GUJARAT ELECTRICITY REGULATORY COMMISSION
Gandhinagar

Minutes of the 15th Meeting of the Co-Ordination Forum held on 6th August, 2014.

The 15th meeting of the Co-ordination Forum was held in the Conference room of the GSECL TPS, Gandhinagar on 6th August, 2014 at 03:00 PM.

The following were present in the meeting,

1. Shri Pravinbhai Patel, Chairman, GERC
2. Dr.M.K.Iyer, Member (Finance), GERC
3. Shri DIlip Raval, Secretary, GERC

Members / Representatives of Co-ordination Forum:

1. Shri Raj Gopal, IAS, MD, GUVNL
2. Shri H. S. Patel, IAS, MD, DGVCL
3. Shri S.B. Khayaliya MD, MGVCL
4. Shri Sandeep Kumar, IAS, MD, PGVCL
5. Shri N. Srivastava, IFS, MD, UGVCL
6. Shri S. K. Negi, MD, GETCO
7. Shri A. A. Chhaya, I/c ED, GSECL
8. Shri P. L. Panchal, DS (NCE), EPD
9. Shri P.N. Gandhi, Chief Electrical Inspector
10. Smt. Alpana Dani, Office of the Chief Electrical Inspector
11. Shri Anil Purohit, GEDA
12. Shri K.P. Jangid, G.M.(Commerce),GUVNL
13. Shri R. M. Bhadang, CFM, GSECL
14. Shri Y. D. Brahmbhatt, I/c CE (Tech), GUVNL
15. Shri B.B. Mehta, CE, SLDC , Vadodara
16. Shri S. G. Naik, ACE, DGVCL
17. Ms. S. A. Naik, DGVCL
18. Shri I. Z. Patel, CE, DGVCL
19. Shri Y. B. Sukhadia, CE, MGVCL
20. Shri M. K. Rathod, ACE, UGVCL
21. Shri S. H. Upadhyay, SE, GETCO
22. Shri J. J. Gandhi, SE (R&C), PGVCL
23. Shri R. P. Raval, SE, UGVCL
24. Shri Amit Sachan, GETCO
25. Shri S. P. Trivedi, EE, GUVNL
26. Ms. S.S. Mohinuddin, DE, GUVNL

27. Shri Kamal Sindhi, DE, UGVCL
28. Shri N. D. Bidarkar, MGVCL
29. Shri V. K. Gulati, MGVCL
30. Shri Sudhir Shah, TPL
31. Shri C. M. Bundela, TPL
32. Shri S. R. Desai, GM (Tech.), TPL-S
33. Ms. Luna Pal, TPL
34. Shri Mehul Rupera, Sr. Manager, MUPL
35. Shri Pratik Lunavia, Deputy Manager, MUPL
36. Shri Dipak Thakkar, Adani Power

Officers of the Commission:

1. Shri D.R.Parmar, Joint Director,
2. Shri S. T. Anada, Deputy Director,
3. Shri Apurva Adhvaryu, Deputy Director,
4. Shri Gopal Dayalani, Deputy Director,

Shri Dilip Raval, Secretary welcomed all the members of the State Co-ordination Forum in the meeting.

The meeting was presided over by Shri Pravinbhai Patel, Chairman, GERC. Chairman welcomed all the members to the meeting and congratulated GUVNL and PGVCL for receiving Most Progressive State and Best Distribution Company Awards from Independent Power Producers Association of India. Thereafter, the discussion took place on the agenda items.

Agenda Item No. 1: Approval of the minutes of the 14th Meeting of the Co-ordination Forum held on 24th January, 2014

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 14th Meeting of the Co-ordination Forum.

2.1 Item No. 2.2 (6): Chairman reviewed the progress made about illegal cables removal activities. DISCOMs stated that the Cable Operators are used to reinstall the cables hence cable removal activity is continuous process. TPL informed that they are removing the cables from the network and seize such cables. The Forum recognized that installing

cable on electricity poles is not a permissible activity and in no way can be regularized. The Forum decided to enhance awareness amongst public and Cable Operators. It is also decided to carry out cable removal activity in coordination with District Magistrate and concerned Commissioner of Police, Home Department personnel. CEI was entrusted to expedite respective departments of the State Government and issue a guideline for the procedure to be adopted for removal of such cables on permanent basis.
(Actions: CEI)

2.2 Item No.2.2 (9): The Commission appreciated the work done by PGVCL in reducing T & D losses and hoped that the efforts will be continued.

2.3 Item No. 2 (8): CEI stated that the final test report format is submitted and also implemented in most of the areas of DISCOMs. DISCOMs confirmed that Test Report Form, showing name and other requisite details of the consumer, is being generated through e-urja at the time of payment of estimates by such prospective consumer. The same Test Report Form is used by the licensed electrical contractor to fill up the remaining details and then it is submitted to the DISCOMs office. TPL also confirmed the same practice.

2.4 Item No. 2 (9 (B))**:** DISCOMs confirmed that they are receiving copy of the orders from the Ombudsman. The Commission emphasized that orders of the Ombudsman should be reviewed regularly at the MDs level in all the utilities.

2.5 Item No. 2 (10): DISCOMs confirmed that as directed in the last Co-ordination Forum Meeting, HVDS transformers are now considered as metered transformers even where only one consumer is being supplied through meter and accordingly DT Metering Report is being prepared and furnished. All the Distribution Licensees shall continue to furnish the DT Metering Report to the Commission.
(Actions: All Distribution Licensees)

2.6 Item No. 2 (2.7) (Item No. 4): UGVCL and DGVCL have informed that 5 numbers of Solar Pumps are installed at the cost of DISCOMs and consumers are being charged at Agriculture Tariff. MD, UGVCL stated that only remote area consumers have been selected for installation of Solar Pumps. He further stated that satisfaction level of such

consumers is not up to the mark. These consumers want to be connected with the Grid Line as and when the grid is available to them. On a query from the Commission about the reasons for such dissatisfaction, MD, MGVCL responded that one of the reason could be such cases consumers are restricted to the capacity of the Solar Pump and cannot go for the higher HP if ground water level depleted. The representative of the GEDA informed the Forum that now 15 HP capacity Solar Pumps are also available in the market. He also informed about the MNRE scheme of installation of 10,000 Solar Pumps with 30% subsidy from the Central Government. He further stated that 200 Solar Pumps will be distributed to the Gujarat under this scheme.

2.7 Item No. 5: Action Taken reports on Fuel Audit Report from GSECL and TPL are received.

2.8 Agenda Item No. 7: Action Taken Reports submitted by DISCOMs is noted by the Forum.

Agenda Item No. 3: Amendments in MYT Regulations, 2011

The Commission informed the Forum that it has decided to revisit the MYT Regulations, 2011. The Forum was suggested to send comments/suggestions on changes they find necessary to be made in the existing Regulations and not to wait for the publication of the Draft.

(Action: All the Utilities)

Agenda Item No. 4: Pendency of Agriculture Connection Applications

The Commission constituted the Committee comprising of MD, PGVCL, MD, UGVCL, Shri Maganbhai Patel, Member SAC, Shri Kirtibhai Amin, Member SAC under the Chairmanship of the Secretary, GERC. The Committee shall look into the matter of pendency of new agriculture connection applications along with other issues like disallowance of second agriculture connection in the same survey number, allowance of splitting of contracted demand to facilitate more number of water resources for irrigation purpose. The Committee shall submit its report within 2 months.

(Action: Secretary, GERC)

Agenda Item No. 5: Regulation on Demand Side Management

The Forum was informed about the outcome of the meeting held on 03/06/2014 at the Commission's office regarding findings of load research activities, available technical potential of DSM in licensee's area and proposed DSM Programme. Accordingly DGVCL, MGVCL and PGVCL have submitted proposed DSM Programme Documents in the given time limit. UGVCL and TPL have confirmed that DSM Programme shall be submitted within 15 days.

(Actions: UGVCL and TPL)

Agenda Item No. 6: Standard of Performance (SoP) and Monitoring of performance of CGRFs

The Commission observed that the human fatal accidents are reduced marginally in FY 2013-14 compared to FY 2012-13 in all the licensees. However, the animal fatal accidents have increased to a great extent in almost all the licensees' area. The Commission expressed apprehension about huge number of accidents taking place in the licensees' area. The CEI briefed the Commission that out of the total human fatal accidents major number of accidents are occurred in the premises of the consumers on which licensees have no control. MD, GUVNL expressed his great concern over the electrical accidents and assured the Commission that some concrete and result oriented steps will be taken to minimize the figures of accidents.

The Commission expressed their concern on increasing rate of distribution transformer failure in PGVCL and advised PGVCL to control the same.

The Commission made an observation that in DGVCL license area number of faulty meters is quite large. MD, DGVCL confirmed that within 2 months all the faulty meters will be replaced.

(Action: All the Distribution Licensees)

Agenda Item No. 7: Draft Amendment to RPO Regulations, 2010.

The Forum was informed that 36 comments from stakeholders are received on Draft Amendment and the Commission will issue the Amendment after due consideration of the objections/suggestions of the stakeholders within short span of time.

Agenda Item No. 8 Renewable Purchase Obligation.

Chairman stated that RPO has become source of serious concern at the Central level. Chairman also stated that TPL has already filed a petition for revision of the RPO targets for FY 2013-14 while the Commission has started suo-motu proceedings for monitoring the RPO compliance by other Distribution Licensees.

Agenda Item No. 9: Status of Transmission Projects.

MD, GETCO briefed the Forum about Transmission Infrastructure Capacity addition during FY 2013-14, Transmission Losses from 2002-03 to 2013-14, Equipment failure rate from 2006-07 to 2013-14, Summary of accidents for 2013-14 and 2014-15, Capitalization from 2002-03 to 2013-14, Renovation and Modernization from 2007 to 2014, Planning of 2014-15, Ongoing schemes, Steps towards Smart Grid, Renewable Energy Effect, Network constraints, Deviation Settlement Mechanism etc.

Copy of the presentation is attached at Annexure - I.

Agenda Item No. 10: Status of RPO.

Shri Anil Purohit, GEDA presented the RPO compliance status of different licensees for FY 2012-13, FY 2013-14 and first quarter of FY 2014-15.

Copy of the presentation is attached at Annexure - II.

Agenda Item No. 11: Presentation on Power sector Scenario by GUVNL.

General Manager, GUVNL made a detailed presentation on the power scenario in the State. He mentioned that total capacity as on 1st April, 2014 is 18510 MW and during FY 2013-14 capacity additions was 240 MW and as per the demand growth installed capacity required by 2015 will be 18500 MW while capacity addition planned by 2015 is 2076 MW, so there will be surplus by 2086 MW by 2015. He has also briefed the Forum about the Capacity Addition Plan up to 2016-17. He further briefed about installed Renewable Capacity and addition to that, RPO obligations fulfilled during the year 2013-14.

Copy of the presentation is attached at Annexure - III.

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

SECRETARY

GERC

15th Meeting of The Co-ordination Forum

Overview of Transmission Projects

Gujarat Energy Transmission Corporation Limited

[An ISO 9001 : 2008 Company]

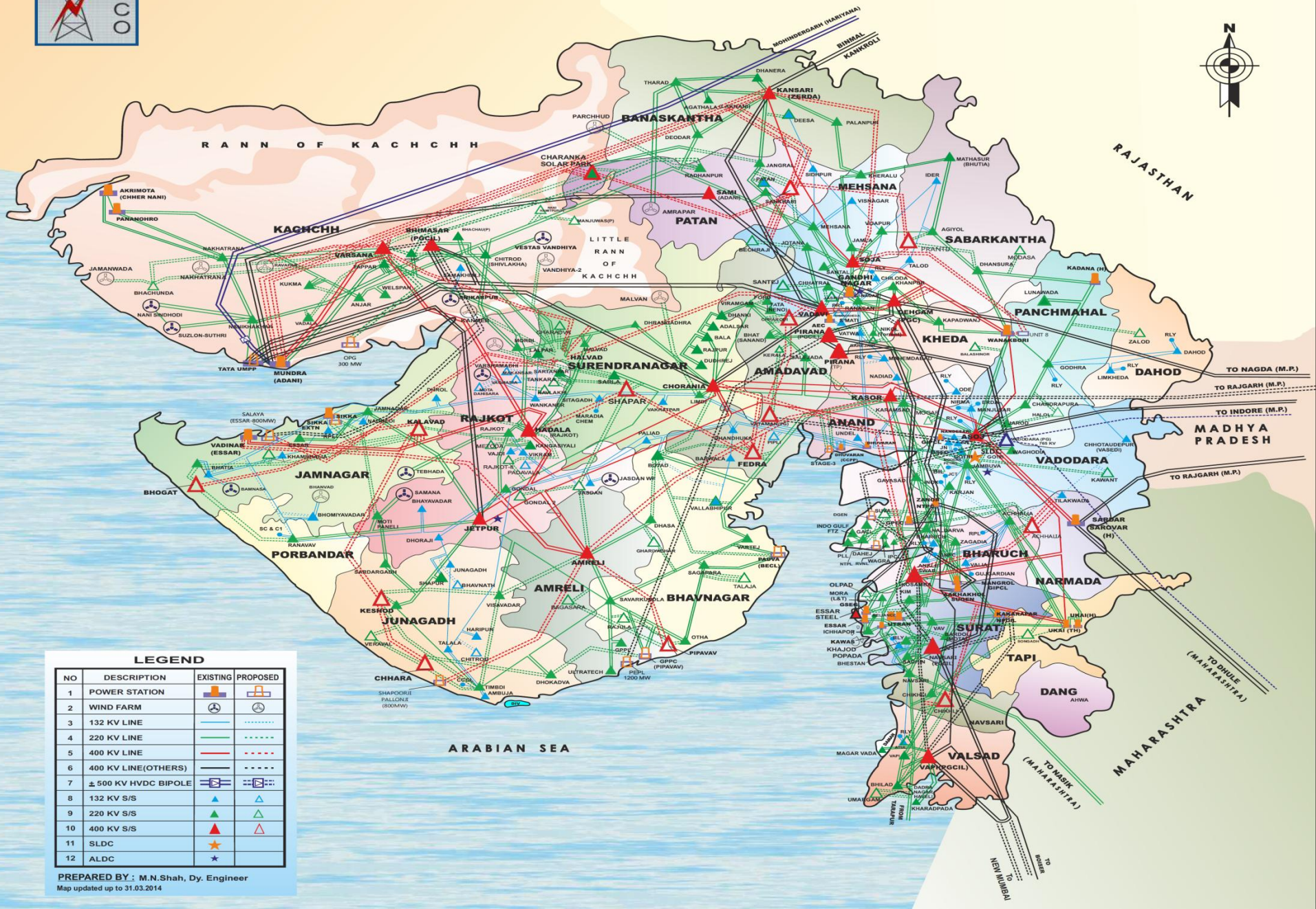
6th August, 2014

Presentation Outline

1. Development of Transmission Network & its Performance
2. Planning & Progress of FY 2013-14
3. Planning of FY 2014-15
4. Step towards Smart Grid
5. System Performance
6. Renewable Energy Effect
7. Deviation Settlement Mechanism
8. Network Constraints

