Calcom Cement India Limited

A Subsidiary of Dalmia Cement Bharat Limited

Umrangso, Assam

Submission of Presentation : 11th Aug'22
Award Presentation Date : 23rd - 25th Aug'22

We Welcome

You All To The Presentation Of Our Unit

At CII National Award For Excellence In Energy Management 2022

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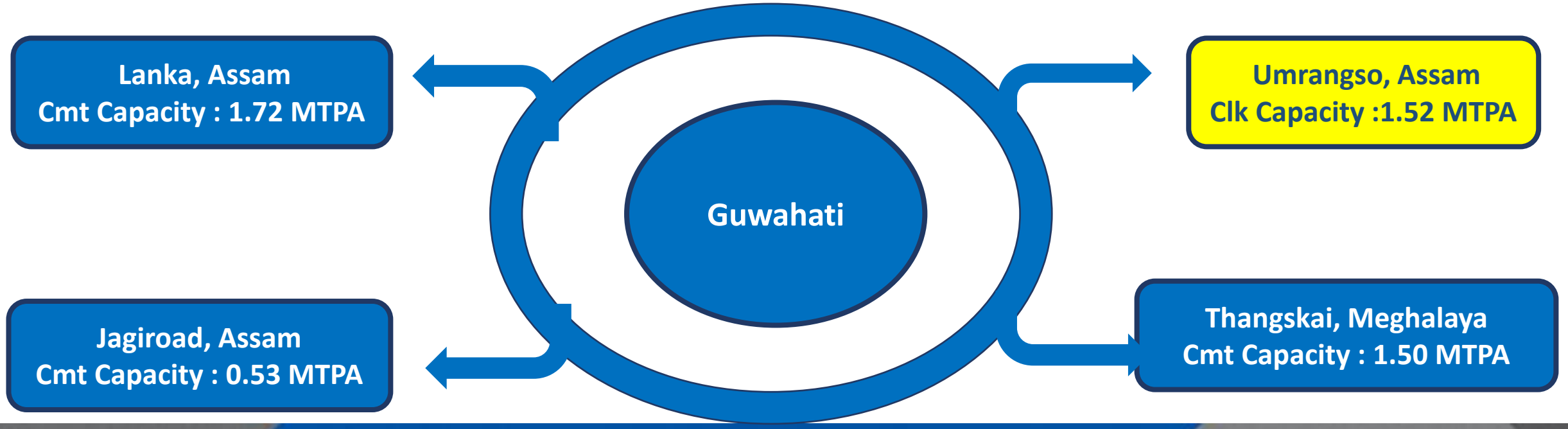
Brief Introduction of Calcom Cement India Limited, Umrangso :-

- **2004** : Established Calcom Cement India Limited By Other Group.
- **2010** : Lanka Grinding Unit Commissioned By Other Group.
- **2012** : Taken Over By Dalmia Cement Bharat Limited.
- **2015** : Umrangso Clinkerisation Unit Commissioned.

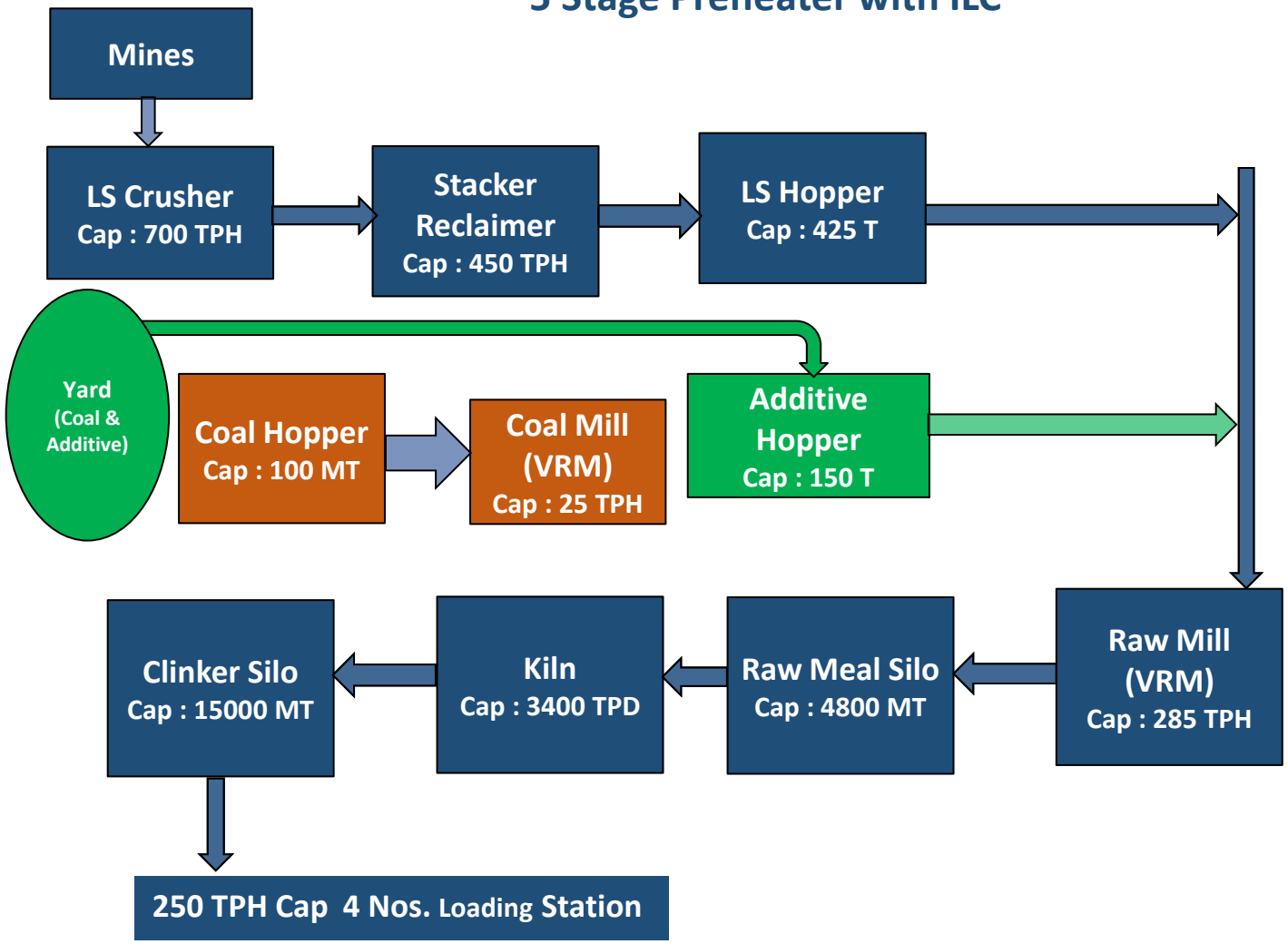
Plant Name : Umrangso
State : Assam
District : Dima Hasao
District Head Quarter : Haflong
Product manufactured : Clinker

