

# GUJARAT ELECTRICITY REGULATORY COMMISSION

## Ahmedabad

### Minutes of the 13<sup>th</sup> Meeting of the Co-Ordination Forum held on 18<sup>th</sup> July, 2013.

The 13<sup>th</sup> meeting of the Co-ordination Forum was held in the Conference room of the GERC Office, GIFT City, Gandhinagar on 18<sup>th</sup> July, 2013 at 11.00 A.M.

The following were present in the meeting,

1. Dr.P.K.Mishra, Chairman, GERC
2. Shri Pravinbhai Patel, Member (Technical), GERC
3. Dr.M.K.Iyer, Member (Finance), GERC

#### **Members / Representatives of Co-ordination Forum:**

1. Shri Raj Gopal, IAS, MD, GUVNL
2. Shri Gurdeep Singh, MD, GSECL
3. Shri S.K. Negi, MD, GETCO
4. Shri S.B. Khayaliya MD, MGVL
5. Shri Sandeep Kumar, IAS, MD, PGVL
6. Shri P. L. Panchal, Dy. Secretary, Energy and Petrochemical Dept.
7. Shri Manoj K. Vagh, Energy and Petrochemical Dept.
8. Shri P.N. Gandhi, Chief Electrical Inspector
9. Shri Jagrut Vyas, Executive Director, Torrent Power Limited, Surat.
10. Shri Sudhir Shah, General Manager (Commerce), GSEG
11. Shri S. L. Amrani, IAS, Director, GEDA
12. Shri S.B.Patil, Dy. Director, GEDA
13. Shri Ketan B. Parekh, Sr. Manager, GSEG
14. Shri K.P. Jangid, G.M.(Commerce),GUVNL
15. Shri Y. D. Brahmhatt, GUVNL
16. Mrs. C. R. Desai, GUVNL
17. Shri S. P. Trivedi, EE, GUVNL
18. Shri B.B. Mehta, CE, SLDC , Vadodara
19. Shri Mahesh K. Patel, Electrical Inspector, Ahmedabad
20. Shri D.C. Parmar, CE, UGVL
21. Shri S. M. Godhani, CE, MGVL
22. Shri I. T. Patel, CE, DGVCL
23. Shri R. K. Patel, SE, DGVCL
24. Shri T.S. Bhatt, MD, Essar Power, (Hazira)
25. Shri Abhay Potdar, Sr. VP (operation),CLP India Pvt. Ltd.,

26. Shri Jasmin J. Gandhi, Dy. CAO (R&C), PGVCL
27. Shri C. M. Bundela, TPL
28. Shri Vijay Tankshali, TPL
29. Shri Shailesh Desai, TPL
30. Shri Bhavesh Kundalia, Essar Power Gujarat Ltd.,
31. Shri Mehul Rupera, Sr. Manager, MUPL
32. Shri K. R. Sudhakar, Chief Mechanical Engineer, KPT
33. Shri P.S. Pathan, SE (E), KPT
34. Mr. Rajeev Bhabhra, Aspen Infrastructure Limited.

**Officers of the Commission:**

1. Shri D.R.Parmar, Joint Director,
2. Shri S.R.Pandey, Legal Advisor,
3. Shri M.N.Khalayani, Deputy Director (A & A),
4. Shri K. I. Parikh, Under Secretary,
5. Ku. C. N. Bhatt, CAO,
6. Shri S. T. Anada, Deputy Director,
7. Shri Apurva Adhyaru, Deputy Director,
8. Shri Gopal Dayalani, Deputy Director,

Shri M. N. Khalyani, Deputy Director (A & A) welcomed all the members of the State Co-ordination Forum in the new office of the Commission and in the joint meeting.

The meeting was presided over by Dr. P.K.Mishra, Chairman, GERC. Chairman welcomed all the members to the newly owned office premise at GIFT City in place of the rented premise at Ahmedabad. The Chairman informed the members about the energy efficiency concept implemented while designing the office interiors by the Architect. He stated that the interior of the office is designed in such a way that there is maximum use of natural sun light in the entire office. He further informed that ILFS has provided State of the Art facilities, and modern era office comparable to the best in the Country. Thereafter, the discussion took place on the following agenda.

**Agenda Item No. 1: Approval of the minutes of the 12<sup>th</sup> Meeting of the Co-ordination Forum held on 24<sup>th</sup> April 2013**

Minutes of the last meeting as circulated to the members was confirmed as no comments were received.

**Agenda Item No. 2: Action Taken Report on the minutes of the 12<sup>th</sup> Meeting of the Co-ordination Forum.**

The Commission laid emphasis on timely submission of action taken report on the proposed actions in the minutes of meeting.

Item No. 2.2 (6) : CEI representative stated that the laws related to laying cables by cable operators and internet service providers, CEA safety regulations, relevant Indian Standards and requirement of co-ordination between involved authorities are being studied. The Commission instructed CEI to complete the entire process for framing the safety rules within one month. The Commission reviewed the progress of removal of cables hanging on electricity poles. The Commission appreciated the work carried out by UGVCL and TPL and instructed PGVCL, MGVCL and DGVCL to expedite the work. They may, if required, take help of District Administration also.

(Action: CEI , TPL and DISCOMs)

Item No.2.2 (9) : PGVCL explained the steps taken to reduce T & D losses and informed the Forum that as on May, 2013 the distribution loss recorded as 22.50 % against 23.24% loss in the month of April, 2013. The Commission advised to take steps to achieve the target at the end of FY 2013-14.

(Action: PGVCL)

Item No. 7: GUVNL submitted that suggestions for framing Draft Guidelines for Connectivity Standards for Distributed Generation Sources for voltage level below 33 kV have been submitted to CEI. MD, GUVNL explained some of the suggestions to the Commission. CEI stated that they have received the suggestion from GUVNL as well as TPL and are studying them. Islanding facility available in the inverter placed with solar plants was discussed. It was felt that over and above this facility, a second level protection is necessary to safe guard the persons working in the distribution network. The Commission advised CEI to consult inverter manufacturers about islanding facilities they are offering in the inverter and suggest improvement in it. The Commission emphasized that while encouraging roof top solar generation, safety of the humanbeing must be given utmost importance. The Commission instructed CEI to come out with the Guidelines for Connectivity within one month.

(Action: CEI)

Item No. 8: CEI stated that recently the State Government has notified a regulation regarding measures related to safety and issuance of license to electrical contractors electricity supply. He explained that under these regulations there are provisions for establishment of a licensing board, procedures to issue licenses to contractors, supervisors and wiremen, procedure related to conduct of examination etc. He emphasized that licensed contractors are responsible persons and issue test report only after proper installation and testing. He stated that it is also the responsibility of distribution licensees to check the earthing and other installations at the consumers' premises. MD, GUVNL emphasized that the test report to be submitted by licensed contractor should include details such as no.of electrical gadgets, type of electrical gadgets, quality of material used, Megger value of earthing etc. The Commission advised GUVNL to hold a meeting with DISCOMs, TPL and CEI to frame the test report format and formulate a system for enforcement of the same.

(Action: GUVNL, TPL, DISCOMs and CEI)

Item No. 9 (B) : The Commission directed DISCOMs and TPL to give a detailed report of the review done by their MDs on compliance of CGRF and Ombudsman's orders showing numbers of order issued by them, numbers of order implemented and reason for non-implementation of orders instead of giving general reply.

(Action: DISCOMs, TPL)

Item No. 10: The Commission looked at the progress of installation of meter on distribution transformers of all DISCOMs. Reiterating the need of DT meters for the purpose of energy audit, the Commission directed DISCOMs to install meter on HVDS transformers also even if there was only one metered consumer connected to that transformer.

(Action: DISCOMs)

### **Agenda Item No. 3: Petitions for Review of Business Plan**

During the meeting with the members of State Coordination Forum, the Commission informed the utilities to file petitions for Review of Business Plan and review of trajectory, if they desire so, latest by 30<sup>th</sup> August, 2013 as per provisions of GERC (Multi Year Tariff) Regulations, 2011.

#### **Agenda Item No. 4 : Demand Side Management**

During the meeting, Joint Director, GERC explained in brief the provisions of GERC (Demand Side Management) Regulations, 2012 and informed that DISCOMs and TPL have framed their DSM cells to carry out various activities stipulated under the regulations. He further informed that DISCOMs have appointed TERI as a consultant for identification of technical potential and preparation of the DSM plan. DISCOMs informed that all the required data has been provided to TERI and discussion with Stake Holders like industrialists, consumers have been started by TERI. The Commission advised that DSM activities should be taken up by utilities in its true spirit. The Commission also suggested to incorporate the plan of installing solar pumps for irrigation purpose as one of the DSM activity.

(Action: DISCOMs and TPL)

#### **Agenda Item No. 5: Fuel Audit of GSECL and TPL Stations**

Final suggestions from GSECL and TPL are received and submitted to M/s Pricewaterhouse Coopers Pvt. Ltd., who were assigned the work of Fuel audit. PwC have submitted its report. The Commission is studying the report and the outcome will be circulated soon.

#### **Agenda Item No. 6: Comprehensive Third-Party Audit of Annual Accounts of State Owned DISCOMs and TPL.**

The consultant has already completed the audit work and the report is received. The Commission is analyzing the report and will be circulated in due course.

#### **Agenda Item No. 7: Standard of Performance (SoP) and Monitoring of performance of CGRFs**

During the meeting, the Commission observed that number of accidents in DISCOMs and TPL during Q 4 of FY 2012-13 have substantially increased compared to that of Q 4 of FY 2011-12. The Commission expressed its disappointment on the maintenance activities. The Commission advised them to take up the maintenance activities vigorously. The Commission also observed that the number of faulty meters is also in the

increasing trend in case of PGVCL and DGVCL. The Commission advised Chairman, PGVCL to look into the matter and give a clear road map for clearing the backlog.