1 Development of Transmission Network & its Performance

POWER MAP OF GUJARAT



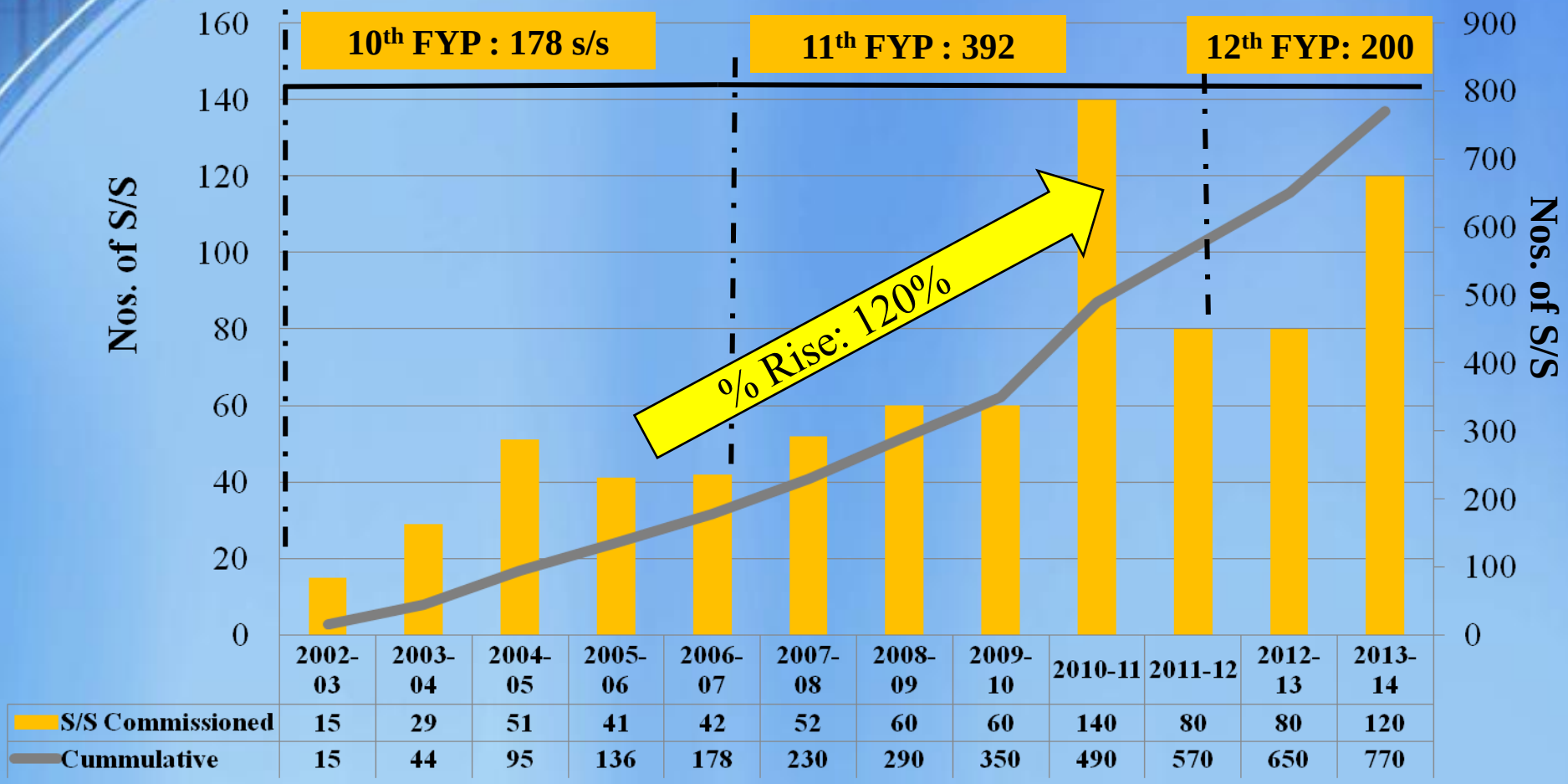
LEGEND

NO	DESCRIPTION	EXISTING	PROPOSED
1	POWER STATION	▬	▭
2	WIND FARM	⊛	⊛
3	132 KV LINE	─	┈
4	220 KV LINE	─	┈
5	400 KV LINE	─	┈
6	400 KV LINE(OTHERS)	─	┈
7	± 500 KV HVDC BIPOLE	═▷═	╌▷╌
8	132 KV S/S	▲	△
9	220 KV S/S	▲	△
10	400 KV S/S	▲	△
11	SLDC	★	
12	ALDC	★	

PREPARED BY : M.N.Shah, Dy. Engineer

Map updated up to 31.03.2014

Transmission Infrastructure Capacity Addition (Substation)

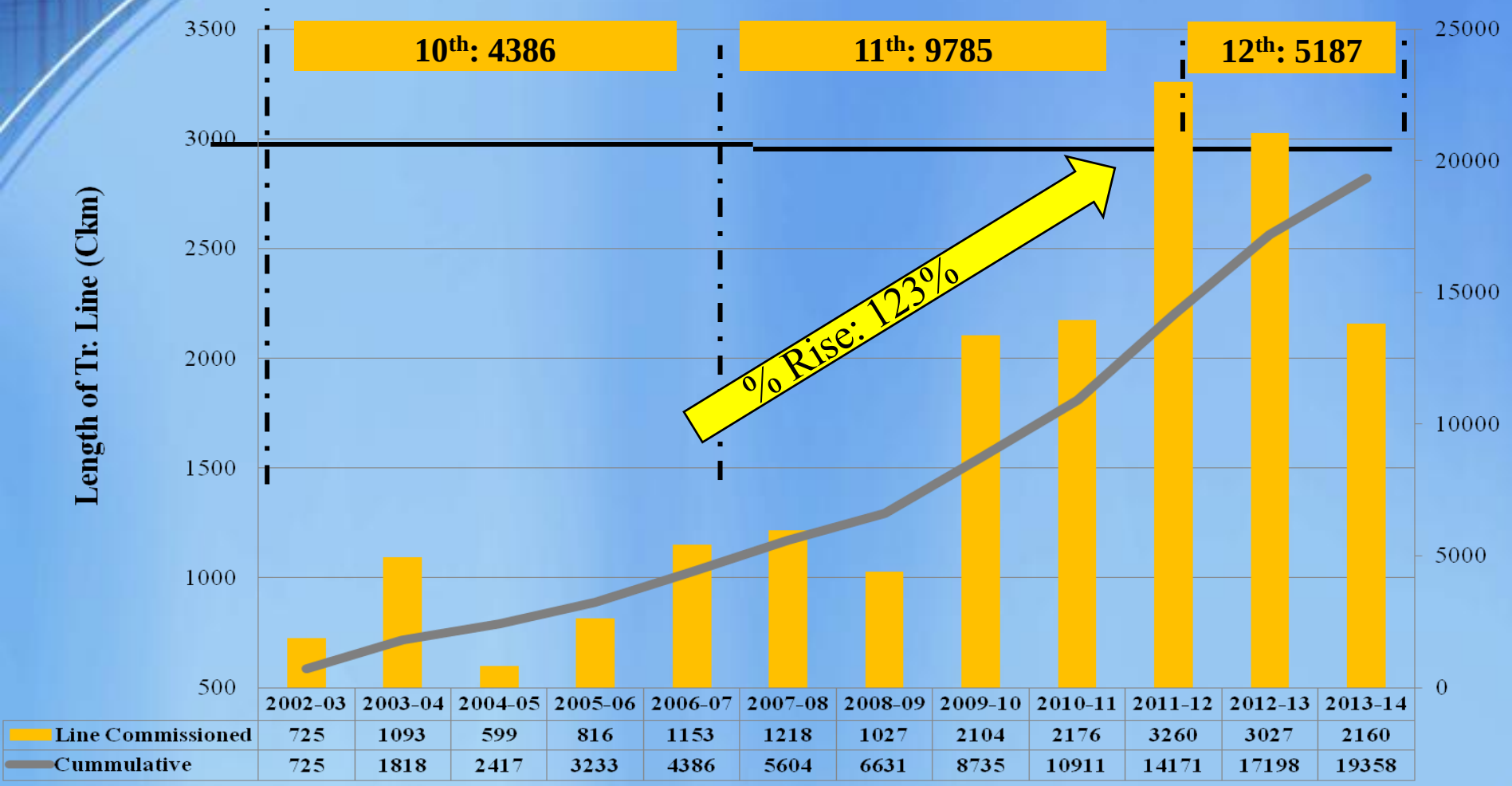


	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
S/S Commissioned	15	29	51	41	42	52	60	60	140	80	80	120
Cummulative	15	44	95	136	178	230	290	350	490	570	650	770

Particulars	FY 2013-14	Cumulative
No of Substation	120*	1470

* 100 % of Target

Transmission Infrastructure Capacity Addition – Tr. Line



Particulars	FY 2013-14	Cumulative
Transmission line (Ckm)	2160 *	50133

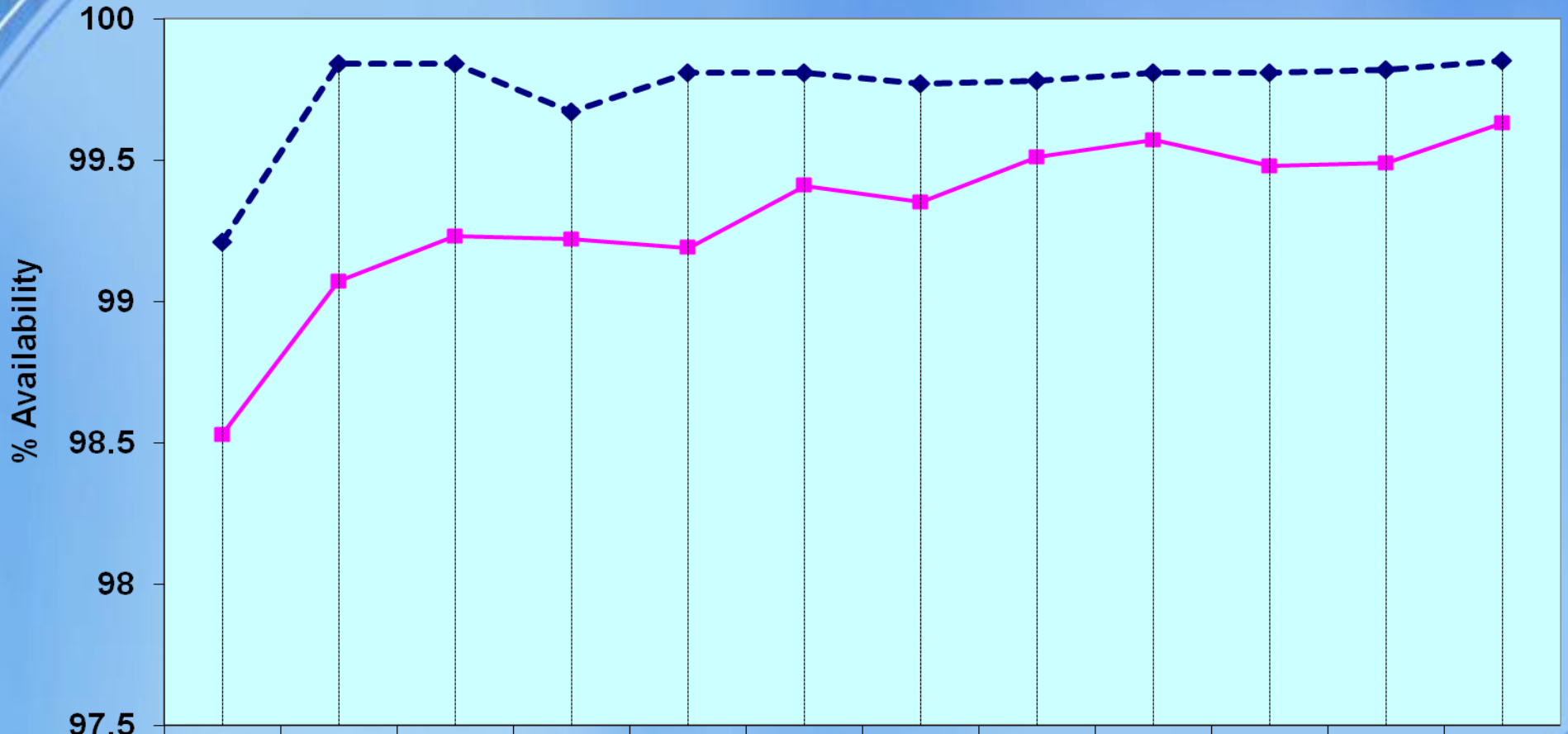
* 87.5 % of Target (2470 Ckt Km)

Transmission Infrastructure Capacity Addition - MVA

Particulars	FY 2013-14	Cumulative
MVA Capacity	6628	69197

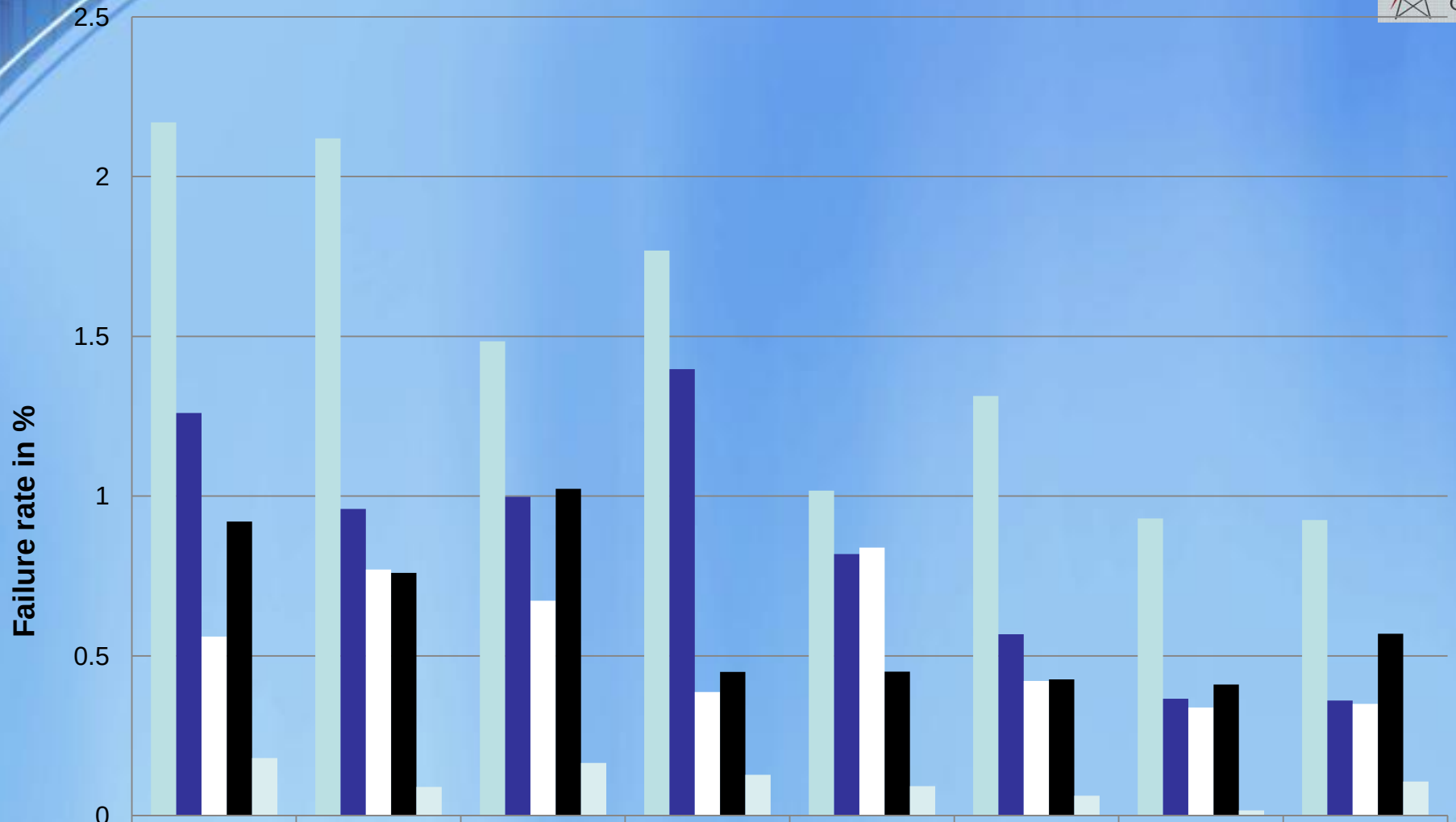
Transmission Losses (%)