Group Presence In North East :-



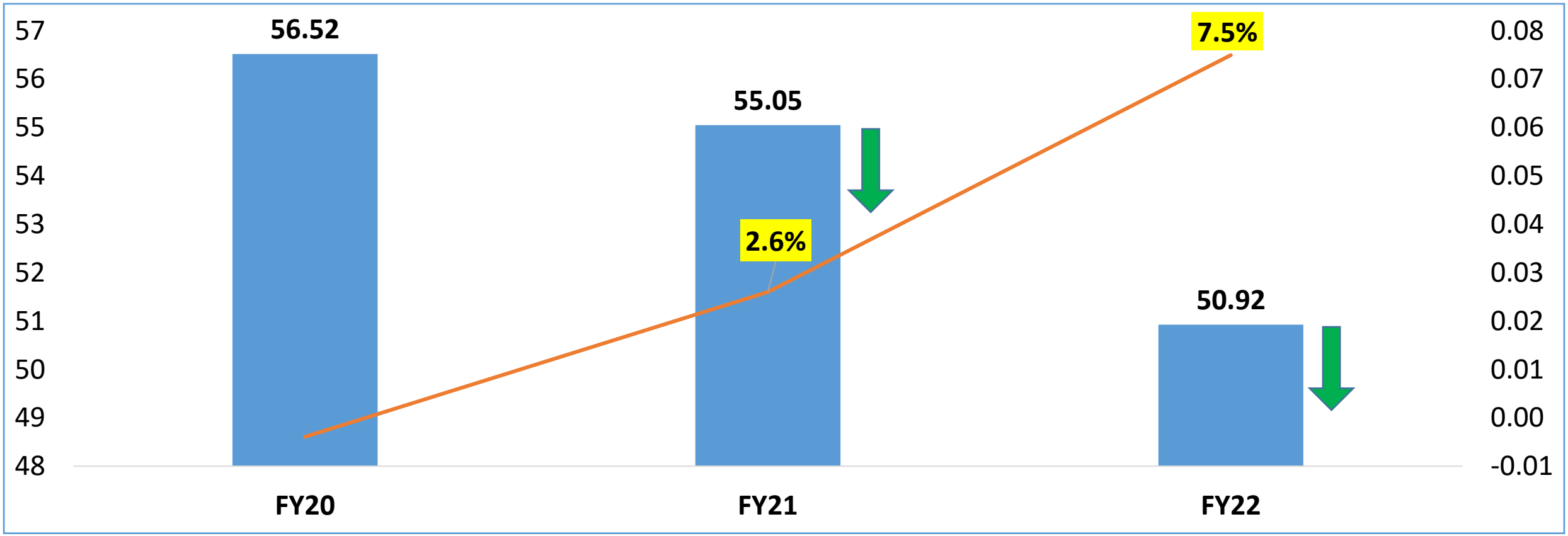
Technology / Specifications of Major Sections :-

5 Stage Preheater with ILC



Sl. No	Equipment / Area		Capacity
1	LS Stock Pile	Storage Capacity	56400 MT
		Active Capacity	40000 MT
2	LS Crusher (L&T)	Capacity	700 TPH
3	Re claimer	Capacity	450 TPH
4	Stacker	Capacity	850 TPH
5	Weigh feeder - Additive	Capacity	4-40 TPH
6	Weigh feeder - Lime stone	Capacity	31.5-315 TPH
7	Weigh feeder – Sand	Capacity	2-20 TPH
8	Raw Mill (VRM, Polysius)	15% Residue on 90 micron	285 TPH
		1.5% Residue on 212 micron	285 TPH
9	Raw Mill Silo	Storage capacity	4800 MT
10	Kiln Feed Elevator	Capacity	285 TPH
11	Kiln (TKIL)	Capacity	3400 TPD
12	Clinker bulk loading	Hopper Capacity	100 MT Each
		Telescopic Loading Spout	250 TPH
13	Coal Firing System - PC	Capacity	25 TPH
14	Coal Firing System – Kiln	Capacity	15 TPH
15	Coal Mill (VRM, Polysius)	15 % R on 90 micron	25 TPH
16	Clinker Silo	Storage capacity	Design :15000 MT Actual: 12500 MT

Specific Power Consumption in Trend (KWH/T of Clinker) :-

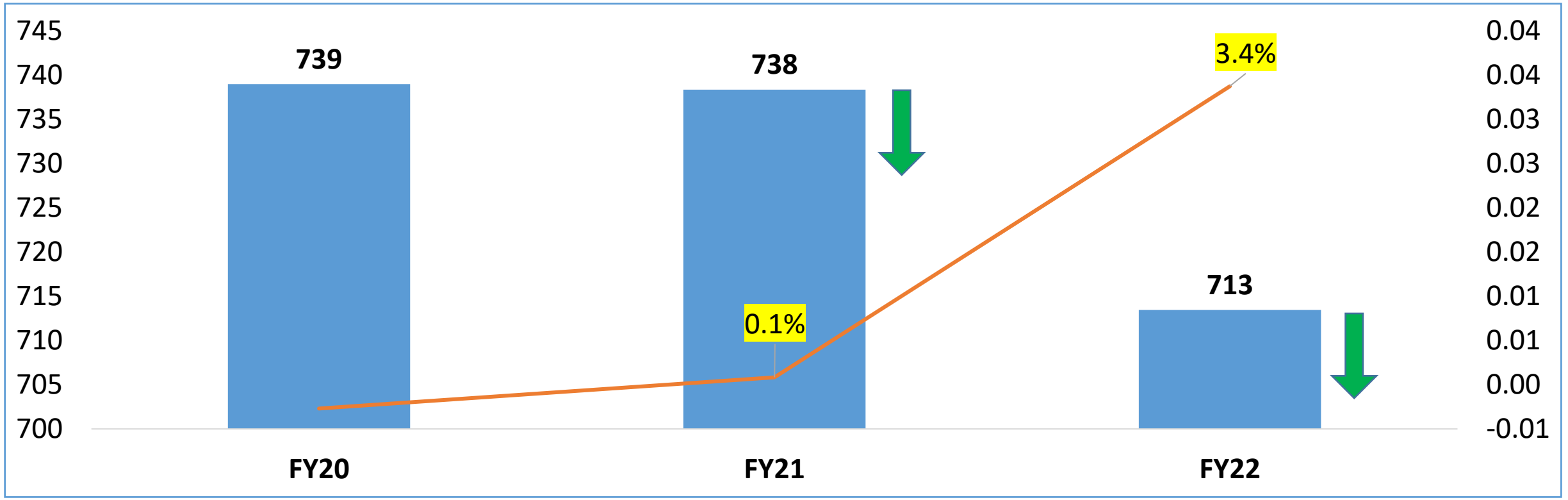


 # % of improvement is correspond to previous year

Major Initiative Executed :-

- ✓ High efficiency PH, RM, RABH and cooler Fan, CFD analysis & recommended modification in PH, RM, CM & RABH circuit.
- ✓ Start of New mines.