**Agenda Item No. 8: Discussion Paper on determination of tariff for procurement of power by distribution licensees and others from biomass based power projects and bagasse based co-generation projects for the state of Gujarat.**

The Commission informed the members of Forum that a Discussion Paper for Determination of Tariff for procurement of energy from Biomass and Bagasse based Generation Projects has been floated and all the Stake Holders including utilities may submit their suggestion/objections for the same within the stipulated time.

**Agenda Item No. 9: Renewable Purchase Obligation**

The Commission discussed the status of RPO obligation by the utilities, GUVNL, TPL and others for the year FY 2012-13. The utilities explained that the shortfall was on account of supply constraint under “Other” and “Wind” sub-categories and many developers have not come forward for signing the PPAs under Preferential Tariff.

**Agenda Item No. 10: Status of Transmission Projects.**

The Managing Director, GETCO briefed the Commission on the development of transmission network, performance of transmission network, planning and achievement for the FY 2012-13, planning and progress of FY 2013-14, steps taken by GETCO towards Smart Grid and critical issues being faced by utility. The CE, SLDC explained the problems being faced while operating the State Grid due to frequent variations in wind generation on account of vagaries of weather.

**Agenda Item No. 11: Status of RPO – Presentation by GEDA.**

Shri S.B. Patil, GEDA gave the current status of renewable energy generation by Biomass, Wind and Solar projects. He has also briefed about RPO compliance status of different licensees for the year 2012-13.

**Agenda Item No. 12: Presentation on Power sector Scenario by GUVNL.**

Managing Director, GUVNL made a detailed presentation on the power scenario in the State. He pointed out that as on 1<sup>st</sup> July 2013, the total installed capacity was 18270 MW

with addition of about 2964 MW in the year of 2012-13. He indicated that generation capacity of about 2086 MW would be commissioned in the current year 2013-14. He further briefed about capacity addition in the next four years, the current status of such projects, load growth, renewable capacity addition, details of Open Access consumers such as numbers of Open Access consumers as on March-2012 and March-2013 as well as power purchased under open access by such consumers in FY 2011-12 and FY 2012-13.

The meeting was concluded with a Vote of Thanks to the chair.

-Sd-

**SECRETARY  
GERC**

# **13<sup>th</sup> Meeting of The Co-ordination Forum**

## **Overview of Transmission Projects**

**Gujarat Energy Transmission Corporation Limited**

[ An ISO 9000 : 2008 Company ]

**18<sup>th</sup> July, 2013**

# Presentation Outline



1 Development of Transmission Network

2 Performance of Transmission Network

3 Planning & Achievement of FY 2012-13

4 Planning & Progress of FY 2013-14

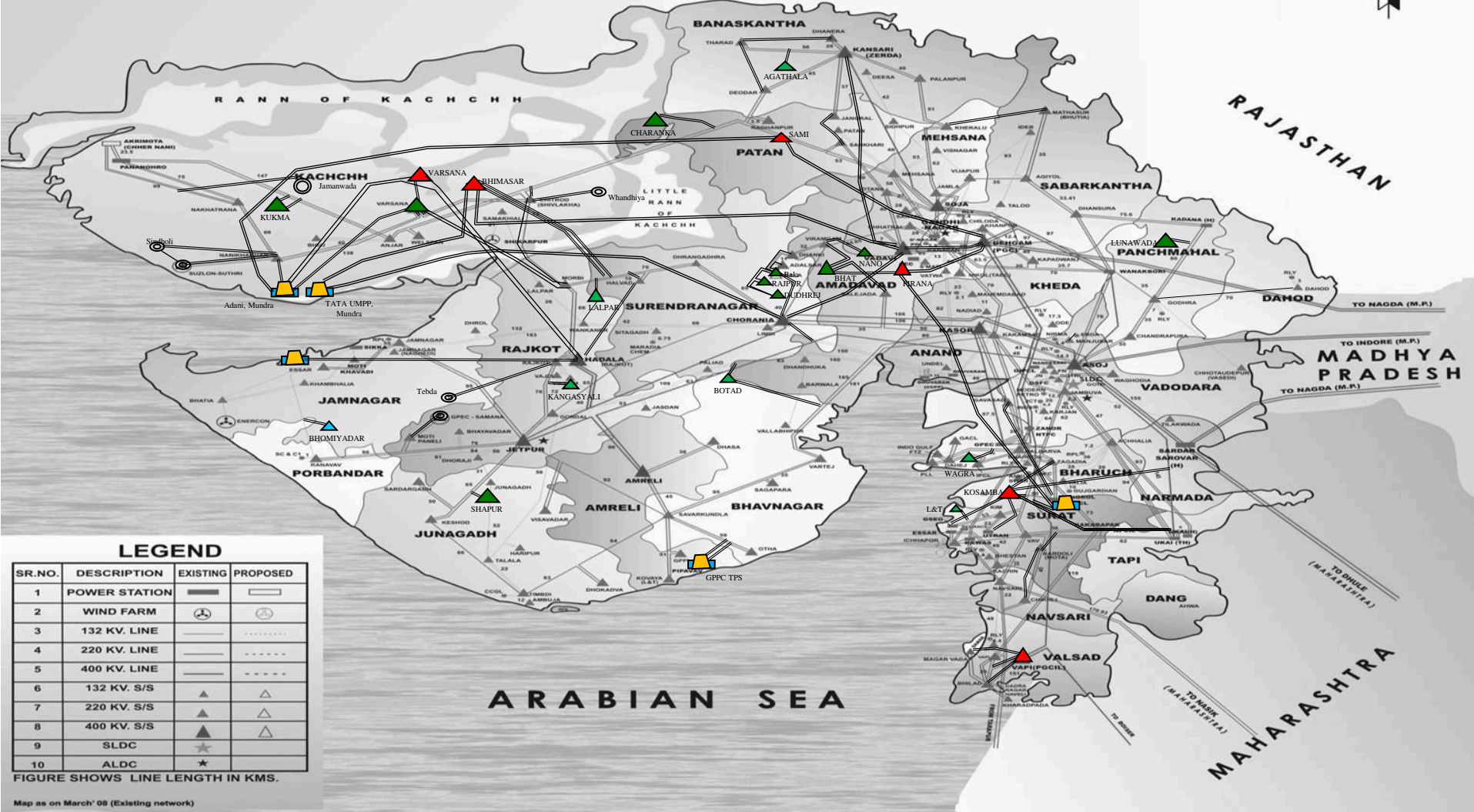
5 Step towards Smart Grid

6 Critical Organization Issues

1

# Development of Transmission Network

# POWER MAP OF GUJARAT



LEGEND			
SR.NO.	DESCRIPTION	EXISTING	PROPOSED
1	POWER STATION		
2	WIND FARM		
3	132 KV. LINE		
4	220 KV. LINE		
5	400 KV. LINE		
6	132 KV. S/S		
7	220 KV. S/S		
8	400 KV. S/S		
9	SLDC		
10	ALDC		

FIGURE SHOWS LINE LENGTH IN KMS.

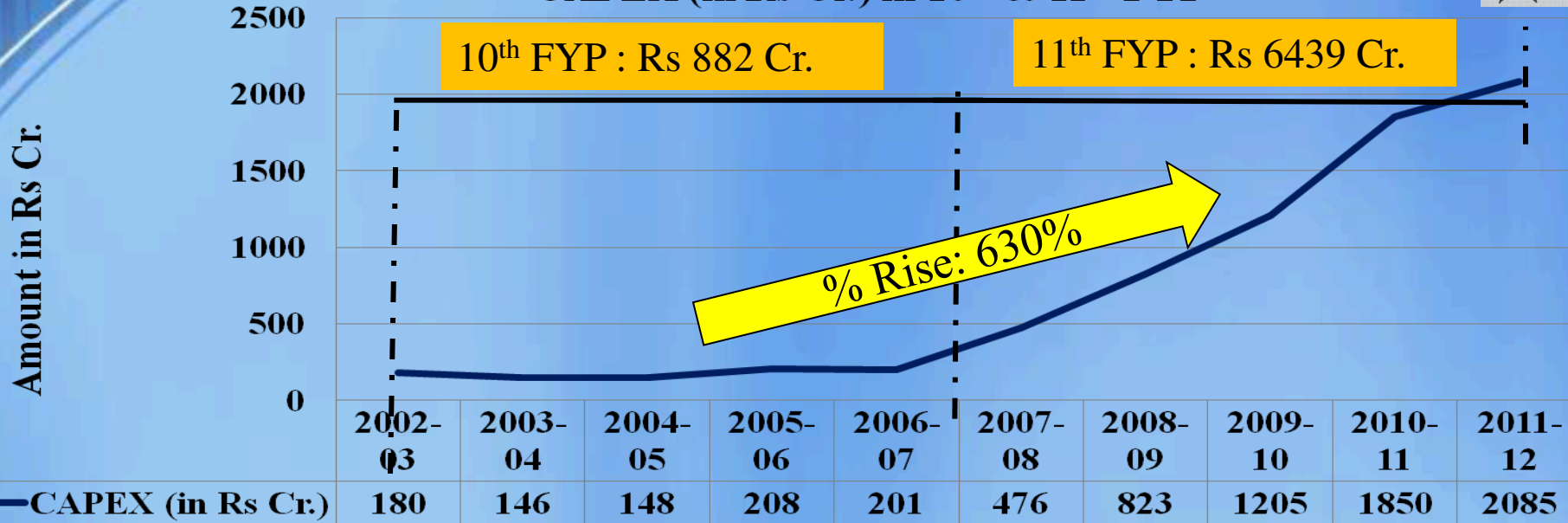
Map as on March '08 (Existing network)

