Gujarat Industries Power Co. Ltd.

Surat Lignite Power Plant

25th National Award for Excellence in Energy Management

Presentation by

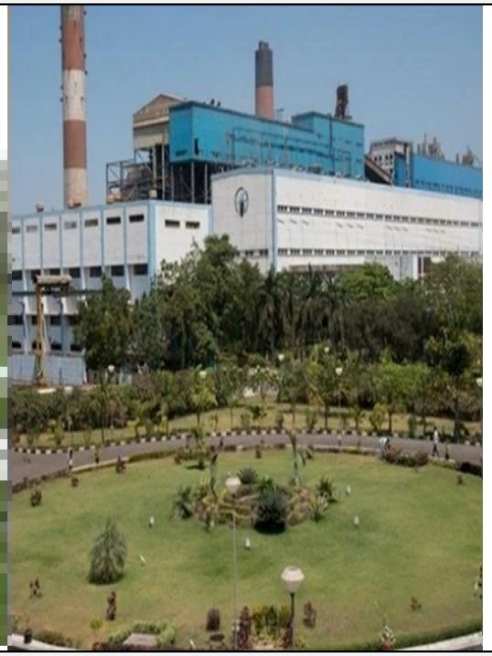
Vikas R Gupta, DGM (Operation)

Kashyap J Thakkar, Sr. Manager (BLR Maint.)

GIPCL - Company Profile

An IMS (9001, 14001, 45001, 50001) Company, Established in 1985

TOTAL: 810 MW Thermal & Gas Based



4x125 MW Lignite Based CFBC Units
Phase-I (Yr 2000), Phase II (Yr 2010)

Gas Based Power Plant at Baroda
145 MW (Yr 1992) 165 MW (Yr 1997)

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TOTAL: 262 MW Solar Power & increasing…

- 5 MW Solar Plant at SLPP (2012)
- 2x1 MW Distributed Solar Power cum Agriculture Pilot Projects-2016
- Solar Plants 2X40MW (2017), 75MW (2019) at Charankha,
- 100MW at Raghanesda, Distt. Banaskantha
- 600MW under implementation & 500 MW U/Tendering stage at Khavda,
- 75MW at SLPP U/C

GIPCL - Company Profile

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TOTAL: 112.4 MW Wind Power Projects in Gujarat

- 50.4 MW in Kuchhdi Windfarm, Porbandar
- 26 MW, Rojmal Windfarm, Dist. Botad & Rajkot
- 15 MW, Kotadapitha Windfarm, Dist. Amreli
- 21 MW, Nakhatrana SN1 & SN5 Windfarm, Dist. Kutch

GIPCL - Company Profile

An IMS (9001, 14001, 45001, 50001) Company, Established in 1985

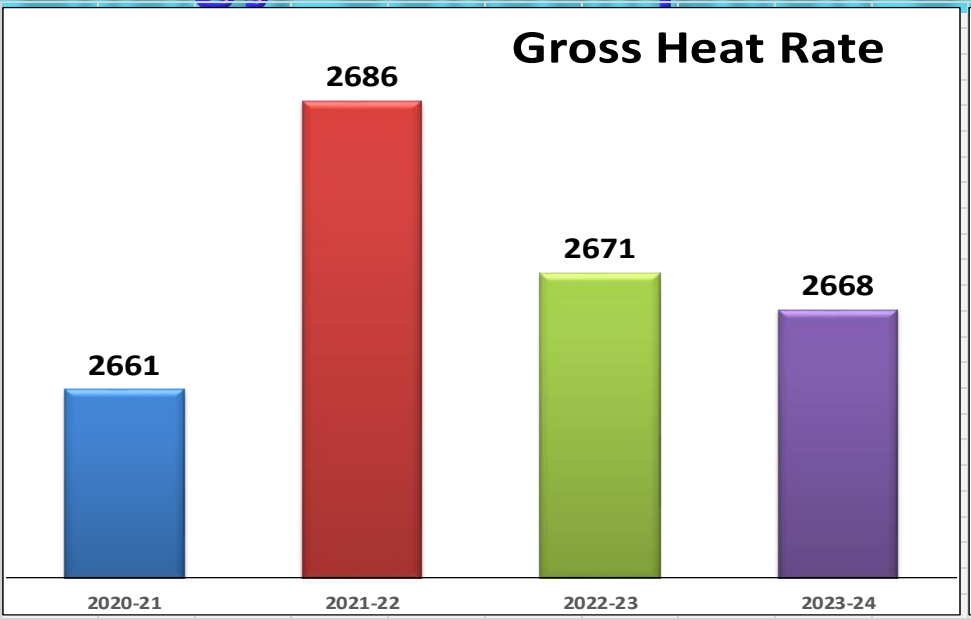
GIPCL Lignite & Limestone Mines

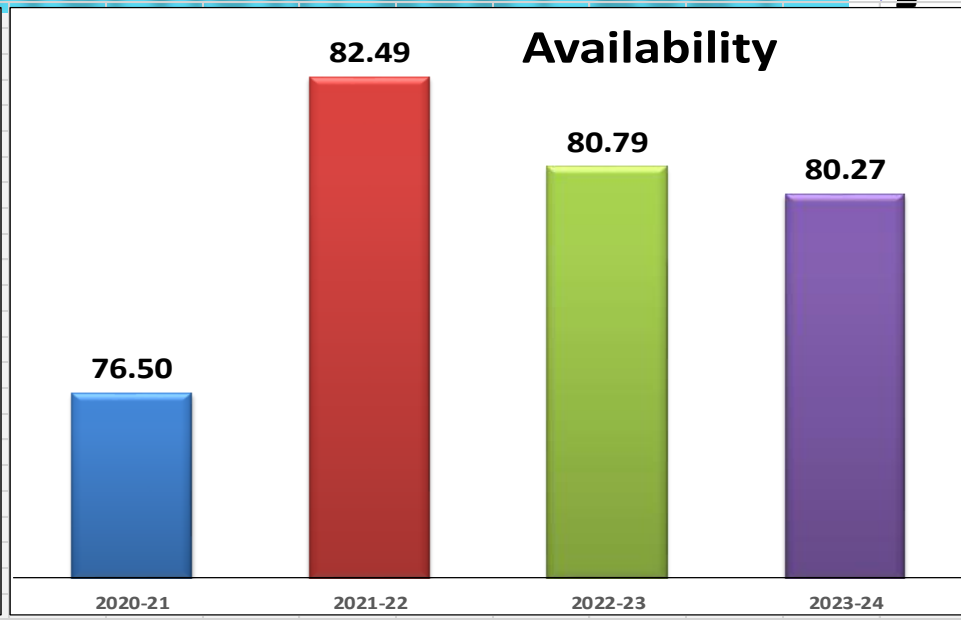
- **Mangrol Valia Lignite Mine Mineable Reserve of Lignite 170.39 Mte**
- **Vastan Lignite Mine Mineable Reserve of Lignite 36.0 Mte**
- **Vastan Limestone Mine Mineable Reserve of Lignite 12.0 MTe**