Specific Heat Consumption in Trend (Kcal/Kg of Clinker) :-

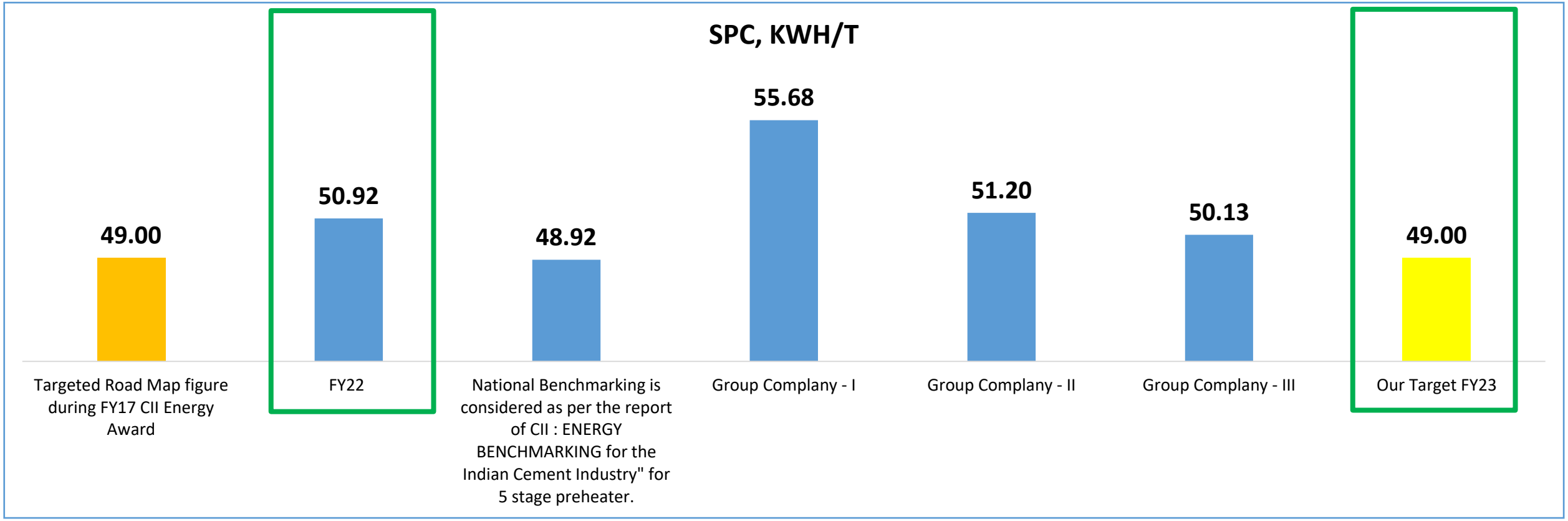


 # % of improvement is correspond to previous year

Major Initiative Executed :-

- ✓ Multicore at Coal firing as well as Kiln Feed , CBA for Lime Stone, Pyro jet Burner, Kiln inlet seal, CFD analysis & implementation of recommendation in PH circuit.
- ✓ Start of New mines.

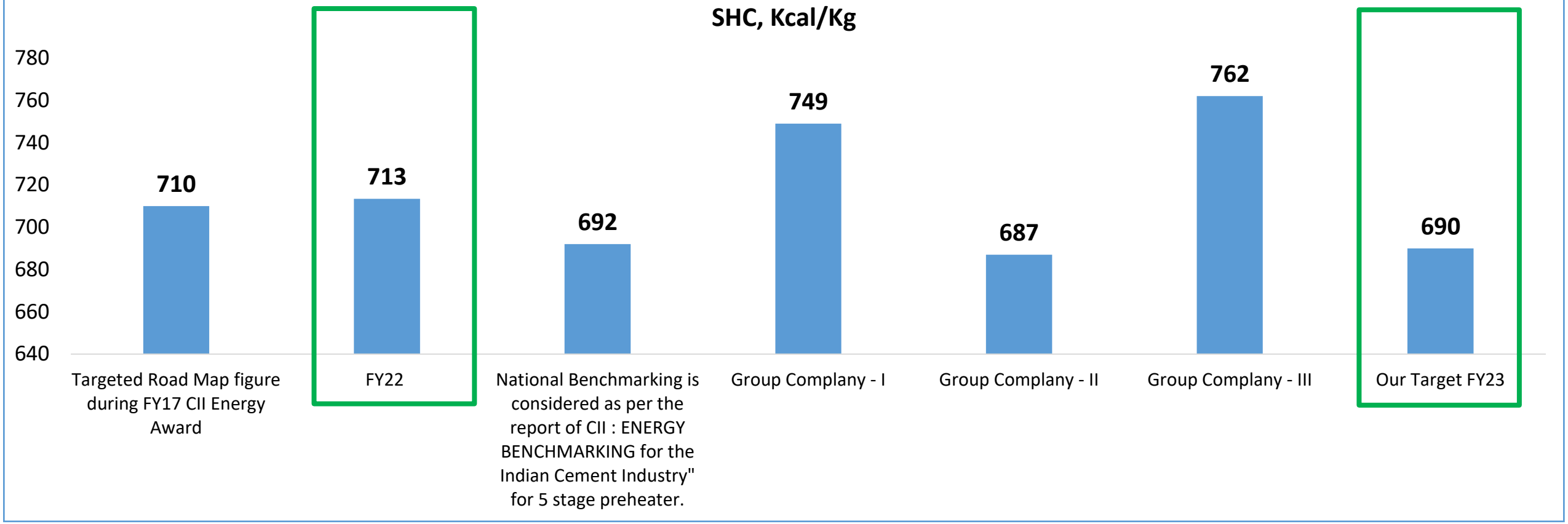
Internal & external Benchmarking :-



Major Initiative Planned for FY23 :-

- ✓ Installation of IKN pendulum cooler by replacing grate cooler.
- ✓ Coal Mill & Raw Mill Duct modification (Increase of Diameter) for enhancement of Productivity.

Road Map to achieve national / global benchmark :-



Major Initiative Planned for FY23 :-

- ✓ Installation of IKN pendulum cooler by replacing grate cooler (Expected Saving of 20 Kcal/kg) .
- ✓ Increase of Calciner Height.