System Availability (%)



	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
S/S	99.21	99.84	99.84	99.67	99.81	99.81	99.77	99.78	99.81	99.81	99.82	99.85
Line	98.53	99.07	99.23	99.22	99.19	99.41	99.35	99.51	99.57	99.48	99.49	99.63

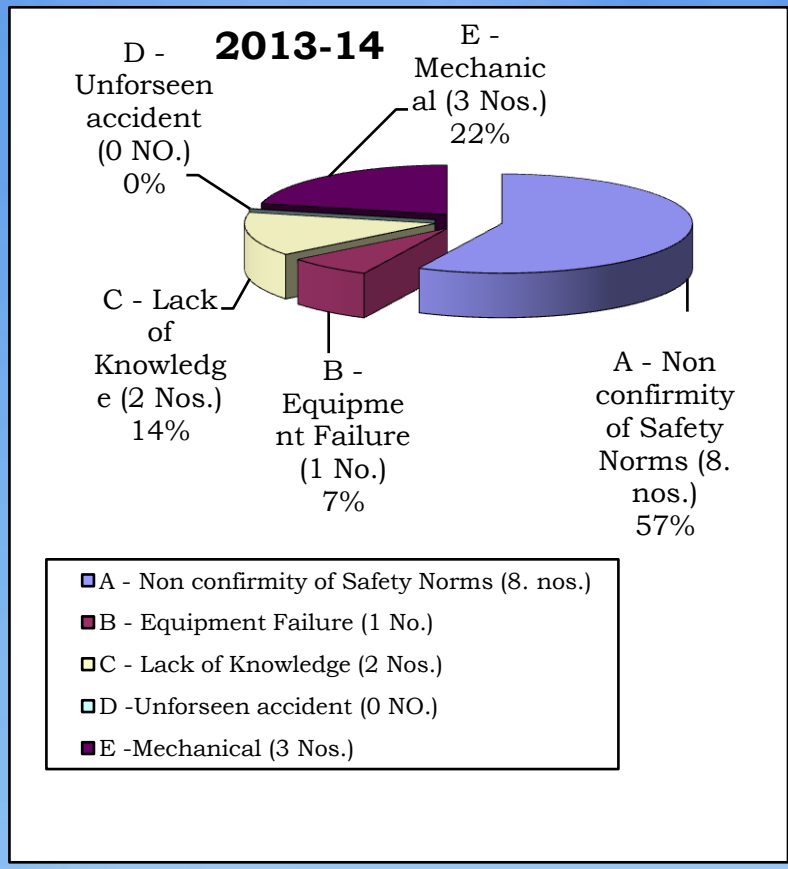
Equipment failure rate (in %)



	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Transformer	2.17	2.12	1.48	1.77	1.02	1.31	0.93	0.92
CT	1.26	0.96	1.00	1.40	0.82	0.57	0.37	0.36
PT	0.56	0.77	0.67	0.39	0.84	0.42	0.34	0.35
LA	0.92	0.76	1.02	0.45	0.45	0.43	0.41	0.57
CB	0.18	0.09	0.16	0.13	0.09	0.06	0.02	0.11

Summary of Accidents: FY 2013-14

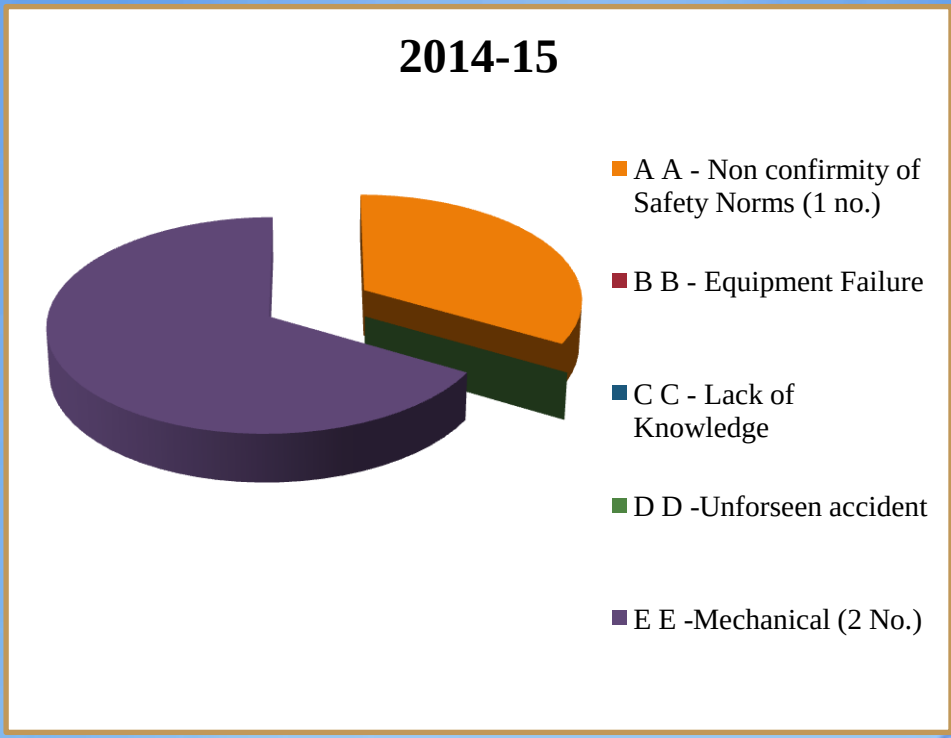
Sr. No.	Month	Employee (GETCO)				Outsider				Total
		Fatal		Non fatal		Fatal		Non fatal		
		Electrical	Mechanical	Electrical	Mechanical	Electrical	Mechanical	Electrical	Mechanical	
1	Apr-13	1	0	1	0	0	0	0	0	2
2	May-13	0	0	1	0	0	0	0	0	1
3	Jun-13	0	0	0	0	0	0	0	0	0
4	Jul-13	0	0	0	0	0	0	0	0	0
5	Aug-13	0	0	0	0	0	0	0	0	0
6	Sep-13	0	1	1	0	0	0	0	0	2
7	Oct-13	0	0	2	2	0	0	0	0	4
8	Nov-13	0	0	1	0	0	0	0	0	1
9	Dec-13	0	0	0	0	0	0	0	0	0
10	Jan-14	0	0	1	0	0	0	0	0	1
11	Feb-14	0	0	1	0	0	0	0	0	1
12	Mar-14	1	0	1	0	0	0	0	0	2
Total		**2**	**1**	**9**	**2**	**0**	**0**	**0**	**0**	**14**



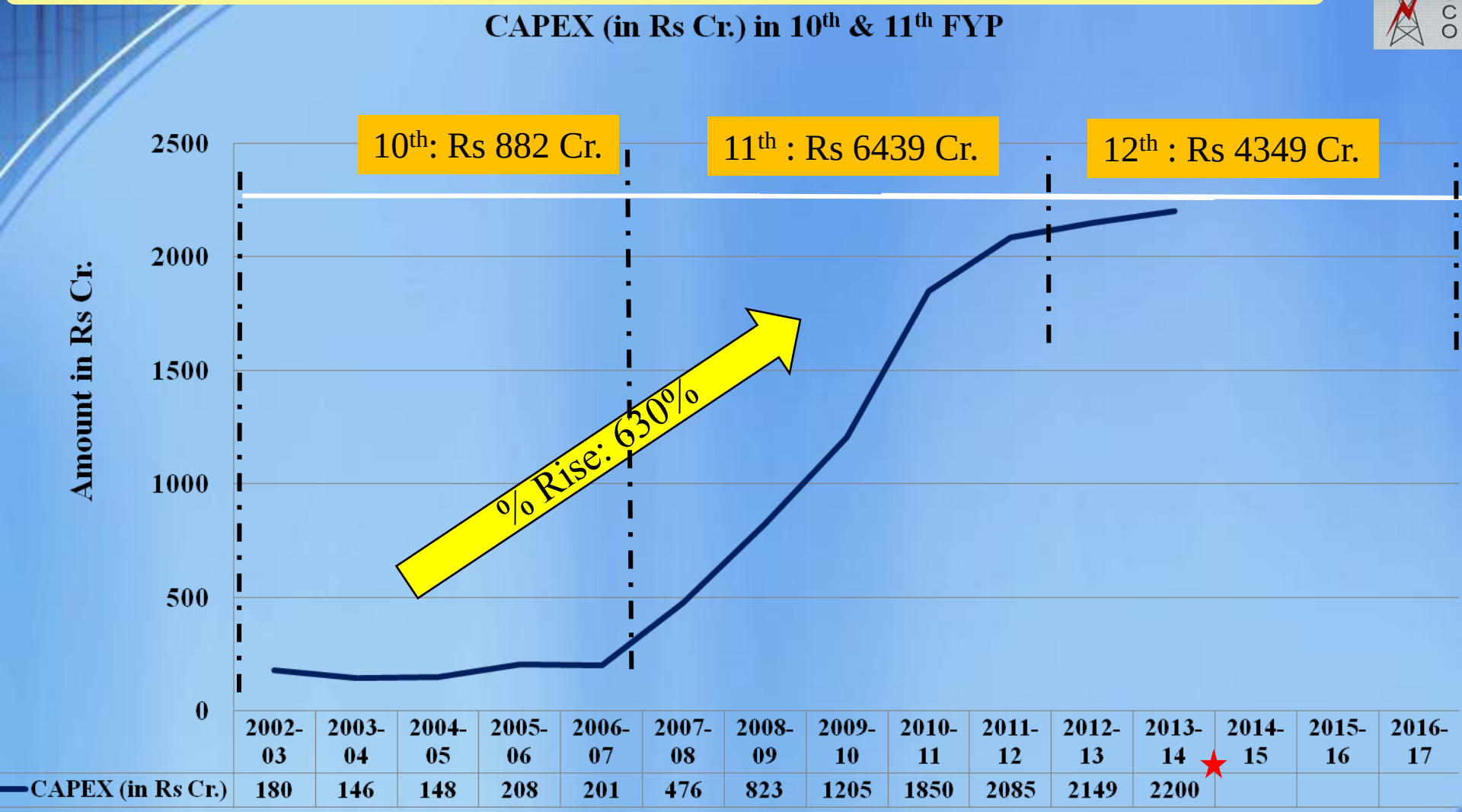
Particulars	FY 2005-06	FY 2006-07	FY 2007-08	FY 2008-09	FY 2009-10	FY 2010-11	FY 2011-12	FY 2012-13	FY 2013-14
Accidents	54	33	19	17	20	17	15	15	14

Summary of Accidents: FY 2014-15

Sr. No.	Month	Employee (GETCO)				Outsider				Total
		Fatal		Non fatal		Fatal		Non fatal		
		Electrical	Mechanical	Electrical	Mechanical	Electrical	Mechanical	Electrical	Mechanical	
1	Apr-14	0	0	0	0	0	0	0	0	0
2	May-14	0	0	1	0	0	0	0	0	1
3	Jun-14	0	0	0	1	0	0	0	0	1
4	Jul-14	0	0	0	1	0	0	0	0	1
Total		**0**	**0**	**1**	**2**	**0**	**0**	**0**	**0**	**3**



Investment



Estimated Figure

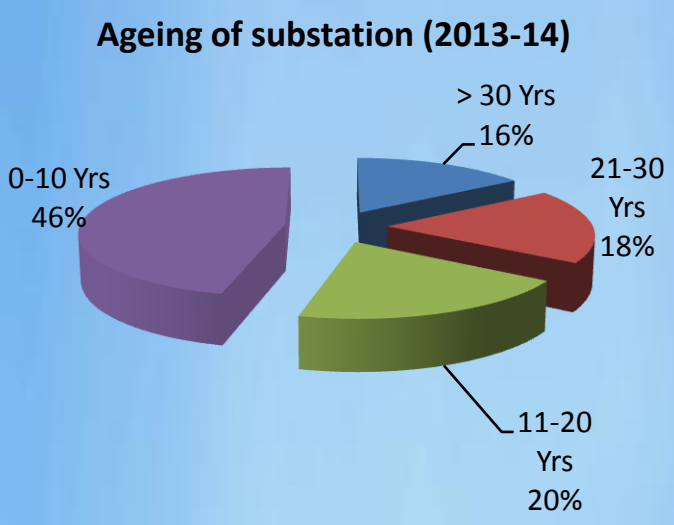
FYP	CAPEX	Capitalization
11th	6439	4679
12th (2 years)	4349	3334*

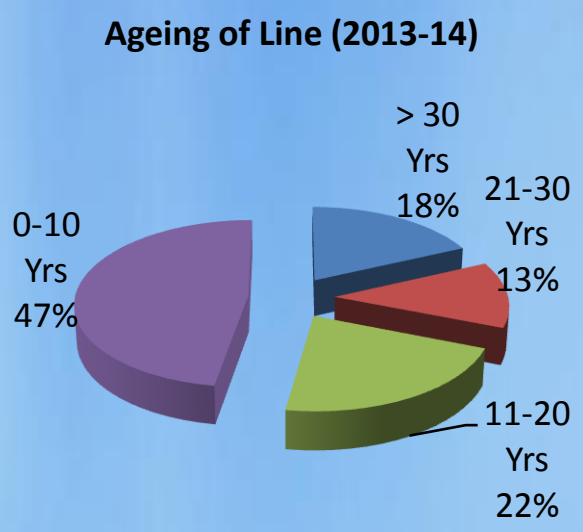
in Rs Cr.