Particulars	At the end of 10 <sup>th</sup> FYP	Addition in 11 <sup>th</sup> FYP	Added in 2012-13	Total
Substation	878	392	80	1350
Tr. Lines	35160	9785	3027	47972

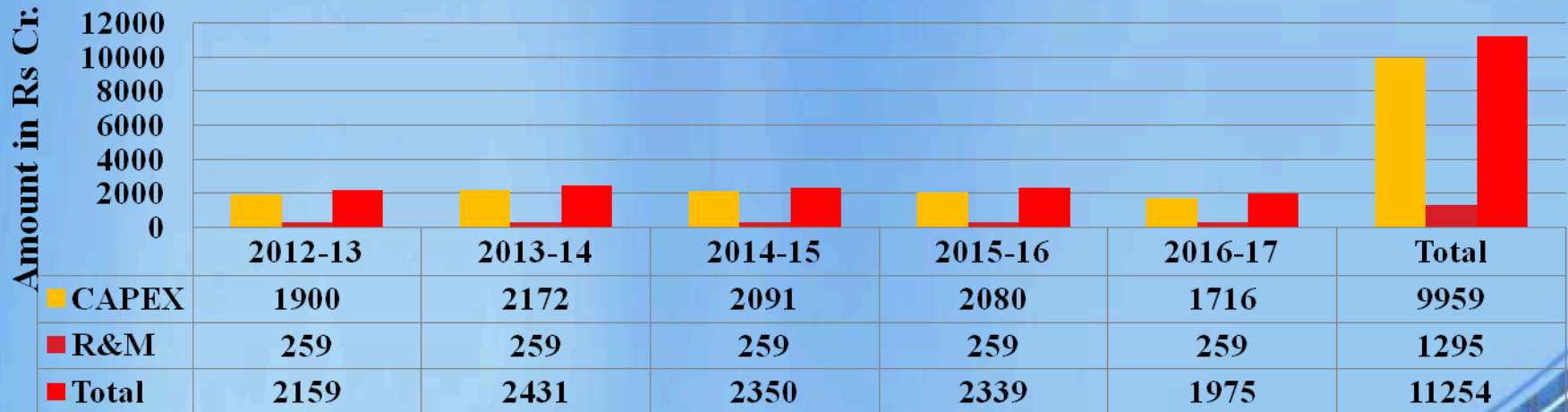
# Financial Progress



## CAPEX (in Rs Cr.) in 10<sup>th</sup> & 11<sup>th</sup> FYP



## 12th FYP Investment Plan in Rs Cr.



- For FY 2012-13, Expected Capex = + Rs 2000 Crs

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## Performance of Transmission System

# Performance – Transmission Loss (%)

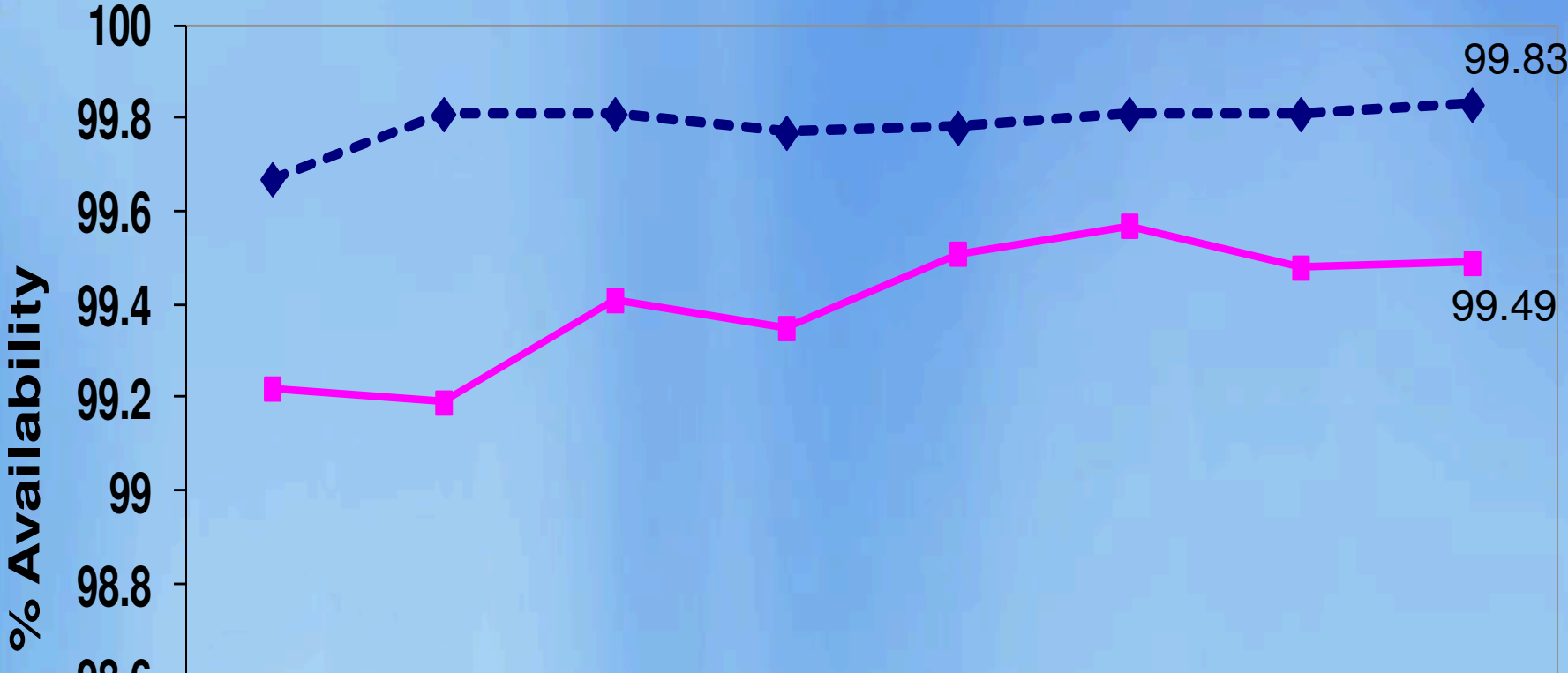


Target : Transmission Losses Target for FY 2012-13: **4.15 %**



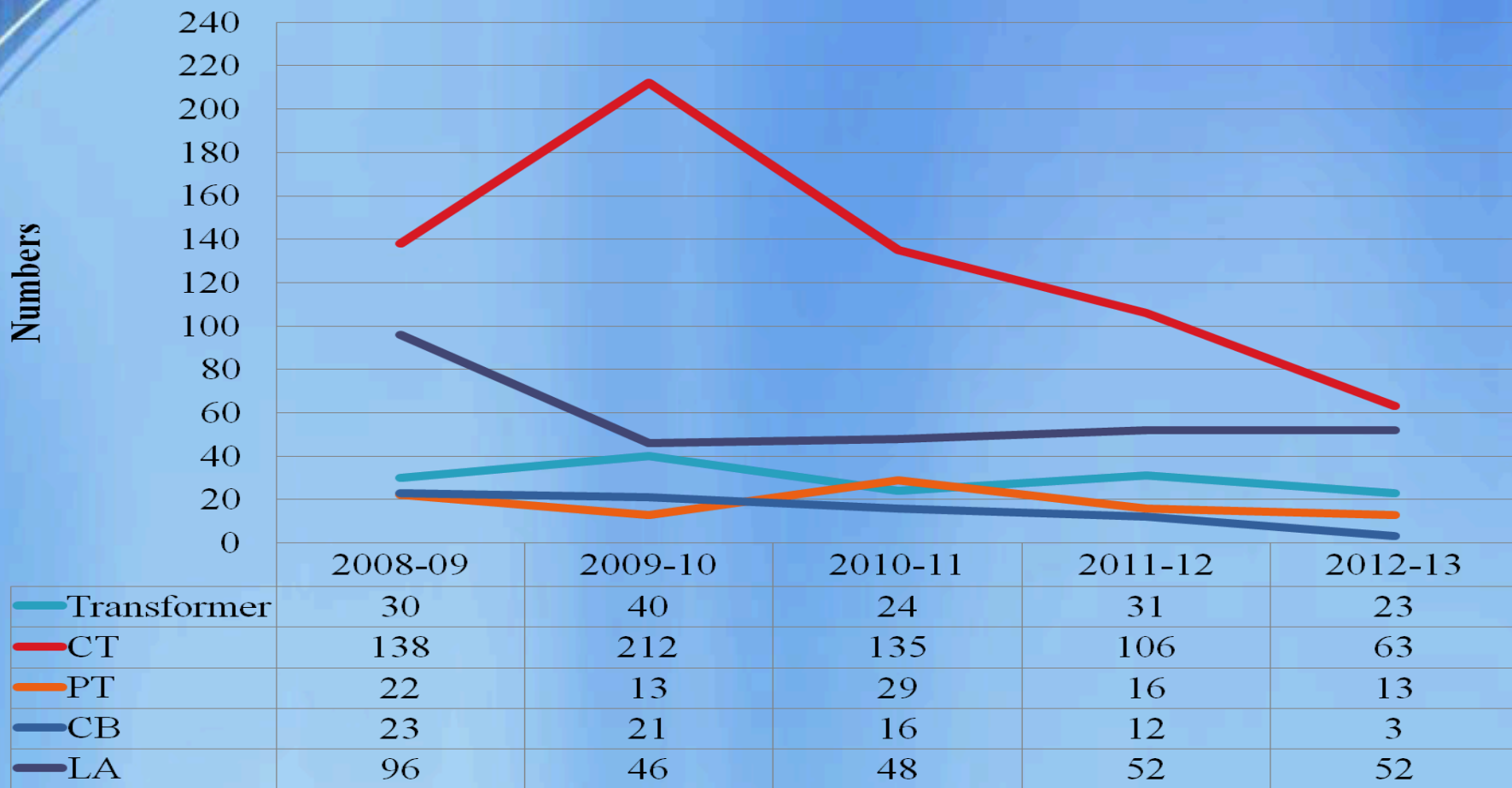
# Performance – System\_Availability

Transmission System Availability for FY 2012-13 : **99.50%**



	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
S/s	99.67	99.81	99.81	99.77	99.78	99.81	99.81	99.83
LINE	99.22	99.19	99.41	99.35	99.51	99.57	99.48	99.49

