

**GUJARAT ELECTRICITY REGULATORY COMMISSION
GANDHINAGAR**

Minutes of the 22nd Meeting of the Co-ordination Forum

Venue: Hotel Mercure, GIFT CITY, Gandhinagar

Date: 31st August 2023

Time: 11:30 AM

The meeting started with welcome address by Hon'ble Chairman, GERC. It is emphasized that the meeting is scheduled after a long gap efforts would be made to schedule meeting more frequently.

Thereafter, discussions on agenda items took place.

Agenda Item No. 1: Approval of the minutes of the 21st Meeting of the Co-ordination Forum held on 26th September, 2019.

Minutes of the 21st 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: Action Taken Reports on Minutes of 21st Meeting of the Co-ordination Forum.

As the meeting is scheduled after gap of four years, Action Taken Reports received on Minutes of 21st Meeting of the Co-ordination Forum have taken on the record and proceeded with the deliberation on current issues of the Sector.

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

Status on compliance of RPO as received from the entities discussed and it was noted that there is shortfall in meeting RPO by GUVNL & TPL. GUVNL and TPL apprised the Forum about efforts put in by them to reach at the RPO targets. They were asked to make more efforts in complying with RPO targets.. The Forum was apprised about specification of RPO targets by MoP till 2029-30 and accordingly, it was informed that the Commission is in process of setting of RPO targets. Further, applicability of RPO to captive consumers and Open Access consumers was apprised and requirement of submission of compliance reports on quarterly basis by them was deliberated.

Agenda Item No. 4: Presentation by GPRD Cell – GUVNL and GETCO on implementation of Broken Conductor for 11/22 kV Feeders

GPRD Cell – GUVNL and GETCO through a detailed presentation apprised the Forum about Broken Conductor phenomena, Broken Conductor Protection implementation and its constraints. Research being carried out by GPRD Cell and GETCO for possible development of High Impedance Fault Relays. Further, information about design and development of

Extended Guard Earth Bar for Earth Fault is provided to the Forum. Copy of the presentation is enclosed.

Agenda Item No. 5: Presentation by Chief Electrical Inspector on Hospital Installations checked

Chief Electrical Inspector through detailed presentation apprised the Forum about efforts being made to curb out electrical accidents in Hospitals. Copy of the presentation is enclosed.

Agenda Item No. 6: Presentation by Chief Electrical Inspector about Safety Action Plan.

Detailed presentation on Electrical Safety Action plan inclusive of identification of common causes of electrical accidents, legal provisions pertaining to electrical safety, suggestive systematic interventions to prevent electrical accidents, suggestive measures to curb electrical accidents, was made by the Chief Electrical Inspector. Copy of the presentation is enclosed.

Agenda Item No. 7: Regulatory Developments

The Forum was apprised about various regulatory developments carried out by the Commission, inclusive of Draft Regulations based on Electricity Rights of Consumers Rules of MoP, GoI, Draft Regulations on Green Energy Open Access based on GEOA Rules of MoP, GoI, Discussion Papers on (i) wind-solar hybrid tariff framework, (ii) Municipal Solid Waste to energy tariff framework and (iii) Multi-Year tariff framework for 4th Control Period.

Agenda Item No. 8: Representations of consumers for discussion during the meeting

The Forum was apprised about receipt of the representation from the Gujarat Krushi Vij Grahak Suraksha Sangh for increasing number of CGRFs in the State and it is noted that the Amendment in the Regulations in this regard based on the MoP Rights of Consumers Rules for establishment of circle wise CGRF, is in process.

It is also noted by the Forum that there are complaints from Stakeholders in regard to non-compliance of order of the Hon'ble High Court in SCA 1634/2019 and non-compliance of Regulation 4.95 of the GERC Electricity Supply Code and Related Matters Regulations. Mr. J. J. Gandhi, GM (Commerce), GUVNL apprising about the issue in detail submitted that misinterpretation of Clause 4.95 of the GERC by the Chief Electrical Inspector led to approach of the Hon'ble High Court by MGVL, where decision of Chief Electrical Inspector was upheld against which SCA before Division bench of the Hon'ble High Court was filed which is listed for final hearing.

Agenda Item No. 9: Presentation on Transmission Network Status by GETCO

Detailed presentation on GETCO's Transmission Network, measures to tackle growing Renewable Energy Integration, adoption of new technologies, measure taken up for ease of doing business, GETCO's commitment towards climate and efforts taken in this regard, long term transmission plan was made. Copy of the presentation is enclosed.

Agenda Item No. 10: 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 enclosed.

Various measures being taken by Utilities to meet RPO targets were apprised to the Forum by representatives of the Utilities.

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 Anil Mukim, IAS, Chairman, GERC
2. Shri Mehul M. Gandhi, Member, GERC
3. Shri S. R. Pandey, Member, GERC

Members / Representatives of Co-ordination Forum:

1. Shri JayPrakash Shivahare, IAS, MD, GUVNL
2. Shri Arun Mahesh, IAS, MD, UGVCL
3. Shri M. J. Dave, IAS, MD, PGVCL
4. Shri Yogesh Choudhary, IAS, MD, DGVCL
5. Shri Tejas Parmar, IAS, MD, MGVCL
6. Shri Upendra Pande, MD, GETCO
7. Shri D. N. Patel, ED, GSECL
8. Shri Chetan Bundela, ED, TPL
9. Shri Mehul Rupera, Director, MUL
10. Shri K. M. Patel, CEI
11. Shri J. J. Gandhi, GUVNL
12. Shri S. S. Modi, GUVNL
13. Dr. A. J. Chavda, GETCO
14. Shri K. J. Bhuva, GETCO
15. Shri D. N. Shah, SLDC
16. Shri I. A. Nawab, GSECL
17. Shri N. B. Kansara, GSECL
18. Shri J. B. Upadhyay, GPRD
19. Shri G. K. Prajapati, CEI Office
20. Shri L. K. Chandawat, CEI Office
21. Shri S. Mani, GIPCL
22. Shri J. V. Desai, GEDA
23. Shri P. S. Darji, GEDA
24. Shri Jay Patel, GEDA
25. Shri Jaydeep J. Jadav, Western Railway
26. Shri M. T. Sangada, MGVCL
27. Shri R. J. Vala, PGVCL
28. Shri G. H. Engineer, UGVCL
29. Shri Jignesh Langalia, TPL
30. Ms. Luna Pal, TPL
31. Shri Anil Rabadia, MUL

Officers of the Commission:

1. Shri D. R. Parmar, Director, GERC
2. Shri S. T. Anada, Joint Director, GERC
3. Shri M. R. Jhala, Joint Director, GERC
4. Shri A. S. Makwana, Assistant Director, GERC
5. Shri Jignesh Makwana, IT Manager, GERC
6. Shri K. M. Thanki, Assistant Director, GERC

Agenda No:4 of the 22nd Meeting of the Coordination forum

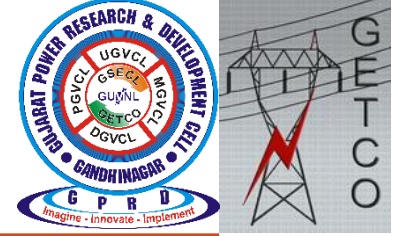
Implementation of Broken Conductor for 11/22 kV Feeders & Research work for the detection of High Impedence Faults in power distribution system

Presented By: Joint Research Team “GPRD and GECTO”

Date: Thursday, 31st August, 2023

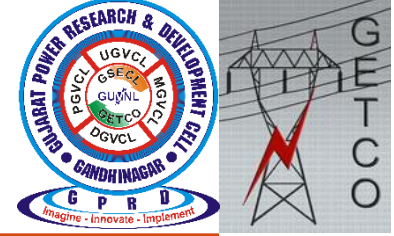
Venue: Mercure Hotel, GIFT CITY, Gandhinagar

Broken Conductor (BRC) Phenomenon



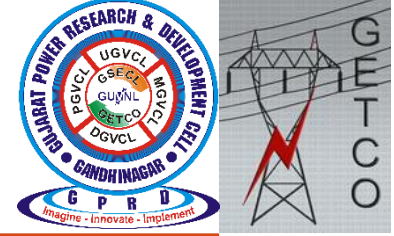
- Broken line Conductor / open jumper creates unbalanced type of fault in the System.
- If the broken conductor / Jumper doesn't touch ground
 - it will not cause an increase in Phase Current. But it will produce negative sequence current.
- If the broken conductor / Jumper touches ground / pole
 - it will cause an increase in Phase Current and it will also produce zero and negative sequence current.
 - it will not cause substantial increase in Phase current if the ground resistance is high.
 - it will also not cause substantial increase in Phase current if the conductor is broken from load side.
- If the broken conductor falls on passersby / livestock and property
 - it will not cause substantial increase in Phase current but it presents a serious hazard and may lead to non-fatal or even fatal accidents.

BRC Protection Implementation & Constraints

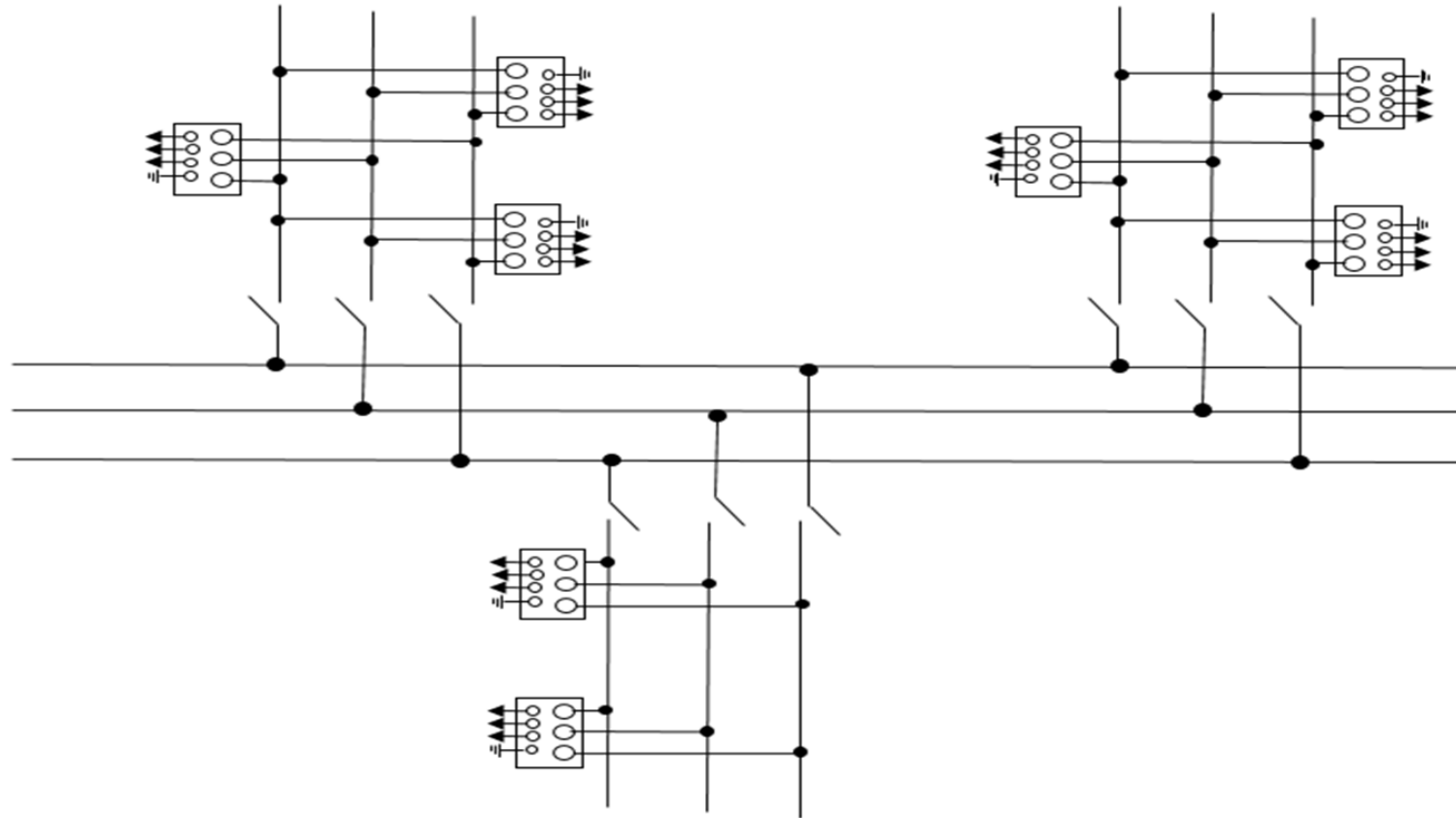


- Numerical Over Current & Earth Fault Protection Relays with broken conductor protection feature are installed on 11kV / 22kV feeders.
 - It trips the feeder if fault (zero sequence) current is above set value
 - It also trips the feeder if unbalance (negative sequence) current is high
- Constraints
 - it will not trip the feeder if the ground resistance is high as fault current is very low
 - it may also not trip the feeder if the conductor is broken from load side due to distribution transformer impedance in fault loop and load current of healthy section of feeder
 - It trips the feeder due to high unbalance current in normal condition of the feeder

BRC Protection Implementation & Constraints

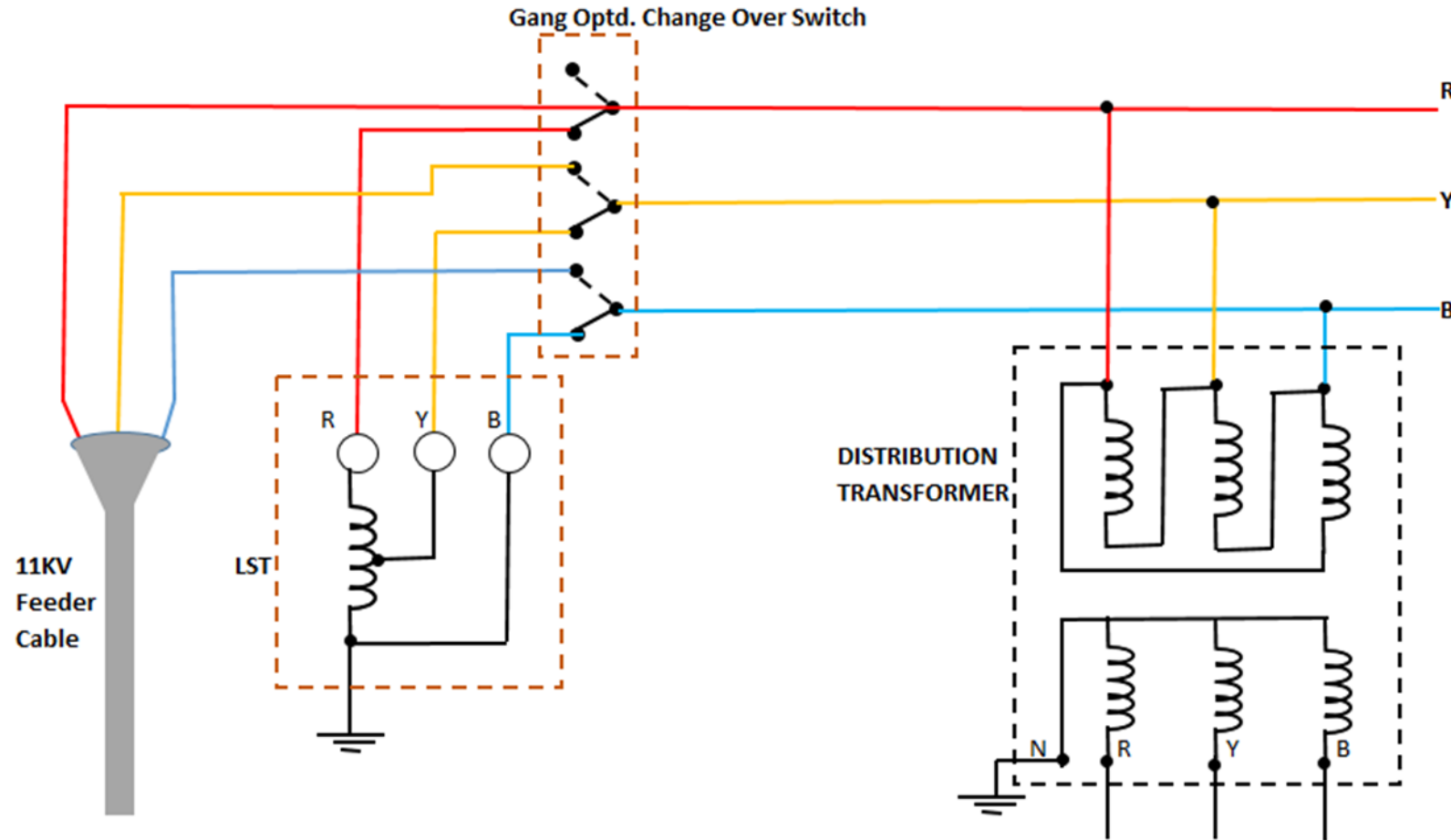


- Configuration and Dynamic nature of 11KV Radial Feeders with number of DTRs and MV switches; which constraints use of Broken Conductor Relays.



