GAIL (India) Limited

GAIL(India)Limited - Jhabua Compressor Station

PRESENTING TEAM MEMBERS

NAME	DESIGNATION
D. S. DIVEKAR	CHIEF GENERAL MANAGER (REGIONAL HEAD)
PRABUDDHA MAJUMDAR	GENERAL MANAGER (PLANT HEAD)
YEDUKONDALU. MIDASALA	CHIEF MANAGER (HOD-OPERATIONS)

1. INTRODCUTION TO THE COMPANY

GAIL(INDIA)LIMITED

INDIA'S YOUNGEST MAHARATNA COMPANY

CII- National Award For Excellence In Energy Management : 2024

GAIL(India)Limited - Jhabua Compressor Station

MISSION & VISION

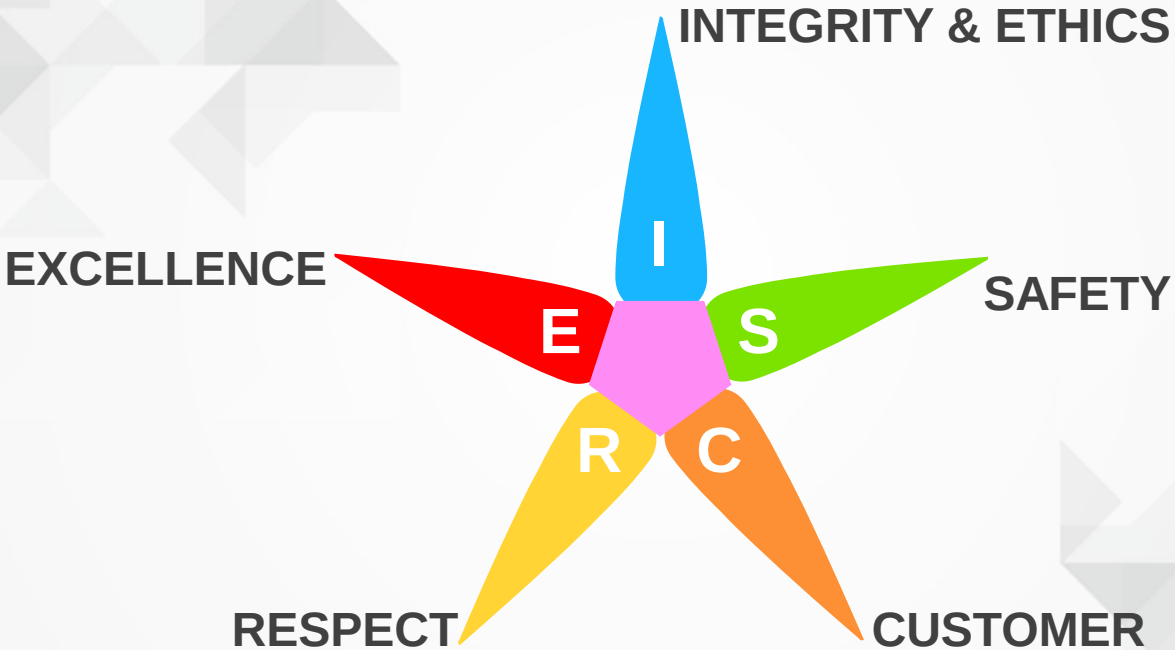
Mission

Enhancing quality of life through clean energy and beyond

Vision

Be the leader in natural gas value-chain and beyond, with global presence, creating value for stakeholders with environmental responsibility

GAIL'S CORE VALUES



GAIL'S DIVERSIFIED PORTFOLIO

GAIL'S DIVERSIFIED PORTFOLIO

#hawabadlo

LPG & Liquid Hydrocarbons

- ✓ 5 Processing Plants
- ✓ 1.4 MMTPA of capacity
- ✓ 4.58 MMTPA of LPG transmission capacity

Petrochemicals

- ✓ 15% domestic market share
- ✓ Capacity of 810 KTA at Pata & 280 KTA at BCPL

City Gas Distribution

- ✓ 72 cities/GAs out of total 307 Gas
- ✓ Subsidiaries-GAIL Gas Ltd., Bengal Gas & TNGCL+8 Domestic CGD JVs

Diversified Portfolio

Transmission & Marketing

- ✓ Around 16,243 km of Natural Gas Pipeline Network
- ✓ Long Term Portfolio of ~15.5 MMTPA

Exploration and Production

- ✓ Participation in 13 Blocks
- ✓ Presence in US & Myanmar

New Upcoming

Renewables

- ✓ 118 MW of Wind Power capacity
- ✓ 17 MW of Solar Power capacity

Hydrogen Production & Blending in CGD

ssLNG, CGB-CGD, Synthetic Natural Gas

GAIL(India)Limited - Jhabua Compressor Station

2. UNIT PROCESS INTRODUCTION

GAIL JHABUA COMPRESSOR station is an Intermediate gas pipeline pressure boosting unit

Major Equipment Installed	Installed Quantity	Capacity (Each)
Gas Turbine Compressors (DR) (Year of Commissioning: March 1990)	07 Nos.* (5+2)	3.60 MMSCMD (18 MMSCMD)
Gas Turbine Compressors (NP) (Year of Commissioning: April 1998)	03 Nos. (2+1)	8.43 MMSCMD (16.68 MMSCMD)
Gas Turbine Compressors (RR) (Year of Commissioning: March 2011)	03 Nos. (2+1)	39.9 MMSCMD
Gas Turbine Generators (Year of Commissioning: March 1990)	02 Nos. (1+1)	2.70 MW

