Adani Cement Limited

Unit -ACC Jamul Cement Works, Chhattisgarh

Presented By

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Jamul Cement Works, Chhattisgarh

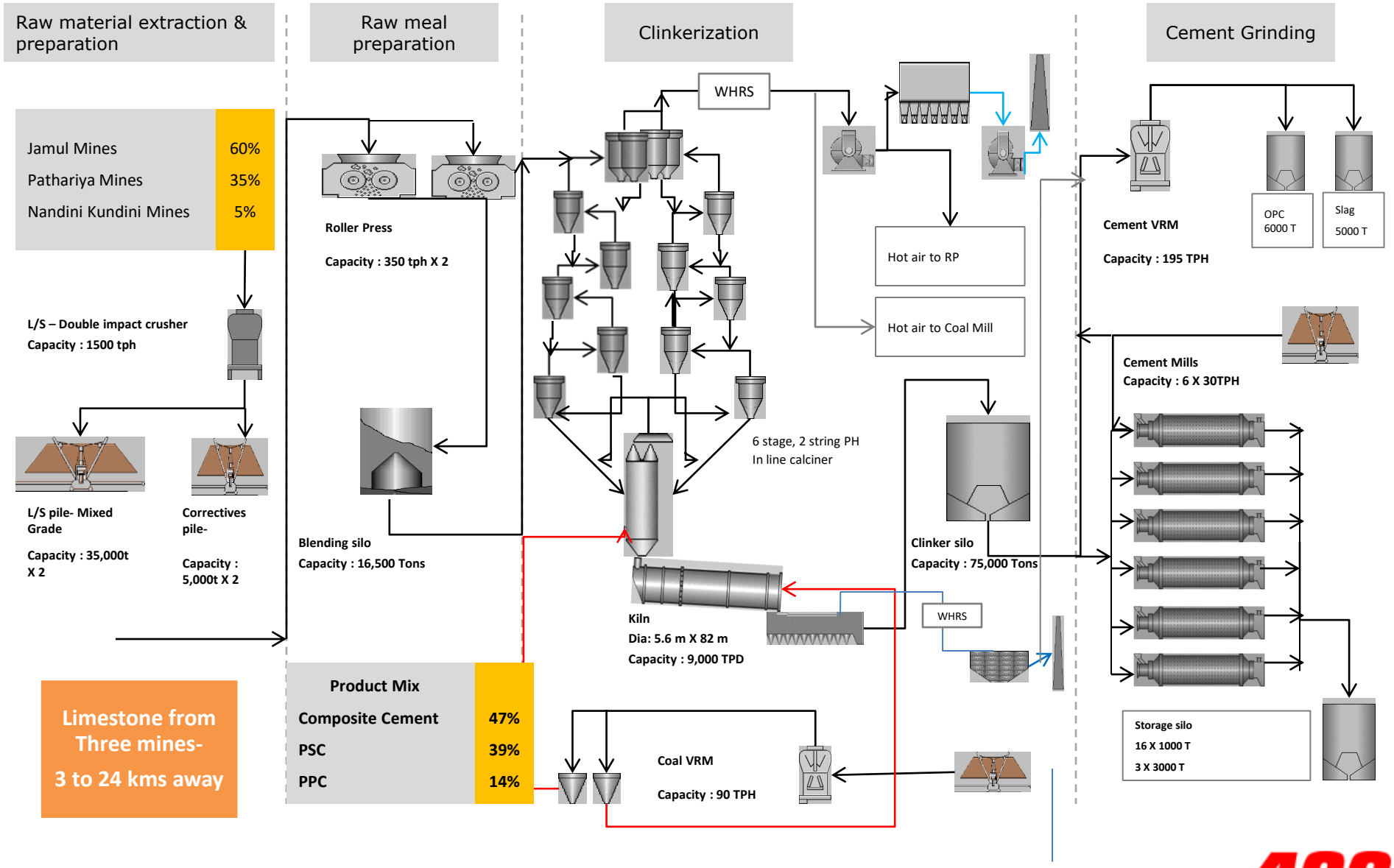
Company Profile

- **Company Name- Adani Cement Limited**
- **Manufacturing Products-Bulk Cement, Portland cement, Ready Mixed Concrete, concrete and precast products**

