

Venue: “Moneta Ball Room”, GIFT CITY Club and Business Centre, Tapas Marg, GIFT CITY, Gandhinagar

Date: 26th September, 2019

Time: 11:30 AM

The meeting started with welcome address by Hon’ble Chairman, GERC. It is emphasized that the meeting is important from the point of view of agenda items to be discussed which have significance in today’s scenario such as Renewable Energy integration into the grid and GETCO and SLDC’s preparedness for such grid integration.

Thereafter, discussions on agenda items took place.

Agenda Item No. 1: Approval of the minutes of the 20th Meeting of the Co-ordination Forum held on 11th July, 2018.

Minutes of the 20th Meeting was circulated to the members of the Forum and since no comments were received from any of the members of the Forum, the minutes were confirmed.

Agenda Item No. 2: Members were apprised about the issues deliberated during 20th Meeting of the Co-ordination Forum and directives issued to utilities on the basis of discussions. Action Taken Reports received from the concerned entities on the minutes of 20th Meeting of the Co-ordination Forum were discussed.

Item No. 2.1: Monitoring RPO compliance

Members of the Forum were apprised about judgment dated 05.05.2015 of the Hon’ble High Court of Gujarat in LPAs filed against order dated 12.03.2015 in SCA No. 171 of 2011. It was informed that as per the said judgment RPO Regulations are applicable to Open Access and CPP consumers until final decision in these LPAs. Accordingly, it was directed to the staff of the Commission to work out modalities whereby SLDC can verify RPO compliance by Open Access Consumers and Chief Electrical Inspector can verify RPO compliance by CPPs.

(Action: Staff of the Commission)

Item No. 2.2: Pending applications of railway crossing

Based on the discussions on pending electrification work due to pending applications of railway crossing, representative of Western Railways was directed to clear all such applications at the earliest and submit a report during next meeting.

The Representative of Railways raised the issue of non-acceptability of RBI Letter of Mandate in place of Letter of Credit/ Bank Guarantee towards Payment Security Mechanism. Director (Finance), GUVNL informed that the said Letter of Mandate is revocable at the instance of Railways and accordingly, it does not offer any payment security unless it is made irrevocable. It was decided that Western Railways shall approach their Finance Department to look into the issue get the Letter of Mandate modified so as to make it unconditional and irrevocable. Western Railways can approach to the Commission in case of any further requirements.

(Action: Western Railways)

Item No. 2.3: Establishment of more number of CGRFs

Feedback received from Members of CGRFs during last meeting to review performance of CGRFs and Ombudsman was shared with Distribution Licensees and it was advised to provide appropriate infrastructure and sufficient staff to CGRFs. It was also advised to ensure the presence of Convener to assist the CGRF members in the hearings.

Item No. 2.4: Mandatory installation of ELCB

For the issue of mandatory installation of ELCB for electrical installation of more than 2 kW, it was informed by Chief Electrical Inspector that a separate meeting will be scheduled with officials of Distribution Licensees to deliberate on this.

It was decided to amend the GERC Supply Code Regulations, 2015 to make installation of ELCB mandatory for all kind of electrical connections irrespective of contracted load. Staff of the Commission shall initiate the action in this regard.

(Action: Staff of the Commission)

Item No. 2.5: Establishment of Legal Cell

The Committee members were informed that issue of establishment of special cell in the Commission for providing clarity in some interpretation issue while implementing the orders/regulations is under deliberation.

Agenda Item No. 3: Status report on compliance of RPO target

GEDA made a detailed presentation apprising the Members about status of RPO compliance by obligated entities. Copy of the presentation is annexed as Annexure 1.

The representative of TERI also made a detailed presentation on RPO web tool being developed by TERI to monitor RPO compliance at national level. Copy of the presentation is annexed as Annexure 2. It was informed that relevant data of Open Access and CPP consumers have been received from GEDA, however, stakeholders interaction is necessary to make them aware about this web tool. Accordingly, it was decided that GEDA shall arrange a workshop in consultation

with TERI for all the stakeholders to make them conversant about the use of this web tool.

(Action: GEDA)

Agenda Item No. 4: Compliance status of GSECL and TPL in meeting environmental norms

GSECL made a detailed presentation in regard to steps taken to meet environmental norms set by Ministry of Environment, Forest and Climate Change, Government of India. Copy of the presentation is annexed herewith as Annexure 3.

It was informed by Torrent Power Limited that they have appointed Tata Consultancy to assist them in this regard.

Based on the discussions, it was decided to seek status report on compliance of environmental norms from generating stations having installed capacity of 100 MW and above.

(Action: Staff of the Commission)

Further, it was also decided that GUVNL and GSECL shall approach Ministry of Power, Government of India to seek support from Power System Development Fund (PSDF) for incurring expenditure to meet the environmental norms.

(Action: GUVNL, GSECL)

Agenda Item No. 5: Forecasting of RE and Amendments of CERC DSM Regulations

SLDC made a detailed presentation on their preparedness to accurately forecast RE and compliance of provisions laid down in fourth and fifth amendments of CERC DSM Regulations. It was informed that detailed analysis on financial implication before and after implementation of fifth amendment of CERC DSM Regulations will be carried out and shared with the Commission.

Copy of the presentation is annexed herewith as Annexure 4.

(Action: SLDC)

Agenda Item No. 6: Large number of un-metered agriculture connections pending to be metered

It was informed that Distribution Licensees are facing stiff resistance from farmers. It was also informed that implementation of SKY will help to meter the un-metered agriculture connections as there is a condition in the scheme that only metered connections can participate.

It was decided that GUVNL shall submit a detailed status of implementation of SKY after 31st March, 2020.

Agenda Item No. 7: Replacement of faulty meters

It was decided that GUVNL shall carry out analysis of the faulty meters keeping in view the manufacturer of the meters, area of the licensee where number of faulty meters is large, nature of fault etc. and submit a report to the Commission.
(Action: GUVNL)

Agenda Item No. 8: Power Quality Report

MGVCL made a presentation on implementation of SCADA at various locations in their license area. Copy of the presentation is annexed herewith as Annexure 5.

It was decided that Distribution Licensees shall submit their views on the Power Quality Report at the earliest.

It was also decided that Torrent Power Limited shall install the Power Quality Analysers on few locations in their distribution network and shall share the report.
(Action: GUVNL, TPL)

Agenda Item No. 9: Draft GERC (Multi-Year Tariff) Regulations, 2021

Due to paucity of time, this agenda item could not be discussed.

Agenda Item No. 10: Standard of Performance Report

Due to paucity of time, this agenda item could not be discussed.

Agenda Item No. 11: Presentation by GETCO on transmission projects

GETCO made a detailed presentation on updated status of transmission network. Information on GETCO's preparedness to tackle the issues of grid integration of varying renewable energy was also submitted. Further, information on transmission network established and planning for completion of the remaining transmission projects under Green Energy Corridor was also submitted.

Copy of the presentation is annexed herewith as Annexure 6.

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

GUVNL made a presentation on current power sector scenario. Information on renewable capacity tied up/ to be tied up for compliance of RPO was also provided.

Copy of the presentation is annexed herewith as Annexure 7.

Minutes of 21st Meeting of the Coordination Forum held on 26.09.2019 at “Moneta Ball Room”, GIFT CITY Club and Business Centre, Tapas Marg, GIFT CITY, Gandhinagar

Hon’ble Chairman, GERC thanked members of the Forum for their participation in the meeting. The meeting ended with a Vote of Thanks to the Chair.

Sd/-

(Roopwant Singh, IAS)

Secretary

Gujarat Electricity Regulatory Commission
Gandhinagar

List of Participants

Hon'ble Chairman & Members:

1. Shri Anand Kumar, Chairman, GERC
2. Shri K. M. Shringarpure, Member, GERC
3. Shri P. J. Thakkar, Member, GERC

Members / Representatives of Co-ordination Forum:

1. Ms. Shahmeena Husain, MD, GUVNL
2. Shri M. R. Kothari, MD, MGVL
3. Ms. Shweta Teotia, MD, PGVL
4. Shri Mahesh Singh, MD, UGVL
5. Shri B. B. Chauhan, MD, GETCO
6. Shri H. N. Baxi, I/c MD, GSECL
7. Shri S. B. Khyalia, D (F), GUVNL
8. Shri K. M. Bhuva, D (T), GUVNL
9. Shri H. H. Khoja, CEI
10. Shri B. B. Mehta, CE, SLDC
11. Shri S. B. Patil, OSD, GEDA
12. Shri Ranjitsinh Dhadhal, AGM (E), GPPC
13. Shri Ravi Tamakuwala, AM (Tech), GSEG
14. Shri S. Mani, DGM, GIPCL
15. Shri Vishal Bhatia, CLP India
16. Shri H. C. Patel, DS, EPD
17. Shri Vijaysingh Vaghela, AS, EPD
18. Shri Varun Mehta, ED, TPL
19. Shri Y. D. Brahmbhatt, CE, GSECL
20. Shri Sailaja Vachhrajani, GM (IPP), GUVNL
21. Shri B. R. Icecreamwala, CE, DGVCL
22. Shri R. K. Purohit, CE, DGVCL
23. Shri H. R. Shah, CE, MGVL
24. Shri J. J. Gandhi, CE, PGVL
25. Shri P. B. Pandya, CE, UGVL
26. Shri A. N. Khambhatta, ACE, GUVNL
27. Shri J. K. Darji, ACE, UGVL
28. Shri J. S. Kedaria, SE, DGVCL
29. Shri Parag Desai, EE, UGVL
30. Ms. S. S. Modi, GUVNL
31. Shri H. M. Patel, GUVNL
32. Shri D. H. Patel, DE, GETCO
33. Shri K. D. Barot, DE, UGVL
34. Shri Shashank Suman, Assistant Manager, GETCO
35. Shri Samir Patel, DGM, Nayara Energy Ltd.
36. Shri Abhijit Das, DGM, Nayara Energy Ltd.

- 37. Shri Jignesh Langalia, GM, TPL
- 38. Ms. Luna Pal, AGM, TPL
- 39. Shri N. B. Shah, Office of the CEI
- 40. Shri Mehul Panchal, Office of the CEI
- 41. Shri R. V. Arya, Sr. Project Executive, GEDA
- 42. Ms. N. C. Bhuptani, Assistant Project Executive, GEDA
- 43. Shri M. L. Meena, Western Railway
- 44. Shri Nitin Chandra, Western Railway

Officers of the Commission:

- 1. Shri D. R. Parmar, Director, GERC
- 2. Shri S. R. Pandey, Legal Advisor, GERC
- 3. Shri S. T. Anada, Joint Director, GERC
- 4. Shri M. R. Jhala, Joint Director, GERC
- 5. Shri P. J. Jani, Deputy Director, GERC
- 6. Shri K. J. Bhuva, Deputy Director, GERC
- 7. Shri Apurva Adhvaryu, Deputy Director, GERC
- 8. Shri A. S. Makwana, Assistant Director, GERC
- 9. Shri Jignesh Makwana, IT Manager, GERC
- 10. Shri K. M. Thanki, Executive, GERC

21st Meeting of Co-ordination Forum

Date : 26.09.19

STATUS OF RPO

PRESENTED BY:
GUJARAT ENERGY DEVELOPMENT AGENCY,
GANDHINAGAR

GERC (PROCUREMENT OF ENERGY FROM RENEWABLE SOURCES) (FIRST AMENDMENT) REGULATION, 2014

- The Commission has declared 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
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	7.75	1.75	0.5	10.0

GERC (PROCUREMENT OF ENERGY FROM RENEWABLE SOURCES) (SECOND AMENDMENT) REGULATIONS, 2018

- The Commission has declared the following trajectory for the RPO. Contd*

Minimum Quantum of purchase (in %) from renewable sources (in terms of energy in kWh)

Year	Wind(%)	Solar(%)	Other(%)	Total(%)
2017-18	7.75	1.75	0.5	10.0
2018-19	7.95	4.25	0.50	12.70
2019-20	8.05	5.50	0.75	14.30
2020-21	8.15	6.75	0.75	15.65
2021-22	8.25	8.00	0.75	17.00

Obligated Entities- DISCOMS

- (1) GUVNL (MGVCL+PGVCL+UGVCL+DGVCL)
- (2) Torrent Power Ltd. (A'bad + Surat)
- (3) Torrent Energy Ltd. (Dahej, SEZ)
- (4) Jubilant Infrastructure Ltd.
- (5) Aspen Infrastructure Ltd.
- (6) Kandla Port Trust
- (7) MPSEZ Utilities Pvt. Ltd.
- (8) GIFT Power Company Ltd.

- Total CPP Users are 107
- Total STOs as per the list received from SLDC 278

Status Report for RPO Compliance of Obligated Entities for FY 2018-19

Obligated Entities	Total RPO Obligation Percentage			Actual RE Consumption(Mus)			Actual Total RPO fulfilled for the year (%)		
	Non-Solar	Solar	Total	Non-Solar	Solar	Total	Non-Solar	Solar	Total
	(A)	(B)	©	(A)	(B)	©	(C) + (E)	(D) + (F)	%
Gujarat Urja Vikas Nigam Ltd (Provisional)	8.45	4.25	12.70	8234	2455	10689	9.33	2.78	12.11
Torrent Power Ltd. (Ahemadabad & Surat)	8.45	4.25	12.70	935.41	431.28	1366.69	7.95	3.67	11.62
Torrent Power Ltd. (DAHEJ)	8.45	4.25	12.70	29.69	10.28	39.97	6.73	2.33	9.06
MPSEZ Utilities Pvt.Ltd.	8.45	4.25	12.70	29.28	12.38	41.66	9.43	3.99	13.42
Total	8.45	4.25	12.70	9228.38	2908.94	12137.32	9.16	2.89	12.05

Status Report for RPO Compliance of Obligated Entities for FY 2019-20(1st Qtr)

Obligated Entities	Total RPO Obligation Percentage			Actual RE Consumption(Mus)			Actual Total RPO fulfilled for the year (%)		
	Non-Solar	Solar	Total	Non-Solar	Solar	Total	Non-Solar	Solar	Total
	(A)	(B)	©	(A)	(B)	©	(C) + (E)	(D) + (F)	%
Gujarat Urja Vikas Nigam Ltd (Provisional)	8.8	5.5	14.3	2335	750	3085	9.53	3.06	12.59
Torrent Power Ltd. (Ahemadabad & Surat)	8.8	5.5	14.3	249.5	97.8	347.3	6.97	2.73	9.70
Torrent Power Ltd. (DAHEJ)	8.8	5.5	14.3	7.3	3.1	10.3	5.91	2.49	8.40
MPSEZ Utilities Pvt.Ltd.	8.8	5.5	14.3	16.9	2.0	18.8	23.78	2.75	26.53
Total	8.8	5.5	14.3	2608.63	852.81	3461.4	9.22	3.01	12.24

Status Report for RPO Compliance of OE's upto the FY 2017-18, 2018-19 & 2019-20(Up to 1st Qtr)

Case I: STOA's

Year	No. of OE's	No. of OE's complied	No. of OE's fulfilled RPO
2017-18	278	37	6
2018-19	278	15	3
2019-20	278	10	1

Case II: CPP's

Year	No. of OE's	No. of OE's complied	No. of OE's fulfilled RPO
2017-18	107	15	0
2018-19	107	16	2
2019-20	107	4	0

Guidance required from The Hon'ble Commission

The following queries have been raised by various OE's, for which GEDA also requires guidance;

- Is RPO applicable on Auxiliary Consumption?
- It has been decided earlier that, for data verification, data of CPP will be verified by CEI while data of STOs will be verified by SLDC. But SLDC represents that they have only scheduled data not actual consumption data of STOs hence they suggest time to time that data verification of STOs should be done by the State DisCom
- As per MNRE Notification, dated 1.2.19, in case of CPP, RPO is applicable as per the commissioning year, in this regards, clarification is required for RPO applicability to the CPPs registered prior to 2010.
- Whether Shortfall of RPO can be fulfilled by overachievement in RPO in next year ?



Action Plan

- MNRE (along with TERI) has launched National level RPO WebTool.
- On dated 25.2.19, its one of the workshop has been held in Gujarat, Gandhinagar.
- GEDA is planning to start shift the data from Existing State's RPO Tool to new MNRE's national webtool.
- GEDA has shared OEs detail with TERI, to create registration.
- Within short period of time , orientation program of all OEs for this new Web tool will be organized.



THANK YOU

Introduction to National RPO Portal



Creating Innovative
Solutions for a
Sustainable Future

26th Sept 2019,

GERC meeting,
Gift city,
Gujarat

Outline

- Mission statement
- Key features
- Challenges addressed
- Unique features
- Reports
- Users roles & responsibilities
- Tools and technologies
- Way forward



Creating Innovative
Solutions for a
Sustainable Future

Scope of Work for RPO Portal

Mission Statement:

Develop a configurable portal to address current challenges and meet changing future requirements for RPO monitoring

Features looked into

- Development of a **dynamic** RPO Portal
- Ensure data **uniformity with flexibility**
- Provide State level **customization** to meet state specific requirements
- Registration of stakeholders i.e. Obligated Entities, Implementing Agencies, SERCs, MNRE, MoP, CERC, SNA, CNA etc.
- Online Submission of data at defined periods
- Online Verification of Data by single/ multiple agencies
- Online monitoring of RPO Compliance at State level and National level
- System generated email notifications, alerts and reminders
- Generation of routine and analytical MIS reports



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Unique features

- Easy quickly implementable
 - No need to reconfigure basic software
- Integration framework
 - Can access on line data from other portals developed at state levels
 - Data can be entered through software using simple Excel based forms in areas where connectivity can be issue



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Challenges addressed by dynamic portal



Data consolidation at national level



Reporting of Non-Solar REs in different states

- Maharashtra: Non-Solar (Mini /Micro hydro), Non Solar (excluding Mini /Micro hydro)
- Chattisgarh: Non-Solar (Biomass), Non-solar (Wind, hydel, waste heat recovery)



Reporting period may differ in states

- Quarterly/ Monthly reporting for unaudited data
- Half Yearly/ Yearly for audited data



RPO Targets may vary for different types of Obligated Entities

- Example(Non-Solar): 6% for OA, 7% for CPP, 8% for Discoms



RPO targets may be based on Installed Capacity range

- 6% up to 10MW, 8% above 10MW
- OE status for above 1 MW CPP



Verification authority may be different for GEC & RES

- Agency-A for Solar Energy
- Agency-B for Non-Solar (Mini /Micro hydro)
- Agency-C for Non Solar (excluding Mini /Micro hydro)

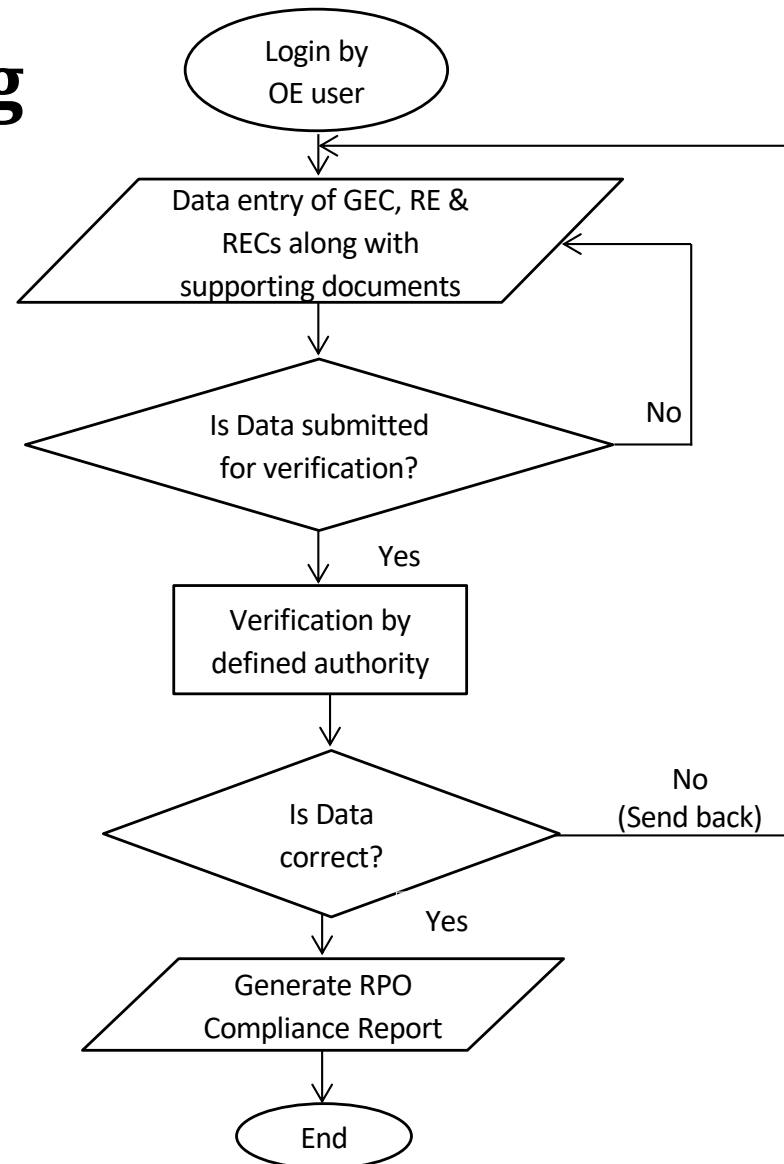


Add new RE source anytime in future or make an existing one inactive



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RPO Data Reporting Process Flow



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Key Features★

- National level configuration to ensure data uniformity across states
- State level configuration to meet state specific needs
- Registration of all stakeholders
- User Management & Profile-based access to portal
- Periodic Online submission of energy data
- Workflow for data verification
- Online monitoring of RPO Compliance
- Email Notifications, Alerts and Reminders to increase stakeholders involvement
- Search
- Routine and analytical MIS reports



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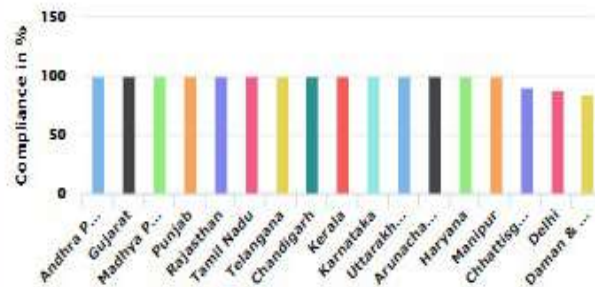
REPORTS

Home Page

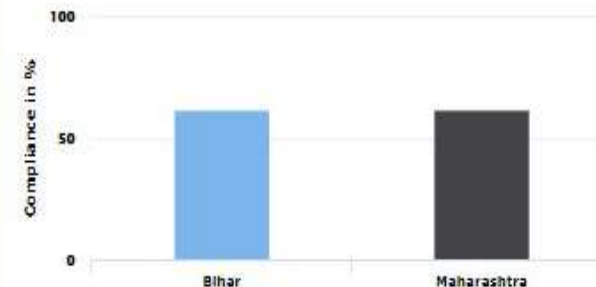
National Level Portal for Renewable Purchase Obligation Compliance

RPO Compliance Status of(2016-2017) as per Individual State Target

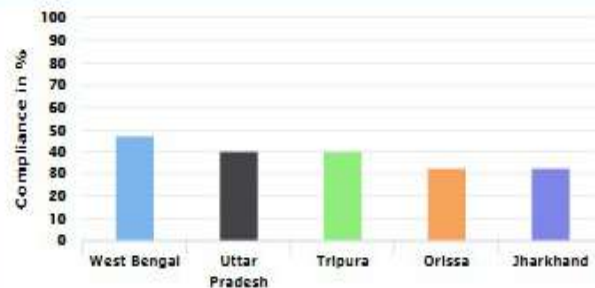
75% and above Compliance



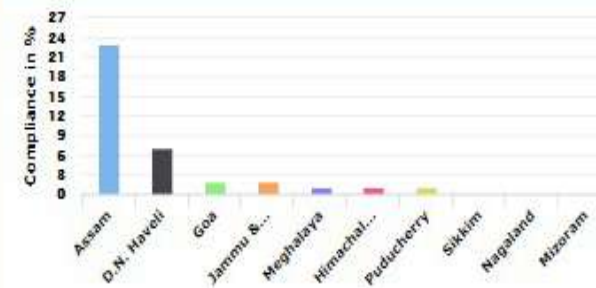
50 - 74% Compliance



25 - 49% Compliance



0 - 25% Compliance



CNA Dashboard

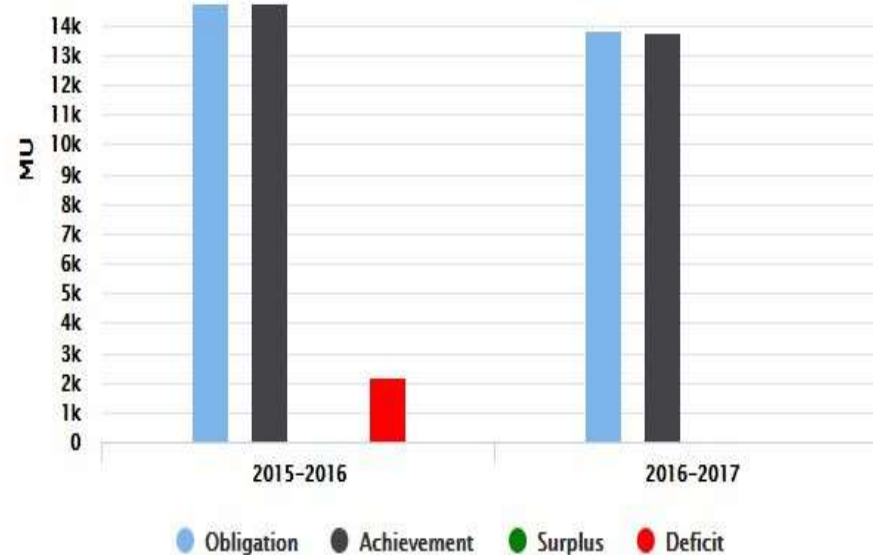
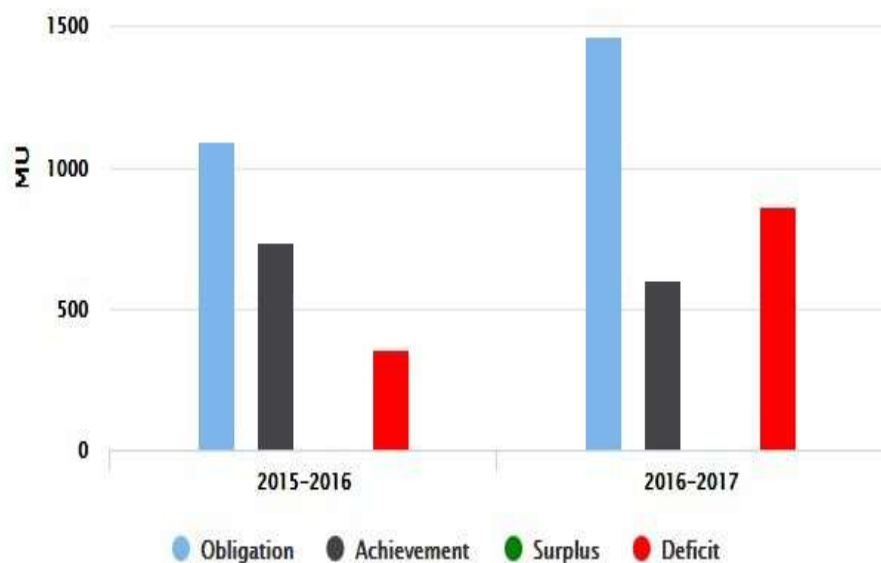


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RPO Compliance Status

State Agencies



Solar RPO Compliance			
Financial Year	Obligation (MU)	Achievement(MU)	Achievement(%)
2015-2016	1093.82	736.58	67
2016-2017	1464.85	603.69	41

Non-Solar RPO Compliance			
Financial Year	Obligation (MU)	Achievement(MU)	Achievement(%)
2015-2016	17977.65	15796.09	88
2016-2017	13849.73	13774.39	99

SNA/SERC Dashboard

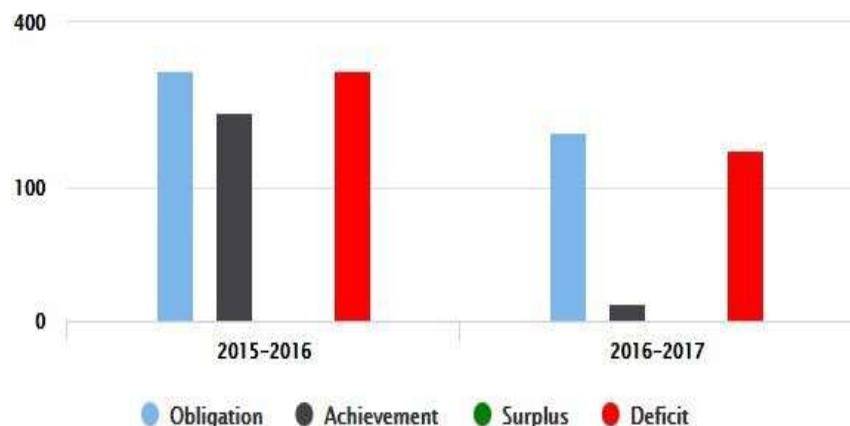


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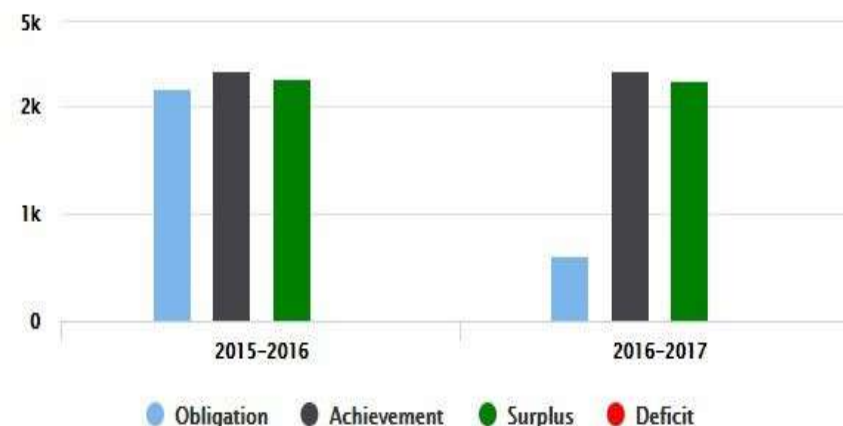
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Chhattisgarh RPO Compliance Status

Solar RPO Compliance



Non-Solar RPO Compliance



Solar RPO Compliance

Financial Year	Obligation (MU)	Achievement(MU)	Achievement(%)
2015-2016	348.07	156.34	45
2016-2017	140.96	12.84	9

Non-Solar RPO Compliance

Financial Year	Obligation (MU)	Achievement(MU)	Achievement(%)
2015-2016	2175.44	4449.55	205
2016-2017	610.83	2854.45	467

Reporting Status

Agency wise Report



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RPO Compliance at Agency Level

State

Chhattisgarh

Financial year

2015-2016

Agency

CSPDCL

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Search:

Energy Source	Obligation (%)	Obligation (MU)	RE	REC	Total (RE+REC)	Achievement (%)	Surplus / Deficit (MU)
Agency : Chhattisgarh State Power Distribution Company Ltd. (CSPDCL)						Conventional Energy (MU) : 23630.16	
Non-Solar (All sources)	6.25	1476.88	746.47	0.00	746.47	50.54	-730.41
Solar	1.00	236.30	146.59	0.00	146.59	62.04	-89.71

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Entity Type wise Report



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Energy Source	Obligation (%)	Obligation (MU)	RE	REC	Total (RE+REC)	Achievement (%)	Surplus / Deficit (MU)
Agency : Chhattisgarh State Power Distribution Company Ltd. (CSPDCL)						Conventional Energy (MU) : 23630.16	
Non-Solar (All sources)	6.25	1476.88	746.47	0.00	746.47	50.54	-730.41
Solar	1.00	236.30	146.59	0.00	146.59	62.04	-89.71
Agency : Jindal Steel & Power Ltd. (JSPL), Raigarh						Conventional Energy (MU) : 737.59	
Non-Solar (All sources)	6.25	46.10	0.00	0.00	0.00	0.00	-46.10
Solar	1.00	7.38	0.00	0.00	0.00	0.00	-7.38
Agency : Town Electrical Engineering Deptt., BSP (TEED)						Conventional Energy (MU) : 202.0532	
Non-Solar (All sources)	6.25	12.63	14.69	0.00	14.69	116.31	2.06
Solar	1.00	2.02	0.05	0.00	0.05	2.29	-1.97

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National level report

RPO Compliance at National Level

Financial year

2015-2016

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		Solar					Non-Solar				
State	Gross Energy Consumption	RPO Target (%)	RPO Target (MU) (1)	Achievement (MU) (2)	Achievement (%)	Surplus / Deficit (MU) (3=2-1)	RPO Target (%)	RPO Target (MU) (4)	Achievement (MU) (5)	Achievement (%)	Surplus / Deficit (MU) (6=5-4)
Chhattisgarh	35427.63	1.00	354.28	160.92	45.42	-193.35	6.25	2214.23	4247.94	191.85	2033.71
Maharashtra	13702.79	0.50	68.51	604.52	882.38	536.00	8.50	1164.74	10957.96	940.81	9793.23
Uttarakhand	49595.67	0.10	49.60	7.36	14.84	-42.24	8.00	3967.65	812.93	20.49	-3154.72

Showing 1 to 3 of 3 entries

Previous

1

Next

Actions during implementation

- Hosted on NIC server
- Facilitating data updates
 - Development of templates for Data Export & Data Import
- Configuring email for Notifications, Alerts and Reminders
- Develop demand based reports
- Incorporating users feedback



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Way Forward

- Updated data on Open Access and Captive power producers
- Uniformity of RPOs
- Uniformity on Obligated Entity criteria
- Verification through cross checking with other agencies. (At present CA audited reports are submitted to SNA)
- National level RPO portal integration to state portals through API



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User Roles & Responsibilities



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National level configurations/ controls

- **Energy sources:** all energy sources to be entered with following details:
 - **Energy Source Type:** Renewable/ Conventional
 - **Energy Source:** name of energy source e.g. Solar, Non-Solar (Biomass), Non-solar (Wind)
 - **Group Source Type:** Yes/ No – Is it a group of other sources e.g. Non-solar (All sources)
 - **Action:** - Break-up of group source/ Edit details
- **Entity types:** e.g. CPP, OA, DISCOMs, CNA, SNA, CERC etc.
- **State Lists**
- **User Roles:** Entity type-wise Administrators/ Users



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State level configurations

RE to be reported separately:
financial year-wise to meet state
specific data reporting structure

RPO Targets: define state RPO
targets with following details:

- Financial Year
- Obligated Entity Type (Discom/ OA/ CPP)
- Installed Capacity range
 - From (in MW)
 - To (in MW)
- Energy Source
- Obligation expressed as % of gross
energy consumption (GEC)

Provisional reporting period:
financial year-wise reporting
period

- Monthly/ Quarterly/ Half –Yearly/ Yearly

Audited reporting period:
financial year-wise reporting
period

- Monthly/ Quarterly/ Half –Yearly/ Yearly



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State level configurations...contd.