* Estimated FY 2013-14 = Rs 1700 cr

Asset Mapping of Gujarat Power Network

- 1600 Kms of coastal line with wind pressure/ creek areas.
- Chemically polluted industrial zone.
- Challenge of uninterrupted & quality power supply on 24 X 7 basis due to frequent equipment failure and tripping of lines.
- Many obsolete design equipments - Unsafe and Energy inefficient



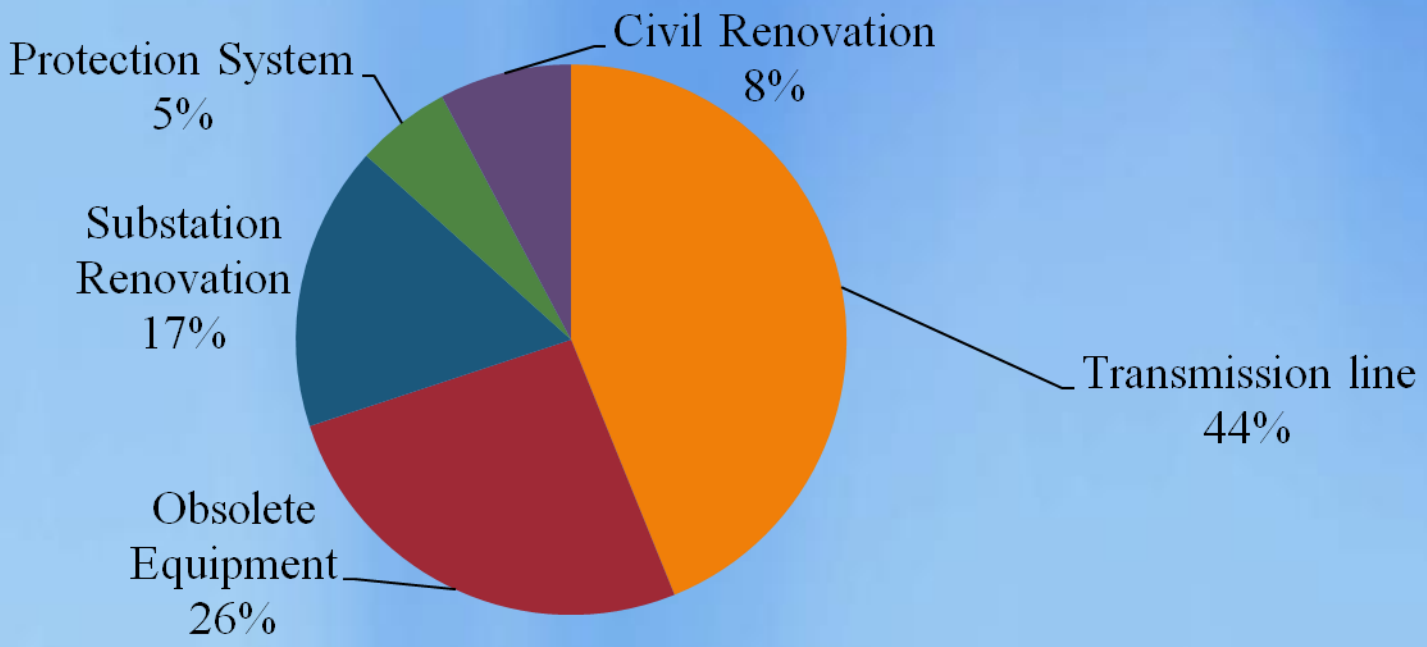


FY 2013-14

34% of substations & 31% of Transmission lines are more than 20 years old.

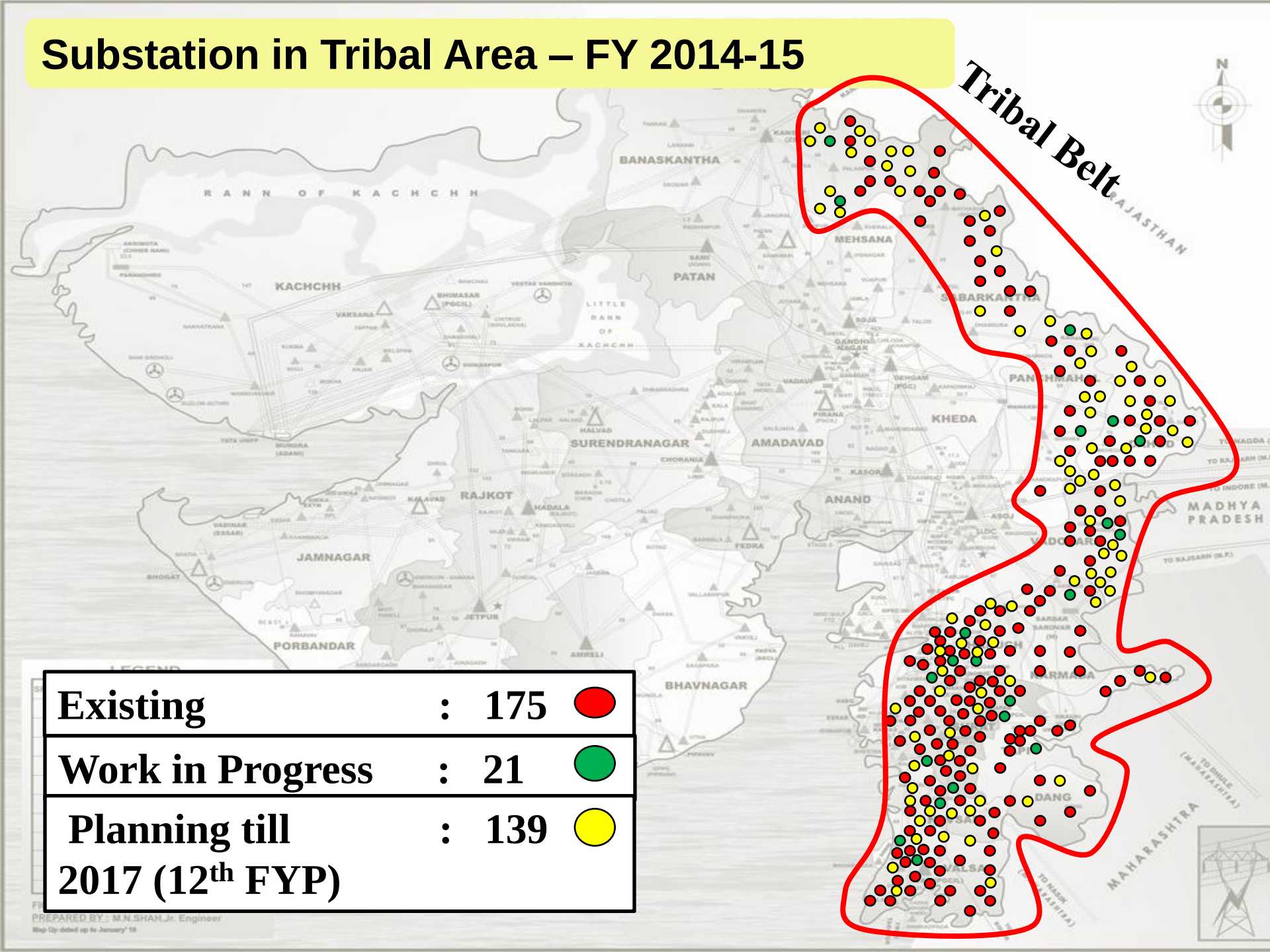
Renovation and Modernization: 2007-2014

Financial expenditure under R&M activity (in Rs Crores): 913.75 Crore



Particulars	FY 2007-08	FY 2008-09	FY 2009-10	FY 2010-11	FY 2011-12	FY 2012-13	FY 2013-14
R&M Expenses	109.82	76.49	114.49	100.64	147.06	165.83	199.39

Substation in Tribal Area – FY 2014-15



Existing	:	175
Work in Progress	:	21
Planning till 2017 (12th FYP)	:	139

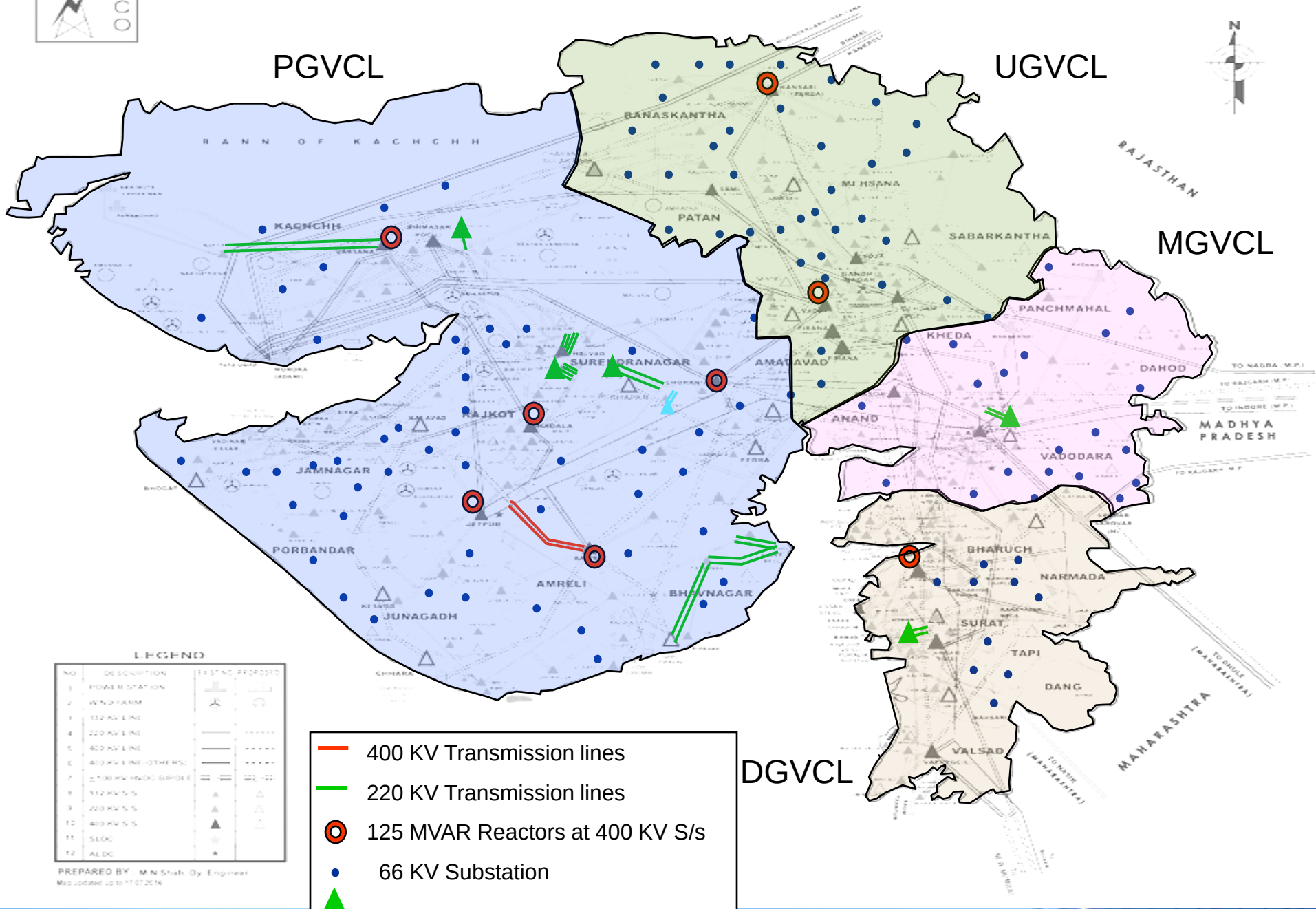
2

Planning & Progress of FY 2013-14

Achievement of FY 2013-14

Voltage Class	Substations (Nos)		Transmission Lines (Ckm)	
	Planned	Achieved	Planned	Achieved
400KV	1	0	633	304
220KV	4	5	723	502
132KV	1	1	10	65
66KV	114	114	1104	1288
Total	**120**	**120**	**2470**	**2160**

Major transmission lines commissioned in FY 2013-14



Major transmission lines commissioned in FY 2013-14

SR. NO.	NAME OF LINE & (Type of Conductor)	No. of Ckts	Length (Ckm)
A	**400kV SCHEME**		
1	400kV Vadinar(Essar)-Amreli with ACSR Twin Moose Conductor (Package-I)	D/C	117
B	**220 kV SCHEME**		
1	220kV D/C Nakhatrana - Varsana line with AL-59 Conductor	D/C	214
2	220kV Otha - Sagapara line with ACSR Zebra conductor	D/C	96
3	220kV D/C BECL - Sagapara line with ACSR Zebra conductor	D/C	83
4	LILO of 220kV S/C Savarkundla-Vartej at BECL with ACSR Zebra conductor	D/C	57
5	220kV LILO to Sadla from Chorania - Gondal line with ACSR Zebra conductor	D/C	59
6	LILO of one circuit of 220kV D/C Wanakbori – Asoj line at Vyankatpura (Jarod) S/S with ACSR Zebra conductor	D/C	28
7	LILO of both circuits of 220kV D/C Hadala - Halvad line at 220kV Sartanpar S/S on M/C towers with ACSR Zebra conductor	2xD/C	51
8	220 kV D/C Tappar - Shivlakha line LILO at PS-3 line with ACSR Zebra conductor	D/C	3
9	220kV LILO at Popada from Navsari - Vav line with ACSR Zebra conductor	D/C	18
10	LILO Of 220kV Halvad - Bhimasar D/C Line at 400kV Halvad S/S with M/C Towers.	2xD/C	18

Major Substations commissioned in FY 2013-14

S. No.	Name of Sub-Station	Voltage Ratio (kV/kV)	Capacity (MVA)
1	220 kV Venkatpura (Jarod)	220/66	100
2	220 kV Sartanpar	220/66	160
3	220 kV Popda	220/66	100
4	220 kV PS 3 (Bhachau)	220/11	50
5	220 kV Karjan	220/66	100
6	132 kV Vakhatpar	132/66	25

Major Reactors commissioned in FY 2013-14

Sr. No.	Name of Substation	Reactor (MVAR)
1	400 kV Kansari	125
2	400 kV Chorania	125
3	400 kV Amreli	125
4	400 kV Vadavi	125
5	400 kV Hadala	125
6	400 kV Varsana	125
7	400 kV Jepur	63
8	400 kV Kosamba	80