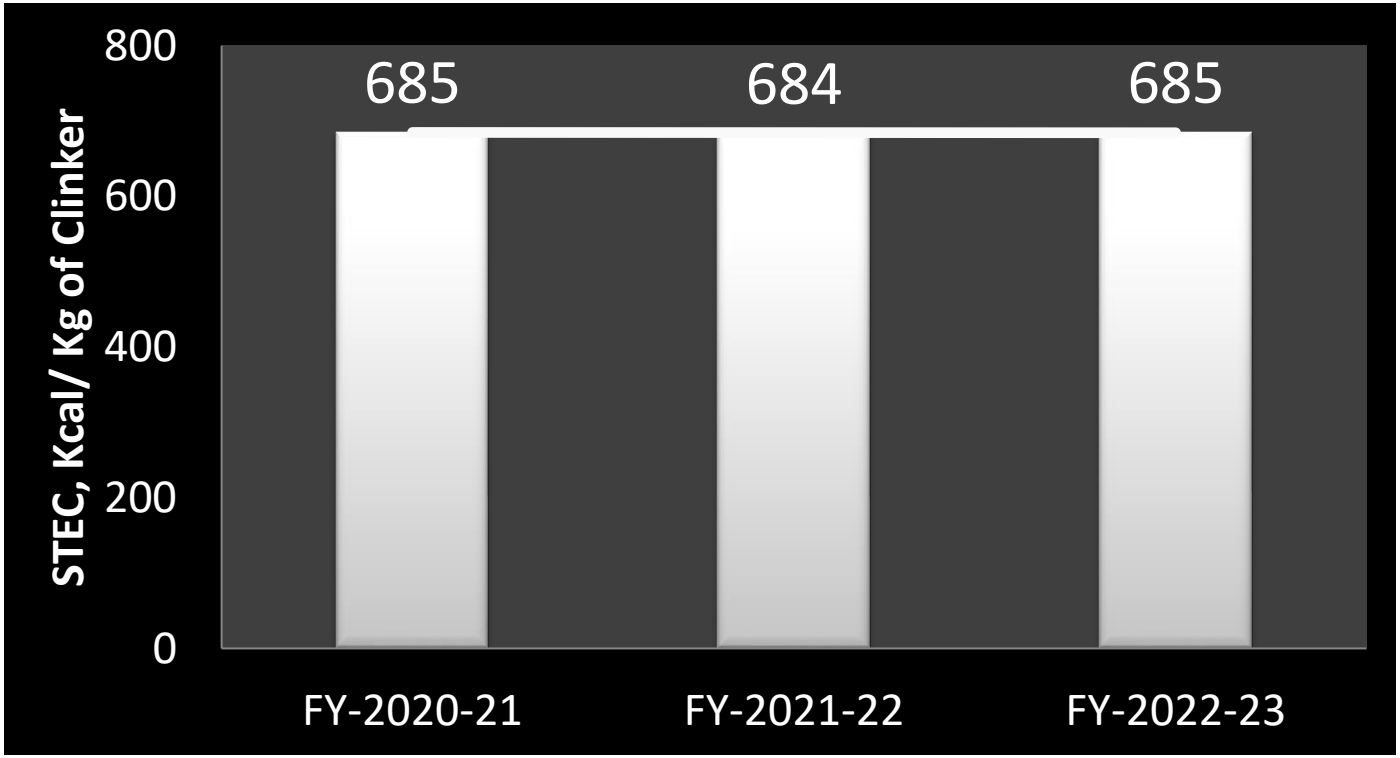
ACC at a glance

- Plant Name- **ACC Jamul Cement Works**
- **Owner- Adani Cement**
- **Products-PPC, PSC & Composite Cement**
- **Year of Establishment of Plant 1965**
- **New Plant commissioned- 2016**
- **Clinker production Capacity -3.6 Million Ton**
- **Grinding Capacity -3.0 Million Ton**
- **25 MW Captive Power Plant**
- **10 MW WHRS**
- **Onsite Solar Power – 5.35MWP**