HVJ PIPELINE NETWORK

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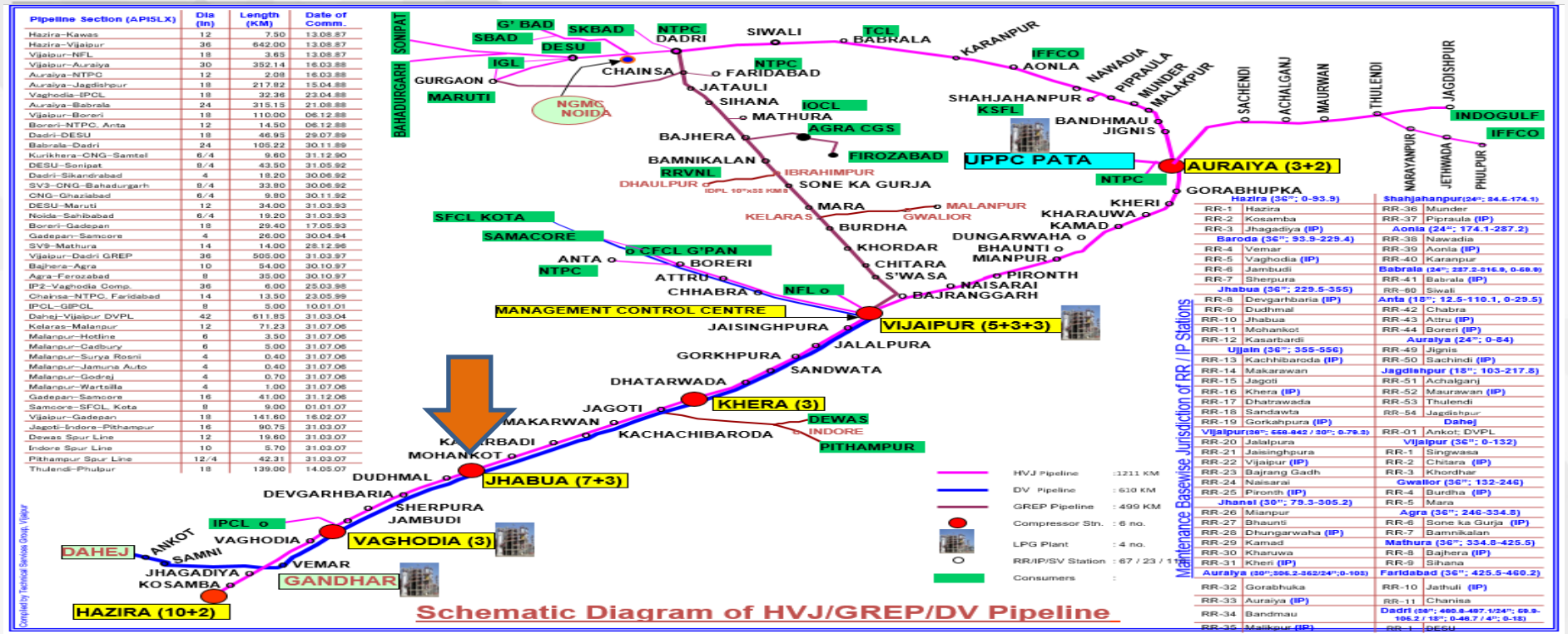
Pipeline Section (API5LX)	Dia (in)	Length (KM)	Date of Comm.
Hazira–Kawas	12	7.50	13.08.87
Hazira–Vijaipur	36	642.00	13.08.87
Vijaipur–NFL	18	3.65	13.08.87
Vijaipur–Auraiya	30	352.14	16.03.88
Auraiya–NTPC	12	2.08	16.03.88
Auraiya–Jagdishpur	18	217.82	15.04.88
Vaghodia–IPCL	18	32.36	23.04.88
Auraiya–Babrala	24	315.15	21.08.88
Vijaipur–Boreri	18	110.00	06.12.88
Boreri–NTPC, Anta	12	14.50	06.12.88
Dadri–DESU	18	46.95	29.07.89
Babrala–Dadri	24	105.22	30.11.89
Kurikhera–CNG–Samtel	6/4	9.60	31.12.90
DESU–Sonipat	8/4	43.50	31.05.92
Dadri–Sikandrabad	4	18.20	30.06.92
SV3–CNG–Bahadurgarh	8/4	33.80	30.06.92
CNG–Ghaziabad	6/4	9.80	30.11.92
DESU–Maruti	12	34.00	31.03.93
Noida–Sahibabad	6/4	19.20	31.03.93
Boreri–Gadepan	18	29.40	17.05.93
Gadepan–Samcore	4	26.00	30.04.94
SV9–Mathura	14	14.00	28.12.96
Vijaipur–Dadri GREP	36	505.00	31.03.97
Bajhera–Agra	10	54.00	30.10.97
Agra–Ferozabad	8	35.00	30.10.97
IP2–Vaghodia Comp.	36	6.00	25.03.98
Chainsa–NTPC, Faridabad	14	13.50	23.05.99
IPCL–GIPCL	8	5.00	10.01.01
Dahej–Vijaipur DVPL	42	611.85	31.03.04
Kelaras–Malanpur	12	71.23	31.07.06
Malanpur–Hotline	6	3.50	31.07.06
Malanpur–Cadbury	6	5.00	31.07.06
Malanpur–Surya Rosni	4	0.40	31.07.06
Malanpur–Jamuna Auto	4	0.40	31.07.06
Malanpur–Godrej	4	0.70	31.07.06
Malanpur–Wartsilla	4	1.00	31.07.06
Gadepan–Samcore	16	41.00	31.12.06
Samcore–SFCL, Kota	8	9.00	01.01.07
Vijaipur–Gadepan	18	141.60	16.02.07
Jagoti–Indore–Pithampur	16	90.75	31.03.07
Dewas Spur Line	12	19.60	31.03.07
Indore Spur Line	10	5.70	31.03.07
Pithampur Spur Line	12/4	42.31	31.03.07
Thulendi–Phulpur	18	139.00	14.05.07



Maintenance Basewise Jurisdiction of RR / IP Stations

	Hazira (36"; 0-93.9)		Shahjahanpur(24": 84.6-174.1)
RR-1	Hazira	RR-36	Munder
RR-2	Kosamba	RR-37	Pipraula (IP)
RR-3	Jhagadiya (IP)		Aonla (24"; 174.1-287.2)
	Baroda (36"; 93.9-229.4)	RR-38	Nawadia
RR-4	Vemar	RR-39	Aonla (IP)
RR-5	Vaghodia (IP)	RR-40	Karanpur
RR-6	Jambudi		Babrala (24"; 287.2-316.9, 0-69.9)
RR-7	Sherpura	RR-41	Babrala (IP)
	Jhabua (36"; 229.5-355)	RR-60	Siwali
RR-8	Devgarhbaria (IP)		Anta (18"; 12.5-110.1, 0-29.5)
RR-9	Dudhmal	RR-42	Chabra
RR-10	Jhabua	RR-43	Attru (IP)
RR-11	Mohankot	RR-44	Boreri (IP)
RR-12	Kasarbardi		Auraiya (24"; 0-84)
	Ujjain (36"; 355-556)	RR-49	Jignis
RR-13	Kachhibaroda (IP)	RR-50	Sachindi (IP)
RR-14	Makarawan		Jagdishpur (18"; 103-217.8)
RR-15	Jagoti	RR-51	Achalganj
RR-16	Khera (IP)	RR-52	Maurawan (IP)
RR-17	Dhatrawada	RR-53	Thulendi
RR-18	Sandawta	RR-54	Jagdishpur
RR-19	Gorkahpura (IP)		Dahej
	Vijaipur(36"; 558-642 / 30"; 0-79.3)	RR-01	Ankot: DVPL
RR-20	Jalalpura		Vijaipur (36"; 0-132)
RR-21	Jaisinghpura	RR-1	Singwasa
RR-22	Vijaipur (IP)	RR-2	Chitara (IP)
RR-23	Bajrang Gadh	RR-3	Khordhar
RR-24	Naisarai		Gwalior (36"; 132-246)
RR-25	Pironth (IP)	RR-4	Burdha (IP)
	Jhansi (30"; 75.3-305.2)	RR-5	Mara
RR-26	Mianpur		Agra (36"; 246-334.8)
RR-27	Bhaunti	RR-6	Sone ka Gurja (IP)
RR-28	Dhungarwaha (IP)	RR-7	Bamnikalan
RR-29	Kamad		Mathura (36"; 334.8-425.5)
RR-30	Kharuwa	RR-8	Bajhera (IP)
RR-31	Kheri (IP)	RR-9	Sihana
	Auraiya (30";306.2-362/24";0-103)		Faridabad (36"; 425.5-460.2)
RR-32	Gorabhuka	RR-10	Jathuli (IP)
RR-33	Auraiya (IP)	RR-11	Chanisa
RR-34	Bandmau		Dadri (36": 460.8-497.1/24"; 69.9-105.2 / 18"; 0-46.7 / 4"; 0-15)
RR-35	Malikpur (IP)	RR-1	DESU