# Performance – Equipment Failure (Nos)



# R&M Expenditure for 11<sup>th</sup> FYP

Year	2007-08	2008-09	2009-10	2010-11	2011-12	Total
R&M (Rs in Lacs)	15824	13918	17515	16343	27214	90817

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## Planning & Achievement of FY 2012-13

# Substation & Transmission Line Achievement (FY 2012-13)



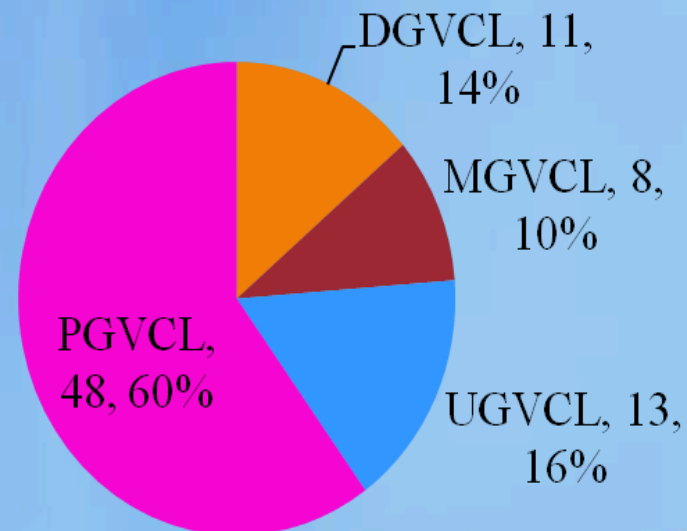
## Substations

Sr. No.	Voltage Class	Planned	Achieved
1	400 KV	0	0
2	220 KV	4	4
3	132 KV	1	1
4	66 KV	75	75
	<b>Total</b>	<b>80</b>	<b>80</b>

## Transmission Lines (CKM)

Sr. No.	Voltage Class	Planned	Achieved
1	400 KV	709	414
2	220 KV	1280	922
3	132 KV	29	131
4	66 KV	924	1560
	<b>Total</b>	<b>2942</b>	<b>3027</b>

## DISCOM-wise S/S Charged



# Completion of Major EHV Line – FY 2012-13



## A. Evacuation Lines

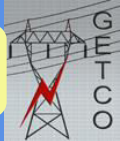
Sr. No.	Name of Tr. Line	Length in Ckm
1	400KV D/C Ukai - Kosamba line with ACSR Twin Moose Conductor	144
2	220KV Savarkundla - Otha LILO at GPPC line No. 2 with ACSR Zebra conductor	83

## B. System Strengthening Lines

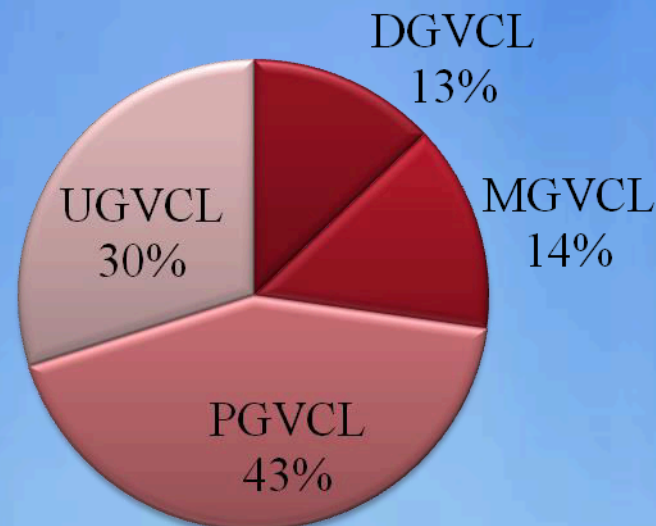
Sr. No.	Name of Tr. Line	Length in Ckm
1	LILO of 220kv Halvad - Morbi line No. 1 at 400kv Bhachau (PGCIL) S/S with ACSR Zebra conductor	217
2	LILO of 220kv Halvad - Morbi line No. 2 at 400kv Bhachau (PGCIL) S/S with ACSR Zebra conductor	217
3	220KV Hadala - Halvad line with ACSR Zebra conductor	168
4	220KV Kosamba- Mobha line with ACSR Zebra conductor	178
5	220KV D/C Tharad - Thavar line with ACSR Zebra conductor	97
6	220KV D/C Tharad - Deodar line with ACSR Zebra conductor	78
7	220KV LILO at Vondh from Varsana - Morbi line with ACSR Zebra conductor	2.32
8	220KV D/C Tharad - Kintech line with AL-59 conductor	173

## 4 Planning & Progress of 2013-14

# Substation & Transmission Line FY 2013-14

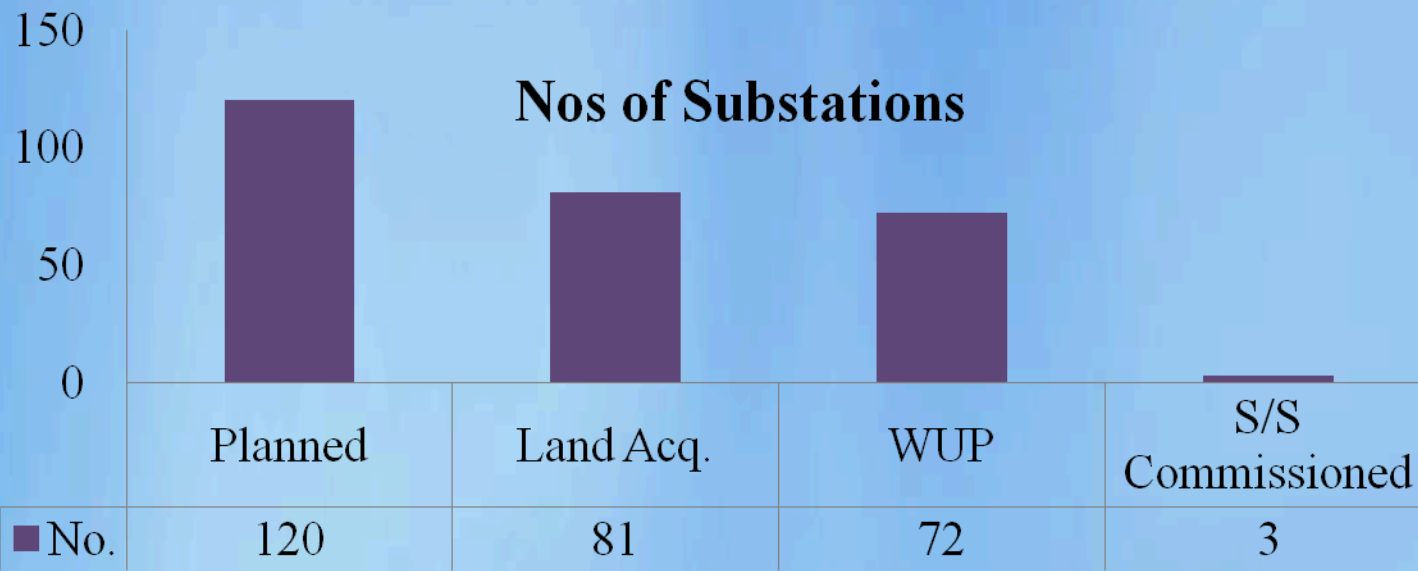


Sr. No.	Voltage Class	Substation (Nos)	Tr. Lines (Ckm)
1	400 KV	1	762
2	220 KV	8	888
3	132 KV	1	10
4	66 KV	110	1204
	Total	120	2864



**DISCOM wise S/S Planned**

## Substations : FY 2013-14 (Status as on 14-07-2013)



Substation status as on 14-7-13

## Ongoing EHV Projects

# Status of Transmission Lines for Power Evacuation



Sr. No.	Name of Generating Station & associated Transmission lines	Length in Ckm.	PRESENT STATUS (As on 14.07.13)	Revised Target	Remarks
			% Completion		
<b>1</b>	<b>Ukai Extension (500MW) C.O.D. - Oct'12</b>				
i	400KV D/C Ukai – Kosamba line	136.20	100%	<b>Done (31.03.13)</b> <b>Done (30.03.13)</b>	
ii	400KV D/C Kosamba–Chorania line ( <b>Package-I</b> )	222.40	85%	Dec-13	W I P
	400KV D/C Kosamba–Chorania line ( <b>Package-II</b> )	234.60	84%	Dec-13	W I P
	<b>Total</b>	<b>457.00</b>	<b>84%</b>		
iii	LILO to Kosamba from 400kV Asoj-Ukai line	62.5	100%	<b>Done (31.12.2011)</b>	
iv	220KV D/C Kosamba - Zagadia line	48.40	100%	<b>Done (09.07.2011)</b>	