BRC Protection Implementation & Constraints

- LSTs (Load Shedding Transformers) at Substation end leading to unbalanced phase wise loading.

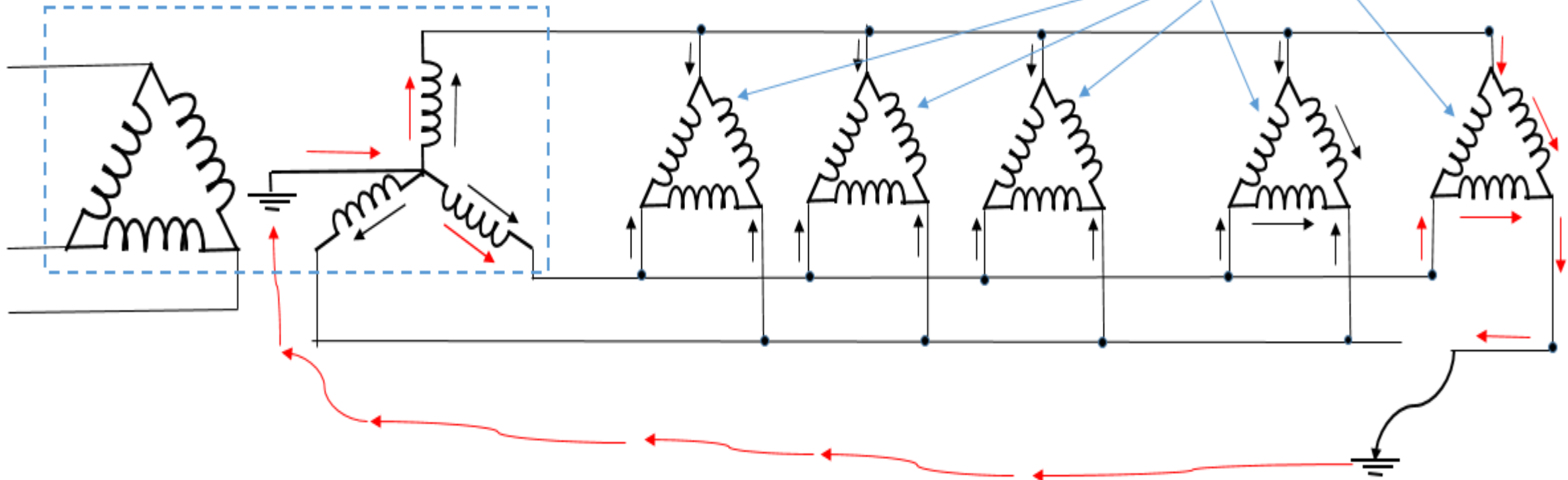


BRC Protection Implementation & Constraints

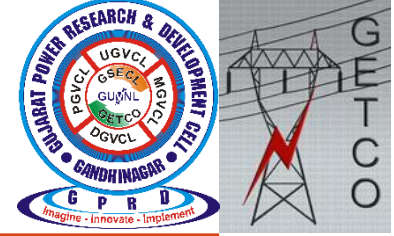
Line Conductor Snapping from Load Side and touching Earth at the Farthest end of a 11KV Feeder

66/11KV Transformer at Substation end

HV Winding of Distribution Transformer

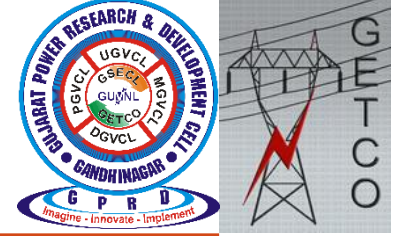


BRC Protection Implementation & Constraints



- As shown in the previous slide, one phase line conductor snapping from load side – at far end of the feeder. Fault current finds path through Distribution transformer winding, due to impedance of the winding, fault current value is limited.
- As shown in same slide, the load current (Positive sequence current) feeding through Distribution Transformers connected preceding to the location of conductor snapping – is continued.
- For such cases, the value of positive sequence current may be significant. And compared to that, negative sequence current (due to unbalance created during broken conductor fault) value may be less.
- Broken conductor protection relay works on I_2 / I_1 ratio (Ratio of Negative Sequence current to Positive sequence current).
- For such cases i.e. broken conductor faults taking place on load side at location away from the source end, I_2 / I_1 value may not cross the threshold value, and so broken conductor protection may not operate.

BRC Protection Implementation & Constraints



- High penetration of Solar Rooftops and its unpredictable generation pattern creates unbalance in the System which may cause unwanted tripping of Broken Conductor Relays.

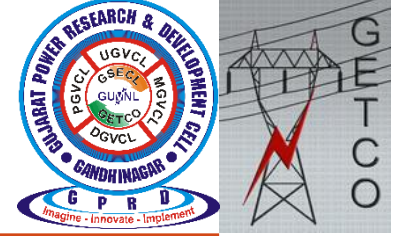


Urban Feeder Network and SRT Consumers



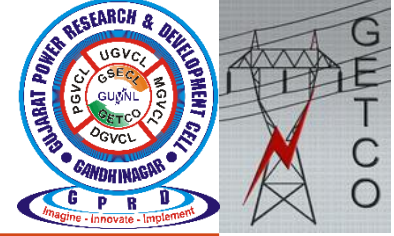
AGDOM Feeder Network and SKY Consumers

Genesis of Research



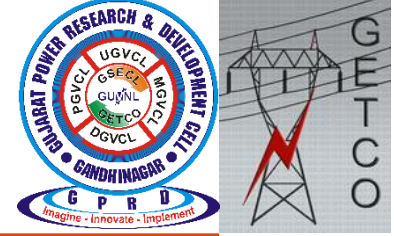
- The 11 kV distribution feeders are mainly overhead lines and they are prone to faults.
 - These faults are generally detected & cleared by conventional Over Current & Earth Fault Protection Relays.
 - Sometimes, it happens that 11kV feeder conductor makes unwanted electrical contact with a road surface, sidewalk, sod, tree limb, or with some other poorly conductive surface or object which offers high impedance path and thus restricts the flow of fault current to a very low value, even well below the load current.
 - Thus, these 'High Impedance Faults' (HIF) are difficult to discriminate and detect reliably by conventional / traditional Over Current & Earth Fault Protection Relays.
 - Similarly, the load side downed / broken conductor also results in very low fault current.
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Genesis of Research..... Continue

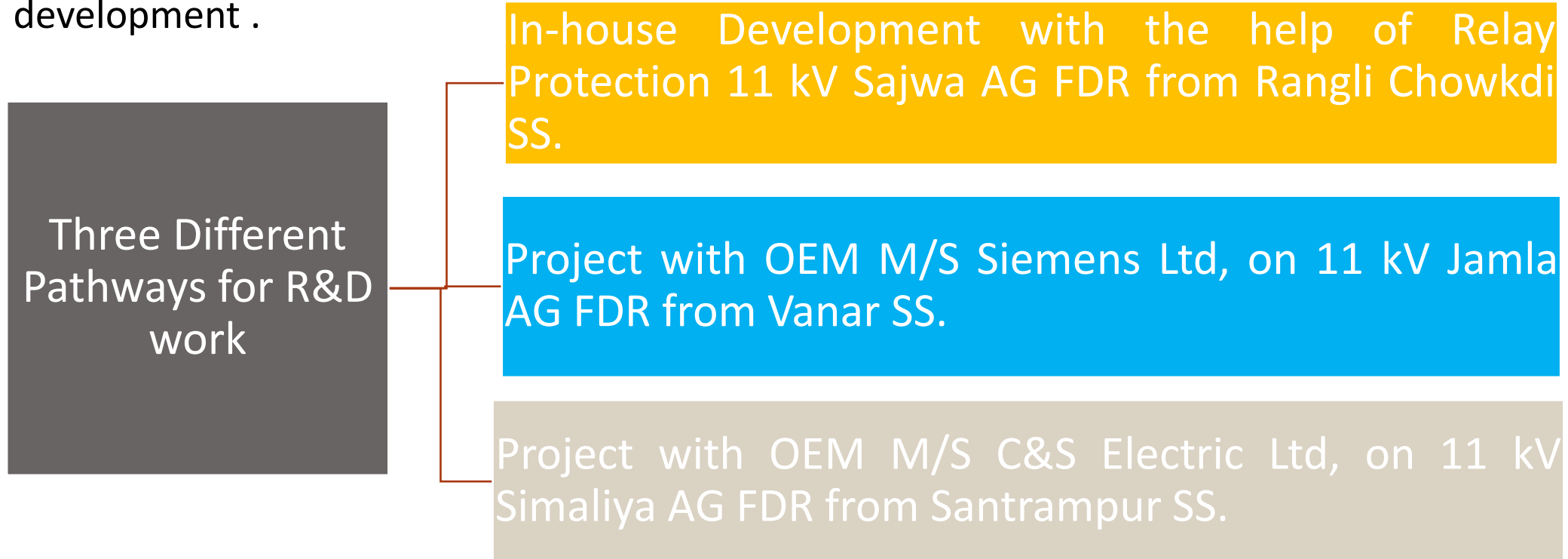


- The situation in AGDOM feeder during load shedding condition further gets worsen. In such occurrences, sometimes the conductor may remain energized and when it is within reach of passersby / livestock and property, it presents a serious hazard and may lead to non-fatal or even fatal accidents.
- The ability to detect HIF has been a topic of research and development since many years but still the utilities are not getting any reliable and financially viable solution / product.
- **In view of the above, the Joint Research Team of GPRD and GETCO engineers are working on the research project for the development of High Impedance Fault Relay specifically for downed/broken conductor of 11kV distribution feeders. MGVCL is also associated with this project.**

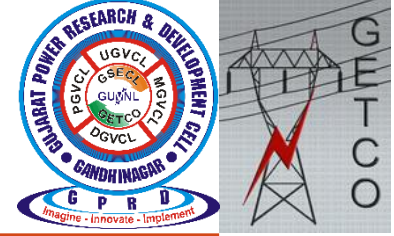
Joint Research Team- GPRD & GETCO



- The Joint Research Team (JRT) of GPRD Cell and GETCO was formed for the specific R&D work of reliable & cost effective High Impedance Fault Relays for power distribution network in 2019.
- The team is working on three different pathways for possible development of HIF Relays. The first phase of the work is to select the appropriate feeder and to acquire the fault data to analyze for logics development .



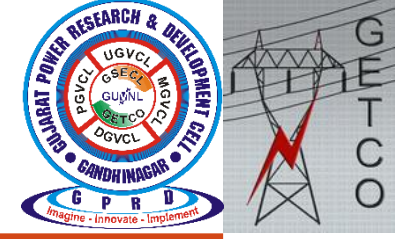
Activities @11 kV Sajwa AG FDR from Rangli Chowkdi SS.



- **Completed Research activities**

- Software simulation of faults & with hardware as per AGDOM feeder configuration.
- Configuring “Schweitzer Engineering Laboratories (SEL): SEL 751 A” make Over Current & Earth Fault Protection Relay for different protection algorithm/logics.
- Feeder selection based on the different criteria viz. Max conductor snapping, BCR relay, AGDOM category, passing through different terrains, frequent tripping, history of electrical accident.
- Preparation of SLD, deployment of various equipment viz. specially designed CTPT unit in series with SDT, SEL relay with remote data communication.
- Correlation of relay performance with actual fault event using mobile application through line staff engagement.

Activities @11 kV Sajwa AG FDR from Rangli Chowkdi SS.

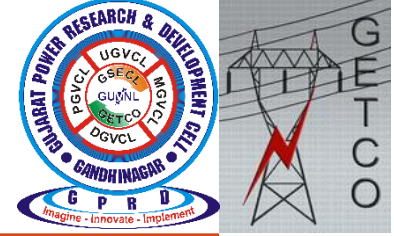


Fault simulation @ Chhani store-MGVCL

System Set Up@Rangli Chowkdi SS



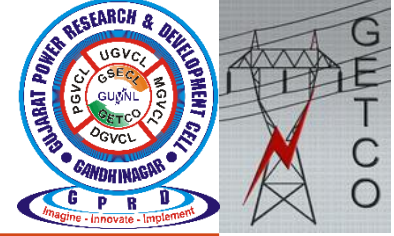
Activities @11 kV Sajwa AG FDR from Rangli Chowkdi SS.



- **Future Research activities**

- Based on the data analysis & requirements, on field fault simulation shall be carried out by actually snapping the live conductor on different terrains to create HI faults and relay observations.
- With whole set of fault and relay behaviour data, protection algorithm and logics to be developed for HI fault detection.

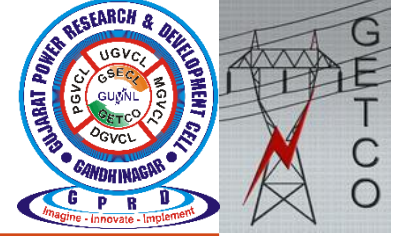
Activities @11 kV Jamlā AG FDR from Vanar SS.



- **Completed Research activities**

- Engagement of Relay OEM **M/S Siemens Ltd** for the Research work of HIF relay development with series of meetings.
- Finalization of SLD, BoQ of equipment viz. Power Quality Meter, Precise Fault Recorder, Data storage computers, Neutral CTs for Power Transformers, Specially design CTPT in series with SDT, & peripherals.
- Feeder selection based on the different criteria viz. Max conductor snapping, BCR relay, AGDOM category, passing through different terrains, frequent tripping, history of electrical accident.
- Installation & commission of defined equipment in December-2019.
- Fault data recording and analysis till March-2021

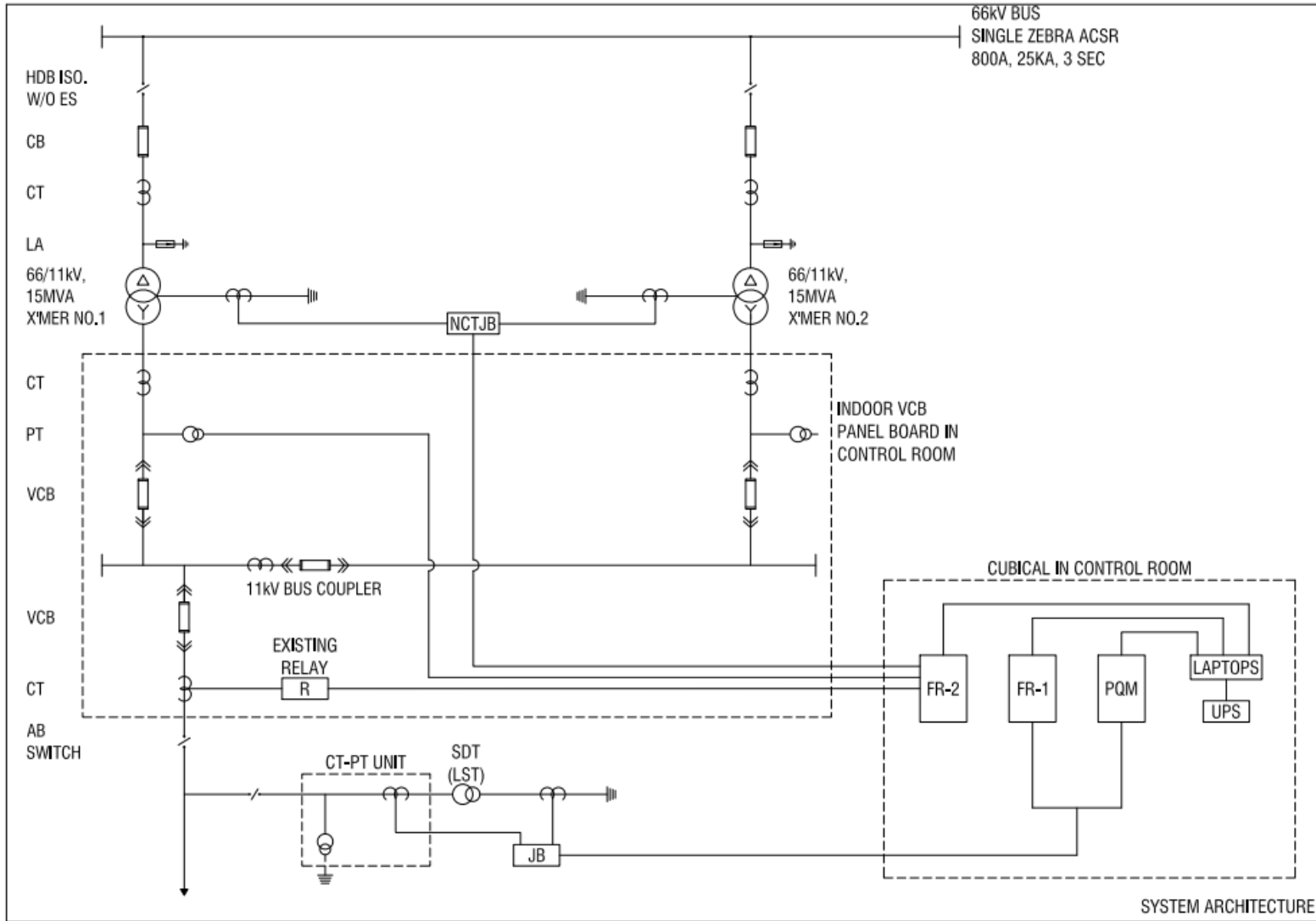
Activities @11 kV Jamlā AG FDR from Vanar SS.