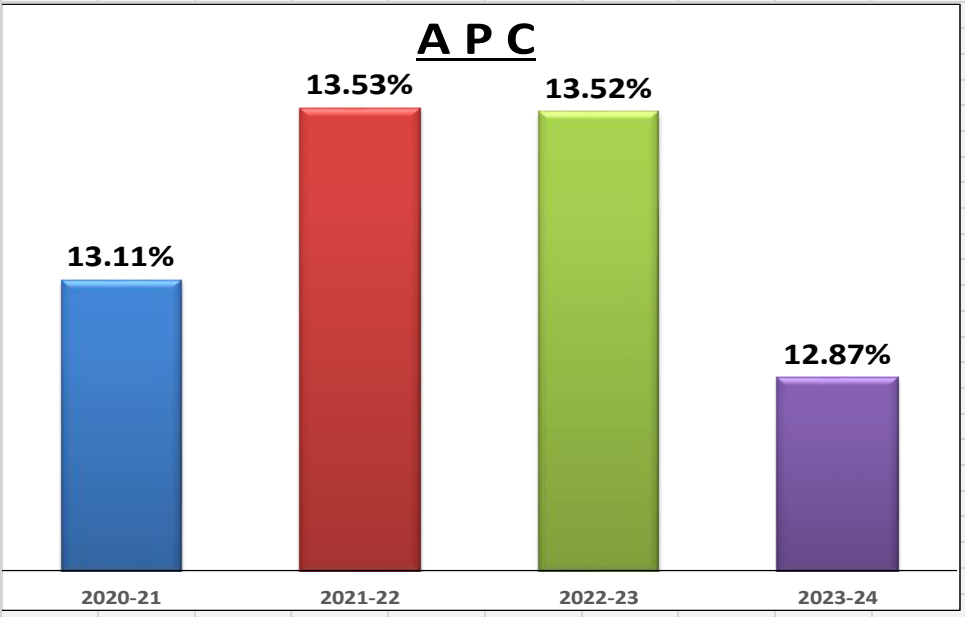
SLPP Performance Overview 23-24

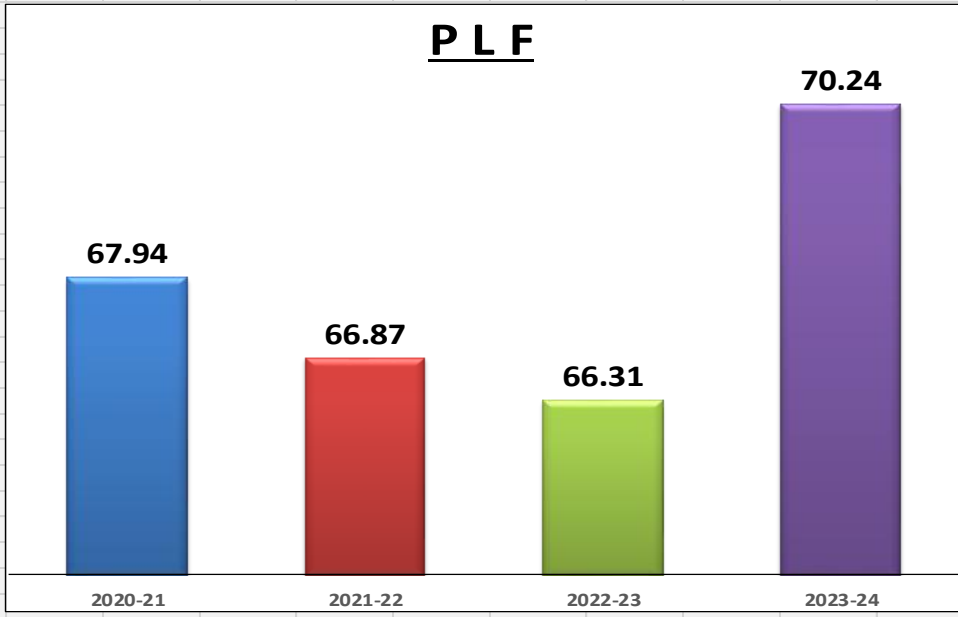
– Annual Generation	3085.05 MUs
– PLF	70.24%
– Availability	80.27%
– Gross Heat Rate	2667.88 kCal/kWh
– Auxiliary Power	12.87%
– Boiler Efficiencies	78.53%
– Turbine Heat Rate	2095.08 kCal/kWh
– DM Water Consumption	1.824%
– Raw Water Consumption	1.9025 M3/MW
– Specific Oil Consumption	0.325 ml/kWh

Energy Consumption Overview: 2021-2024









Major Reason for Improvement : Use of blending of Lignite with Imported Coal and Energy Saving Efforts

BENCHMARK DATA

Comparison of Specific Energy Consumption

Based on Same CFBC technology & FBHE Design

Name of Power Station	Net Station Heat Rate (kCal/kWh)	
	FY 2023-24	Un-Normalized NHR*
JSW Energy (Barmer) Ltd.**	2,867.84	2883.69
Barsingsar TPS, NLC Limited	2882.28	2962.29
Surat Lignite Power Plant	3,061.95	3036.10
Akrimota TPS	N A	3598.11
BECL TPS	3155.17	3598.11
Kutchh (Lignite) TPS	N A	3921.83
CEA Norm (Pertains to our plant design)	**3060.57**	

* **Taken from MoP Notification - PAT Cycle III S. O. 4491 (E) – 26th Oct 2021.**

** **Different Boiler Design in terms of FBHEs**

1) National / Global Benchmark data are not available with respect to our CFBC Technology Plant & Unique FBHE Design 2) SLPP's consistent performance (Average PLF 73.6% and Average Availability at 82% Since commissioning) is always above National average as well as better than other utilities operating on similar CFBC technology & Boiler design is itself a Benchmark for others.

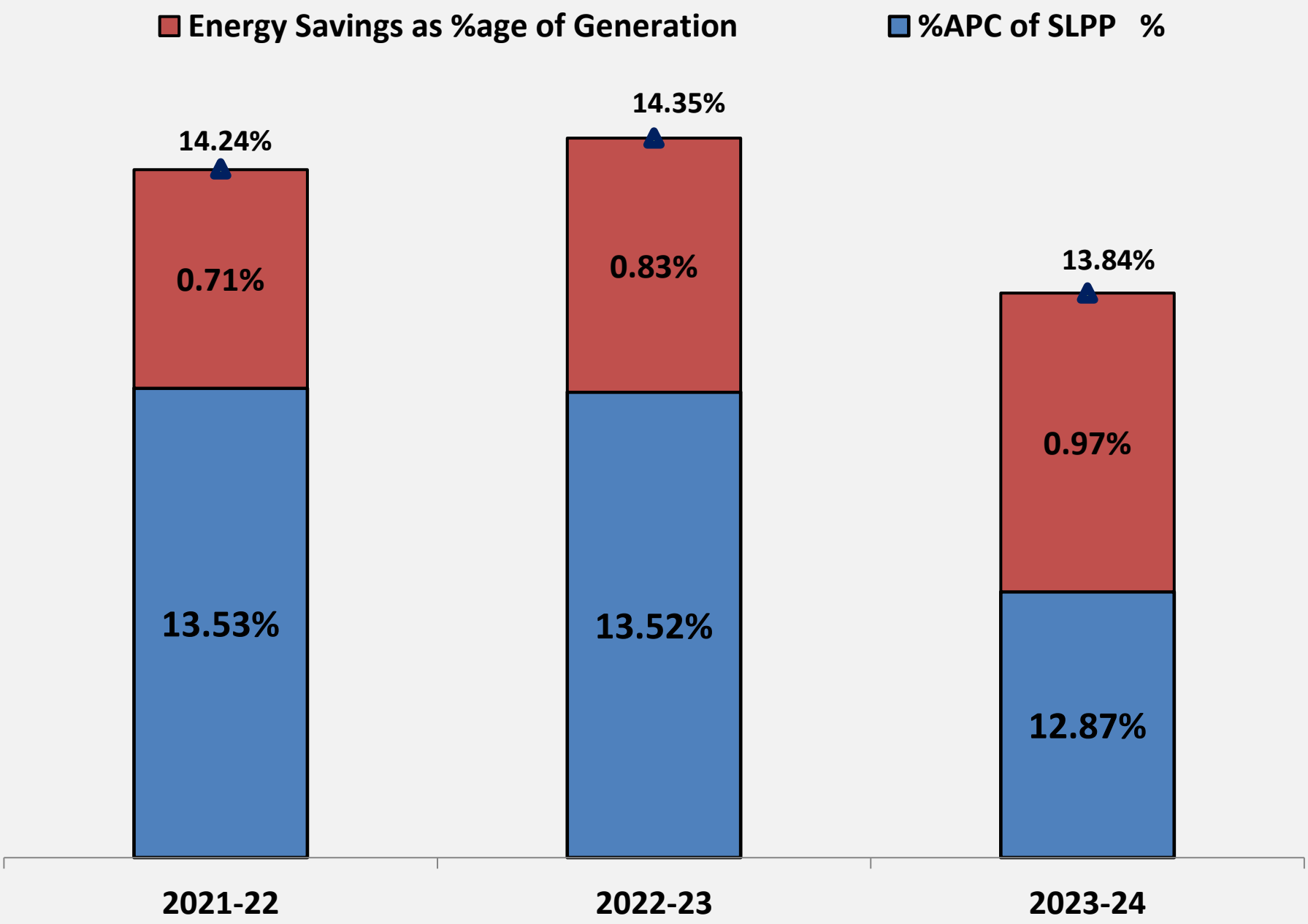
Summary of Energy Savings:2021-2024

Finn. Year	No of Energy Saving Projects	Electrical Savings (in MUs)	Thermal Savings (in MTOE)	Total Annual Savings Rs Million
2021-22	15	20.664	45560	259
2022-23	22	24.066	38181	361
2023-24	17	30.038	30267	297
Grand Total	53	74.768	114008	917.11