Major Encon project planned during 2022-2023 :-

Sl.No	Description of Project	Saving on SPC, KWH/T	Saving on SHC, Kcal/Kg	Required for enhancement of Productivity	Expected Completion Date	Remarks
1	Installation of IKN Pendulum cooler (93 Sqm) by replacing Grate Cooler (65 Sqm)	0.6	15	Yes	Aug'22	Under execution
2	Increase of Calciner Height by 47 Meter (840 m3 to 1498 m3)	-	5	Yes	Aug'22	Under execution
3	Modification of Raw Mill Duct (Cyclone outlet to RM Fan inlet) by increasing of diameter from 3.1 meter to 3.5 meter	0.2	-	Yes	Aug'22	Under execution
4	Modification of Coal Mill Duct [Mill Outlet to BH inlet & BH outlet to Fan inlet] by increasing of diameter from 1.15 meter to 1.40 meter	-	-	Yes	Aug'22	Under execution
5	Capacity enhancement of Kiln Feed elevator from 240 TPH to 285 TPH	-	-	Yes	Aug'22	Under execution
6	Upgradation of Kiln main drive for higher RPM of 6.0	-	-	Yes	Aug'22	Under execution
7	Coal mixing arrangement with full portal system along with tipper car arrangement	-	-	Yes	Mar'23	All material ordered / Civil work is under progress
8	Installation & commissioning of 5 MWp Solar for Umrangso unit at our Lanka Grinding unit (70 KM from Umrangso plant) & wheeling of Solar power	-	-	-	Aug'22	Under commissioning
9	Installation & commissioning of 6.2 MW WHRS	-	-	-	Sep'22 Oct'22	AQC - By Sep'22 PH - By Oct'22
	Total	0.8	20			

✓ Investment (Sl no 1 to 7) – Rs 85 Crs, WHRS – Rs 108 Crs , Solar - Rs 20 Crs.

Energy Saving projects implemented During Last three years :-

Year	No of Energy Saving Projects	Investment (INR Million)	Electrical Saving (Million kWh)	Thermal savings (Million Kcal)	Savings (INR Million)	Impact on SEC (Electrical kWh/MT Clinker)	Impact on SEC (Thermal kcal/Kg Clinker)
FY 2019-20	4	2.6	0.6	0.0	3.9	0.7	0.0
FY 2020-21	8	16.3	2.5	7770.2	27.2	2.6	8.1
FY 2021-22	5	8.8	1.4	19343.3	36.6	1.3	17.8
Total	17	28	5	27114	68	4.6	26

 # Only Major Projects are included.

Major Project Executed During Last Three years :-

1. Installation of high efficiency PH, RM & RABH Fan.
2. CFD analysis at PH, RM & Coal Mill circuit and implementation of recommended modification.
3. Intelligent Flow Controller for Compress air.
4. Upgradation on Down Comer Water Spray.
5. VFD on Bag filer fans .
6. Upgradation of Burner pipe to Pyro jet burner.
7. Installation of Kiln outlet seal.

Innovative projects :- Reduction of Pressure Drop on Preheater Top Cyclone

Reduction of Pressure Drop on Preheater Top Cyclone :-

Preheater twin top cyclone was running at Higher pressure drop (160 mmwg) since commissioning of the plant during Apr'15. We did brain storming along with team and below mentioned actions were carried out : -

- Pressure & temperature are cross checked manually & found to be ok.
- Checked for any material accumulation/coating formation inside & found to be all clear.
- Gas velocity at cyclone measured/calculated & found to be on the higher side.

So, we decided to do a Computational Fluid Dynamics (CFD) study for top twin cyclone as well as down comer duct to identify root cause of high pressure drop.

Trigger for implementing the project :-

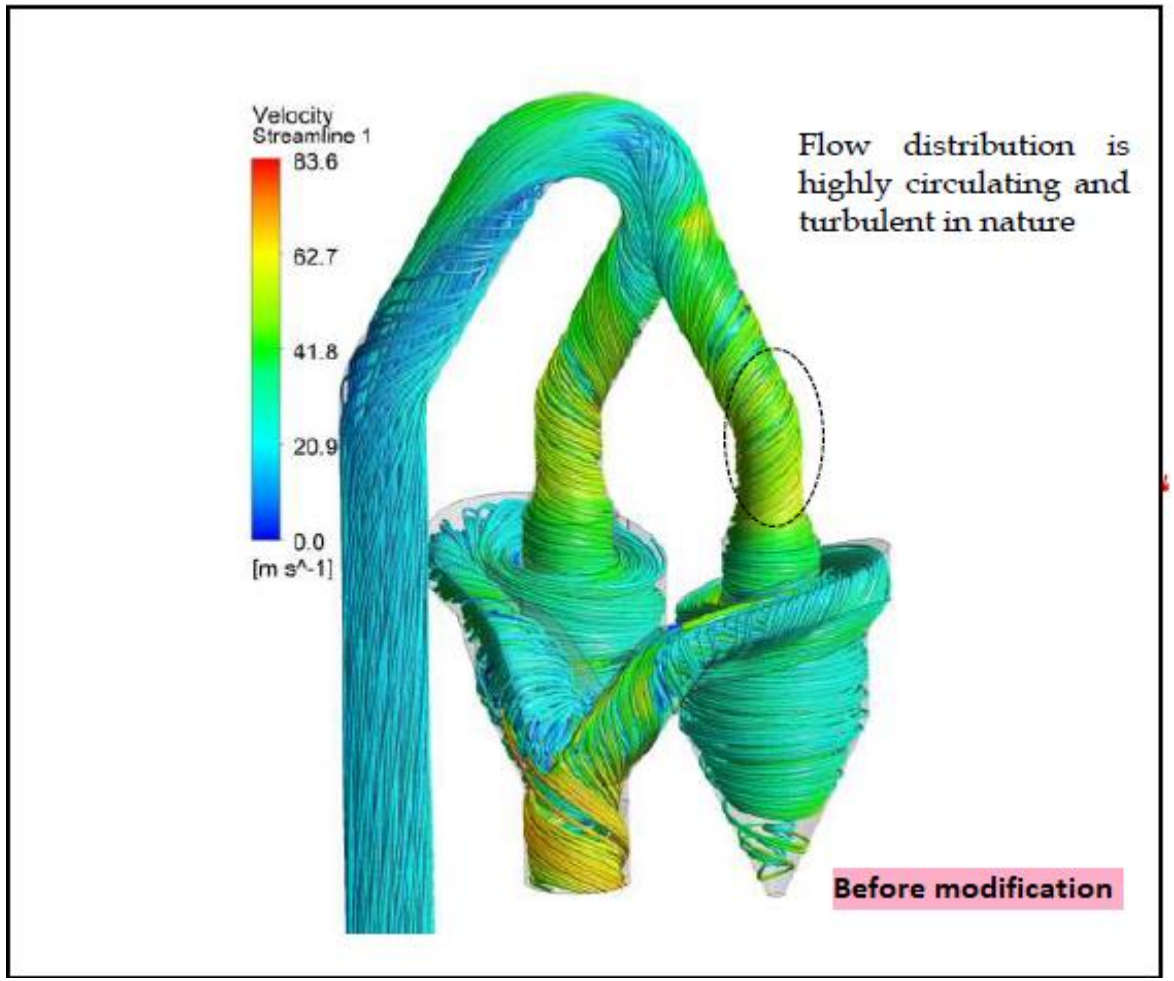
✓ Reduction in pressure drop at top cyclone.
✓ Improvement of heat transfer at top cyclone.
✓ Reduction on Specific Power Consumption of Preheater Fan.
✓ Reduction of specific heat consumption.