Augmentation in FY 2013-14

Sr. No.	Name of Substation	MVA
1	132 & Above kV	1667.5
2	66 kV	2190

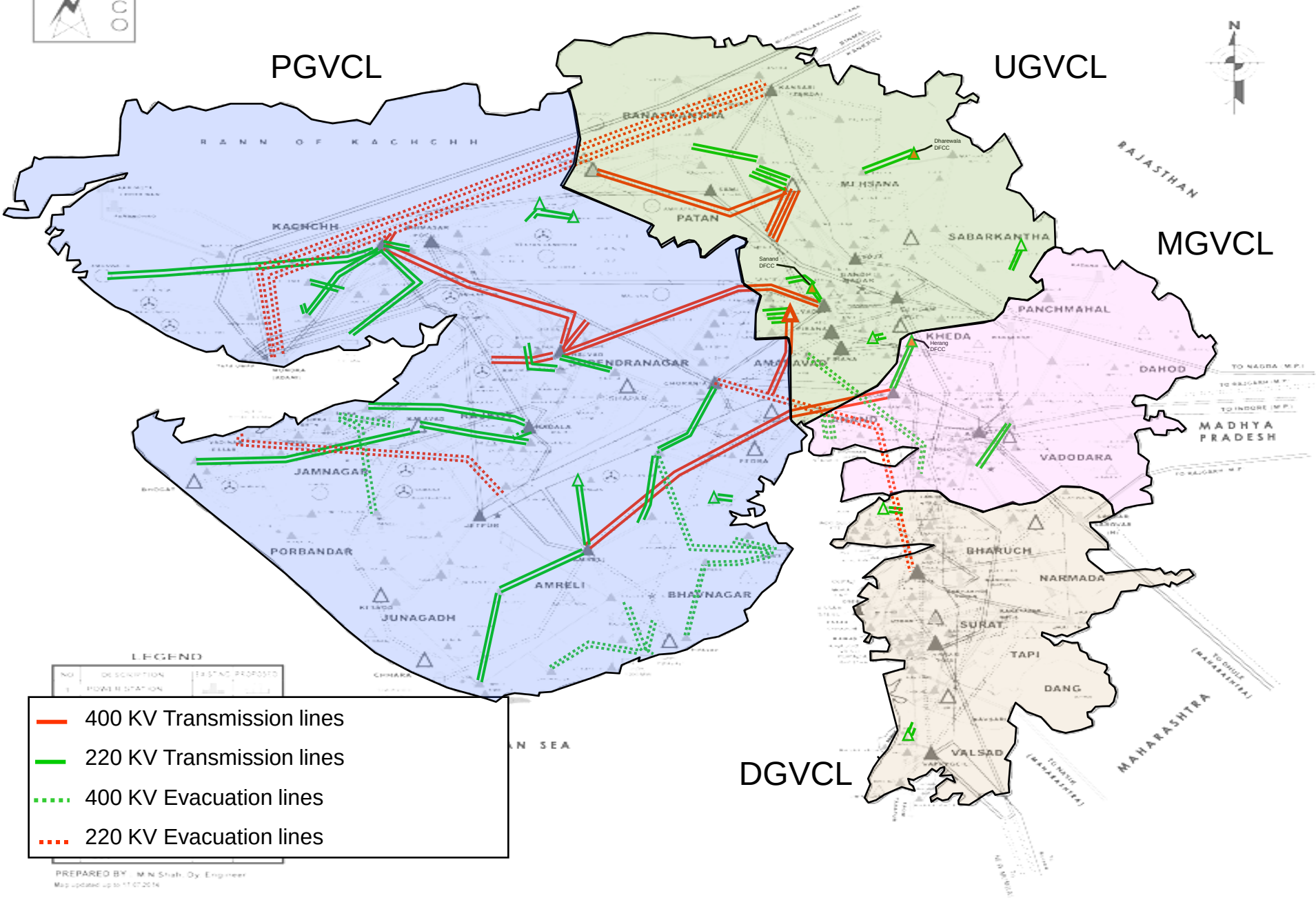
3

Planning of 2014-15

Substation & Transmission Line FY 2014-15

Sr. No.	Voltage Class	Substation (Nos)	Tr. Lines (Ckm)
1	400 KV	1	432
2	220 KV	5	1000
3	132 KV	1	10
4	66 KV	93	600
Total		**100**	**2042**

Ongoing Evacuation & System Strengthening Lines



Ongoing System Strengthening Lines

Sr. No.	Name of Generating Station & associated Transmission lines	Length in Ckm.	Target
1	400KV Mundra - Hadala LILO to Halvad	89.40	Dec-14
2	400KV D/C Amreli - Kasor line	470.55	Mar-15
3	LILO of one ckt. of 400KV D/C Mundra-Zerda line at 400KV Varsana S/S	5.60	Aug-14
4	400kV D/C Charanka - Veloda (Sankhari) line	199.24	Oct-14
5	400kV D/C Vadavi - Halvad Line	290.82	Dec-15
6	400kV D/C Varsana - Halvad Line	237.19	May-16
7	LILO of one ckt of 400kV D/C Mundra-Chorania line at 400kV Halvad S/s	2.61	Nov-15
8	LILO of one ckt. of 400kV D/C Vadavi-Zerda line at Veloda (Sankhari) S/s	29.30	Mar-15
9	LILO of one ckt. of 400kV D/C Kosamba-Chorania line at 400kV Sanand-II GIDC S/s.	90.00	May-16
10	220KV LILO to Kukma from Shivlakha-Nanikhakhar line	34.00	--
11	220KV D/C Halvad - Sadla line	76.00	Dec-14
12	220KV D/C Bhatiya - Kalawad line	238.00	Dec-14
13	220KV D/C Kalawad - Kangasiyali line	111.88	Dec-14
14	Termination of one D/C line of 220KV 2xD/C Achhaliya-Jambuva line at Vyankatpura (Jarod) S/S	68.39	Dec-14

Ongoing System Strengthening Lines

Sr. No.	Name of Generating Station & associated Transmission lines	Length in Ckm.	Target
15	220KV D/C SSNNL PS-1 to PS-2 line	21.96	Sep-14
16	220kV Shivlakha - Deodar Line LILO at SSNNL PS-2	43.40	Dec-14
17	220kV D/C Charanka - Jangral Line (AP-13/0 To Jangral)	190.96	Dec-14
18	220kV LILO at Suva from Kosamba - Mobha Line	115.24	Sep-14
19	220KV D/C Visavadar - Timbdi line	185.04	Aug-14
20	220KV D/C Varsana - Jamanwada line	350.00	Sep-14
22	220kV D/C Amreli - Sukhpar line with AL-59 conductor	79.60	Aug-14
23	220kV D/C Bhadreshwar - Varsana line with AL-59 conductor	2x41 + 2x11 = 140.00	Dec-14
24	220kV Vadavi-Chhatral line LILO at 220kV Santej S/s (Work for Initial part from Santej)	7.40	Mar-15
25	220kV Vadavi-Chhatral line LILO at 220kV Santej S/s	43.26	Mar-15

Ongoing System Strengthening Lines

Sr. No.	Name of Generating Station & associated Transmission lines	Length in Ckm.	Target
26	220kV LILO to Atul from Navsari-Bhilad line	8.64	Oct-14
27	220kV Morbi-Lalpar line LILO at 220kV Sartanpar S/s	16.42	Sept-14
28	220kV Vadavi-Sanand DFCC line	61.08	Apr-15
29	220kV Botad-Chorania line	103.24	Oct-15
30	Both ckt of 220kV Viramgam-Bhat line LILO at 400kV Sanand S/s	12.17	Aug-14
31	220kV Jamnagar-Hadala line	139.14	Nov-15
32	220kV Tappar-Nani Khakhar line LILO at Mokha S/s	20.84	Nov-14
33	220kV Varsana-Mokha line	2x41.0 + 2x12.0 = 106.00	Oct-14
34	220kV Amreli-Dhasa line LILO at 220kV Botad S/s	99.98	May-15
35	LILO of 220kV Sankhari-Jangral line at Veloda (Sankhari) S/s	51.88	Jan-15
36	220kV D/C Kasor-Herang (DFCC) line	36.80	Jan-15
37	220kV Botad-Vartej LILO at Vallabhipur S/s	1.94	Sep-14
38	220kV D/C Visavadar - Amreli line	132.06	Feb-16
39	220kV D/C Varsana-Bhachau line	62.38	-
40	LILO of Both ckt of 220kV D/C Kadana-Dhansura line at 220kV Modasa S/s on M/C Tower	22.13	Feb-15

Ongoing System Strengthening Lines

Sr. No.	Name of Generating Station & associated Transmission lines	Length in Ckm.	Target
41	LILO of 220kV Nyara-Kangasiyali line at 400kV Hadala S/s.	33.12	May-15
42	220kV D/C Kheralu-Dharewada (DFCC) line	53.36	Nov-15
43	LILO of 220kV Karamsad-Ranasan line at 220kV Barejadi S/s.	14.92	Aug-14

4 Step towards Smart Grid

Adoption of Smart Grid Technology

Smart Grid technologies adopted	Status
Substation Automation System - Human interface at limited points, Manpower optimization	Installed in 21 Nos. of substations 400 KV – 3 Nos, 220 KV – 13 Nos, 66 KV – 5 Nos. Work in progress for more 9 Nos of substations
Optical CT and merging units – A step towards Digital Substation for better reliability and availability	1) Two pilot projects of 220KV Optical CT completed at 220 KV Jambuva and Lunawada substations. 2) One pilot project of Analog Merging Unit with conventional CT & PT and Intelligent Control Unit for Circuit Breaker and Isolators commissioned in one line bay at 400 KV Asoj substation
OPGW – The communication highway (13159 Km) & Replacement of Conventional PLCC to FOTE	105 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 – 2 Substations (Shashtri Maidan, Rajkot and Lal Banglow, Jamnagar) – Already commissioned. Work in one more substation (66 KV Bhalka) in progress 220KV GIS - Work in progress (Atul substation) 220 KV Hybrid – 2 Substations (Sartanpar and Suva) commissioned
High Capacity Conductor	AL 59 permanently adopted for 220 kV. **431 KM already commissioned.**
Geographical Information System (GIS) – Better network planning and asset management	Project completed for 400 KV, 220 KV and 132 KV Lines. For 66 KV Lines – 54% completed, rest of work is in progress.
Reactive power compensation – Quality power	4964 MVAR installed

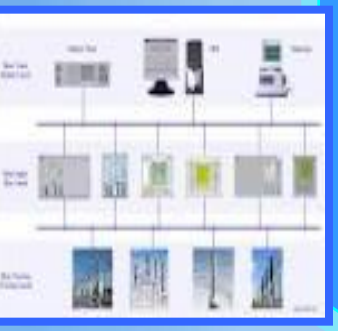
Adoption of Smart Grid Technology

Transmission technologies

- Innovative Conductor
- Network Capability Assessment
- OPGW

Power System Operation

- Grid monitoring & control
- Decision making process mechanism & tools
- Grid Stabilization System- Efficient operation
- Reactive Power Mgmt
- Automatic Demand Side Mgmt (ADMS)
- RE Integration - RECC



Protection and Automation

- IEC 61850 Process bus – Intelligent primary equipments
- Unmanned S/S
- Extensive Use of IT for protection and data transfer

Asset Management

- Asset mapping
- Condition Monitoring (offline / online)
- Expert System for diagnostics analysis
- Health Index

Nanotechnology

Insulating Oil :

- Dielectric Strength and increased heat conductivity
- Vegetable Oil as Insulating Medium

Conductors:

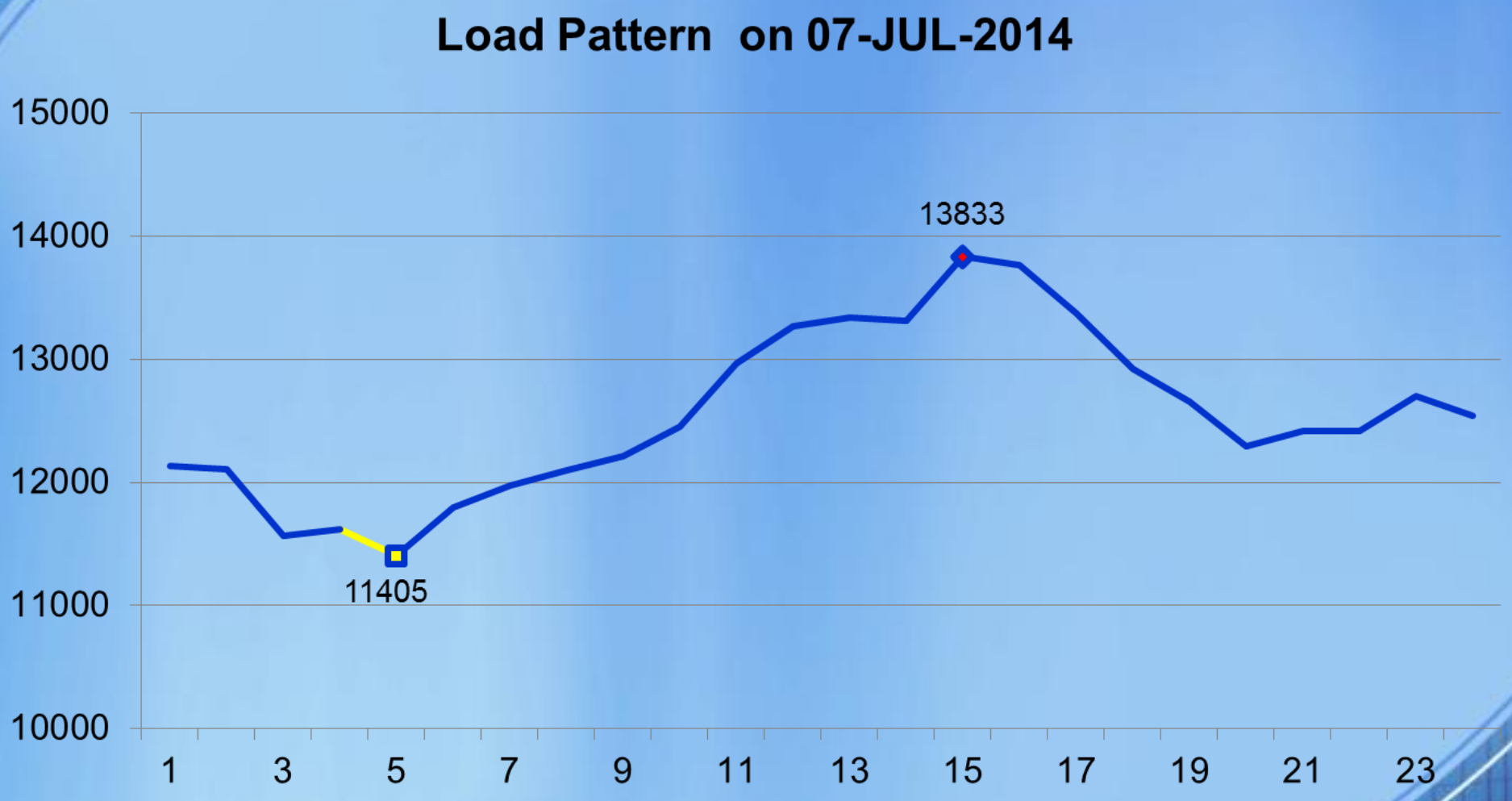
- Mechanical Strength
- Low loss conductor material

Earthing:

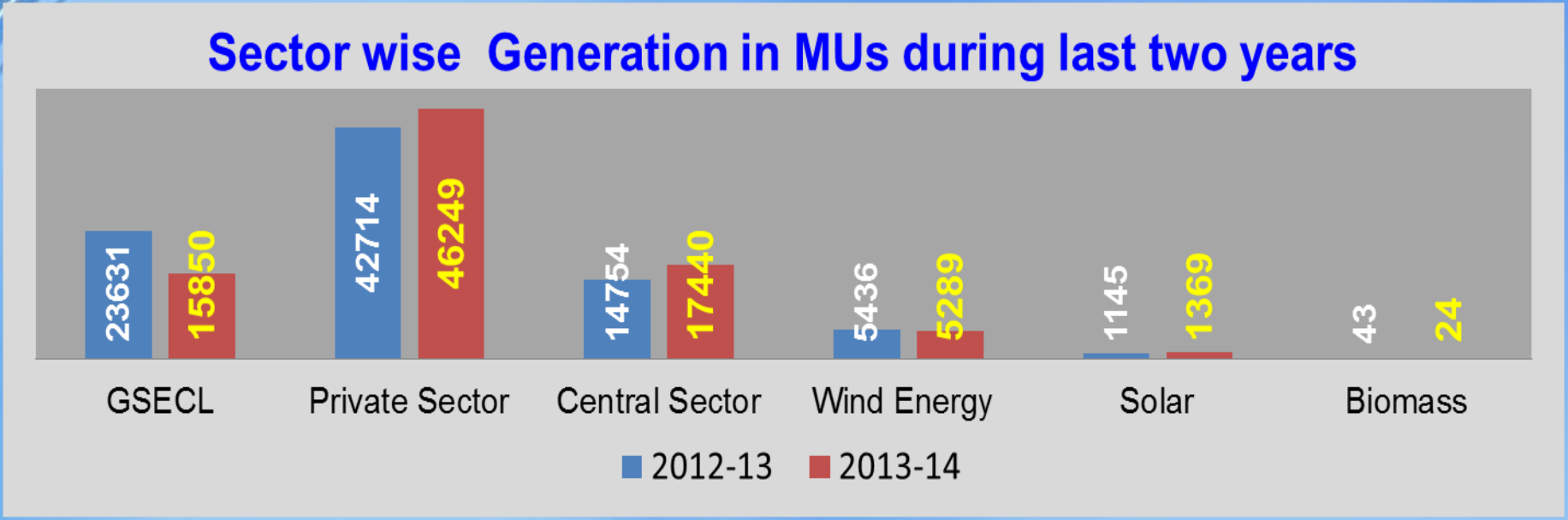
- Reduced Soil resistivity

5 System Performance

Ever highest State Demand Catered on 07.07.2014 (13833 MWH)



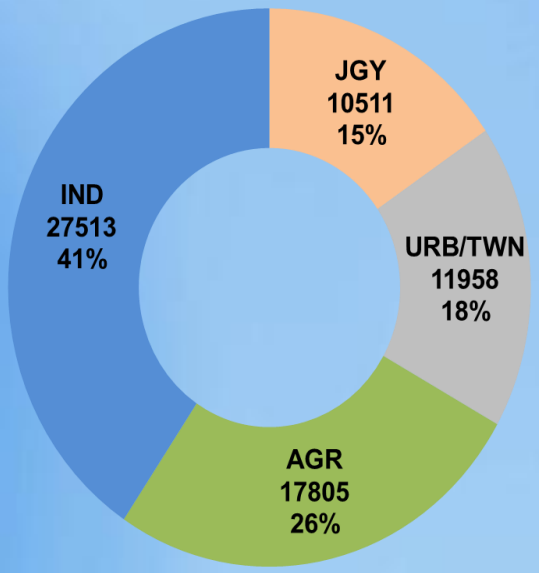
Generation & Supply in FY 2013-14



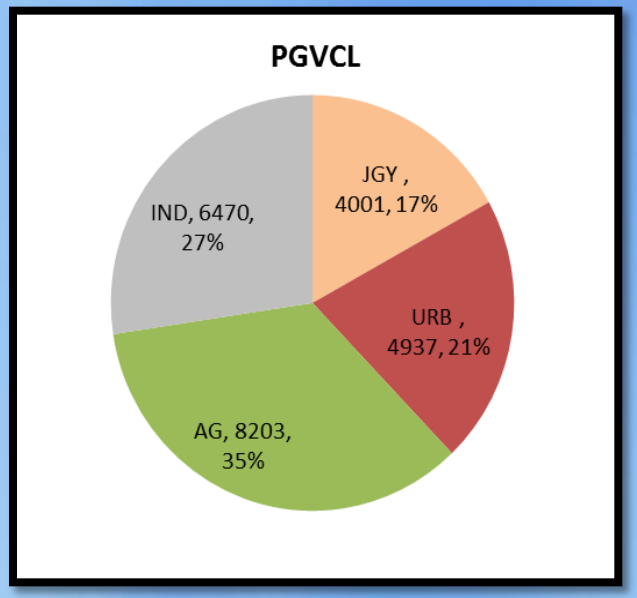
Discoms wise Energy supplied during FY 2013-14						
	PGVCL	**UGVCL**	**MGVCL**	**DGVCL**	**TPSEC**	**TPAEC**
MUs	23610	17354	9785	17038	3352	7209
% of Total	*31*	*22*	*12*	*22*	*4*	*9*

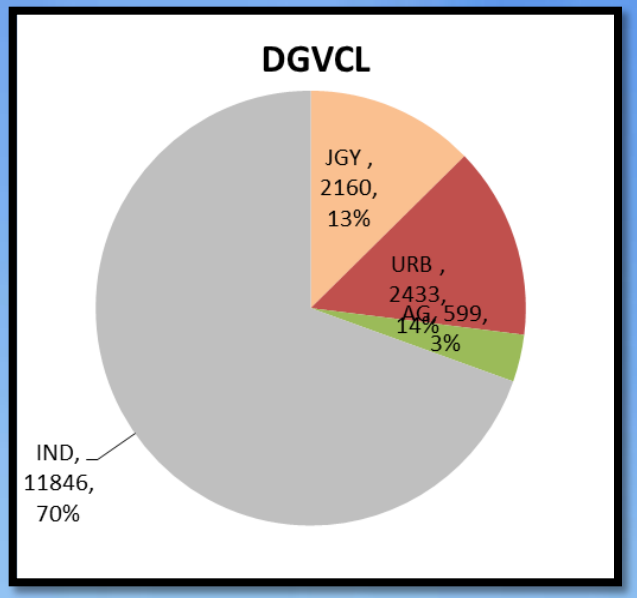
2012-13: 87723 MUs **2013-14: 86221 MUs**

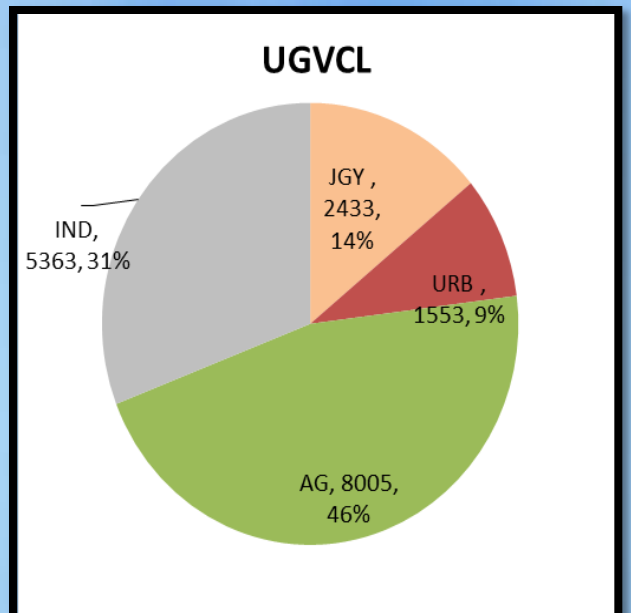
Category wise energy distribution Year 2013 -14

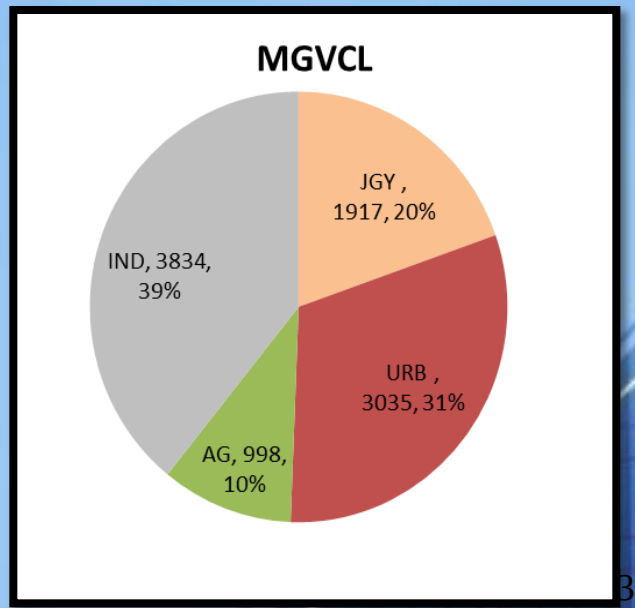


Category wise energy supplied Year 2013-14



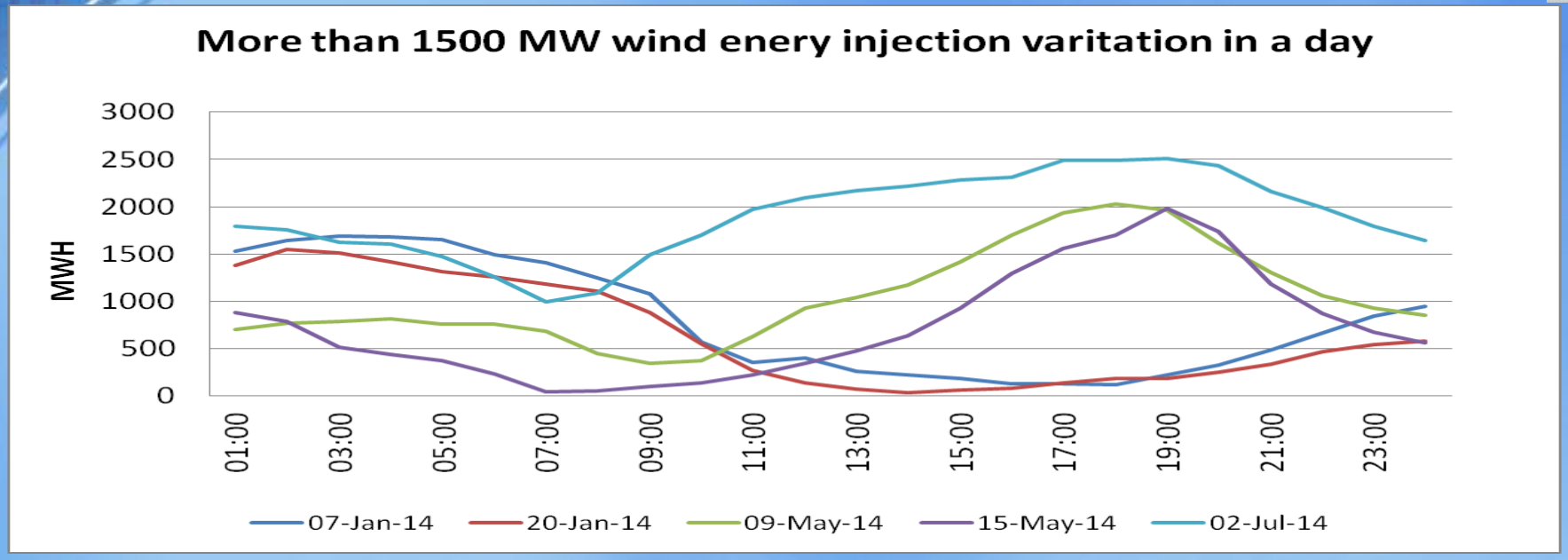


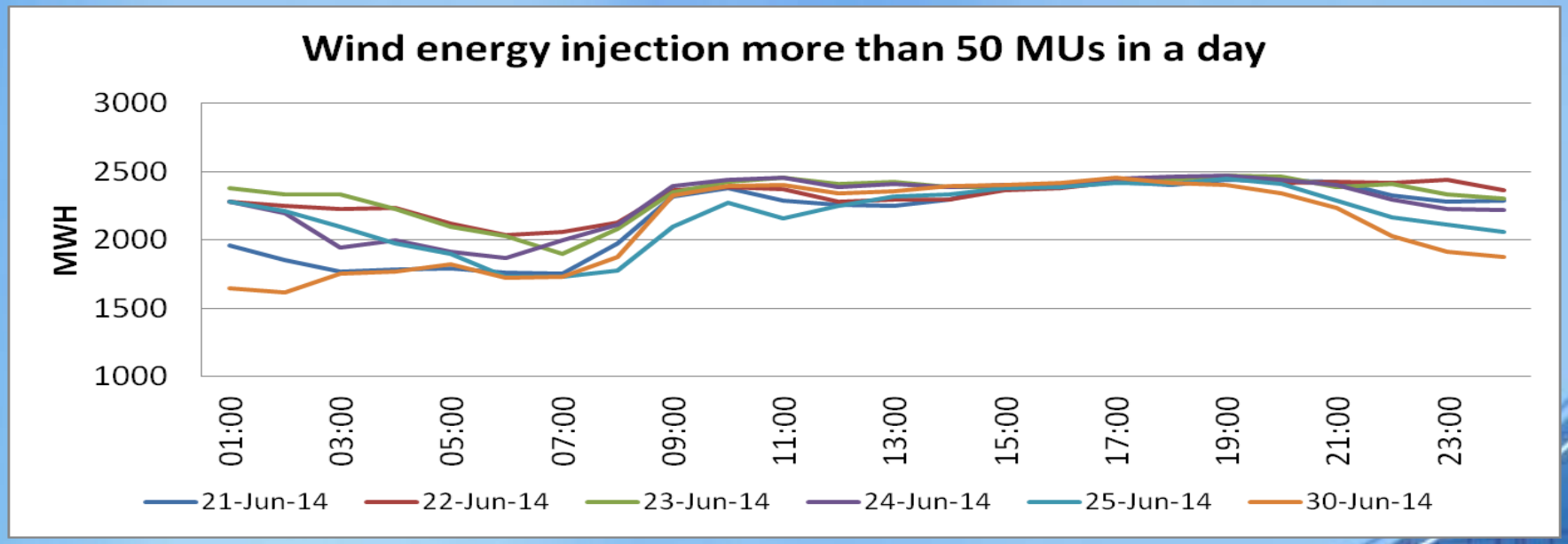




6 Renewable Energy Effect

RE generation variation: Grid Operation Challenges





Grid Operation Complexity

Year	No of days when variation between Maximum and Minimum *demand*		No of days when variation between Maximum and Minimum *wind generation*
	>2000 MW	>1500 MW	>1000 MW
2011-12	51	159	11
2012-13	104	259	60
2013-14	114	260	82

- Variation of 1000-1200 MW RE generation & 2000 MW variation in demand in a day is quite common.
- Such variation in the system is persistent and is handled by continuously, generation regulation, optimizing the operation of lines, ICTs and shunt elements like capacitors and reactors.

Grid Operation challenges due to uncertainty of wind generation:

- Require more reserve capacity of conventional plant on bar to handle RE (must run status).
- Frequent regulations / start -stop of the conventional generation. It leads to additional HFO consumption, more wear and tear and inefficient operation.
- EHV lines / ICT constraints
  - During high wind injection: Critical loading on 400 D/C KV APL – Dehgam, 400 KV S/C Kasor – Chorania, 220 KV D/C Tappar – Shivalakha, 400/220 KV ICTs at APL, 220 KV S/C Chorania – Salejada, 132 KV S/C Sikka – Bhatia & 132 KV S/C Khambhalia - Jamnagar etc.
  - During low wind injection: Critical loading on 220 KV D/C Hadala – Nyara, ICTs at Jetpur and Amreli S/S, 220 KV D/C Amreli – Savarkundla etc.
- Operation of costly fuel plant in the event of sudden drop in RE.
- Renewable Regulatory Fund (RRF) mechanism to be repatriated.