Implementing Agency: Type of Entity, Organization Name, user role, email-id and Reporting Authority

Obligated Entities: Type of Entity, Organization Name, user role, email-id, verifying authority



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RPO data entry details

➤ Unaudited data & Audited data

- Conventional Power
- Renewable Power

➤ Data details

- *RE Type*
- Transaction Type: Generation/ Purchase/ Sale/ *REC*
- Agency (Purchased from/ Sold to)
- Quantum (in MUs)
- Supporting document
- Remarks (If any)



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RPO data Verification process

- Verification authorities may be different
- Verification of all data submitted by OEs
- On line verification of supporting documents
- Each entry level action : Correct/ Send back
- Observation remarks
 - Mandatory in case of “Send back”
- Form level action
 - Submit to complete verification
 - Hold to verify later



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Key Reports

- Agency level
 - Agency performance in past 2 years
- State level
 - RPO compliance of all agencies of a state in selected year
- National level
 - State-wise RPO compliance in selected year

* More reports can be designed & developed during implementation



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Tools & Technology (Microsoft)

Development platform	ASP.Net MVC 6 Entity Framework 6.0
Database	MS SQL 2012
Software	Operating System: Windows Web server: IIS
Framework	Framework 4.6
IDE	Visual Studio 2015



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**Looking forward to your active
participation!!!
Thank You!**

shirishg@teri.res.in



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GSECL's initiative to meet
New Environmental norms
as per MoEF & CC
notification

New Environmental norms as per MoEF & CC notification dated 7th Dec 2015

Emission parameter	TPPs (units) installed before 31st December, 2003	TPPs (units) installed after 31st December 2003 and Up to 31st December 2016	TPPs (units) to be installed from 1st January 2017
Particulate Matter	100 mg/Nm ³	50 mg/Nm ³	30 mg/Nm ³
Sulphur Dioxide (SO₂)	600 mg/Nm ³ for units less than 500MW Capacity 200 mg/Nm ³ for units 500MW and above capacity	600 mg/Nm ³ for units less than 500MW capacity 200 mg/Nm ³ for units 500MW and above capacity	100 mg/Nm ³
Oxides of Nitrogen (NO_x)	600 mg/Nm ³	300 mg/Nm ³	100 mg/Nm ³

R&M carried out to achieve new environmental norms (PM)

Sr. No.	Environmental parameters	Unit No.	Before R&M	After R&M (during PG test)
1	Particulate Matter	UTPS # 3	150 mg/NM3	43.42 mg/Nm3
2	Particulate Matter	UTPS # 4	175 mg/NM3	39.08 mg/Nm3
3	Particulate Matter	UTPS # 5	155 mg/NM3	28.85 mg/Nm3
4	Particulate Matter	WTPS # 1	170 mg/NM3	42.69 mg/Nm3
5	Particulate Matter	WTPS # 2	178 mg/NM3	37.40 mg/Nm3
6	Particulate Matter	WTPS # 3	203 mg/NM3	29.55 mg/Nm3

Note:

1. Lol for ESP retrofitting of WTPS # 4, 5 & 6 is awarded to M/s BHEL at an cost of Rs. 112.50 including GST.
2. Consultancy order for retrofitting of ESP of KLTPS # 3 & 4 and installation of FGD is awarded to M/s Worley Parsons, Thane and draft tender is received.
3. Budgetary provision: (2019-20) is 82 Cr

Steps taken by GSECL to meet present environment norms for SOx control

A. New Units:

1. WTPS # 8:

- Order for installation of FGD is placed on 16.03.2019 and basic engineering work is under progress.
- Total Duration of project: 30 months from the zero date (i.e. 13.08.2021)
- Order cost = **Rs. 357 Cr plus 18% GST** (including 3 years O&M).
- Budgetary provision: (2019-20) is 464 Cr.

2. UTPS # 6 and STPS # 3&4:

- Tender under preparation.
- Estimated cost **of Rs. 530 Cr** (including 3 years O&M).
- Budgetary provision: (2019-20) is 306 Cr.

B. Old units:

- Feasibility Study and Detailed project report were completed. (Total cost 57 lakhs)
- Order for Owners Engineering consultancy is placed to M/s Worley Parsons, Thane.
- Consultant has submitted tender after incorporating comments of GSECL.
- Estimated Cost: @ Rs. 1765 Cr (including 3 years O&M).



Thank
you!!

Preparedness of SLDC for accurate forecasting & Compliance of DSM with handling large penetration of RE

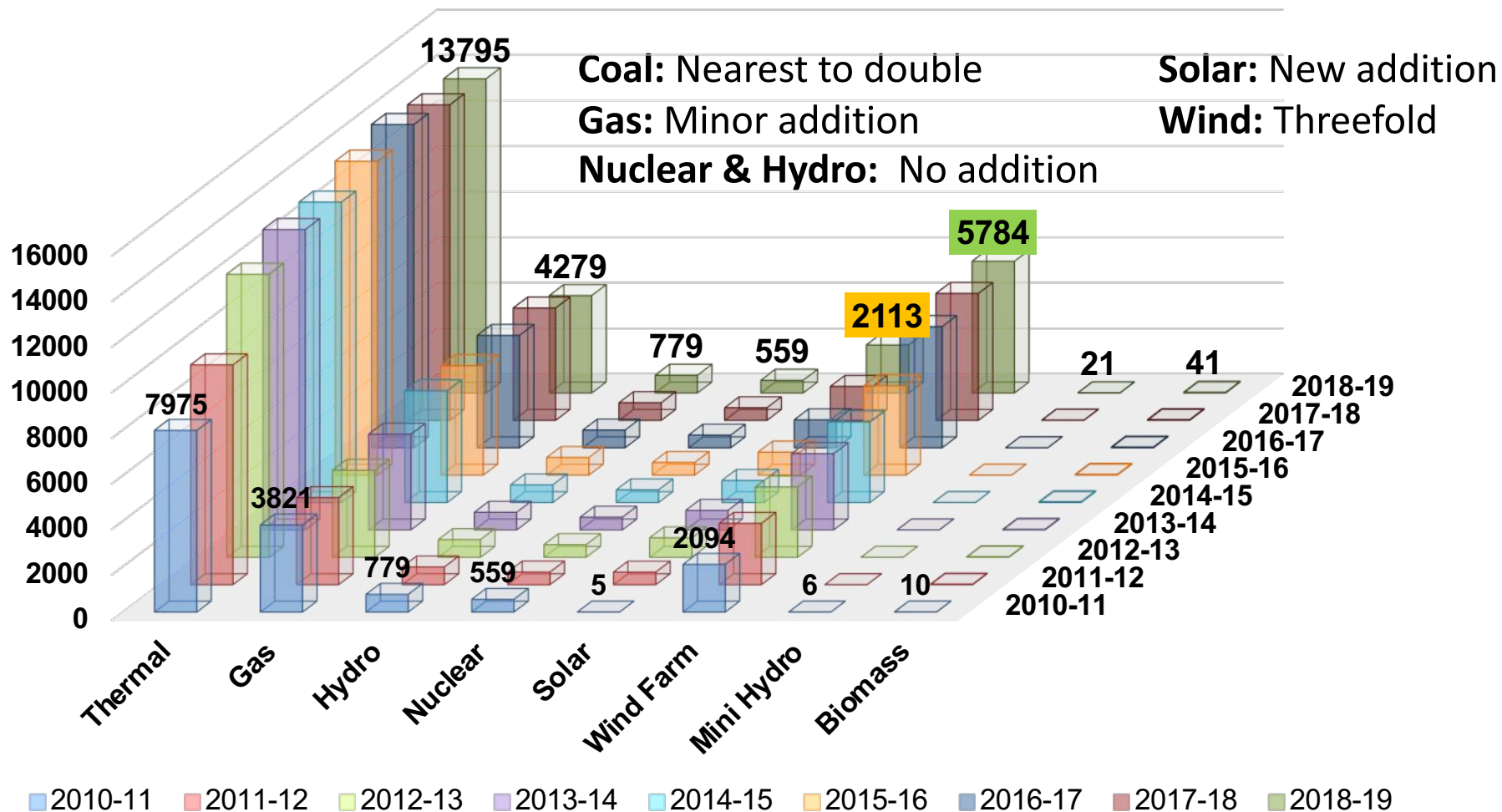
State Load Despatch Centre,
Gujarat Energy Transmission Co. Ltd.



Changing Dynamic of Installed Capacity



Growth in Installed Capacity in MW

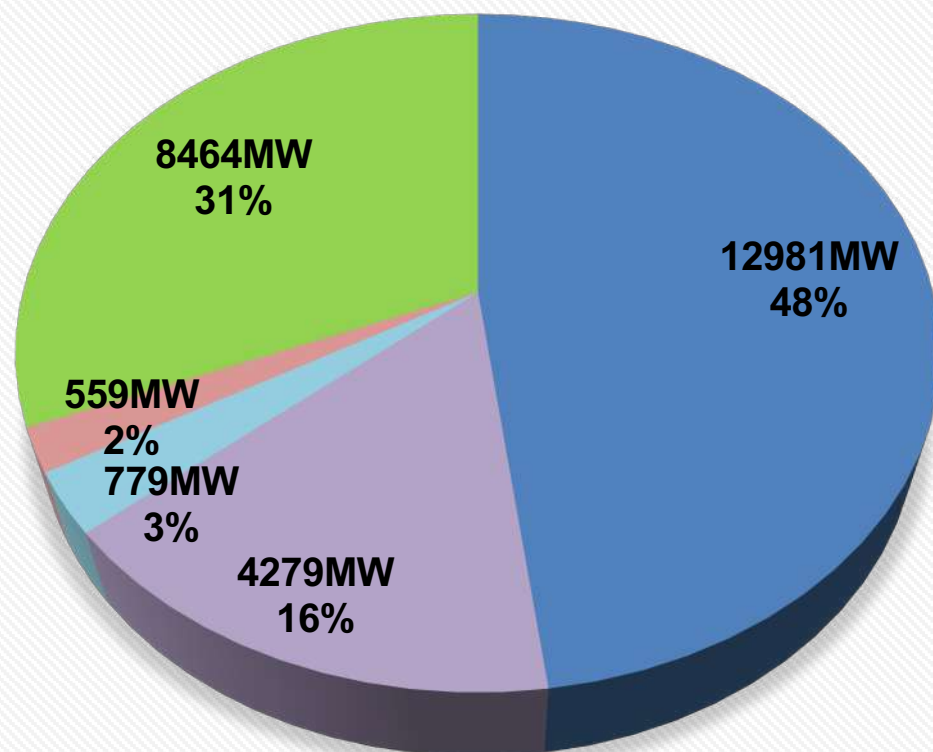


Total Gujarat Inst. Cap 27370

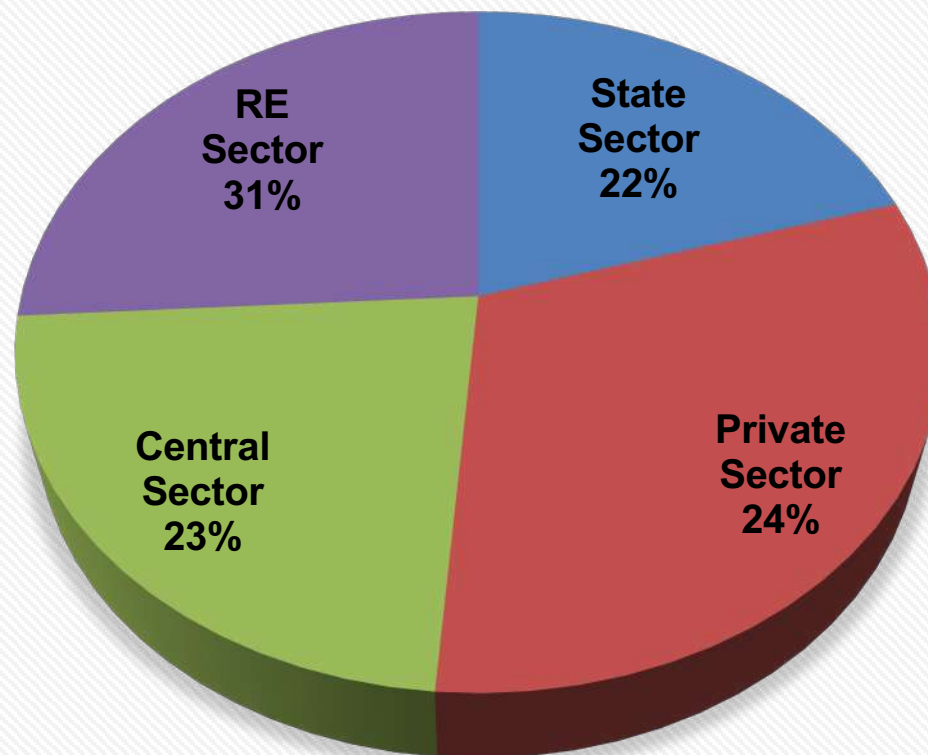
Up to Mar 19



Power System Statistics at a Glance



■ Coal ■ Gas ■ Large Hydro
■ Nuclear ■ RE Energy



■ State Sector ■ Private Sector
■ Central Sector ■ RE Sector

Total Gujarat Installed Capacity: 27062 MW

As on Aug 19



Power System Operational at a Glance



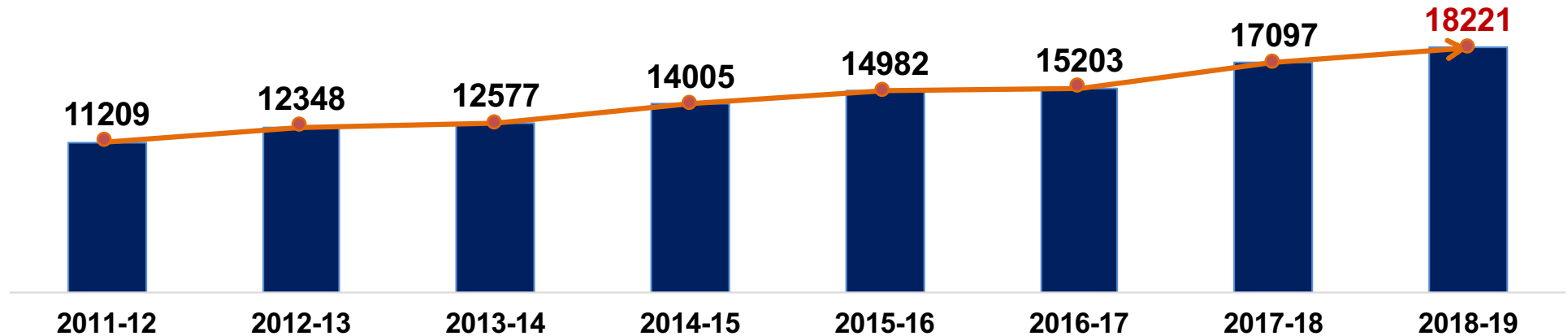
System scenario	Energy	Date
Max Catered in Mus	403.204	21.09.18
Max Catered in MW	18424	11.06.19
Max Wind Gen in Mus	107.544	15.07.19
Max Wind Gen in MW	4752	
Max Solar Gen in Mus	11.178	19.04.19
Max Solar Gen in MW	1477	



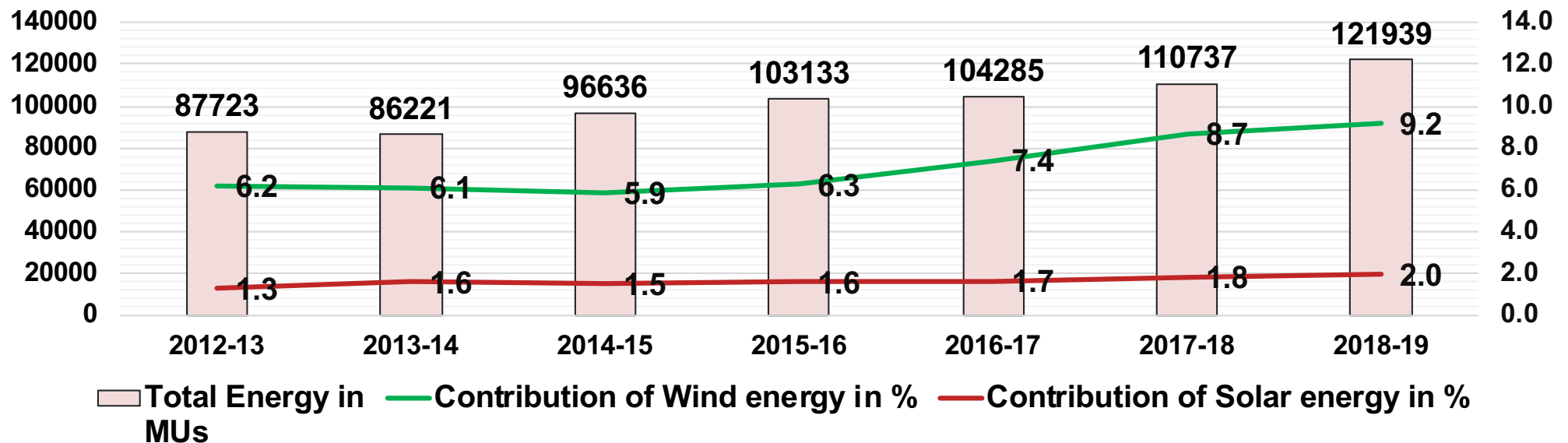
Demand Analysis & RE Generation Mix



Maximum Demand in MW in Power System



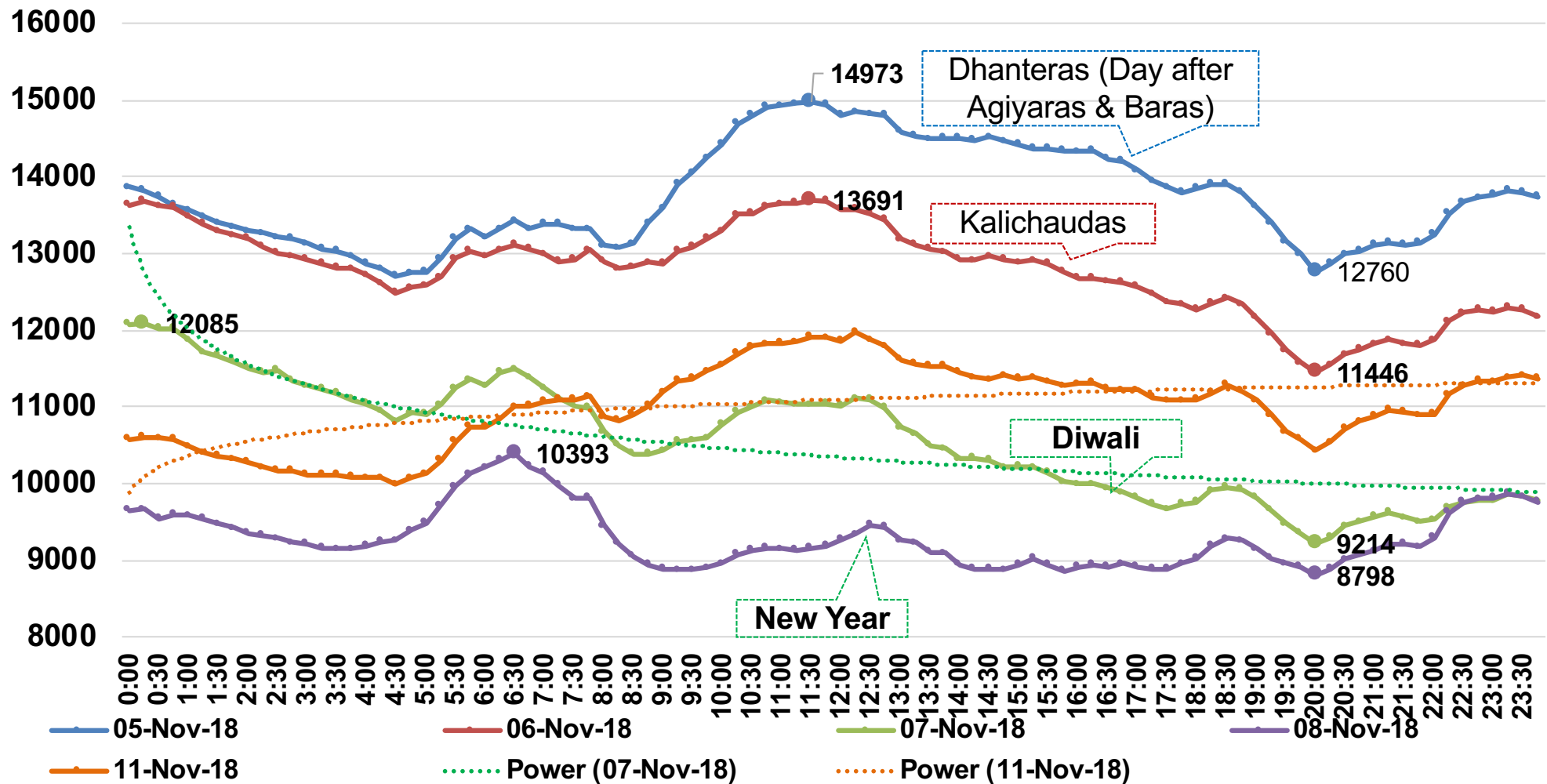
RE Contribution in Power System Operation



Demand Variation – Days of Diwali



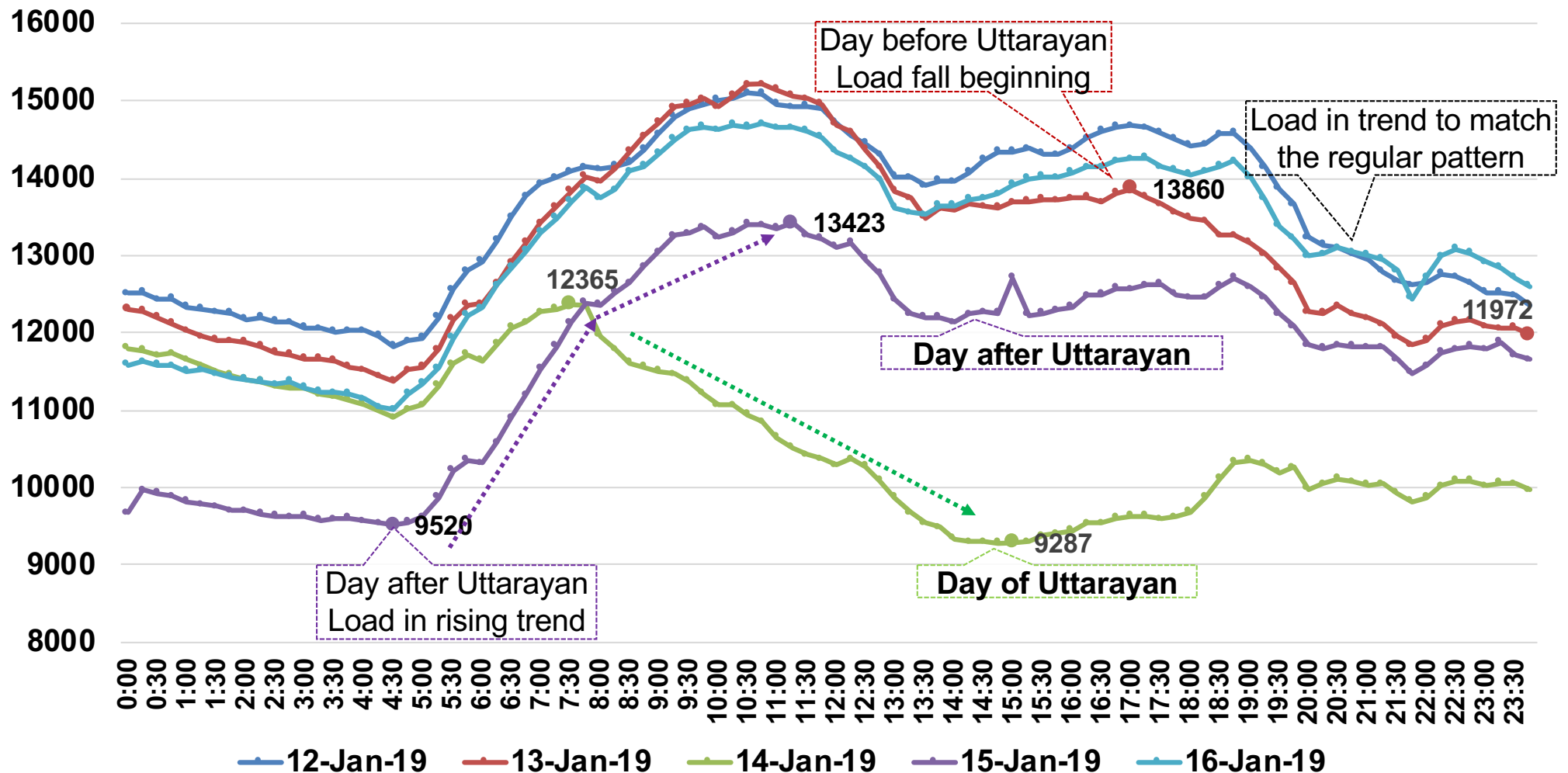
Demand Variation on Diwali Festival 2018



Demand Variation – Days of Uttarayan

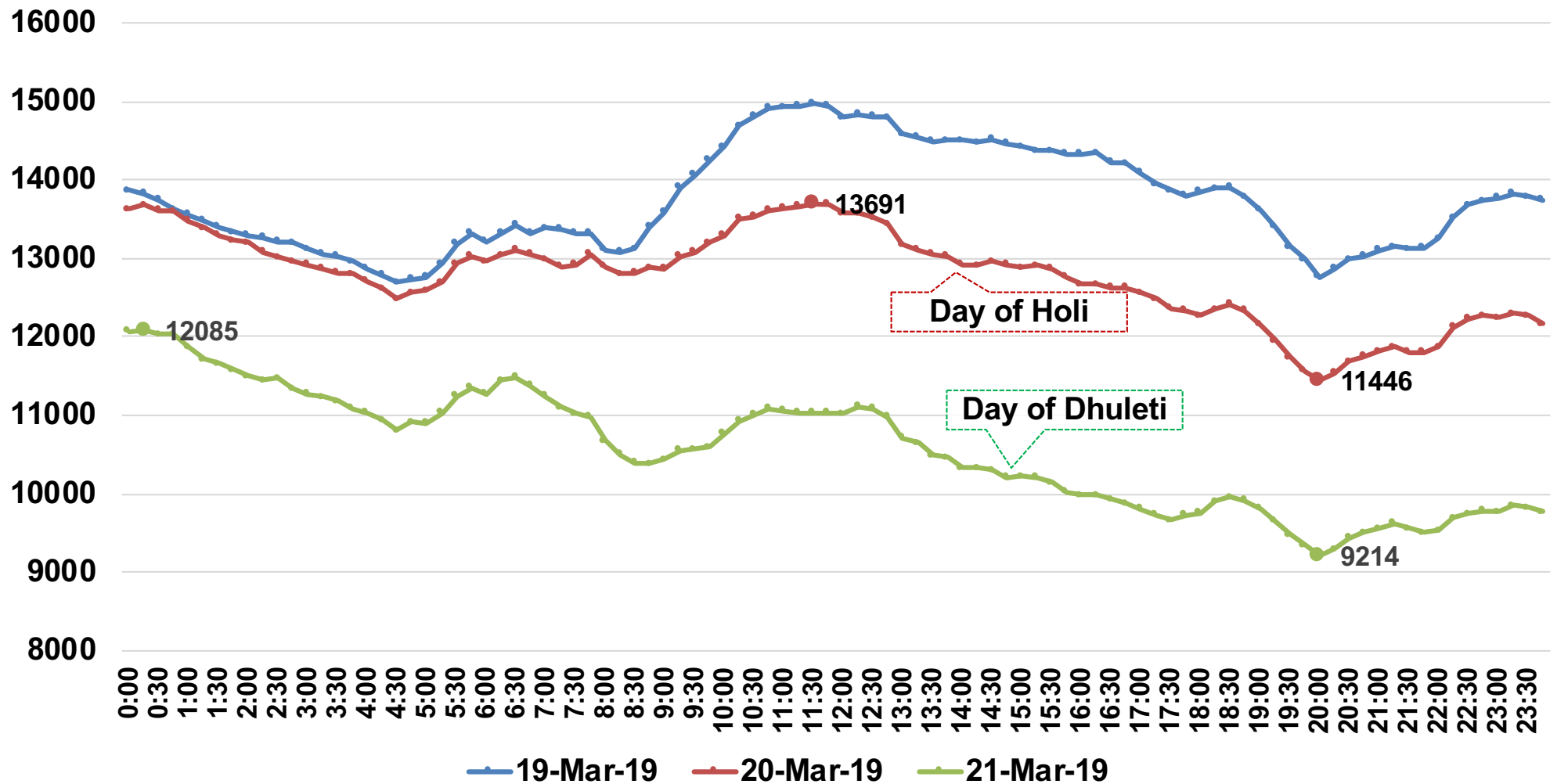


Demand Variation on Uttarayan Festival 2019

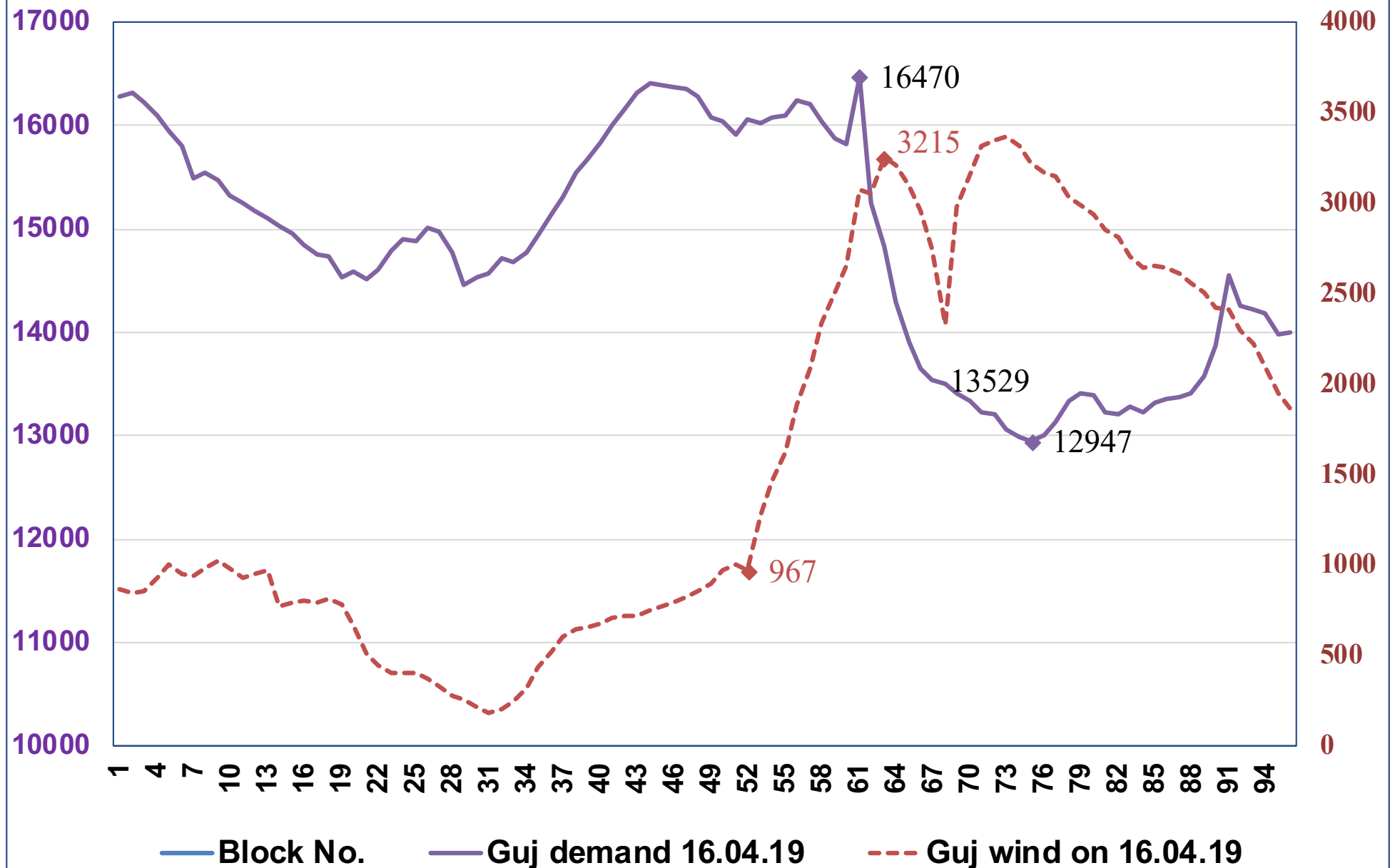


Demand Variation – Days of Holi

Demand Variation on Holi Festival 2019



Unseasonal rain impact on System due to Load & Wind Generation Variation on 16.04.19