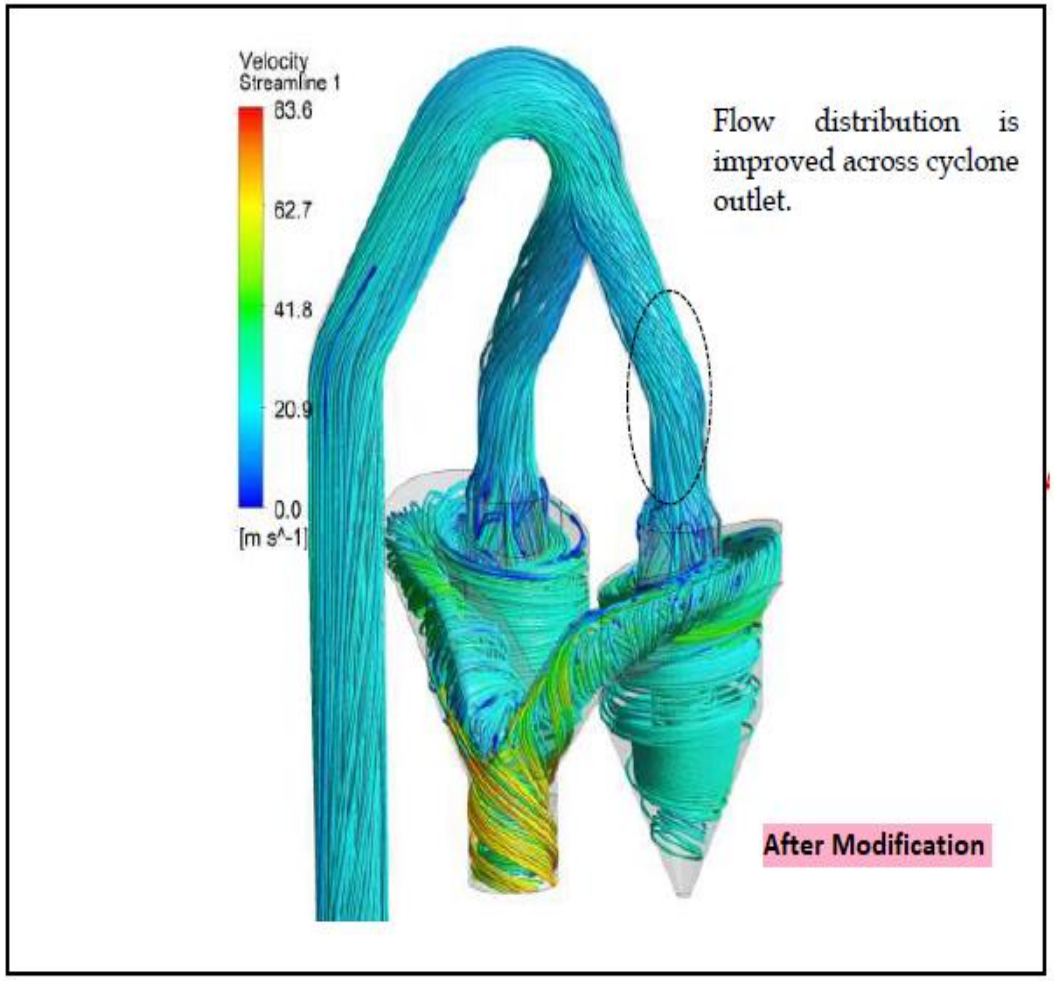
Improvement :-

✓ Reduction of Pressure drop by 40 mmwg (From 160 mmwg to 120 mmwg.)
✓ Reduction of PH fan specific heat consumption by 0.44 KWH/T of clinker.
✓ No visible improvement observed in heat transfer.