Impact of Energy Saving on APC

Particulars	Unit	2021-22	2022-23	2023-24
Generation	MU	2899.897	2904.231	3085.046
APC of Phase-I&II	MU	392.42	392.554	396.941
%APC of SLPP	%	13.53%	13.52%	12.87%
Energy Saving	MU	20.66	24.066	30.038
APC without Energy Saving	MU	413.08	416.62	426.98
APC% without Energy Saving	%	14.24%	14.35%	13.84%
Impact of	% of APC	5.27%	6.13%	7.57%
Energy Savings	% of Gen	0.71%	0.83%	0.97%

Impact of Energy Saving on APC



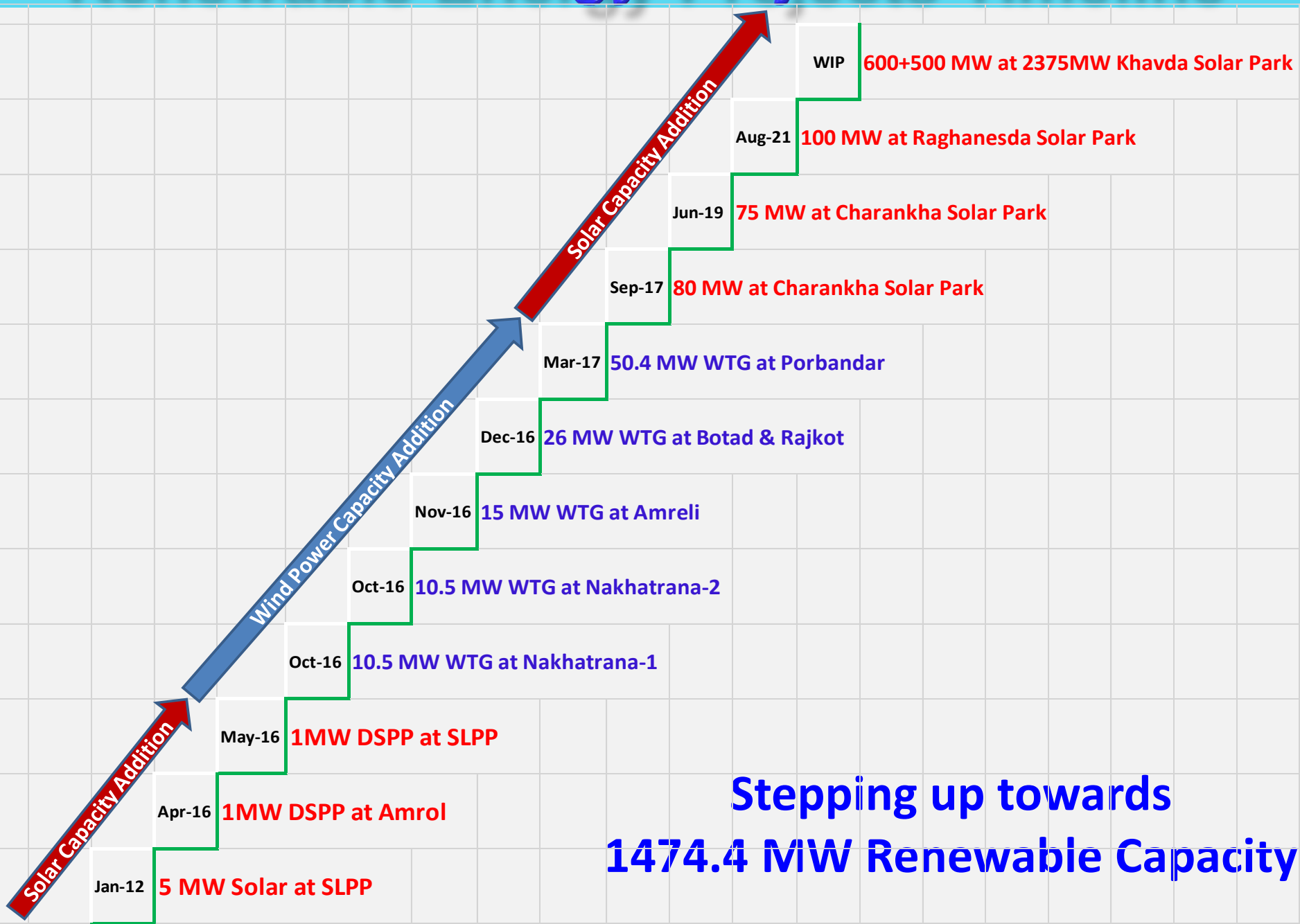
Details of Energy Saving Measures taken during 2021-2024

Sr No	Project Description FY 2021-22	Electrical Saving (MU)	Thermal Saving MkCals	Total Savings (Rs Million)	Investment (Rs Million)
1	Unit-4 Cooling Tower (CT) Fills replacement work was done. After completion of work, 6.1^{O}C improvement was achieved in CT outlet temp. This has resulted in improvement of about 42.7 kCal/kWh in Unit-4 Gross Turbine Heatrate.	0.0	37405	18.59	10.6
2	Unit-1, 2, 3 & 4 Consolidated Energy Saving in Boiler Draft power due to plugging of air ingress at different sections of flue gas path / ESP casing / Tubular Air preheater (TAPH) leaking tubes blocking during the year.	18.6387	50057	79.1354	38.32
3	In Unit 1 2, 3 & 4 boilers, energy efficient surface insulation applied in hot areas to improve boiler efficiency further. Application was done in 3084.81 Sq Mtr in different layers. There was achievement of saving of 33744.3 MT lignite in a year.	0.0	82977	41.2389	
4	Unit Annual Overhaul - U2 (Improvement in Unit Heat rate - 44.06 kCal/kWh)	0.0	38597	19.1821	
5	Unit Annual Overhaul - U3 (Improvement in Unit Heat rate - 51.74 kCal/kWh)	0.0	45324	22.5257	
6	CT Fan - 4/1, 3/1, 3/3 Blades Replacement	0.2526	678	1.0726	1.7136
7	During FY 2020-21 total 2543.8 Sq Mtr thermal insulation was replaced due to damaged or missing insulation in different layers ranging from 1 to 4 of thickness 50mm, 100mm, 150mm & 200mm in different areas of varying temperatures. Due to this total 37753.1 MT lignite saving was achieved.	0.0	92835	46.1381	
8	During FY 2021-22 total 1908.4 Sq Mtr thermal insulation was replaced due to damaged or missing insulation in different layers ranging from 1 to 4 of thickness 50mm, 100mm, 150mm & 200mm in different areas of varying temperatures. Due to this total 19305.37 MT lignite saving was achieved.	0.0	47472	23.5931	
9	Replacement of Total 2787 nos. lamps & Choke coils of different capacity by different suitably but lesser capacity LED lamps.	0.7245	1946	3.0761	4.085
10	Improvement in Specific Power Consumption of Lignite Handling System from 3.63 kWh/Ton to 3.31 kWh/Ton helped to reduce electrical power consumption by approx. 986375.33 kWh and save Lignite by 1077.3 MT.	0.9864	2649	4.1879	0.0
11	Specific Power consumption of Bed Ash Handling System was at 9.94 kWh/Ton during last FY-2020-21 which improved to 8.84 kWh/Ton this FY-2021-22. This has resulted in reduction of electricity consumption by 56245 kWhr and saving of lignite by 61.4 MT.	0.0562	151	0.2388	0.0
12	Pneumatic positioners in instrument air system were replaced with smart positioners (4 nos.) which helped to reduce consumption of instrument air and resulted into saving of about 5,280 kWh electrical energy and 5 MT Lignite during the year	0.0053	14	0.0224	