Process /Technology/ Specifications – Jamul Plant

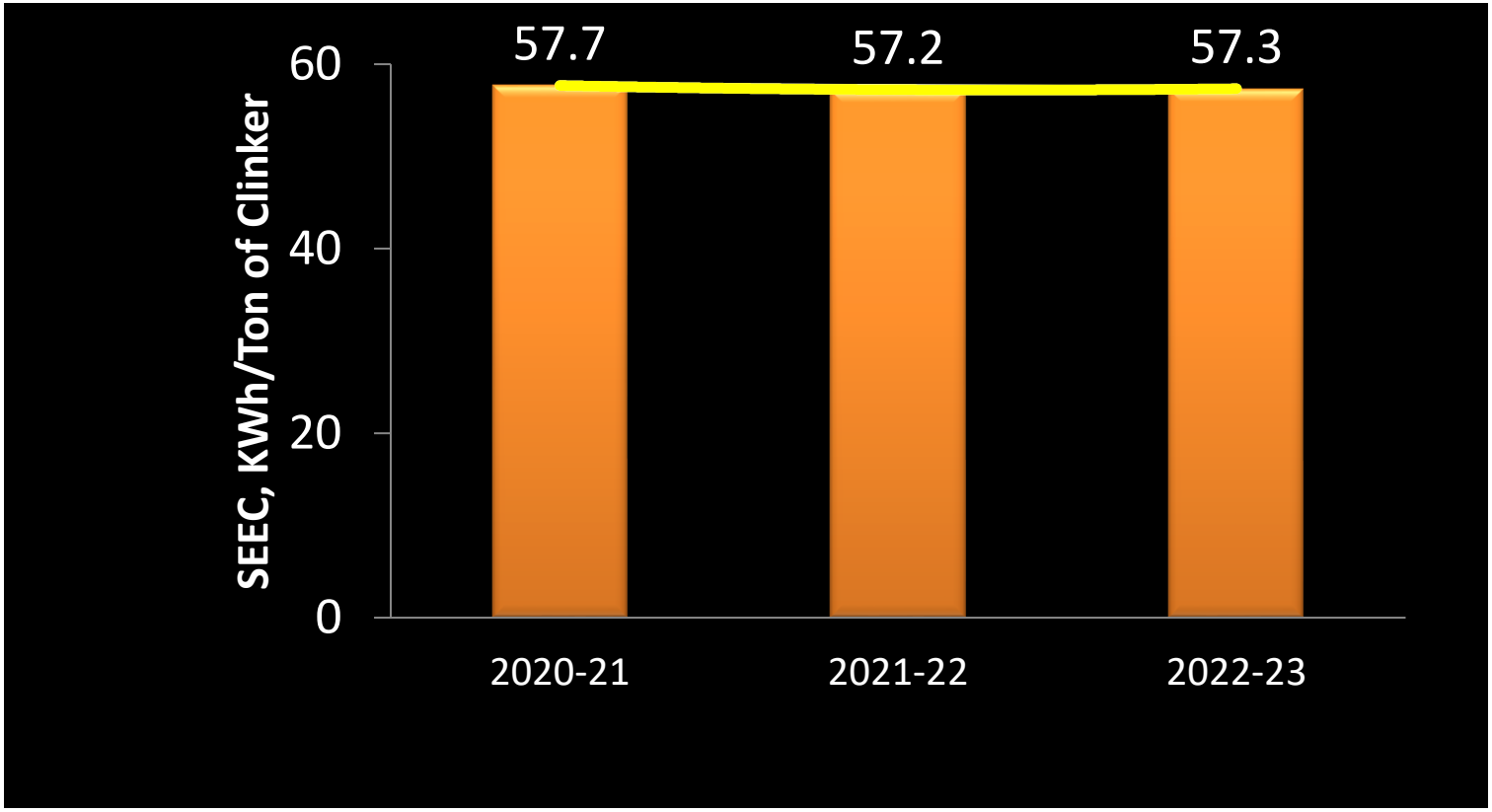


Thermal SEC Kcal/Kg of Clinker, Including AF



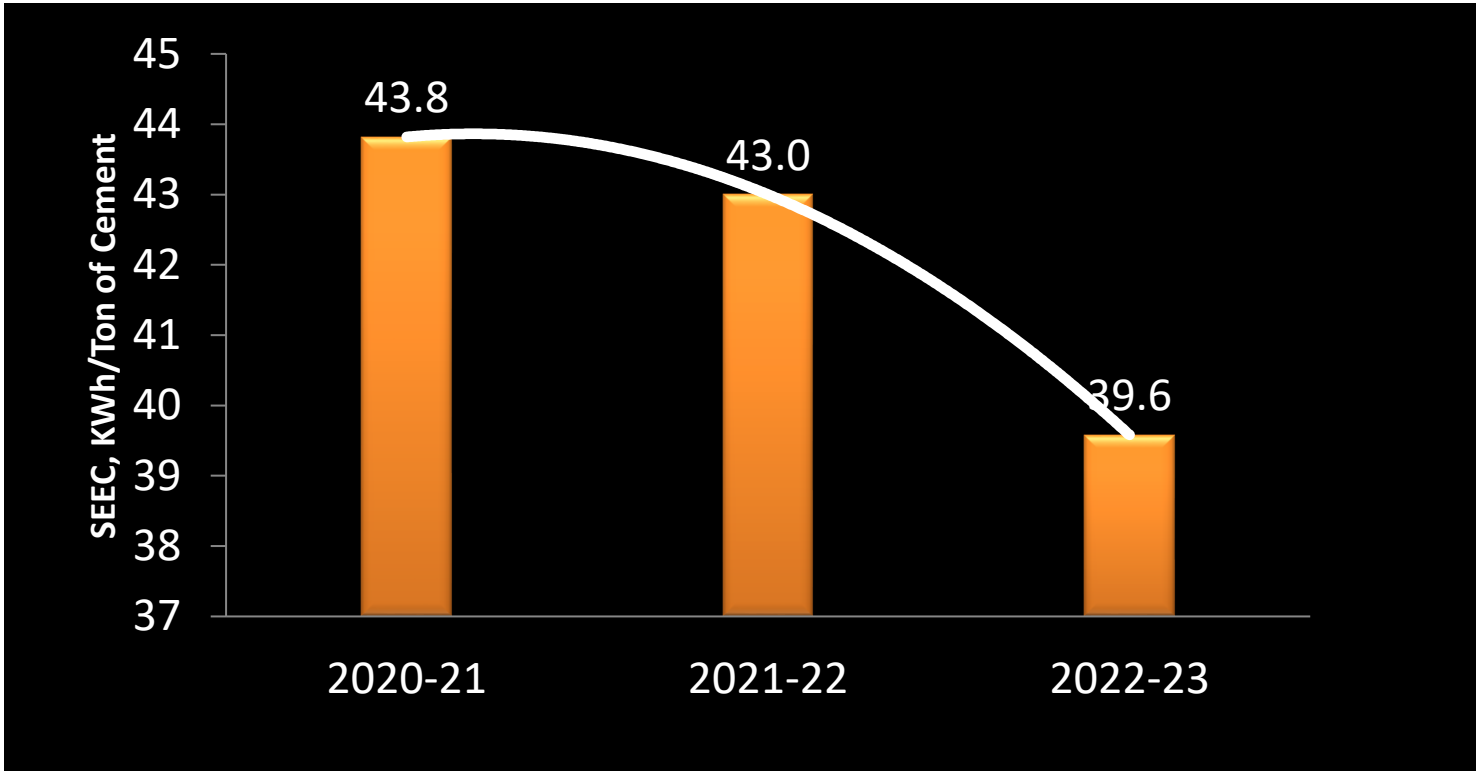
In last three years Thermal Energy Consumption is sustained at an optimum of 685 Kcal/ Kg of Clinker