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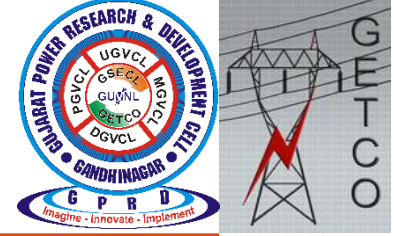
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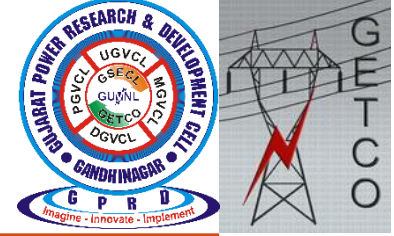
Activities @11 kV Jamlā AG FDR from Vanar SS.



- **Future Research activities**

- Based on the data analysis & requirements, on field fault simulation shall be carried out by actually snapping the live conductor on different terrains to create HI faults and relay observations.
- Data sharing with other relay OEMs (other than M/S Siemens Ltd.) for development of protection algorithms/logics.
- With whole set of fault and relay behaviour data, protection algorithm and logics to be developed for HI fault detection by M/S Siemens Ltd.

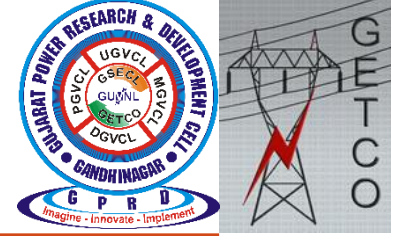
Activities @11 kV Simaliya AG FDR from Santrampur SS.



- **Completed Research activities**

- Engagement of Relay OEM **M/S C&S Ltd** for the validation & testing of their HIF relay (CSENEX-I) with series of meetings.
- Performance review of installed C&S HIF relay by site visits of JVVNL area.
- Feeder selection based on the different criteria viz. Max conductor snapping, BCR relay, AGDOM category, passing through different terrains, frequent tripping, history of electrical accident.
- Installation & commission of C&S relay in series of existing relay in January-2022 (No tripping from this relay).

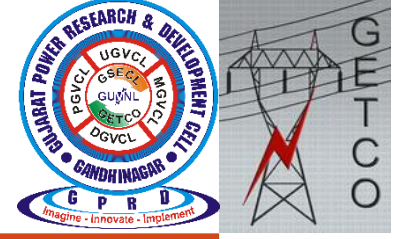
Activities @11 kV Simaliya AG FDR from Santrampur SS.



- **Future Research activities**

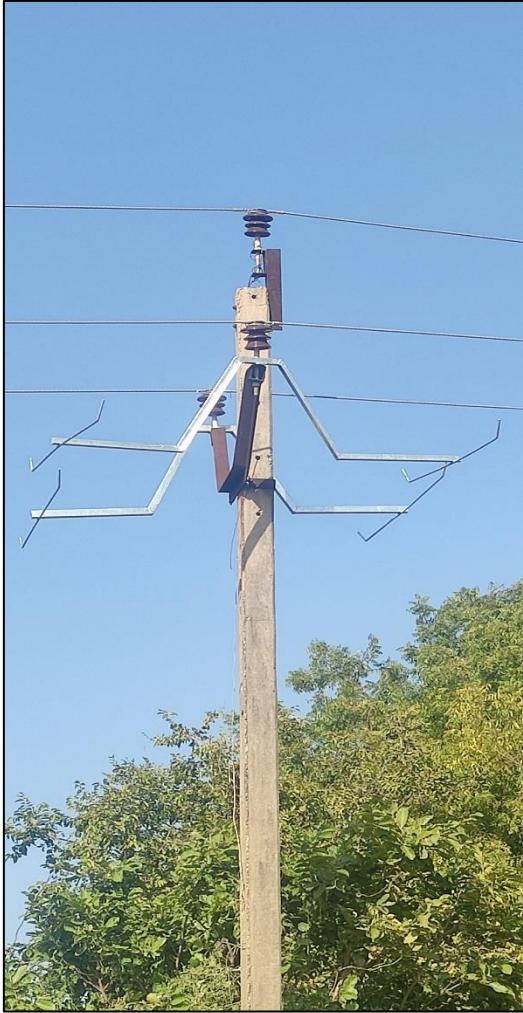
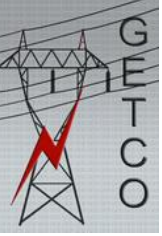
- Observation of relay performance in correlation with actual faults using mobile application.
- Based on the data analysis & requirements, on field fault simulation shall be carried out by actually snapping the live conductor on different terrains to create HI faults and relay observations.
- If requires, modification in protection algorithms/logics in relay by M/S C&S Ltd.

Other Research activities

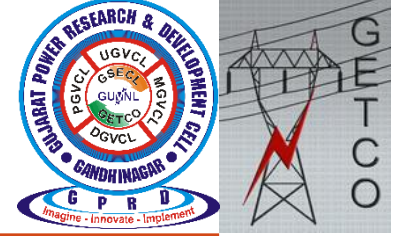


- Design & development of “Extended Guard Earth Bar” with effective earthing for reliable operation of earth faults in case of conductor snapping.
- Field deployment on 11 kV Dagvadiya AGDOM feeder from Tatosan SS under UGVCL.
- Actual snapping of conductor created to validate the design of earth bar in January-2022.
- Further development and standardization of design for all different line configuration of the network.

Extended Guard Earth Bars



Conclusion

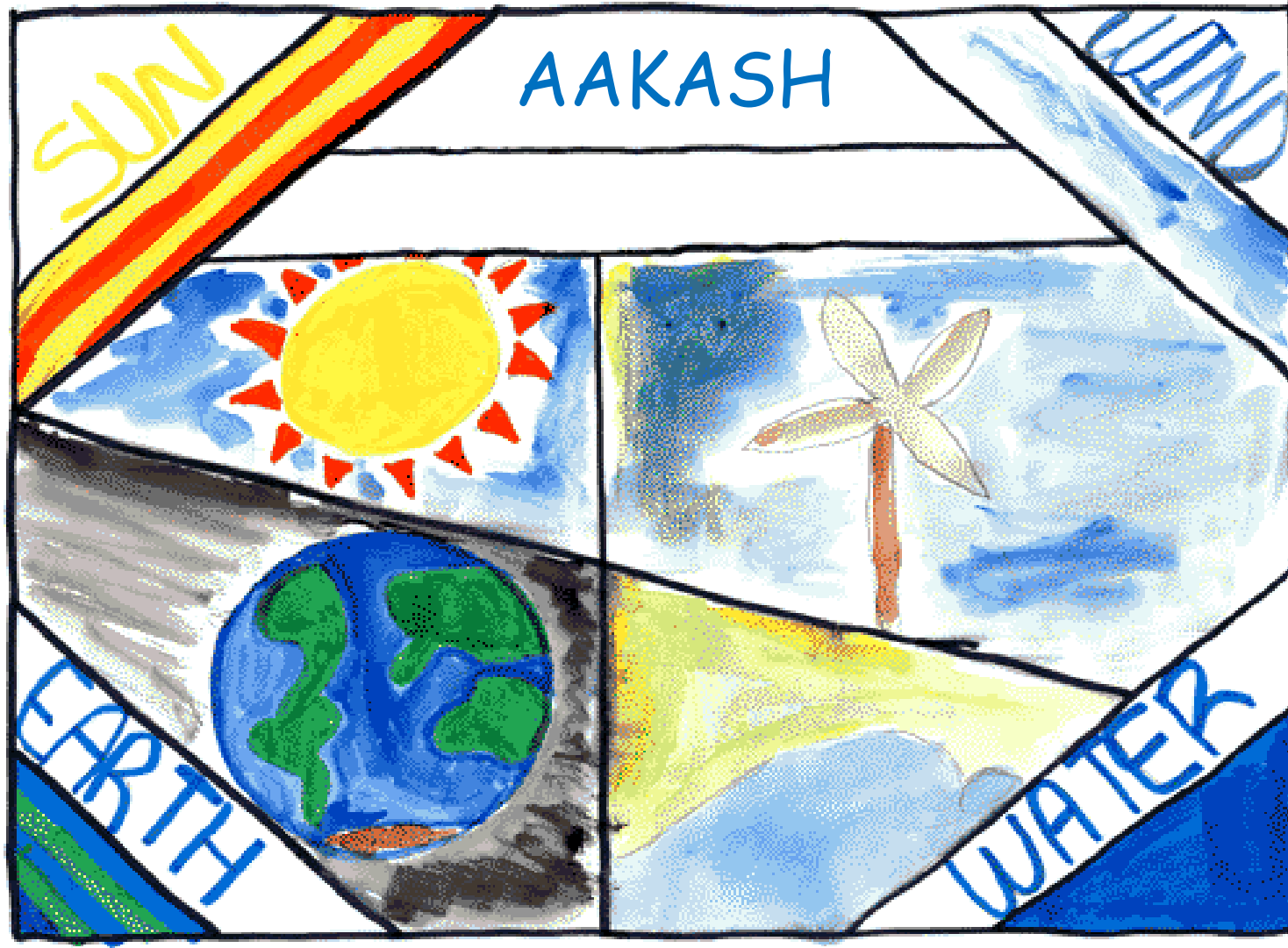
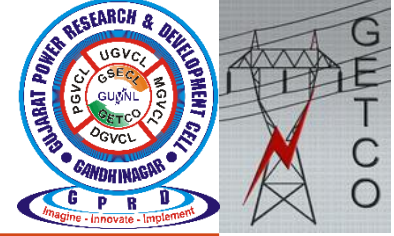


- Load pattern and configuration of 11kV feeder is dynamic, hence it is quite difficult to derive logic for relay to operate in each and every situation.
- Providing earthing to faulty / broken conductor is the easy way to operate the relay.

Suggestion

- Continuous Guarding to 11kV feeder is the best solution in present scenario.
 - Provide extended cross arm is another economical solution
 - Undergrounding Network with cable
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Thank you !!!



FIRE INCIDENCES IN ICUs OF HOSPITALS



22nd Meeting of the Co-ordination Forum

31st Aug, 2023

O/o the Chief Electrical Inspector

Major Fire Incidences in ICUs



- Shrey Hospital, Ahmedabad
- Uday Shivanand Hospital, Rajkot
- Patel Welfare, Bharuch

Details of Fire incidences



➤ **Shrey Hospital, Ahmedabad :**

In the early hours of 06th August, 2020, a fire took place in the ICU of the Shrey Hospital situated at Navrangpura, Ahmedabad. Eight (8) patients admitted for COVID treatment in the said ICU situated on the fourth floor of the building lost their lives in the said fire incident.

➤ **Uday Shivanand Hospital, Rajkot:**

Another fire incident, took place in the ICU of Uday Shivanand COVID hospital, being operated in a three storeyed building at Anand Bungalow Chowk, Mavdi Road, Rajkot on 27th November, 2020 at about 00:30 hrs. Five (5) patients admitted for COVID treatment in the said ICU situated on the first floor of the building lost their lives in the said fire incident.

➤ **Patel Welfare Hospital, Bharuch :**

On 01st May, 2021 , at 01:00hrs another fire incidence took place in ICU at Patel Welfare Hospital, Bhauruch where 16 people including Covid-19 patients and hospital staff died

Appointment of Inquiry Commission



- ❧ The Government has appointed Hon'ble Justice D A Mehta inquiry commission.
- ❧ In all the three incidences, the cause of fire was internal fault in the bio-medical equipment installed in ICUs.
- ❧ No fault in Electrical installation.

Fire Safety Audit Committee (FSAC)



- The Government of Gujarat constituted Fire Safety Audit Committee (FSAC) comprising consequent to these incidences. The FSAC was to undertake Fire Safety Audits of DCHs initially in the four major Corporation areas of Ahmedabad, Surat, Rajkot and Vadodara within four weeks.
- A special drive for joint checking/ Inspection of Hospitals was carried out with DISCOMs across the State.

Hospitals Installation Checked



No	Nature of Installation	No. of Inspections	Overload observed	Unbalanced Load observed	Absence of backup source of power	Defect observed in Internal wiring	No Defect Observed in Internal wiring
1	COVID Hospitals & COVID Care Centers	1713	185	704	578	1010	703
2	Oxygen Manufacturing Plants	90	4	13	62	45	45
	Total	1803	189	717	640	1055	748

O/o the Chief Electrical Inspector

Remedial Measures Suggested



- In hospital installations, the distribution of the power shall be made with Bus Bar Trunking system only.
- The body and neutral of transformer/Generator/Panels shall be connected with two separate and distinct earth connections.
- Efficient Earthing to all non conducting metal Parts.
- All electric supply lines & apparatus shall be of sufficient rating for power, insulating & estimated fault current.
- The electrical installation and wiring and its regular maintenance, repairing, additions/alterations should have been carried out by the **Licensed Electrical Contractor** only under the direct supervision of the competency certificate holder.
- Hospital shall be supplied electricity through a single connection as far as possible.
- Connected or utilized load not to exceed the sanctioned load.
- No loose connection to avoid heating

Remedial Measures Suggested



- Temporary wiring and extension board shall be avoided in hospitals.
- If extension board is inevitable then not more than one equipment shall be connected in plug-socket.
- Worn out cables shall be replaced.

Meter Room:

- Meter room shall not be near staircase of the hospitals.
- The meter room shall be well ventilated.
- No flammable and other material shall be stored in the meter room, electrical panel room or control room.

Remedial Measures Suggested



Internal wiring and Protection :

- Low smoke, halogen free wires/ cables shall be used.
- The fault loop impedances at origin of installation shall be got tested by Hospital Management to ensure automatic disconnection of the protective device in case of a fault of negligible impedance.
- In order to avoid accidents due to leakages, ELCB/RCCB of adequate sensitivity and load carrying capacity must be installed.

Air Conditioning systems:

- Overload and earth fault protective device for each AC
- Appropriate capacity of Air Conditioning System for OT / ICU
- Periodical maintenance and servicing of AC

Remedial Measures Suggested



Bio-medical equipment:

- All biomedical equipment's shall be used as per the manufacturer specification and duty cycle of the equipment.
- Bio-medical equipment shall be monitored and periodically tested as per the manufacturer guidelines by the bio-medical engineers.

Amendment in Safety Regulations



- Based on the Special drive, this Inspectorate suggested to the Central Government, to the Central Electricity Authority(CEA) for mandatory provision of appropriate capacity of RCCB / ELCB in every electrical installation irrespective of the load.
- The suggestion was accepted by the CEA, New Delhi and in recently published regulations, the Provision for mandatory installation of RCCB/ELCB in electrical installations is incorporated irrespective of load.

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Thank You...!!!