Sr No	Project Description FY 2022-23	Electrical Saving (MU)	Thermal Saving MkCal	Savings (Rs million)	Investment (Rs million)
1	In Unit-4 remaining CEP pump 4A is replaced with 5 Staged pump cartridge, which resulted in saving of 37 kW power. (CEP - 4B was de-staged in Yr 2018 was running half year, while remaining half year 7 staged pump 4A was running as per the changeover schedule of 15 days)	0.131	349.7	0.802	0.74
2	Unit-1, 2, 3 & 4 Consolidated Energy Saving in Boiler Draft power due to plugging of air ingress at different sections of flue gas path / ESP casing / Tubular Air preheater (TAPH) leaking tubes blocking during the year.	14.3803	38409	88.112	49.53
3	Replacement of Total 1700 nos. lamps & Choke coils of different capacity by different suitably but lesser capacity LED lamps.	0.434	1160.5	2.662	2.765
4	Total 1905.9 Sq Mtr thermal insulation was replaced due to damaged or missing insulation in different layers ranging from 1 to 4 of thickness 50mm, 100mm, 150mm & 200mm in different areas of varying temperatures. Due to this total 27390.5 MT lignite saving was achieved.	0.0	71281.5	60.051	4.551
5	Overhauling of Raw Water Pump-3 was carried out.	0.065	173.6	0.398	0.255
6	Unit Annual Overhaul - U1 (Improvement in Boiler Draft Power by 722 kW)	2.555	6824.0	15.654	30.749
7	Unit Capital Overhaul - U4 (Improvement in Boiler Draft Power by 967 kW)	3.422	9139.6	20.966	30.749
8	Unit Capital Overhaul - U4 (Improvement in Unit Heat Rate due to Improvement in Boiler Efficiency by 2.69% equivalent to 93.38 kCal/kWh)	0.0	82608.7	69.593	
9	Unit Capital Overhaul - U4 (Improvement in GTHR by 36.76 kCal/kWh due to Turbine Overhauling OR 46.834 kCal/kWh in terms of Unit Heat Rate.	0.0	42522.9	34.904	37.8
10	Attended CE Pump Re-circulation and LP bypass spray valve for passing in Unit-2	0.148	395.6	0.907	0.00
11	Attended Re-circulation and LP bypass leakages valve for leakage in CE Pump of CE Pump of Unit-4	0.205	547.9	1.257	0.15
12	Attended BFP - 3A of Unit-3 Re-circulation Valve passing	0.515	1376.4	3.157	1.00
13	Attended BFP – 4A & 4B of Unit-4 Re-circulation valve for passing	1.119	2987.9	6.854	1.00
14	Overhauling and maintenance of CCW Pump-1B of Unit-1 to increase flow up to design	0.046	121.8	0.279	0.01
15	Specific Power consumption of Limestone Milling System was at 22.544 kWh/Ton during last FY 2021-22 which improved to 18.60 kWh/Ton this FY 2022-23. This has resulted in reduction of electricity consumption by 838982 kWhr and saving of lignite by 861.1 MT.	0.839	2240.9	5.141	60
16	Specific Power consumption of Limestone Conveying System was at 10.673 kWh/Ton during last FY 2021-22 which improved to 9.673 kWh/Ton this FY 2022-23. This has resulted in reduction of electricity consumption by 207086.5 kWhr and saving of lignite by 212.5 MT.	0.207	553.1	1.269	
17	Gross Heat rate of Phase-I got improved due to use of blending the lignite with imported Coal resulted in decrease of Unit Heat rate by 21.17 kCal/kWh has resulted in saving of 11089 MT of Lignite to generate same amount of electrical energy	0.0	37456.1	31.555	2587.47
18	Gross Heat rate of Phase-II got improved due to use of blending the lignite with imported Coal resulted in decrease of Unit Heat rate by 10.48 kCal/kWh has resulted in saving of 6206.31 MT of Lignite to generate same amount of electrical energy	0.0	18542.3	15.621	

Sr No	Project Description FY 2023-24	Electrical Saving (MU)	Thermal Saving in MkCal	Savings (Rs million)	Investment (Rs million)
1	Unit-1, 2, 3 & 4 Consolidated Energy Saving in Boiler Draft power due to plugging of air ingress at different sections of flue gas path/ ESP casing/ Tubular Air preheater (TAPH) leaking tubes blocking during the year	27.465	73264.7	161.054	47.149
2	CT fan-3 & 6 of Unit-4 fan blades were replaced with new energy efficient blades.	0.231	616.6	1.355	1.3275
3	In instrument air system 04 nos. pneumatic positioners were replaced with smart positioners. This helped to reduce consumption of compressed air.	0.0053	14.1	0.031	0.15
4	Replacement of Total 1408 nos. lamps & Choke coils of different capacity by different suitably but lesser capacity LED lamps.	0.6041	1611.53	3.543	2.377
5	Specific Power consumption of Limestone Handling System was at 0.829 kWh/Ton during last FY 2022-23 which improved to 0.76 kWh/Ton this FY 2023-24. This has resulted in reduction of power consumption by 13590 kWhr & 13.948 MT Lignite.	0.0136	36.253	0.08	0.0
6	Specific Power consumption of Limestone Milling System was at 18.603 kWh/Ton during last FY 2022-23 which improved to 15.99 kWh/Ton this FY 2023-24. This has resulted in reduction of power consumption by 560923.9 kWhr and 576 MT lignite.	0.5609	1496.32	3.289	0.0
7	Specific Power consumption of Bed ash Conveying System was at 10.616 kWh/T during last FY 2022-23 which improved to 10.3 kWh/Ton this FY 2022-23. This has resulted in reduction of power consumption by 13775 kWhr and saving of lignite by MT.	0.0138	36.746	0.081	0.0
8	During FY 2023-24 total 1487.56 M^2 damaged or missing thermal insulation was replaced in different layers ranging from 1 to 4 of thickness 50, 100, 150 & 200 mm in different areas of varying temperatures. Due to this total 17089 MT lignite saved.	0.0	43901	33.373	3.97
9	Unit-1 AOH: Unit Heat rate Improvement of 13.43 kCal/kWhr is achieved.	0.0	11804	8.973	11
10	Unit-2 AOH : Unit Heat rate Improvement of 42.85 kCal/kWhr gain is achieved.	0.0	37662	28.63	36
11	Unit-3 AOH: Unit Heat rate Improvement of 49.34 kCal/kWhr gain is achieved.	0.0	43366	32.97	42
12	ESP Fields Charging System Upgradation from Single Phase to Three Phase transformers along with Upgradation of next generation Controller & Panel	1.145	3017.96	6.712	50

Renewable Energy Projects Timeline



Stepping up towards

1474.4 MW Renewable Capacity

Renewable Energy Generation

Total Present Renewable Power Generation Capacity
374.4 MW

Type of Renewable Energy	Installed Capacity	Annual Generation in MUs For 2020-21	Annual Generation in MUs for 2021-22	Annual Generation in MUs for 2022-23	Annual Generation in MUs for 2023-24
Wind Energy	112.4 MW	216.47	225.59	215.60	209.32
Solar Plants	5+1+1+80+75+ 100+600*+500* + 75*	317.26	453.21	525.01	536.04
Building Integrated Solar	(25+25+20) kW	0.095461	0.089572	0.089020	0.088501

Above data is based on Net Export Basis. * Total 1100 MW erection under progress.

Energy Saving Plans for FY 2024-25

1. Approx 15 MUs saving is expected in Boiler Draft Power by arresting Air ingress at different sections of Flue Gas Path / ESP Casing / TAPH Leaking Tubes Blanking and /or Replacement during opportunities like AOH, BTL Etc.

2. Total 2000 Sq. Mtr. Old & Damaged insulation will be replaced in which approx 5000MT lignite saving is expected.

3. Unit-1&2 Cooling Tower fills will be replaced. Approx. 45 kcal/kWh in Gross Turbine Heat rate is expected.

4. Interconnection of CW Fore-bay Make-up line with CW system of Phase-2

5. Remaining Condensate Extraction Pumps of Unit-3 will be de-staged from 7 to 5 stages, which will result in saving of approx. 37kW per hour.