# Status of Transmission Lines for Power Evacuation



Sr. No.	Name of Generating Station & associated Transmission lines	Length in Ckm.	PRESENT STATUS (As on 14.07.13)	Revised Target	Remarks
			% Completion		
2	<b>Dhuvaran CCPP-III (360 MW) C.O.D. - Sep'13</b>				
i	LILO of 220KV Kasor – Botad S/C at Dhuvaran CCPP-III	82	17%	Jan-14	WIP
ii	LILO of 220KV Karamsad – Vartej S/C at Dhuvaran CCPP-III	78	59%	Sep-13	

\* Back charging through 132/220 KV transformer by 30-4-13 for start up power

# Status of Transmission Lines for Power Evacuation



Sr. No.	Name of Generating Station & associated Transmission lines	Length in Ckm.	Present Status (As on 14.07.13)	Revised Target	Remarks
			% Completion		
<b>(B) Transmission Schemes associated with IPP</b>					
<b>3</b>	<b>Adani Power, Mundra (Bid-02) (2011-12) (1000 MW) Feb'12</b>				
i	400kV D/C Mundra-Zerda Line No. 1 (Package-I)	160	40%	Mar-14	W I P
	400kV D/C Mundra-Zerda Line No. 1 (Package-II)	190	22%	Mar-14	W I P
	400kV D/C Mundra-Zerda Line No. 1 (Package-III)	314	19%	Mar-14	W I P
	<b>Total</b>	<b>664</b>	<b>26%</b>		
ii	400kV D/C Mundra-Zerda Line No. 2	662	80%	Mar-14	W I P

\* Stuck-up due to forest clearance - Not in our control.

# Status of Transmission Lines for Power Evacuation



Sr. No.	Name of Generating Station & associated Transmission lines	Length in Ckm	PRESENT STATUS (As on 14.07.13)	Revised Target	Remarks
			% Completion		
4	<b>GSPC Pipavav Power Co. Ltd. C.O.D. - Apr'13 (1x350 MW)</b>				
i	220KV D/C GPPC – Dhokadva line	100	60%	Jun-13	W I P (Severe RoW)
ii	LILO to GPPCL from 220KV Savarkundla – Otha Ckt. No.1*	90.5	100%		<b>Done (17.03.2012)</b>
iii	LILO to GPPCL from 220KV Savarkundla – Otha Ckt. No.2*	82.6	100%		<b>Done (21.07.2012)</b>
iii	220KV D/C Otha – Sagapara line	95.6	100%		<b>Done (05.06.13)</b>

\* Plant Not Operative.

# Status of Transmission Lines for Power Evacuation



Sr. No.	Name of Generating Station & associated Transmission lines	Length in Ckm.	PRESENT STATUS (As on 14.07.13)	Revised Target	Remarks
			% Completion		
<b>5</b>	<b>Bhavnagar Energy Co. Ltd. (BECL), (2x300=600 MW)</b>				
i	220kV D/C BECL - Botad line	188.52	14%	Mar-14	WIP
ii	220kV D/C BECL - Sagapara line	82.40	57%	Dec-13	WIP
iii	LILO of 220kV S/C Savarkundla-Vartej at BECL	56.20	100%	<b>Done (06.06.2013)</b>	

**\* Plant likely by March, 2014.**

# Status of Transmission Lines for Power Evacuation



Sr. No.	Name of Generating Station & associated Transmission lines	Length in Ckm.	PRESENT STATUS (As on 14.07.13)	Revised Target	Remarks
			% Completion		
6	Sikka Unit 3 & 4 (2 x 250= 500 MW) C.O.D. - Mar'14				
i	220KV D/C Sikka – Moti Paneli line*	156.00	16%	Jan-14	WIP
iii	LILO to Sikka from 220kV Jamnagar – Jetpur ckt. No.2	120.00	11%	Feb-14	WIP

\* Plant likely by March, 2014.

# Ongoing System Strengthening Lines



Sr. No.	Name of Tr. Lines	Length (Ckm)	Target
1	400KV Mundra - Hadala LILO to Halvad	89	Dec-13
2	400KV D/C Amreli - Kasor line	471	Mar-14
3	220kV D/C Nakhatrana - Varsana line (Commercialized)	214	07.05.13
4	220KV D/C Halvad - Sadla line	76	Dec-13
5	220KV LILO to Sadla from Chorania - Gondal line	58	Sep-13
6	220KV D/C Bhatiya - Kalawad line	238	Mar-14
7	220KV D/C Kalawad - Kangasiyali line	112	Mar-14
8	LILO of one circuit of 220KV D/C Wanakbori – Asoj line at Vyankatpura (Jarod) S/S	28	Mar-14
9	Termination of one D/C line of 220KV 2xD/C Achhaliya-Jambuva line at Vyankatpura (Jarod) S/S	68	Mar-14
10	220kV D/C Charanka - Jangral Line (AP-13/0 To Jangral)	191	Mar-14
11	220kV LILO at Suva from Kosamba - Mobha Line	112	Mar-14
12	220kV LILO at Popada from Navsari - Vav Line	17	Nov-13
13	220KV D/C Visavadar - Timbdi line	185	Aug-14
14	220KV D/C Varsana - Jamanwada line	350	Dec-13

## Ongoing Reactor Bays installation to control high voltage

Sr. No.	Name of Substation	Rating (MVAR)	Target
1	400 KV Ranchodpura	125	<b>Done (8-7-13)</b>
2	400 KV Varsana	125	July-13
3	400 KV Rajkot	125	July-13
4	400 KV Amreli	125	<b>Done (12-7-13)</b>
5	400 KV Zerda	125	Aug-13
6	400 KV Choraniya	125	July-13
7	400 KV Jetpur	63	<b>Done (11-7-13)</b>

- 326 MVAR Reactors are added in FY 2012-13.
- 233 Nos. (630 MVAR) of 11KV Capacitor Banks is installed in 1<sup>st</sup> phase and in 2<sup>nd</sup> phase, 72 Nos. (180 MVAR) of 11KV capacitor Banks is under progress - Target Aug 2013.

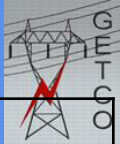
## Year-wise ARR

	2010-11	2011-12	2012-13	2013-14
ARR (in Rs Cr.)	1357	1626	1880	2178
MW Allocation	13656	16006	18510	20076
Rs/MW/day	2720	2775	2780	2970

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## Step towards Smart Grid

# Adoption of Smart Technology



Smart Grid technologies adopted	Status
Substation Automation System - Human interface at limited points, Manpower optimization	5 Nos. of substations completed
Optical CT and merging units – A step towards Digital Substation for better reliability and availability	1) Two pilot projects completed. 2) In process for 400 KV substation
Digital Substation – Pilot Project of 1 Bay	Work Awarded
OPGW – The communication highway (5270 Km) & Replacement of Conventional PLCC to FOTE	110 km of OPGW laid and rest work under progress
GIS and Hybrid switchgear - High reliability and availability, Maintenance free and economical on life cycle cost basis	66 KV GIS adopted and 220 KV Hybrid at Dahej and Sartanpar (Morbi) are under execution
Geographical Information System (GIS) – Better network planning and asset management	Project completed for 400 KV and 220 KV Lines
Reactive power compensation – Quality power	4728 MVAR installed
PMU and WAMS – Pre warning and control system for entire grid (Deployment Under Process)	Sponsored R&D project with IIT for Development of following analytics: 1. Online Power System Oscillation mode identification 2. Hybrid State Estimator 3. Dynamic Security Assessment with voltage stability
New Energy Accounting Software for ABT by Infosys	Job Awarded

6

## Critical Organization Issues

- Capex for the sub-stations and associated lines met through funding from banks
  - meet pre-requirements and documentation
    - ❑ clear NOC of concern collectorate is required to be submitted
  - GETCO unable to fulfill the conditions of financial institutions timely
    - ❑ liable to pay extra penal interest @ 1 %.
    - ❑ Recently United Bank of India issued penal interest notice
    - ❑ State Bank of India (erstwhile State Bank of Saurashtra) audit authority has taken objection for this lapse and it is apprehended that the Bank will be constrained to recover penal interest in view of their audit objection
- **Remedial Measure**
  - Directives should be issued to all collector offices for the speedy clearance of pending NoCs.
  - Since GETCO is 100% GoG holding company in a public utility sector, treating it as in special category, GETCO should be exempted from the NoC clause and freedom should be given for the mortgage of land.

- Every year GoG is fixing a target of more than 100 nos of substations.
- Timely acquisition of land for the execution of these sub-stations highly essential
  - Require minimum 9 months for 66 KV substation
  - 2-3 years for 132 KV and above.
- For FY 2013-14 Field offices have identified & submitted the proposals for land transfer for 195 Nos. sub-stations and following up vigorously for early transfer of lands.
- But till date, GETCO received possession of only 80 Nos. of lands. Major challenges faced during Land Acquisition process are:
  - Joint Measurement Survey (JMS) of Land by DILR is done after the advance possession of land
  - Lack of updated records by Revenue Authority
  - New resolution on Gauchar Land which says Gauchar land only be allotted if there is enough gauchar land for cattle and also a positive resolution is required by Gram Panchayat
  - Lengthy procedure for the acquisition of private land.
- **Remedial Measure**
  - Directive should be issued from Revenue Department to all collector office for giving priority to GETCO for land acquisition process.