Electrical Accidents & Safety Action Plan

22ND MEETING OF STATE CO-ORDINATION FORUM
AUGUST 31, 2023

Prepared By: Office of the Chief Electrical Inspector, Gandhinagar

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- Legal Provisions Pertaining to Electrical Safety
- Deep Dive on Electrical Accidents in Gujarat State
- Measures to Curb Electrical Accidents
- Safety action plan of DISCOMs.

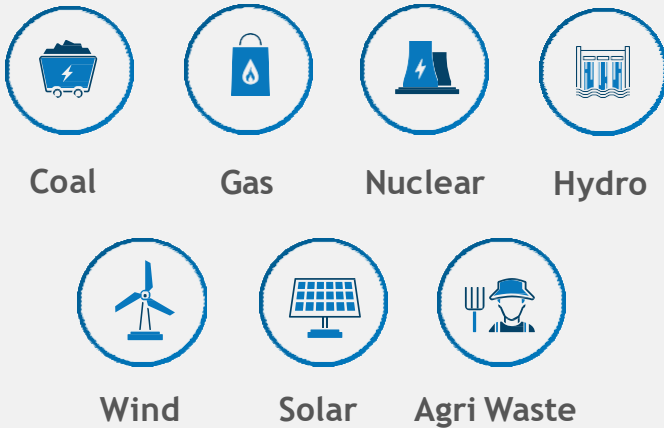




Introduction

DIVERSIFIED AND RAPIDLY GROWING POWER SECTOR MAKES ELECTRICAL SAFETY A PRIORITY

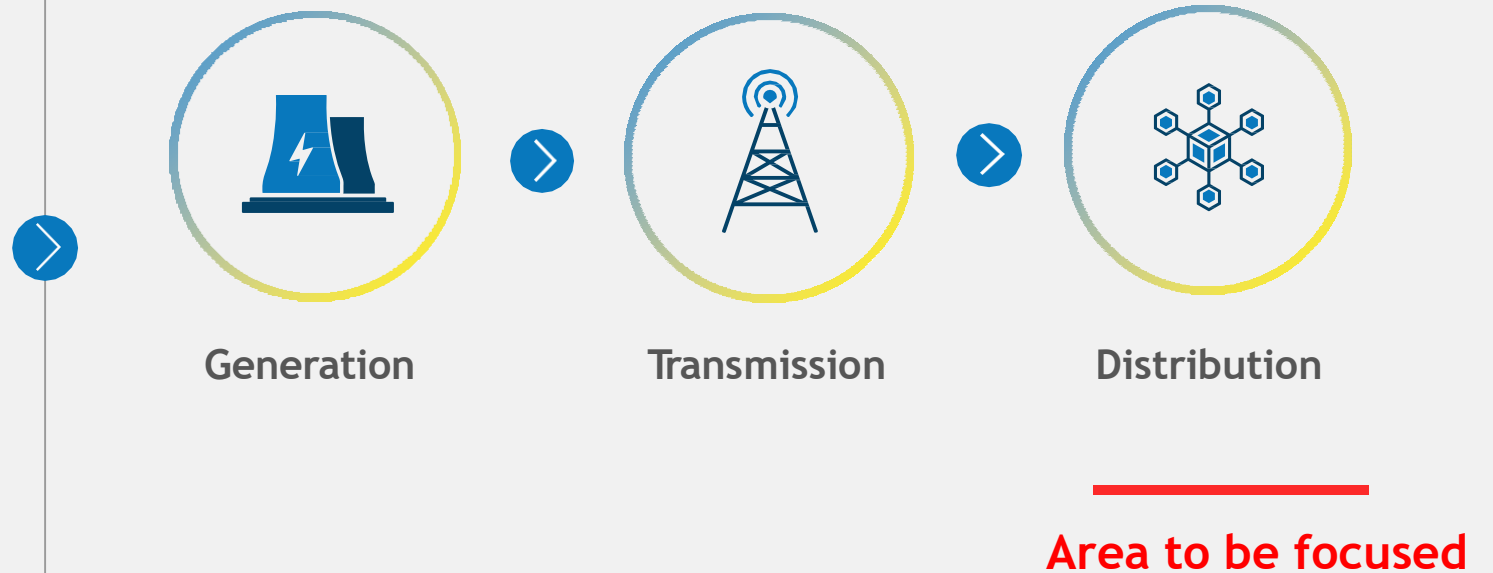
Indian power sector is highly diversified...



...and rapidly growing



Safety needs to be ensured across the entire electricity supply chain



12 COMMON CAUSES OF ELECTRICAL ACCIDENTS HAVE BEEN IDENTIFIED BASIS ELECTRICAL ACCIDENT INVESTIGATION



Unsafe System
of Work



Inadequate
Information



Lack of
Training



Inadequate
Isolation



Non-compliance
of Safety
Regulations



Ineffective work
supervision



Working on
Live Wires



Sub-standard
Test Equipment



Poor
Installation
Maintenance



Failure to
Manage Work



Non-competent
Personnel



Uninsulated
Electrical Wiring



Legal Provisions Pertaining to Electrical Safety

THE CENTRAL ELECTRICITY AUTHORITY (CEA) HAS MADE SEVERAL REGULATIONS RELATED TO CONSTRUCTION, OPERATION AND MAINTENANCE OF ELECTRICAL INSTALLATIONS

1



The CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2010.

Generation

2



The CEA (Grid Standards) Regulations, 2010 which every transmission licensee has to comply for operation and maintenance of transmission lines.

Transmission

3



The CEA (Measures relating to Safety and Electric Supply) Regulations, 2023

Distribution

NOTICE AND INVESTIGATION OF ELECTRICAL ACCIDENTS (IN PURSUANCE OF SECTION 161 OF THE ELECTRICITY ACT, 2003)



Fatal/Non-Fatal
accident occurs to
human/animal



Inform Electrical
Inspector within 24
hours of knowledge
(by phone, email,
fax, etc.)

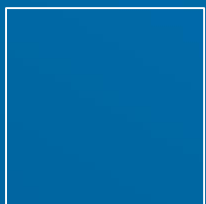


Give written notice
in Form-A within 48
hours of knowledge



Electrical Inspector inquires and reports as to the cause of any electrical accident affecting the safety of the public, or as to the manner in, and extent to, which the provisions of the Act or rules and regulations made thereunder or of any licence, so far as those provisions affect the safety of any person, have been complied with.

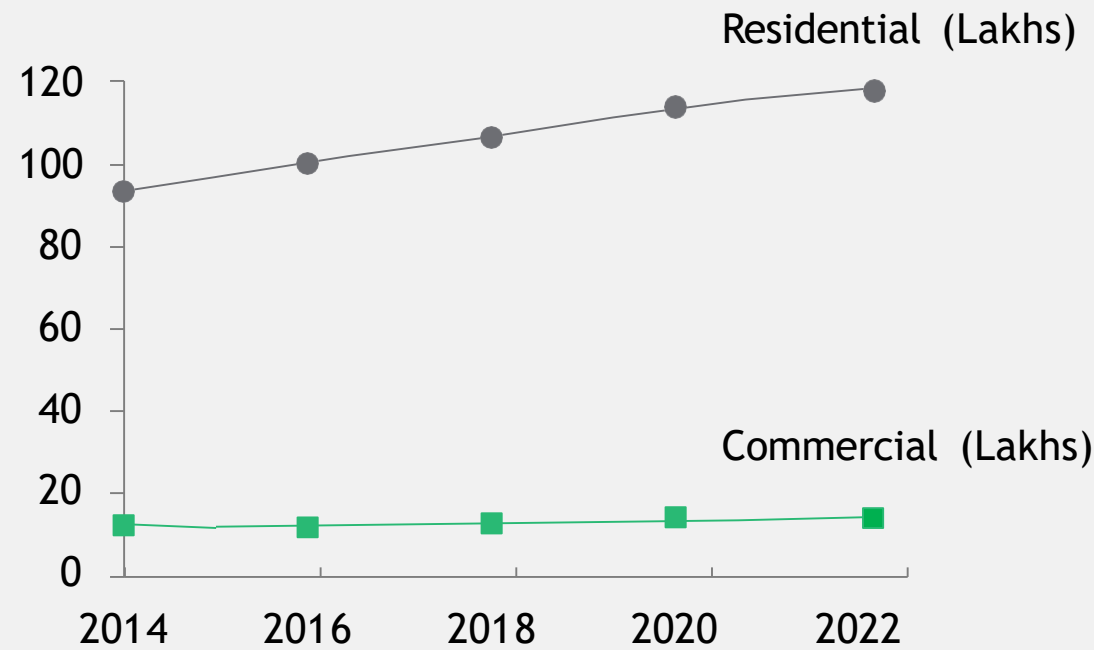
Gujarat Electricity (Notice of Occurrence of Accident) Rules, 2004.



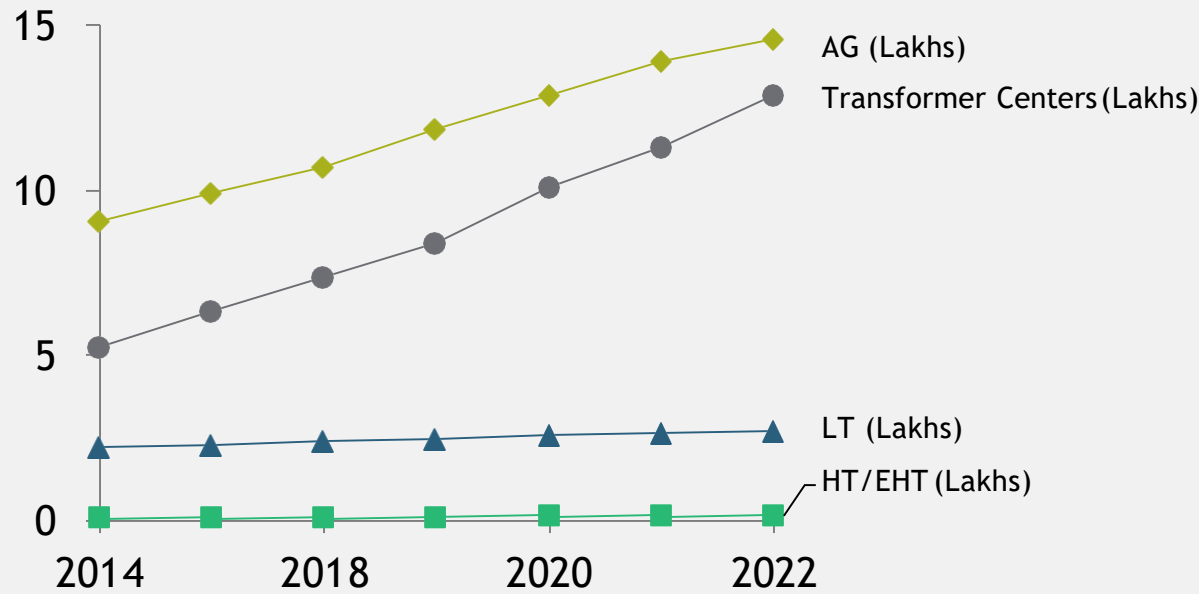
Deep Dive on Electrical Accidents in Gujarat State

ECONOMIC DEVELOPMENT HAS RESULTED IN INCREASED NUMBER OF INSTALLATIONS AND NETWORK COMPLEXITY...

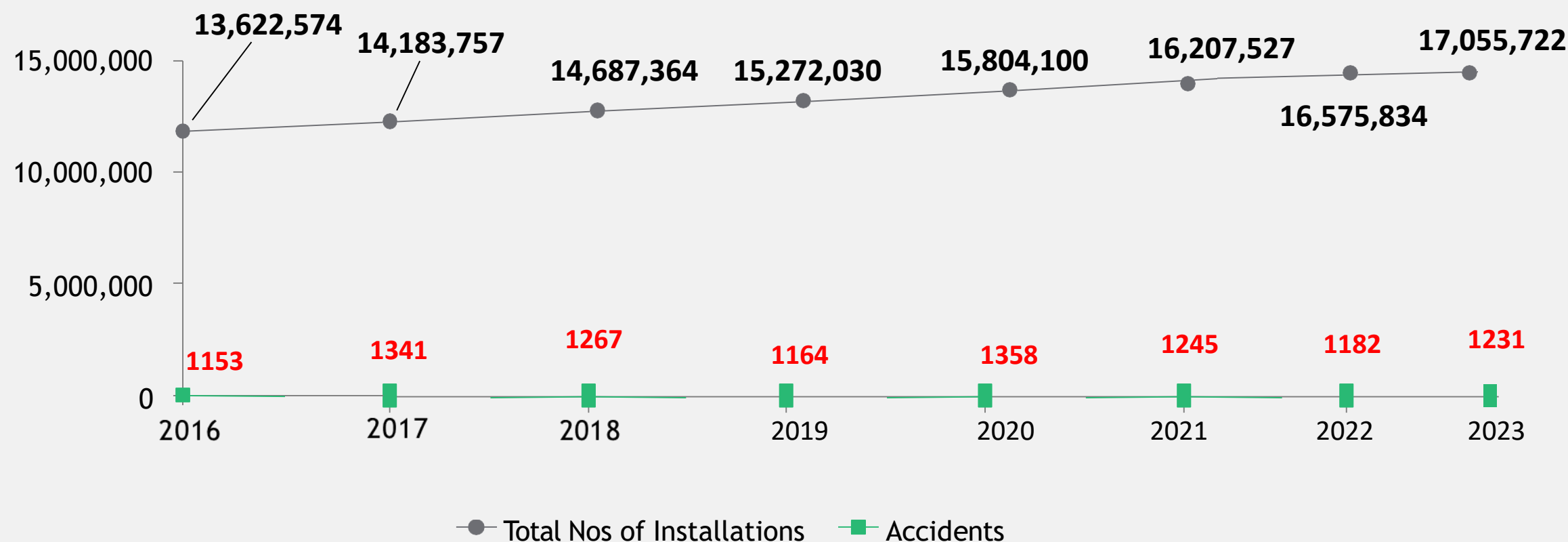
Significant growth in residential installations



Network has become increasingly complex



...BUT THE NUMBER OF ELECTRICAL ACCIDENTS HAS REMAINED ALMOST STAGNANT OVER THE YEARS



NUMBER OF ACCIDENTS PER CONSUMER AND PER UNIT INFRASTRUCTURE HAVE ALSO DECREASED

Indicator Type	INDICATOR/RATIO (HIGHER IS BETTER)	2011-12	2022-23
Accidents per Consumer	$\frac{\text{Total Number of Consumers}}{\text{Total Accidents}}$	8670	13855
Accidents per Unit Infrastructure	$\frac{\text{Total Length of Transmission Line in KM}}{\text{Total Number of Accidents in Transmission Line}}$	92	857
	$\frac{\text{Total Number of Distribution Transformers}}{\text{Total Number of Accidents on Industrial Installations}}$	5467	46807
	$\frac{\text{Total Number of Distribution Transformers}}{\text{Total Number of accidents on other than Industrial Installations}}$	1822	5690
	$\frac{\text{Total Number of Distribution Transformers}}{\text{Total Number of accidents in Distribution System}}$	1071	1520

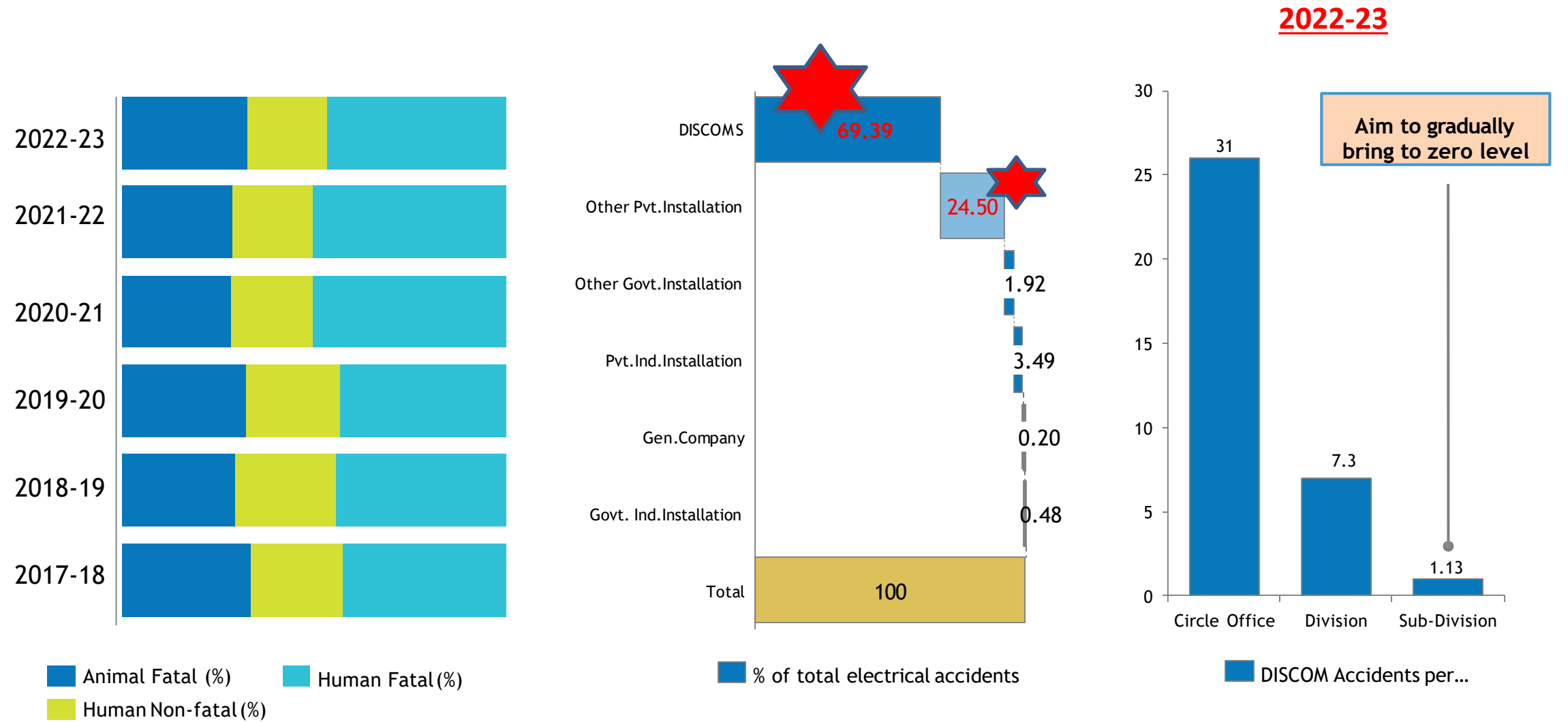
The inspectorate's vision of 'Zero Accident' is at the center of this analysis. Electrical accidents (no matter how small their number is) must be focused and addressed through systematic interventions.