CAPACITY AUGMENTATION

01 HVJ Pipeline 36”
18.2 MMSCMD: 1987-97

02 GREP Project-36”
33.4 MMSCMD: 1997-2004

03 DVPL-1 Pipeline Project-42”
23.9 MMSCMD: 2004-2010

04 VDPL Pipeline Project-48”
11 MMSCMD: 2010-13

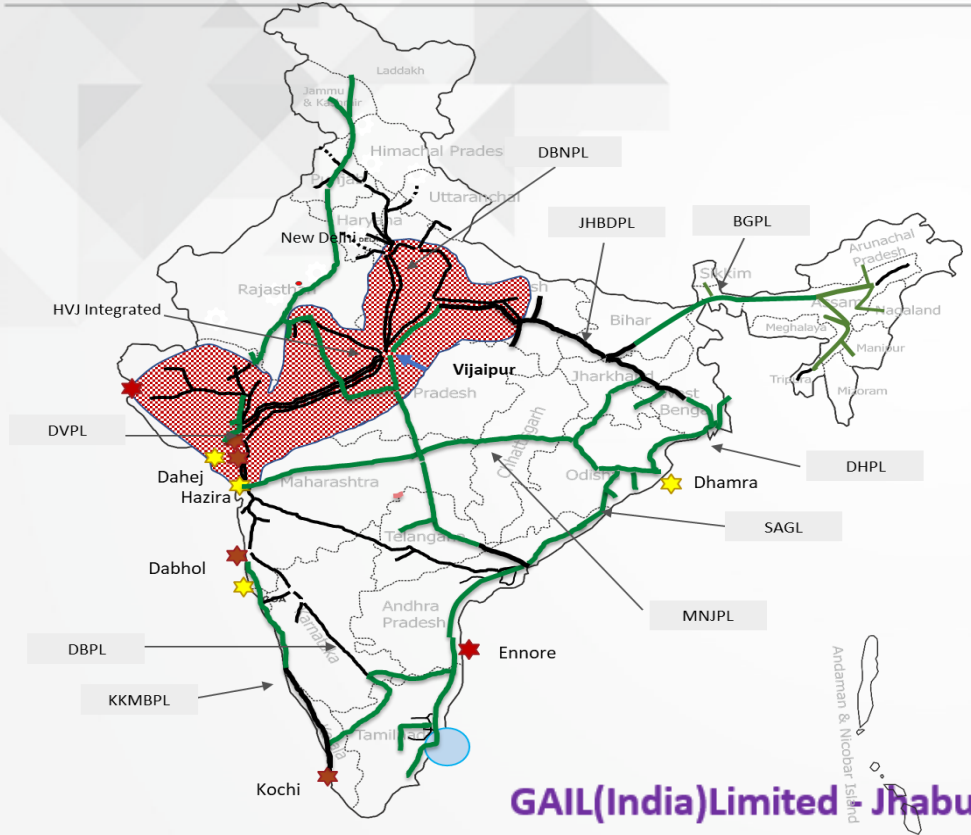
05 DVPL-II Pipeline Project-48”
43 MMSCMD: 2013

HVJ: Hazira-Vijaipur - Jagadishpur Pipeline
GREP: Gas Rehabilitation and Expansion Project
DVPL I: Dahej –Vijaipur – Pipeline
DVPL – GREP Upgradation: Dahej –Vijaipur – Pipeline (Phase 1&2)

2013 Onwards 111.4 mmscmd

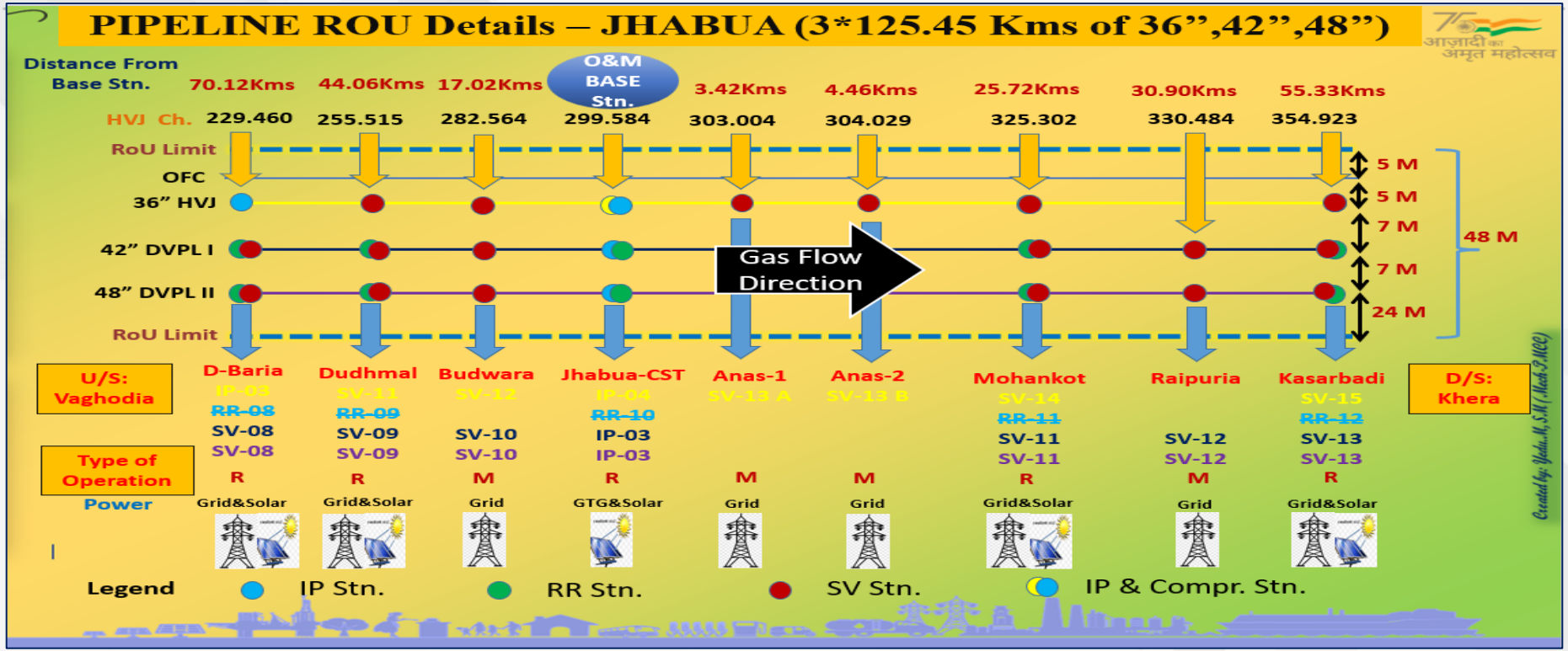
GAIL(India)Limited - Jhabua Compressor Station

IMPORTANCE OF STATION: Part and Parcel of NGG



Description	Nos.	Remarks
HVJ Pipeline System	6195 km	HVJ Integrated Networks Recently Commissioned VAPL – 36”x352 km
Regional Pipeline Total	693 Km 6888 Km	Regional Pipeline Network, Vadodara HVJ & Regional Combined
Compressor Stations	8	Hazira, , Vaghodia, Jhabua, Khera, Vijaipur, Dibiyapur, Kailaras, Chhainsa
Other Work Centers/ Maintenance bases	13	- Vadodara, Dahej, Undera, Bharuch, Pithampur - Gadepan, Kota & Chittorgarh, Agra, Firozabad, Malanpur, Jhansi
Major Gas Sources	~82 MMSCMD	ONGC Hazira – 25 MMSCMD PLL Dahej - 45 MMSCMD PIL Ankot – 3 MMSCMD Shell Hazira – 4 MMSCMD CBM Shadol – 0.5 MMSCMD ONGC Anklewar /Gandhar - 4 MMSCMD & other regional sources