Energy Saving Plans for FY 2024-25

6. Phase–1 Air Compressors ACW circuit modification & Oil Coolers acid cleaning / replacement will be done. This will help in reduction of lube oil temp and increase in outlet flow.

7. In instrument air system, replacement of 10 nos. pneumatic positioner with smart positioners will be carried out. Expected saving of 13200kWhr in a year & 13.9MT of Lignite.

8. Replacement of existing CFL, Fluorocent lamps, Halogen lamps are by suitable capacity LED lamps already on cards. Total 1420 lamps will be replaced during 2024-25. Since 2019-20 The company has replaced total 7563 lamps have been replaced in which 2.2425 MUs electrical energy being saved annually as on date.

Implementation of 3-phase ESP Transformers
(Category C & D Mix type Innovative Project)

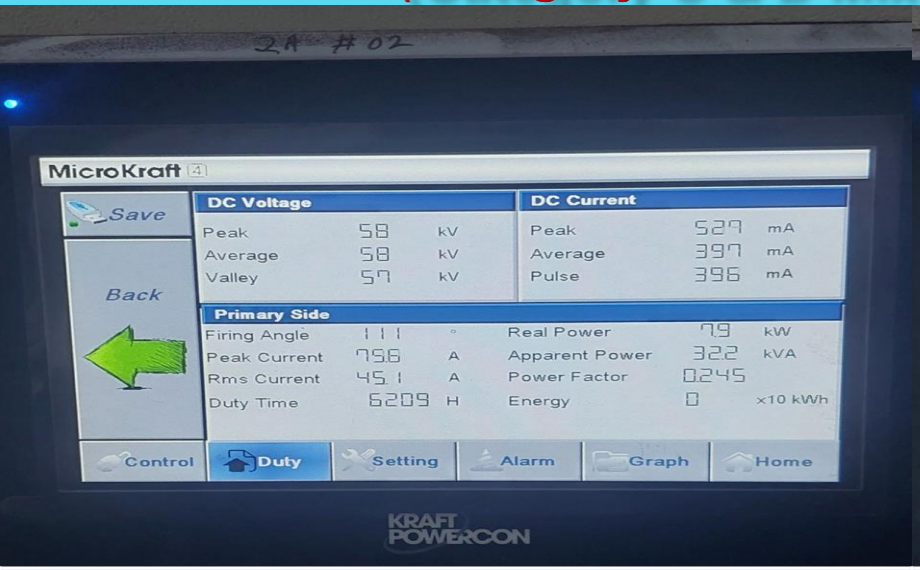
Name of the Project	Brief description on why innovative (within 450 Characters)	Trigger for implementing the project (within 450 Characters)	Select Project category (A/B/C/D)	Replicability	Impact on SEC	Year of Implementation	Annual Savings (Rs. In lakhs)	Investment (Rs. In lakhs
To meet revised env. norms by GoI, It was decided to Upgrade Existing field charging System. In ESP Fields Charging System Upgradation from 1-Phase transformer to 3-Phase transformer along with Upgradation of Controller & Panel from 2nd Generation to 4th Generation.	Presently in Phase-1 ESP Fields are supplied with 1-phase, 70 kV transformer with 1st gen. controller. Similarly in Phase-2 Single Phase 95 KV transformer with 2nd gen. controller are in use. Initially Total 20 fields decided to replace. Innovative because existing old technology system being replaced with new one to achieve better performance, energy saving and stability. Initially Total 20 fields decided to replace in phased manner.	1) To meet Revised Env. Norms by GoI. GIPCL-SLPP decided to Upgrade field charging system. 2) To achieve & run at reduced pollution parameters conditions. 3) As our lignite contains TM% (50+), the flue gas contains higher residual dust having higher resistivity. To collect it more efficiently, higher voltage is required. A 3-phase transformer provides higher Avg. operational voltage & lower losses with same rating. 4) Energy Efficiency	Class C & D Type (Mix) innovation. Known Concept (Risk Taken/Self Driven/Beyond OEM)	Yes. It can be replicated in other Utilities using ESP as pollution control Unit subject to dust characteristics.	Till date out of 20 transformer have been upgraded, Energy consumption at same output in terms of collection efficiency & Field performance without sparks at output parameter of 400mA , Power consumption with single Phase TR is 23.9 kW / 48.8 kVA and with three phase TR power consumption is 8.117 kW /32.2 KVA.	Since FY 2019-20 to 2023-24 in phase manner	Energy consumption at same output in terms of collection efficiency & same field performance without sparks at output parameter of 400mA, Reduction in energy cons. per field is 8.117 kW (See figures & calculations herewith) For 20 field it is 162.344 kW and 1.14462 MUs / 85.885 Lacs in a year.	500 lakh tentative for 20 Fields

Comparison of Fields Power Consumption

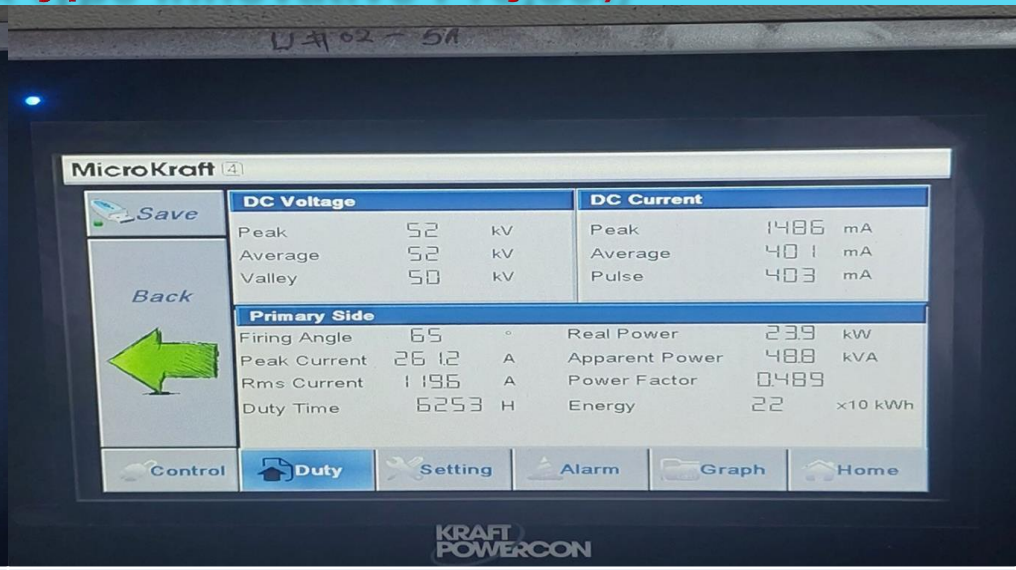
Field 2A with 3 Phase Xmer at 0.245 pF is drawing	7.889	kW	ESP Field 2A	
Field 2A with 3 Phase Xmer at 0.489 pF will Draw	15.746	kW	ESP Field 2A	
5A Field with Single Phase Xmer is drawing at 23.863 kW at 0.489 pF	23.863	kW	ESP Field 5A	
Net Saving at same pF by converting from 1-Phase to 3-Phase	8.117	kW		
Net Saving in %age at same pF by converting from 1-Phase to 3-Phase	34%	%		

Implementation of 3-phase ESP Transformers

(Category C & D Mix type Innovative Project)



ESP Field 2A Unit-2 with 3-Phase Transformer



ESP Field 5A Unit-2 with 1-Phase Transformer

Old Panels when replacement was started

Replacement Completed with All New Panels

New 3-Phase Transformers installed in 1A & 1B Fields in Unit-1.