Chief Electrical Inspector, Gandhinagar, Gujarat

MAJOR SOURCES AND ROOT CAUSES OF ELECTRICAL ACCIDENTS IDENTIFIED - DISCOMs TO BE ADDRESSED FIRST

Category of Accident	Major Source(s) of Accident	Root Cause(s)
Human Fatal	• DISCOMs • Other Private Installations	• Accidental Live Contact • Defective Installation • Unauthorised Work
Human Non-Fatal	• DISCOMs	• Neglect of Safety Measures
Animal Fatal	• DISCOMs	• Conductor Snap • Lack of Maintenance

ABOUT HALF OF TOTAL ACCIDENTS HUMAN FATAL IN NATURE; MORE THAN 2/3RD OF TOTAL ACCIDENTS OCCURRING IN DISCOMS



SAURASHTRA & SOUTH ZONES MUST BE TARGETED ON PRIORITY

Electrical Accidents during the Year 2022-23

Zone	Human Fatal	Human Non-Fatal	Animal Fatal	Total Accidents
Saurashtra zone 	249	65	149	463
South zone	135	77	105	317
Central zone	98	37	91	226
North zone	100	28	97	225
Total	582	207	442	1231



Measures to Curb Electrical Accidents

SAFETY MEASURES CURRENTLY TAKEN PRIOR TO COMMENCEMENT OF NEW SUPPLY

Mandatory Inspection before energizing >650 V installations

Electrical installations having voltage level exceeding 650 V are inspected by the Electrical Inspectors prior to energisation as provided in **Regulation 45** of the CEA (Measures relating to Safety and Electric Supply) Regulations, 2023 and permission to energise such electrical installations is granted if electrical safety parameters are observed. If the installation is found unsafe, appropriate actions are advised for rectification of the defects and energisation permission is granted once the defects are complied with and thereafter supply is commenced by the DISCOM.

Electrical Contractors test installations <650 V before energizing, DISCOMs verify

No pre-energizing inspection is carried out by the Electrical Inspectorate for the **installations having voltage level up to 650 V**. Supply to such installations is commenced by the DISCOMs upon receiving the test report of the Licensed Electrical Contractor. The role of the Licensed Electrical Contractor and the DISCOMs become very much critical with regard to verification of observance of safety parameters of such installations before commencement of supply so as to avoid mishaps and accidents.

Strict actions by Licensing Board on fraudulent Test Report of installations by the Contractor, DISCOMs must also ensure

As experienced, many a times, **Electrical Contractors submit Installation Test Reports to the DISCOMs without actually carrying out any testing** thereby jeopardizing safety. **Electrical Inspectorate takes strict actions against the electrical contractor** who is found guilty and involved in such malpractice or certifying unsafe work. It is, therefore, very much desirable that **the DISCOMs should also verify the safety of the installations before commencing supply** to such installations.

**Safety
measures
suggested
to
DISCOMs**

1

During 2022-23 out of total 1231 accidents, 775 (i.e. 62%) accidents took place across 685 Sub-Divisions of DISCOMs in the State translating into 1.13 accident per Sub-Division.

2

DISCOMs have been requested to direct every Sub-Division to achieve zero accident in its area of jurisdiction.

3

The Sub-Divisions achieving zero accident during the year may be rewarded by letter of appreciation.

4

The Sub-Divisions where number of accidents increase as compared to the previous year shall be answerable and accountable for the same.

5

Every Sub-Division shall ensure that recurrence of the accident does not happen within the particular Sub-Division due to the same reason.

6

Electrical Safety Officer is designated at every Sub-Division who shall act in pursuance of regulation 5.

ELECTRICAL SAFETY ACTION PLAN OF DISCOMS FOR 2021-22: **KEY FOCUS AREA**

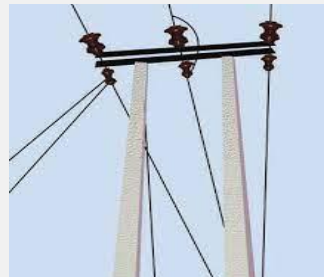
SAFETY OF DEPARTMENTAL STAFF



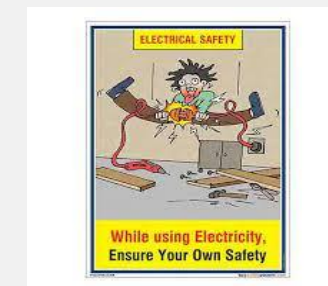
IDENTIFICATION OF VULNERABLE LOCATIONS AND ITS RECTIFICATION



REMOVAL OR RECTIFICATION OF LINE CROSSING



SAFETY AWARENESS TO GENERAL PUBLIC



MEASURES TAKEN BY DISCOMs FOR REDUCTION IN ELECTRICAL ACCIDENTS

- **Removal of feeder crossing or rectification for safe working.**
- **Daily reminder to adopt safe work practice & carry safety gadgets.**
- **Enforcing use of safety gadgets.**
- **Safety training**
- **Ascertain pole climbing skill**
- **Co-ordination with contractors.**
- **Safety seminar/ safety committee meetings at each level.**
- **Punitive action for safety breach.**
- **Check list for doing work.**
- **LC authorization & SMS to supervisor.**
- **Encourage/ appreciate zero/reduced accident subdivision.**
- **Designated safety officer.**

MORE ACTIONS REQUIRED BY THE DISCOMS

- **Stringent verification of test report before releasing new connection.**
- **Ensuring RCD (ELCB/RCCB) before releasing new connection.**
- **Efficient earthing system for Transformer Centers and Overhead lines.**
- **Adequate protection system for HV/LV side of the Distribution Transformers.**
- **Adequate horizontal and vertical clearance from the overhead lines.**
- **Guarding arrangement at all road crossing and dense public area.**
- **Adequate preventive maintenance for overhead lines and transformer centers.**
- **Safe work culture and usage of PPE by all the technical employees/ line staff**
- **All electrical accidents shall be intimated to the Electrical Inspectorate.**

**Safety
Measures
for
Private
Premises**

1

During 2022-23 out of total 1231 accidents, 369 (i.e. 29.97%) accidents took place in the private installations of the persons across the State.

2

This number may be reduced by ensuring installation of RCD (ELCB/RCCB) in all the installations of the consumers.

3

Release of new connection after thoroughly verification of all safety aspect would help reducing such accidents.

4

Safety awareness campaign for the consumers.

LONG WAY TO GO...



Thank You!



Gujarat Energy Transmission Corporation Limited

22nd meeting of The Co-ordination forum

31st August, 2023

Gujarat Power Sector Overview

GETCO Today

Renewable Energy Integration

Adoption of New Technology

Ease of Doing Business

Commitment to Climate

STU Perspective Plan

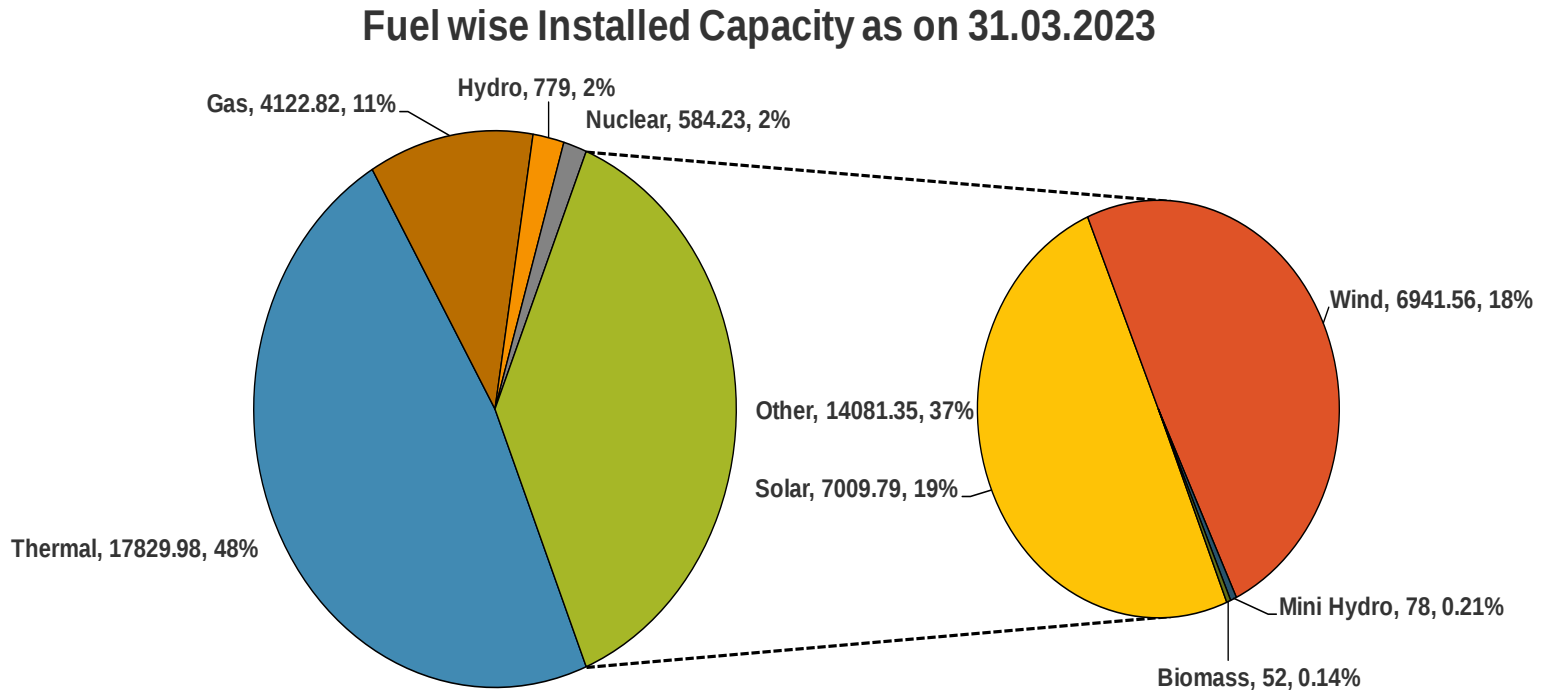


Gujarat Power Sector Overview

Gujarat Power Sector : Installed Capacity (as on Mar'23)



Sr. No.	Sector	As on 31.03.2023
1	State	6677
2	Private	7475
3	Central Sector	9165
4	Wind	6942
5	Solar	7010
6	Biomass	52
7	Mini Hydel	72
Grand Total...		37397



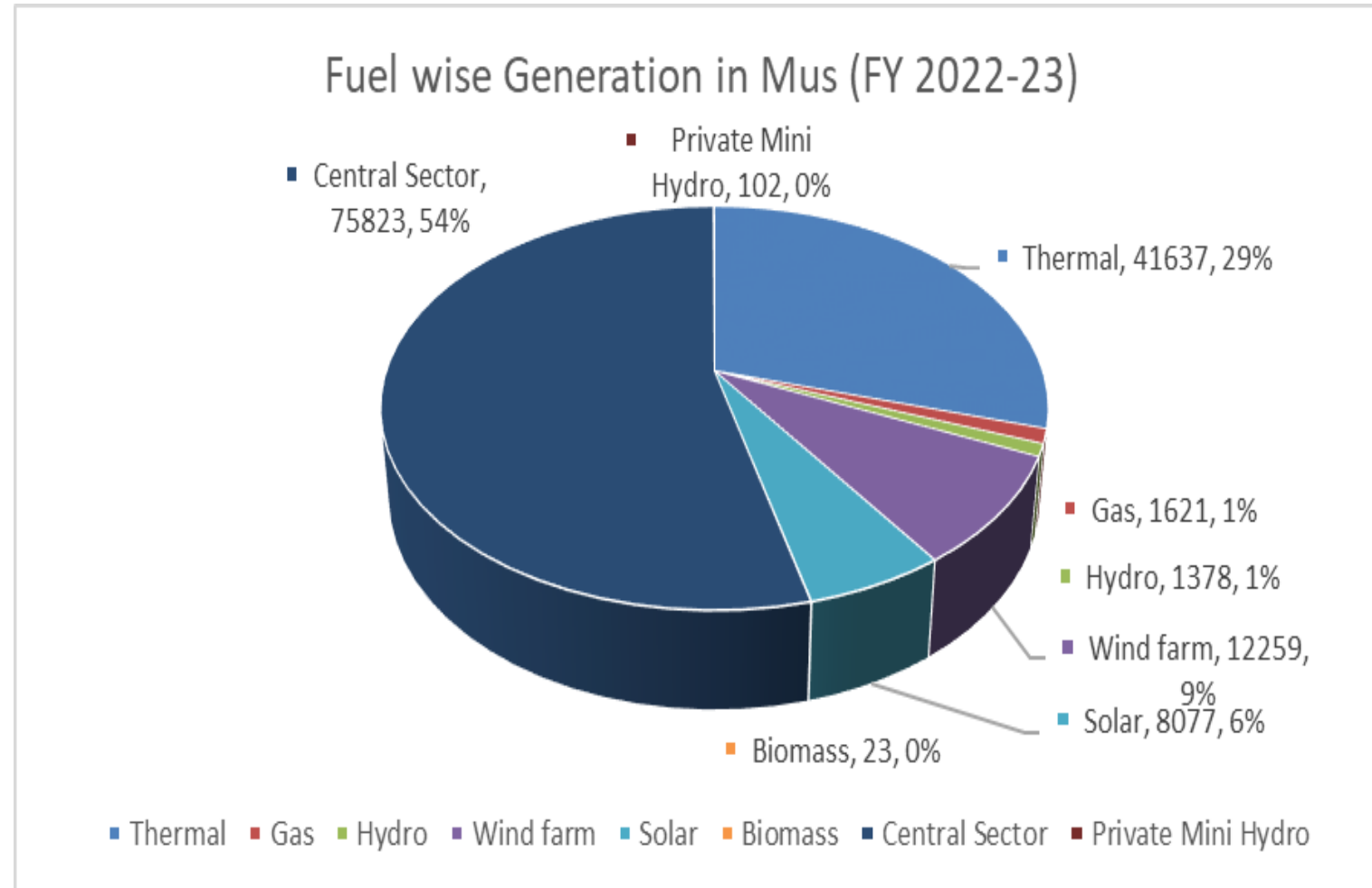
Thermal	Gas	Hydro	Nuclear	Solar	Wind Farm	Biomass	Total
17830	4123	857	584	7010	6942	52	37397
48%	11%	2%	2%	19%	19%	0.1%	100.0%