- Today, major bottleneck for the timely completion of transmission projects is Right of Way issue.
- To overcome this, we have already revised the compensation given to the land owners from Rs 1 lack to Rs 5 lacks and further to Rs 9 lacks. But land owners are yet not satisfied.
- Our major transmission lines are delayed due to RoW issue by more than one year.
- **Remedial Measure**
  - State level committee consisting of Revenue Department, Energy Department and Agriculture Department is to be appointed after obtaining nominations to review the compensation mechanism because as per act compensation only covers the livelihood compensation without considering the depletion of valuation of land.

- In 11<sup>th</sup> FYP transmission lines were delayed due to the late approval from forest authorities.
- This not only delays in the project but also adds into overall cost.
- Major Challenges faced during Forest Clearance Process are:
  - Lengthy process of query and compliance.
  - Quite exorbitant rates for the Compensatory Afforestation Land charged.
  - No accountability of Forest Authorities
  - Lack of updated knowledge of most of the DCFs and very rigid nature by most of the staff of forest department.
  - Misinterpretation of circular from forest department.
- **Remedial Measure**
  - Special provision for Central Government Undertaking Project is “diversion of forest land may be permitted against compensatory afforestation on double the degraded land in the first instance”.  
As Power is a basic need for survival, similar provision should be applied to State Government undertaking Power Utilities.
  - Nominal rates depending upon the type and usage land should be charged for the Compensatory Afforestation instead of exorbitant rates.

## 5

## Safety (Cross Boundary Protection)

- Safety is a prime concern for our sector
- cross boundary protection is one of the vital preventive measures to insure
  - safety which comes under the purview of DISCOMs.
  - But with constant reminder, the work under cross boundary protection is not up to satisfactory. Since 2008, only 50% work is completed
- **Remedial Measure**
  - Special notice from Energy Department should be given to all DISCOMs for speedy completion of cross boundary protection.

## 6

## Interest charges on the cost of land

- As per Revenue Department's circular dated 07.01.04,
  - Interest charges is payable only when the payment of land cost is not made within 3 months from the demand notice date.
  - Request has been made to Energy department but replied interest @ 8% chargeable from the date of advance possession till the date of actual payment.
  - The catch here while advance possession given, valuation takes abnormal time for which GETCO cannot be held responsible and liable to pay interest
- **Remedial Measures**
  - Date of demand note should be considered for the charges on interest rate as per Revenue Department circular stated above.

- Transmission loss is very dynamic in nature depends upon
  - lots of controllable and uncontrollable factors.
  - Earlier in 2007, the power was flowing from Southern and Central Gujarat to Northern and Western Gujarat through long transmission lines.
  - But today with the addition of generation from located in Kutch and backing down of Gas based plants of Southern Gujarat
    - ❑ Power is flowing from Western Gujarat to Northern and Southern Gujarat.
- Thus, variation in transmission loss not entirely in control of GETCO as Location of Generating Stations and future load growth the governing factors.
- Other major factor
  - location of RE integration. Majority of RE generation plants
  - Abnormal increase in the agricultural load which is causing high losses in the month of August, September, October and November;
  - Merit order dispatch
  - Last 5 years losses:

Year	2008-09	2009-10	2010-11	2011-12	2012-13
Transmission Loss (%)	4.17	4.30	3.85	3.94	3.89

- **Remedial Measure**
  - It might be possible looking to the current scenario, transmission loss may increase and following measure will help in curtailing losses:
  - Generation from Pipavav plant though gas pricing is an issue.
  - Expedite BECL plant at dist. Bhavnagar
  - Generation from Southern Gujarat plants, namely Utran I & II, GSEG I & II, Essar, CLPI, Kwas, Zanor, Suzen which is presently back down

- GETCO working in close coordination with GIDC to
  - support the industrial infrastructure development and land is allotted by GIDC in specific pockets.
  - Cost of the land demanded by GIDC is on very high
- **Remedial Measure**
  - Being a public utility, GIDC may give special consideration to us and may allot land for Substation free of cost or at nominal cost under special category.

9

## Clearance of corridors for EHV consumers located in GIDC

- GIDC grants corridor for laying the transmission network within GIDC.
- But it is observed that work of laying of line and underground cable at various locations within GIDC is not progressing as the corridor has not been cleared by GIDC.
- These are our important EHV consumer which when completed will fetch handsome revenue to the Distribution utility.
- **Remedial Measure**
  - Dedicated corridor for Power Transmission Line should be provided beforehand by GIDC at planning stage of industrial area/zone.


10

## Grid Management Constraints

- **Backing down of plants:** Reduction in generation from Gas Based generating stations located in south Gujarat area due to high cost of gas and grid operation on merit, following elements are getting critically loaded:
  - 400 KV S/C Sugan – Vapi (PG) line (650 MW),
  - 220 KV D/C Ukai – Mota line (225 MW each),
  - 220 KV D/C Jhanor – Haldarva line (200 MW each),
  - 220 KV D/C KAPP – Vapi line (170 MW each),
  - 220 KV D/C Kawas – Ichchhapore line (220 MW each),
  - 220 KV S/C Navsari – Bhilad & Chikhli – Vapi lines,



- During high wind injection into the GETCO grid especially with off-peak demand scenario, following elements \ getting critically loaded in Saurashtra and Kutch:
  - 132 KV Bhatia – Sikka line (80-90 MW)
  - 132 KV S/C Khambhalia – Jamnagar line (75 MW)
  - 220 KV S/C Shivilakha – Sankhari line (175 MW)
  - 220 KV S/C Shivilakha – Charanka – Deodar line (200 MW)
  - 220/400 KV, 2 x 315 MVA ICTs at APL Mundra (190-200 MW each)
  - 400 KV D/C APL Mundra – Dehgam line (510 MW each with 1550 MW at APL Mundra)
- During low wind injection into the GETCO grid, following elements are getting critically loaded:
  - 400/220 KV, 3 x 315 MVA ICTs at Jetpur (250 MW each)
  - 400/220 KV, 2 x 315 MVA ICTs at Amreli & Hadala (220 MW each)
  - 220 KV D/C Amreli – Savarkundla line (170-200 MW each)
  - 220 KV D/C Hadala – Nyara line (200-240 MW each)
- These constraints are prohibiting us to give short term open access.
- Frequent backing down of conventional plant to a technical minimum during variable and uncertain RE generation has become quite common and at times load dispatcher is constrain to depend on gas plants which have fast ramping up rate.



Thank You

# Status of RPO Compliance 2012-13

18-7-2013



**GEDA**

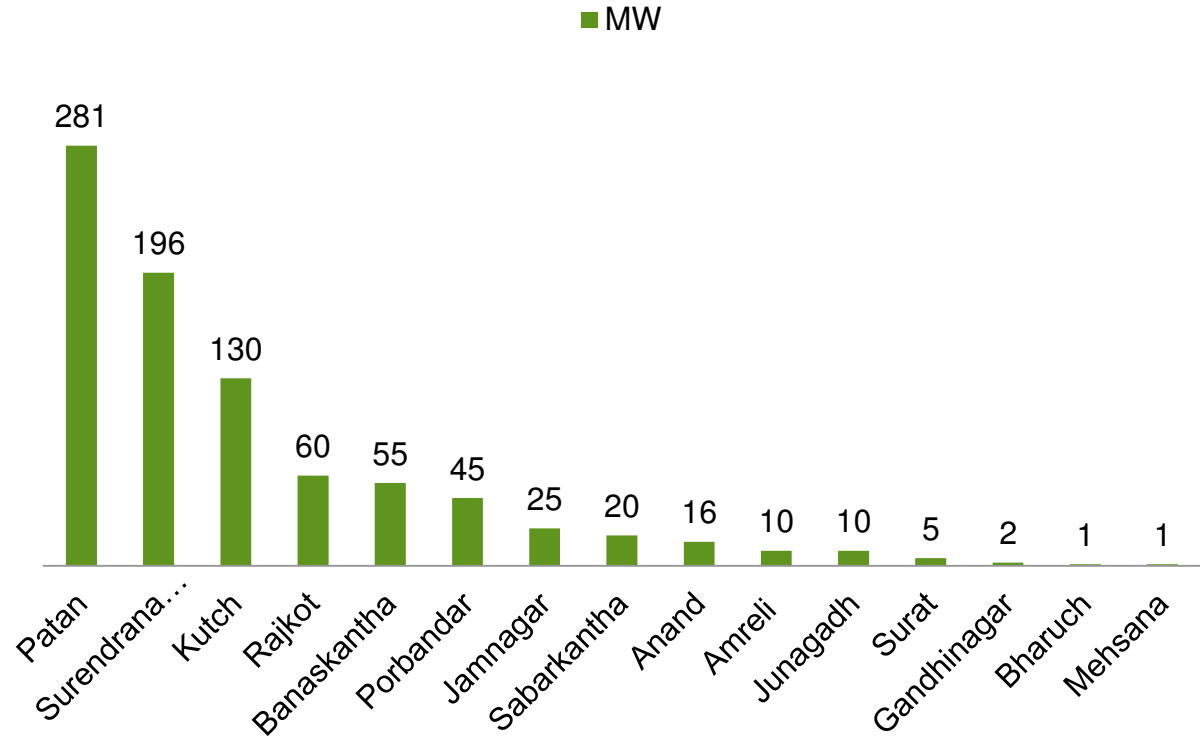
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**GUJARAT ENERGY DEVELOPMENT AGENCY**