Electrical SEC-Up to Clinker (KWh/t Clinker)



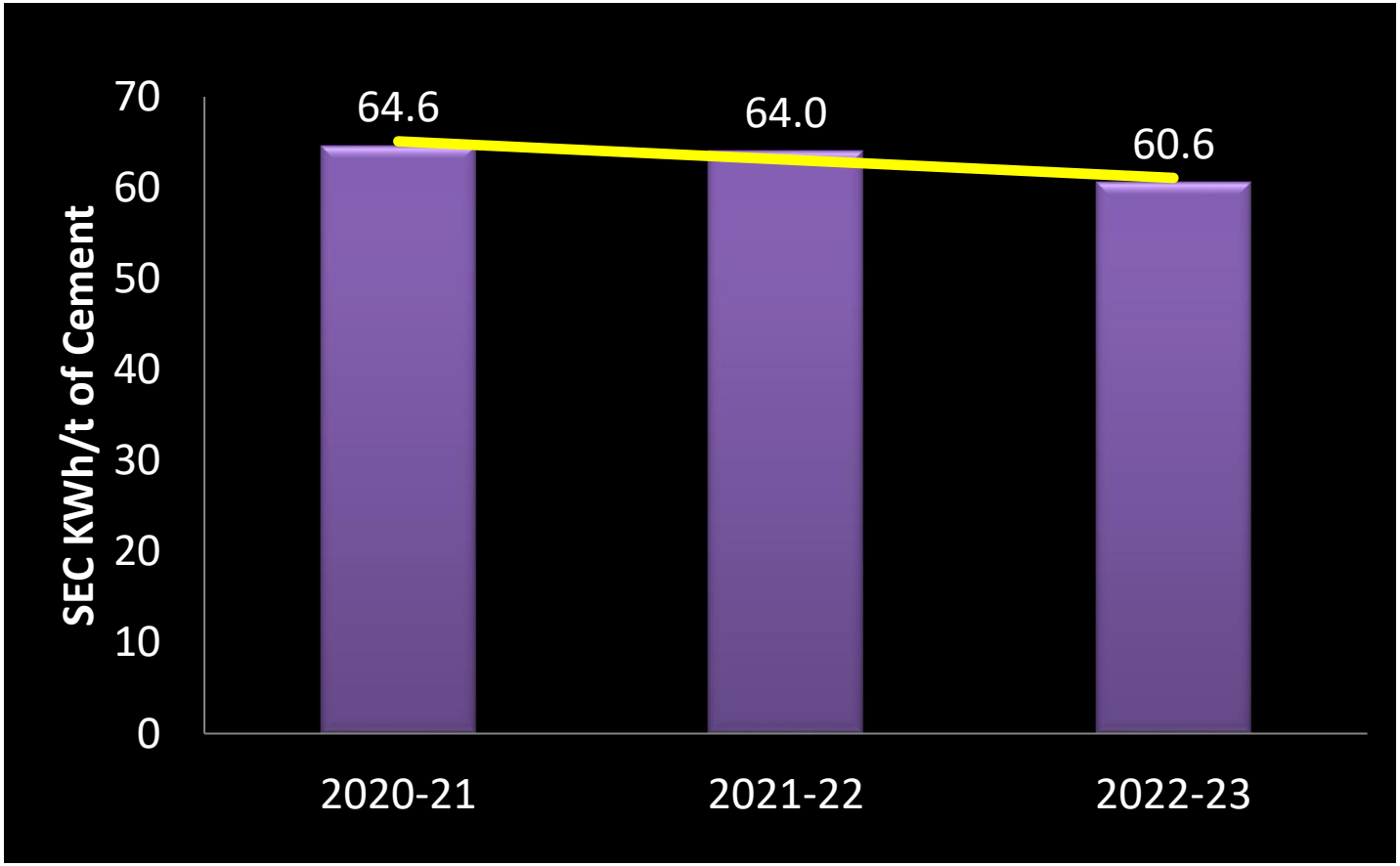
Electrical Energy Consumption up to Clinkerisation is Sustained