- Currently, 40% share of RE and 60% of rest of other energy i.e. Thermal, Gas, Nuclear

Energy Catered scenario from different sources (in MUs)

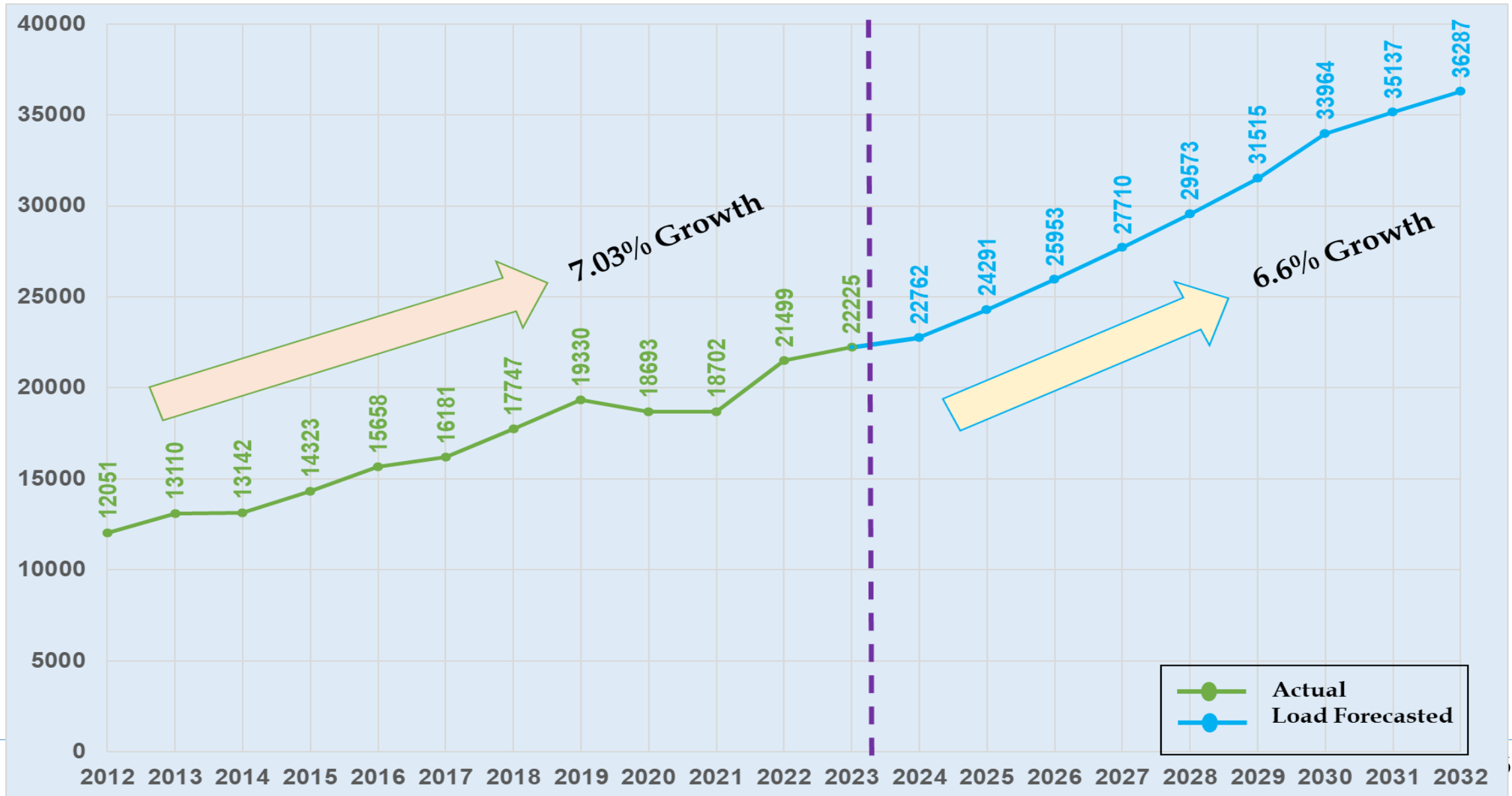


Sources	2021-22	2022-23
GSECL	23992	24921
Pvt. Sector	24695	19714
Central Sector	62728	75823
Wind Energy	12143	12259
Solar	5674	8077
Biomass	1	23
Mini Hydro	84	102
Total MUs	129317	140921



Gujarat Load growth

Yearly Maximum Demand catered and Peak forecasted Electricity demand





GETCO Today

Phenomenal Growth



Transmission Network: 2004

Peak Load: 8,078 MW as on 24.09.2004

Asset	400 kV	220 kV	132 kV	66/33 kV	Total
Substation (nos.)	7	62	48	684	801
Transmission Line (ckm)	1,695	11,334	4,550	16,438	34,017

Transmission Network: 2023

Peak Load: 22,225 MW as on 09.06.2023

Asset	400 kV	220 kV	132 kV	66/33 kV	Total
Substation (nos.)	18	113	52	2,020	2,203
Transmission Line (ckm)	6,722	21,820	5,833	38,679	73,054

Major Highlights of 2022-23



Asset addition:

	Commissioned during the year	Network as on 31 st Mar,2023
Substation (Nos)	104	2203
Transmission Lines (ckm)	2676	73054
Transformation Capacity (MVA)	15755	162906
Transmission system availability of 99.46% (FY 21-22)		
Capex - Rs 3,649 Crore & Capitalization - Rs 3,955 Crore		

DISCOM wise Substation Addition in FY 2022-23



Sr. No.	Voltage Class	Addition during the year 2022-23				Total
		DGVCL	MGVCL	UGVCL	PGVCL	
1	400 kV	--	--	--	1	1
2	220 kV	--	--	--	3	3
3	132 kV	--	--	--	--	--
4	66 kV	23	14	16	47	100
Total...		23	14	16	51	104

Technology wise GETCO Substations



(in Nos.)

Sr. No.	District	400 KV	220 KV	132 KV	66 KV	Grand Total
1	Air Insulated Substation	12	102	51	2014	2179
2	Gas Insulated Substation	6	6	-	5	17
3	Hybrid Switchgear Substations	-	5	1	1	7
	Total Substations	18	113	52	2020	2203
4	Remotely operated substation	13	41	-	8	62

Kisan Suryodaya Yojana – To provide day time Agriculture Power

- ❑ Capital Expenditure incurred: Rs 830 cr
- ❑ Transmission lines commissioned: 1114 Ckm (84 nos)
- ❑ Districts ready for KSY implementation: 23

Tribal Area Sub-Plan (TASP) – Power infrastructure strengthening in Tribal Region

- ❑ Capital Expenditure incurred: Rs 160 cr
- ❑ Nos of substation commissioned: 16 nos

Sagarkhedu Sarvangi Vikas Yojana – Power infrastructure strengthening in Coastal Region

- ❑ Capital Expenditure incurred: Rs 188 cr
- ❑ Nos of substation commissioned: 10 nos

Green Energy Corridor - I



Sr. No.	Type	Voltage Class	Nos of Projects	Completed	Pending
1	Substations	400 kV	3 s/s (5300 MVA)	3 s/s (4300 MVA)	0
2		220 kV	5 s/s (2680 MVA)	5 s/s (2680 MVA)	0
3	Transmission Line	400 kV	4 lines (839 Ckm)	1 lines (129 Ckm)	3 lines (710 Ckm)
4		220 kV	13 lines (1036 Ckm)	10 lines (622 Ckm)	3 lines (414 Ckm)
5		132 kV	1 lines (59 Ckm)	1 lines (59 Ckm)	0
6	Reactors	220 kV	2 Package (Supply+Erection) (5 nos)	2 Package (5 nos)	0
Total Packages			28 Packages	22 Packages	6 Packages

Project Cost: Rs 1932.40 Cr

Green Energy Corridor – II



	Nos	Present Status
Transmission lines	17	• Work under progress: 2 Nos. • Awarding activities under process: 3 Nos • Pre-tendering activities under process: 9 Nos. • Revised Proposal submitted to MNRE: 2 Nos • Activity yet to start: 1 Nos (CTU location finalization under process)
Sub-Stations	6	• Work under progress: 1 Nos. • Awarding activities under process: 2 Nos • Land acquisition under process: 3 Nos

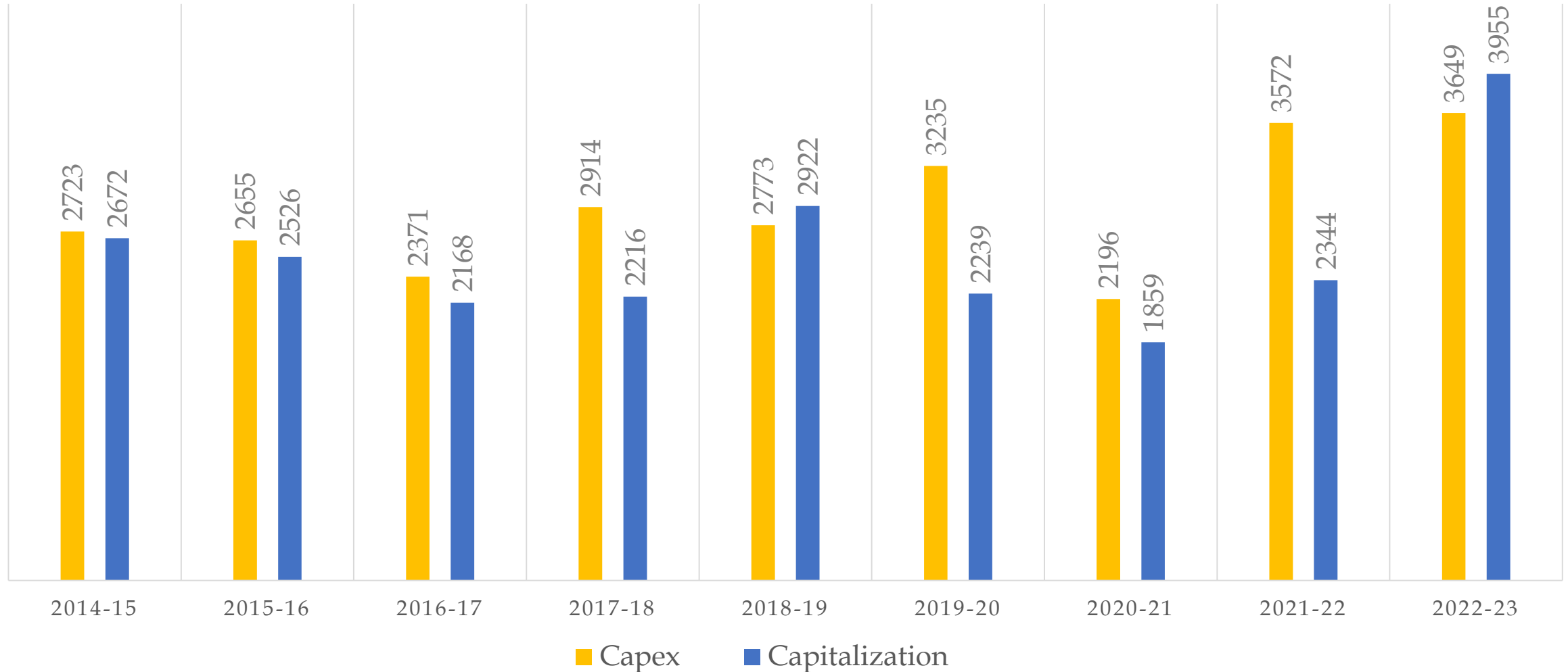
- Project Cost Rs. 3667.29 Crore
- Project Completion Schedule March, 2026.
- Requested MNRE for extension of completion schedule up-to March, 2027, looking to the revision in 02 Nos of transmission lines and CTU has yet to finalize the location for 765 Vataman S/s.



Capital Expenditure vs Capitalization

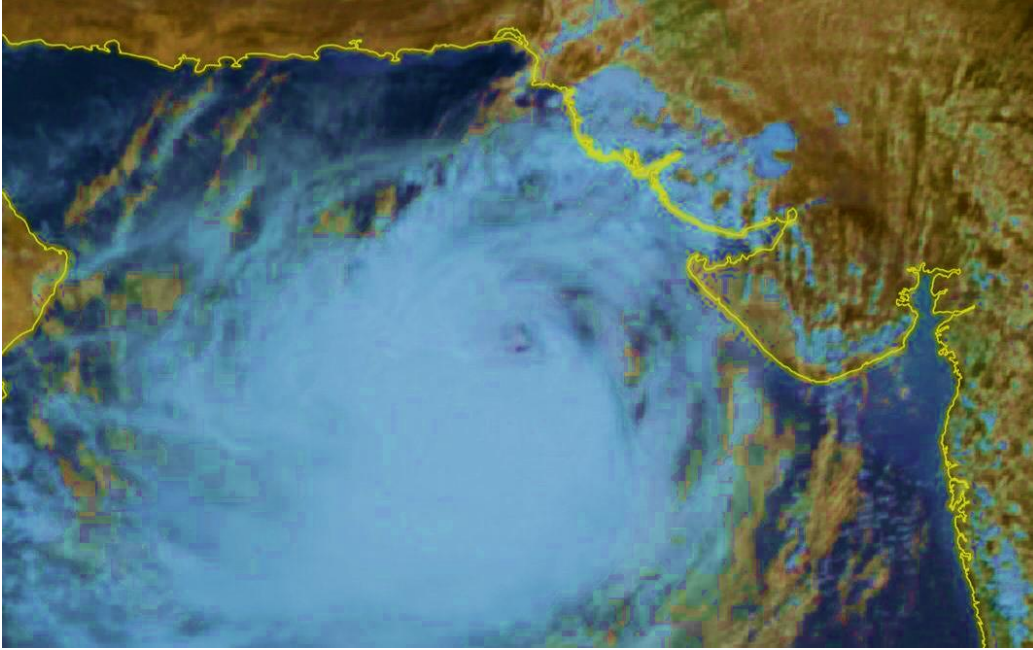


Investment (in Rs Crore)



*FY 22-23 :Provisional Figures

Catastrophic effect of Cyclone 'Biparjoy'



Significant Damage to :

391 Nos

Substations

675 Nos

Transmission
Lines

78 Nos

Transmission
Towers

43 Nos

H-Frame
Structures

GETCO implemented various steps to mitigate the effects of the 'Biparjoy' Cyclone:

- ❑ Land fall on 15.06.2023
- ❑ Sustained speeds of 125-135 kmph
- ❑ Areas affected : North Gujarat and Saurashtra-Kutch.

- MD level meeting for pre-cyclone preparedness and strategic decisions.
- Deputation of senior officials in advance at strategic locations for monitoring & assessment.
- Formation of GETCO teams with sufficient manpower.
- Mobilization of Material at strategic locations in advance to save the crucial time.

Restoration of Power

GETCO mobilized 100 teams of more than 600 employees, enabling power restoration to substations and critical areas.