JHABUA PIPELINE JURISDICTION: ROU



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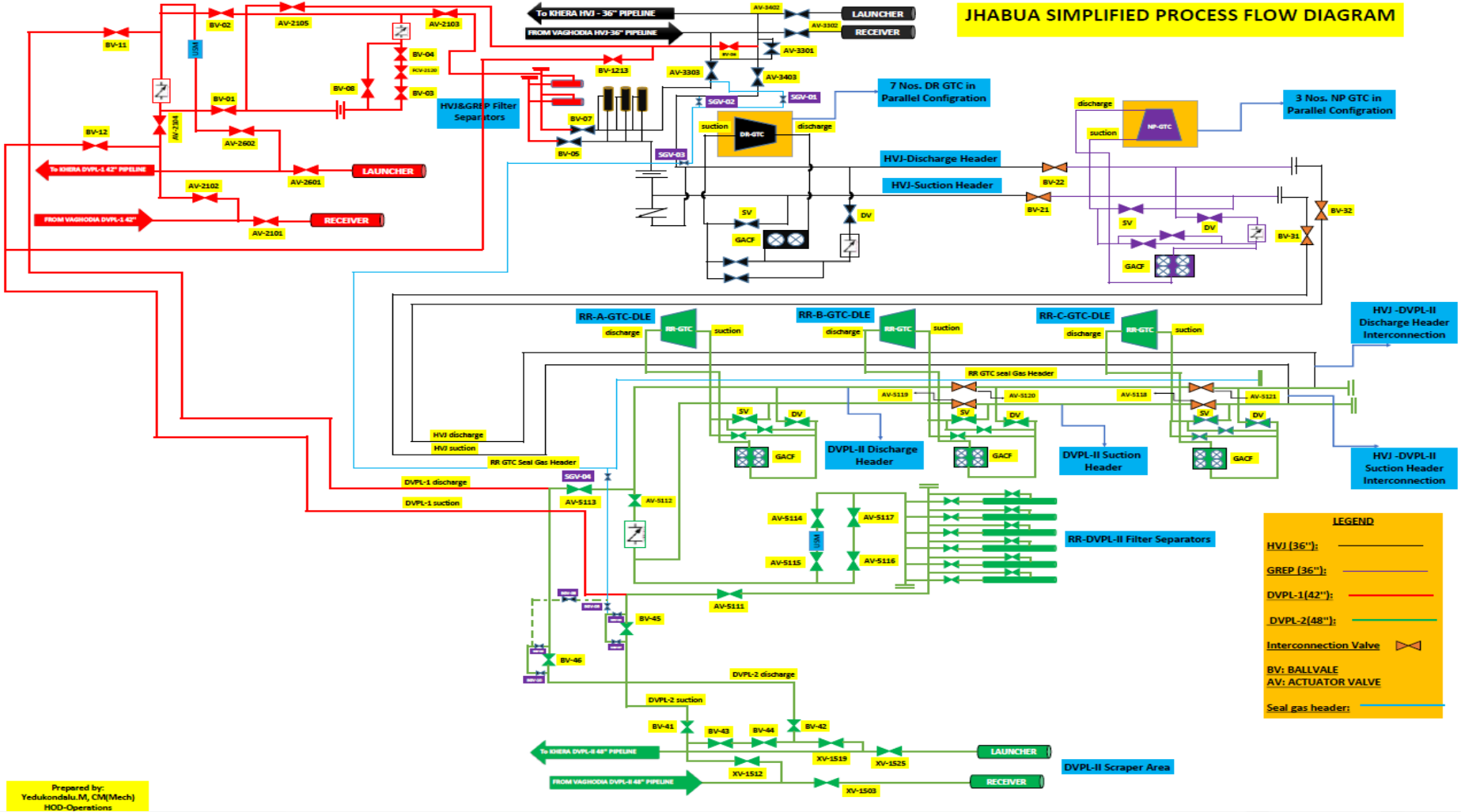
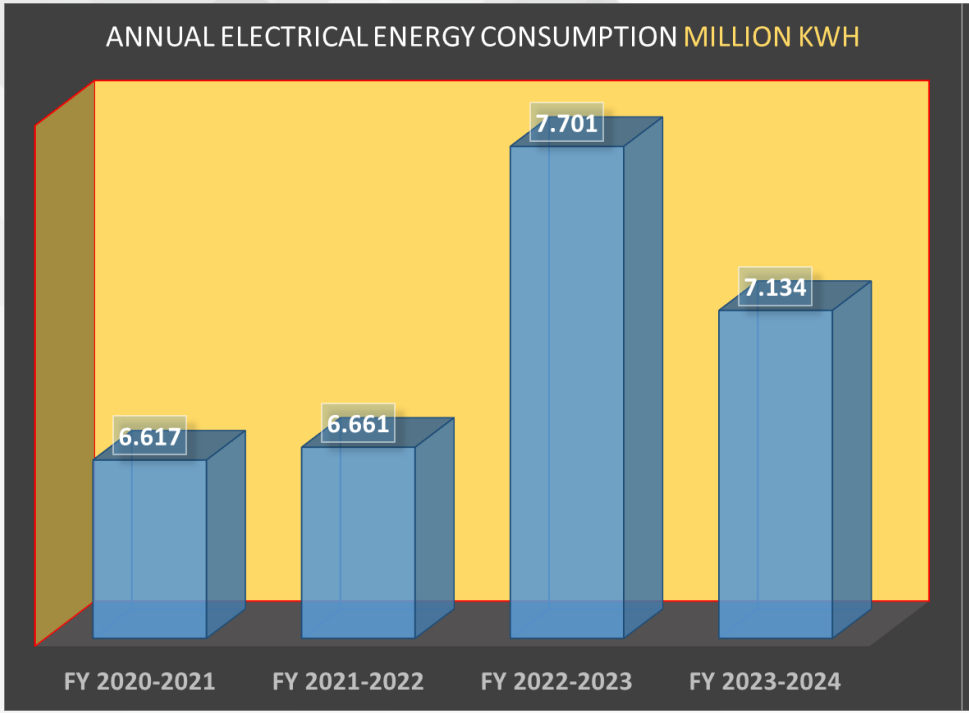
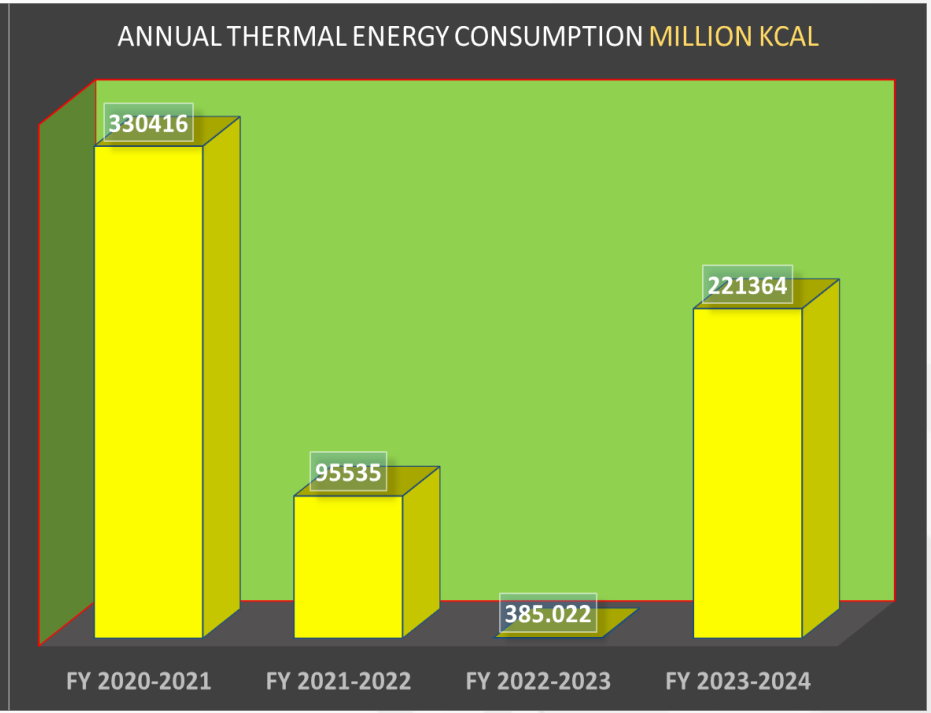


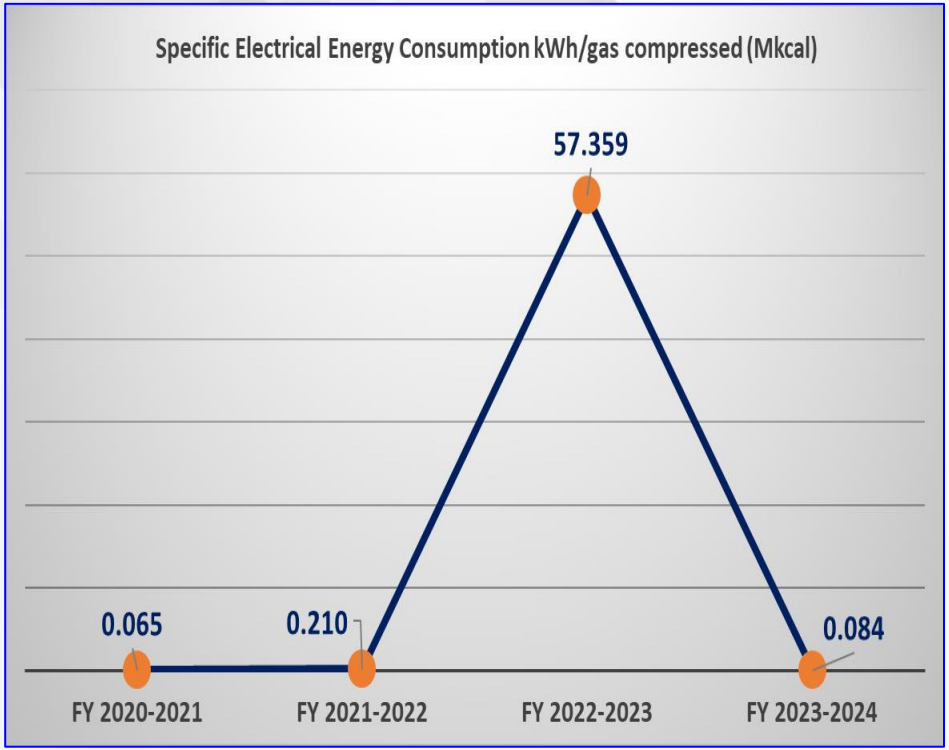
Prepared by:
Yedukondalu.M, CM(Mech)
HOD-Operations