Operational Complexity - Demand Variation

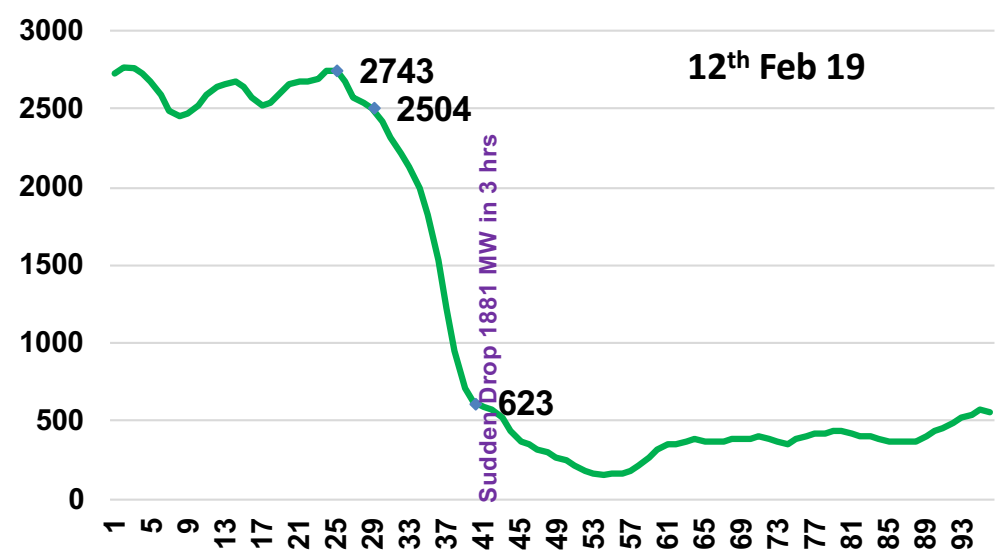
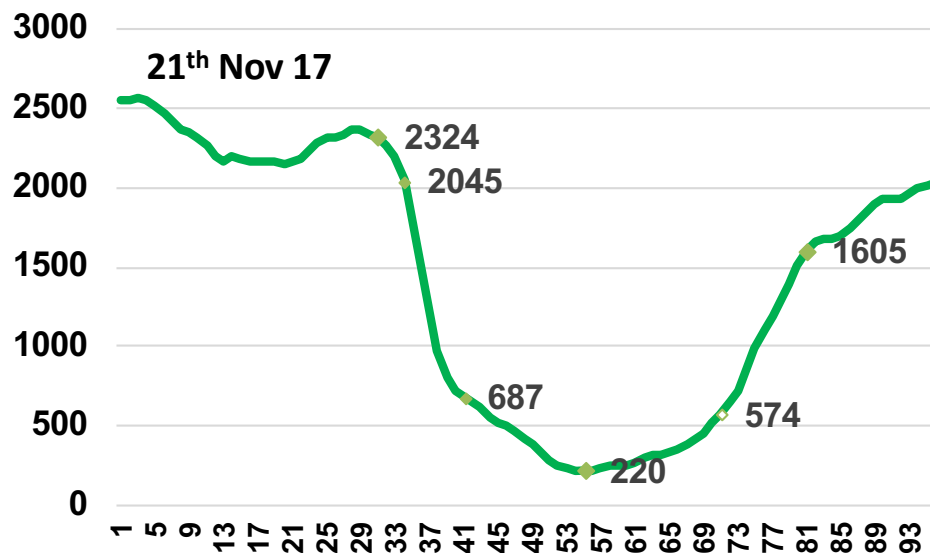
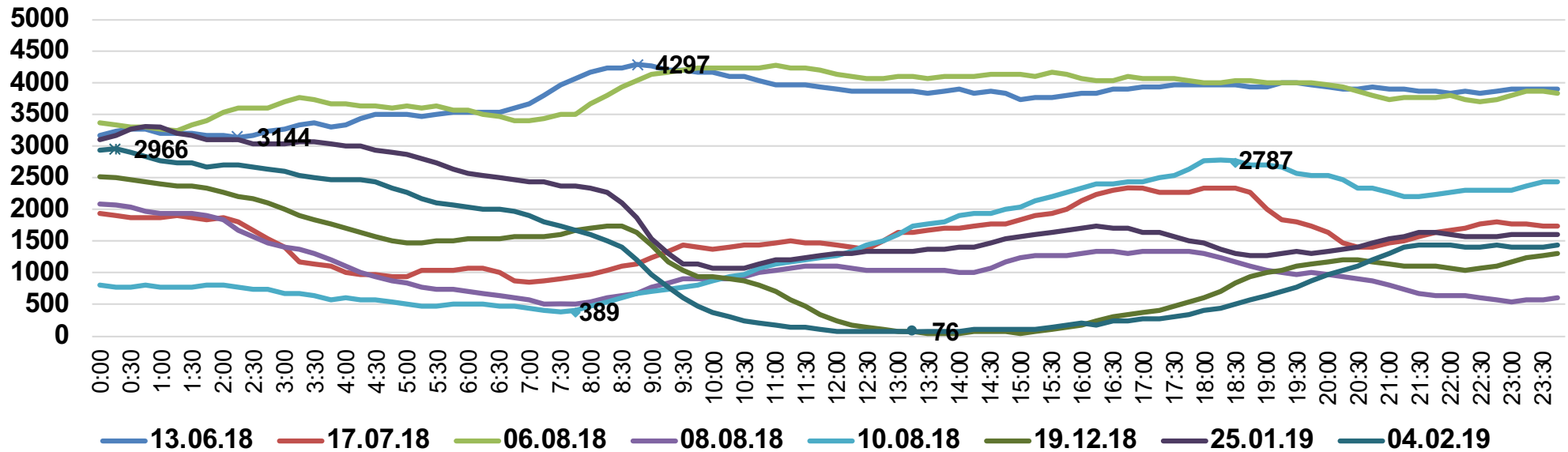
Year	No of days when variation between Maximum and Minimum demand				
	>1500 MW	>2000 MW	>2500 MW	>3000 MW	>3500 MW
2012-13	259	104	22	0	0
2013-14	260	114	34	6	0
2014-15	304	137	58	20	4
2015-16	336	213	94	28	2
2016-17	332	252	139	54	13
2017-18	350	302	198	119	54
2018-19	354	298	194	93	35



Operational Complexity – Wind Generation Variation



Wind Generation: Variable, Intermittent, Uncertain

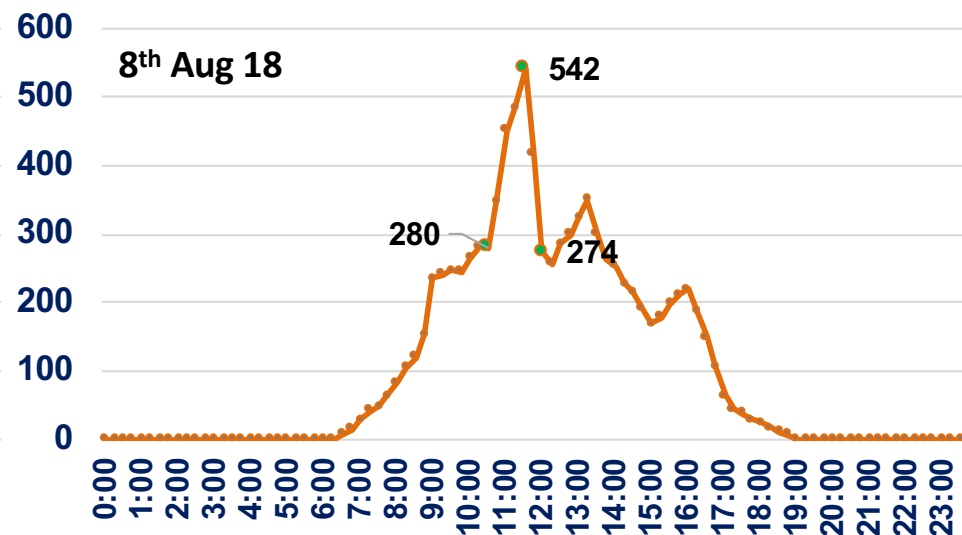
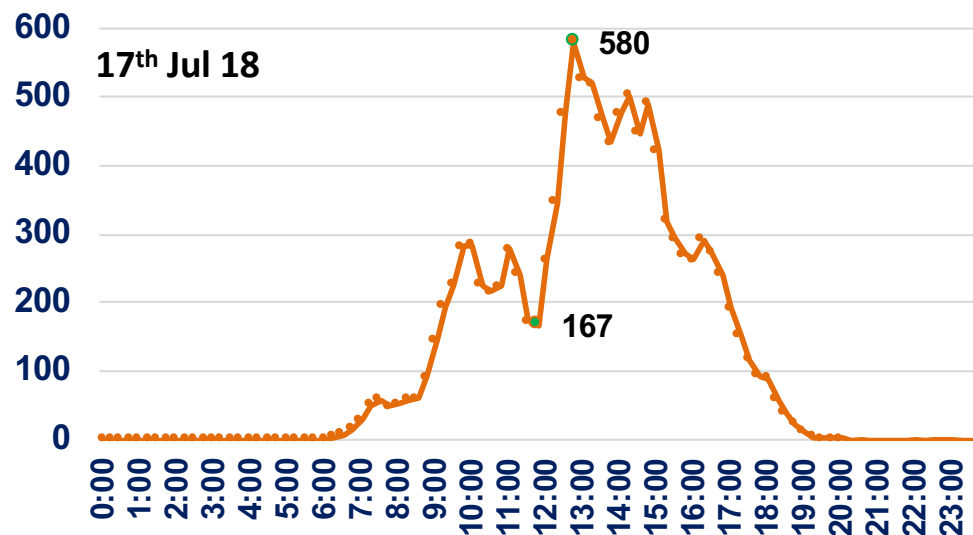
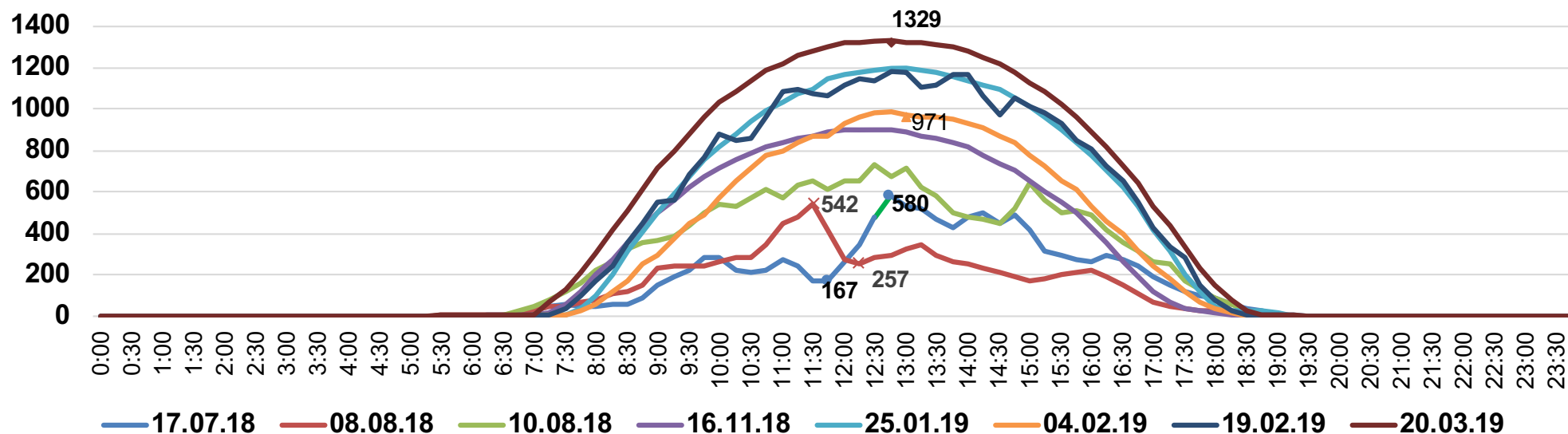


Sudden drop / Sudden rise in wind generation in a day.

Operational Complexity – Solar Generation Variation



Solar Generation: Highly Weather & Seasonal Varies



**Solar Generation: Highly ramp up and down at morning and evening.
Extremely variable during monsoon and cloud cover.**

Operational Complexity – RE Generation Variation



Solar Generation

Highly ramp and down during morning and evening
Extremely varies during cloud cover and monsoon

Wind Generation

Variable, Intermittent, Uncertain

Variation of Wind Generation in MW in a day	2015-16	2016-17	2017-18	2018-19
0 – 500	70	72	38	24
500 - 1000	181	147	120	90
1000 - 1500	103	120	125	132
More than 1500	12	26	82	119

Variation of 1000 MW are quite common in a day



Forecasting – Load & RE Generation



In house Forecasting

- Discom upload the load forecast on Day ahead & Real-time basis
- Wind Generation Forecasting

Forecasting Service Aailed

- M/S REConnect provided Day ahead & Real-time basis - Wind Generation Forecast – up to April 19
- M/S 50Hz Provides Day ahead & Real-time basis - Load & RE Generation Forecast - Since July 19

Input Data:

- Static Data (one time) &
- Variable Data (weekly ABT meter data & real time SCADA data)

Deliverables from FSP:

- Week Ahead Forecasting
- Day Ahead Forecasting
- Real time Forecasting: 16 Revision for Wind & 9 Rev for Solar



In-house Load Forecast - DA Accuracy



Month	For (Mus)	Act (Mus)	Average Nos of block 250MW or Below / Day	Average % Nos of block 250MW or Below / Day	Average Nos of blocks In +/-3% (wrt F) / Day	Average % Nos of blocks In +/-3% (wrt F) / Day
April 18 to March 19	332	330	51	53	72	75
April 19 to August 19	350	348	39	40	62	64

In-house Load Forecast - RT Accuracy

Month	For (Mus)	Act (Mus)	Average Nos of block 250MW or Below / Day	Average % Nos of block 250MW or Below / Day	Average Nos of blocks In +/-3% (wrt F) / Day	Average % Nos of blocks In +/-3% (wrt F) / Day
April 18 to March 19	331	330	64	67	84	88
April 19 to August 19	346	348	58	61	84	88





In-house Wind Gen Forecast - DA Accuracy

Month	Forecast (Mus)	Actual (Mus)	Average Nos. of blk in 30% Range / Day	Average % blk in 30% Range / Day	Average Nos. of blks as per CERC 15% / Day	Average % blks within CERC 15% / Day
April 18 to March 19	28	30	46	48	89	93
April 19 to August 19	39	42	56	58	81	85

In-house Wind Gen Forecast - RT Accuracy

Month	Forecast (Mus)	Actual (Mus)	Average Nos. of blk in 30% Range / Day	Average % blk in 30% Range / Day	Average Nos. of blks as per CERC 15% / Day	Average % blks within CERC 15% / Day
April 18 to March 19	30	30	81	84	95	99
April 19 to August 19	41	42	84	88	94	98



FSP Wind Gen Forecast – RT (REConnect)



Month	Average Nos. of blk in 15% Range / Day	Average % blk in 15% Range / Day	Average Nos. of blk in 30% Range / Day	Average % blk in 30% Range / Day
April 18 to March 19	52	54	76	78





Salient points on CERC DSM (4th Amendment)

- This regulations was effected from 01.01.2019.
- DSM price vector has been linked to the daily average clearing price discovered in Day Ahead Market on Power Exchanges.
- DSM frequency band changes to 49.85 Hz to 50.05 HZ.
- Maximum DSM rate is 8.00 Rs. corresponding to below 49.85 Hz.
- The rate corresponding to 50.05 Hz is 0.00 Rs.
- In the event of sustained deviation from schedule in one direction (positive or negative) by any regional entity (buyer or seller), such regional entity shall have to change sign of their deviation from schedule, at least once, after every 6 time blocks.
- Provided that violation of the requirement under this clause shall attract an additional charge of 20% on the daily base DSM payable / receivable as the case may be.”



Salient points on CERC DSM (5th Amendment)

- This regulations was effected from 03.06.2019.
- Up to 31.03.2020, if the sustained deviation from schedule continues for 12 time blocks, the regional entity (buyer or seller), shall correct its position by making the sign of its deviation from schedule changed or by remaining in the range of +/- 20 MW with reference to its schedule, at least once, latest by 13th time block.

Provided that each violation of the requirement under this clause shall attract an additional charge of 10% on the time block DSM payable / receivable as the case may be.



Salient points on CERC DSM (5th Amendment)

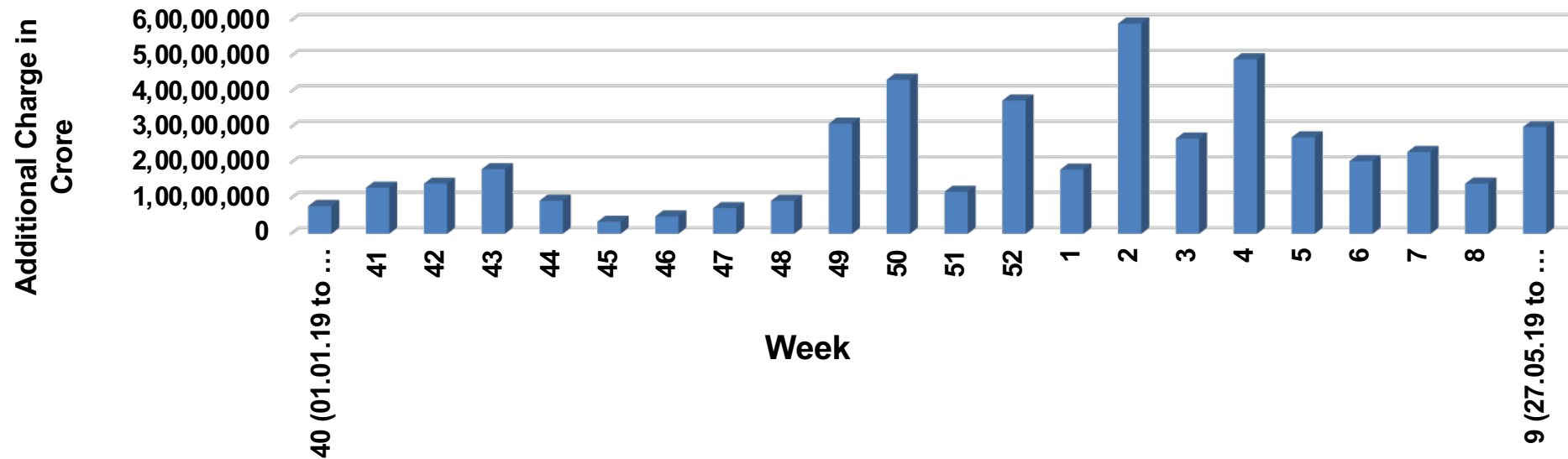
- From 01.04.2020, if the sustained deviation from schedule continues for 6 time blocks, the regional entity (buyer or seller), shall correct its position, by making the sign of its deviation from schedule changed or by remaining in the range of +/- 20 MW with reference to its schedule, at least once, latest by 7th time block.

No. of violations in a Day	Additional Charge Payable
From first to fifth violation	For each violation, an additional charge @ 3% of daily base DSM payable / Receivable
From sixth to tenth violation	For each violation, an additional charge @ 5% of daily base DSM payable / Receivable
From eleventh violation onwards	For each violation, an additional charge @ 10% of daily base DSM payable /Receivable

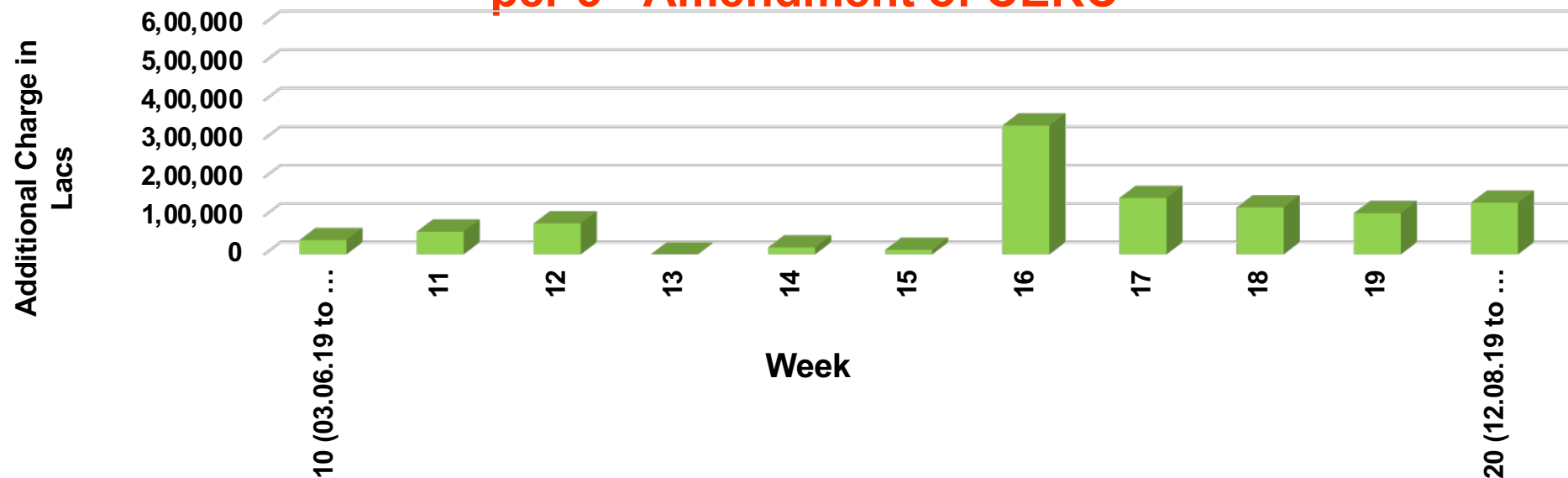


As per 4th Amendment of CERC DSM Regulation

Additional Charge on account of violation of deviation in sign change



Additional Charge on account of violation of deviation in sign change as per 5th Amendment of CERC



RE Notification - 1 / 2019 - Mock Bill



RE Deviation Charges of Wind and Solar Generating stations payable to state DSM pool

Wk.	From Dt.	To Dt.	Total Dev. Charge-wind payable to State DSM pool	Total Dev. Charge-solar payable to State DSM pool	Total Dev. Charge-wind & solar payable to State DSM pool	INST. CAP. (MW)-Wind	INST. CAP. (MW)-Solar	INST. CAP. (MW)-Wind & Solar	Per MW Dev. Charge-Wind	Per MW Dev. Charge-Solar	Per MW Dev. Charge-Wind & Solar	ACTUAL ENERGY (MWh)-Wind	ACTUAL ENERGY (MWh)-Solar	ACTUAL ENERGY (MWh)-Wind & Solar	Per KWh Dev. Charge-Wind (Pasia/Kwh/Week)	Per KWh Dev. Charge-Solar (Pasia/Kwh/Week)	Per KWh Dev. Charge-Wind & Solar (Pasia/Kwh/Week)
49	04/03/2019	10/03/2019	24397979	6267877	30665856	5784	1579	7363	4218	3969	4165	124532	65794	190327	20	10	16
50	11/03/2019	17/03/2019	39013345	6877347	45890692	5784	1579	7363	6745	4355	6233	202382	67365	269747	19	10	17
51	18/03/2019	24/03/2019	20364062	8194840	28558902	5784	1579	7363	3521	5189	3879	152294	69964	222258	13	12	13
52	25/03/2019	31/03/2019	32667973	7418834	40086807	5784	1579	7363	5648	4698	5444	229381	69148	298529	14	11	13
1	01/04/2019	07/04/2019	26990864	6985100	33975964	5784	1654	7438	4667	4223	4568	190828	70533	261361	14	10	13
2	08/04/2019	14/04/2019	25184886	8048959	33233844	5796	1654	7450	4345	4866	4461	196955	71059	268015	13	11	12
3	15/04/2019	21/04/2019	33223198	9871666	43094863	5813	1666	7479	5715	5927	5762	243648	65934	309583	14	15	14
4	22/04/2019	28/04/2019	24988437	7502592	32491029	5813	1676	7489	4298	4477	4338	231902	73264	305166	11	10	11
5	29/04/2019	05/05/2019	29914336	8144465	38058801	5835	1681	7516	5127	4846	5064	279102	71510	350612	11	11	11
6	06/05/2019	12/05/2019	25665480	9231035	34896515	5835	1681	7516	4398	5493	4643	293985	71594	365580	9	13	10
7	13/05/2019	19/05/2019	26411592	8296207	34707800	5875	1681	7556	4495	4936	4594	309907	69024	378931	9	12	9
8	20/05/2019	26/05/2019	22233387	8510360	30743748	5875	1701	7576	3784	5004	4058	277850	71821	349671	8	12	9
9	27/05/2019	02/06/2019	25606602	8719839	34326440	5947	1714	7661	4306	5088	4481	343091	71237	414328	7	12	8
10	03/06/2019	09/06/2019	26951263	8671297	35622560	5947	1711	7657	4532	5068	4652	327820	68884	396704	8	13	9
11	10/06/2019	16/06/2019	55019766	9089234	64108999	5833	1652	7485	9433	5501	8565	375528	56901	432430	15	16	15
12	17/06/2019	23/06/2019	39845767	7410137	47255904	5972	1706	7678	6672	4344	6155	300587	57262	357850	13	13	13
13	24/06/2019	30/06/2019	27389863	7350209	34740072	5972	1706	7678	4587	4309	4525	294086	54671	348757	9	13	10
14	01/07/2019	07/07/2019	23156611	7004881	30161492	6046	1706	7751	3830	4106	3891	353297	50911	404207	7	14	7
15	08/07/2019	14/07/2019	26175091	8230486	34405577	6046	1941	7986	4330	4241	4308	597790	58234	656023	4	14	5



RE Notification - 1 / 2019 - Mock Bill



RE Deviation Charges of Wind and Solar Generating stations payable to state DSM pool

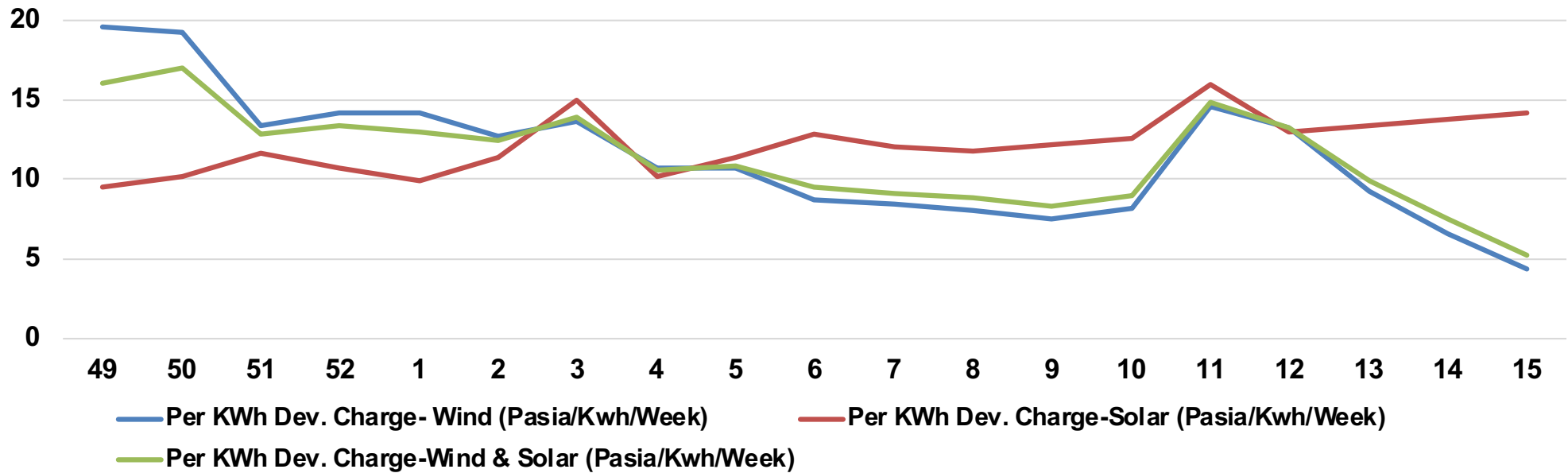
Week	From Dt.	To Dt.	Per MW Dev. Charge- Wind	Per MW Dev. Charge- Solar	Per MW Dev. Charge- Wind & Solar	Per KWh Dev. Charge- Wind (Pasia/Kwh/ Week)	Per KWh Dev. Charge-Solar (Pasia/Kwh/ Week)	Per KWh Dev. Charge-Wind & Solar (Pasia/Kwh/ Week)
49	04/03/2019	10/03/2019	4218	3969	4165	20	10	16
50	11/03/2019	17/03/2019	6745	4355	6233	19	10	17
51	18/03/2019	24/03/2019	3521	5189	3879	13	12	13
52	25/03/2019	31/03/2019	5648	4698	5444	14	11	13
1	01/04/2019	07/04/2019	4667	4223	4568	14	10	13
2	08/04/2019	14/04/2019	4345	4866	4461	13	11	12
3	15/04/2019	21/04/2019	5715	5927	5762	14	15	14
4	22/04/2019	28/04/2019	4298	4477	4338	11	10	11
5	29/04/2019	05/05/2019	5127	4846	5064	11	11	11
6	06/05/2019	12/05/2019	4398	5493	4643	9	13	10
7	13/05/2019	19/05/2019	4495	4936	4594	9	12	9
8	20/05/2019	26/05/2019	3784	5004	4058	8	12	9
9	27/05/2019	02/06/2019	4306	5088	4481	7	12	8
10	03/06/2019	09/06/2019	4532	5068	4652	8	13	9
11	10/06/2019	16/06/2019	9433	5501	8565	15	16	15
12	17/06/2019	23/06/2019	6672	4344	6155	13	13	13
13	24/06/2019	30/06/2019	4587	4309	4525	9	13	10
14	01/07/2019	07/07/2019	3830	4106	3891	7	14	7
15	08/07/2019	14/07/2019	4330	4241	4308	4	14	5



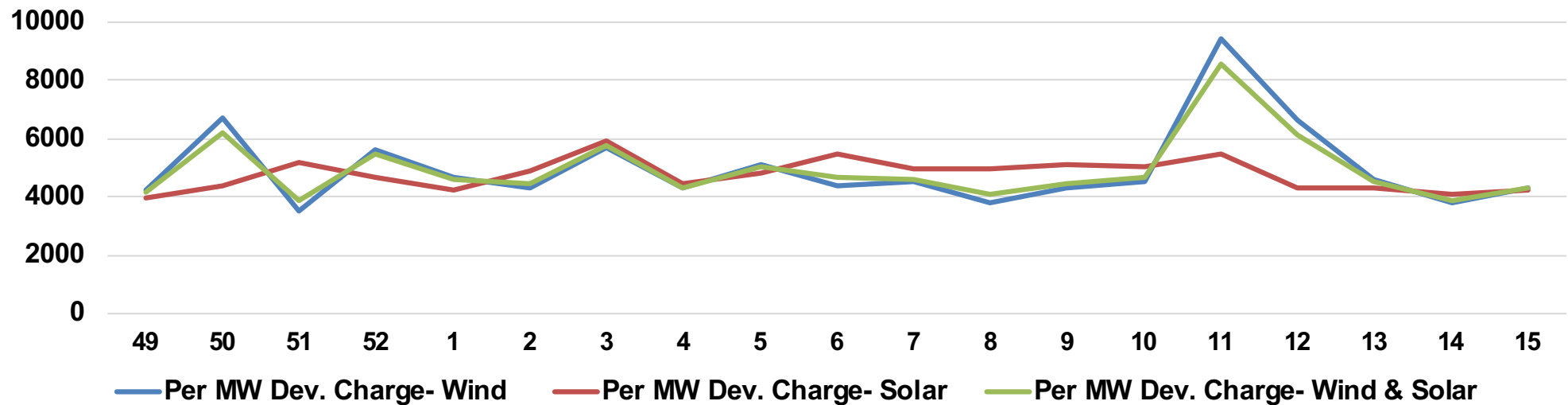
RE Notification - 1 / 2019 - Mock Bill



Per KWh Dev. Charge



Per MW Dev. Charge

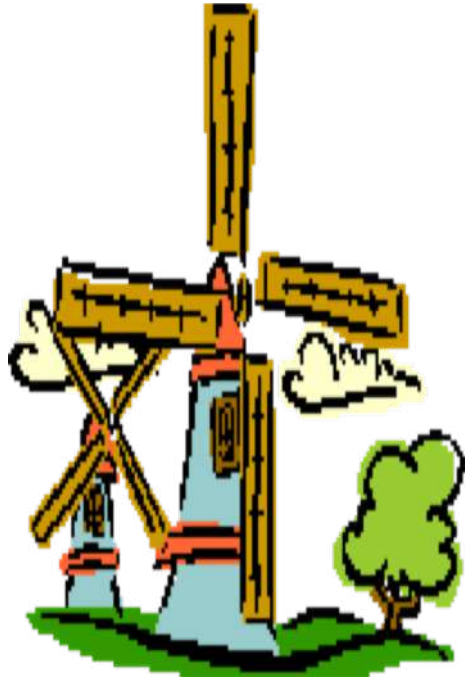


Preparedness for RE Notification - 1 / 2019



- Identified all RE project above 1 MW:
 - Wind 79 Nos. & Solar 117 Nos. Total: 196
- 100% real time data capturing
- Registration of QCA:
 - Provisionally registered QCA: 6 Nos., Self Registered: 28 Nos.
- Registration of Pooling station through QCA / Self Registration
 - Through QCA: 168 Nos., Self Registered: 28 Nos.
- Forecasting & Scheduling initiated
- Mock bill prepared: From 4th March 19 to 14th July 19 (up to Week 15).
- Fully geared up for commercial settlement of above regulation from 01st Aug 2019





Thanking you !!!



Suggestions for Model regulation for Intra-State Ancillary services

Objective:

To relieve the congestion in the Intra-State transmission system and to initiate counter measures against the defaulting entities.

Role of Nodal Agency (SLDC):

- Nodal Agency shall prepare merit order stack of all SGS covered under these regulation.
- Nodal agency shall direct the selected RRAS Provider(s) based on the merit order for economical dispatch for Regulation Up and Regulation Down, as and when requirement arises in the system on account of any of the following events:
 - Dispatch under RRAS in the common interest of State grid operation.
 - Dispatch under RRAS to the defaulting entity(ies) as decided by the Nodal agency under the circumstances mentioned in the detailed procedure.
- Nodal agency shall direct the selected RRAS Provider(s) to withdraw their services after the circumstances leading to triggering of RRAS no longer exist.

Suggestions for Model regulation for Intra-State Ancillary services

Role of Reserves Regulation Ancillary Services Provider (RRAS Provider):

- Shall submit details of fixed charges and variable charges, and any other applicable statutory charges, to the Nodal Agency on monthly basis.
- The RRAS Provider shall inject or back down generation as per the instruction of the Nodal Agency

Dispatch of Reserves Regulation Ancillary Services:

- Generation under the RRAS shall be scheduled to the Virtual Ancillary Entity in case of RRAS is triggered for the common interest of State grid operation.
- Generation under the RRAS shall be scheduled directly on one to one case basis for the defaulting entity(ies).
- Once the time period as specified by the Nodal Agency in the scheduled procedure starts, RRAS shall be deemed to have been triggered.
- Any deviations in schedule of RRAS Provider(s) beyond the revised schedule shall be treated in accordance with the existing deviation settlement mechanism adopted by the State.

Energy Accounting:

- On weekly basis along with Deviation Settlement Account based on interface meters data and schedule.
- SLDC shall issue an Ancillary Services Statement along with the Intra-State Deviation Settlement Mechanism Account.