Power Restoration in record time of
72 hours

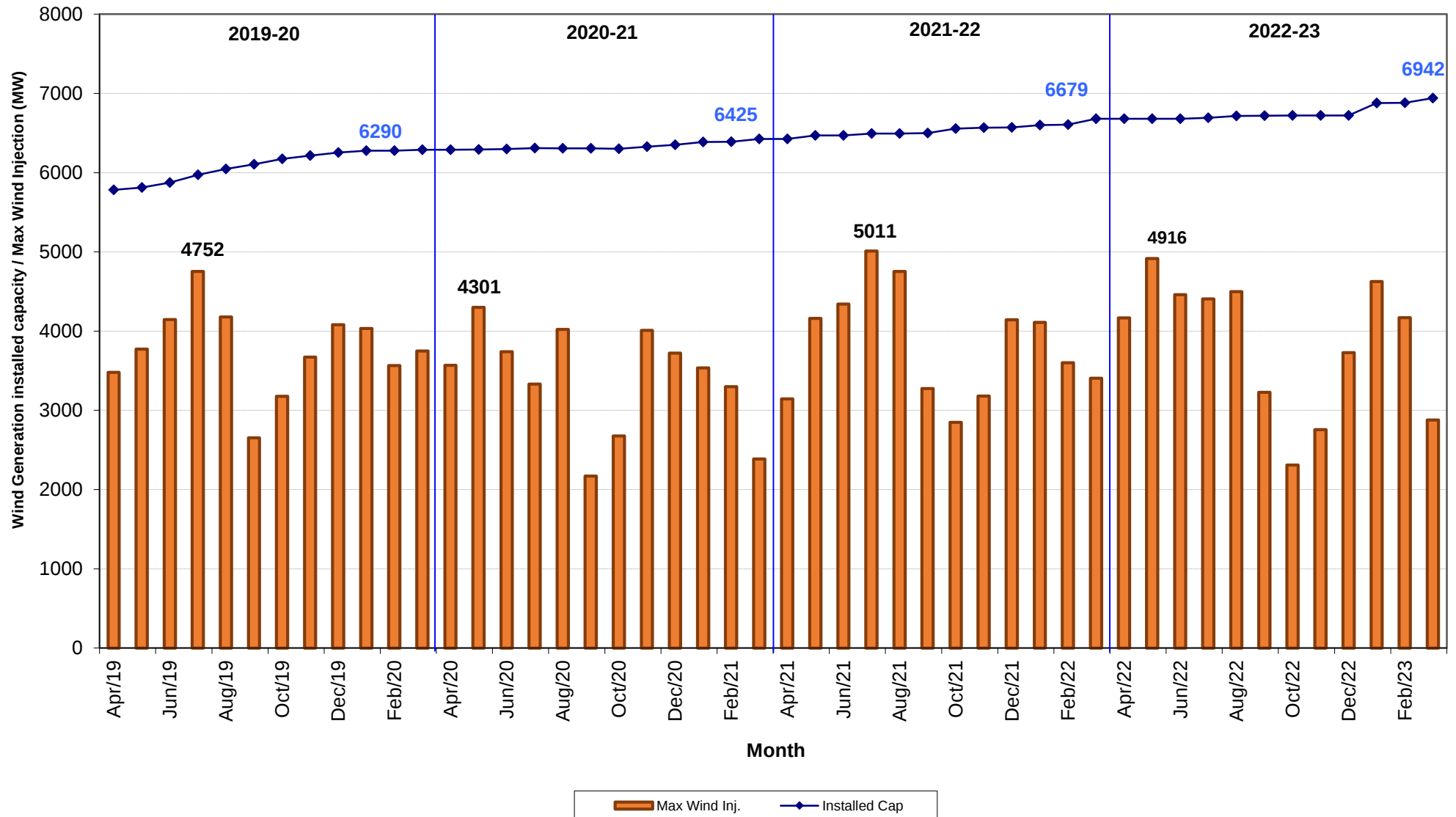


Renewable Energy Integration

Wind Generation Integration



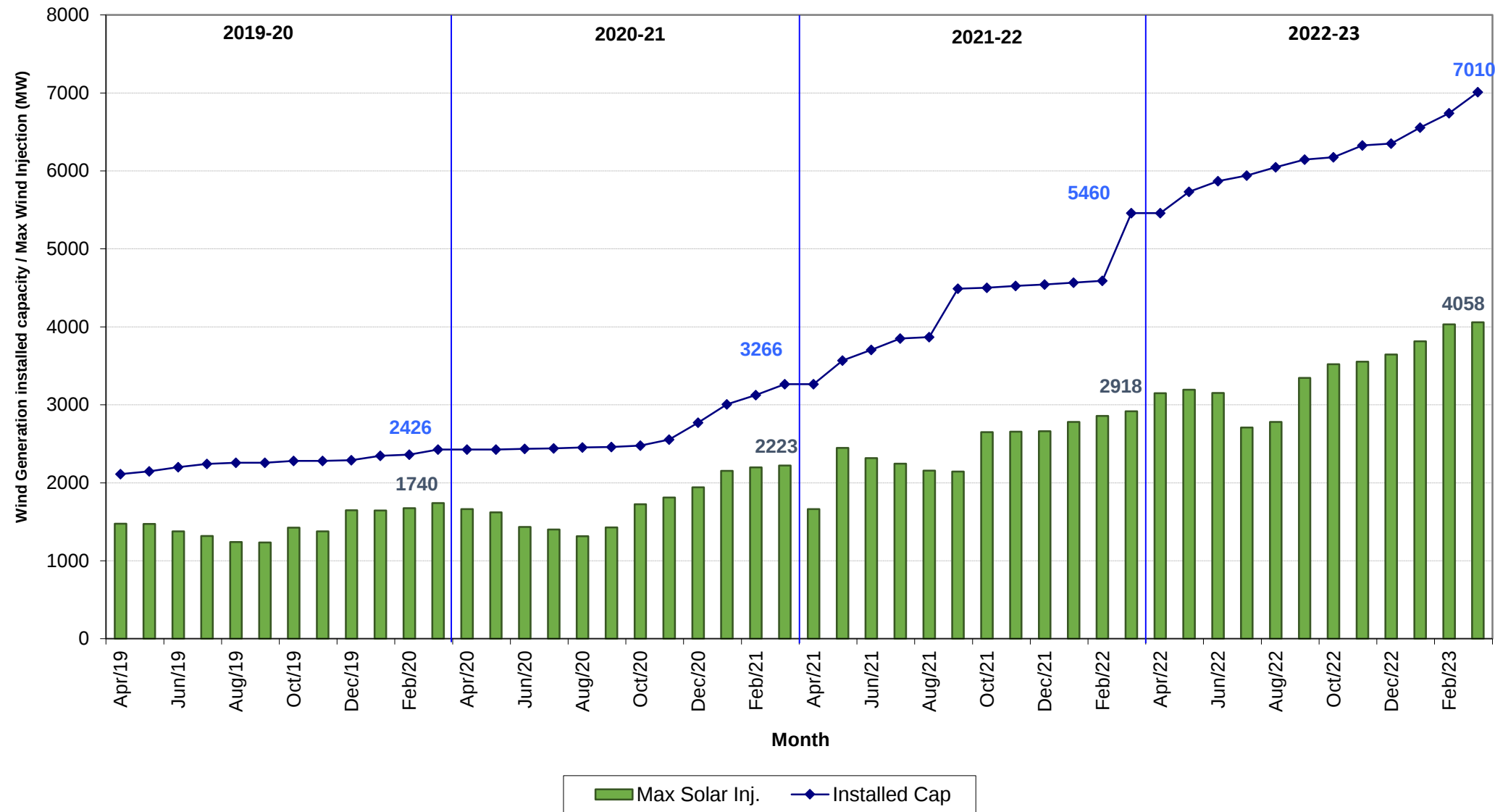
Wind Generation Integration



Solar Generation Integration



Solar Generation Integration



RE connectivity procedure

- ❑ Hon'ble GERC approved detailed procedure for **Grant of Connectivity to Projects based on Renewable Sources to Intra-State Transmission System** on 7th January, 2023.
- ❑ An efficient, effective & transparent process.
- ❑ **Punah-prapayh Urja Sankalan Hit Portal (PUSHP)** - For submission and approval of connectivity applications for Renewable projects.



PUSHP portal launching ceremony on 18th January, 2023 in august presence of PS EPD, MD GUVNL and other distinguished guests

Status of Applications under PUSHHP as on July'23



Stage I connectivity

Number of Applications handled	148
Capacity	11578 MW

Stage II connectivity

Number of Applications granted	63
Capacity	5055 MW

Online RE Connectivity System



Gujarat Energy Transmission
Corporation Ltd.

Admin Login Panel

User ID / Email ID

Password



I'm not a robot



reCAPTCHA
[Privacy](#) - [Terms](#)

Sign In

Adoption of New Technology

Adoption of State of Art Technology



Sr No	Smart Grid technologies adopted	Purpose	Status
1	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 62 Nos. of substations. And 30 substations are under pipeline.
2	Optical CT and merging units and Aspiration to Digital Substation	Digital Substation: A step towards better reliability and speed.	Construction of Fully Digital substation is under process at 220 kV Sevaliya substation.
3	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, 1 Nos of 132 kV & 1 Nos of 66 kV Substations are with Hybrid Switchgear. • 6 Nos of 66kV, 5 No. of 220 kV and 6 No. of 400 kV GIS substations are in service.
4	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.

Adoption of State of Art Technology



Sr No	Smart Grid technologies adopted	Purpose	Status
5	Integrated Asset Management System	Centrally Managed Monitoring System through INTRANET	Transmission Asset Management System (TAMS) in operation
6	Static Synchronous Compensator (STATCOM)	Dynamic reactive power compensation and improvement in voltage profile	Installed at 220 kV Timbdi substation (Rating: ± 120 MVAR, 220 kV STATCOM)
7	Optical Fiber Ground Wire (OPGW)	Communication Highway	11113 KM completed, 6795 KM under progress. 232 Nos. of FOTE commissioned and installation of 13 Nos. of FOTE is under progress
8	Common Busbar Arrangement in 11 kV Indoor VCB Panel with Integrated Adapter Cubicle.	To avoid flashovers in adaptors due to ▪ insufficient clearances ▪ poor degree of protection ▪ use of improper material.	Practice in service

Ease of Doing Business

Ease of doing Business-

- Online Project Monitoring System (In-house design)
- Vendors' Conference every year.
- Speedy issuance of estimate to EHT consumers - Standardization of Procedures
- MTOA applications through digital platform. Similar approach for LTOA applications under process.
- Standardization of various drawings & procedures

Ease to RE Developers-

- Online RE Connectivity Portal (PUSHP) for grant of connectivity to RE developers.
- Prospective Plan of upcoming substations on GETCO website.
- RE developers plan their projects in advance by choosing future connectivity options.



Commitment to Climate

Commitment to Climate



(166 Nos) Natural Ester Oil Green power transformer in 66/11kV class.
(1No) 100 MVA 220/66 KV Natural Ester Oil Power Transformer.



Roof Top Solar panel in existing substations to reduce the auxiliary consumption and carbon footprints.



High Ampacity conductors, AL 59 adopted for 220 kV & 400 kV Transmission lines to reduce tower footprints.



Recycle & Reutilization of Transformer oil by DISCOMs.



Annual Tree Plantation drives; 54,404 saplings planted during FY 22-23.



Creation of 66kV substation as Green Substation under planning.



STU Perspective Plan



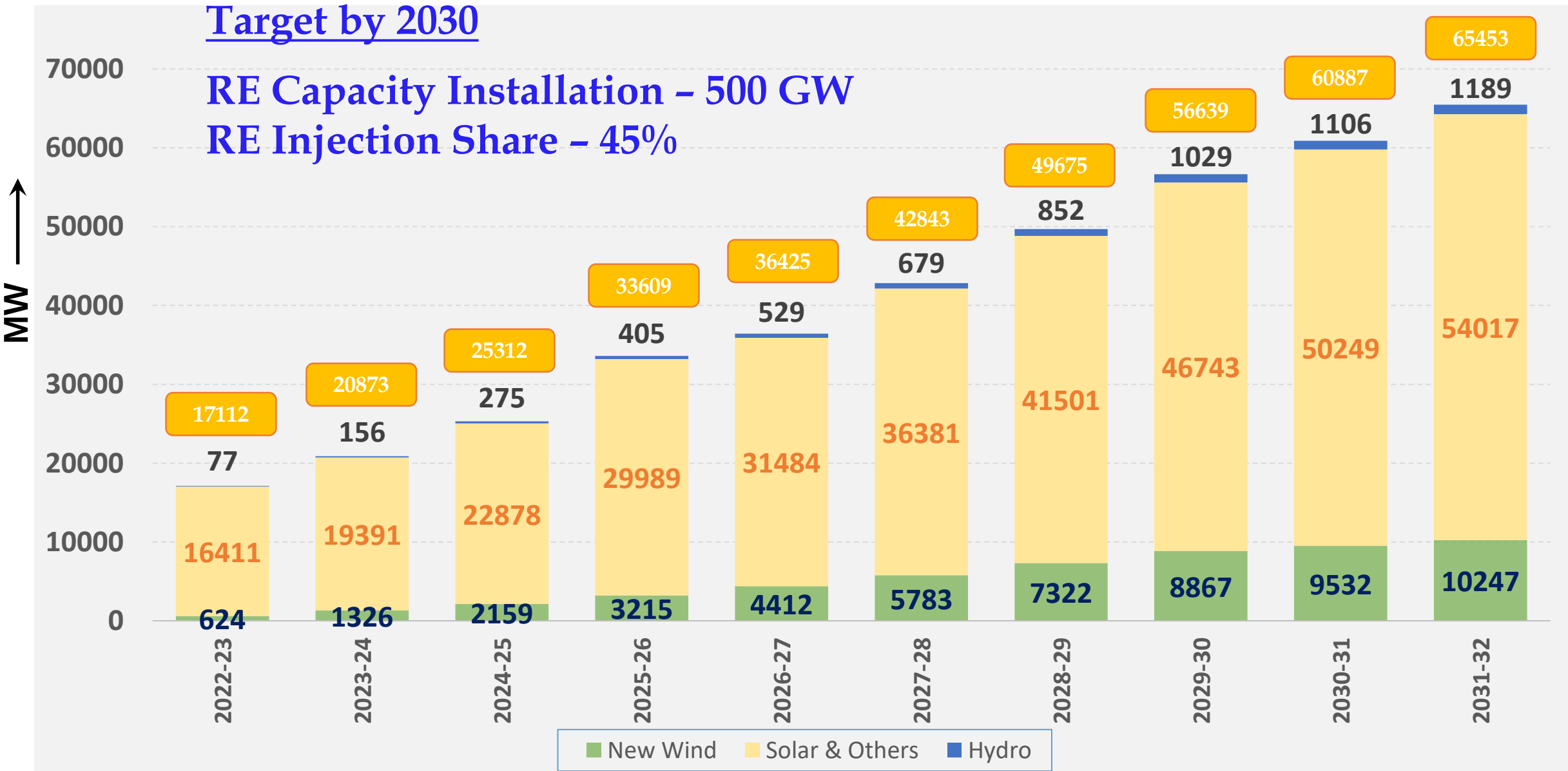
Demand Perspective Plan

- Projected demand of Gujarat State by 2032 is 36287 MW as 20th Electric Power Survey Report
- DISCOMs have submitted anticipated demand for next 10 years.

RE Integration Perspective Plan

- RPO by 2030 - 43.33% (As per MoP, GoI)
- Gujarat RE Potential:
 - Solar - > 235 GW (TERI Report)
 - Wind - 142 GW @ 120 mtr agl (MNRE Report)
- GUVNL target 56 GW RE by 2030 – addition of around 40 GW RE capacity.

Trajectory of RE Capacity addition

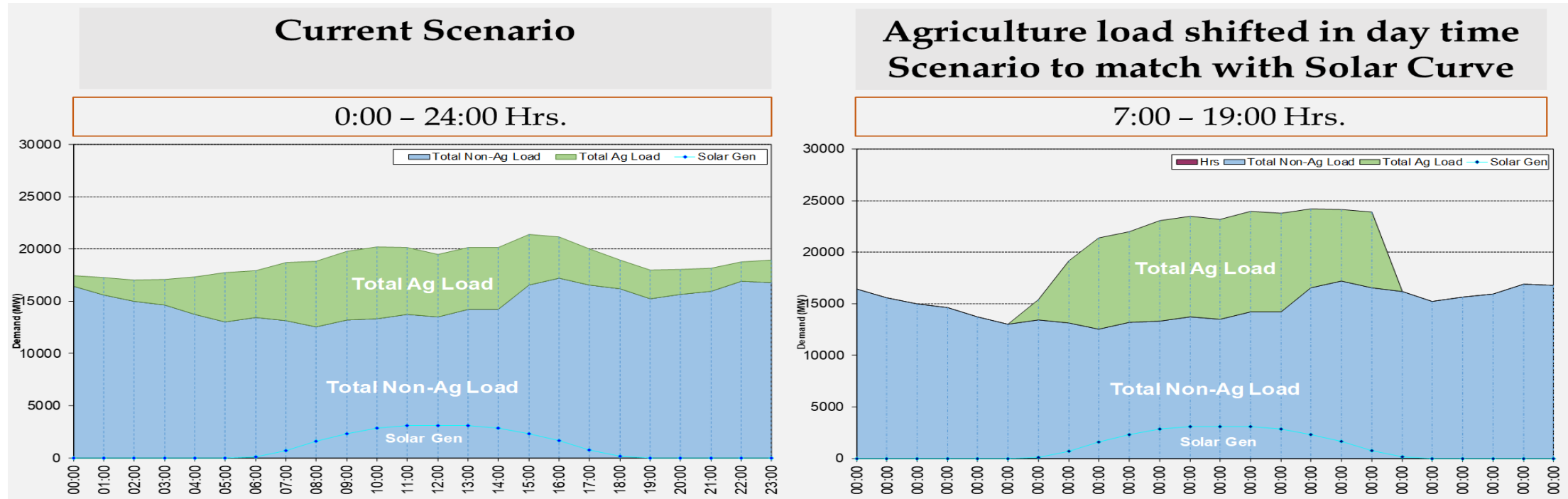


Consultative approach by Gujarat STU



Agriculture Power Supply during day time:

- Phase-I: Shifting of night hours agriculture supply to 05:00 to 21:00 Hrs is in progress and planned to implemented by March-24.
- Phase-II: Agriculture demand to be catered during 07:00 to 19:00 Hrs. to match solar generation curve.
- This will result in peak agriculture demand of around 13000-14000 MW.