7 Deviation Settlement Mechanism

Charges for deviation as per Hon'ble CERC regulation w.e.f. 17.02.14

No over drawl is allowed. Overdrawl @ 16.48 Rs / KWh i.e. 100% additional charge of Freq 49.70 Hz

Frequency range								
49.70	49.75	49.80	49.85	49.90	49.95	50.00	50.05	50.10
Rate in Rs per KWh								
8.24	6.99	5.94	4.90	3.86	2.82	1.78	0.00	0.00

Under drawl / over injection Penalty @ 1.78 per KWh

Causes for Over drawl:

- Drop in Wind Injection.
- Tripping of large size units.
- Schedule Variations at Regional PP:
  - Adani To Haryana (Increase)
  - Short Term (Purchase/Sale)
  - Effect of ISGS schedule variation

Under drawl/ over injection is payable up to 12 % of schedule or 150 MW but beyond this, it is Zero

If 12% of drawl schedule is more than 150 MW, then additional charges is as below:

- OD in range (150 to 200 MW) 20% additional charges
- OD in range (200 to 250 MW) 40% additional charges
- OD more than 250 MW , 100 % additional charge

If 12% of drawl schedule is less than 150 MW, then additional charges is as below:

- OD in range (12% to 15%) 20% additional charges.
- OD in range (15% to 20%) 40% additional charges.
- OD more than 20%, 100 % additional charge

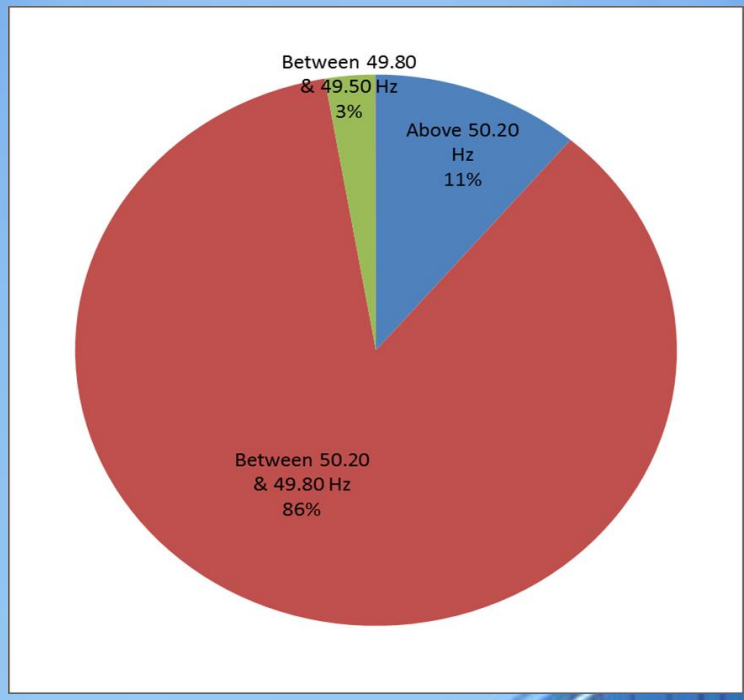
Causes for Under drawl:

- High Wind Injection.
- Schedule Variations at Regional PP:
  - Adani To Haryana (Decrease)
  - Short Term (Purchase/Sale)
- Effect of ISGS schedule variation

Sustain deviation from schedule in one direction (+/-) of entity, entity shall have to make sign change at least once after every 12 time block.

DATE	No of time Block		
	U /D @ 50.10 Penalty	U /D > 150 MW Loss of revenue	Minimum / Maximum wind
17-Feb-14	28	33	172 / 851
18-Feb-14	6	22	75 / 838
19-Feb-14	8	38	45 / 438
20-Feb-14	3	45	74 / 576
21-Feb-14	8	35	80 / 686
22-Feb-14	12	31	179 / 1221
23-Feb-14	29	26	612 / 1629
24-Feb-14	15	16	586 / 1670
25-Feb-14	2	13	102 / 1312
26-Feb-14	8	44	65 / 1130
27-Feb-14	18	30	119 / 1123
28-Feb-14	9	21	107 / 1062
01-Mar-14	1	31	87 / 680
02-Mar-14	3	16	82 / 422
03-Mar-14	7	18	71 / 466
04-Mar-14	9	31	190 / 972
05-Mar-14	3	18	120 / 1261
06-Mar-14	9	25	155 / 1157
07-Mar-14	9	31	297 / 1303
08-Mar-14	1	30	352 / 1147
09-Mar-14	4	4	75 / 575
Out of (7days*3weeks*96blk) = 2016	192	558	
Percentage %	9.52	27.68	

Loss of revenue for Under drawl because of wind injection, etc.



DATE	Time Block		
	O /D > 150 MW	*O / D @ below 50.05Hz & > 150 MW Addl Penalty*	Mimimum / Maximum wind
17-Feb-14	9	7	172 / 851
18-Feb-14	12	3	75 / 838
19-Feb-14	6	5	45 / 438
20-Feb-14	3	3	74 / 576
21-Feb-14	5	1	80 / 686
22-Feb-14	12	7	179 / 1221
23-Feb-14	15	5	612 / 1629
24-Feb-14	23	16	586 / 1670
25-Feb-14	21	19	102 / 1312
26-Feb-14	9	9	65 / 1130
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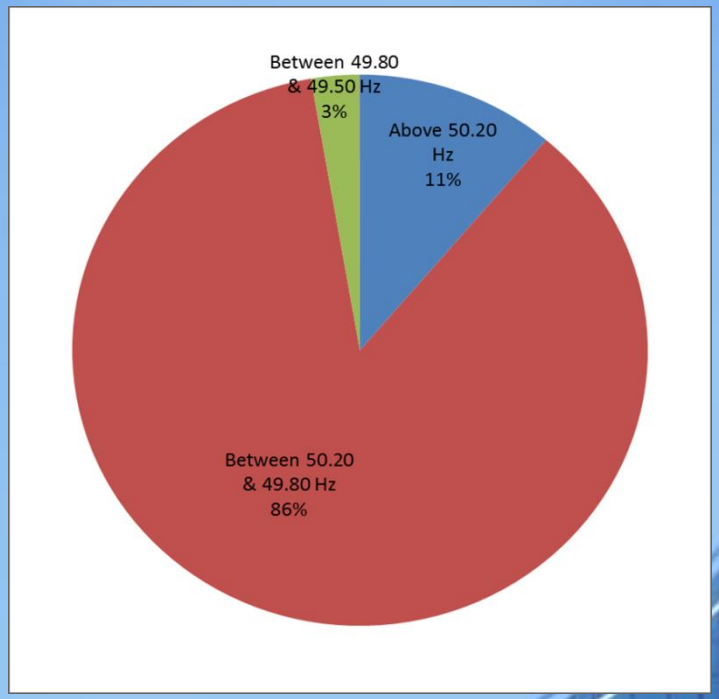
04-Mar-14	6	6	190 / 972
05-Mar-14	15	8	120 / 1261
06-Mar-14	14	9	155 / 1157
07-Mar-14	16	14	297 / 1303
08-Mar-14	10	8	352 / 1147
09-Mar-14	44	42	75 / 575
Out of (7days*3weeks*96blk) = 2016	291	199	
Percentage %	14.43	9.87	

Additional Charges for over drawl because of sudden drop of wind energy and tripping of larger sized units.



Deviation Settlement Mechanism: Issues and challenges

1. Tripping of bigger size units and sudden reduction in generation from the abundant renewable energy sources may lead to over drawl more than 150 MW now and then.
2. Merchant capacity of private players in the State with around 2000 MW capacity meant for outside the State plays a significant role in drawl schedule of the State.
3. During rainy season, in night hours huge drop & high wind energy injection is observed. In spite of shutting down many of the State generating units, keeping the running units at coal minimum and also reducing share of ISGS units, under drawl of the States would remain more than 150 MW continuously.
4. There is no scope of revision in collective transaction schedule in case of generator tripping.
5. In Gujarat State, around 75 % installation of renewable sources have not been covered under RRF mechanism. Their unforeseen variation also cause substantial deviation at State periphery.

8 Network Constraints

Network Constraints in Gujarat Grid

1. Generation capacity of the order of 2500 MW, which otherwise was served to consumers at 220 KV / 132 KV level remains unutilized most of the time due to costly fuel (Gas). Hence, there are always severe constraints in Central & South Gujarat system. Particularly, loading on following elements remains on higher side:
    - 400/220 KV 500 MVA ICTs at Asoj
    - 220 KV S/C Asoj – Jambuva line
    - 220 KV D/C Ukai – Mota,
    - 220 KV S/C Kosamba – Kim
    - 220 S/C KV Kosamba – Vav
    - 220 KV S/C Zagadia – Kim
    - 132 KV D/C Asoj - Fertilizer

    500 MW additional despatch from Jhanor, Kawas, CLPIPL and GIPCL would certainly help to improve system stability & reliability and to meet any contingency in Central & South Gujarat pocket

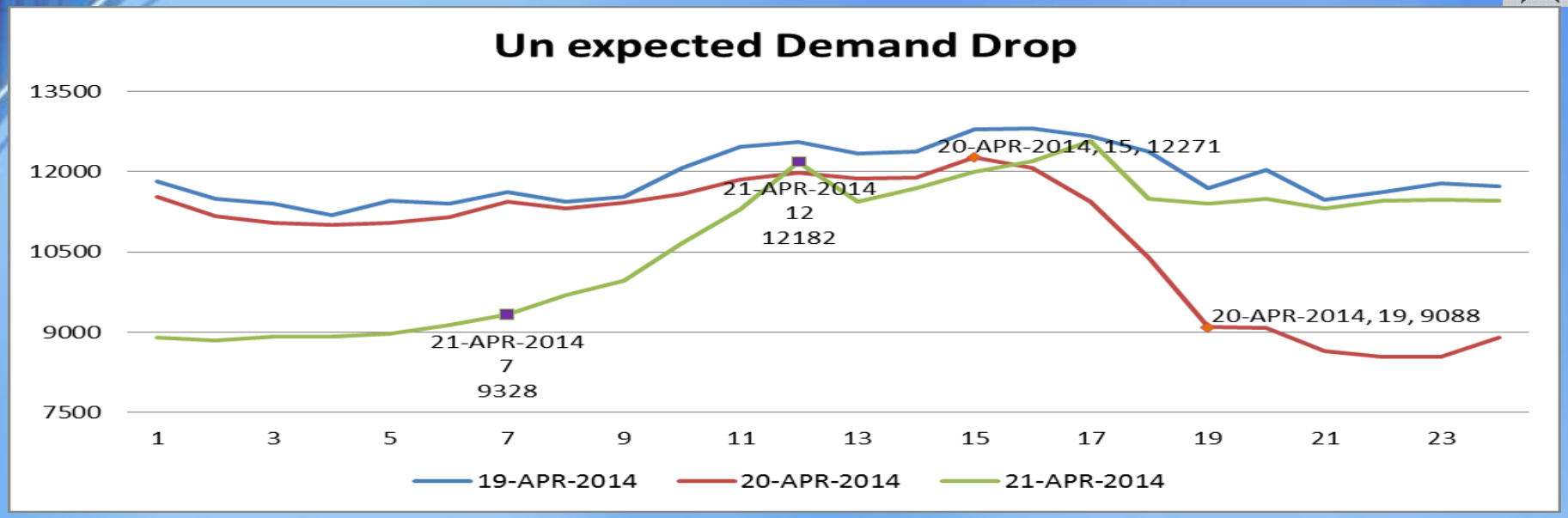
Transmission constraints in Gujarat Grid

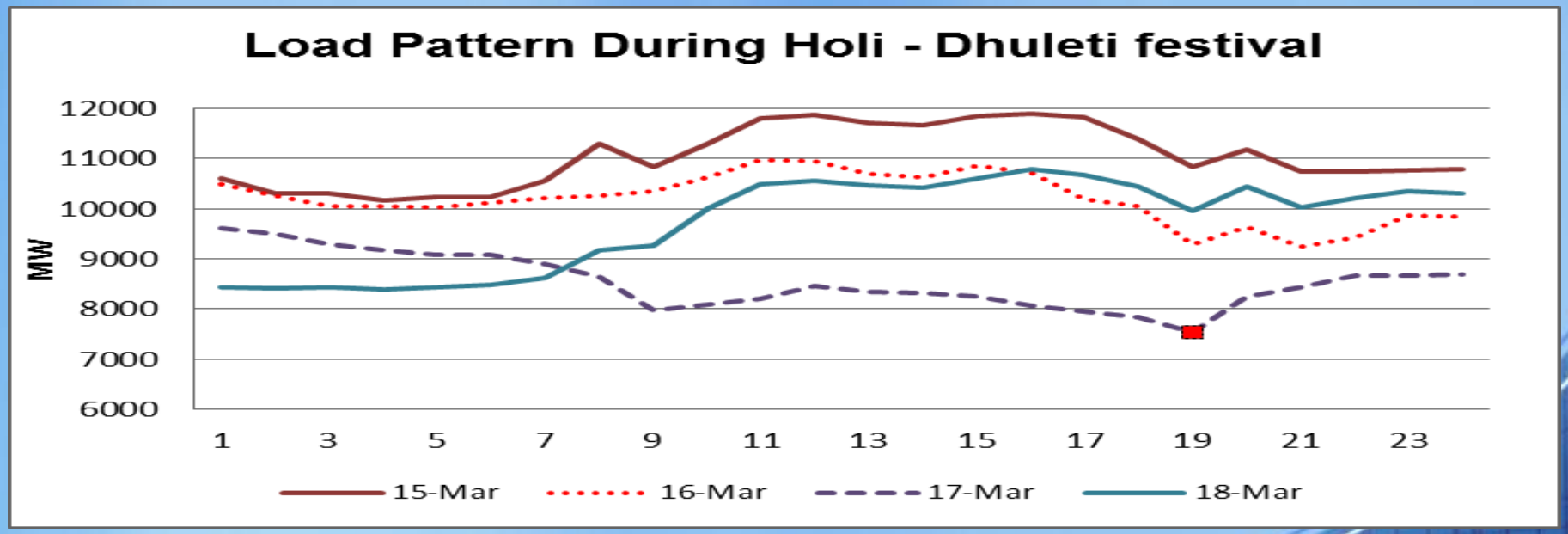
2. During high wind injections, the loading on following elements observed on higher side:
   - 400 KV D/C APL – Dehgam line
   - 400 KV S/C Chorania – Kasor line
   - 220 KV S/C Deodar – Charanka line
   - 220 KV S/C Chorania – Salejada line
   - 132 KV S/C Khambhalia – Jamnagar line
   - 132 KV S/C Sikka – Bhatia line
   - 2 x 400/220 KV 315 MVA ICTs at APL (Step up of the order of 250 to 270 MW on each ICT)
   - 220 KV S/C Vadavi –Chattral line

During low wind injection & high demand in PGVCL, the loading on following elements observed on higher side:

- ICTs at Amreli S/S.
- 220 KV D/C Hadala – Nyara line.
- 220 KV D/C Amreli –Savarkundla line
- 220 KV S/C Jetpur – Gondal line