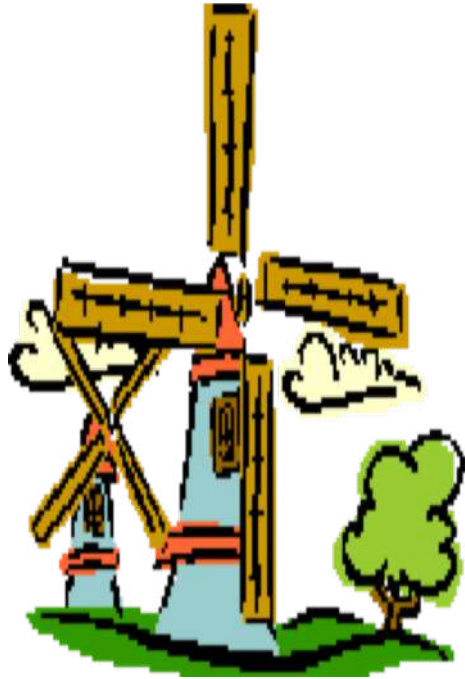
Reserves Regulation Ancillary Services Settlement:

- Separate account head of Reserves Regulation Ancillary Services.
- The payment to RRAS Provider(s) shall be from the State Deviation Pool Account Fund. There can be two types of pool. One is ZERO balance pool and other is pool having residual amount after settlement.
- In case of ZERO balance (also known as revenue neutral) pool, payment under RRAS from or to State DSM pool to be considered as a part of pool balancing and accordingly payable and receivable to be made equal.
- In case of Non-ZERO balance pool, settlement towards RRAS to be done directly with pool. In case of deficit pool, settlement to be decided prior to dispatch RRAS.
- The RRAS Provider(s) shall be paid at their fixed and variable charges, with mark-up on fixed cost, as decided by the Commission through a separate order from time to time. Provided that, the fixed and variable charges allowed by the Commission and as applicable at the time of delivery of RRAS shall be used to calculate the payment for this service and no retrospective settlement of fixed or variable charges shall be undertaken even if the fixed or variable charges are revised at a later date.

Suggestions for Model regulation for Intra-State Ancillary services

Reserves Regulation Ancillary Services Settlement (Cont.):

- The RRAS Provider(s) shall adjust the fixed charges to the original beneficiaries for the quantum of un-requisitioned surplus scheduled under Regulation Up service.
- For Regulation Down service, the RRAS Provider(s) shall pay back 75% of the variable charges corresponding to the quantum of Regulation Down services scheduled, to the pool.
- No commitment charges shall be payable to the RRAS Provider(s) for making themselves available for the RRAS.
- In case of dispatch under RRAS to defaulting entity(ies), payment would be made directly from defaulting entity to RRAS providers(s).



Thanking you !!!



R-APDRP (**Restructured Accelerated Power Development and Reforms Programme**)

SCADA/DMS Implementation

Gujarat

Project Overview

SCADA

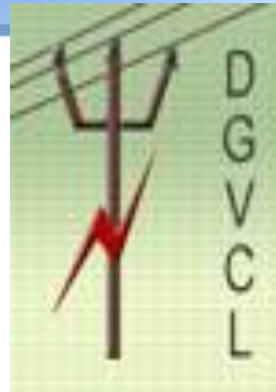
Supervisory Control And Data Acquisition

Remotely **monitors** the Power system, facilitates **supervisory control** of devices and provides **decision support tools** to **improve the system performance**.

Overall Project Scope of Work



Baroda



Surat

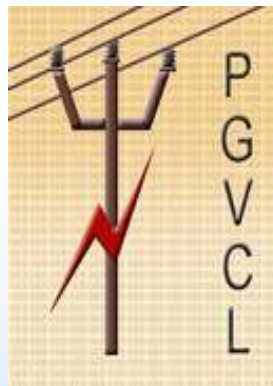


Ahmedabad

Rajkot

Jamnagar

Bhavnagar



■ Eligibility Criteria under R-APDRP(SCADA/DMS)

–the project area having more than 4 lacs population and annual input energy of the order of 350 MU

Functions of SCADA

- Remote substation/Distribution asset Monitoring
- Remote control of assets
- Total network status information
- Alarms/Events
- Trends/Reports

Functions of SCADA

- Remote substation/Distribution asset Monitoring

1. Breaker/Isolator Status
2. Asset protection/Healthy information
3. Transformer OLTC position
4. Feeder Measurements
5. RMU/Sectionaliser Status
6. FPI fault indication

SCADA/DMS System

Monitor and control Substation assets like

Breaker, isolator, Transformer Tap,

Monitor and control remotely by using RTU(remote terminal unit)

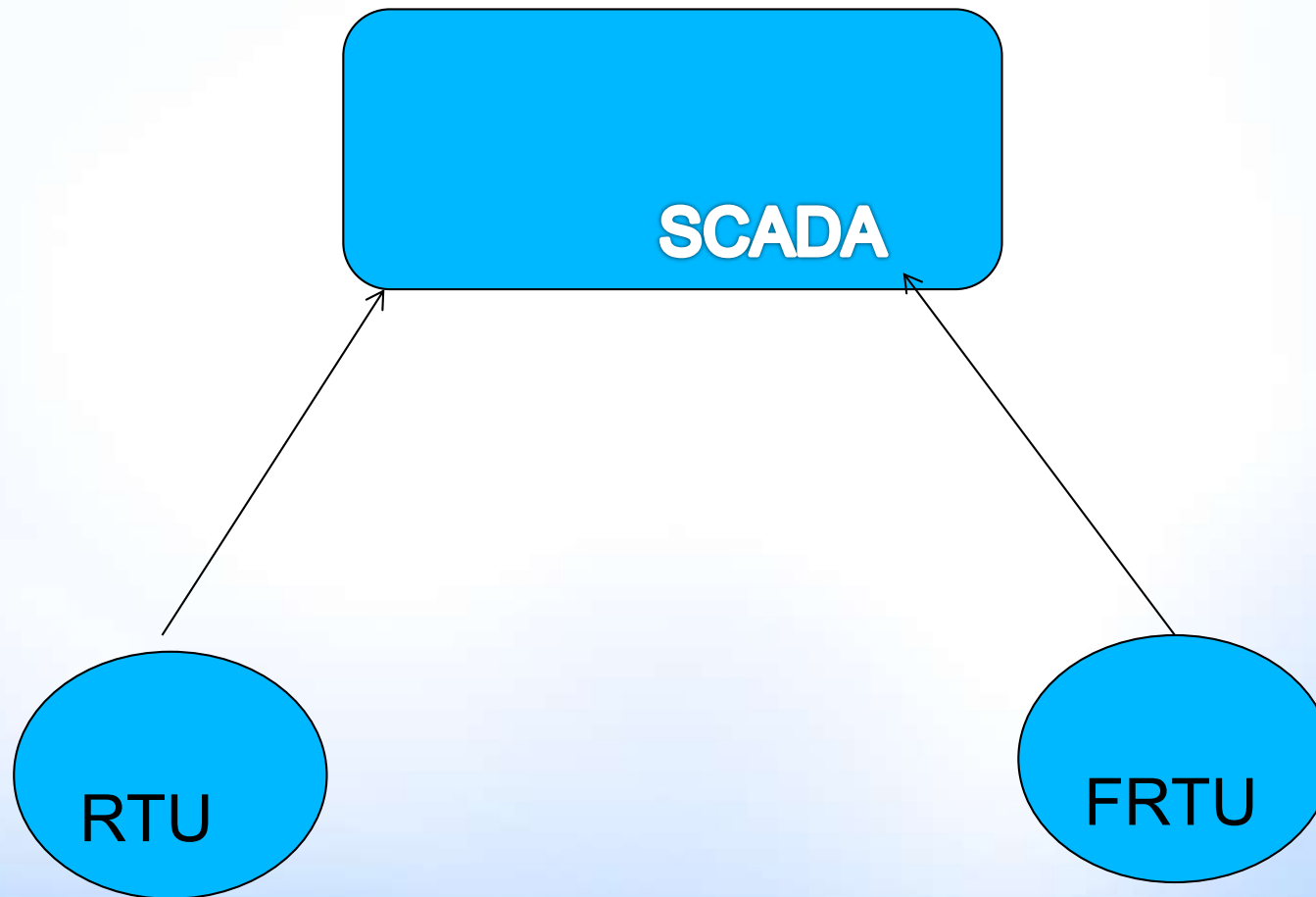
SCADA/DMS System

Monitor and control the distribution assets like

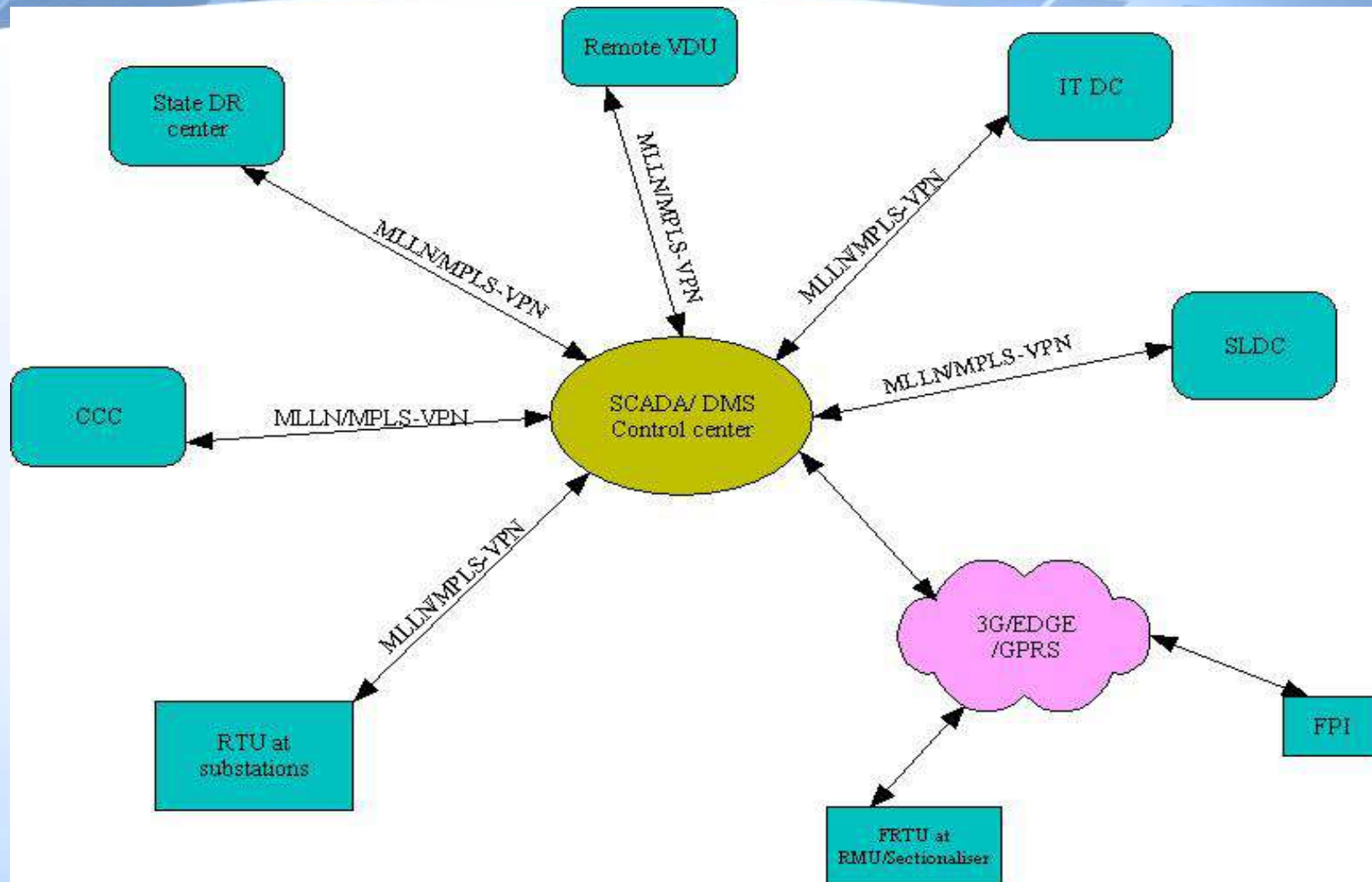
RMU, Sectionaliser, FPI

Monitor and control remotely by using FRTU(Field Remote terminal unit)

RTU/FRTU communicating with SCADA



Communication to SCADA/DMS



Automation Concept

Rather than rely on manual switching by field crews, automated feeder devices can be used to

Detect and isolate a faulted feeder section

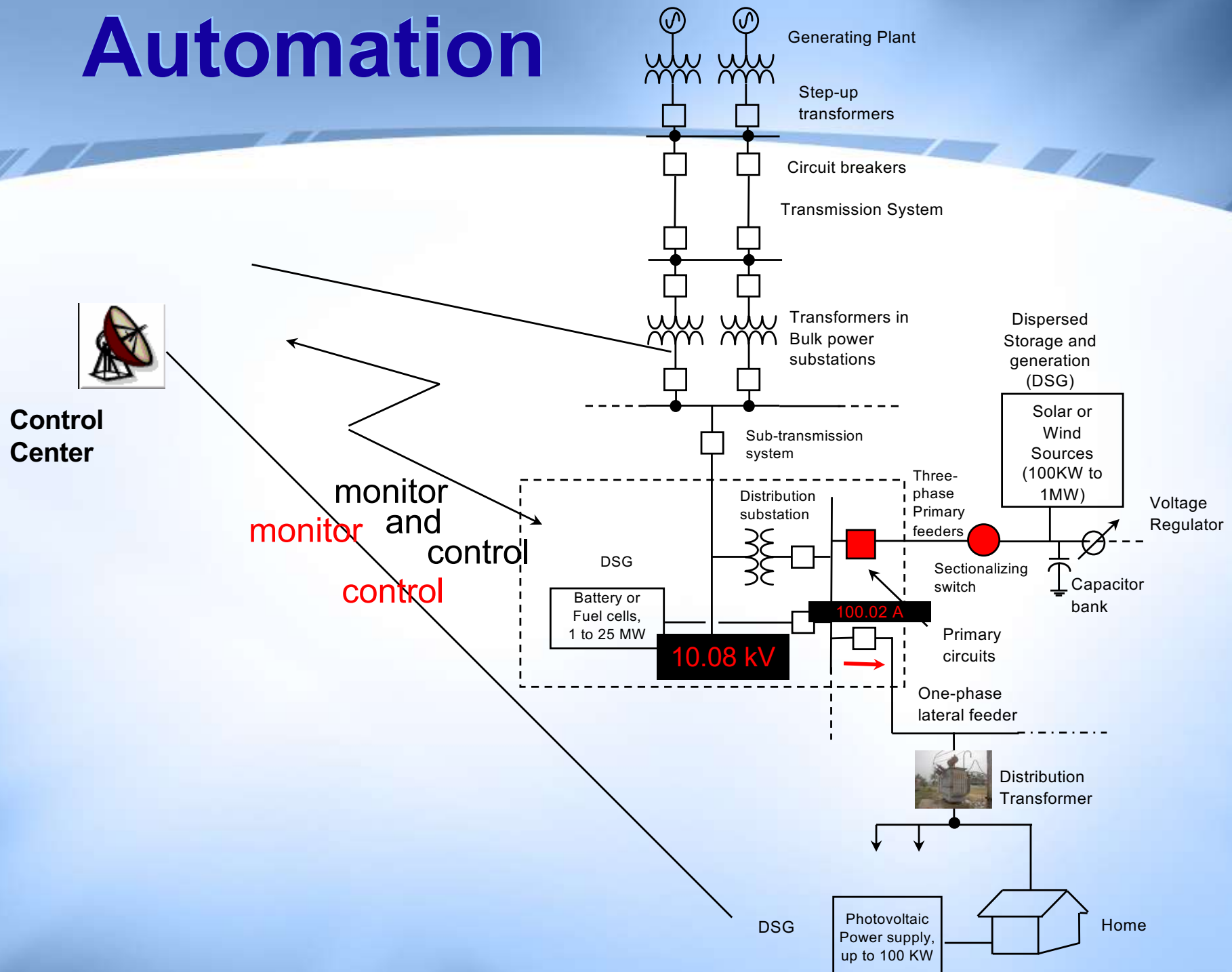
Restore power to customers upstream of the fault

Restore power to customers downstream of the fault

Concept Of RMU, Sectionalizer and FPIs

Automatic restoration/Remotely controlled restoration

Automation

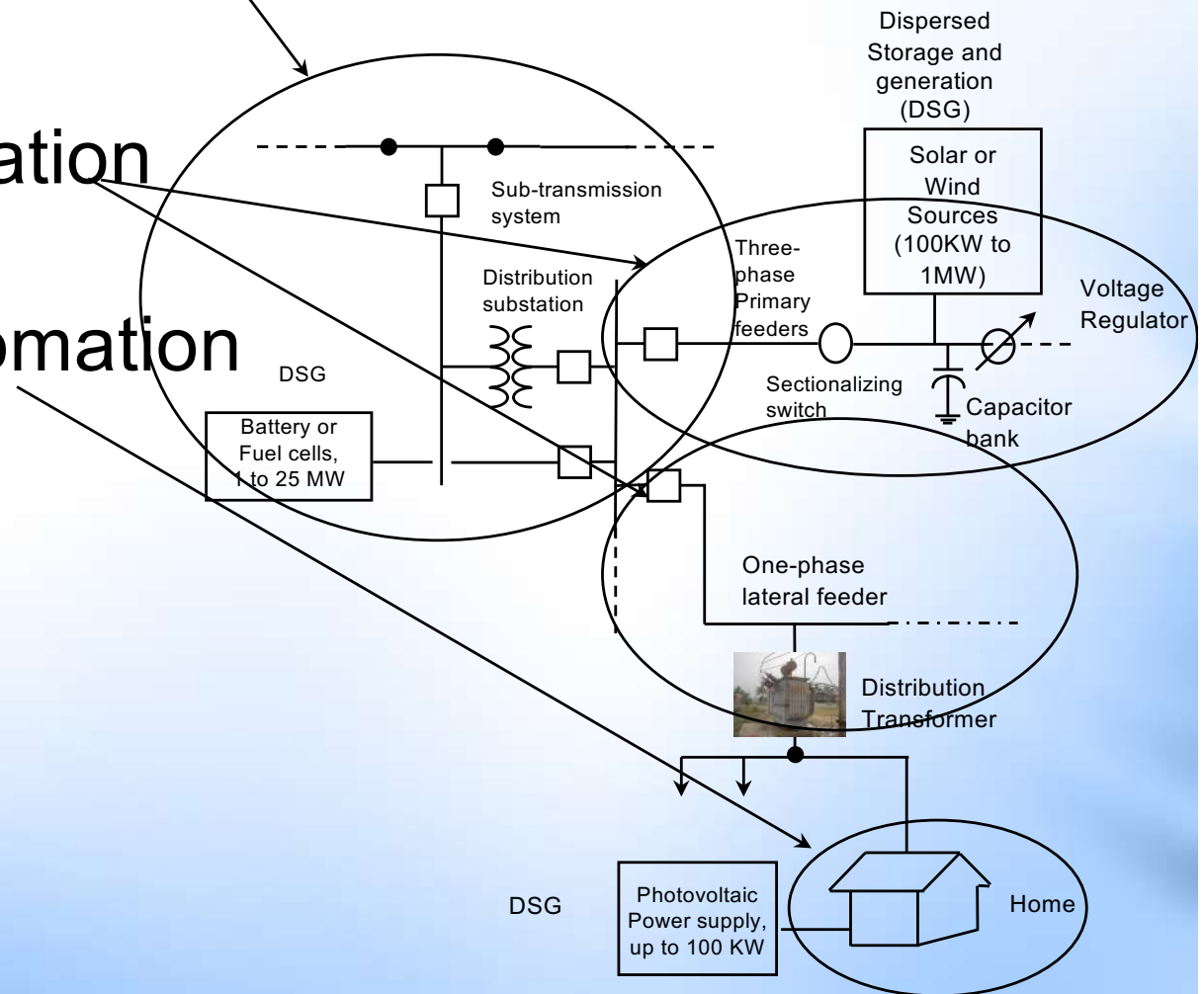


Levels of Automation

Substation Level Automation

Feeder Level Automation

Customer Level Automation



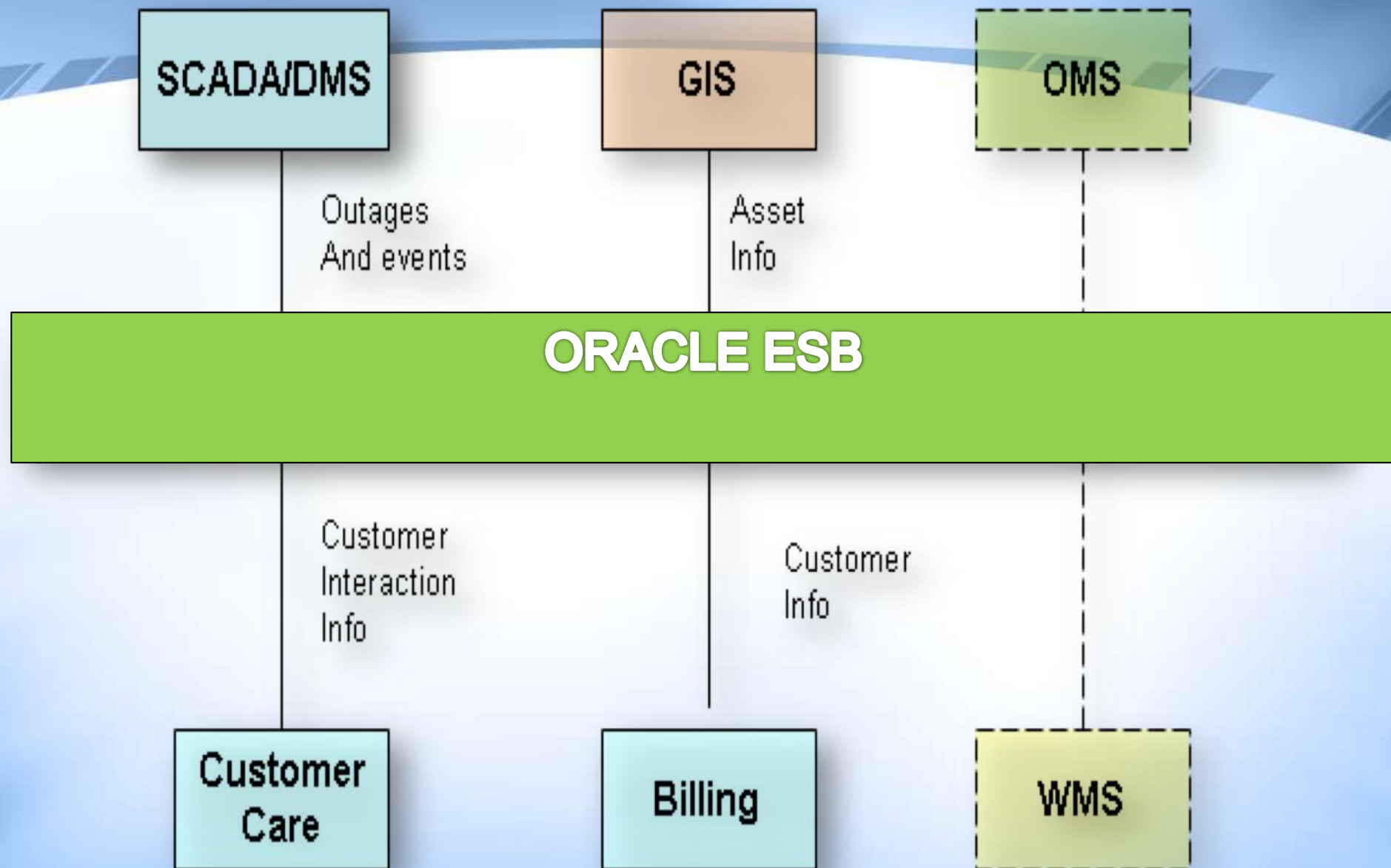
Performance Indices

Access to accurate and timely outage information is critical in order to maximize operational efficiency, minimize customer complaints, and maintain electric system reliability.

Track & benchmark reliability using standard performance indices such as CAIDI, SAIFI, and SAIDI.

These indices serve as valuable tools to compare utility reliability performance.

Integration with IT Systems



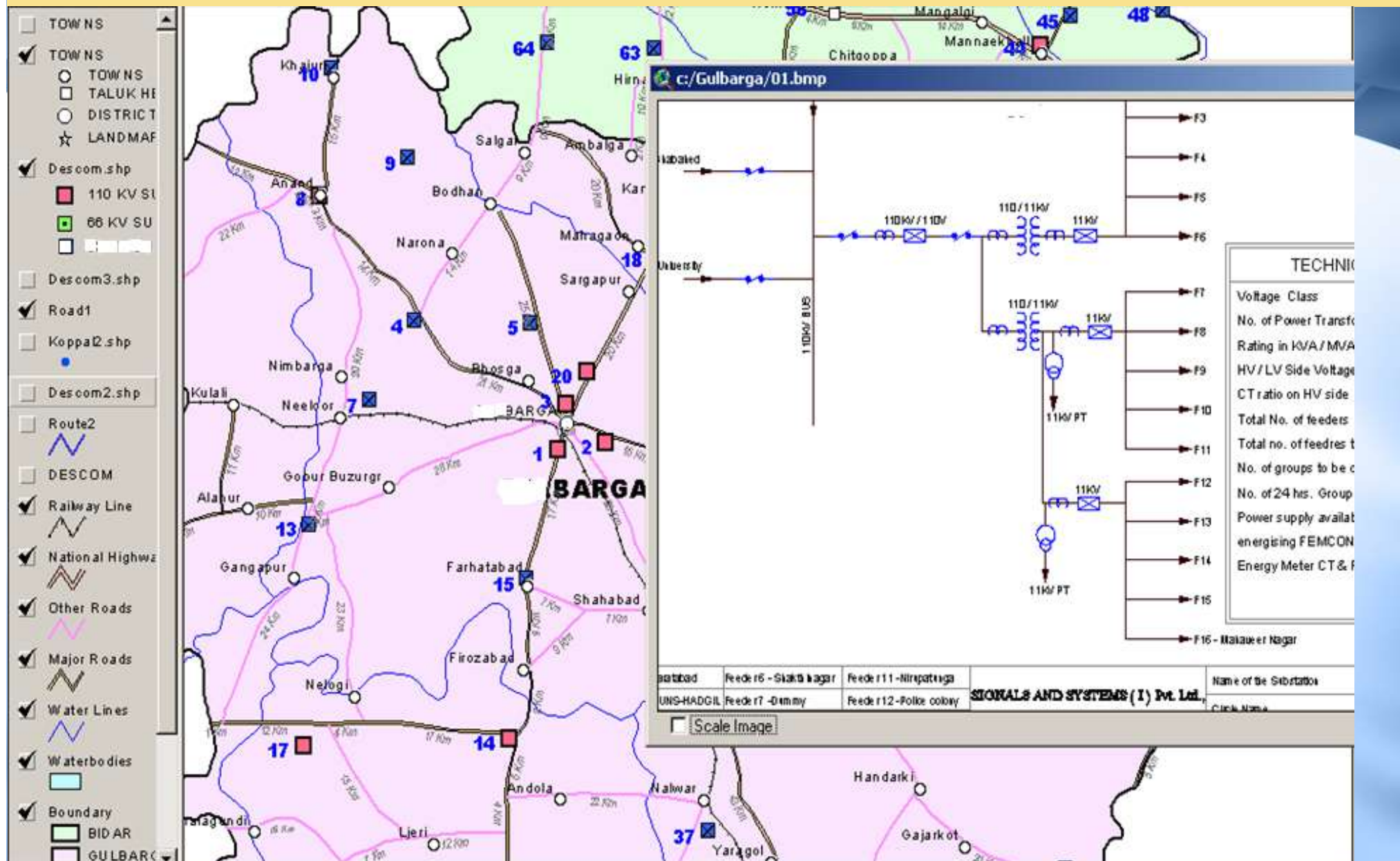
MIS Reports

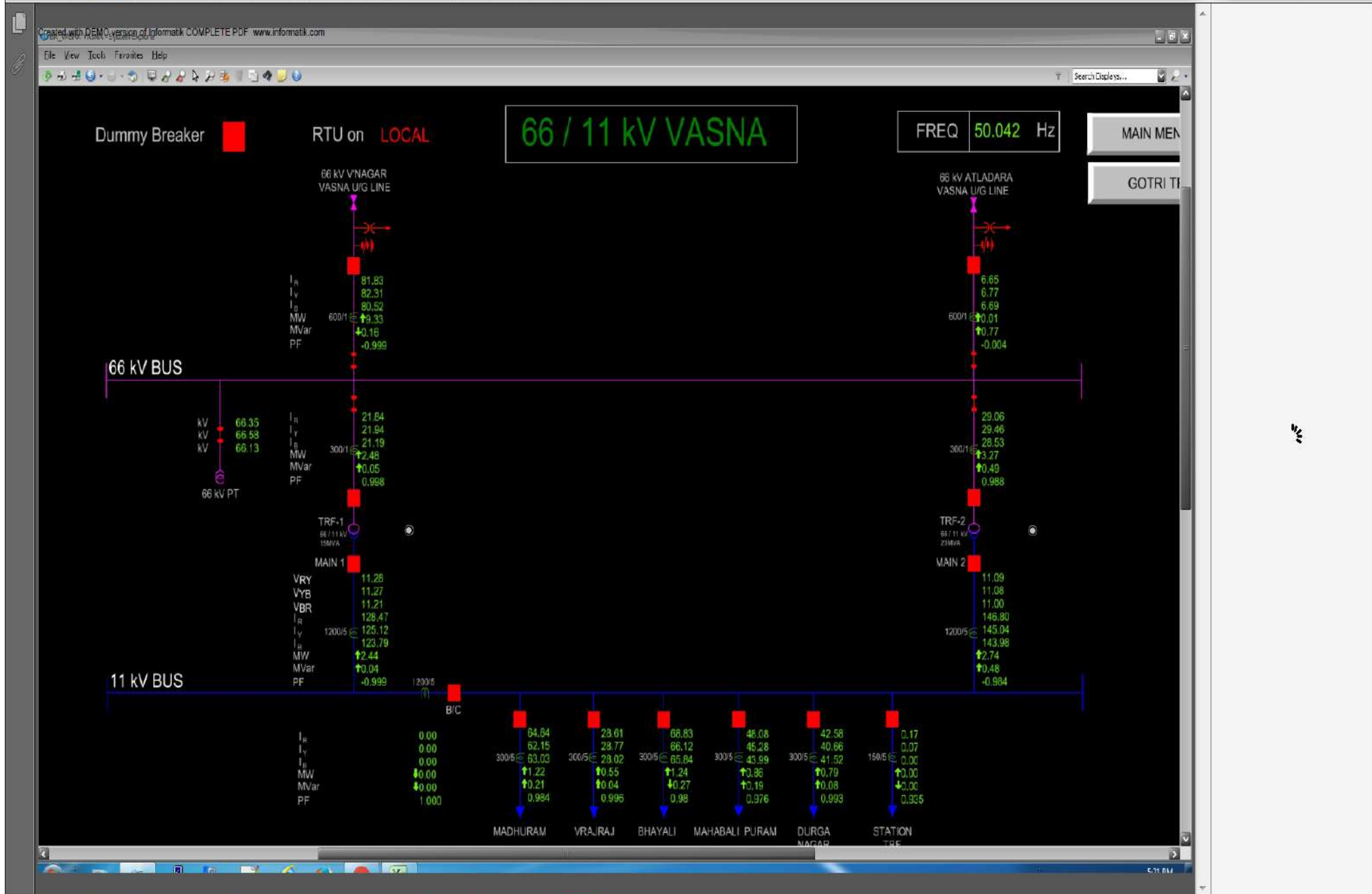
- DISCOM LEVEL
- BOUNDARY METER LEVEL
- CIRCLE LEVEL
- DIVISION LEVEL
- SUB-DIVISION LEVEL
- SS LEVEL
- FEEDER LEVEL

Reports – DISCOM level

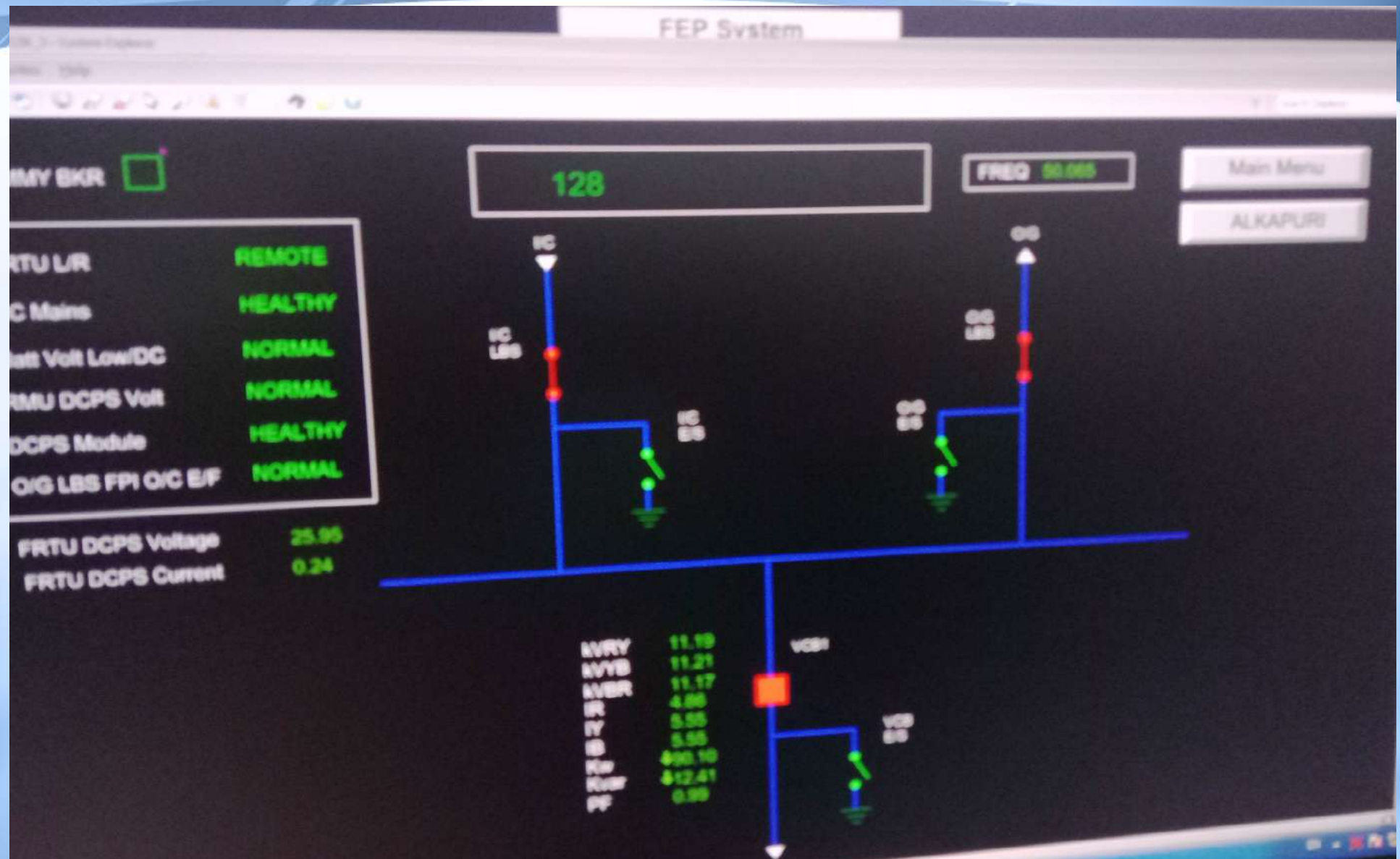
- DAILY INPUT INTO DISCOM
- ENERGY PROFILE
- DAILY DEMAND (KVA, KWH, RKVAH) PROFILE
- FREQUENCY PROFILE
- PERFORMANCE INDICES AT VARIOUS LEVELS