Electrical Energy Consumption, Grinding (KWh/T Cement)



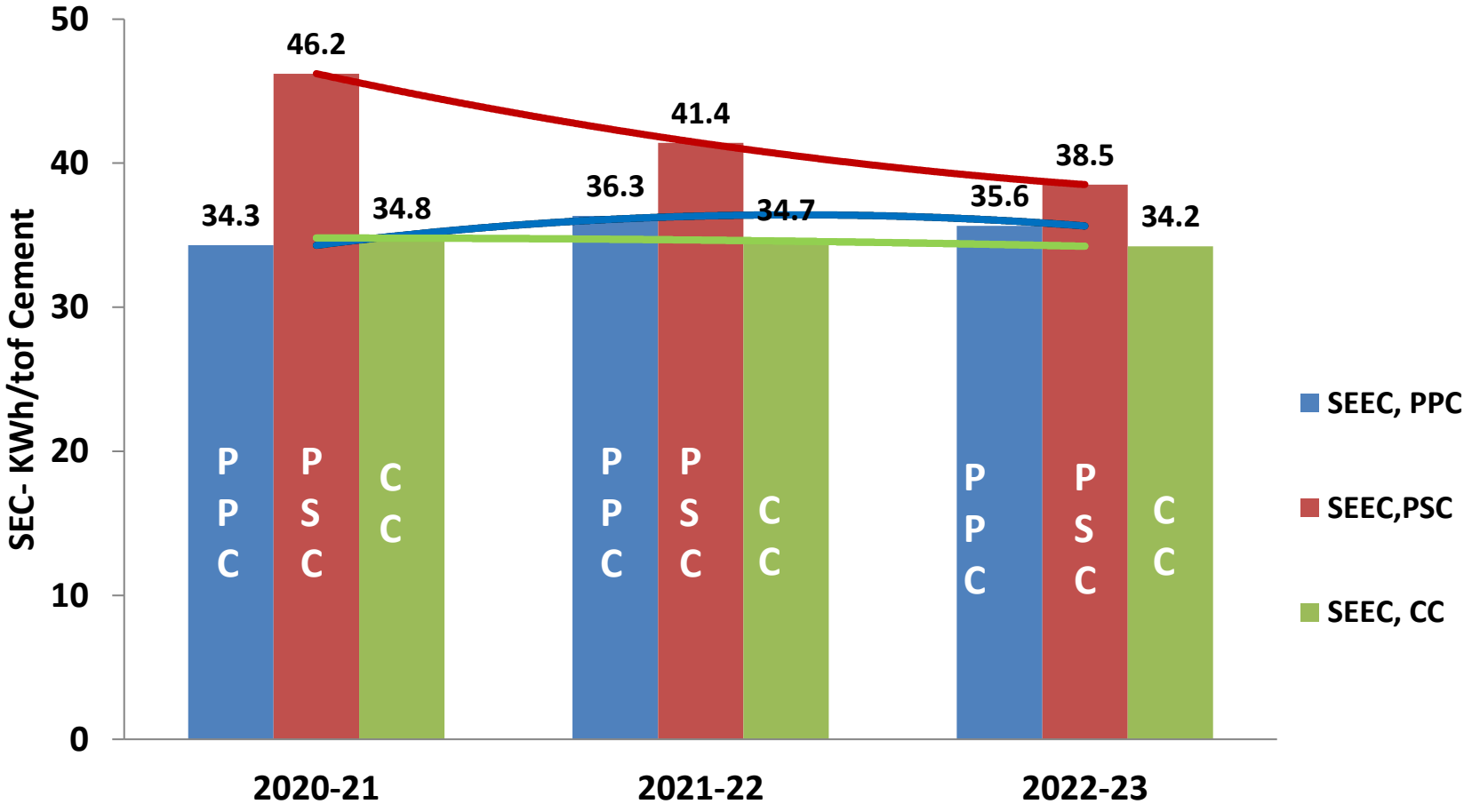
Grinding Electrical Energy for Cement Production has gradually reduced over the years by reducing running of inefficient old ball mills