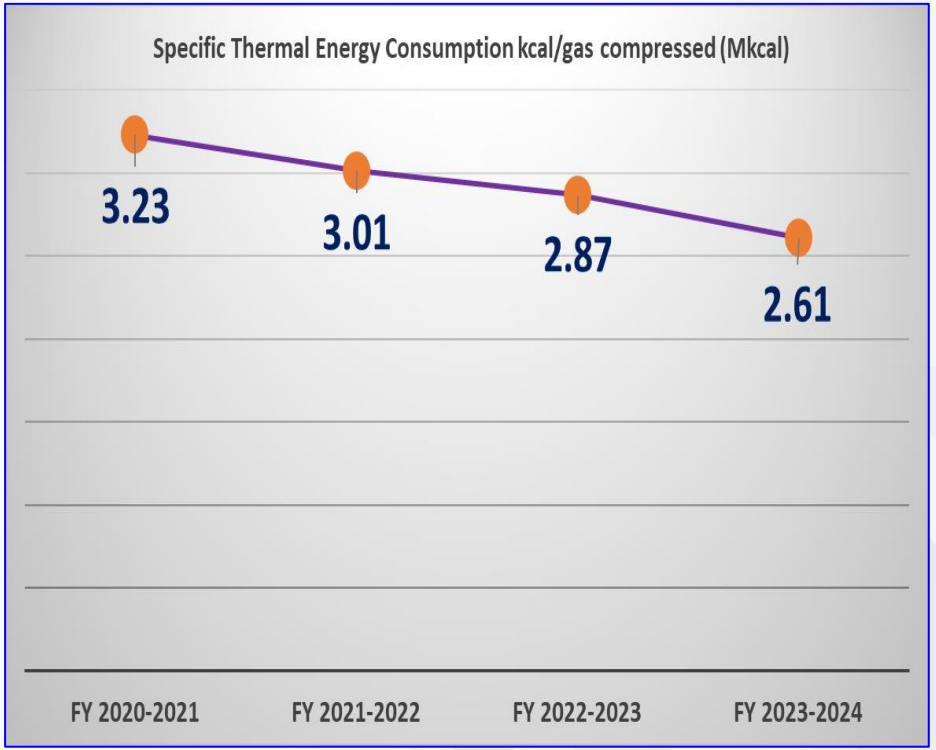
3.1: Over All Energy Production & Consumption



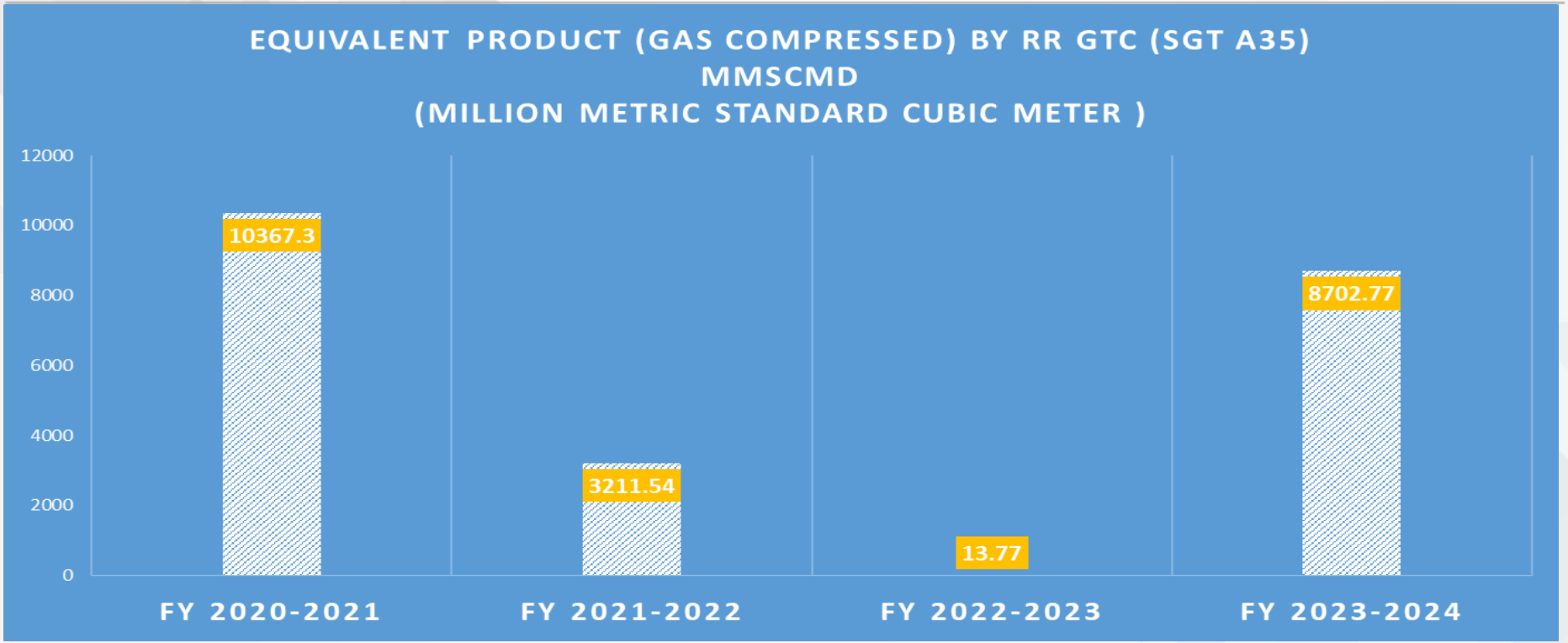


3.2: Sp. Energy Consumption (Thermal & Electrical)