Sub Station – Network & Feeder details

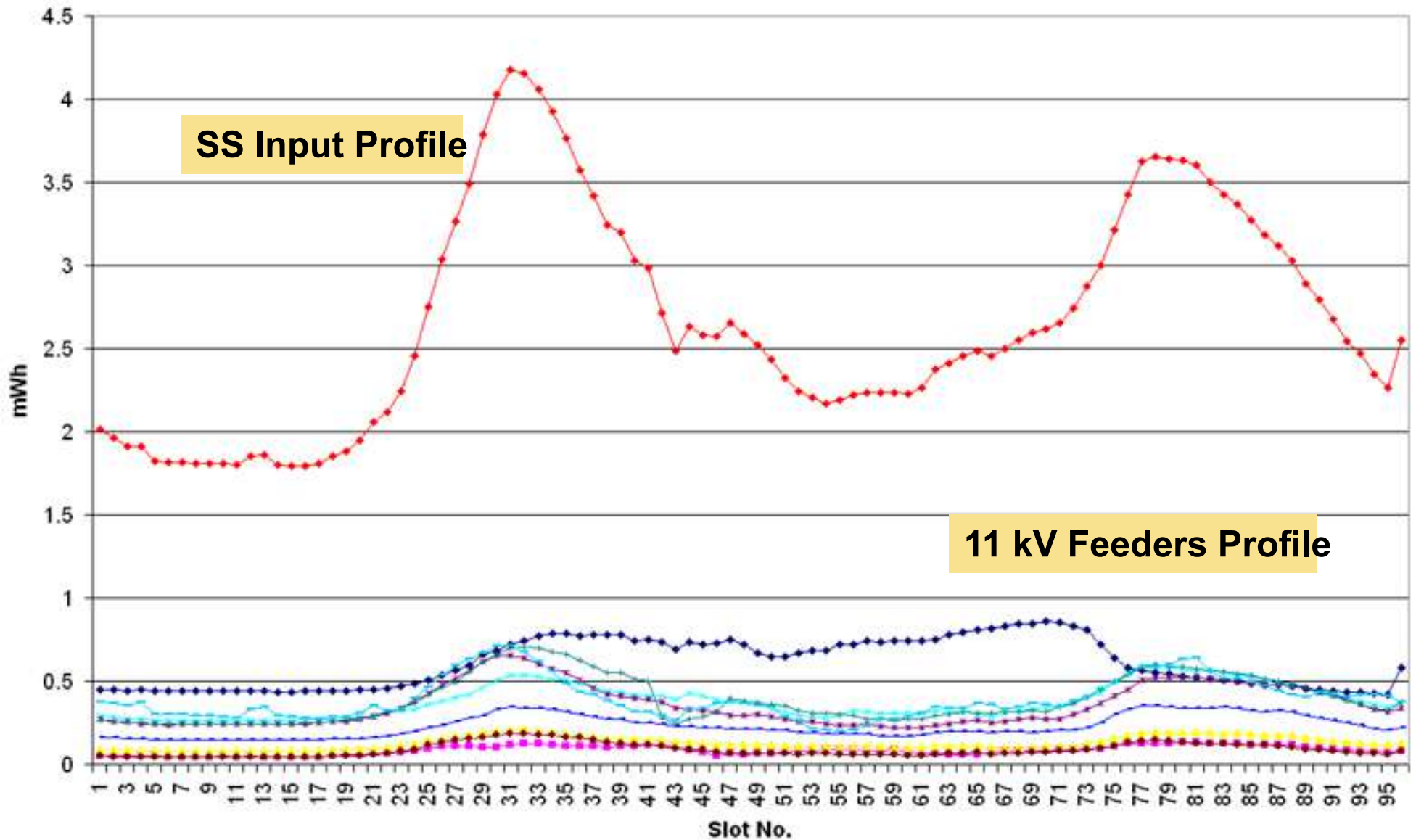




3way RMU SLD



Energy profile – SS level





DAILY INSTANTANEOUS REPORT
STATION:VASNA

24-Sep-19																			
TIME	11kv DURGA NAGAR									11kv STN TRF									
	VOLT	VOLT	VOLT	AMP	AMP	AMP	MW	MVAR	PF	VOLT	VOLT	VOLT	AMP	AMP	AMP	MW	MVAR	PF	
	(1-2)	(2-3)	(3-1)	(1)	(2)	(3)				(1-2)	(2-3)	(3-1)	(1)	(2)	(3)				
1:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
2:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
3:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
4:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
5:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
6:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
7:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
8:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
9:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
10:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
11:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
12:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
13:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
14:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
15:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
16:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
17:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
18:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
19:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
20:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
21:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
22:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
23:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
0:00	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
MIN	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
MIN TIME	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	
MAX	11.06	11.07	10.98	42.58	40.66	41.52	-0.79	-0.08	0.98	11.07	11.09	11.00	0.17	0.07	0.00	0.00	0.00	0.94	
MAX TIME	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	

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DAILY ENERGY REPORT STATION:VASNA

24-Sep-19	66KV								11KV									
TIME	VIDN VASN Ln		ATLD VASN Ln		TRF1		TRF2		MAIN 1		BUS COUPLER		MADHURAM		VRAJRAJ		BHAILI	
	IMP (MWH)	EXP (MWH)	IMP (MWH)	EXP (MWH)	IMP (MWH)	EXP (MWH)	IMP (MWH)	EXP (MWH)	IMP (MWH)	EXP (MWH)	IMP (MWH)	EXP (MWH)	IMP (MWH)	EXP (MWH)	IMP (MWH)	EXP (MWH)	IMP (MWH)	EXP (MWH)
0:15	0.00	2.94	0.00	0.00	0.78	0.00	1.03	0.00	0.00	0.78	0.00	0.00	0.42	0.00	0.20	0.00	0.28	0.00
0:30	0.00	2.86	0.00	0.00	0.74	0.00	0.99	0.00	0.00	0.74	0.00	0.00	0.40	0.00	0.18	0.00	0.27	0.00
0:45	0.00	2.74	0.00	0.00	0.74	0.00	0.98	0.00	0.00	0.74	0.00	0.00	0.40	0.00	0.18	0.00	0.26	0.00
1:00	0.00	2.74	0.00	0.00	0.71	0.00	0.94	0.00	0.00	0.72	0.00	0.00	0.38	0.00	0.18	0.00	0.25	0.00
1:15	0.00	2.62	0.00	0.00	0.71	0.00	0.94	0.00	0.00	0.69	0.00	0.00	0.38	0.00	0.18	0.00	0.26	0.00
1:30	0.00	2.62	0.00	0.00	0.70	0.00	0.92	0.00	0.00	0.69	0.00	0.00	0.37	0.00	0.18	0.00	0.25	0.00
1:45	0.00	2.53	0.00	0.00	0.67	0.00	0.88	0.00	0.00	0.67	0.00	0.00	0.37	0.00	0.17	0.00	0.24	0.00
2:00	0.00	2.46	0.00	0.00	0.66	0.00	0.88	0.00	0.00	0.65	0.00	0.00	0.35	0.00	0.17	0.00	0.24	0.00
2:15	0.00	2.46	0.00	0.00	0.66	0.00	0.87	0.00	0.00	0.65	0.00	0.00	0.36	0.00	0.17	0.00	0.24	0.00
2:30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2:45	0.00	4.80	0.00	0.00	1.26	0.00	1.67	0.00	0.00	1.27	0.00	0.00	0.70	0.00	0.33	0.00	0.46	0.00
3:00	0.00	2.30	0.00	0.00	0.62	0.00	0.83	0.00	0.00	0.60	0.00	0.00	0.34	0.00	0.16	0.00	0.23	0.00
3:15	0.00	2.32	0.00	0.00	0.62	0.00	0.81	0.00	0.00	0.62	0.00	0.00	0.34	0.00	0.16	0.00	0.23	0.00
3:30	0.00	2.27	0.00	0.00	0.61	0.00	0.80	0.00	0.00	0.60	0.00	0.00	0.33	0.00	0.16	0.00	0.23	0.00
3:45	0.00	2.26	0.00	0.00	0.60	0.00	0.80	0.00	0.00	0.60	0.00	0.00	0.33	0.00	0.16	0.00	0.22	0.00
4:00	0.00	2.32	0.00	0.00	0.62	0.00	0.81	0.00	0.00	0.60	0.00	0.00	0.34	0.00	0.16	0.00	0.22	0.00
4:15	0.00	2.27	0.00	0.00	0.60	0.00	0.80	0.00	0.00	0.62	0.00	0.00	0.34	0.00	0.16	0.00	0.22	0.00
4:30	0.00	2.32	0.00	0.00	0.62	0.00	0.82	0.00	0.00	0.59	0.00	0.00	0.32	0.00	0.15	0.00	0.23	0.00
4:45	0.00	2.29	0.00	0.00	0.62	0.00	0.80	0.00	0.00	0.61	0.00	0.00	0.34	0.00	0.15	0.00	0.22	0.00
5:00	0.00	2.29	0.00	0.00	0.60	0.00	0.80	0.00	0.00	0.61	0.00	0.00	0.33	0.00	0.14	0.00	0.22	0.00
5:15	0.00	2.19	0.00	0.00	0.59	0.00	0.78	0.00	0.00	0.58	0.00	0.00	0.32	0.00	0.14	0.00	0.22	0.00
5:30	0.00	2.30	0.00	0.00	0.61	0.00	0.81	0.00	0.00	0.60	0.00	0.00	0.33	0.00	0.15	0.00	0.22	0.00
5:45	0.00	2.32	0.00	0.00	0.62	0.00	0.82	0.00	0.00	0.61	0.00	0.00	0.33	0.00	0.14	0.00	0.22	0.00
6:00	0.00	2.34	0.00	0.00	0.62	0.00	0.82	0.00	0.00	0.61	0.00	0.00	0.34	0.00	0.13	0.00	0.22	0.00
6:15	0.00	2.43	0.00	0.00	0.65	0.00	0.86	0.00	0.00	0.66	0.00	0.00	0.35	0.00	0.14	0.00	0.23	0.00
6:30	0.00	2.61	0.00	0.00	0.70	0.00	0.92	0.00	0.00	0.68	0.00	0.00	0.35	0.00	0.14	0.00	0.24	0.00
6:45	0.00	2.72	0.00	0.00	0.70	0.00	0.93	0.00	0.00	0.72	0.00	0.00	0.37	0.00	0.15	0.00	0.24	0.00
7:00	0.00	2.69	0.00	0.00	0.73	0.00	0.97	0.00	0.00	0.70	0.00	0.00	0.37	0.00	0.14	0.00	0.25	0.00
7:15	0.00	2.67	0.00	0.00	0.72	0.00	0.94	0.00	0.00	0.72	0.00	0.00	0.38	0.00	0.14	0.00	0.24	0.00
7:30	0.00	2.64	0.00	0.00	0.70	0.00	0.93	0.00	0.00	0.70	0.00	0.00	0.36	0.00	0.13	0.00	0.25	0.00
7:45	0.00	2.78	0.00	0.00	0.74	0.00	0.97	0.00	0.00	0.73	0.00	0.00	0.37	0.00	0.14	0.00	0.29	0.00
8:00	0.00	2.80	0.00	0.00	0.74	0.00	0.99	0.00	0.00	0.74	0.00	0.00	0.35	0.00	0.14	0.00	0.41	0.00



Feeder-wise Outage report

SAFI-SADI (cb_trip_report)25919.pdf - Adobe Reader

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Chemtrols

INDUSTRIES LIMITED

CB TRIP / OUTAGE REPORT

*Start Date:

24-09-19 00:00:00

*End Date:

25-09-19 00:00:00

Query Results

STATION NAME	OSI KEY	CB NAME	TRIP TIME	CLOSE TIME	OUTAGE DURATION
ATLADARA	02000021	11kV KALALI ROAD CB	24-Sep-19 07:00:03	24-Sep-19 07:30:02	29m: 59s
ATLADARA	02000008	11kV SUNCITY CB	24-Sep-19 14:43:03	24-Sep-19 14:45:41	02m: 38s
CHHANI-A	02002013	11kV CHHANI TOWN CB	24-Sep-19 10:37:29	24-Sep-19 10:47:05	09m: 36s
CHHANI-A	02002010	11kV PRAKURTI CB	24-Sep-19 14:38:02	24-Sep-19 14:43:46	05m: 44s
CHHANI-A	02002010	11kV PRAKURTI CB	24-Sep-19 14:53:17	24-Sep-19 15:05:39	12m: 22s
CHHANI-A	02002010	11kV PRAKURTI CB	24-Sep-19 15:15:42	24-Sep-19 15:29:05	09m: 23s
CHHANI-B	02003016	11kV NIZAMPURA CB		24-Sep-19 02:42:40	
GAJRAWADI	02004011	11kV D MART CB		24-Sep-19 09:00:11	
GAJRAWADI	02004008	66kV TRF-2 CB		24-Sep-19 09:00:11	
GAJRAWADI	02004004	66kV JAMBUVA I/C Ln CB		24-Sep-19 09:00:11	
GAJRAWADI	02004005	66kV MOTI O/G Ln-1 CB		24-Sep-19 09:00:11	
GAJRAWADI	02004006	66kV MOTI O/G Ln-2 CB		24-Sep-19 09:00:11	
GAJRAWADI	02004007	66kV TRF-1 CB		24-Sep-19 09:00:11	
GAJRAWADI	02004009	66kV TRF-3 CB		24-Sep-19 09:00:11	
GAJRAWADI	02004010	11kV DHANTESHWAR CB		24-Sep-19 09:00:11	
GAJRAWADI	02004003	66kV WAGODIYA I/C Ln CB		24-Sep-19 09:00:11	
GAJRAWADI	02004024	11kV KAPURAI CB		24-Sep-19 16:36:33	
GAJRAWADI	02004021	11kV WADI CB	24-Sep-19 09:05:26	24-Sep-19 14:10:17	05h: 04m: 51s
GORWA	02005007	11kV MAIN-1 CB	24-Sep-19 10:27:21	24-Sep-19 11:40:19	01h: 12m: 58s
GORWA	02005005	66kV TRF-1 CB	24-Sep-19 10:27:30	24-Sep-19 11:38:24	01h: 10m: 54s
GOTRI-B	0200F023	11kV NARAYAN GARDEN CB	24-Sep-19 12:36:54	24-Sep-19 12:35:53	04m: 59s
GOTRI-B	0200F023	11kV NARAYAN GARDEN CB	24-Sep-19 12:36:03	24-Sep-19 12:58:43	22m: 40s
GOTRI-B	0200F017	11kV GERI_1 CB	24-Sep-19 15:28:09	24-Sep-19 15:29:37	01m: 28s
INDRAPURI	02007015	11kV PANI GATE TANKI CB		24-Sep-19 08:38:36	
INDRAPURI	02007024	11kV RAJIN NAGAR CB	24-Sep-19 09:01:39	24-Sep-19 09:07:32	05m: 53s
INDRAPURI	02007024	11kV RAJIN NAGAR CB	24-Sep-19 09:32:59	24-Sep-19 09:40:29	07m: 30s
INDRAPURI	02007008	11kV GARISON CB	24-Sep-19 23:06:48	24-Sep-19 23:06:36	05m: 48s
MAKARFURA-A	02009027	11kV TALSAT CB	24-Sep-19 09:26:57	24-Sep-19 09:23:24	02m: 27s
MAKARFURA-A	02009019	11kV MANEJA CB	24-Sep-19 05:36:38	24-Sep-19 05:36:16	05m: 38s
MAKARFURA-A	02009019	11kV MANEJA CB	24-Sep-19 06:03:04	24-Sep-19 06:03:47	43s
MAKARFURA-A	02009019	11kV MANEJA CB	24-Sep-19 06:13:17	24-Sep-19 06:16:12	02m: 55s
MAKARFURA-A	02009027	11kV TALSAT CB	24-Sep-19 08:34:33	24-Sep-19 08:36:16	01m: 43s
MAKARFURA-B	02012004	66kV MKR-A Ln CB		24-Sep-19 11:15:18	
MAKARFURA-B	02012004	66kV MKR-A Ln CB	24-Sep-19 11:15:18		
MOTEAUG	02009022	11kV LEHRIPURA CB		24-Sep-19 01:58:58	
MOTEAUG	02009010	11kV CHIMAN BAUG CB		24-Sep-19 14:01:25	
MOTEAUG	02009002	66kV GJW MOTI Ln-2 CB		24-Sep-19 14:01:25	
MOTEAUG	02009003	66kV GJW MOTI Ln-1 CB		24-Sep-19 14:01:25	
MOTEAUG	02009006	11kV GUJ KALA BHAVAN CB		24-Sep-19 14:01:25	
MOTEAUG	02009007	11kV SOUTH RING CB		24-Sep-19 14:01:25	



Feeder-wise Outage report

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P23

MGVCL

OUTAGE Report

Developed By

Chemtrols

INDUSTRIES LIMITED

*Start Date:

24-09-19 00:00:00

Start Query

Clear Fields

Current Month

*End Date:

25-09-19 00:00:00

Query Results

STATION NAME	OSI KEY	CB NAME	TRIP TIME	CLOSE TIME	OUTAGE DURATION	REMARKS	Outage Type
TARSALI	0200C005	66KV JAMBUVA TAR Ln-1 CB		24-Sep-19 00:08:04			Planned
TARSALI	0200C004	66KV JAMBUVA TAR Ln-2 CB		24-Sep-19 00:08:04			Planned
TARSALI	0200C003	66KV TAR MKR-B Ln-2 CB		24-Sep-19 00:08:04			Planned
TARSALI	0200C009	11KV STN TRF-1 CB		24-Sep-19 00:08:04			Planned
TARSALI	0200C006	66KV TRF-1 CB		24-Sep-19 00:08:04			Planned
TARSALI	0200C010	11KV I/C-1 CB		24-Sep-19 00:08:04			Planned
TARSALI	0200C002	66KV TAR MKR-B Ln-1 CB		24-Sep-19 00:08:04			Planned
TARSALI	0200C007	66KV TRF-2 CB		24-Sep-19 00:08:04			Planned
GAJRAWADI	02004006	66KV MOTI O/G Ln-2 CB		24-Sep-19 09:00:11			Planned
GAJRAWADI	02004009	66KV TRF-3 CB		24-Sep-19 09:00:11			Planned
GAJRAWADI	02004007	66KV TRF-1 CB		24-Sep-19 09:00:11			Planned
GAJRAWADI	02004005	66KV MOTI O/G Ln-1 CB		24-Sep-19 09:00:11			Planned
GAJRAWADI	02004003	66KV WAGODIYA I/C Ln CB		24-Sep-19 09:00:11			Planned
GAJRAWADI	02004010	11KV DHANESHWAR CB		24-Sep-19 09:00:11			Planned
MOTIBAUG	02009011	11KV TEEN MURTI CB		24-Sep-19 14:01:25			Planned
MOTIBAUG	02009010	11KV CHIMAN BAUG CB		24-Sep-19 14:01:25			Planned
MOTIBAUG	02009012	11KV MAIN-2 CB		24-Sep-19 14:01:25			Planned
MOTIBAUG	02009007	11KV SOUTH RING CB		24-Sep-19 14:01:25			Planned
MOTIBAUG	02009006	11KV GUJ KALA BHAVAN CB		24-Sep-19 14:01:25			Planned
MOTIBAUG	02009005	66KV TRF-2 CB		24-Sep-19 14:01:25			Planned
MOTIBAUG	02009004	66KV TRF-1 CB		24-Sep-19 14:01:25			Planned
MOTIBAUG	02009008	11KV NAV-1 CB		24-Sep-19 14:01:25			Planned
MOTIBAUG	02009009	11KV KHADI BHANDAR CB		24-Sep-19 14:01:25			Planned
MOTIBAUG	02009002	66KV GJW MOTI Ln-2 CB		24-Sep-19 14:01:25			Planned
MOTIBAUG	02009003	66KV GJW MOTI Ln-1 CB		24-Sep-19 14:01:25			Planned
MAKARPURA-A	02008027	11KV TALSAT CB	24-Sep-19 00:20:57				Planned
MOTIBAUG	02009022	11KV LEHRIPURA CB	24-Sep-19 03:07:40	24-Sep-19 05:15:06	02h: 07m: 26s		Planned
MOTIBAUG	02009022	11KV LEHRIPURA CB	24-Sep-19 05:19:22	24-Sep-19 05:23:24	04m: 02s		Planned
MAKARPURA-A	02008019	11KV MANEJA CB	24-Sep-19 05:30:38			24-09-18 05:30:38: 11KV MANEJA Spring Chrg/TCH:FAILE D: DEVICE CHANGE OF	Planned

OUTAGEQuery

SaifiSaidi

SaifiSaidi-Div

READY

70%

Desktop 17:45 25-09-2019

Feeder-wise Indices report

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Q33

		Planned		MADHYA GUJARAT VIDYUT COMPANY LTD (No. of consumers mapped on 11kv feeders in SCADA circle)				Developed By						SAIDI = $\Sigma(r_i * N_i) / N_T$ Where, SAIDI = System Average Interruption Duration Σ = Summation function. r_i = Restoration time, minutes. N_i = Total number of customers interrupted. N_T = Total number of customers served.			
		GT 5Min															
		SAIFI	0.000	SAIDI	0.383	Start Date	24-Sep-19 00:00:00		End Date	25-Sep-19 00:00:00							
DIVISION	SUB-DIVISION	SUB STATION	11kv FEEDERS	CONSUMERS	Consumers Affected (Consumers * Trip Count)	Total TT (Hrs) (Cons * Time)	FEEDERS		SUBSTATION								
							SAIFI	SAIDI	SAIFI	SAIDI							
VISH EAST DIV	TOWER	NAV/LAKHI	11kv TOWER CB	4282	0.00	0.00	0.000	0.000	0.036	0.005							
VISH EAST DIV	DANDIA BAZAR	NAV/LAKHI	11kv S.S.G HOSPITAL CB	469	0.00	0.00	0.000	0.000									
VISH EAST DIV	DANDIA BAZAR	NAV/LAKHI	11kv POLICE BHAVAN CB	48	0.00	0.00	0.000	0.000									
VISH EAST DIV	DANDIA BAZAR	NAV/LAKHI	11kv DHARAMSHALA CB	166	0.00	0.00	0.000	0.000									
VISH EAST DIV	DANDIA BAZAR	NAV/LAKHI	11kv NAULAKHI SST CB	10	0.00	0.00	0.000	0.000									
VISH EAST DIV	MANDVI	NAV/LAKHI	11kv MANDVI FEEDER CB	2961	0.00	0.00	0.000	0.000									
VISH EAST DIV	DANDIA BAZAR	NAV/LAKHI	11kv GAS OFFICE CB	1374	0.00	0.00	0.000	0.000									
VISH EAST DIV	TOWER	NAV/LAKHI	11kv KIRTI MANDIR CB	499	0.00	0.00	0.000	0.000									
VISH EAST DIV	DANDIA BAZAR	NAV/LAKHI	11kv GROUND CB	5	0.00	0.00	0.000	0.000									
VISH EAST DIV	DANDIA BAZAR	NAV/LAKHI	11kv MARKET CB	3021	0.00	0.00	0.000	0.000									
VISH EAST DIV	DANDIA BAZAR	NAV/LAKHI	11kv CENTRAL JAIL CB	376	0.00	0.00	0.000	0.000	1.000	0.145							
BARODA O & M	CHHANI	CHHANI-A	11kv PRAKURTI CB	2142	2142.00	333.80	1.000	0.156									
BARODA O & M	CHHANI	CHHANI-A	11kv CHHANI TOWN CB	3774	3774.00	840.76	1.000	0.223	0.151	0.022							
VISH WEST DIV	SAMA	CHHANI-A	11kv HARNI CB	0	0.00	0.00	0.000	0.000									
VISH WEST DIV	FATEGUNJ	CHHANI-B	11kv ADITYA CB	2606	0.00	0.00	0.000	0.000									
VISH WEST DIV	FATEGUNJ	CHHANI-B	11kv SHASTRI BRG CB	3649	0.00	0.00	0.000	0.000									
VISH WEST DIV	FATEGUNJ	CHHANI-B	11kv DELUXE CB	3249	0.00	0.00	0.000	0.000									
VISH WEST DIV	FATEGUNJ	CHHANI-B	11kv DEEP CB	2553	0.00	0.00	0.000	0.000									
VISH WEST DIV	FATEGUNJ	CHHANI-B	11kv FATEHGUNJ CB	2965	0.00	0.00	0.000	0.000									
VISH WEST DIV	FATEGUNJ	CHHANI-B	11kv NIZAMPURA CB	3575	0.00	0.00	0.000	0.000									
VISH WEST DIV	FATEGUNJ	CHHANI-B	11kv AAVRAN CB	2953	0.00	0.00	0.000	0.000									
VISH WEST DIV	SAMA	CHHANI-B	11kv PANI TANKI CB	3888	0.00	0.00	0.000	0.000									
VISH WEST DIV	SAMA	CHHANI-B	11kv NARMADA CB	4265	0.00	0.00	0.000	0.000									
VISH WEST DIV	FATEGUNJ	CHHANI-B	11kv ALEMBIC CB	552	0.00	0.00	0.000	0.000									
VISH WEST DIV	SAMA	CHHANI-B	11kv KADAM NAGAR CB	2388	0.00	0.00	0.000	0.000									
LALBAUG DIV	LALBAUG	GAJRAWADI	11kv DHANTESHWAR CB	4274	4859.00	641.10	1.137	0.150									
VISH EAST DIV	PANIGATE	GAJRAWADI	11kv D MART CB	2043	0.00	0.00	0.000	0.000									
LALBAUG DIV	LALBAUG	GAJRAWADI	11kv RAILWAY CB	2332	0.00	0.00	0.000	0.000									
LALBAUG DIV	WADI	GAJRAWADI	11kv CHANDAN CB	5828	0.00	0.00	0.000	0.000									
LALBAUG DIV	BARANPURA	GAJRAWADI	11kv GHANDIYADI POLE CB	213	0.00	0.00	0.000	0.000									

OUTAGEQuery SaifiSaidi SaifiSaidi-Div

READY

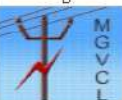
Feeder-wise Indices report

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B		C		D		E		F		G		H		I		K		M		N		O		P		Q		R		S		T		U		V		W		X		Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		Unplanned		MADHYA GUJARAT VIDYUT COMPANY LTD																		Developed By																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			

Feeder-wise Indices report

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MADHYA GUJARAT VIDYUT COMPANY LTD						
(No. of consumers mapped on 11kv feeders in SCADA circle)						
SAIFI		0.000		SAIDI		0.383
SI.No	DIVISION	SUB-DIVISION	Sub Division		Division	
			SAIFI	SAIDI	SAIFI	SAIDI
1	BARODA O & M	TOWER	0.059	0.014	0.059	0.014
2	JAMBUVA	JAMBUVA	1.000	0.394	1.000	0.394
3	LALBAUG DIV	BARANPURA	0.736	0.055	0.208	0.031
4	LALBAUG DIV	GIDC	0.239	0.074		
5	LALBAUG DIV	LALBAUG	0.310	0.047		
6	LALBAUG DIV	MANJALPUR	0.075	0.012		
7	LALBAUG DIV	TARSALI	0.000	0.000		
8	LALBAUG DIV	WADI	0.058	0.014	0.078	0.018
9	VISH EAST DIV	DANDIA BAZAR	0.443	0.103		
10	VISH EAST DIV	IND SEC OFFICE	0.000	0.000		
11	VISH EAST DIV	KARELI BAUG	0.000	0.000		
12	VISH EAST DIV	MANDVI	0.000	0.000		
13	VISH EAST DIV	PANIGATE	0.000	0.000	0.044	0.010
14	VISH EAST DIV	SARDAR IND ESTT	0.082	0.020		
15	VISH EAST DIV	TOWER	0.059	0.014		
16	VISH WEST DIV	AKOTA	0.075	0.021		
17	VISH WEST DIV	ALKAPURI	0.083	0.021		
18	VISH WEST DIV	FATEGUNJ	0.000	0.000	0.000	0.000
19	VISH WEST DIV	GORWA	0.000	0.000		
20	VISH WEST DIV	GOTRI	0.114	0.020		
21	VISH WEST DIV	SAMA	0.000	0.000		
22	VISH WEST DIV	VASNA	0.000	0.000		

$$SAIDI = \Sigma(r_i * N_i) / N_T$$

Where,

SAIDI = System Average Interruption Duration

Σ = Summation function

r_i = Restoration time

N_i = Total number of customers interrupted

N_T = Total number of customers served

$$SAIFI = \Sigma(N_i) / N_T$$

Where,

SAIFI = System Average Interruption Frequency Index

Σ = Summation function

N_i = Total number of customers interrupted

N_T = Total number of customers served

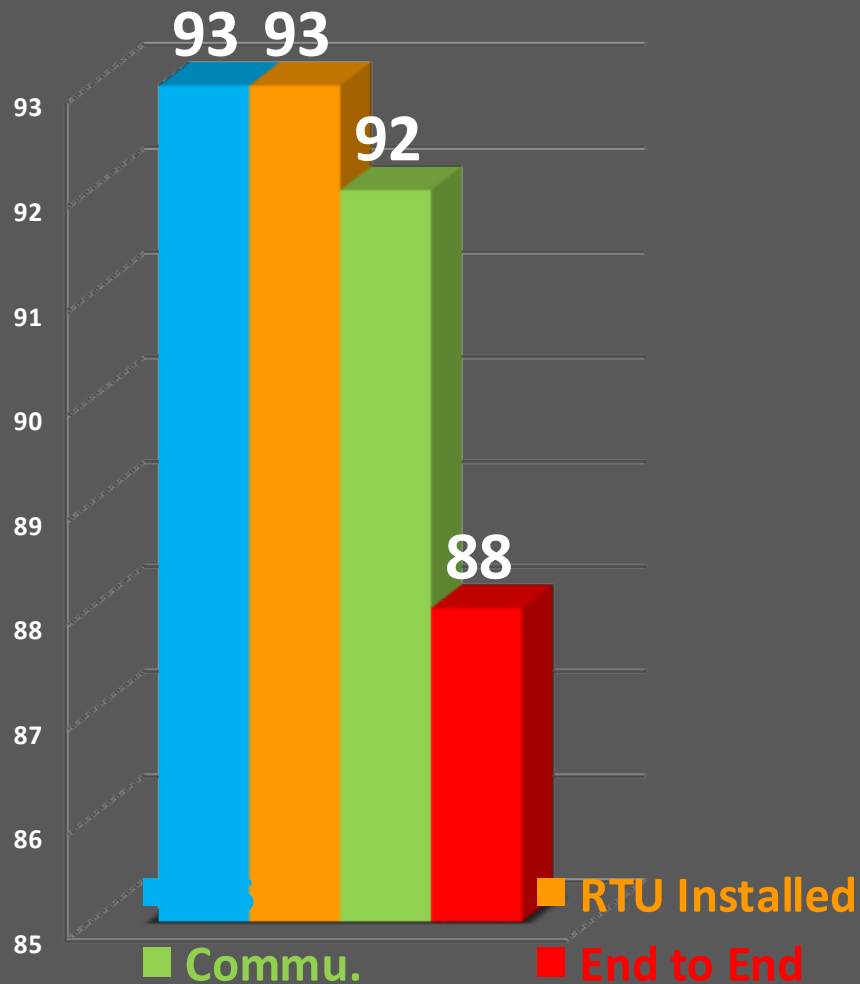
Feeder-wise Indices report

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FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW																								
C3																								
	A	B	C	D	F	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V				
1			ADHYA GUJARAT VIDYUT COMPANY LTD																					
2			(No. of consumers mapped on 11kv feeders in SCADA circle)																					
3																								
4	SI.No	DIVISION	SUB-DIVISION	Sub Division	Division																			
5				MAIFI	MAIFI																			
6	1	BARODA O & M	TOWER	0.000	0.000																			
7	2	JAMBUVA	JAMBUVA	0.000	0.000																			
8	3	LALBAUG DIV	BARANPURA	0.000	0.039																			
9	4	LALBAUG DIV	GIDC	0.000																				
10	5	LALBAUG DIV	LALBAUG	0.353																				
11	6	LALBAUG DIV	MANJALPUR	0.000																				
12	7	LALBAUG DIV	TARSALI	0.000																				
13	8	LALBAUG DIV	WADI	0.000																				
14	9	VISH EAST DIV	DANDIA BAZAR	0.000	0.000																			
15	10	VISH EAST DIV	IND SEC OFFICE	0.000																				
16	11	VISH EAST DIV	KARELI BAUG	0.000																				
17	12	VISH EAST DIV	MANDVI	0.000																				
18	13	VISH EAST DIV	PANIGATE	0.000																				
19	14	VISH EAST DIV	SARDAR IND ESTT	0.000																				
20	15	VISH EAST DIV	TOWER	0.000	0.041																			
21	16	VISH WEST DIV	AKOTA	0.000																				
22	17	VISH WEST DIV	ALKAPURI	0.177																				
23	18	VISH WEST DIV	FATEGUNJ	0.000																				
24	19	VISH WEST DIV	GORWA	0.000																				
25	20	VISH WEST DIV	GOTRI	0.000																				
26	21	VISH WEST DIV	SAMA	0.000																				
27	22	VISH WEST DIV	VASNA	0.139																				
28																								
29																								