Electrical SEC-(Overall Cement) KWh/t Cement



The reduction in overall power consumption is due to reduction of cement grinding power

Electrical SEC (Grinding)-Product wise



Grinding Power has reduced for PSC by grinding more quantum in VRM than BMs

Internal & External Benchmarking

Parameters	Electrical SEEC	Thermal STEC
SEC Value of JCW	57	685
UOM	Kwh/ Ton of Clinker	Kcal/ Kg clinker
Competitor-I (Internal)	A	A
SEC Values for Competitor -1	63	723

National Benchmarking

Parameters	Electrical SEEC	Thermal STEC
UOM	Kwh/ Ton of Clinker	Kcal/ Kg clinker
Name of the Company	B	B
SEC Values for Competitor -1	52	709

Short term & Long term Target & Roadmap

Action plan to achieve reduction in SEC

1. Enhancement in WHRS Power generation capacity from 10 MW to 19 MW
2. RP power consumption- implementation of study report points of OEM, Conversion of Complex circuit (2 RP + 1 Separator) to separate circuits (2 RP +2 separator)
2. Modification of inclined V Separator to vertical V separator
3. Replacement of low efficiency Preheater fan with high efficiency PH fan with increased KW and volume
4. Modification in PH cyclones to reduce pressure drop
5. Energy Audit of Coal VRM to reduce power consumption
6. Energy Audit of Cement VRM to increase productivity & completely stopping of old BMs

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List of Major Encon project planned in FY 2023-24

No	Title of Project	Annual Electrical Saving(Million kwh)	Annual Thermal Saving(Million Kcal)	Investment (Rs in Million)
1	Recirculation Water Pump replacement with optimized Head and capacity Pumps	1.6	0	3
2	Coal VRM TPH improvement through screw capacity enhancement (Coal 70 to 90 TPH, Petcoke 55 to 65 TPH)	2.2	0	8
3	Remove PH down comer inlet damper at I and II string & installation of Slide gates.	1.6	0	10
4	Trial of Thermact PC -Fuel Additive trail (K cal/ kg Clk)	0	22.4	1
5	CVRM tph improvement from 193 to 215, Hot gas temp balance with WHRS, False air plugging, dry flyash uses	2.5	0	0.5
6	BM concrete hopper overhauling, rail maintenance and mill internal health, GM management (Reduction in SEEC in ball mill from 49.5 to 43.7 kWh/ Tn)	5	0	0
7	Cooling Tower Refurbishment	2.04	6	10
		14.94	28.4	32.5

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Summary of 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)	Impact on SEC/ SHC (Electrical kWh /MT cement
2020-21	9	5.55	3	0	20.21	1.278
2021-22	9	46.32	3935	0	17.04	2223.2
2022-23	4	1101.2	82	0	478.06	44.5

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List of Major projects implemented in FY 2020-2021

No	Title of Project	Investment Made (Rs million)	Annual Electrical Saving (Million kWh)	Annual Thermal Saving Million Kcal/kg	Total Annual Savings (Rs million)	Impact on SEC/ SHC (Electrical kWh /MT cement
1	Optimize operational efficiencies in Cement grinding section	0	0.71	0	5	0.313
2	Optimize operational efficiencies in Kiln	0	0.71	0	5	0.313
3	Optimize operational efficiencies in Roller press	0	0.57	0	4	0.251
4	Modification of cement VRM reject handling circuit	2.8	0.30	0	2.1	0.132
5	CM-123 reject bin modification	0.2	0.18	0	1.25	0.079
6	Reduction of (LS crusher) Bag filter Fan power through VVFD installation	1.3	0.16	0	1.12	0.070
7	Coal Mill VRM HLC implementation and stabilization	0.4	0.16	0	1.0	0.070
8	Automation of packing house – 2 Packer	0.4	0.01	0	0.06	0.004
9	VFD installation in Conveying Air compressors	0.45	0.102	0	0.59	0.045
		5.55	2.90	0	20.21	1.28

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List of Major projects implemented in FY 2021-2022