A Government of Gujarat Organisation

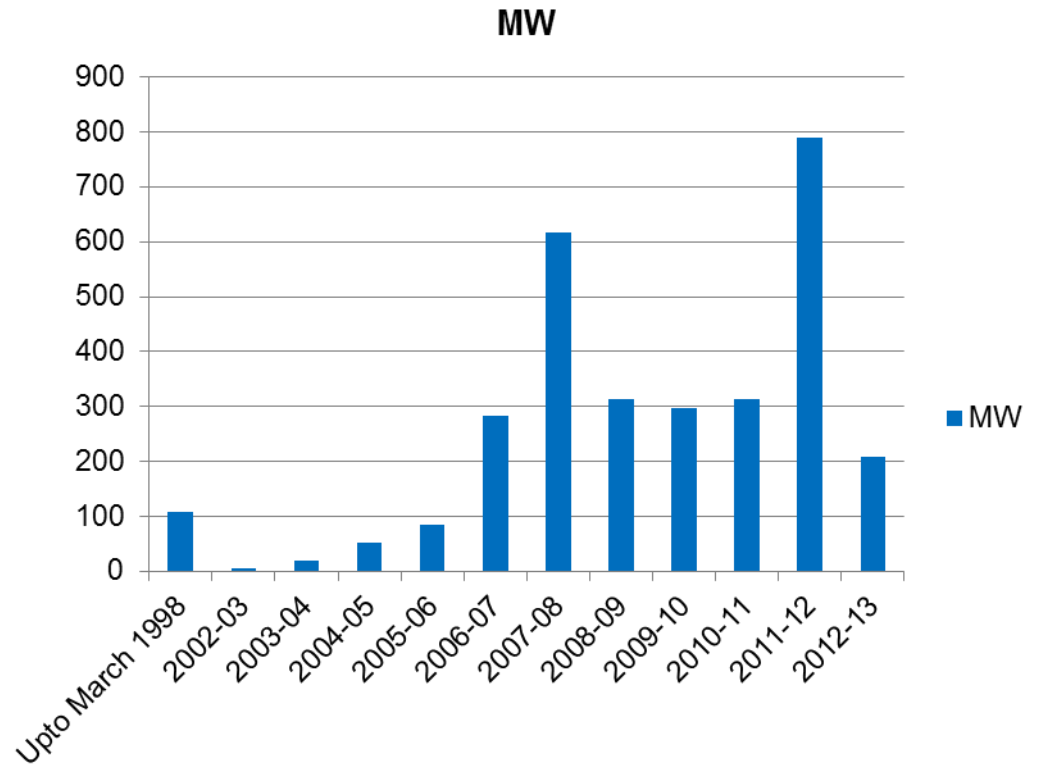
# Solar Power Projects Commissioned

	District	MW
1	Amreli	10
2	Anand	16
3	Banaskantha	55
4	Bharuch	1
5	Gandhinagar	2
6	Jamnagar	25
7	Junagadh	10
8	Kutch	130
9	Mehsana	1
10	Patan	281
11	Porbandar	45
12	Rajkot	60
13	Sabarkantha	20
14	Surat	5
15	Surendranagar	196
		<b>857</b>



# Wind Power – Capacity Addition

Year	MW
Upto March 1998	109
2002-03	6
2003-04	19
2004-05	52
2005-06	85
2006-07	284
2007-08	616
2008-09	314
2009-10	297
2010-11	313
2011-12	790
2012-13	208
2013-14 (June)	75
<b>Total</b>	<b>3166</b>



## Wind Power – End Use

End Use of Electricity	MW	%
GUVNL @ Pref. Tariff	1673	54.12
Captive Use	974	31.50
GUVNL @ APPC	205	6.65
REC Captive	120	3.87
Torrent Captive +REC Captive	70	2.25
Torrent @ Pref. Tariff	50	1.62
<b>TOTAL</b>	<b>3092</b>	<b>100.00</b>

## Regulatory Framework in Gujarat

Year (1)	Minimum Quantum of purchase (in %) from renewable sources (in terms of energy in kWh) of total consumption			
	Wind (2)	Solar (3)	Other (4)	Total
2010-11	4.5%	0.25 %	0.25%	5 %
2011-12	5%	0.5%	0.5%	6%
2012-13	5.5 %	1%	0.5%	7%

## Obligated Entities for year 2012-13

1. GUVNL (MGVCL+PGVCL+UGVCL+DGVCL)
2. Torrent Power Ltd. (A,bad+Surat)
3. Torrent Energy Ltd. (Dahez,SEZ)
4. Jubilant Infrastructure Ltd., Bharuch
5. Aspen Infrastructure Ltd., Vadodara
6. Kandla Port Trust, Kandla
7. MPSEZ Utilities Pvt. Ltd., Mundra

# RPO Compliance 2012-13

## GUVNL

Annual Consumption: 65711 Mus

	RPO %	Required Mus for RPO	Purchased Mus	Purchased Mus against required, %	RPO fulfilled %	Short fall , Mus
Non Solar	7.05%	4632	3387	77.86	5.15	1245
Solar	1.22%	804	1162	150.72	1.77	-358
<b>Total</b>	<b>8.27%</b>	<b>5436</b>	<b>4549</b>	<b>88.65</b>	<b>6.92</b>	<b>887</b>

## RPO Compliance 2012-13

### Torrent (Ahmedabad + Surat)

Annual Consumption: 10110 Mus

	RPO %	Required Mus for RPO	Purchased Mus	Purchased Mus against required, %	RPO fulfilled %	Short fall , Mus
Non Solar	6.02%	608.86	385.39	63.30	3.81	223.5
Solar	1.47%	148.93	0.0901	0.06	0.00	148.8
<b>Total</b>	<b>7.49%</b>	<b>757.79</b>	<b>385.48</b>	<b>50.87</b>	<b>3.81</b>	<b>372.3</b>

## RPO Compliance 2012-13

### Torrent (Dahej)

Annual Consumption: 67.09 Mus

	RPO %	Required Mus for RPO	Purchased Mus	Purchased Mus against required, %	RPO fulfilled %	Short fall , Mus
Non Solar	6.00%	4.03	1	24.84	1.49	3.03
Solar	1.00%	0.67	0	0.00	0.00	0.67
<b>Total</b>	<b>7.00%</b>	<b>4.70</b>	<b>1</b>	<b>21.29</b>	<b>1.49</b>	<b>3.70</b>

## RPO Compliance 2012-13

### MPSEZ Utilities P. Ltd.

Annual Consumption: 146.53 Mus

	RPO %	Required Mus for RPO	Purchased Mus	Purchased Mus against required, %	RPO fulfilled %	Short fall , Mus
Non Solar	6.00%	8.78	Nil	Nil	Nil	8.78
Solar	1.00%	1.46	Nil	Nil	Nil	1.46
<b>Total</b>	<b>7.00%</b>	<b>10.24</b>	<b>Nil</b>	<b>Nil</b>	<b>Nil</b>	<b>10.24</b>

MPSEZ requested Hon'ble Commission to continue exemption from compliance of RPO for 2012-13

## RPO Compliance 2012-13

- **Jubilant Infrastructure Ltd.:** RPO not applicable for 2010-11 & 2011-12 as per order dated 17-8-2012. During 2012-13, they purchased power from DGVCL, hence RPO not applicable. For 2013-14, signed agreement with DGVCL for purchase of power, hence RPO not applicable for 2013-14.
- **Aspen Infrastructure Ltd.:** RPO not applicable for 2010-11 & 2011-12 as per order dated 17-8-2012. Compliance report for 2012-13 awaited.
- **Kandla Port Trust:** Exempted from RPO compliance for the year 2010-11 & 2011-12, as per order dated 17-8-2012. Compliance report for 2012-13 awaited.

Thank You

# Presentation to Co-ordination Forum

## Gujarat Power Sector Scenario



**Gujarat Urja Vikas Nigam Ltd.**



# Gujarat : Power Scenario

Total Capacity (as on 01-04-12) :	15306 MW
Capacity added in 2012-13 :	2964 MW
Total Capacity (as on 01-07-13) :	18270 MW
State :	7063 MW (39%)
Centre share :	3600 MW (20%)
IPP :	7607 MW (41%)

<b>Coal: 11720</b>	<b>Gas: 4172</b>	<b>Hydro: 779</b>	<b>Lign: 1040</b>	<b>Nucl: 559</b>
64.15%	22.84%	4.26 %	5.69 %	3.06%

<b>Projected Peak Demand in 2014 (@ 8% growth )</b>	<b>14,400 MW</b>
<b>Installed Capacity Required by 2014 (at 80% PLF)</b>	<b>18,000 MW</b>
<b>Planned Capacity Addition by 2014</b>	<b>2086 MW</b>
<b>Capacity Available by 2014</b>	<b>20,356 MW</b>
<b>(Deficit) / Surplus by 2014</b>	<b>2356 MW</b>

# Capacity Added in 2012-13

Name of Project	Loc.	Dev.	Sector	Fuel	MW
Ukai Extn. Unit-6	Gujarat	GSECL	State	Coal	500
Mundra UMPP (Unit 2,3,4 &5)	Gujarat	TATA	Private	Coal	1444
ACB (India) Ltd	Chhattisgarh	ACB	Private	Coal	100
Essar Power Gujarat Ltd	Gujarat	EPGL	Private	Coal	500
Mouda TPP (Unit1)	Maharashtra	NTPC	Central	Coal	120
Vindhyachal STPP IV (Unit1)	MP	NTPC	Central	Coal	120
Sipat STPS Stage I (Unit 3)	Chhattisgarh	NTPC	Central	Coal	180
<b>Total</b>					<b>2964</b>