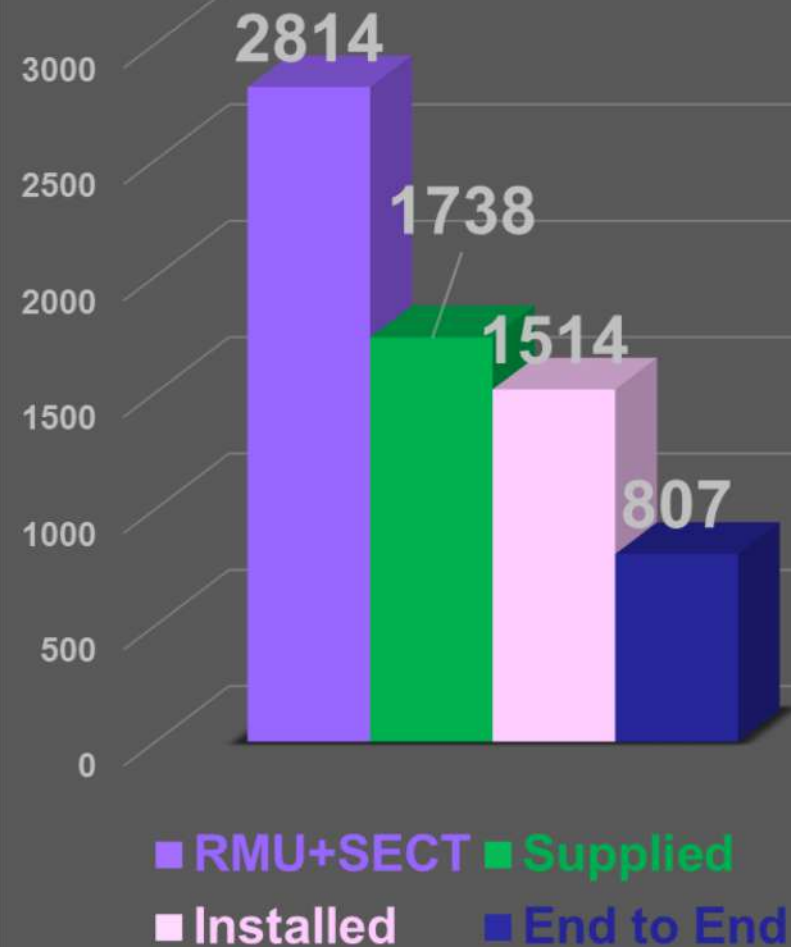
OUTAGEQuery SaifiSaidi SaifiSaidi-Div

Gujarat Total- 6 Towns

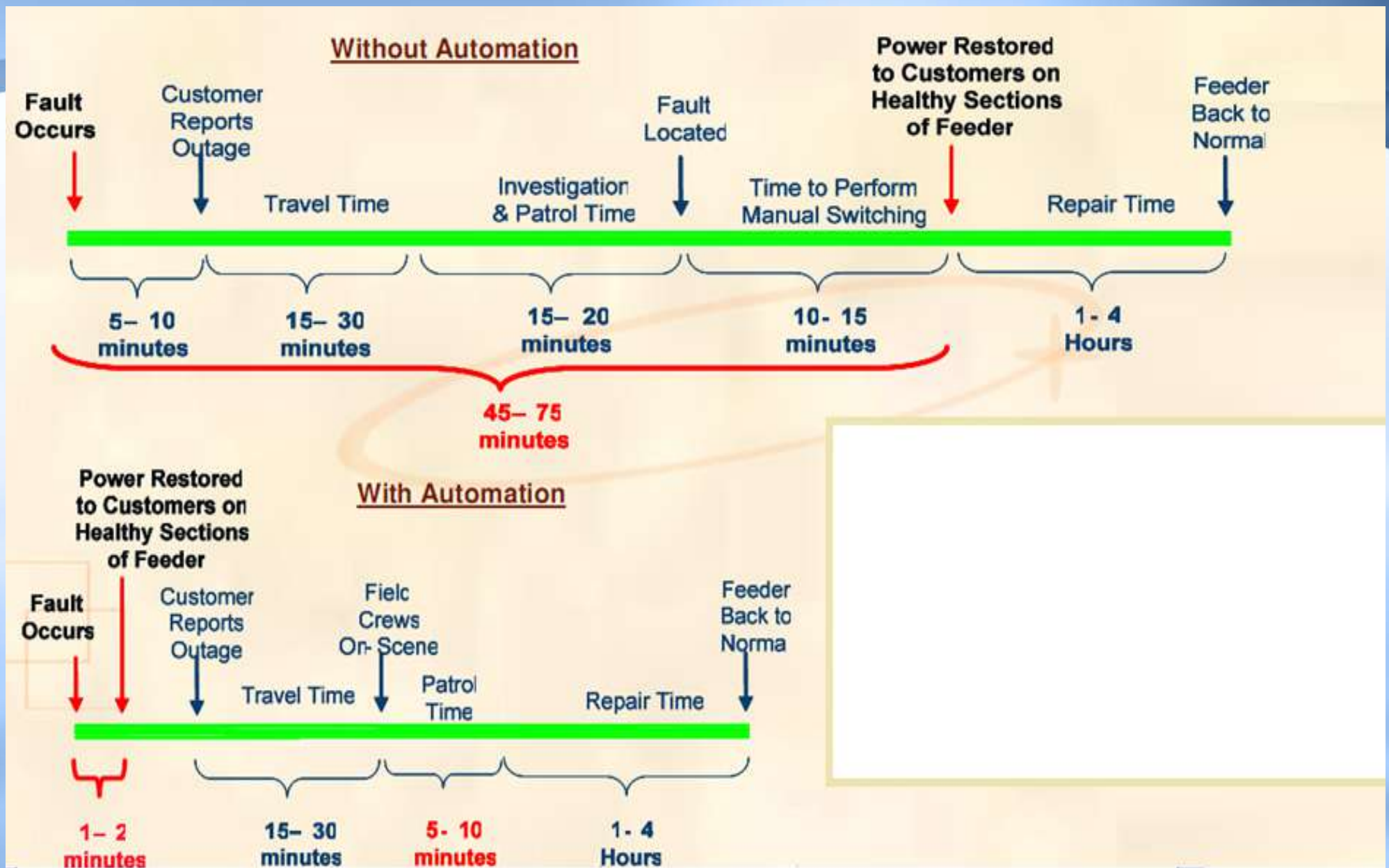
RTU Progress



FRTU Progress



Impact in the fault mangement





Rural Feeder Monitoring-Progress of meter replacement by GETCO & replacement of defective Modem / accessories by RECTPCL & allied agencies



METER DATA ACQUISITION SYSTEM

Welcome MGVC L LOGOUT

DASHBOARD

HIERARCHY MANAGEMENT

METER MANAGEMENT

METER DATA REPORTS

SYSTEM MANAGEMENT

DATA SUMMARY

COMMUNICATION SUMMARY

OUTAGES

HIERARCHY

Discom

Zone

Circle

Division

Town

Section

Sub station

Category

Select Date

MGVCL

Select Zone

Select Circle

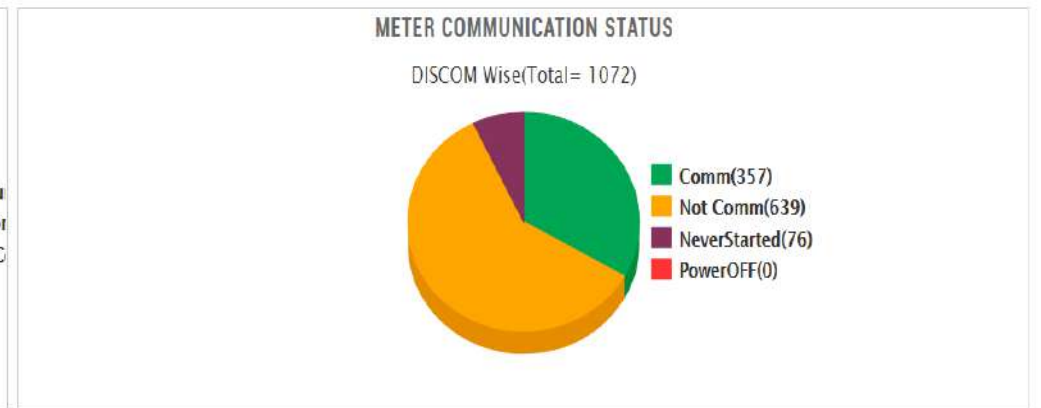
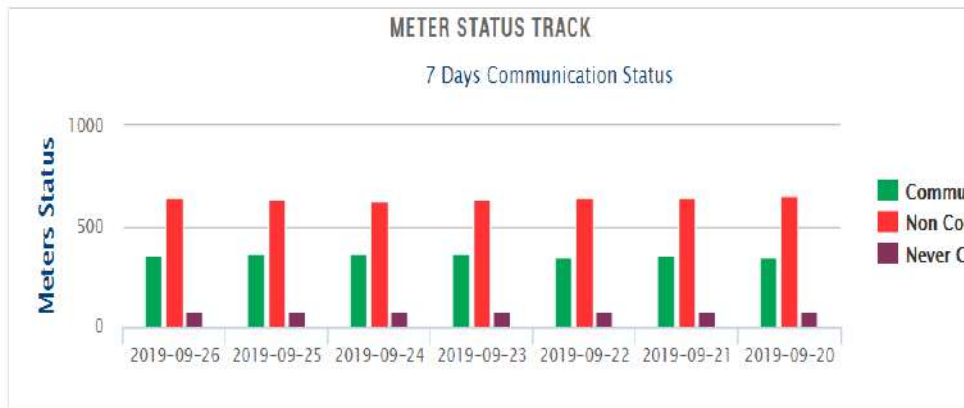
Select Divisor

Select Town

Select Section

Select Sub St

ALL



METER RAWDATA AND CDF INFO [26-09-2019]

SI No	METER No	CD	IP	CDF			
				TOTAL	MIN SIZE	MAX SIZE	SHARED TO CIA
1	GEB17778	1	7	1	576688	576688	YES
2	GET11593						
3	GEB17779						

OUTAGES

SI No	SSName	FeederName	Modem SrNo	Time Stamp
-------	--------	------------	------------	------------

Communication Status of Modem Installed



Sr. No	DISCOM	Modem Installed	Modem Communication Status As on:
1	DGVCL	827	372
2	MGVCL	1072	623
3	PGVCL	4210	2422
4	UGVCL	3453	2266
	Total	9562	5683



Ministry Of Power
Government of India

RURAL FEEDER MONITORING SCHEME

(AN INITIATIVE BY GOVT. OF INDIA AND MINISTRY OF POWER)

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26-09-2019 08:36:35 AM

Home
NPP Reports
Discom Reports
Meter Data
Configuration

Outage & Reliability Report (Gujarat)

GUJARAT Discom MGVCCL District Anand Period 23-09-2019 24-09-2019



State:	GUJARAT
Discom:	MGVCCL
District:	Anand
Period:	23-09-2019 to 24-09-2019

Name of Feeder	Meter No	Name Of Villages	Feeder Type	Total no of Consumers	Total Hours of Supply (HH:MM)	Average Hours of Supply in a day (HH:MM)	No. of Power Failures/Outages (Nos.)	Duration of Power Failure/Outage (Minutes)	% Availability	Minimum Voltage	Maximum Current (Ampere)	Fwd. kWh (A)	Rev. kWh (B)	MF (C)	Fwd. kWh with MF (D=A*C)	Rev. kWh with MF (E=B*C)	No. Load
11KV GOKALPURA	06486497	More Info	AG	422	48:00	24:00	0	0	100	-	-	0	253.486	3	0.0000	760.4589	2
11KV VADTAL	06486526	More Info	AG	782	48:00	24:00	0	0	100	-	-	0	68.7482	6	0.0000	412.4892	2
11KV JILOD	08042676	More Info	AG	340	48:00	24:00	0	0	100	-	-	0	3.4166	1	0.0000	3.4166	2
11KV SANKHYAD	08042700	More Info	AG	656	45:30	22:45	3	150	94.79	-	-	0	3.5032	2	0.0000	7.0064	2
11KV DEVAPURA	08042705	More Info	AG	626	47:30	23:45	1	30	98.96	-	-	0	6.5513	1	0.0000	6.5513	2
11KV KHERDA	10282695	More Info	AG	476	48:00	24:00	0	0	100	-	-	0	259.289	2	0.0000	518.5782	2
11KV SANTOKPURA	11051719	More Info	RURAL	5292	48:00	24:00	0	0	100	-	-	0	24144.1	2	0.0000	48288.1318	2
11KV GANESHPURASARSA	11051882	More Info	AG	300	48:00	24:00	0	0	100	-	-	0	1750.16	2	0.0000	3500.3156	2
11KV PRATAPURA	11104801	More Info	AG	666	24:00	24:00	0	0	100	-	-	0	280.357	2	0.0000	560.7144	1
11KV RADHAKISHA	11105163	More Info	RURAL	543	48:00	24:00	0	0	100	-	-	0	10207.4	2	0.0000	20414.8512	2
11KV KHANPUR SARSA	12041080	More Info	RURAL	2790	24:00	24:00	0	0	100	-	-	0	12313.1	1	0.0000	12313.1174	1
11KV HARKHAPURA	12067231	More Info	RURAL	2319	48:00	24:00	0	0	100	-	-	22457.2	0	1	22457.2104	0.0000	2
11KV DAHEMI JGY	CGL01221	More Info	RURAL	2691	48:00	24:00	0	0	100	-	-	0	426.9	60	0.0000	25614.0000	2

24 x 7 Power For All- Power Supply Status

SL. No.	State	Average Hours of Power Supply in a day to Rural Areas for the Month of May'19			Difference in hours avg Power supply	SAIFI (Sum of no. of Interruptions of all 11 KV feeders (rural & Mixed)/total no. of 11 KV feeders) / month	SAIDI (Sum of duration of Interruptions of all 11 KV feeders (rural & Mixed) /total no. of 11 KV feeders) / month	Peak Demand (MW)	Demand not met %
		Reported by State(s)	As per NPP Portal (from system meters)	% of feeders communicating w.r.t to total feeders					
9	Chhattisgarh	23	22	70.4	1.05	23.8	63.5	4,504	0%
10	Punjab	24	23.2	67.3	0.82	13.7	25.5	8,802	0%
11	Rajasthan	21	20.2	72.3	0.79	35	117	11,791	0%
12	Maharashtra	24	23.3	76.3	0.7	13.6	98.2	23,621	0%
13	Bihar	22.1	21.5	58.2	0.6	190	78.4	5,481	0%
14	Madhya Pr	23.8	23.3	62.8	0.53	9.01	23.3	10,145	0.1%
15	Gujarat	24	23.8	94	0.16	3.49	4.07	18,094	0%
16	Andhra Pr	23.9	23.9	85.5	0.07	5	4.73	9,854	0%
17	Uttar Pradesh	17.9	17.9	75.7	0.04	61.1	174	22,487	1.9%
19	Arunachal Pr**	14.3*						140	1.2%

** Integration with NPP could not be done since neither data is being provided by Discom nor RFMS could have been implemented due to various issues such as unmetered feeders, non compatible feeder meters etc.

*Arunachal Pradesh, Uttar Pradesh, Sikkim & Tamil Nadu April 2019 Month data has been included.

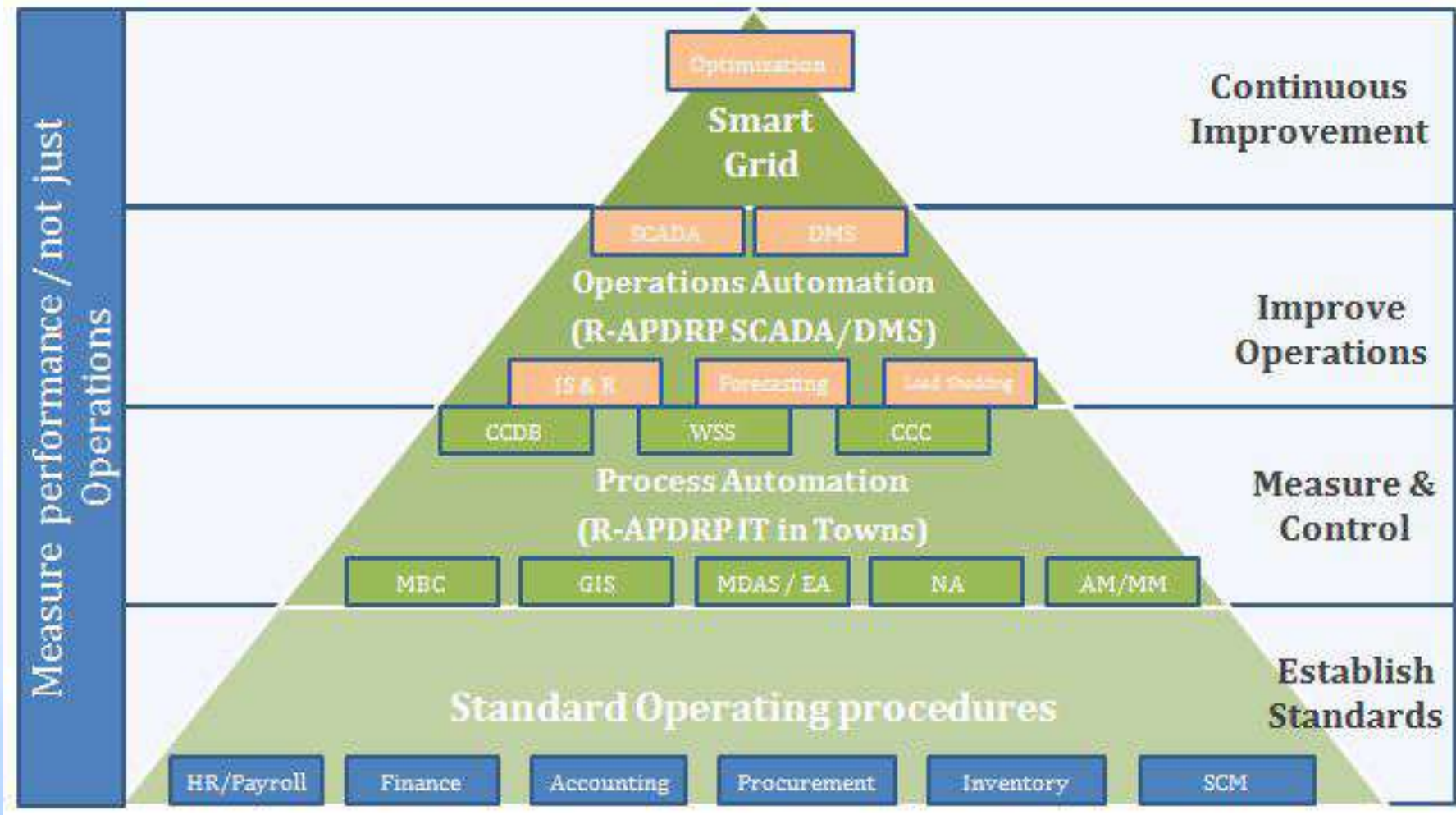


Issues of SCADA

Major Issues:

- Supply of 1076 FRTUs are still pending from M/s Chemtrol side
- Approx. 2007 MFTs not provided by M/s Chemtrol, hence status is communicating without value
- Others materials like Modem, Transducers, DCPS etc. is still pending to supply by M/s Chemtrol
- GIS interface is still pending
- DMS application is pending in all respect

R-APDRP & Smart Grid



Broad Objectives of scheme

- Reduction in Aggregate Technical and Commercial (AT&C) losses
- Improving customer satisfaction
- Increasing reliability & quality of power supply
- Automated metering, Real time energy auditing
- Strategic placement of switches, ring main units & capacitor banks
- The real time monitoring & control of the distribution system through state-of-the art SCADA/DMS system encompassing all distribution Sub-stations & 11 KV network
- The augmentation /up-gradation of the distribution network for real time supervision & control

Major Components of SCADA/DMS

☐ **SCADA/DMS Control Centre Hardware**

- ☐ Servers, Workstations, Switches, Routers, Firewalls, Printers, GPS Clock
- ☐ Video Projection System
- ☐ UPS with Batteries, DCPS

☐ **SCADA/DMS Control Centre Software**

- ☐ SCADA , FEP, ISR & RDBMS, DMS, NMS, Development, GIS Adaptor, DTS, OS, Reporting

☐ **Remote VDUs**

- ☐ Workstation, Router, UPS, Printer

☐ **SCADA/DMS DR Centre Hardware & Software**

- ☐ Servers, Workstations, Switches, Routers, Firewalls, Printers, GPS Clock
- ☐ UPS with Batteries, DCPS
- ☐ RDBMS Software

Major Components of SCADA/DMS

☐ Remote Terminal Units – RTUs

- ☐ RTU Modules, MFTs, HDRs, CMRs, Transducers, Cabinets
- ☐ DCPS with Batteries
- ☐ Field Cables
- ☐ Router for Communications to Control Centre

☐ LDMS at RTU

- ☐ LDMS Workstation, LDMS Software, UPS, Printer

☐ Feeder Remote Terminal Units – FRTUs

- ☐ FRTU Modules, MFTs, HDRs, CMRs, Transducers, Cabinets
- ☐ DCPS with Batteries
- ☐ Field Cables
- ☐ 3G/GPRS Modem for Communications to Control Centre

☐ 3G/GPRS Modems for Stand-alone FPIs

Major Components of SCADA/DMS

- **MPLS Communication System**

- Control Centre to RTUs & LDMS
- Control Centre to Remote VDUs
- Control Centre to DR
- Control Centre to IT Cell & IT Data Centre
- Internet Link at Control Centre

- **CDMA/GPRS Communication Systems**

- Control Centre to FRTUs
- Control Centre to FPI Locations

Major Components of SCADA/DMS

- **Services**

- Integration with IT System –Like Data Centre , CCC, GIS
- Installation, Testing & Commissioning of Hardware
- Training
- Warranty - 36/42 months
- FMS for 5-Years after Operational Acceptance
 - Overall System Availability $\geq 99\%$
 - Individual Hardware Availability $\geq 98\%$



21th Meeting of The Co-ordination Forum



Gujarat Energy Transmission Corporation Limited

[An ISO 9001 : 2008 Company]

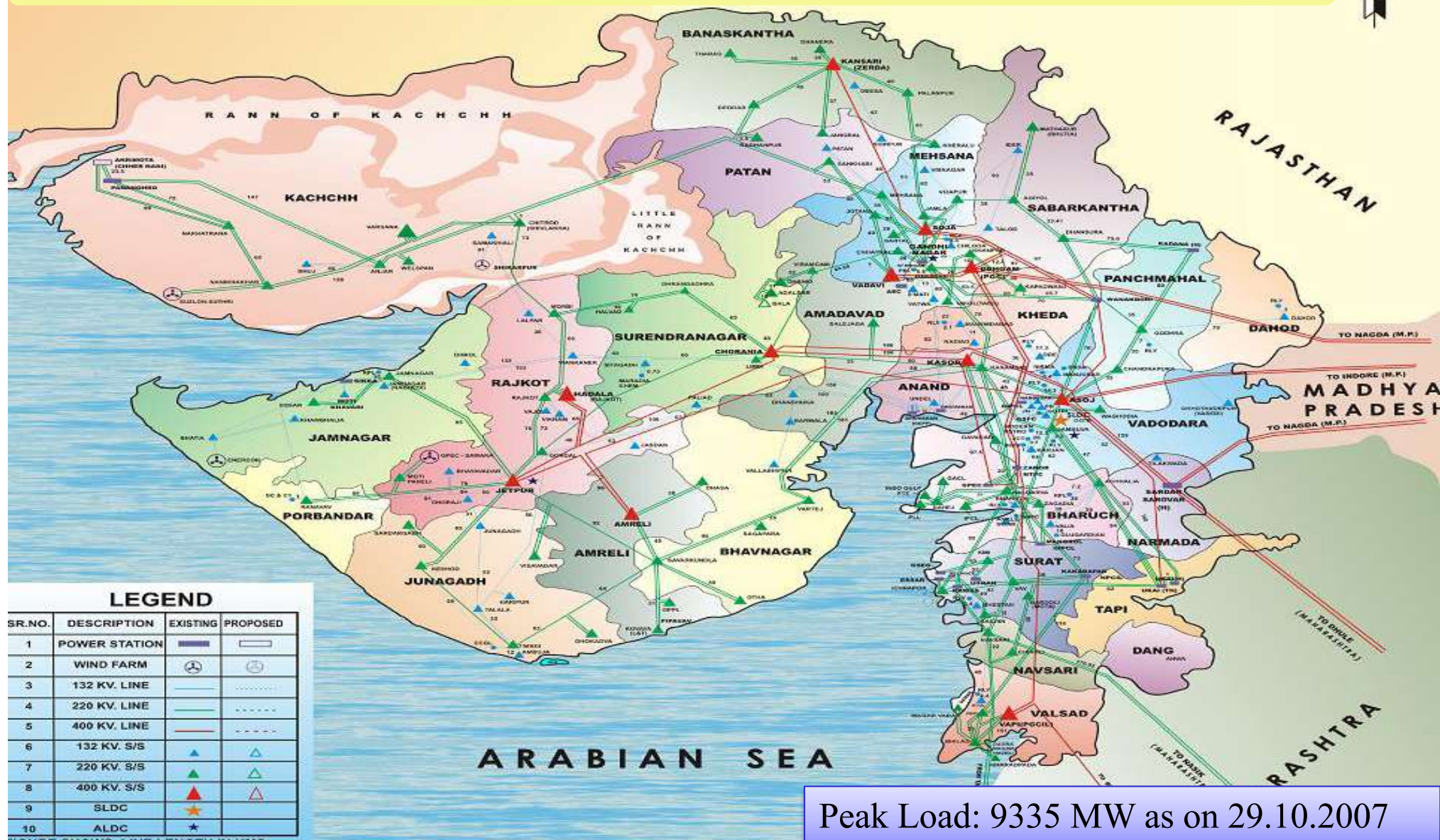
26th Sep, 2019

Presentation Outline



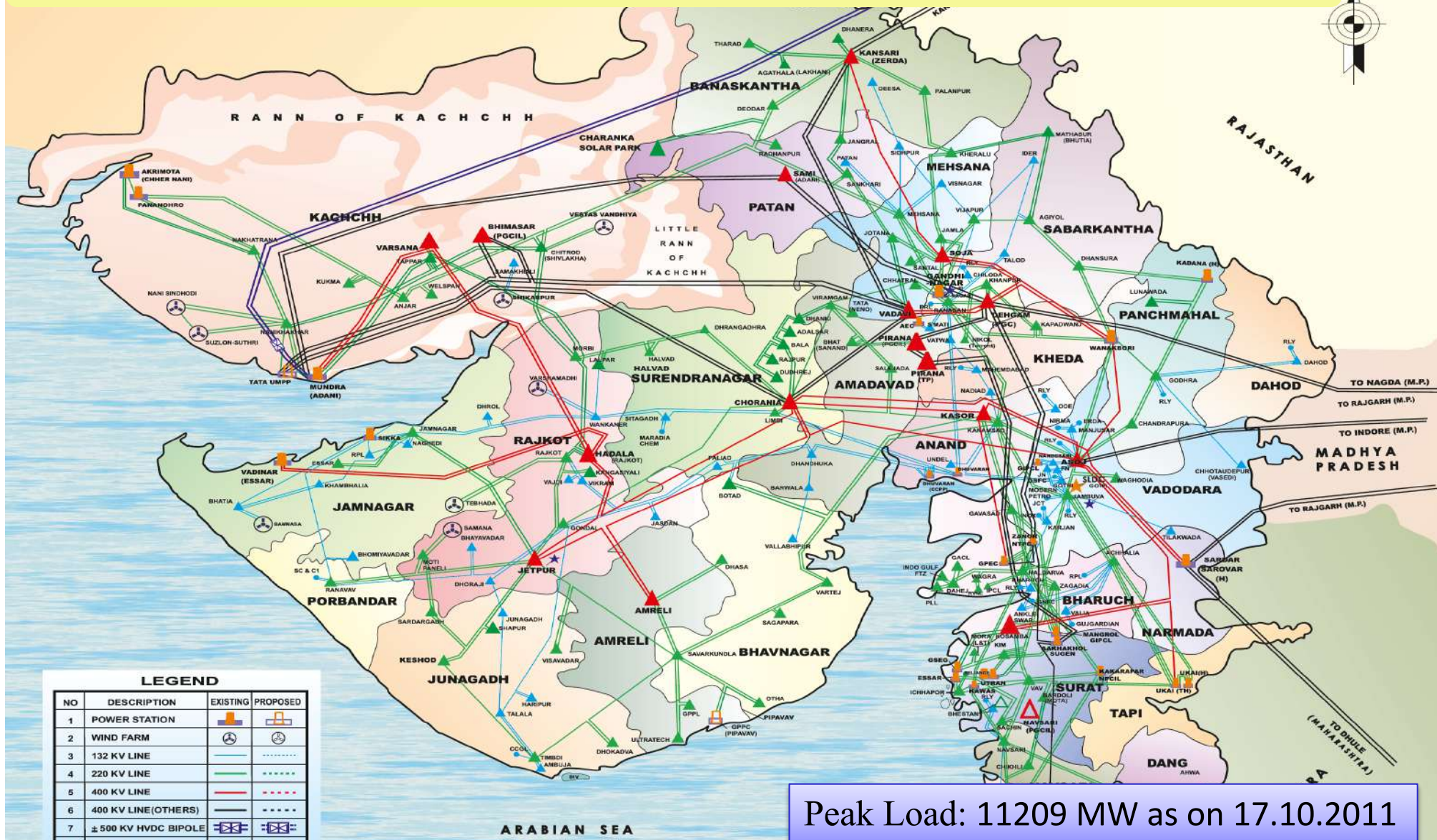
- ❖ GETCO Transmission Asset & Planning
- ❖ Green Energy Corridor
- ❖ Asset Management
- ❖ Adoption of State of Art Technologies
- ❖ Major works of other Government Agencies
- ❖ Challenges

Transmission Network Scenario - 2007



Type of Asset	400 kV	220 kV	132 kV	66/33 kV	Total
Substation (nos)	9	65	48	758	880
Tr. Line (Ckm)	1847	11895	4551	16876	35169

Transmission Network Scenario - 2012



Type of Asset	400 kV	220 kV	132 kV	66/33 kV	Total
Substation (nos)	11	79	49	1131	1270
Tr. Line (Ckm)	3188	14852	4807	22099	44946



Type of Asset	400 kV	220 kV	132 kV	66/33 kV	Total
Substation (nos)	16	105	58	1792	1971
Tr. Line (Ckm)	5912	20026	5477	32227	63642

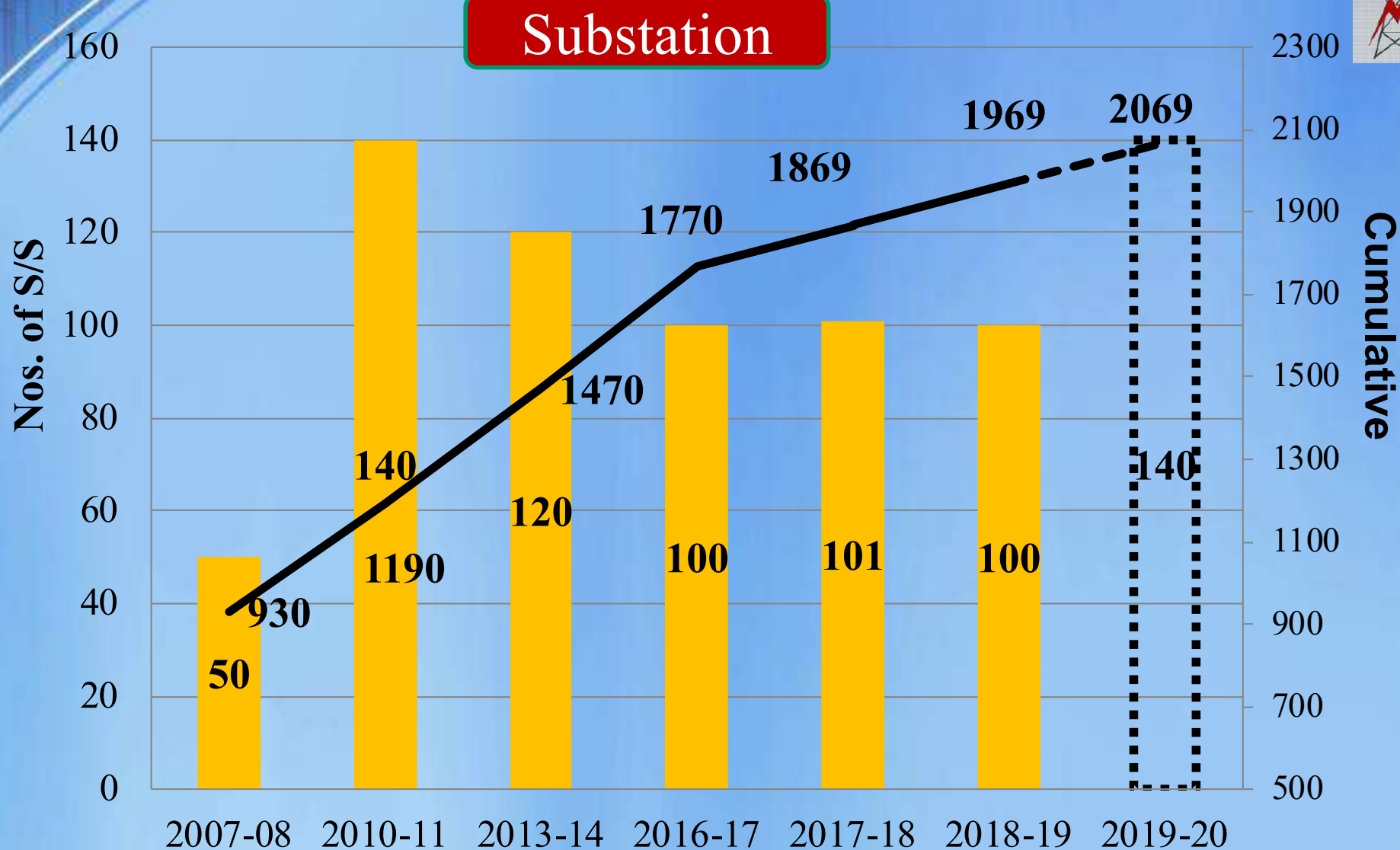
Transmission Network Growth - Comparison



Peak Demand (MW)	Year 2007	9335 MW as on 29.10.2007	% Rise
	Year 2012	11209 MW as on 17.10.2011	20%
	Year 2019	18424 MW as on 11.06.2019	64%
	% Rise from 2007		97%