No	Title of Project	Investment Made (Rs million)	Annual Electrical Saving (Million kWh)	Annual Thermal Saving Million Kcal/kg	Total Annual Savings (Rs million)	Impact on SEC/ SHC (Electrical kWh /MT cement
1	Condensor tube replacement in 25 MW TG	9.5	3933.0	0	4.9	2222.034
2	High efficient BFP installed and operate 1 out of 2 existing running BFP in CPP	10	0.816	0	4.896	0.461
3	Installation Energy Efficient Cooling water pumps with VFD in place of existing pumps	17	0.816	0	4.81	0.461
4	PID optimization in Pyro section	0.22	0.285	0	2	0.161
5	High Efficiency Motor and VVFD installation of ball CA Fan to improved PRI	3.3	0.01504	0	0.10528	0.008
6	High Efficiency Motor (IE3) and VVFD installation in Ball Mill Separators to improved PRI	2.2	0.0144	0	0.1008	0.008
7	High Efficiency Motor (IE3) and VVFD installation in slag dryer	2.9	0.012	0	0.084	0.007
8	Installation of VVFD in Clinker silo top Bag filter	0.65	0.010560	0	0.07392	0.006
9	Installation of VVFD in Raw Mill blending silo aeration blowers	0.55	0.0099	0	0.0693	0.006
		46.32	3934.9789	0	17.0393	2223.152

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List of Major projects implemented in FY 2022-2023

No	Title of Project	Investment Made (Rs million)	Annual Electrical Saving (Million kWh)	Annual Thermal Saving Million Kcal/kg	Total Annual Savings (Rs million)	Impact on SEC (Electrical kWh /MT cement
1	10 MW WHRS Installation	1100	81.5	0	472.5	44.04
2	VFD Installation in Blower, Bagfilters in Clinkering section	1.2	0.55	0	3.63	0.3
3	Auto PID Logic developed for CEP running at optimum Discharge pressure	0	0.10	0	0.73	0.06
4	Auto PID Logic developed for BFP running at optimum Discharge pressure	0	0.20	0	1.2	0.11
		1101.2	82.33	0	478.06	44.5

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Innovative Project

- **Name of the Project**-Installation of 10MW WHRS Power plant

- **Year of Implementation**- 2022

- **Brief description-** By the utilization of waste heat of kiln & cooler exit flue gases Electrical power is generated by installing Waste Heat Boilers.

- **Trigger for implementing the project**-

1)Low cost power Generation
2)Eco friendly
3) Reduction in hot gases discharged to environment
4) Reduction in conservation of fossil fuel for power generation

Replicability- Yes

Investment Made (Rs in Lakhs)	Annual Electrical Saving Rs in Lakhs	Impact on SEC
11000	4725	-

Innovative Project

- **Name of the Project**-Installation of water spray arrangement in Air cooled condensor at WHRS Power plant

- **Year of Implementation**- 2023

- **Brief description-** In the summer season mid day ambient temp is very high. So we are not getting rated vaccum and unable to run TG rated load. So we install a cooling water spray arrangement and cooling pond below at ACC is now helping to achieve rated vaccum and full rated generation in the Summer day during peak ambient temperature.

- **Trigger for implementing the project-** For achieving rated vaccum ,and rated TG Load
- **Replicability**- Yes

Investment Made (Rs in Lakhs)	Annual Electrical Saving Rs in Lakhs	Impact on SEC
2	41.76	-

Innovative Project

- **Name of the Project**- Installation of Solid AF feeding system
- **Year of Implementation**- 2023
- **Brief description-** To achieve TSR upto 10 %
- **Trigger for implementing the project-** To improve reduce overall fuel mix cost by 10 paise /1000 Kcal
- **Replicability**- Yes

Investment Made (Rs in Lakhs)	Annual Electrical Saving Rs in Lakhs	Impact on SEC
2000	224	-

Utilization of Renewable Energy sources

On-Site Generation

Year	Technology (Solar, wind biomass etc)	Installed Capacity (MW)	Generation (in Million kWh)	Consmption (million kWh)	% of overall electrical energy consumption	Share%
2020-21	Solar	5.35	42.44	42.44	1.6	100
2021-22	Solar	5.35	75.75	75.75	3	100
2022-23	Solar	5.35	76.44	76.44	2.88	100

On-Site Generation

Year	Technology (Solar, wind biomass etc)	Installed Capacity (MW)	Generation (in Million kWh)	Consmption (million kWh)	% of overall electrical energy consumption	Share%
2022-23	WHRS	10	38.3	36	13.55	100
2021-22	WHRS	0	0	0	0	0

Capacity addition in FY 2020-2023- Installation of 10MW WHRS Power plant

Year of addition- 2022

Investment made Rs. In Lakhs- 11000

RPO-No obligation in 22-23

Utilization of Renewable Energy sources

Off-Site Generation

Year	Technology (Solar, wind biomass etc)	Total offsite Installed capacity (MW)	Contract demand of the Company (MW)	Consumpto n by the company(m illion kWh)	% of overall electrical energy consumption	Share%
2020-21	Solar	-	-	-		
2021-22	Solar	30	20	37.33	15	100
2022-23	Solar	30	20	43.33	16.3	100