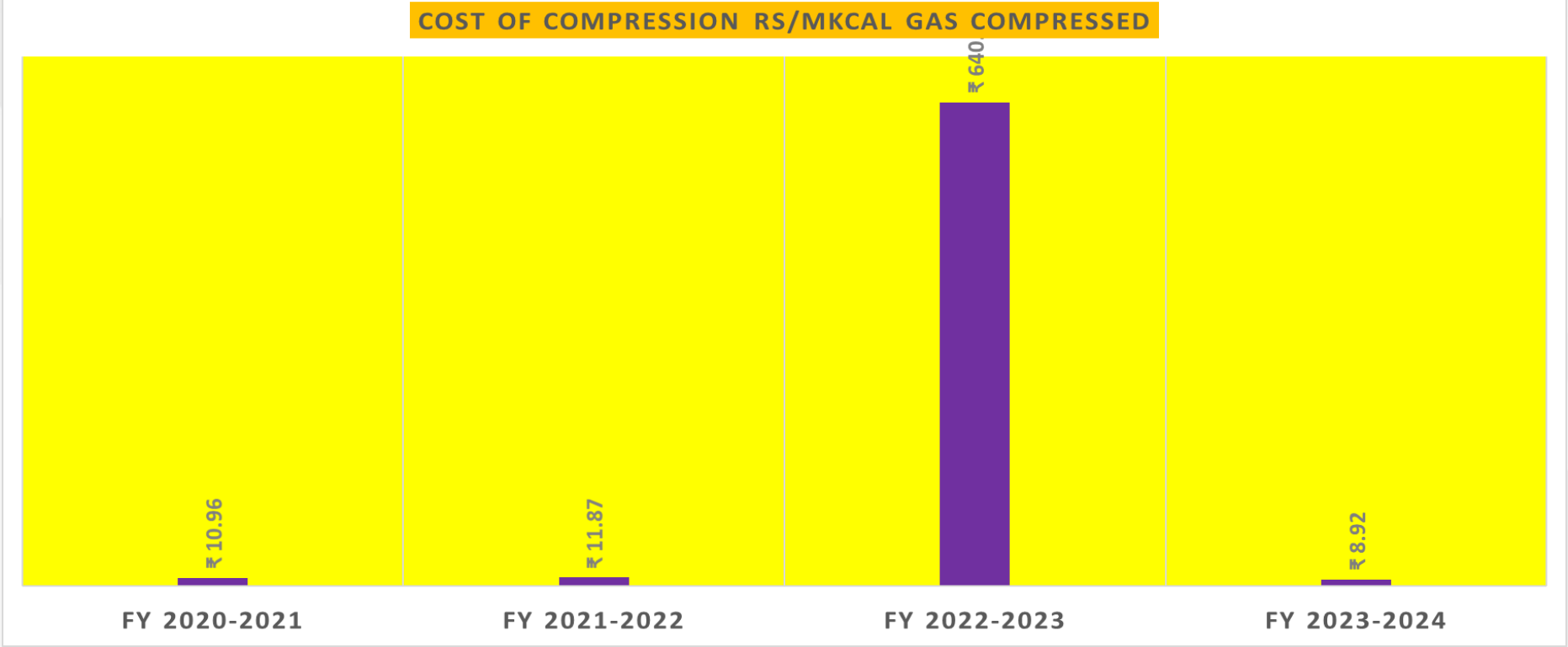




3.3: Gas Compressed Trends by SGT A35 GTC



3.4: Compression Cost Rs./MKcal Gas Compressed for SGT A35 GTC

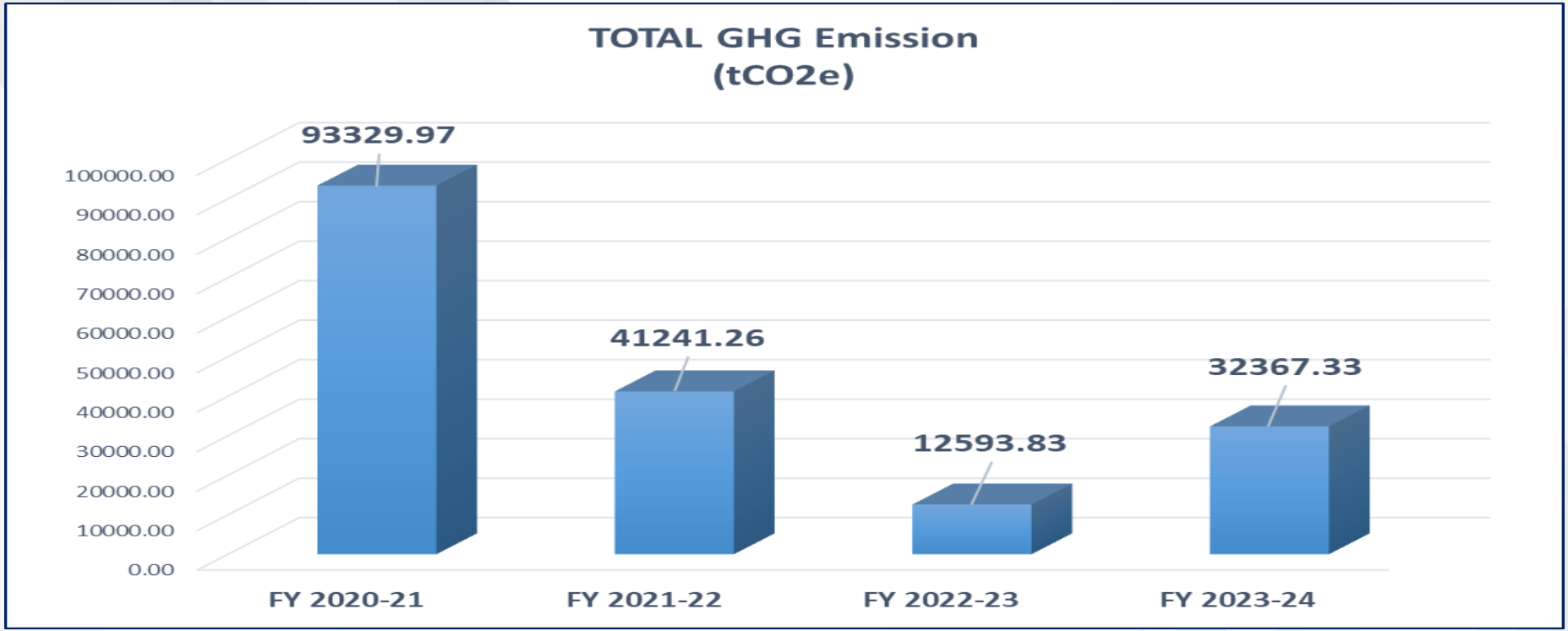


3.5: Percentage (%) of Reduction & Improvement

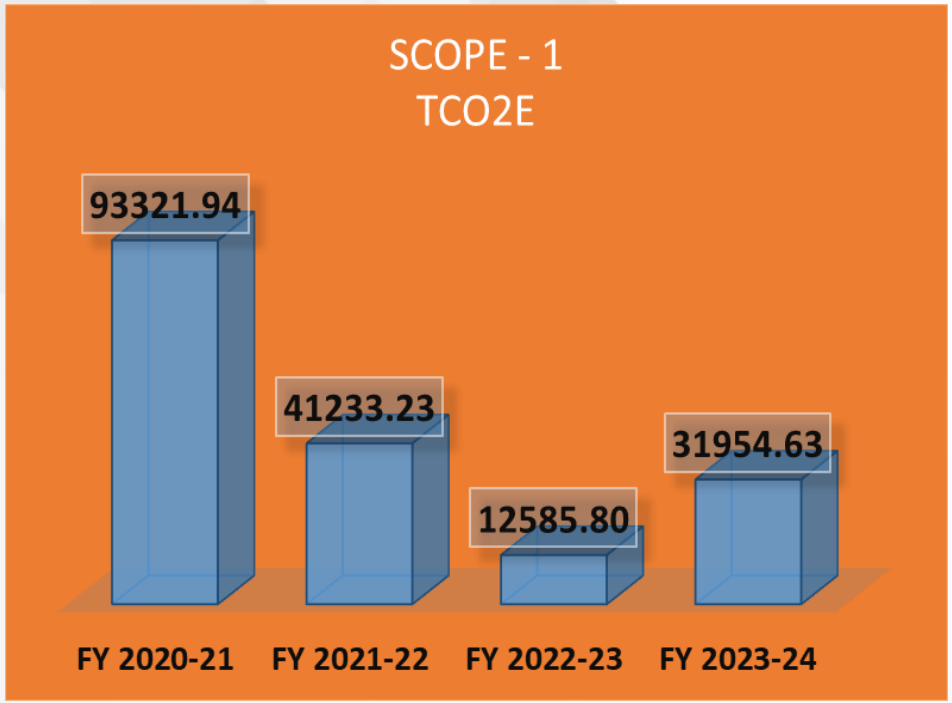
Parameters	Unit of Measurements	FY 2020-2021	FY 2021-2022	FY 2022-2023	FY 2023-2024
Annual Electrical Energy Consumption	million kWh	6.617	6.661	7.701	7.134
Annual Cost of Electricity Consumed	million INR	₹ 72.78	₹ 73.27	₹ 84.71	₹ 54.93
Annual Thermal Energy Consumption	million kcal	330416	95535	385.022	221364
Annual Cost of Thermal Energy Consumed	million INR	₹ 1,048.26	₹ 303.09	₹ 1.22	₹ 702.29
Specific Electrical Energy Consumption	kWh/Equivalent Product	0.065	0.210	57.359	0.084
Specific Thermal Energy Consumption	Kcal/Equivalent Product	3.23	3.01	2.87	2.61