Type of Asset		400 kV	220 kV	132 kV	66/33 kV	Total
Substation (Nos.)	Year 2007	9	65	48	758	880
	Year 2012	11	79	49	1131	1270
	Year 2019	16	105	58	1792	1971
	% Rise from 2007	78%	62%	21%	136%	124%
Tr. Line (Ckm)	Year 2007	1847	11895	4551	16876	35169
	Year 2012	3188	14852	4807	22099	44946
	Year 2019	5912	20026	5477	32227	63642
	% Rise from 2007	220%	68%	20%	91%	81%

Transmission Infrastructure Capacity Addition

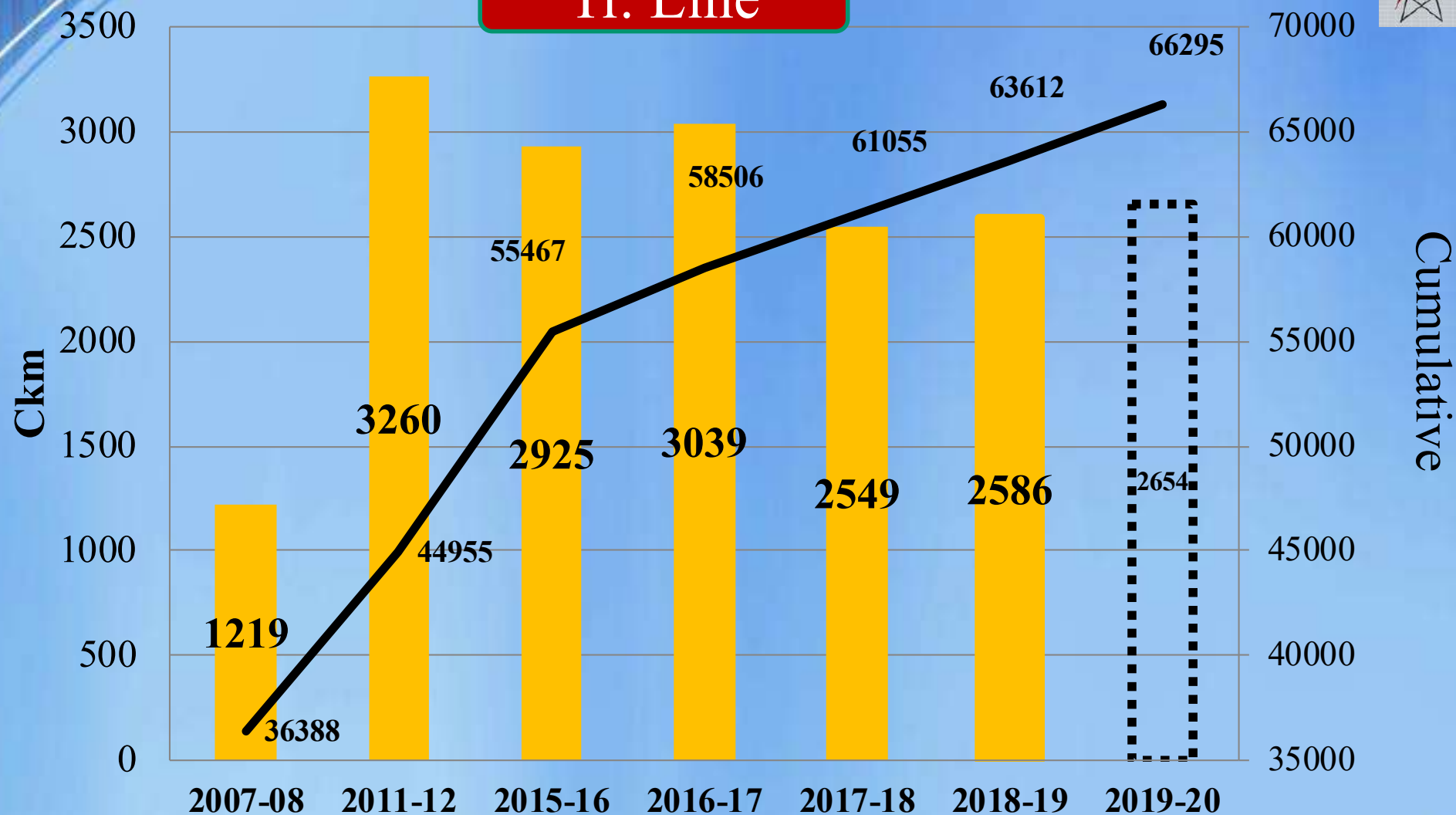


FYP	11 th (2007-08 to 2011-12)	12 th (2012-13 to 2016-17)	2017-18	2018-19	Planning (2019-20)
Nos. of Substations (Addition)	390	500	101	100	140

Transmission Infrastructure Capacity Addition



Tr. Line



FYP	11 th (2007-08 to 2011-12)	12 th (2012-13 to 2016-17)	2017-18	2018-19	Planning (2019-20)
Transmission line in Ckm (Addition)	9786	13551	2549	2586	2654

Transformer Capacity Addition - MVA



FYP	11 th (2007-08 to 2011-12)	12 th (2012-13 to 2016-17)	2017-18	2018-19
Transformation Capacity in MVA (Addition)	12,852	44,666	8788	12309

2

Achievement of FY 2018-19 & Planning of 2019-20

Major Highlights of FY 2018-19



- Addition of 100 numbers of substation against planned 100 numbers and 2586 Ckm of transmission line against planned 2440 Ckm with an investment of around Rs 2700 Crs.
- 12309 MVA of Transformation capacity addition in FY 2018-19 and with this total transformation capacity of Gujarat transmission network has become 1,22,356 MVA to satisfy (n-1) criteria of CEA for the State.
- Maintaining improved system availability of substation and transmission lines in the tune of 99.88% and lines 99.60% respectively.
- Balance network growth with reactive power and efficient grid operation resulted into containment of transmission losses to 3.92%.
- GETCO has commissioned its 2nd 400 kV GIS substation at Vav village of Kamrej taluka in the Tribal belt of South Gujarat area. This will help in evacuation of Ukai TPS Unit No. 6, having capacity of 500 MW & reduce loading on the 220 kV lines. This will also balance the system with future demand during non-availability of gas based generation on bar in the area.
 - LILO of One Circuit of 400KV D/C Ukai-Kosamba Line at 400KV Vav S/S
 - LILO of One Circuit of 400KV D/C Jhanor-Navsari Line at 400KV Vav S/S

Major Highlights of FY 2018-19



- GETCO has successfully commissioned 220/66 kV Bhachunda substation in the Mandvi district of Kutch area.
 - Huge RE potential in Mandvi district and Hub of Big Cement Industries i.e. M/s. Sanghi Cement, M/s. ABG Cement & M/s. Jay Pee Cement in Abdasa Taluka
 - Provide a strong grid connectivity to the Abdasa and other adjoining villages which were being fed through weak & long 66 KV network of 66 KV Naliya, Netra, Kothara, etc. substations.
 - Associated Transmission Lines are:
 - ❑ LILO of both circuits of 220 KV D/C Jamanvada - Varsana line at 220 KV Bhachunda
 - ❑ LILO of one circuit of 220 KV D/C Akrimota - Nakhatrana line at Bhachunda
- Addition of 21 nos of substation in Tribal area with a full utilization of budget of Rs 160 Crore in the TASP Scheme
- In coastal area, GETCO has constructed 14 nos of substations with an investment of Rs 160 crore under Sagarkhedu Sarvangi Vikas Yojana.

Asset Addition in FY 2018-19



Voltage Class	Substation (nos)		Transmission line (Ckm)	
	Planned	Achieved	Planned	Achieved
400 kV	1	1	500	415
220 kV	5	5	700	550
132 kV	0	0	40	29
66 kV	94	94	1200	1592
Total	100	100	2440	2586



Reason of
Deviation

Planning and Status for FY 2019-20



Target of 140 nos. of Substations**

DISCOM	Voltage Class				Total SS Planned	Applied to Collector	Demand Note Received	Land Acquired	Work in Progress
	66 KV	132 KV	220 KV	400 KV					
DGVCL	49	-	1	-	50	50	47	21	15
MGVCL	28	-	1	-	29	29	28	15	10
PGVCL	53	-	6	1	60	60	52	42	34
UGVCL	24	-	1	1	26	26	25	14	12
Total	154		9	2	165	165	152	92	71

**

Final list of 140 nos. of SS shall be declared based on Availability of Land and Progress of associated Tr. Line

Progress of GoG Scheme for FY 2019-20 as on Aug- 2019



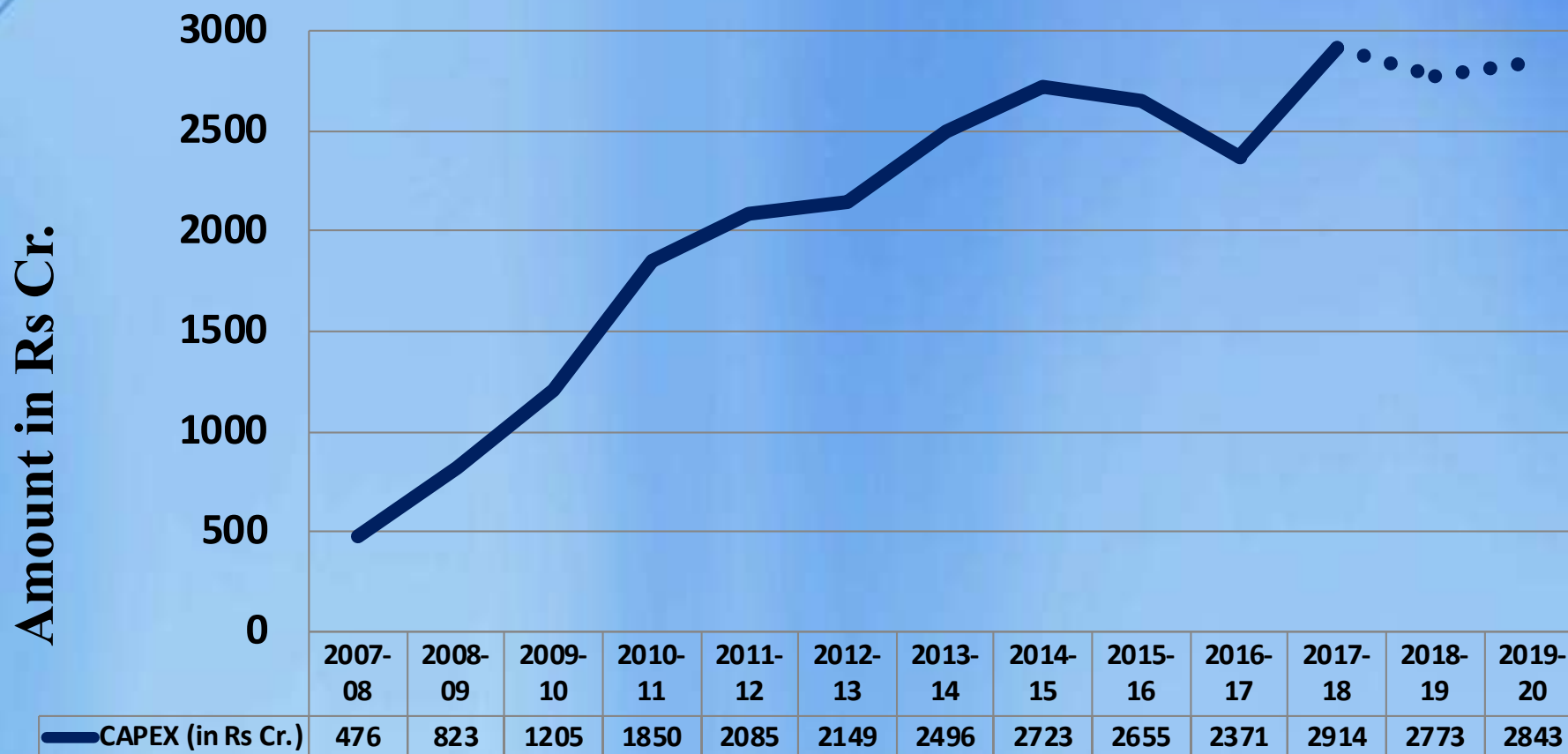
Tribal Area Substation (Target- 50)

Year	Budget Provision (₹. Cr)	No of Sub station	Applied to Collector	Demand Note Received	Land Acquired	Work in Progress
19-20	251	50	60	58	28	19

Capital Expenditure



Investment (in Rs Crore)



FYP	11 th (2007-08 to 2011-12)	12 th (2012-13 to 2016-17)	2017-18	2018-19	Planning (2019-20)
Capex	6439	12394	2914	2773	2843

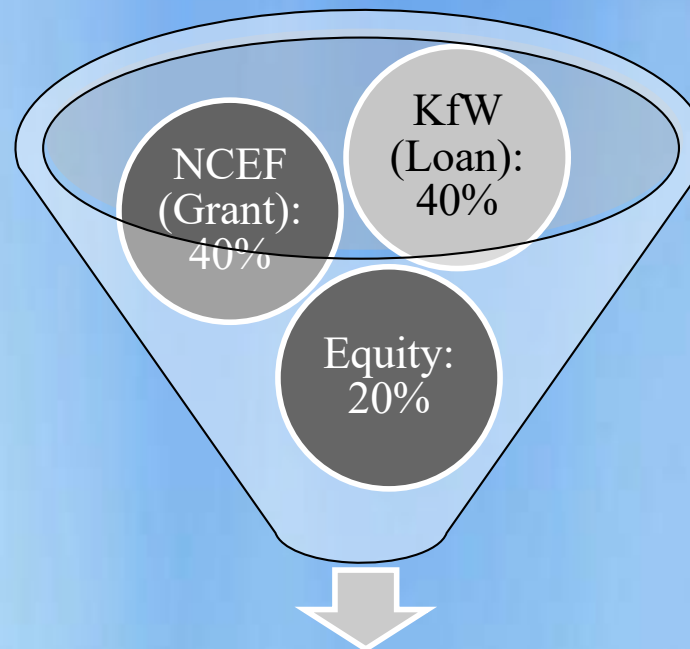
Green Energy Corridor Projects - I



Name of the Project: Green Energy Corridor Scheme

Objective: To integrate and evacuate RE generation from RE rich states

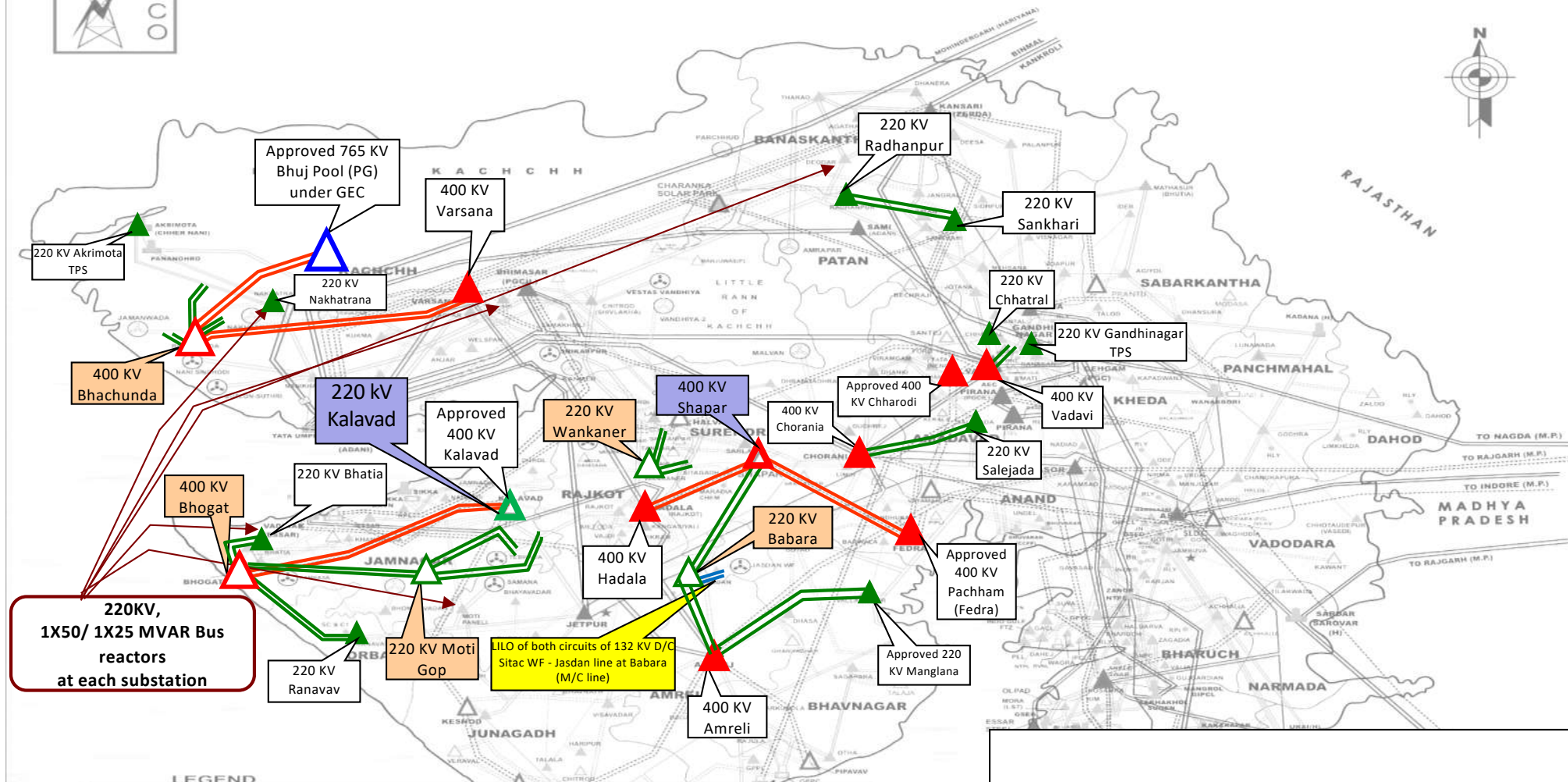
Green Energy Corridor Funding Scheme: 40:40:20



Green Corridor Scheme - I



Intra-State Transmission Schemes under GEC – I of Gujarat



LEGEND

Elements	Scope
400 kV Substation	3 nos of Substation
220 kV Substation	5 nos of substation
400 kV Tr. Line	858 Ckm
220 kV Tr. Line	995 Ckm
132 kV Tr. Line	56 Ckm
Reactor Bays	5 nos

		Existing / Approved substations
		Proposed substations under GEC Scheme
		Proposed 220 KV lines under GEC Scheme
		Proposed 400 KV lines under GEC Scheme

Status of the Transmission Projects under Green Energy Corridor:



Sr. No.	Project	Number/C KM	Dist. - Nos. - Location - Target	Status
1	400 kV Substation	3 Nos	- Jamnagar dist -1 - Bhogat - Dec-20 - Kutch dist – 1 - Bhachunda - Mar-20 - S'nagar dist – 1 (Included in GEC-I on 10/09/2018 looking to the saving in the sanctioned fund) - Shapar - Aug-21	WIP
2	220 kV Substation	5 Nos	- Jamnagar dist -2 – Motigop - Commissioned & Kalawad - Mar-20 - Rajkot dist – 1 - Wankaner - Mar-20 - Amreli dist – 1 - Babra - May-20 - Kutch - 1 (part of 400 kV) - Bhachunda - Commissioned	2 no. – Commissioned
3	400 kV Transmission Line	4 Nos 858 CKM	North, Kutch & Saurashtra Region	WIP
4	220 kV Transmission Line	13 Nos 995 CKM	North, Kutch & Saurashtra Region	6 nos – Commissioned (325 CKm) 7 nos - WIP
5	132 kV Transmission Line	1 No 56 CKM	Saurashtra Region	WIP
6	Reactor Bays	5 Nos	Saurashtra Region	WIP
Total RoW Pending Locations:				
Overall physical progress:				60%
Overall financial progress:				59%

Status of Project Proposal under GEC-II

- **Project Cost: Rs 3738.99 Crs**
 - Nos of Substation: 10 Nos
 - Nos of Tr. Lines: 30 Nos
 - Line Reactor: 08 Nos
- **Approved by the Standing Committee, MoM received on 29.06.2019**

Green Energy Corridor Funding Scheme:

- **40% MNRE Grant (Approval awaited)**
- **40% Nationalized Bank Loan (Approval received)**
- **20% GETCO's Equity**

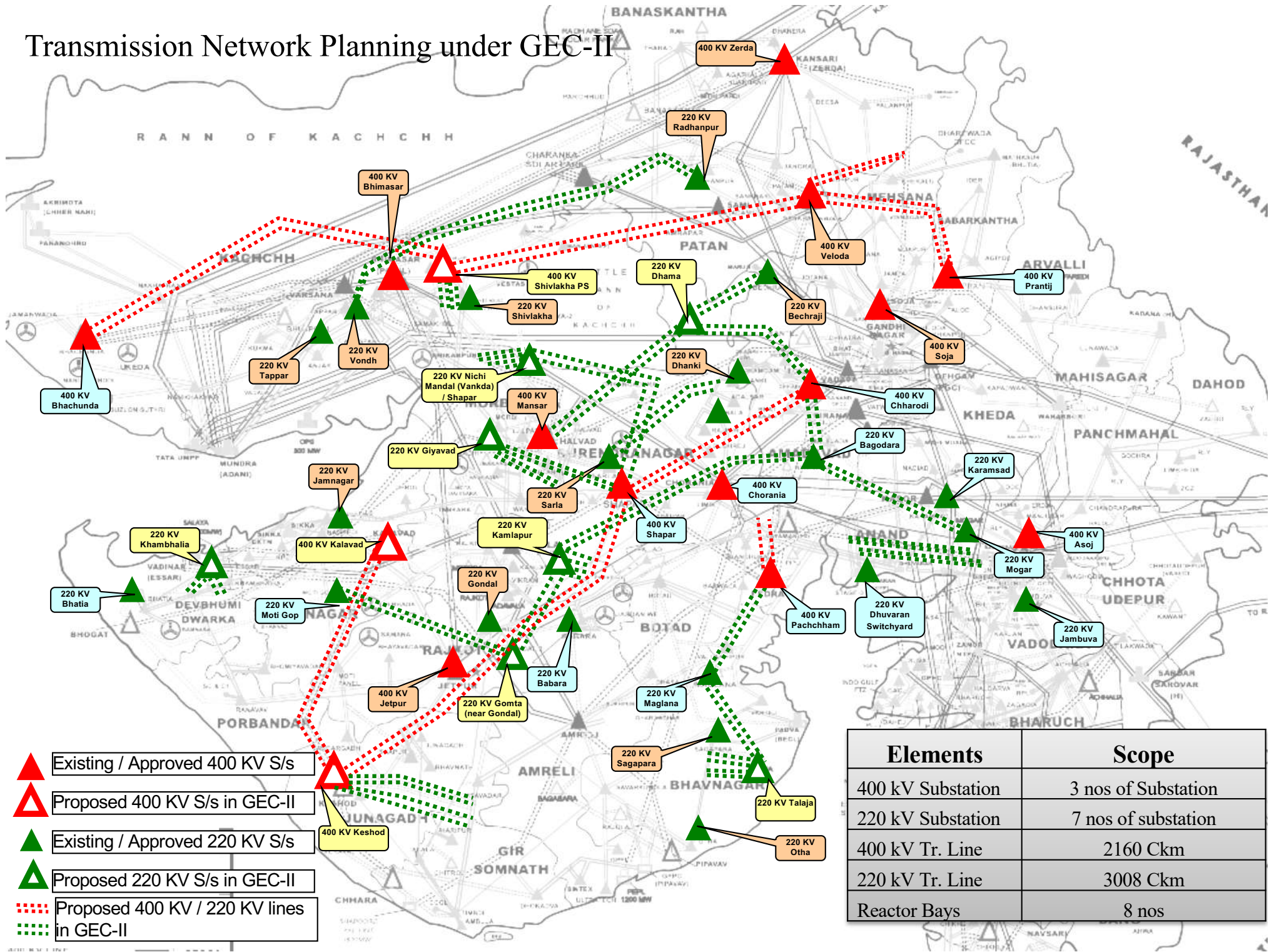


MoM

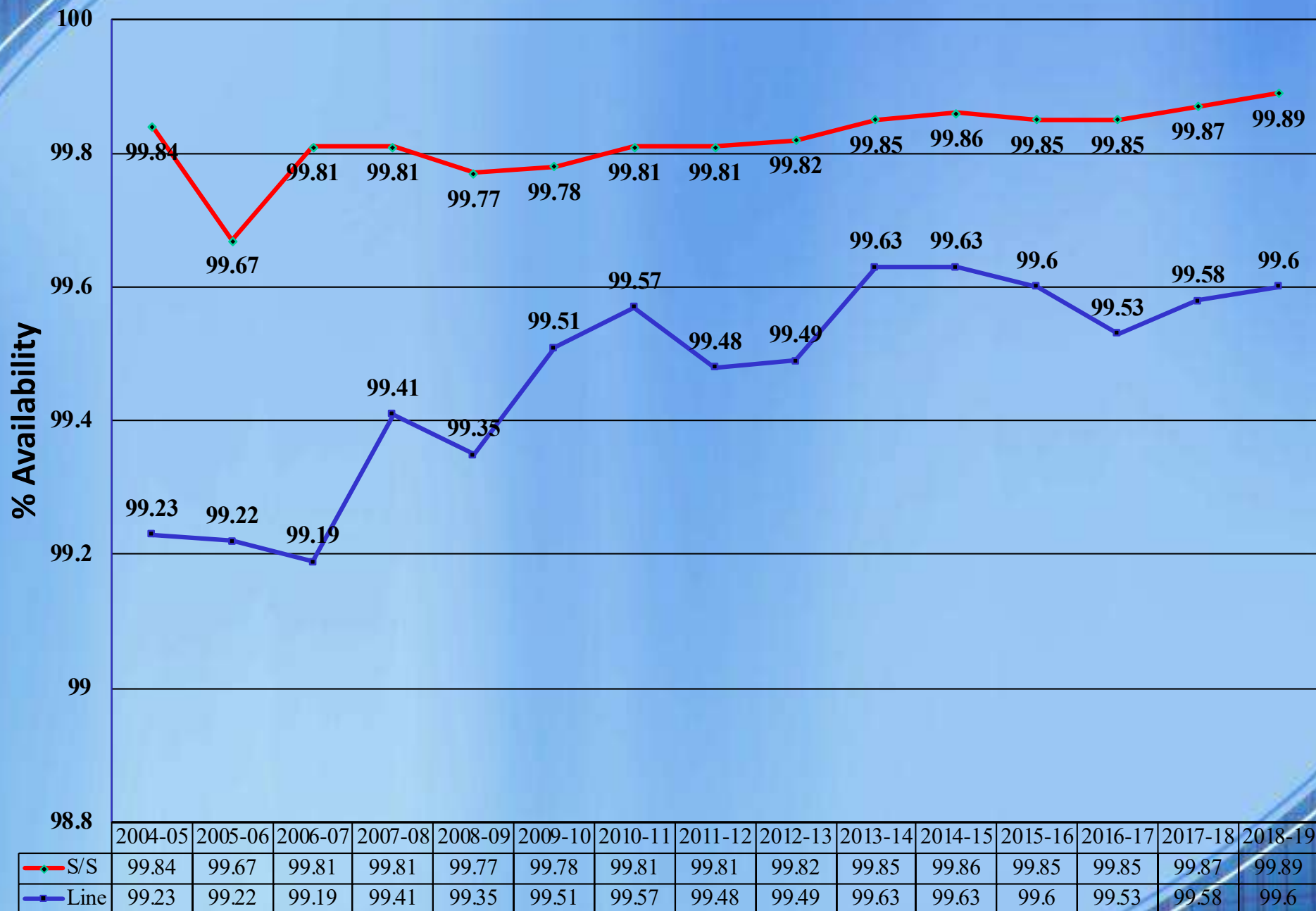


GEC-II Scope

Transmission Network Planning under GEC-II



Improvement in System Availability

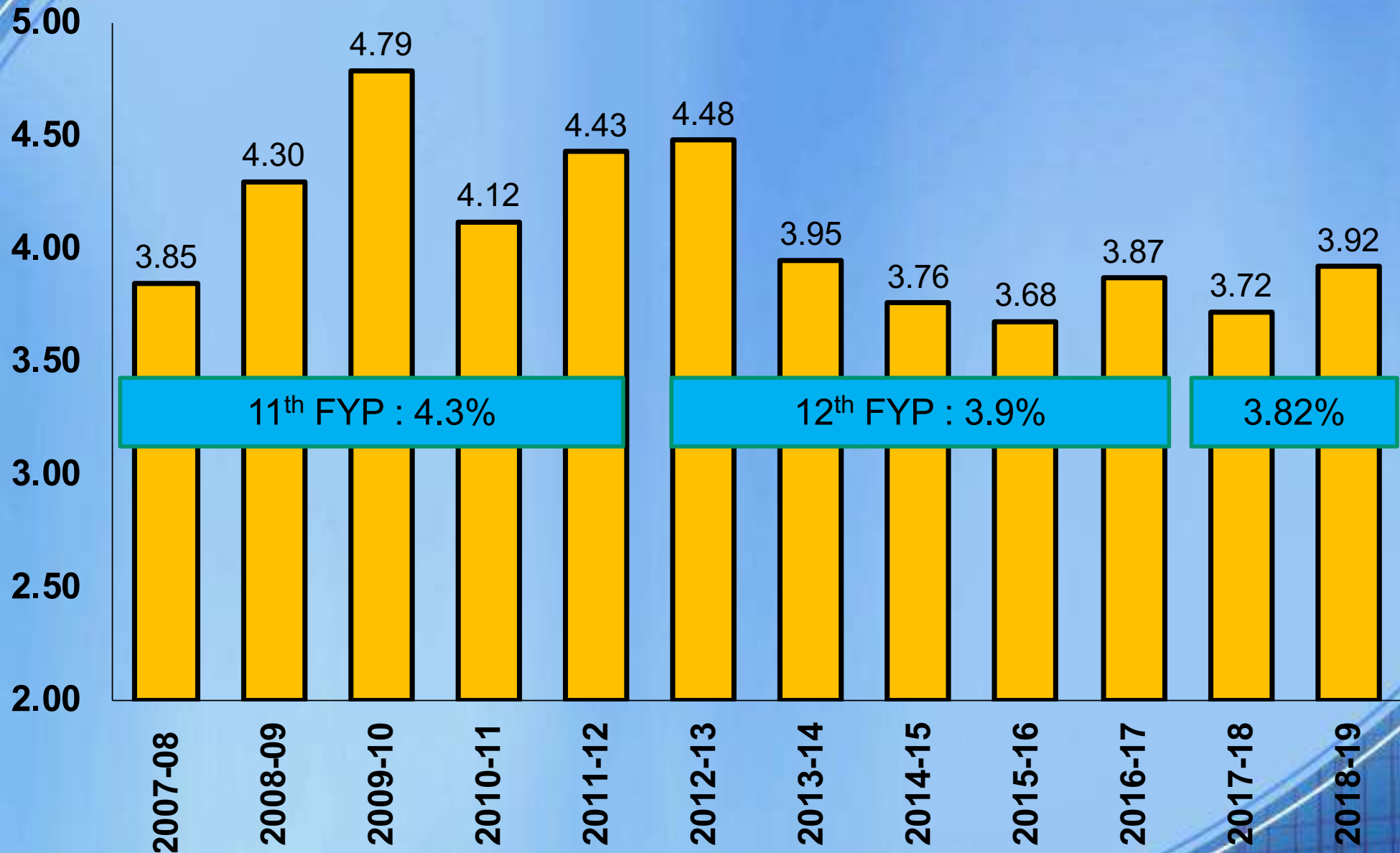


Performance of Transmission System



% Transmission Losses

% LOSSES



Adoption of State of Art Technology - Implemented

Smart Grid technologies adopted	Purpose	Status
Substation Automation System ★	Remote Control Operation: One or more substations are centrally operated from nearby substation which works as a master remote control centre.	SAS installed at 47 Nos. of substations. Out of them, 27 substations are operated from Remote Control Centre (Adjacent substations)
Optical CT and merging units ★	Digital Substation: A step towards better reliability and speed. Inputs for protection control, monitoring and measurements are captured in digits through optical sensors. There will be no hard copper wire cabling in switchyard.	Four pilot projects completed at Jambuva, Asoj, Lunawada and Modasa Based on above experiences, Fully Digital substation is under process at 220 kV Sevaliya substation which is tenderized and at scrutiny stage.
Integrated Asset Management System	Centrally Managed Monitoring System through INTRANET	Transmission Asset Management System (TAMS) in operation
GIS and Hybrid switchgear ★	Suitable for Hostile & Polluted Environment Especially in Urban Areas where there is Scarcity or high cost of Land. Maintenance free and economical on life cycle cost basis	5 Nos of 220 KV & 2 Nos of 132 kV & Substations are with Hybrid Switchgear. 5 Nos of 66kV, 2 No. of 220 kV and 2 No. of 400 kV GIS substations are in service.