Innovative projects :-

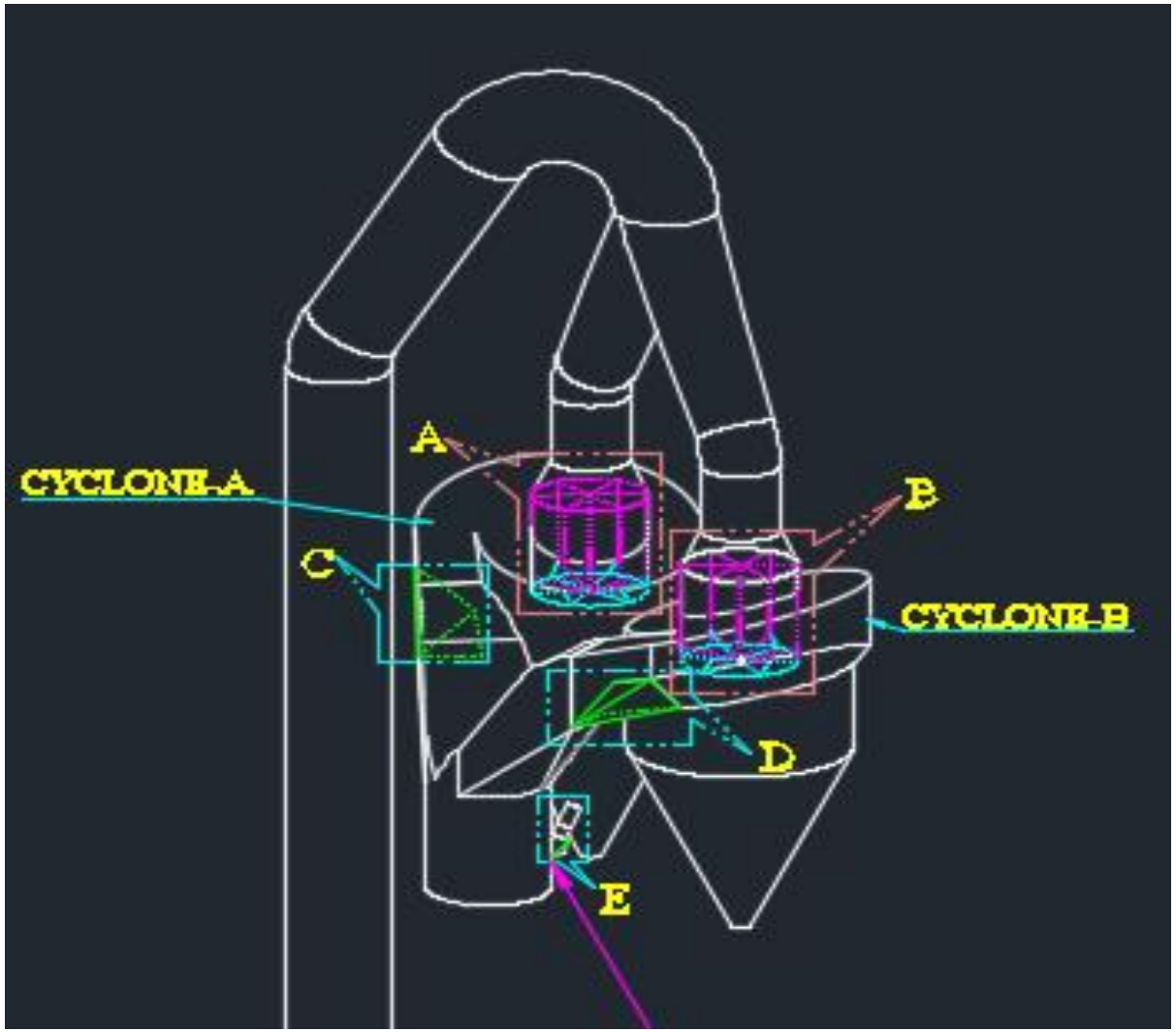
CFD Results :-

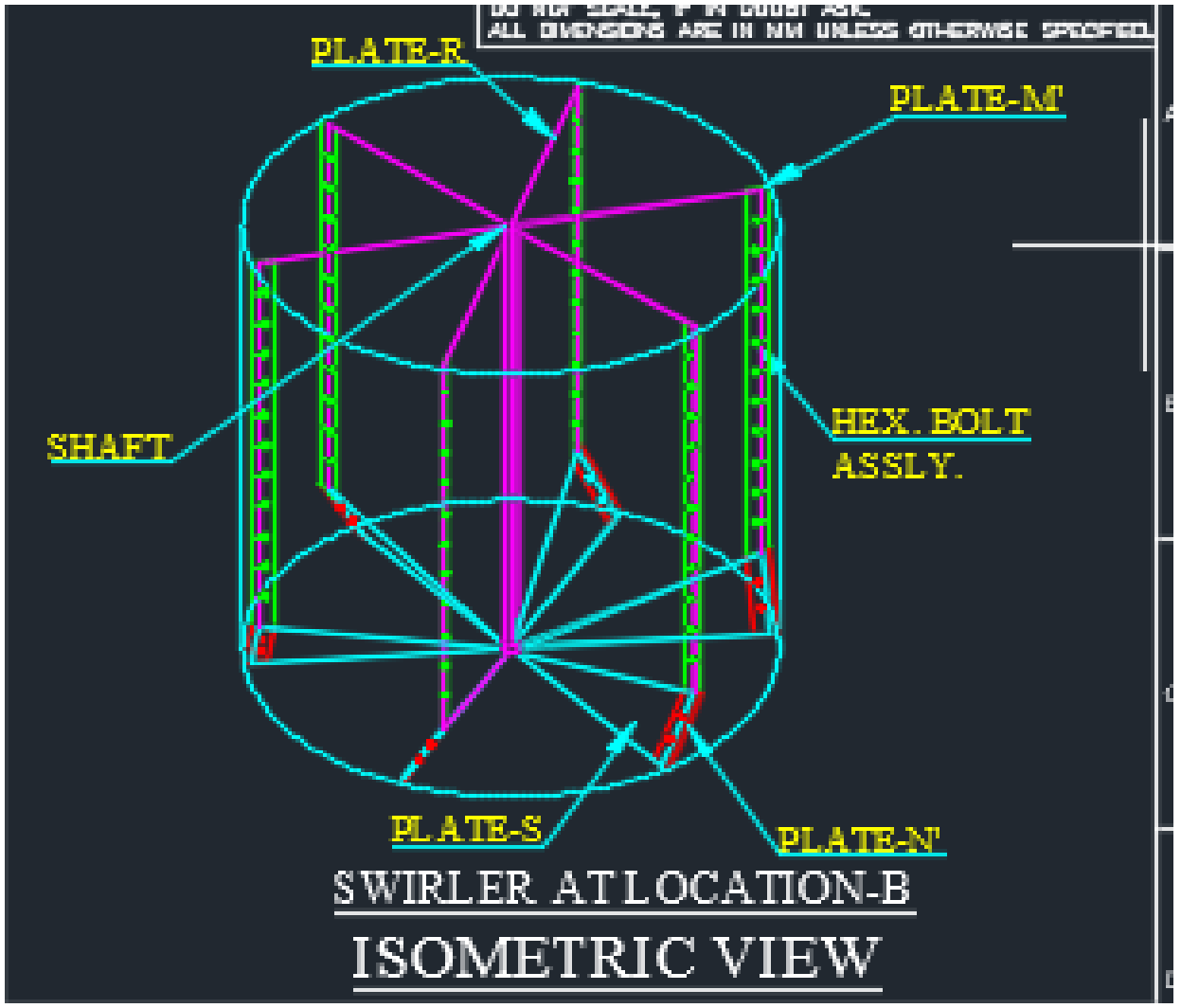




Innovative projects :-

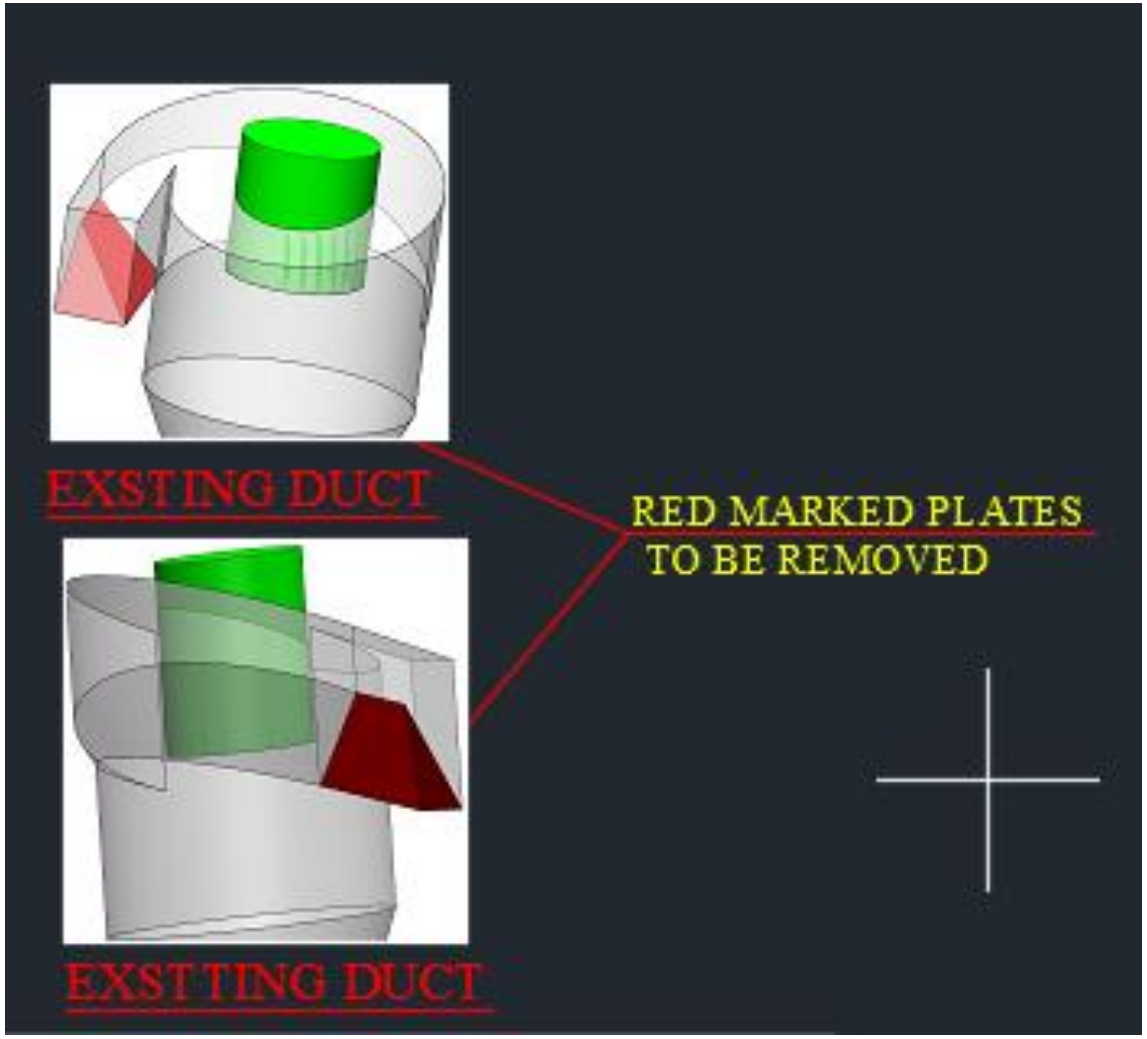
Modification carried out :-





Innovative projects :-

Modification carried out :-



Major Modification Carried out:-

1. Modification in cyclone inlet to increase area.

2. Providing Swirler plates in riser ducts.

3. Baffle plates installed in DC duct bend portion.

Utilization of renewable Energy Source :-

- Till now we have installed only solar lights plant as well as on CSR activities & no such major work carried out for renewable Energy. However we are under execution of WHRS & Solar as mentioned below :-
  - ✓ 6.2 MW WHRS is under execution & expected completion by Sep'22 /Oct'22.
  - ✓ 20 MWp off site Solar installed at out nearby grinding unit & we are getting power from Jul'22 onwards.
- RPO Obligation - Net shortfall as on Jun'22 : 1087 MWH (Solar)