Old 1-Phase Transformers installed in all remaining Fields to be replaced in phase manner

Environment Management – Ash Utilization

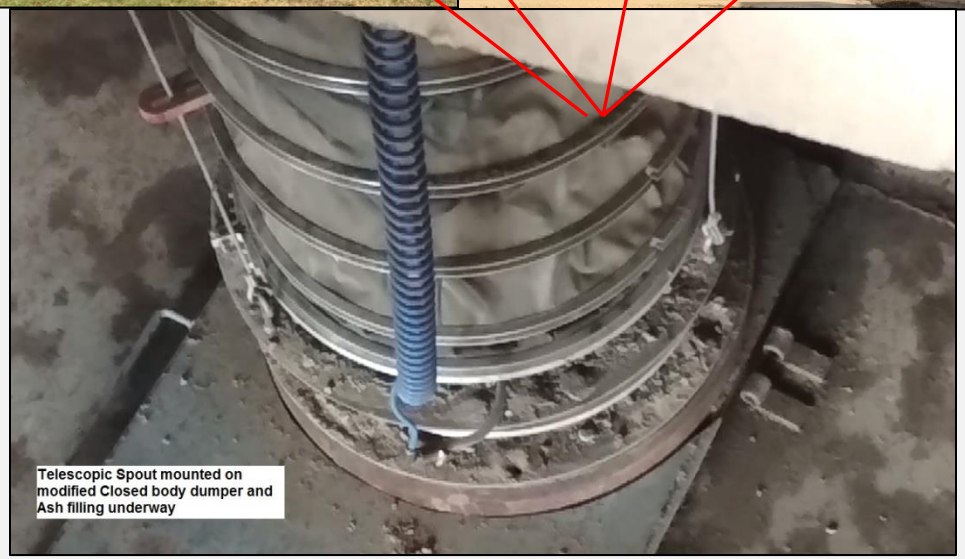
Particulars	UOM	2020-21	2021-22	2022-23	2023-24
Ash Generated	Tons	4,77,177	4,71,914	4,41,914	4,42,348
Ash Utilization	%	100	100	100	100
Ash Utilized in Fly Ash Bricks	MT, %	257676, 54%	425619, 90.2%	419377, 94.9%	418461, 94.6%
Ash Utilized for Road pavements	MT, %	219501, 46%	46295, 0.81%	22538, 5.1%	23887, 5.4%
Ash Utilized in Mine Filling	MT	Nil	Nil	Nil	Nil
Ash Utilized in manufacturing of Cement / Concrete-other similar products	%	Nil	Nil	Nil	Nil
Expenditure on Ash Utilization* (*Annual-Against Road Pavements)	INR (Lakhs)	161	Nil	Nil	Nil

Remark: SLPP has employed Dry Disposal method for Ash Handling in which Ash is conveyed pneumatically from hoppers to Bed Ash & Fly Ash Silos for collection and distribution to various interested parties Bulkers / Covered Dumpers filled through telescopic chute.

GIPCL-Surat Lignite Power Plant has achieved 100% ash utilization since 2004 and also got the "National Award for Fly Ash Utilization (first prize)" jointly awarded by Ministry of Power, Ministry Environment & Forests and Department of Science & Technology, Government of India in 2005. Has received National Awards for 100% Fly Ash Utilization in consecutively 9 times from 2016 to 2024 conferred by Mission Energy Foundation.

Ash Disposal to Outside Parties

The major utilization of Fly Ash is in manufacturing of Bricks, AAC blocks, paver blocks, AC sheets and tiles etc by outside parties. Other use of Ash is for filling of low lying areas, partly in construction of roads etc.



Environment Management – Emission

Particulars	UOM	2020-21	2021-22	2022-23	2023-24
Total CO_2 Emissions Per kW of Generation	Ton/kW	1.28986	1.30706	1.16317	1.15179
Absolute CO_2 Emission	MT	33,31,842	33,11,753	29,15,687	30,96,131
Current SOx Emissions at Full Load	mg/Nm^3	101.38	135.96	129.08	148.19
Current NOx Emissions at Full Load	mg/Nm^3	19.53	31.72	36.96	29.19
Particulate Matter	mg/Nm^3	55.74	66.57	60.59	51.76
Mercury	mg/Nm^3	<0.03	<0.03	<0.03	<0.03

Environment Management – Water

Particulars	UOM	2020-21	2021-22	2022-23	2023-24
DM water Consumption of Plant (Unit - %)	%	**2.07**	**1.703**	**1.711**	**1.824**
Raw Water Consumption of Plant (Unit – m3/MW)	M^3/ MW	**2.22**	**2.03**	**2.08**	**1.9025**
Weather Plant is Zero Liquid Discharge	**Yes**				
Best Practices in Water Management	**Please refer Annexure – Water Conservation by SLPP**				

Bureau Veritas Certification

GUJARAT INDUSTRIES POWER COMPANY LIMITED

SURAT LIGNITE POWER PLANT (SLPP), AT & POST: NANI NAROLI, TALUKA: MANGROL, DIST.: SURAT – 394 110, GUJARAT, INDIA.

Bureau Veritas Certification Holding SAS – UK Branch certifies that the Management System of the above organization has been audited and found to be in accordance with the requirements of the Management System Standard detailed below.

Standard

ISO 50001:2018

Scope of certification

GENERATION OF ELECTRICITY FROM 500 MW (4X125 MW) LIGNITE BASED POWER PLANT

Original cycle start date: **01 June 2013**

Recertification cycle start date: **26 July 2022**

Subject to the continued satisfactory operation of the organization's Management System, this certificate expires on: **25 July 2025**

Certificate No. **IND.22.15079/EN/U** Version: **1** Revision date: **26 July 2022**

Signed on behalf of BVCH SAS UK Branch
Jagdheesh N. MANIAN
Director – CERTIFICATION, South Asia
Commodities, Industry & Facilities Division

UKAS MANAGEMENT SYSTEMS 0008

Certification body address: *5th Floor, 66 Prescot Street, London, E1 8HG, United Kingdom.*

Local office: *Bureau Veritas (India) Private Limited (Certification Business) 72 Business Park, Marol Industrial Area, MIDC Cross Road "C", Andheri (East), Mumbai – 400 093, India.*

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organization. To check this certificate validity please call + 91 22 6274 2000.

ISO-50001: 2018 Implemented Since Year 2013

Details of RLA conducted at SLPP Units

F.Y.	Unit-1	Unit-2	Unit-3	Unit-4
2024-25				AOH (01/07/2024 to 16/08/2024) (RLA: Boiler)
2022-23	AOH (30/06/2022 to 03/09/2022) (65.07 Days) (Re-RLA: Boiler)			COH (20/08/2022 to 05/10/2022) (45.40 Days) (RLA: Generator)
2019-20		COH (01/08/19 to 05/09/19) (35.73 Days) (RLA: Turbine & Generator) (Re-RLA: Boiler)	COH (29/08/19 to 30/09/19) (32.42 Days) (RLA: Generator)	
2016-17	Turbine COH (35.80 Days) (RLA: Turbine)			
2014-15	AOH (20.15 Days) (RLA: Boiler)			
2013-14		AOH (29.11 Days) (RLA: Boiler)		
2008-09		Turbine COH (25.92 Days) (RLA: Generator)		
2007-08	Turbine COH (31.11 Days) (RLA: Generator)			

Learning…

- The platform provides opportunity to interact & network with individuals and companies of repute for further strengthening Energy Efficiency System
- The Presentation files displayed in CII Energy Award Program or any other award programs are circulated through internal mails and share folders among all employees for awareness
- Replication helps in facilitating easier adoption of projects leading to huge saving
- Best practices adopted by Best Performers companies initiates replication of ideas
- Information about Latest market trends & innovative products for Energy Efficiency
- Comprehensive and rigorous assessment by experts helps in identifying strengths and opportunities to excel

Awards Received by SLPP in Recognition of Efforts towards Energy Efficiency

Best Practices in Plant (Other Areas)

Following topics have been covered in next 5 slides in brief

- **Maintenance and Reliability**
- **Asset Management**
- **Digitization**
- **Biodiversity**
- **Afforestation**
- **Research**
- **New Initiatives – Flexibility**
- **Beyond the fence Best Practices for Community & Others**

Maintenance, Reliability and Asset Management:
Through Various Productivity Enhancement Practices &Techniques

Planning and Defects Management

One of the pioneer company adopted SAP for O&M of Thermal Power Plant for activities like Raising & Monitoring Plant's Defects, PTW System, Spares Management, Budgeting, E-tendering system for material procurement, Service Contracts, Advanced preparation for Generation budget & setting up targets and Payroll System.