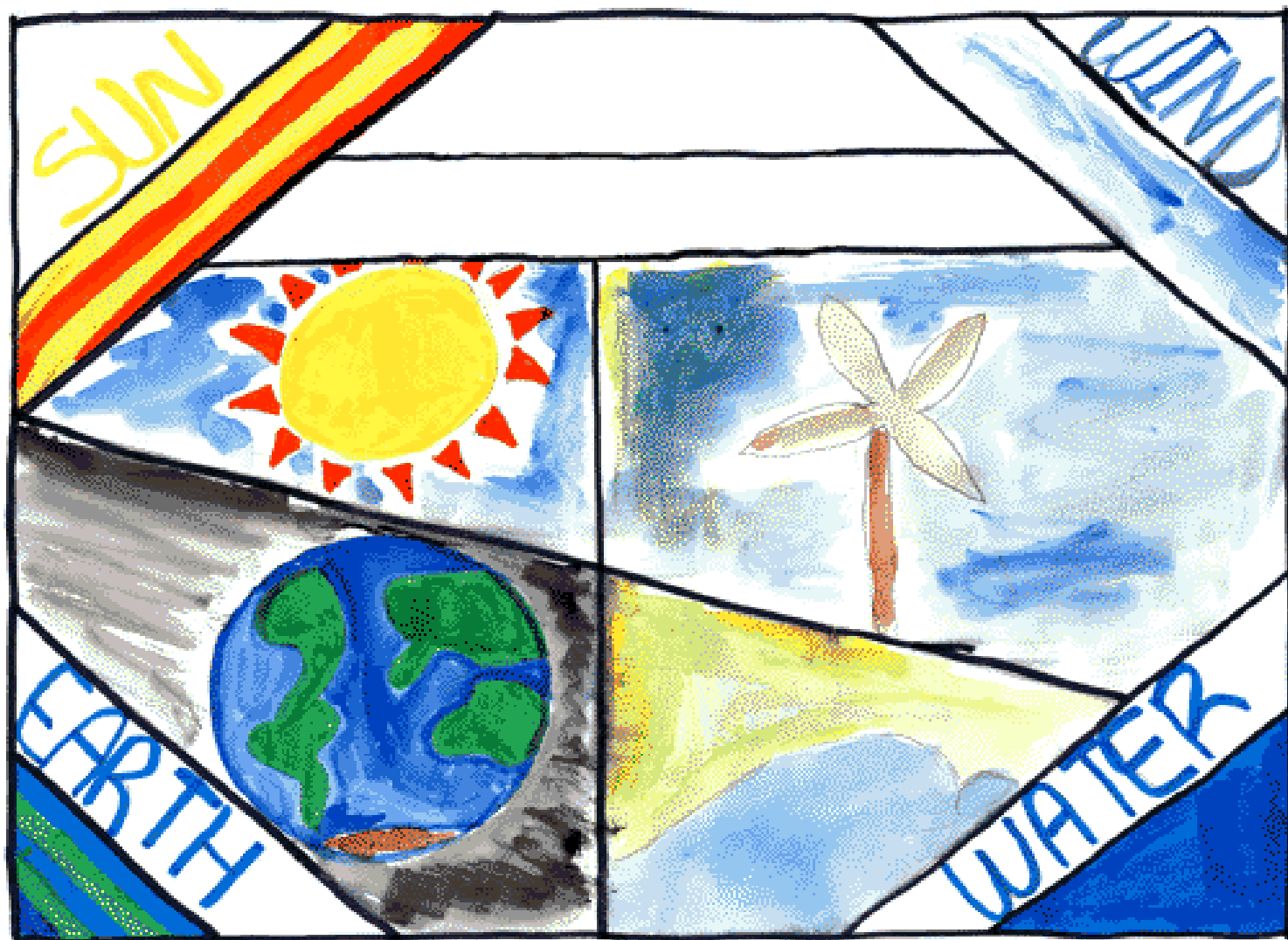


Consolidated 10 year perspective plan



Transmission Elements:

Year		Spillover of 2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	Total
765 kV	Substation	0	0	0	0	1	3	3	1	2	2	12
	Line (RKM)	0	0	0	0	330	990	990	330	660	660	3960
400 kV	Substation	0	1	1	3	5	7	4	3	4	1	29
	Line (RKM)	0	120	120	360	750	1290	930	510	780	420	5280
220 kV	Substation	6	9	9	26	16	9	6	9	4	3	97
	Line (RKM)	300	550	550	2160	1300	1150	700	750	600	250	8310
132 kV	Substation	0	1	0	3	0	0	1	0	0	0	5
	Line (RKM)	0	50	0	150	0	0	50	0	0	0	250
66 kV	Substation	0	85	85	85	85	85	85	85	85	85	765
	Line (RKM)	300	1350	1250	3900	1450	1200	1100	1050	1000	950	13550
Substation (Nos)		6	96	95	117	107	104	99	98	95	91	908
Line (RKM)		600	2070	1920	6570	3830	4630	3770	2640	3040	2280	31350
STATCOM		0	0	2	3	2	2	2	2	2	2	17
Reactive Compensation		0	100	600	600	1210	3130	3130	1210	2170	2170	14320
R&M (Augmentation)		0	50	50	50	50	50	50	50	50	50	450



Thank you !!!

Presentation to Co-ordination Forum

Gujarat Power Sector Scenario

31st August 2023

Gujarat Urja Vikas Nigam Ltd.



Gujarat – Installed Capacity

Sector	MW	%share
State Owned	8566	19%
Private IPPs	7348	16%
Central Sector	7607	17%
Renewable	21504	48%
Total	45025	100%

Fuel	MW	% Share
Coal & lignite	17987	40%
Gas	3965	9%
Hydro	772	2%
Nuclear	797	2%
Renewable	21504	48%
Total	45025	100%

Gujarat - Renewable Capacity in MW

Source	Installed Capacity*	GUVNL's share
Wind	11019	4274
Solar	10281	4458
Bio-Power	112	37.5
Small Hydel	92	28.6
Total	21504	8798
*Includes capacity set up for wheeling / 3rd party use - In installed capacity, Solar includes 2842 MW Rooftop capacity		

Present Power Scenario – Highlights

- At present, State DISCOMs are having total tied up capacity of 30,467 MW on long term basis against peak demand of 20,718 MW (28-08-2023) State Peak - 22776 MW:

Conventional: 16,602 MW

Renewable : 8,798 MW

- The details of arrangement made by GUVNL for meeting increased demand during next quarter:
 - 500 MW capacity tied up through DEEP Portal under Short term for Sept-Dec 2023 with the rates in the range of Rs. 5.29 – 5.98 / unit.
 - Procurement under consideration for RLNG gas on high sea sale basis sourced from GSPC - For 1300 MW capacity at avg. rate of Rs. 9.50 - 10.00/unit during Sept-Oct 23.
 - Any intermittent power requirement shall be met through purchase from Power Exchanges
 - 2513 Mus purchased through Power Exchanges during FY 2023-24 (01-Apr-23 to 28-Aug-23) at an avg. rate of Rs. 5.80/unit.

Capacity Added - 2021-22, 2022-23 & 2023-24 (till August)

Project	Dev.	Sector	Fuel	MW	COD
Kakrapar Expansion	NPCIL	Central	Atomic	238	June-23
MoP Allocation (March-23 to Nov-23)	NTPC	Central	-	317	From existing stations.
Adani Mundra (Bid-02)	Adani	Private	Coal	1200	Power commenced (from march-22)
Essar Power Gujarat	EPGL	Private	Coal	122	As per SPPA dated 01.03.2019
			Total	1877	

Capacity De-rated - 2021-22, 2022-23 & 2023-24 (August)

Project	Dev.	Sector	Fuel	MW	Reason
GIPCL Stage I	GIPCL	State IPP	Gas	52	Reduction in installed Cap due to completion of Useful life
GSEG Hazira	GSEG	State IPP	Gas	156	PPA expired
Total				208	

Capacity under Planning

Sr No	Company	Project	Allocation Sought (MW)
1	NTPC -Coal	Talcher-II	462
2	NTPC-Nuclear	KAPS - 4	238
3	NHPC - Subsidiary	Ranjit IV	103
4	NHPC - Subsidiary	Teesta - VI	429
5	NHPC (JV)	Pakaldul	444
6	NHPC (JV)	Ratle	377
7	NHPC (JV)	Kwar	240
8	NHPC	Dugar	429
9	NHPC	Dibang	500
10	DVC-Coal	RTPS-II	660
11	NTPC	Sipat-III	800
	Total		4682

In addition, GUVNL has Tied up for Long Term Power under Shakti Scheme of MoP for 3000 MW. Tender bid evaluation is under process and Supply of Power is envisaged from Dec - 23

Demand/supply scenario - State

(MW)

Year	Cap. Add. during the year	Capacity de-rated / Withdrawn	Cumulative Capacity (Conventional)	Demand @ 7% growth p.a
2021-22	3259	52	23550	19431 (A)
2022-23	196	156	23590	22225 (A)
2023-24	238	300	23521	22776 (A)
2024-25	-	-	23521	24370 (P)

Demand includes 2000-2400 MW load & Capacity includes 1787 MW generation capacity of M/s Torrent Power Ltd.

State is having total 21504 MW RE Capacity operational as on 31.07.2023

Tie up from Renewable Sources

- Hon'ble GERC vide Regulation dated 08.04.2022 (Third amendment) has notified RPO trajectory for FY 2017-18 to FY 2024-25.

20.70% RPO by FY 2024-25.

Wind – 8.55%, Solar – 11.25%, Hydro-0.10% & others-0.80%

- To meet the above RPO, GUVNL would require to have around 12000 MW Renewable Capacity by FY 2025
- GUVNL tying up new RE Capacity (Wind & Solar) through Competitive Bidding & Reverse Auction
- GUVNL has executed PPAs for 8930 MW Solar & 1562.6 MW Wind through Competitive Bidding
- GUVNL has signed PPAs for 67.2 MW Waste to Energy Projects at Rs. 6.31/unit determined by GERC + VGF – Expected to be commission by Mar-24.
- GUVNL has PPAs for net capacity of 358.79 MW Small Scale Solar projects under SSDSP 2019 Policy after exit options.

GUVNL Tender – Solar

Sr. no.	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-R)	2.44	500	PPA signed in Nov-18	500 MW commissioned
3	Solar (Park III-R) Raghanesda	2.65-2.70	500	PPA signed in Aug-19	500 MW commissioned
4	Solar (Non Park -IV)	2.55-2.68	500	PPA signed in May-19	500 MW commissioned
5	Solar (Park- V) Dholera	2.75	250	PPA signed in Oct-19	250 MW commissioned
6	Solar (Park- VI) Raghanesda	2.65	100	PPA signed in Feb-20	100 MW commissioned
7	Solar (Park- VII) Dholera	2.75	50	PPA signed in Feb-20	50 MW commissioned
8	Solar (Non Park -VIII)	2.61-2.64	350	PPA signed in July-20	310 MW commissioned, Vena Project delayed due to Land Dispute
9	Solar (Park- IX) Dholera	2.79-2.81	700	NA	In APTEL
10	Solar (Park- X R) Raghanesda	2.64	100	PPA signed in Jan-22	Under Implementation
11	Solar (Non Park XI)	1.99	500	PPA signed in Jan-21	120 MW Commissioned
12	Solar (Non Park XII)	2.20-2.21	500	PPA signed in Apr-21	SCOD in Mar-24
13	Solar (Non Park XIII)	2.29	500	PPA signed in May-22	SCOD in Mar-24
14	Solar (Non Park XIV)	2.30-2.31	500+500	PPA signed in Aug-22	SCOD in Mar-24
15	Solar (Non Park XVI)	2.49	750+750	PPA signed in Dec-22	SCOD in Jun-24
16	Solar (Non Park XVII)	2.73-2.89	600+600	PPA signed in Aug-23	SCOD in Nov-24
17	Solar (Non Park XVIII)	2.51-2.52	500+500	PPA signed in Apr-23	SCOD in Oct-24
18	Solar (Non Park XIX)	2.71-2.75	500+500	PPA signed in Aug-23	SCOD in Feb-25
19	Solar (Non Park XX)	2.70-2.71	800+800	Adoption of tariff has been filed in GERC	
20	PM KUSUM C	2.87-3.00	627	LoI Issued Jul-23	
	TOTAL		12977		

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-2018	475 MW commissioned
2	Wind Non park II	2.43 - 2.8	202.5	PPA signed in Aug-2019	160 MW commissioned
3	Wind Non park III	2.9	560	PPA signed in Dec-2022	SCOD in Dec- 2024
4	Wind Non park IV	2.95 - 3.01	300	PPA signed in May-2023	SCOD in May- 2025
5	Wind Non park V	3.11 - 3.17	240	LOI issued in June-2023	PPA yet to be signed
	Total		1802.5		

Power purchase from Renewable Sources

Status RPPO for FY 2022-23 – as per MYT

2022-23 (Prov.)	Wind	Solar	Others	Total
RPPO (%) – As per GERC	8.25%	8.00 %	0.75 %	17.00 %
RE Requirement as per MYT (MUS)	9945	9644	904	20493
Actual Purchased (MUS)	8570	10891	204	19665
Achieved RPO (%)	7.11%	9.03%	0.17%	16.31%

Upcoming Projects – Renewable

Substation based Solar Generation:

- 826 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 7036 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 as per GERC order dtd.19.7.23

Power purchase from Renewable Sources

Status RPPO for FY 2021-22 – As per MYT

2021-22	Wind	Solar	Others	Total
RPPO (%) – As per GERC	8.25%	8.00%	0.75%	17%
RE Requirement as per MYT (MUS)	8844	8576	804	18225
Actual Purchased (MUS)	8686	7247	211	16145
Achieved RPO (%)	8.10%	6.76%	0.20%	15.06%

Shortfall in RPO compliance is attributable to following reasons:

- Extension due to covid-19**
- Delay in commissioning**
- Increase in consumption**

Renewable Power Obligation

RPO Trajectory as notified by MoP

	Wind (%)	Hydro (%)	Other (%)	Total (%)
2023-24	1.6	0.66	24.81	27.07
2024-25	2.46	1.08	26.37	29.91
2025-26	3.36	1.48	28.17	33.01
2026-27	4.29	1.8	29.86	35.95
2027-28	5.23	2.15	31.43	38.81
2028-29	6.16	2.51	32.69	41.36
2029-30	6.94	2.82	33.57	43.33

RE capacity Planning

RE CAPACITY TENDERING TARGET BY GUVNL

(MW)

	Wind	Solar	HYBRID/ RE RTC	TOTAL
2023-24	3000	7400	1000	11400
2024-25	2000	3627	1000	6627

Considering capacity under implementation and 20% contingency

Renewable Purchase Obligation

Expected RPO achievement for GUVNL

2023-24	Wind	Solar	Total
RPPO (%) – As per GERC	8.40%	9.50%	18.70%
Expected Achievement	8.37%	8.38%	16.75%
2024-25	Wind	Solar	Total
RPPO (%) – As per GERC	8.55%	11.25%	20.70%
Expected Achievement	7.88%	13.45%	21.75%

Thank You