Waste utilization and management

Sl. No	Year	Waste as fuel	Quantity	GCV	Waste as percentage of total fuel (%)
1	2022-2023	AF-Non Haz-DOLACHAR	27423	2029	8.643
2	2022-2023	AF-Non Haz-COAL FINES	3513	3433	1.105
3	2022-2023	AF-Liq Haz-WASTE	704	1601	0.221
4	2022-2023	FLUE DUST;BLAST FURNANCE	290	1310	0.091
5	2022-2023	AF-Haz-ACID TAR SLUDGE	155	3217	0.049
6	2022-2023	AFR;PYROLYTIC OIL	79	9816	0.025
1	2021-2022	AF-Non Haz-COAL;WASHERY REJECT	6560	2820	2.0626
2	2021-2022	AF-Non Haz-DOLACHAR	1771	2098	0.5567
3	2021-2022	AF-Liq Haz-WASTE	898	4063	0.2823
4	2021-2022	AF-Haz-ACID TAR SLUDGE	262	3268	0.0822
5	2021-2022	AFR;PYROLYTIC OIL	141	9861	0.0442
6	2021-2022	AF-Non Haz-PLASTIC WASTE	84	3738	0.0265

Waste utilization and management’

Sl. No	Year	Waste as fuel	Quantity	GCV	Waste as percentage of total fuel (%)
1	2020-2021	AF-Non Haz-DOLACHAR	20306	2058	7.13
2	2020-2021	AF-Liq Haz-WASTE	913	4127	0.32
3	2020-2021	AF-Haz-ACID TAR SLUDGE	500	3445	0.18
4	2020-2021	AFR;PYROLYTIC OIL	145	9460	0.05
5	2020-2021	AF-Non Haz-PLASTIC WASTE	20	3467	0.01

- **Infrastructure for AFR co-processing**

1.AF Non Haz Coke Fines ,Flue Dust & Plastic Waste firing in Calciner

2. AF- Liq Haz Waste- firing in Calciner

To further enhance AF Co processing dedicated facility in the Plant will start by Sept 23

GHG Inventorisation

Year	Scope 1 Emission	Scope 2 Emission	Scope 3 Emission	Total Emission
2020-21	476.58	533.79	NA	-
2021-22	572.87	641.73	NA	-
2022-23	576.05	621.7	NA	-

GHG Emission Intensity (Kg CO2 / Ton of Product) of peers/competitors- 576.05 (kg CO2 / t cem mat)

Emission Intensity of Last Three Years

Sl no	Year	NOx (Mg/Nm3)	SO2 (Mg/Nm3)	CO (Mg/Nm3)	VOC (Mg/Nm3)
1	2020-2021	244.13	9.68	8.8	2.85
2	2021-2022	281.84	24.16	10.53	4.53
3	2022-2023	280.04	31.34	15.35	5.05

Target & Action Plan for CO2 Emission reduction

Target :

1. **Scope -1 :**
   - Short term Target year 2023-24 will be 520 kg CO2 /T product
   - Long term Target year 2025-26 will be 470 kgCO2/T Product
2. **Scope -2**
   - Short term Target year 2023-24 will be 620 kg CO2 /T product
   - Long term Target year 2025-26 will 530 kgCO2/T Product

Action Plan for CO2 Emission Reduction

- To reduce CO2 emission maximum production of PSC will be done around 50% for 2023-24 followed by Composite Cement with production around 35% and PPC production will be around 15%.
- Subsequently in the coming financial years of 2024-25 and 2025-26 PSC and Composite Cement production will increase and PPC production will reduce
- Use of Alternate Fuel in the year 2024-25 will be around 5% of the total fuel consumption and the same will increase up to 20% by 2025-26

Emission Intensity FY 2022-23	Cement Group-1	ACC	Cement Group-2	Cement Group-3	Cement Group-4
Scope1 Co2 Emission (Kg CO2 /T Cmnt Mte	513 (Excluding CPP)	466 (Excluding CPP)	557 (Excluding CPP)	521 (Excluding CPP)	463(Excluding CPP)

EMS System and other requirement

1. Existing energy monitoring system / IOT system-Yes

a) Level of monitoring- Up to Individual Sectional Power

b) Challenges and upgradation- IOT system

2. Green Co certification- No

3) ISO 50001 certification- Yes

4) Learning from CII or any other award program-

- Explore possibility to adopt the program learning in our existing installation for improvement
- Use of latest technology to reduce power consumption
- Further enhancement of WHR generation
- Further enhancement in AF co processing capacity
- Further increase in slag based cement production to reduce
- clinker consumption in cement.
- Install more solar power generation capacity

NET ZERO commitment

Net Zero Target year /commitment if any- 2030

Roadmap for achieving the target-

5.35 MWP onsite Solar plant installed , 20 MW offsite solar under PPA contract installed, Solid AFR (10 % TSR achieved) project installation in year 2023

Further increase the TSR % by 20% by 2024

Power Mix of Non fossil power will increase 50 % by 2023, 70% by 2025

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Thank You

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