Adoption of State of Art Technology - Implemented

Smart Grid technologies adopted	Purpose	Status
High Capacity Conductor & HTLS conductor ★	50% more capacity with lesser transmission loss	AL 59 permanently adopted for 220 kV & 400 kV
Power transformer with Ester oil ★	High flash point to safeguard transformer from catching fire. 30% higher MVA Extension	Successfully Adopted in 66/11 kV Class
Geographic Information System (GIS) Mapping of Transmission Assets ★	Capturing asset information on geographical map for better asset management and network planning	Entire GETCO network is mapped.
Wind Forecasting & Scheduling	Tools for wind generation forecast which will help in Scheduling of Power. Contract is awarded to 50Hz.	Installed.
Real Time Grid Visualization	Phasor Measurement Units (PMU) and Wide Area Monitoring System (WAMS) 3 Data Analytics Developed - Online Power System oscillation Mode Identification - Hybrid State estimator - Dynamic security assessment with voltage stability	113 PMUs on 25 Locations



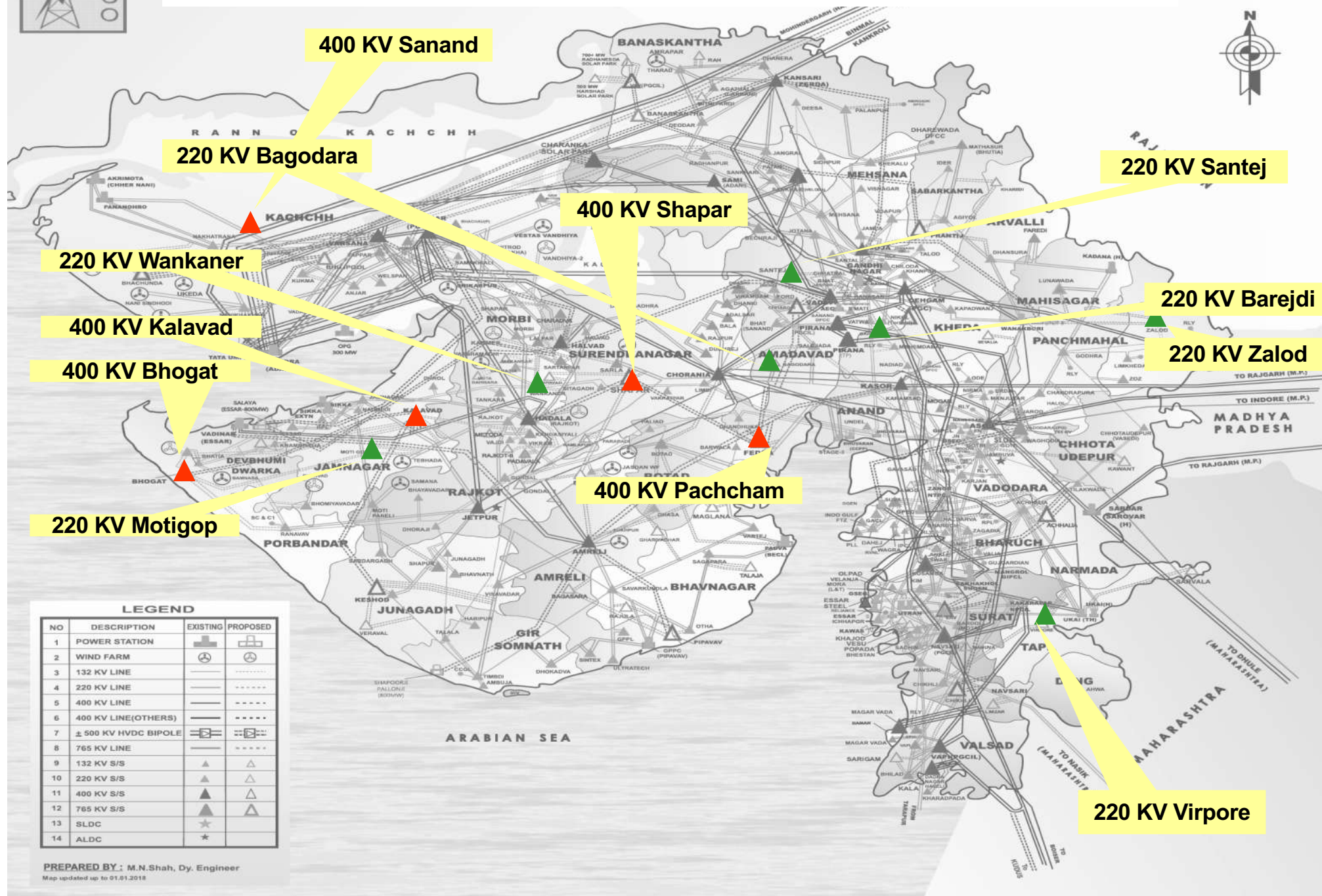
Adoption of State of Art Technology – Under Implementation

- **Line monitoring unit (DLR)** – Dynamic Line Rating (DLR) System - to assess the maximum line capacity – Plan to install in one 66 kV Line Connected to wind Generation. Commissioning is under process. Also, planned to install in EHV (132 -220 kV) lines.
- **11 kV SF6 insulated compact switchgear with SCADA** - Installed
- **Static Synchronous Compensator (STATCOM)** - For dynamic reactive power compensation and improvement in voltage profile – Installed at 220 kV Timbdi substation (Rating: ± 120 MVAR, 220 kV STATCOM)
- **Communication Highway – Optical Fiber Ground Wire** – 3367 KM completed, 3905 KM under construction & 15288 KM approved under PSDF – Planned to complete in next 3 years in phase manner ★
- **Development of Energy Accounting and scheduling software with AMR solution**

Major Deposit works of other Government Agencies – Transmission Lines



Sr No.	Name of Consumer	Total Nos	Under Registration/ estimation	WIP	Target date
1	DFCCIL	2-132KV 6-220 KV	0	5	3 – Completed; 2- Dec'19; 1 – Mar'20; 2 – Dec'20 ;
2	Western Railway (Open Access)	10-66KV 4-132 KV 4-220 KV	5	11	2- Completed 1 - Nov'19; 4 – Dec'19, 1 - Jan'20, 4 - Mar'20, 1 – Sep'20, 2 – Location Not finalized; 3- Under Estimation
3	National High Speed Rail Co. Ltd	10-66 KV 1-132 KV 7-220 KV	0	18	4 TSS and 4 DSS- Dec'21 5 TSS & 5 DSS- Dec'22
4	Sauni Yojna	1-66KV	0	1	1- Dec'19
5	Other Government	12-66KV	0	12	8- Dec'19 ; 4- Feb'20
	Total	57	5	47	



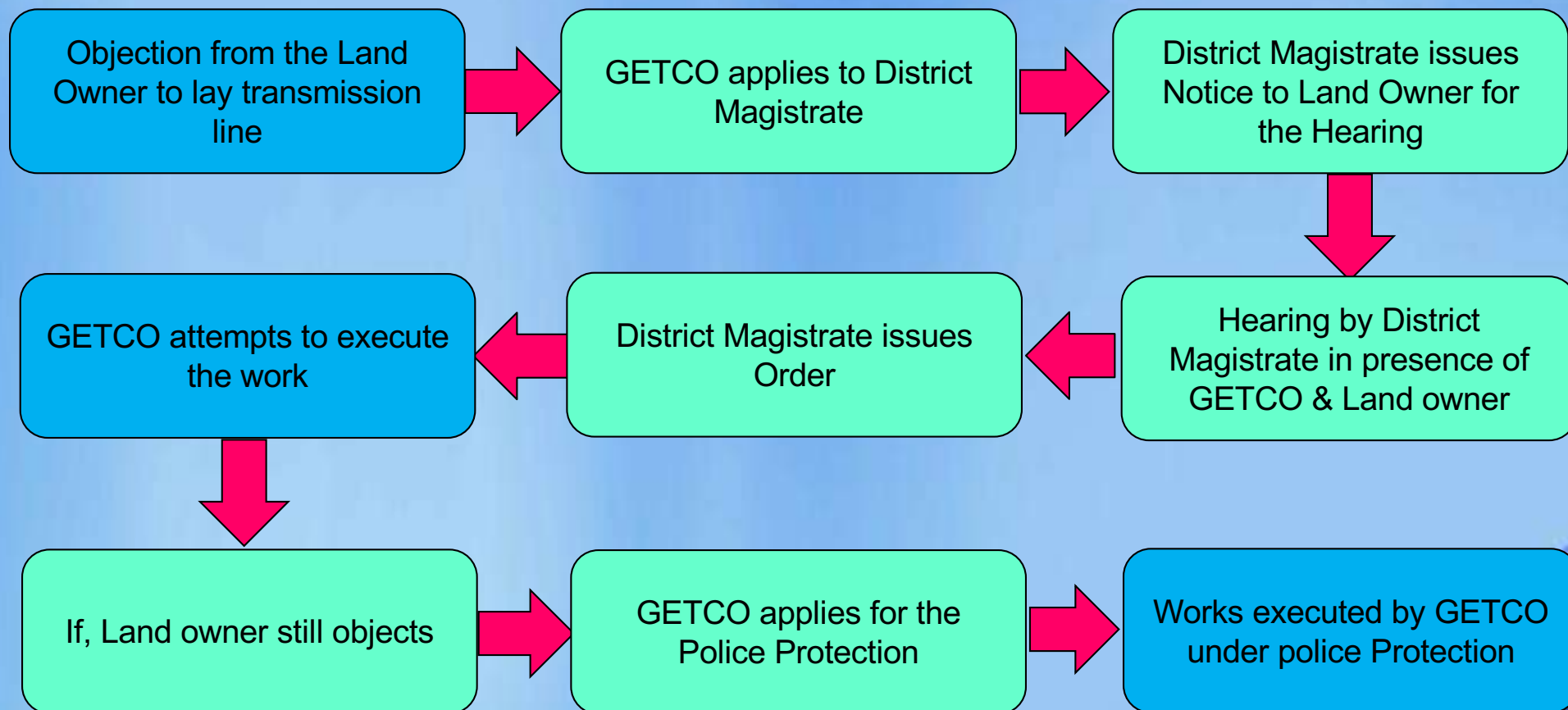
Challenges – Right of Way

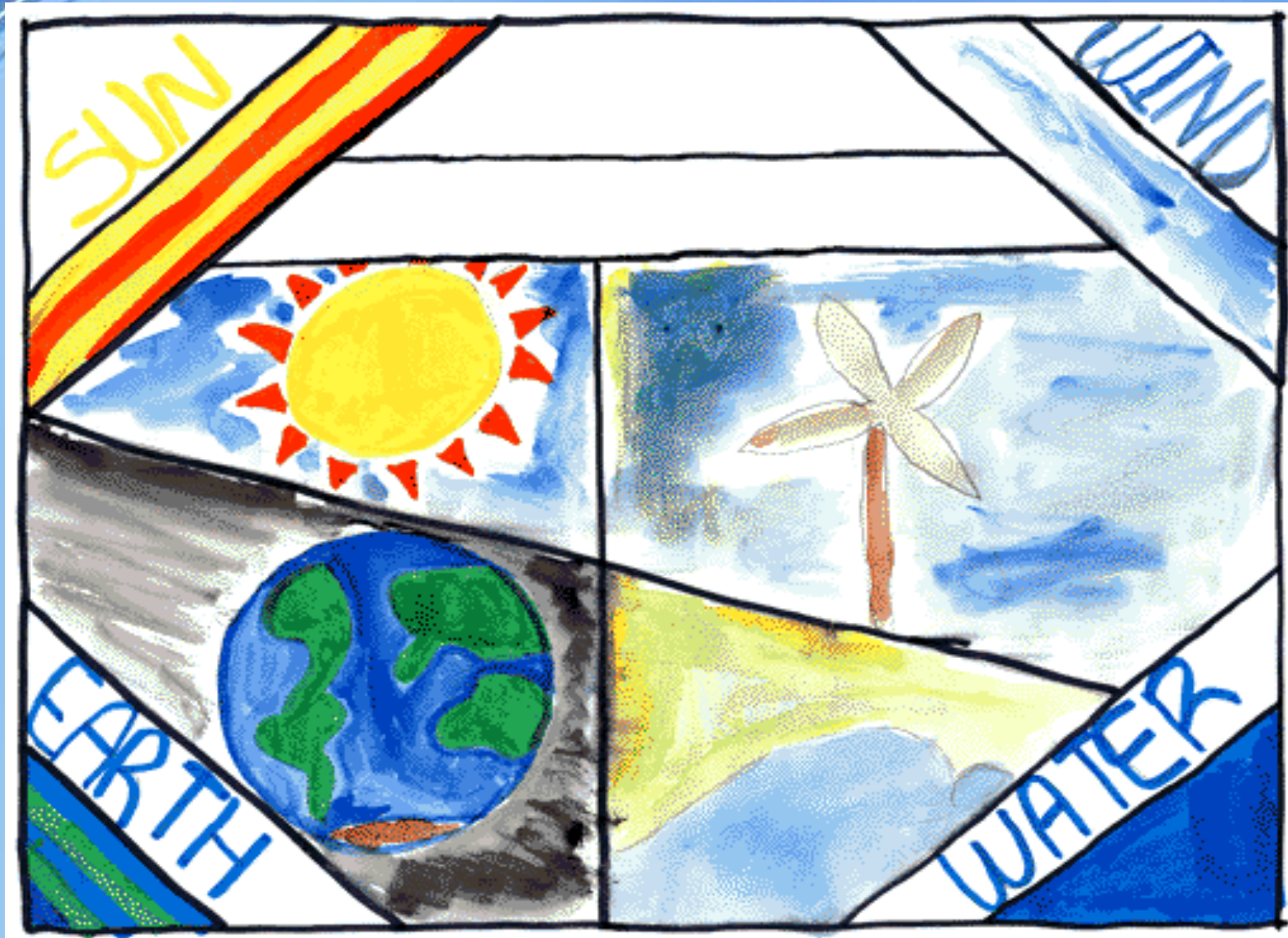


Total RoW cases pending for more than 3 months

Year	No of RoW Cases
2019	882

Procedure of Right of Way Clearance





Thank you !!!

New Right of Way Compensation Policy Adopted



Earlier	Now	
Before issuance of the guideline for Right of Way by Govt. of Gujarat, the following method was in practice for payment of RoW-Crop compensation as per provision of Indian Electricity Act, 2003.	GETCO has adopted the RoW guideline as following issued by Govt. of Gujarat vide Tharav dated 14.08.17.	
Compensation towards actual damage of tree-crop	As per this guideline, the compensation to be paid for laying transmission lines 66KV & above voltage class is as follows:	
	1. Compensation @ 85% of the land value as per online jantri rate for the area occupied by tower base.	
	2. Compensation @ 7.5% of the land value as per online jantri rate for the diminution of land in the RoW corridor.	
	RoW corridor considered for compensation purpose as following.	
	Voltage Class	RoW corridor
	400KV	46 meter
	220KV	35 meter
	132KV	27 meter
	66KV	18 meter
3. Compensation towards actual damage of tree-crop (As per APMC rate)		

1st 400 KV Sanand GIS Substation



**Control Room cum 400KV GIS
Building**



220KV GIS Building



S/S Switchyard

1st 400 KV Sanand GIS Substation



400KV GIS



400KV GIS



220KV GIS



66KV GIS

220 kV Amod Hybrid Switchgear Substation





66/11 kV, 20 MVA Green Transformer : 66 kV Sargasan

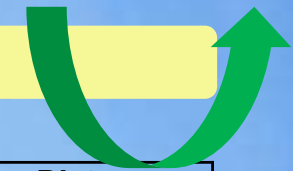


High Performance Conductor - AL-59 Conductor

Benefits of HTLS conductor

220KV S/C Wanakbori - Godhra line

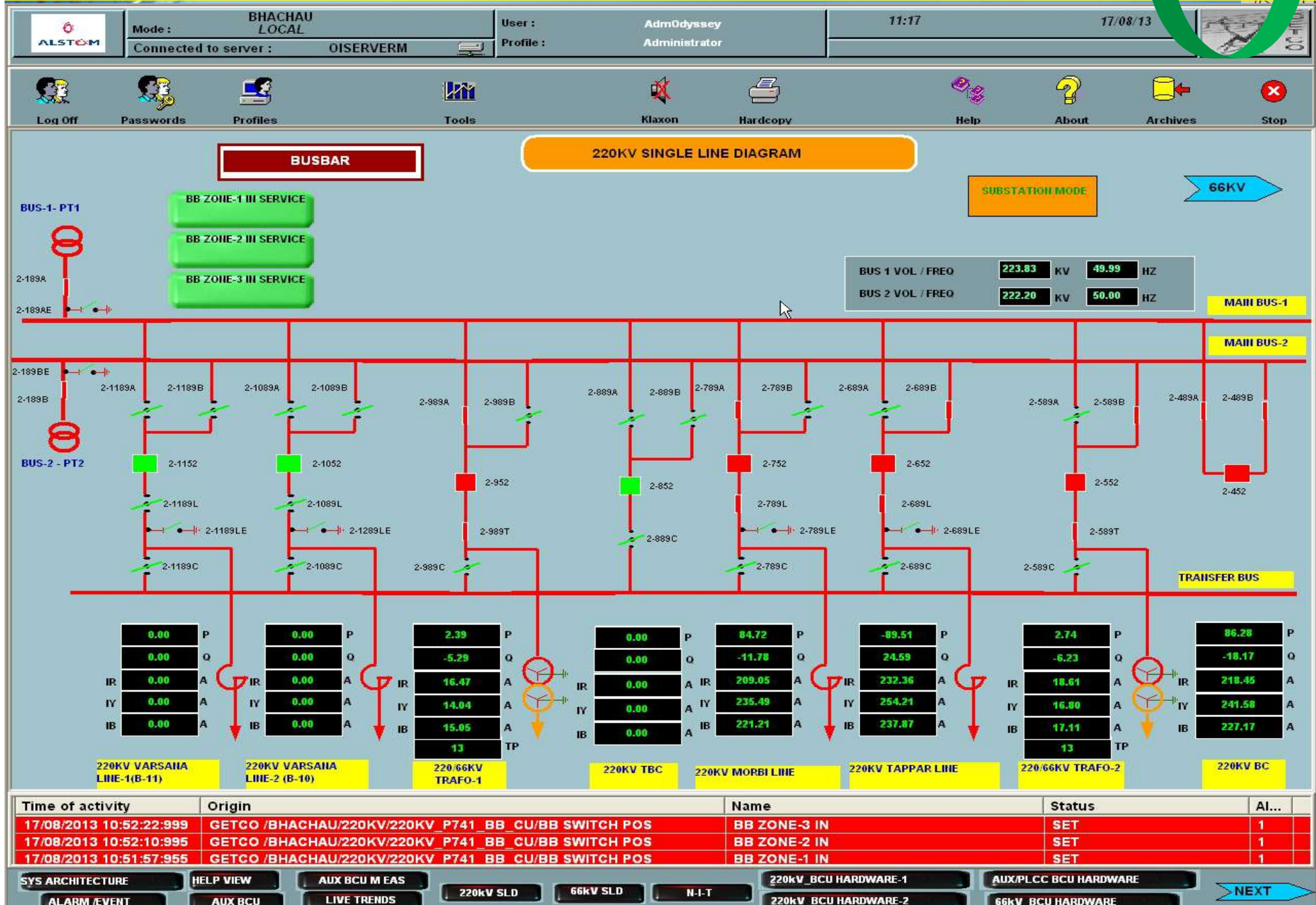
	ACSR Zebra conductor	HTLS - GAP type conductor
Line length	33 Km	33 Km
Ampacity	500 Amp	1000 Amp
MW	180-190 MW	390 MW
Cost per Km	For New line - 62.84 Lakh	For replacement of conductor - 17.20 Lakh
Total cost for 33Km Route length	2073.72 Lakh	567.76 Lakh



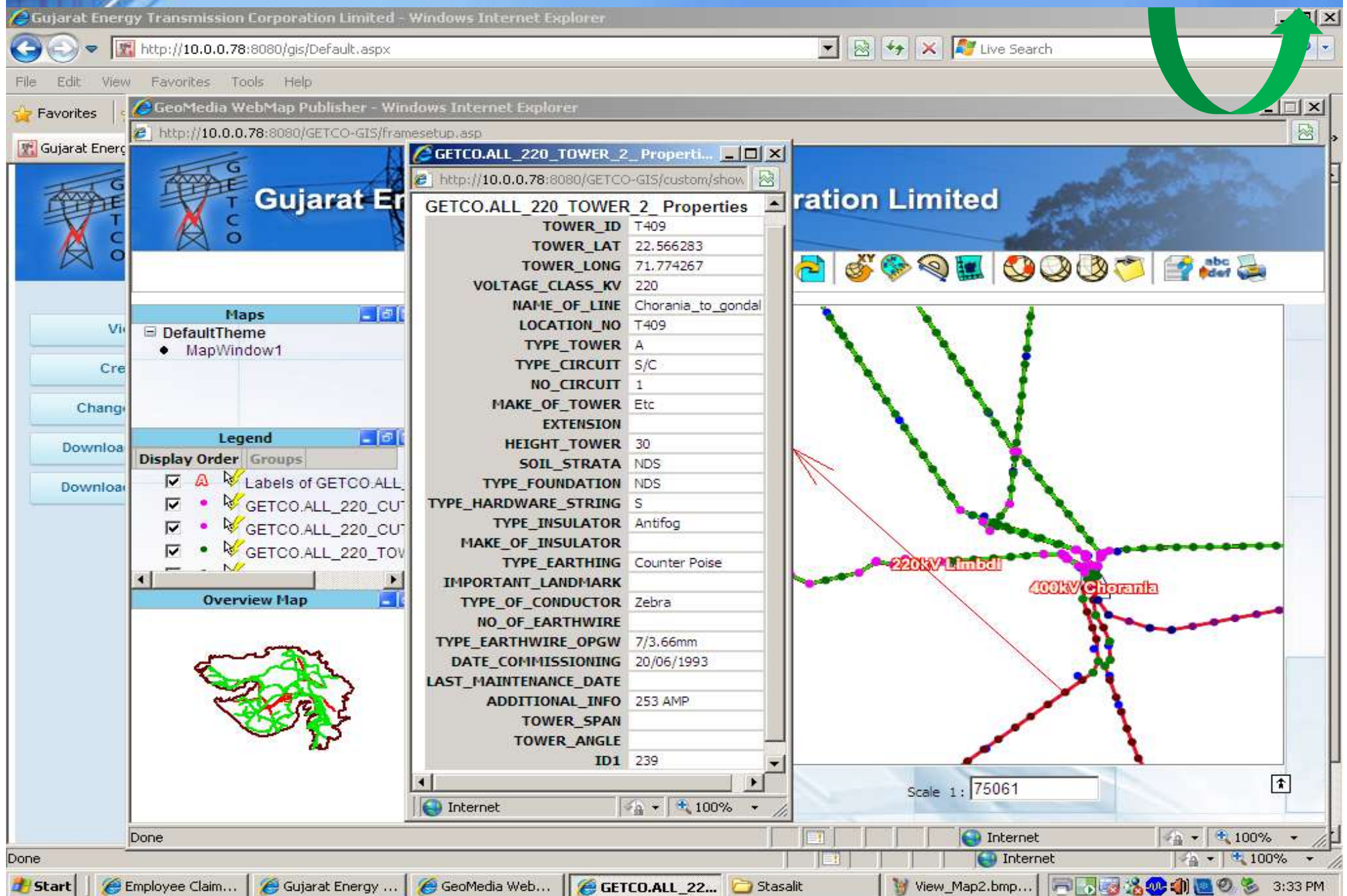
Future Planning based on above Experience

Sr. No.	Name of Transmission Line	Peak Load (MW)	Existing Line Configuration	Distance (CKM)
1	220 KV D/C Asoj – Jambuva line	200-240 MW	ACSR Moose – D/C tower	49
2	220 KV S/C Vav – Sachin line	180-210 MW	ACSR Zebra – D/C tower	38.5
3	220 KV S/C Morbi – Lalpar line	190-235 MW	ACSR Zebra – D/C tower	7.3
4	220 KV S/C Jetpur – Gondal line	180-220 MW	ACSR Zebra – D/C tower	26
5	220 KV S/C Vadavi – Chhatral line (up to LILO point to Santej from Vadavi end)	180-240 MW	ACSR Zebra – S/C tower	2
6	220 KV D/C Tappar – Shivilakha line	350-400 MW	ACSR Zebra – D/C tower	112
7	220 KV S/C Shivilakha – Sankhari line	180-220 MW		185
8	220 KV S/C Shivilakha – Nani Hamirppur (SSNNL PS-2) – Deodar line	170-200 MW		190
9	220 KV D/C Dehgam – Khanpur line	360-400 MW		23.5
10	132 KV S/C Karamsad – Nadiad line	70-90 MW	ACSR double Dog + S/C Panther	27.2
11	132 KV S/C Nyara – Vikram line	70-90 MW	ACSR Panther – D/C tower	33
12	132 KV S/C Nyara – Vajadi – Vikram line	70-90 MW		33
13	132 KV S/C Gondal – Vikram line	70-90 MW	ACSR Panther – D/C tower	39
14	132 KV S/C Gondal – Jasdan line	70-90 MW		50
15	132 KV D/C Ranasan – Sabarmati line	160-190 MW	ACSR Panther – D/C tower	26.2
16	132 KV D/C Ranasan – Vatwa line	140-160 MW		53.2
17	132 KV S/C Sikka – Naghedi line	70-85 MW	ACSR Panther – S/C tower	30

Snapshot of substation automation system display of 220 kV Bhachau substation showing single line diagram with live status



Snapshot of GIS mapping showing transmission line tower locations and parameters



Digital Substation : Optical CT with Merging Unit



Optical CT



**Cable Management
Box**

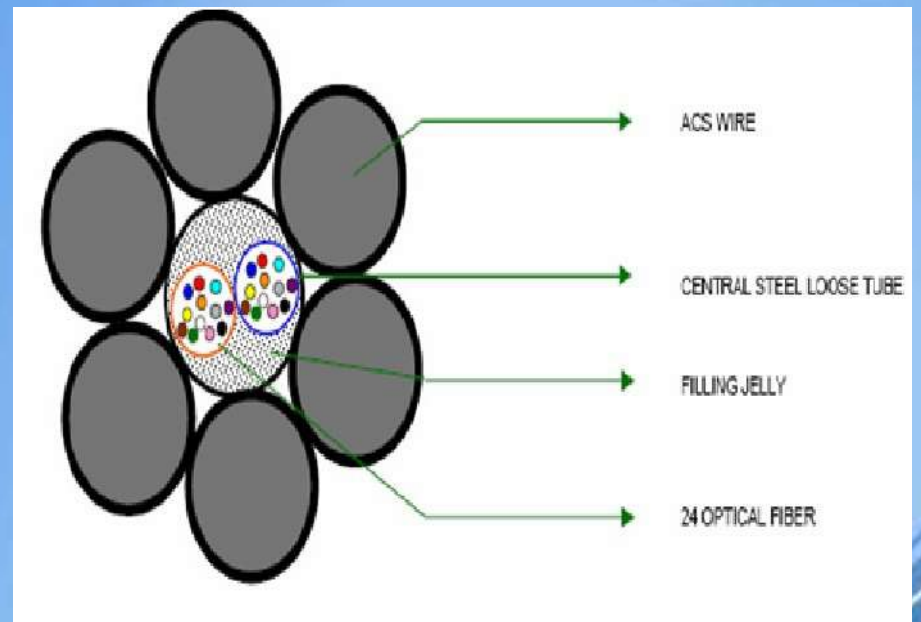
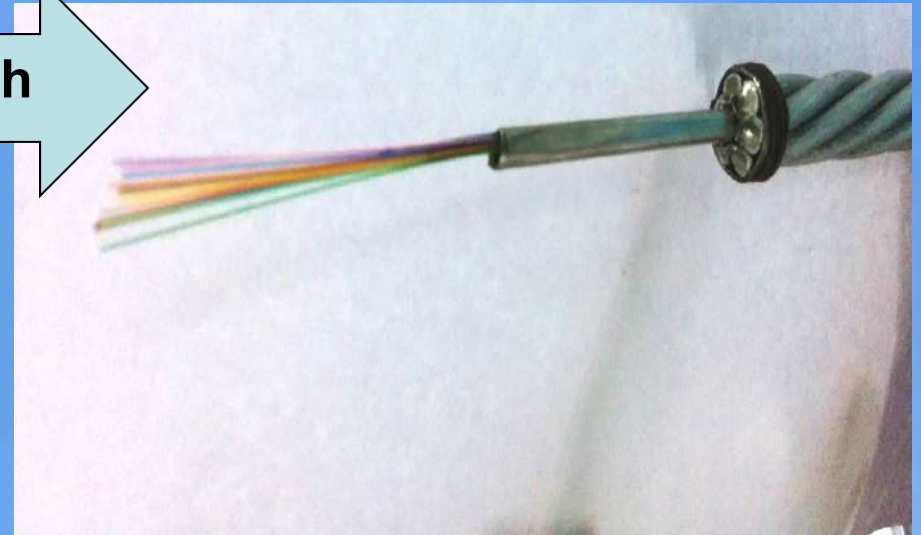


Protection Panel

Optical Fiber Ground Wire



Replace with



Presentation to Co-ordination Forum

Gujarat Power Sector Scenario

26th Sept 2019

Gujarat Urja Vikas Nigam Ltd.



Gujarat – Installed Capacity

Sector	MW	%share
State Owned	8121	29%
Private IPPs	5752	20%
Central Sector	4379	16%
Renewable	9669	35%
Total	27921	100%

Fuel	MW	% Share
Coal & lignite	13019	46%
Gas	3895	14%
Hydro	779	3%
Nuclear	559	2%
Renewable	9669	35%
Total	27921	100%

**Capacity includes 1547 MW Torrent capacity(400 MW – coal & 1147 MW – Gas)*

Gujarat - Renewable Capacity in MW

Source	Installed Capacity*	GUVNL's share
Wind	6880	3994
Solar	2654	1616
Biomass	81.6	30
Small Hydel	53.7	21.6
Total	9669	5662
<i>*Includes capacity set up for wheeling / 3rd party use - Solar includes 394 MW Rooftop capacity</i>		

Present Power Scenario – Highlights

- At present, State DISCOMs are having total tied up capacity of 22,263 MW on long term basis against peak demand of 15,500 MW:

Conventional: 16,602 MW

Renewable : 5,662 MW

- The details of arrangement made by GUVNL for meeting increased demand during next quarter:
 - 1000 MW capacity tied up with M/s GMR under Flexible Utilization of Coal policy of Ministry of Power at Rs. 3.16/unit – around 500-750 MW being supplied
 - RLNG gas on high sea sale basis sourced from GSPC - For 1500 MW capacity at Rs. 3.61/unit during Oct-Nov 19
 - Any intermittent power requirement shall be met through purchase from Power Exchanges
 - 879 Mus purchased through Power Exchanges during FY 2019-20 (Apr-19 to 22 Sep-19) at an avg. rate of Rs. 3.68/unit

Capacity Added – 2017-18, 2018-19 & 2019-20 (Sep)

Project	Dev.	Sector	Fuel	MW	COD
NTPC Mouda Stage II	NTPC	Central	Coal	147	Oct-17
Adani Mundra (Bid 1)	Adani	Private	Coal	200	Apr-19
NTPC Gadarwara (Unit 1)	NTPC	Central	Coal	152	Jun-19
			Total	499	

Capacity De-rated – 2017-18, 2018-19 & 2019-20(Sep)

Project	Dev.	Sector	Fuel	MW	Reason
Ukai TPS (Unit 1 & 2)	GSECL	State	Coal	240	Completion of useful life /PPA expiry / termination
Sikka TPS (Unit 1 & 2)	GSECL	State	Coal	240	
China Light (GPEC)	CLP	Private	Gas	655	
Adani Mundra (Bid 2)	Adani	Private	Coal	1000	
			Total	2135	

Capacity Addition Plan by 2022

Project	Dev.	Sector	Fuel	MW	Likely COD
Essar Power Gujarat	EPGL	Private	Coal	100	Upon approval of SPPA by GERC
NTPC Lara (Unit 1 & 2)	NTPC	Central	Coal	157	Oct-19 & Mar-20
NTPC Gadarwara STPP (Unit 2)	NTPC	Central	Coal	152	Mar-20
Wanakbori Ext. Unit 8	GSECL	State	Coal	800	Oct-19
NTPC Khargone	NTPC	Central	Coal	246	Oct-19 & Feb-20
Kakrapar Expansion	NPCIL	Central	Nuclear	476	Dec-19 & Dec-20
Total				1931	

Demand/supply scenario - State

(MW)

Year	Cap. Add. during the year	Capacity de-rated	Cumulative Capacity (Conventional)	Demand @ 6% growth p.a
As on 1.4.2019	200	655	18900	18221
2019-20	1693	1000	19593	19314
2020-21	238	140	19691	20473
2021-22	-	156	19535	21702

Demand includes 2000-2400 MW load & Capacity includes 1547 MW generation capacity of M/s Torrent Power Ltd.

State is having total 8609 MW RE Capacity operational as on 1.4.2019 & 9669 MW as on 1.9.2019

Tie up from Renewable Sources

- **Hon'ble GERC vide Regulation dated 21.4.2018 has notified RPO trajectory for FY 2017-18 to FY 2021-22**

17% RPO by FY 2021–22

Non-Solar – 9% & Solar – 8%

- **To meet the above RPO, GUVNL would require to have around 9500 MW Renewable Capacity by FY 2022**
- **GUVNL tying up new RE Capacity (Wind & Solar) through Competitive Bidding & Reverse Auction**
- **GUVNL has executed PPAs for 2250 MW Solar & 702.5 MW Wind through Competitive Bidding**
- **GUVNL has signed PPAs for 78.7 MW Waste to Energy Projects at Rs. 6.31/unit determined by GERC + VGF – scheduled to commission by Mar-21**

GUVNL Tender – Solar

Bid	Tender	Tariff (Rs/unit)	MW	LoA / PPA	Project Status
1	Solar (Non Park I)	2.65 - 2.67	500	PPA signed - Oct-17	500 MW commissioned
2	Solar (Non Park II)	2.44	500	PPA signed in Nov-18	SCOD in Oct-20
3	Solar (Non Park III)	2.55 - 2.68	500	PPA signed in May-19	SCOD in Nov-20
4	Solar (Park I) (Raghanesda Solar Park)	2.65 - 2.70	500	PPA signed in Aug-19	SCOD in Nov-20
5	Solar (Park II) (Dholera Solar Park)	2.75	250	LoAs issued July-19	SCOD in Jan-21
Total			2250		

GUVNL Tender – Wind

Bid	Tender	Tariff (Rs/unit)	MW	LoA / PPA	Project Status
1	Wind (Non Park I)	2.43 - 2.45	500	PPA signed in Jan-18	233.1 MW commissioned
2	Wind (Non Park II)	2.80	202.5	PPA signed in Aug-19	SCOD in Jan-21
Total			702.5		

Power purchase from Renewable Sources

Status RPPO for FY 2018-19 – As per MYT

2018-19 (Prov.)	Wind	Solar	Others	Total
RPPO (%) – As per GERC	7.95%	4.25%	0.50%	12.70%
RE Requirement as per MYT (MUS)	7058	3773	444	11275
Actual Purchased (MUS)	8010	2455	224	10689
Achieved RPO (%)	9.02%	2.77%	0.25%	12.04%

Upcoming Projects – Renewable

Substation based Solar Generation:

- **2500 MW estimated capacity**
- **Projects at vicinity of existing Sub-Stations having RE Integration spare capacity & availability of Govt. Waste Land - optimum utilization of existing transmission infrastructure & other resources**
- **GSECL & GETCO have jointly applied for 5038 Hectares of land**
- **Capital subsidy of 50% of estimated capital cost of Rs 4 Crs / MW, i.e. Rs 2 Crs / MW to GSECL**
- **PPA to be signed with GUVNL at net cost after subsidy**

Upcoming Projects – Renewable

Small Scale Projects of 500 KW to 4 MW

- **2000 MW estimated capacity**
- **To promote small investments and projects in decentralized manner – to overcome inability of small investors to participate in Competitive bidding process**
- **PPA to be signed at:**

Avg. of tariffs contracted by GUVNL under Competitive Bidding during 6 months period i.e 31st Mar & 30th Sept in the succeeding six month period

Plus Rs 0.20 / unit towards transmission / distribution cost, land cost and higher capital & O&M cost due to smaller size of projects

Thank You