Grid Operation Challenges






Thank You

Status of Transmission Lines for Power Evacuation

Sr. No.	Name of Generating Station & associated Transmission lines	Length in Ckm.	PRESENT STATUS (As on 31.07.14) % Completion	Revised Target	Remarks
1	**Ukai Extension (500MW) - C.O.D. Oct'12**				
i	400KV D/C Kosamba–Chorania line **(Package-I)**	222.40	100%	**Commissioned on 05.07.14**	
	400KV D/C Kosamba–Chorania line **(Package-II)**	234.60	100%		
	Total	**457.00**	**100%**		
2	**Dhuvaran CCPP-III (360 MW) – C.O.D. Jul'13**				
i	LILO of 220KV Karamsad – Vartej S/C at Dhuvaran CCPP-III	78.08	100%	**Commissioned on 02.05.14**	
ii	LILO of 220KV Kasor – Botad S/C at Dhuvaran CCPP-III	82	48%	**WIP**	

Status of Transmission Lines for Power Evacuation

Sr. No.	Name of Generating Station & associated Transmission lines	Length in Ckm.	Present Status (As on 31.07.14)	Revised Target	Remarks
			% Completion		
3	**Adani Power, Mundra (Bid-02) (2011-12) (1000 MW) Feb'12**				
i	400kV D/C Mundra-Zerda Line No. 1 **(Package-I)**	160	44%	Jun-15	W I P
	400kV D/C Mundra-Zerda Line No. 1 **(Package-II)**	190	26%	Jun-15	W I P
	400kV D/C Mundra-Zerda Line No. 1 **(Package-III)**	314	30%	Jun-15	W I P
	Total	**664**	33%		
ii	400kV D/C Mundra-Zerda Line No. 2	662	85%	Mar-15	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 31.07.14) % Completion	Revised Target	Remarks
4	**GSPC Pipavav Power Co. Ltd. C.O.D. - Apr'13 (1x350 MW)**				
i	220KV D/C GPPC – Dhokadva line	100	80%	Nov-14	W I P (Severe RoW)
ii	LILO to GPPCL from 220KV Savarkundla – Otha Ckt. No.1*	90.5	100%	**Done (17.03.2012)**	
iii	LILO to GPPCL from 220KV Savarkundla – Otha Ckt. No.2*	82.6	100%	**Done (21.07.2012)**	
iii	220KV D/C Otha – Sagapara line	95.6	100%	**Done (05.06.13)**	

Status of Transmission Lines for Power Evacuation

Sr. No.	Name of Generating Station & associated Transmission lines	Length in Ckm.	PRESENT STATUS (As on 31.07.14) % Completion	Revised Target	Remarks
5	**Bhavnagar Energy Co. Ltd. (BECL), (2x300=600 MW)**				
i	220kV D/C BECL - Botad line	188.52	27%	Mar-15	WIP
ii	220kV D/C BECL - Sagapara line	82.40	100%	**Done (30.03.14)**	
iii	LILO of 220kV S/C Savarkundla-Vartej at BECL	56.20	100%	**Done (06.06.2013)**	

Status of Transmission Lines for Power Evacuation

Sr. No.	Name of Generating Station & associated Transmission lines	Length in Ckm.	PRESENT STATUS (As on 31.07.14)	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	58%	Dec-14	WIP
ii	LILO to Sikka from 220kV Jamnagar – Jetpur ckt. No.2	120.00	50%	Dec-14	WIP

Status of Transmission Lines for Power Evacuation

Sr. No.	Name of Generating Station & associated Transmission lines	Length in Ckm.	PRESENT STATUS (As on 31.07.14)	Revised Target	Remarks
			% Completion		
7	**Utran CCPP (374 MW): Commissioned - Nov'09**				
i	220KV D/C Gavasad - Salejada line	120.00	44%	Dec-14	WIP

Status of Transmission Lines for Power Evacuation

Sr. No.	Name of Generating Station & associated Transmission lines	Length in Ckm.	PRESENT STATUS (As on 31.07.14)	Revised Target	Remarks
			% Completion		
8	**Essar Power, Vadinar (Bid-3) (2011-12) (1000 MW)**				
i	400kV D/C Vadinar - Amreli line (Package-I)	116.85	100%	400kV Hadala-Jetpur made LILO at Amreli through Vadinar-Amreli line (Pkg-1) at Amreli S/s on 22.11.13 (Stop Gap).	
ii	400kV D/C Vadinar - Amreli line (Package-II)	118.22	94%	Aug-14	WIP
iii	400kV D/C Vadinar - Amreli line (Package-III)	120.94	46%	Mar-15	WIP

THE 15th MEETING OF THE CO-ORDINATION FORUM

Date : 06th August 2014

STATUS OF RPO

PRESENTATION BY:

GUJARAT ENERGY DEVELOPMENT AGENGY

Draft Amendment to RPO Regulation, 2010

- The Commission has proposed the following trajectory for the RPO.

	Minimum Quantum of purchase (in %) from renewable sources (in terms of energy in kWh)			
Year	**Wind**	**Solar**	**Other**	**Total**
2010-11	4.5	0.25	0.25	5.0
2011-12	5.0	0.5	0.5	6.0
2012-13	5.5	1.0	0.5	7.0
2013-14	5.5	1.0	0.5	7.0
2014-15	6.25	1.25	0.5	8.0
2015-16	7.0	1.5	0.5	9.0
2016-17	1.75	1.75	0.5	10.0

Obligated Entities for year 2012-13, 2013-14 & 2014-15

(1) GUVNL (MGVCL+PGVCL+UGVCL+DGVCL)

(2) Torrent Power Ltd. (A,bad + Surat)

(3)Torrent Energy Ltd. (Dahez, SEZ)

(4) Jubilant Infrastructure Ltd.

(5) Aspen Infrastructure Ltd.

(6) Kandla Port Trust

(7) MPSEZ Utilities Pvt. Ltd.

Status Report for RPO Compliance of Obligated Entities for the Year 2012-13

(1) GUVNL - MUs consumed during 2012-13- 65711 MUs								
	RPO-2012-13 %	Required MUs	Shortfall MUs of 2011-12 carried forward	Total MUs required to be purchased in 2012-13	Revised RPO %	Purchased MUs	Shortfall, MUs	RPO Achieved %
Solar	1.00	657	147	804	1.22	1162	-358	1.77
Non Solar	6.00	3943	689	4632	7.05	3387	1245	5.15
(2) TPL (Ahmedabad + Surat) MUs consumed during 2012-13- 10110 MUs								
Solar	1.00	101	47.83	149	1.47	0.09	149	0.001
Non Solar	6.00	606.60	2.25	609	6.02	385.39	223	3.812
(3) Torrent Energy (Dahej)- MUs consumed during 2012-13 - 67.09 MUs								
Solar	1.00	0.671	0	0.671	1.00	0	0.67	0.000
Non Solar	6.00	4.025	0	4.025	6.00	1	3.03	1.491

Status Report for RPO Compliance of Obligated Entities for the Year 2012-13

(4) **M/s. MPSEZ Utilities Pvt. Ltd**.: M/s MPSEZ has consumption of 146.53 MUs during the year 2012-13. Total RPO obligation for the year 2012-13 is 8.79MUs for Non-Solar and 1.47 MUs for Solar. M/s MPSEZ has not fulfilled any obligation for the year 2012-13 hence there is total shortfall of 10.24 MUs for the year 2012-13.

(5) **M/s. Jubiliant Infrastructure Ltd:** M/s Jubiliant Infrastructure Ltd have informed that they have purchased Power from DGVCL during the year 2012-13, hence RPO is not applicable to them. For year 2013-14 they have signed agreement with DGVCL for purchase of power, hence RPO would not applicable for the year 2013-14.

(6) **M/s. Aspen Infrastructure Ltd:** Ms Aspen Infrastructure Ltd have informed that they have purchased power from MGVCL during the year 2012-13 , hence RPO is not applicable for year 2012-13.

(7) **M/s. Kandla Port Trust** have not fulfilled their RPO obligation for the year 2012-13.

Status Report for RPO Compliance of Obligated Entities for the Year 2013-14

(1) GUVNL- Consumption of Units During 2013-14 (April to March) - 65749 MUs							
	RPO 2013-14 %	Required MUs	Purchased MUs	REC`s Purchased Mus	Total MUs upto Present Quarter	Shortfall in MUs	RPO Achieved %
Solar	1.00	657	1362	0	1362	-705	2.07
Non Solar	6.00	3945	3280	0	3280	665	4.99
(2) TPL (Ahmedabad + Surat) - Consumption of Units During 2013-14 (April to March) - 10102.28 MUs							
Solar	1.00	101.02	4.12	2.56	6.68	94.34	0.07
Non Solar	6.00	606.14	96.35	363.00	459.35	146.79	4.55
(3) Torrent Energy (Dahej)- Consumption of Units During 2013-14 (April to March) - 88.55 MUs							
Solar	1.00	0.89	0	0.55	0.55	0.34	0.62
Non Solar	6.00	5.31	0	4.10	4.10	1.21	4.63
(4) MPSEZ Utilites Pvt. Ltd. - Consumption of Units During 2013-14 (April to March) - 176.82 MUs							
Solar	1.00	1.77	0	0	0	1.77	0
Non Solar	6.00	10.61	0	0	0	10.61	0

Status Report for RPO Compliance of Obligated Entities for the Year 2013-14

(5) **M/s. Jubilant Infrastructure Ltd:** M/s. Jubilant have signed an agreement with DGVCL for purchase of power for the year 2013-14. Hence, RPO is not applicable to them.

(6) **M/s. Aspen Infrastructure Ltd:** M/s. Aspen have been exempted for the RPO compliance for the year 2013-14.

(7) **M/s. Kandla Port Trust** has informed that as they are procuring power from PGVCL, they are not obligated for compliance of RPO.

Status Report for RPO Compliance of Obligated Entities for the Year 2014-15 (1st Quarter)

(1) GUVNL-							
	RPO 2014-15 %	Required MUs	Purchased MUs	REC`s Purchased Mus	Total MUs upto Present Quarter	Shortfall in MUs	RPO Achieved %
Solar	1.25						
Non Solar	6.75						
Particulars			Wind	Solar	Others	Total	
%RPPO			6.25%	1.25%	0.50%	8%	
Actual purchae for 1st Qtr (Mus)			1194	390.688025	18.63149	1602.935	
% Achieved at the end of 1st Qtr			6.95%	2.28%	0.11%	9.33%	
(2) TPL (Ahmedabad + Surat) - Consumption of Units During 2014-15 (April to June) - 3053.42 MUs							
Solar	1.25	38.17	16.86	0	16.86	21.31	0.55
Non Solar	6.75	206.11	26.92	0	26.92	179.19	0.88
(3) Torrent Energy (Dahej)- Consumption of Units During 2014-15 (April to June) - 30.15 Mus							
Solar	1.25	0.38	0	0	0	0.38	0
Non Solar	6.75	2.04	0	0	0	2.04	0
(4) MPSEZ Utilites Pvt. Ltd. - Consumption of Units During 2014-15 (April to June) - 52.22 MUs							
Solar	1.25	0.65	0	0	0	0.65	0
Non Solar	6.75	3.52	0	0	0	3.52	0

Status Report for RPO Compliance of Obligated Entities for the Year 2014-15 (1st Quarter)

(5) **M/s. Jubilant Infrastructure Ltd:** Details Awaited.

(6) **M/s. Aspen Infrastructure Ltd:** Details Awaited.

(7) **M/s. Kandla Port Trust:** Details Awaited.

THANK YOU

Presentation to Co-ordination Forum

Gujarat Power Sector Scenario

Gujarat : Power Scenario

Total Capacity (as on 01-04-13)	**:**	**18270 MW**
Capacity added in 2013-14	**:**	**240 MW**
Total Capacity (as on 01-4-14)	**:**	**18510 MW**
State	**:**	**7063 MW** (38%)
Centre share	**:**	**3840 MW** (21%)
IPP	**:**	**7607 MW** (41%)

Coal: 11960	***Gas: 4172***	***Hydro: 779***	***Lign: 1040***	***Nucl: 559***
64.61%	22.54%	4.21 %	5.62 %	3.02%

Projected Peak Demand in 2015 (13700 MW @ 8% growth)	***14,800 MW***
Installed Capacity Required by 2015 (at 80% PLF)	***18,500 MW***
Planned Capacity Addition by 2015	***2076 MW***
Capacity Available by 2015	***20,586 MW***
Surplus by 2015	***2086 MW***

Capacity Addition - 2013-14

Project	Dev.	Sector	Fuel	MW	COD
Mouda (Unit 2)	NTPC	Central	Coal	120	March 14
Vindhyachal IV (Unit 2)	NTPC	Central	Coal	120	March 14
Total				240	

Capacity Addition Plan 2014-15

Project	Dev.	Sector	Fuel	MW	Status/ Likely COD
Pipavav CCPP	GPPC	State	Gas	700	Ready for operation. No gas allocation.
Dhuvaran CCPP Ext – 3	GSECL	State	Gas	376	Ready for operation. No gas allocation.
Sikka Unit 3&4	GSECL	State	Coal	500	Oct-14 & Mar-15
Bhavnagar Energy Co (Unit 1 & 2)	BEECL	State	Lignite	500	Oct-14 & Dec-14
Total				2076	

Capacity Addition Plan

In MW

Year	State	Central	Private	Total	Cum. Add.
Capacity as on 01.4.2014					18510
14-15	2076	-	-	2076	20586
15-16	-	716	-	716	21302
16-17	-	400	-	400	21702
Total	2076	1116	-	3192	

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 01.4.2014	-	18510	12577 (A)
2014-15	2076	20586	17351
2015-16	716	21302	18475
2016-17	400	21702	19670

Gujarat - Renewable Capacity in MW

(As on 1.4.2014)

Source	Installed Capacity
Wind	3352*
Solar	887##
Biomass	31#
Small Hydel	7
Total	4277

- *Including 1284 MW WTGs set up for wheeling of power for captive use/ 3rd party
- * Including PPA of 205 MW under REC Mechanism
- # includes 1 MW plant set up for wheeling of power
- ## includes 30 MW Solar installed capacity of M/s Torrent Power Ltd.

Power purchase from Renewable Sources

RPPO for FY 2013-14 – As per MYT

In Million Units

2013-14 (PROV)	Wind	Solar	Others	Total
RPPO (%) – As per GERC	5.50%	1.0%	0.50%	7.00%
Energy Required to Meet RPPO (on Purchase of 65749 MUs)	3616	657	329	4602
Units Purchased (Actual)	3221	1371	78	4670
RPPO fulfilled	4.90%	2.09%	0.12%	7.10%

GERC has fixed Renewable Purchase Obligation as under:

Year	Wind	Solar	Others	Total
2014-15	6.25%	1.25%	0.5%	8%
2015-16	7.00%	1.50%	0.5%	9%
2016-17	7.75%	1.75%	0.5%	10%

Power Scenario of Gujarat

Particulars	2010-11	2011-12	2012-13	2013-14
Total Energy Catered (MUs)	71256	78651	87723	86221
Daily Max. Energy Catered (MUs)	237.4	251.8	274.6	286
Daily Max Catered (MW)	10461	11209	12348	12577
Wind Energy Generation (Mus)	2815	3960	5436	5288
Daily Max wind Energy (MW)	1350	1711	2208	2096
Average Frequency (Hz.)	49.82	49.80	49.93	50.03

Peak demand reached up to 13833 MW (7th July 14)

Thank You