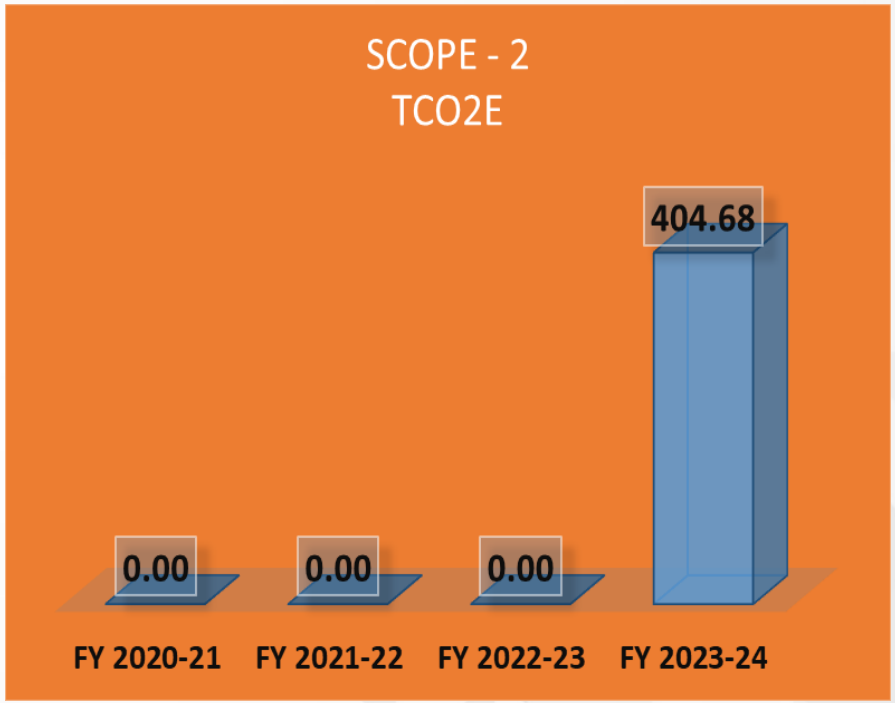
% of reduction in Electrical energy consumption in last 4 years	**60.00%**	**15% reduction every year**
% of reduction in Thermal energy consumption in last 4 years	**19.20%**	**4.8% reduction every year**

4.1: TOTAL GHG Inventorization

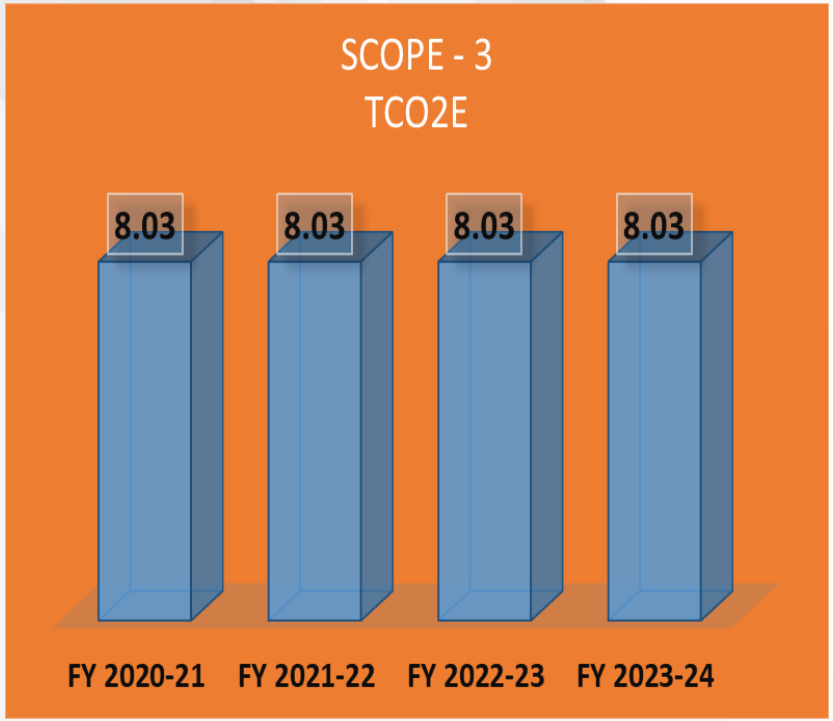


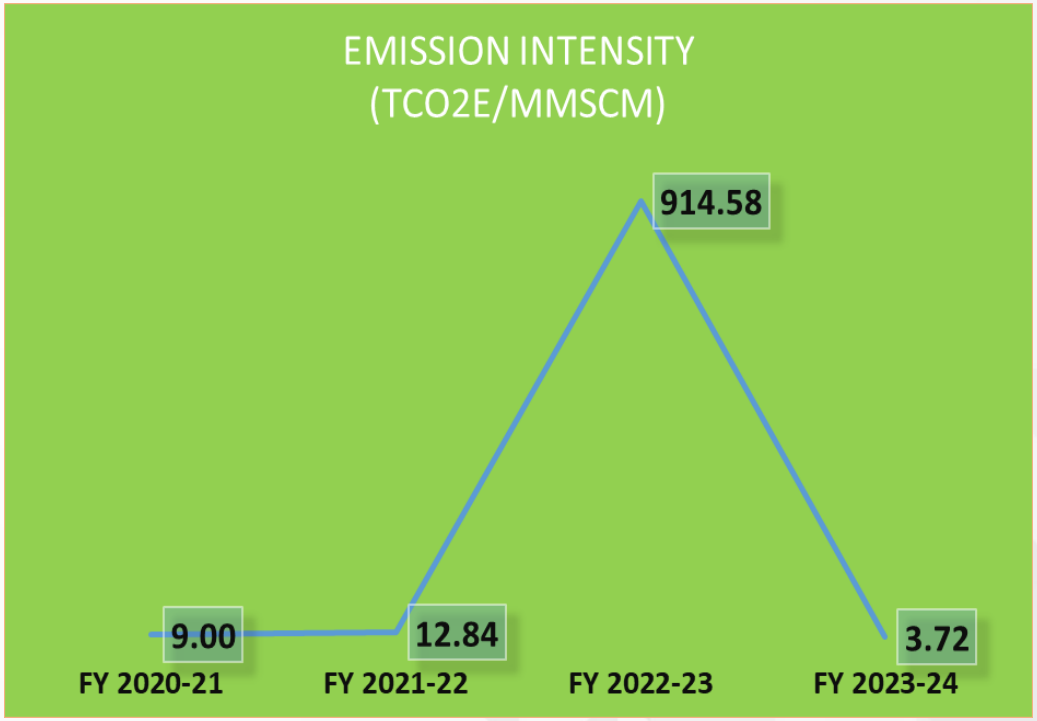
4.2: SCOPE-1 & SCOPE-2





4.3: SCOPE-3 & EMISSION INTENSITY





5.1: Energy Saving Projects Implemented In Last Three Years

YEAR	No of Energy Saving Projects	Investment (INR Million)	Electrical Savings (Million KWh)	Thermal Savings (Million Kcal)	Total Savings (INR million)	Payback Period (Months)
FY2021-22	6	1.5	0	36,350	115	<1month
FY2022-23	4	38.70	2.1	2,688	35.28	13months
FY2023-24	3	32.05	0.342	9,225	49.79	7.7months

5.2: Energy Saving Projects Implemented In Last Three Years

GREAT IMPACTED PROJECTS ONLY

Name of the Project	Investment (INR Million)	Electrical Savings (Million KWh)	Thermal Savings (Million Kcal)	Total Savings (INR million)	Payback Period (Months)
Fuel Gas Flexibility	1	0	36,350	115	<1 month
Back Draft Damper	0.5	0	177	0.95	6.3 months
HVAC Revamping	38.6	2.105	0	28.50	16 months
Starting Seal for GTC	0.035	0	3475	18.75	<1 month
DLE logic modification	0.5	0.0045	885	4.77	1.2 months
GRID connection	32.5	0.342	4963	30.11	3.2 months