# Capacity Addition Plan 2013-14

Project	Dev.	Sector	Fuel	MW	Likely COD/ Status
Pipavav CCPP	GPPC	State	Gas	700	Unit 1 declared ready for operation. No gas allocation.
Mouda (Unit 2)	NTPC	Central	Coal	120	Sep 13
Vindhyachal IV (Unit 2)	NTPC	Central	Coal	120	Sep 13
Dhuvaran CCPP Ext – 3	GSECL	State	Gas	396	Sep 13. No gas allocation
Sikka Unit 3&4	GSECL	State	Coal	500	Boiler Erec. initiated, likely COD by Dec-13 & Jan-14
Bhavnagar Energy Co Ltd. (Unit 1 )	BEECL	State	Lignite	250	Delay due to geological variance, likely COD by March 2014
<b>Total</b>				<b>2086</b>	

# Capacity Addition Plan 2014-15

Project	Dev.	Sector	Fuel	MW	Status
Bhavnagar Energy Co Ltd. (Unit 2 )	BEECL	State	Lignite	250	Delay due to geological variance, likely COD by June 2014
GIPCL Exp Stg III	GIPCL	State	Lignite	500	EPC awarded to M/s Lanco
<b>Total</b>				<b>750</b>	

# Capacity Addition Plan

Year	State	Central	Private	Total	Cum. Add.
Capacity as on 01.07.2013					18270
13-14	1846	240	0	2086	20356
14-15	250	0	500	750	21106
15-16	800	856	1900	3556	24662
16-17	0	1240	0	1240	25902
Total	2896	2336	2400	7632	

# Capacity available with respect to Demand @ 8% growth rate

(MW)

Year	Cap. Add. during the year	Cumulative Capacity available (Installed Capacity)	Demand @ 8 % Growth Rate
As on 01.07.2013	-	18270	12348 (A)
2013-14	2086	20356	13336
2014-15	750	21106	14403
2015-16	3556	24662	15555
2016-17	1240	25902	16799

## Power Scenario of Gujarat

Particulars	2009-10	2010-11	2011-12	2012-13
Total Energy Catered (MUs)	68993	71256	78651	87723
Daily Max. Energy Catered (MUs)	226.8	237.4	251.8	274.6
Daily Max Catered (MW)	9883	10461	11209	12348
Wind Energy Generation (Mus)	2729	2815	3960	5436
Daily Max wind Energy (MW)	1183	1350	1711	2208
Average Frequency (Hz.)	49.64	49.82	49.80	49.93

# Gujarat - Renewable Capacity in MW

(As on 1.7.2013)

Source	Installed Capacity	PPA Signed
Wind	3093*	2213**
Solar	857	882##
Biomass	31#	30
Small Hydel	7	9.60
<b>Total</b>	<b>3988</b>	<b>3135</b>

- \*Including 1183 MW WTG set up for wheeling of power for captive use/ 3rd party
- \*\*Including PPA of 216 MW under REC Mechanism
- # includes 1 MW plant set up for wheeling of power
- # # Net Capacity of PPA signed (90 MW capacity of Solar PPA terminated)

# Power purchase from Renewable Sources

## RPPO for FY 2012-13 – Estimated purchase (RPPO Reg.)

(In Million Units)

	Wind	Solar	Others	Total
On Purchase of 62203 Mus	5.50%	1.00%	0.50%	7.00%
RE purchase required	3421	622	311	4354
Short fall of 2011-12	477	147	212	836
Total RE purchase required	3898	769	523	5190
Revised RPPO (incl. shortfall)	6.27%	1.24%	0.84%	8.34%
Actual RE power purchased	3311	1162	76	4549
RPPO fulfilled	5.32%	1.87%	0.12%	7.31%
Shortfall	587	-393	447	642

## Details of Open Access Consumers in Gujarat

Details	DGVCL	UGVCL	PGVCL	MGVCL	TOTAL
No. of OA Consumers (as on Mar-12)	12	11	14	5	42
Power purchased under OA in Mus (FY 2011-12)	946	154	280	111	1491
No. of OA Consumers (as on Mar-13)	68	49	54	33	204
Power purchased under OA in Mus (FY 2012-13)	2761	421	472	323	3978

GUVNL has filed a petition before Hon'ble GERC for determination of Additional Surcharge to be recovered from OA consumers for compensating DISCOMs towards the financial implications on account of OA consumers purchasing power from sources other than local Distribution Licensee

**Thank You**

# Power purchase from Renewable Sources

## RPPO for FY 2012-13 – Actual Purchase

(In Million Units)

	Wind	Solar	Others	Total
On Purchase of 65711 Mus	5.50%	1.00%	0.50%	7.00%
RE purchase required	3614	657	329	4600
Short fall of 2011-12	477	147	212	836
Total RE purchase required	4091	804	541	5436
Revised RPPO (incl. shortfall)	6.23%	1.22%	0.82%	8.27%
Actual RE power purchased	3311	1162	76	4549
RPPO fulfilled	5.04%	1.77%	0.12%	6.92%
Shortfall	780	-358	465	887

# Capacity Addition Plan 2015-16

Project	Dev.	Sector	Fuel	MW	Status
UMPP – Tilaiya	JIPL	Private	Coal	300	Delay in Land Acq.
Wanakbori Ext Unit 8	GSECL	State	Coal	800	Environment Clearance pending. EPC award in progress
Mouda Stage II	NTPC	Central	Coal	240	EPC awarded to BHEL
Lara	NTPC	Central	Coal	140	Pre-awarding activities initiated
Kakrapar Ext	NPCIL	Central	Atomic	476	Civil work in progress
Shapoorji Pallonji Energy	SPEGL	Private	Imp Coal	800	MoEF clearance obtained on 30.11.12. Land Acq. & EPC award pending
Essar Power Gujarat Ltd.	EPGL	Private	Imp Coal	800	Land Acq. completed & EPC awarded. Env. Clearance Pending.
<b>Total</b>				<b>3556</b>	

# Capacity Addition Plan 2016-17

Name of Project	Dev.	Sector	Fuel	MW	Status
Lara	NTPC	Central	Coal	140	Pre-awarding activities in progress
Dhuvaran STPP Stage I	NTPC	Central	Coal	660	
Khargone STPP	NTPC	Central	Coal	220	
Gadarwara STPP Stage I	NTPC	Central	Coal	220	
<b>Total</b>				<b>1240</b>	

# Demand/supply scenario as per 17th EPS

(MW)

Year	Cap. Add. during the year	Cumulative Capacity available (Installed Capacity)	Demand as per 17th EPS Report
As on 01.07.2013	-	18270	
2013-14	2086	20606	16296
2014-15	750	21106	17351
2015-16	3556	24662	18475
2016-17	1240	25902	19670

# Gujarat: Installed capacity as on 1.7.2013 (MW)

	Name of Power Plant	Cap/Share	Fuel		Name of Power Plant	Cap/Share	Fuel
<b>GSECL PLANTS</b>				<b>SHARE FROM CENTRAL SECTOR</b>			
1	Ukai TPS	850	Coal	1	KORBA-STPS	456	Coal
2	Ukai Extension Unit 6	500	Coal	2	VINDHYACHALSTPS-I	230	Coal
3	Wanakbori TPS	1470	Coal	3	VINDHYACHAL-STPS-II	239	Coal
4	Gandhinagar TPS	870	Coal	4	VINDHYACHAL-STPS-III	266	Coal
5	Sikka TPS	240	Coal	5	VINDHYACHAL-STPS-IV	120	Coal
6	Kutch Lignite TPS	290	Lignite	6	Mouda TPP Unit 1	120	Coal
7	Utran Gas Based	510	Gas	7	GANDHAR-GPS	237	Gas
8	Dhuvaran Gas Based - Stage-I	107	Gas	8	KAWAS-GPS	187	Gas/Naphtha
9	Dhuvaran Gas Based - Stage-II	112	Gas	9	SSNNL -Hydro	232	Hydro
10	Ukai Hydro	305	Hydro	10	KAPS -Atomic	125	Atomic
11	Kadana Hydro	240	Hydro	11	TAPS- 1&2 -Atomic	160	Atomic
12	Panam Hydro	2	Hydro	12	TAPS- 3&4 -Atomic	274	Atomic
	<b>GSECL - Total</b>	<b>5496</b>		13	SIPAT -STPS-Stage-I and II	813	Coal
				14	Kahalgaon-STPS-II (Eastern Region)	141	Coal
<b>STATE PSUs</b>				<b>Central Sector</b>			
1	GSEG -GPS	156	Gas	<b>Total Capacity Gujarat System</b>			<b>18270</b>
2	GIPCL -GPS Stage-I	145	Gas	<b>RENEWABLE ENERGY (As on 1.4.2013)</b>			
3	GIPCL GPS Stage-II	165	Gas	1	Wind Energy-(GUVNL 1910 MW)	<b>3093</b>	Wind
4	GIPCL-SLPP	500	Lignite	* Including Wheeling			
5	GMDC -Lignite	250	Lignite	2	Small / Mini Hydel	7	Mini Hydel
6	GSEG-Hazira	351	Gas	3	Bimass	31	Biomass
	<b>State PSU - Total</b>	<b>1567</b>		4	Solar	857	Solar
	<b>State Sector</b>	<b>7063</b>					
<b>PRIVATE - IPPs</b>				<b>Total Renewable Capacity</b>			
1	GPEC -GPS	655	Gas/Naphtha	<b>Total Capacity (Conv.+Renewable)</b>			<b>3988</b>
2	ESSAR -GPS	300	Gas/Naphtha				
3	TPL -(Thermal & Gas)	500	Coal / Gas				
4	TPL-Sugen	1147	Gas				
5	Adani Power Ltd	2000	Coal				
6	ACB (India) Ltd.	200	Coal				
7	Mundra UMPP - CGPL	1805	Coal				
8	Essar Power Gujarat Ltd-Salaya	1000	Coal				
	<b>Private IPPs</b>	<b>7607</b>					