Weekly/ Monthly



PONDICHERRY SMART GRID PROJECT

உயர்நீர் அமைச்சு / தலைமை அமைச்சு
Electricity Department
Government of Pondicherry

Welcome: admin | Sign Out

Dashboard
Load Monitoring
VEE
Billing
MDMS Services
Alarms Management
Analytics
Reports
Audit Log
Configure

Through Earth | 18921401 : Load Through Earth | 18921401 : Magnetic Temp or Start a temp and

Load Monitoring


Mangalam 110Kv - Town 220Kv - DAT-1 - M18921459

[Report to Excel](#) | [Pdf](#) | [Print](#)

Change Electric Location

Today
Hourly
Week
Month
Year
Billng

Hourly



KWh

Time Period

Customer Details

Policy #	07-33-04-0300
Name	Mr. PALANI D.
Address	33, Othuvadai Street, New Samin, Pudukchery, 605015

AMI Status

	Total	Active	Disconnected
Meters	96	80	16
DT	1	1	0


[More...](#)

	Total	In Progress	Resolved	Service Order
Alarms	615	615	0	85

[More...](#)

Mangalam 110Kv - Town 220Kv - DAT-1 - M18921459

	Today 05-11-2012	The Week	The Month
Usage	10.5 kWh	29 kWh	45.7 kWh




MID : 1.5
MI Timestamp : 03-11-2012 07:30:00 PM

Power Status

Normal

- Normal
- Under Curtailment
- Outage
- Power Cut
- Tamper

Weather

Current Location PONDICHERRY	Temperature 29° C	 <p style="font-size: x-small;">Few Clouds</p>	Humidity : 56% Wind : WNW 9 mph Visibility : 10 mi
			UV Index : 9 - very high Pressure : 20.07 in Dew Point : 47 DF

Smart Meter Parameters

Meter Serial Number	Actual Energy	Apparent Energy	Voltage	Current	Load	Power Factor	Frequency	% Variation from Avg
	(kWh)	(kVAh)	(V)	(A)	(kW)		(Hz)	
1	103.76	103.97	223.5	0.514	0.116	1	50.03	-44.99
2	90.41	106.28	221.7	0.514	0.067	0.59	50.03	-43.77
3	131.75	149.65	218.1	1.906	0.314	0.75	50.03	-20.82
4	140.17	160.12	213.8	6.567	1.4	0.99	50.03	-15.28
5	145.17	177.77	212.7	1.5	0.069	0.21	49.88	-5.94
6	126.18	152.59	228.2	1.001	0.2	0.87	50.03	-19.26
7	197.14	206.39	217.1	0.74	0.151	0.94	49.96	9.20
8	173.16	180.9	215.5	1.236	0.203	0.76	50.03	-4.29
9	785.77	804.86	240	20	4.8	0.06	50.03	325.85
10	237.01	238.11	199.9	3.477	0.77	1	49.96	25.98

Details of Real Time Alarms of the Consumer Meters

Goto System Dashboard

Billing Summary

Total	Prepared	Approved	To Prepare	Error
94	74	69	24	1

Work Order

Total	Open	In Progress	Resolved
86	3	82	1

Alarms

Total	In Progress	Resolved	Service Order
616	616	0	86

AMI

Total	Active	Disconnect
96	80	16

Demand Response

Total	Prepared	Approved	Error
2	1	1	0

Outage

Total	Prepared	Approved	Error
2	1	1	0



The interface includes a map with a red pin and a pop-up window showing three smart meter images. The first two meters show a reading of 542.0 and a tamper type of 'LoadThroughEarth'. The third meter shows a reading of 32.3. Each meter image includes details such as 'CLASS 1', '240V, 50Hz', 'CAL', 'Type: SP1M 24', and 'Property of PED'. The pop-up window also displays customer policy, meter number, cumulative reading, tamper type, and time.

Customer policy	07-35-03-0258
Meter Number	18921481
cumulative	542.0
Tamper Type	LoadThroughEarth
Time	2012-10-14 11:14:00
click here to see more details	
Customer policy	07-35-03-0258
Meter Number	18921481
cumulative	542.0
Tamper Type	LoadThroughEarth
Time	2012-10-15 05:44:00
click here to see more details	

Active Real Time Control of Smart Meters

Components Statistics Management Help

Parameters Data reading Commands Electricity Alerts

Search  

- Puducherry
 - Pilot-Nadu Street DCU
 - 07-35-04-0305**
 - 07-35-04-0329
 - 07-35-04-0335
 - 07-35-04-0336
 - 07-35-04-0337
 - 07-35-04-0346A
 - 07-35-04-0347
 - 07-35-04-0347A
 - 07-35-04-00348AB
 - 07-35-04-0290A
 - 07-35-04-0290A1
 - 07-35-04-0290A2
 - 07-35-04-0290A3
 - 07-35-04-0290A4
 - 07-35-04-0290A6

Parameters Energy Control Load limitation Lcd Display


Relay - 07-35-04-0305

Read

- Get Relay Status Status Relay On Cover Open
- Get Relay Off Minutes

Write

- Set Relay Off Enable Relay On Cover Open
- Set Relay On Disable Relay On Cover Open
- Set Relay Off Minutes

 Command Information

Execute