6: Utilisation of Renewable Energy Sources (Onsite)

YEAR	Source	Installed Capacity (MW)	Capacity addition (MW) after FY 2021	Total Generation (million kWh)	Share % w.r.t to overall energy consumption
FY2021-22	SOLAR	0.015	Nil	0.0184	0.27%
FY2022-23	SOLAR	0.015	Nil	0.0195	0.25%
FY2023-24	SOLAR	0.015	Nil	0.0192	0.27%

7: Net Zero Commitment

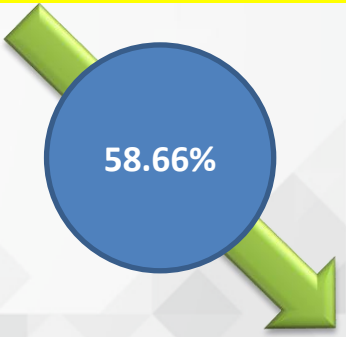
Carbon Abatement Roadmap for GAIL JHABUA

Scope 1, 2 & 3 Percentage Emission Intensity Reduction

(tCO2e/MMSCM gas compressed) Base year considering from 01.04.2021

Type of Emission	% Reduction Short Term 5yrs.	% Reduction Long Term 10 yrs.
GHG emission Intensity (tCO2e/MMSCM gas compressed)	10%	50%

FY2020-21: 9 tCo2/mmscm



FY2023-24: 3.72 tCo2/mmscm

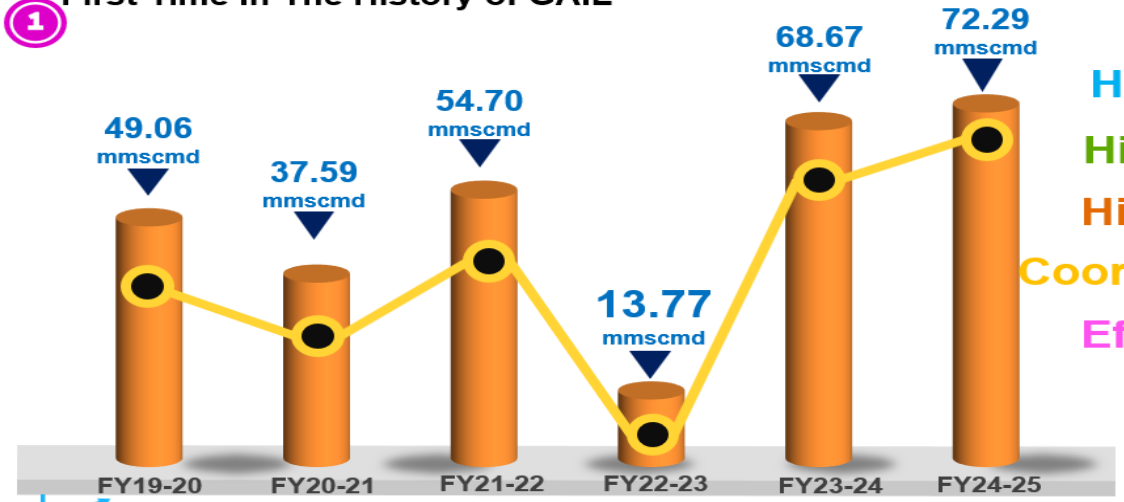
8: Proposed Projects

9: Achievements

HIGHEST EVER GAS COMPRESSED IN A DAY

Highest Ever along INGPL (Integrated Natural Gas Pipeline)

First Time In The History of GAIL



Marching Towards 15% Energy mix of N-gas in PEC

MILESTONES ACHIEVED

Highest	**Compression of GTC in The last 37years** Highest Ever Gas Compressed In a single day
Highest	**Station T-put 48.98mmscmd in 4years** Highest Ever Gas Throughput In a single day
Highest	**Rate of Linepack Enhancement 2.14/day** Reliable Centred Jhabua Compressor Station
Coordination	**NGMC & RGMC-Vijaipur** Right Decision at the right time to evacuate gas
Efficiency	**Highest Efficiency of GG SGT-A35(40%)** SGT-A35 (GT61) DLE Rated 40.5%
SD	**TWO RR-GTC Running Independently** Zero Exhaust Emission – GTC in DLE mode

HIGHEST EVER GAS COMPRESSED IN A DAY

GreenCo Silver Rating for GAIL Jhabua Compressor by CII in FY23-24

1st time at standalone compressor station along the HVJ P/L network

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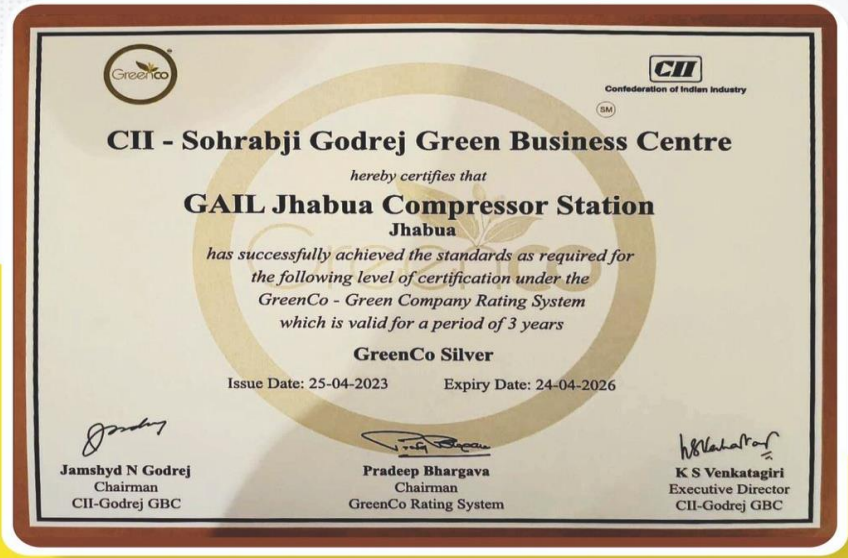
गेल (इंडिया) लिमिटेड



CII - Sohrabji Godrej Green Business Centre

hereby certifies that

GAIL Jhabua Compressor Station

Jhabua

has successfully achieved the standards as required for the following level of certification under the GreenCo - Green Company Rating System which is valid for a period of 3 years

GreenCo Silver

Issue Date: 25-04-2023 Expiry Date: 24-04-2026

Jamshyd N Godrej	Pradeep Bhargava	K S Venkatagiri
Chairman	Chairman	Executive Director
CII-Godrej GBC	GreenCo Rating System	CII-Godrej GBC

Grow Care India "OHSA GOLD Award- Best Safety Practice in Petroleum & Transport Sector" for GAIL Jhabua Compressor station for the FY23-24.

GAIL(India)Limited - Jhabua Compressor Station

GAIL Jhabua Successfully Completed of ISO-50001(2018) (Energy Management System) Certification valid upto 5th December 2026

INTERCERT®

CERTIFICATE OF REGISTRATION

INTERCERT hereby certifies that the Energy Management System of

GAIL (India) Limited, Jhabua Compressor Station

Gaylor Kalan, Jhabua, Distt Jhabua- Madhya Pradesh- India

Has been successfully assessed as per the requirements of

ISO 50001:2018

For the scope of

Receipt, Compression and Supply of Natural Gas through HVJ and DVPL Pipelines.

Initial Certification Date	:	December 06, 2023
Certificate Issue Date	:	December 06, 2023
Surveillance Validity Date	:	December 05, 2024
Recertification Date	:	December 05, 2026

Registration Number: IC-En-2312034

Issued on behalf of InterCert
Head - Certifications

INTERCERT REGISTERED

The validity of this certificate can be verified at www.intercert.com or through email at info@intercert.com. This certificate is the property of INTERCERT INC, 2001 Timberloch Place - Suite 500, The Woodlands, Texas 77380, United States and must be returned on request.

GAIL(India)Limited - Jhabua Compressor Station


THANK YOU