Best Operation Practices

Adopting change in Operation Philosophy For Process Improvement, monitoring & review of Plant Efficiency and Plant Heat Rate, Review of plant logics, permissive & interlocks etc., Total Covering of Monsoon Stocks of Lignite & Limestone,

Best Maintenance Practices

Like shielding of Boiler tubes in different areas, Thickness Survey of Combustor Tubes during opportunities, Employing Smart Scaffoldings, Attending Bed material leakages on-line, Converting Metallic Expansion Joints to Non Metallic Expansion Joints, Extensive Vibration Monitoring & insitu balancing work, Preventive maintenance scheduling & Monitoring etc.

Optimization of Resource Utilization

Continuous monitoring for effective use of resources, minimizing the losses by identifying leakages, insulation condition etc., Recovery of wastes etc.

Environment Management through ISO-14001:2018,

Adoption of Environment Friendly CFBC Technology to control emission of NOx & SOx by adding limestone powder in Combustor. Continuous Monitoring of Electro-Static Precipitators (ESP) performance & Repair & Replacement, Maintaining COC above 5.5, Maintaining Zero Water Discharge System, Green Belt Development & Maintenance, Waste (water, ash, Kitchen waste) Management

Health and Safety Management through ISO-45001:2018

Significant risks are determined in Hazard identification and risk assessment (HIRA) register by each departmental as per their process/functions and being monitored, updated & risks are mitigated through Management program and additional measures, if required. Some highlights showing how safety is ensured in day to day works are

- Department wise safety coordinators are trained to monitor safety compliances, Creating Awareness, keeping vigilant everyone in their respective area
- Advanced Safety gears like Arc Protection Suits, Illuminated Windsock, LOTO system etc are in practice
- Training on basic safety, fire fighting & first aid being imparted to company & contract employees as time to time
- Permit to Work System, Regular Safety Meeting, Conducting Safety Audits, Fire Audit, NDT & Load Testing of Pressure vessels, T&P, Cranes, Hoists, EOT load Testing, Conducting Electrical Safety Audit, Earthing Audit etc are being done at regular prescribed intervals.
- Conducting various Mock drills and Periodic safety training to all employees and contract workers
- Safety related defects separately categorized in Defects Management System (in SAP)

Housekeeping

- Very challenging task due to Lignite handling and operating pressurized boilers
- Department wise housekeeping coordinators meetings / inspections are being done regularly and Interdepartmental Housekeeping Audits being conducted at regular interval.
- Adopted various measures to maintain cleanliness, prevent fugitive emission after identification and attending root cause
- SLPP considered as one of the companies maintaining best housekeeping (has got appreciation by CEA)

Digitization

- Various modules of SAP are being used for Plants Defects Monitoring, Work Permit System, Resource Management, Finance Management, daily maintenance activities, Spare management & Procurements. Various day to day work like security gate pass issue for men & materials, Payroll System and Attendance System. Fly Ash & Bed Ash distribution automated by scheduling of ash takers through SMS.
- Company owns internet website & internal email system, intranet websites like DS or UI monitoring, Online Energy Monitoring System for APC Monitoring etc.
- Plants Design Drawing of various system & equipment as well as O&M Manuals have been converted into soft formats and being used extensively.
- Use of Video conferencing & Microsoft Meeting App is being used extensively for all sorts of meetings
- Use of Window based platforms for Main plant, BOP & Equipment Operations. Solar & Wind Power generation plant data on-line monitoring using SCADA system.

New Initiatives – Flexibility & Research

Company's innovative thinking towards adopting new technology and flexibility in implementation: Keeping with the theme as above the Company has implemented total 72 measures during 2023-24, 82 measures during 2022-23 and 64 measures during 2021-22. These include outcome of adoption of new technology, new ideas, equipment, improvisations, change in MOC, methods etc. which has resulted in improving plant availability, economy, ease in O&M, Indirect/Intangible benefit in Energy Conservation/Environment Protection / Safety Enhancement. For details please visit the company website (www.gipcl.com), download the Annual Reports of corresponding years.

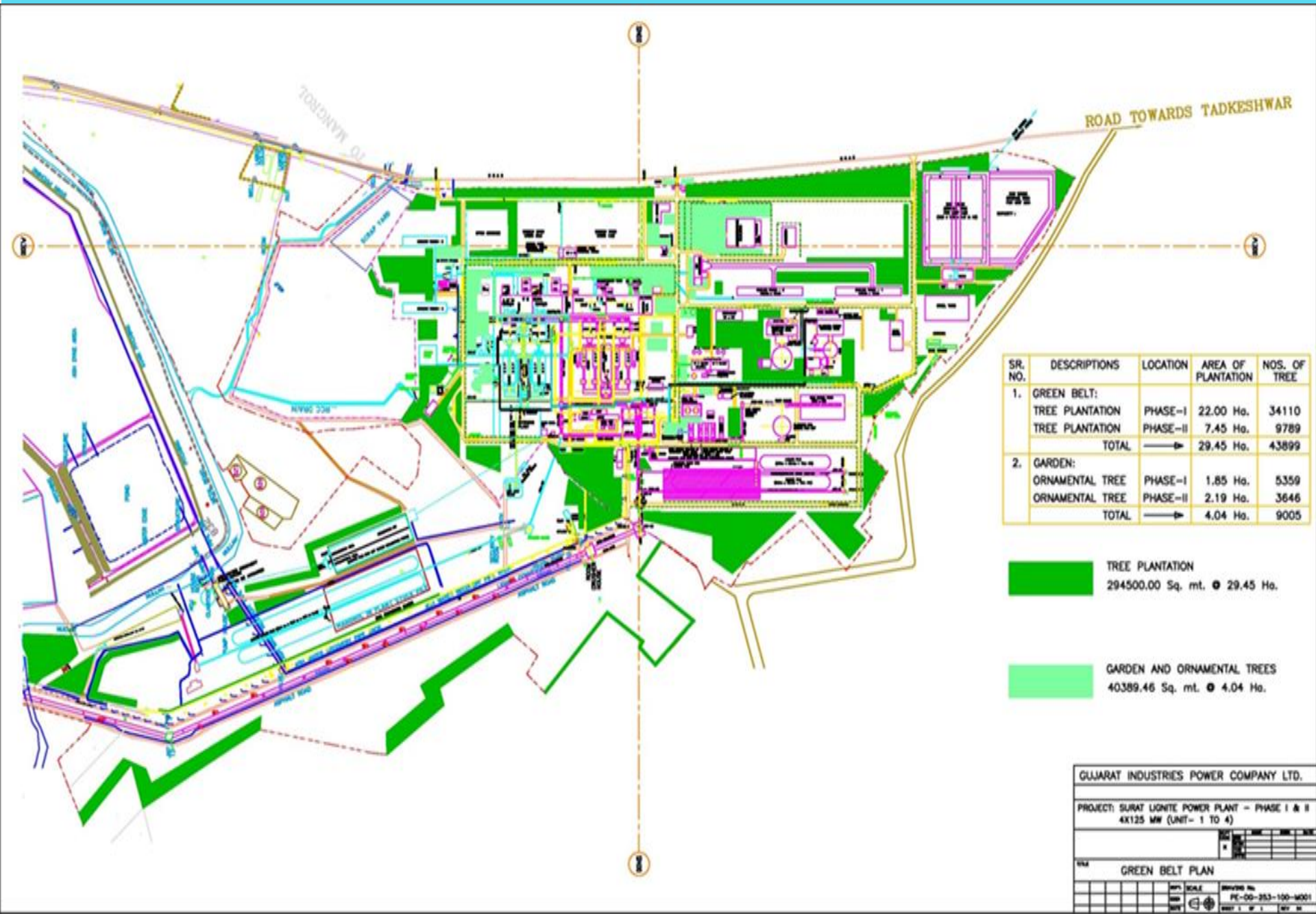
Afforestation & Bio-Diversity

Green Belt Development Activity: GIPCL-SLPP has shown its commitment towards developing, mentoring & protecting environment since its establishment. The Company has planted more than 12.08 Lacs trees in 719 hectares area of Plant, Colony, Mines, Mine dumps since 1997-`98 with an average survival rate of 83.74%. Plants of different local species like Sissoo, Simea, Neem, Desi Babool, Ashok, Jatropha, Bamboo, etc. have been grown between the year 1998 to 2017. Seeds spraying activities were also taken up in 235 hectare area. At present, almost all the Power Plant Area (Apporx 30Ha) has been covered & Colony areas, Mines area, Mine's Dump area has been converted into a forest. Bio-diversity is also maintained in these areas because of dense plantation and greenery developed and maintained herd of Nilgai, flocks of peacocks etc coexist in and around our plant & Mines premises. Large no of Peacocks can be witnessed here and even leopards have been spotted in Mines & its dump (OB) areas.

A dense green belt has been developed in & around the power plant. Following are the details of plantation : -

Survival rate: 90%.
Green belt area of Station-I: 22 Ha. / **Station-II** 7.34 Ha
Nos. of Tree Planted: 34250 Nos. / 9737 Nos
Garden & Ornamental Tree of Station-I: 1.85 Ha / 2.19 Ha
Nos. of Tree Planted: 5359 Nos. / 3646 Nos
Total Tree planted: 39922 Nos. / 13383 Nos

Green Belt Development: In & Around The Power Plant



SR. NO.	DESCRIPTIONS	LOCATION	AREA OF PLANTATION	NOS. OF TREE
1.	GREEN BELT:			
	TREE PLANTATION	PHASE-I	22.00 Ha.	34110
	TREE PLANTATION	PHASE-II	7.45 Ha.	9789
	TOTAL	⟶	29.45 Ha.	43899
2.	GARDEN:			
	ORNAMENTAL TREE	PHASE-I	1.85 Ha.	5359
	ORNAMENTAL TREE	PHASE-II	2.19 Ha.	3646
	TOTAL	⟶	4.04 Ha.	9005

TREE PLANTATION
294500.00 Sq. mt. @ 29.45 Ha.

GARDEN AND ORNAMENTAL TREES
40389.46 Sq. mt. @ 4.04 Ha.

GUJARAT INDUSTRIES POWER COMPANY LTD.

PROJECT: SURAT LIGNITE POWER PLANT - PHASE I & II
4X125 MW (UNIT- 1 TO 4)

GREEN BELT PLAN

PE-00-253-100-W001

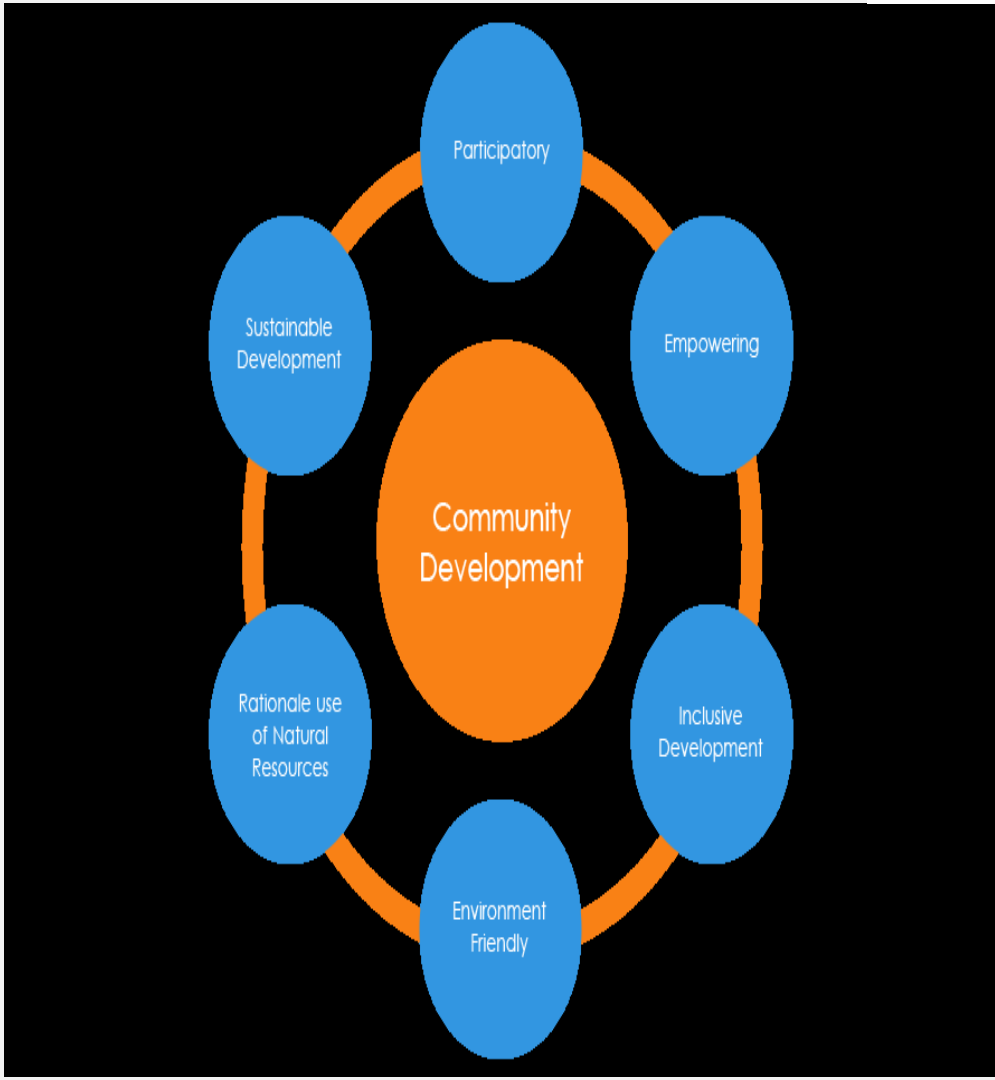
Beyond the fence: Best practices for community & Others

The GIPCL-SLPP established & promoted - Development Efforts For Rural Economy And People (DEEP), is a Trust exclusively to undertake its Corporate Social Responsibility's (CSR) activities. DEEP operates independently under the visionary and professional guidance of the Board of governors. It work towards holistic development of the communities through integrated social development approach in nearby villages with a focus on multiple thematic sectors such as Health, Education, Social Up-liftment, Livelihood, Infrastructure Development, Environment Protection and helping in Land-Loser's development also. It works at grass-root level, Ensures active participation of communities at all stages of project development and implementation by employing consultative processes. It is working since commissioning of the plant.

Approach

The approach of DEEP is founded on Pillars shown in adjacent figure

Please refer our website for details: www.gipcl.com



The Deep has made large nos of Toilets, Water Tanks, Small Stop Dams, School, Roads inside Nearby Villages, Self Help Individuals, Arranging various types of Programs for Social Upliftment & Education and providing free medical facilities to surrounding villages.

Teamwork, Employee Involvement & Monitoring

1. Energy Management Cell was established in the year 2010. Company Energy Manager is the convener of the cell.

2. All BEE certified Ems / EAs (Total 28) from various departments are default members of the cell. Also there are 31 internal auditor for IMS covering 50001:2018 also.

3. Energy Management Cell meetings are conducted once in a three months & chaired by Station Head.

4. Suggestion format as per IMS is available in common server. Employees who wish to put their suggestions can send filled format through e-mail. Suggestion boxes are also provided at various locations to enable wide participation of the employees.

5. Suggestions received are first reviewed by EM Cell & discussed in EM Cell Meetings. After discussion, implementable projects are accepted and conveyed to the concerned department for implementation.

6. Energy conservation day is celebrated every year and EM cell is conducting quiz program, Slogan competition, Painting competition etc among the employees & their family members.

Teamwork, Employee Involvement & Monitoring

1. **Daily Monitoring System** – Daily Gen. Reports, Through EMS Screens available to all as Intranet Website and Daily Planning Meetings

2. **EM Cell Review Meeting** – Every Three Months chaired by Station Head

3. **Separate Budget for Energy Conservation**

   – No, having different budgeting system, identify during review meeting & procedures laid.

4. **Energy Efficiency / Awareness Training Program**

   –Being arranged on EC Day / Energy Newsletter circulated on daily basis

5. **Projects implemented through Kaizens (Workers and Supervisor level)**

   – not exactly, but on similar methodology, involves everyone

6. **Major Areas of concern in terms of Energy Efficiency and Reliability -** Boiler & Fuel Quality especially high moisture with Sulphur & Chlorides

Thank You

Contact

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