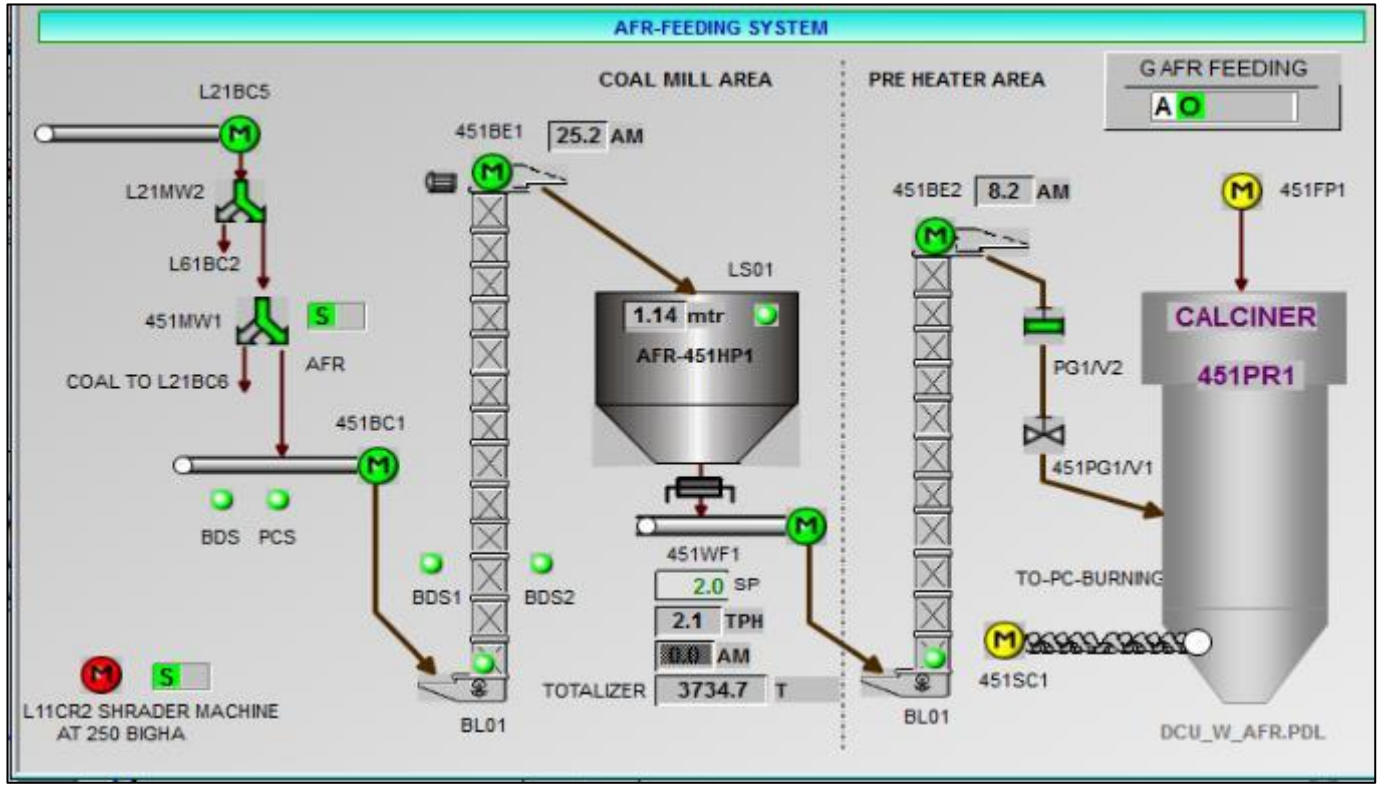
Waste Utilization and Management :-

Sl.No	Water as fuel	Quantity in KMT				GCV, Kcal/kg			TSR %		
		FY 19-20	FY 20-21	FY 21-22	**Total**	FY 19-20	FY 20-21	FY 21-22	FY 19-20	FY 20-21	FY 21-22
1	Saw Dust	1.81	3.75	2.76	**8.32**	2829	2126	2101	0.65	1.12	0.75
2	Fire Wood	0.94	0.08		**1.02**	3261	3392		0.39	0.04	-
3	Sugercane Bugasse			0.60	**0.60**			3262	-	-	0.25
4	Plastic Waste	0.37	1.02	0.43	**1.81**	4494	4458	4430	0.21	0.64	0.24
5	RDF			0.16	**0.16**			1919	-	-	0.04
6	Bamboo Dust	0.46	0.45		**0.91**	3247	3228		0.19	0.21	-
7	HDPE Mtrl		0.03	0.02	**0.05**		5748	5040	-	0.02	0.02
8	Bamboo	0.73	0.01		**0.74**	3323	3392		0.31	0.01	-
9	Herbal Waste	0.11			**0.11**	2926			0.04	-	-
10	Fly Ash Bags	0.43			**0.43**	1670			0.09	-	-
11	Pharma Waste		0.29	0.78	**1.06**		3085	2751	-	0.12	0.27
12	Carbon Black	0.02	0.56	0.37	**0.95**	6694	6622	6594	0.02	0.52	0.31
13	Rice husk		0.13	0.00	**0.13**		2407	2797	-	0.04	0.00
14	Dry Coke 2		0.01		**0.01**		4582		-	0.01	-
15	Dry Coke 1		0.01		**0.01**		4440		-	0.01	-
16	Ink Waste/Nitrocellulose		0.03	0.01	**0.03**		6556	6541	-	0.02	0.01
17	Edible Product		0.04	0.09	**0.13**		3037	2898	-	0.02	0.03
18	Sludge		0.05	0.21	**0.27**		752	587	-	0.01	0.02
19	BBD Liquid			0.01	**0.01**			5369	-	-	0.00
20	Spent Charcoal		0.01		**0.01**		2071		-	0.00	-
21	Prcsorgresl			0.00	**0.00**			5751	-	-	0.00
22	Oilsoak Cotton Waste			0.01	**0.01**			3095	-	-	0.00
23	Spent Addditives		0.01	0.01	**0.02**		2141	4017	-	0.00	0.00
	Overall	**4.87**	**6.48**	**5.43**	**16.77**	**3071**	**3060**	**2784**	**1.89**	**2.79**	**1.95**

Major Infrastructure of AFR :-

1. Covered Shed & storage area
2. Wood Shredder Machine – 5 TPH
3. Bamboo Shredder Machine – 5 TPH
4. Plastic Shredder Machine – 5 TPH
5. Plastic/RDF Shredder Machine – 20 TPH
6. Feeding System through hoist at PH.

Waste Utilization and Management :-

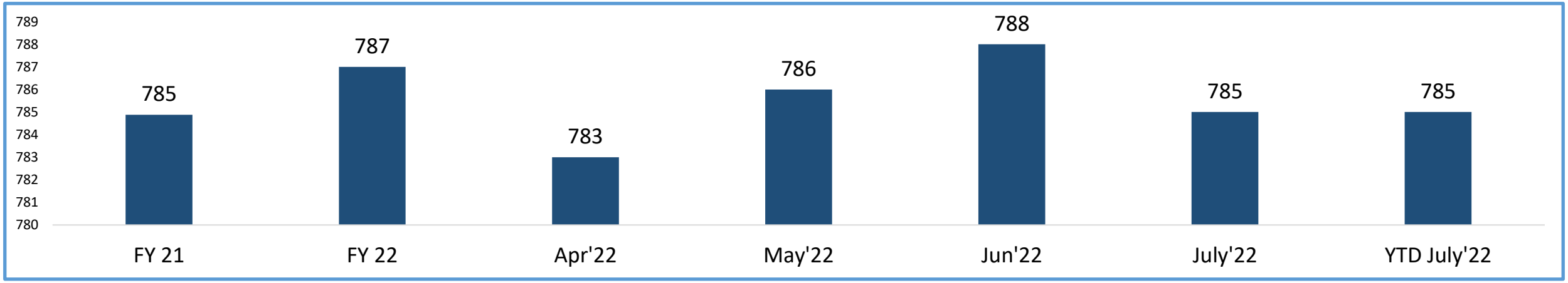


Proposed upgradation of AFR infra:-

- Full fledged feeding system for higher TSR % – Capex under finalization & Study and preparation of drawing completed.
- Increase of Calciner height – Under execution.

GHG Inventorization :-

CO2 Emission (Kg/MT of Clinker)							
Unit / Company	FY 21	FY 22	Apr'22	May'22	Jun'22	July'22	YTD July'22
USO	785	787	783	786	788	785	785



Action Plan for Reduction of CO2 Emission :-

- ✓ Increase of AFR usages from 2~5 % to 20~25 %
- ✓ Increase usage of Bio Diesel at Mines as well as Raw Material Handling Equipment.
- ✓ Higher Usage of Solar Power (5 MWP commissioned & 200 MWp under initial planning).
- ✓ Bio Diversity Park.
- ✓ Bamboo plantation all around plant villages.

GHG Inventorization :-

Bamboo Plantation At Nearby Villages

- ✓ Approx. 65000 Nos of Bamboo Sampling Planted at nearby villages covering 145 Ha (Total House Hold – 326 Nos from 13 Villages).
- ✓ We shall be using these Bamboo as AFR after 2~3 years.
- ✓ This will be a WIN WIN situation for villagers as well as us & improve local farmers income.

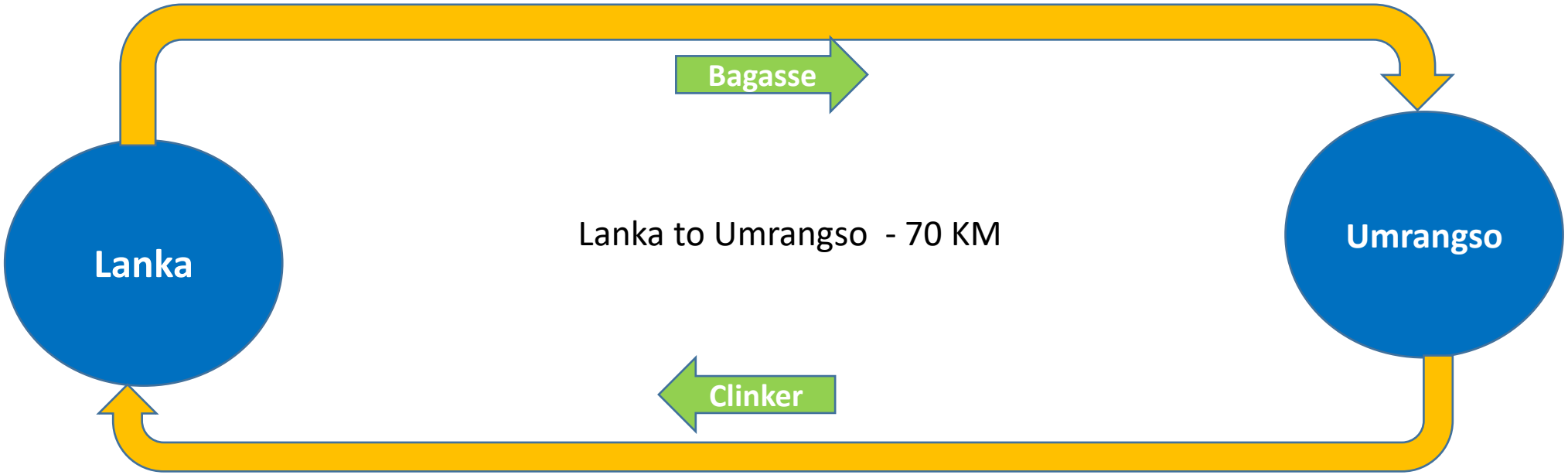
Green Supply Chain Management :-

Executed Project :-

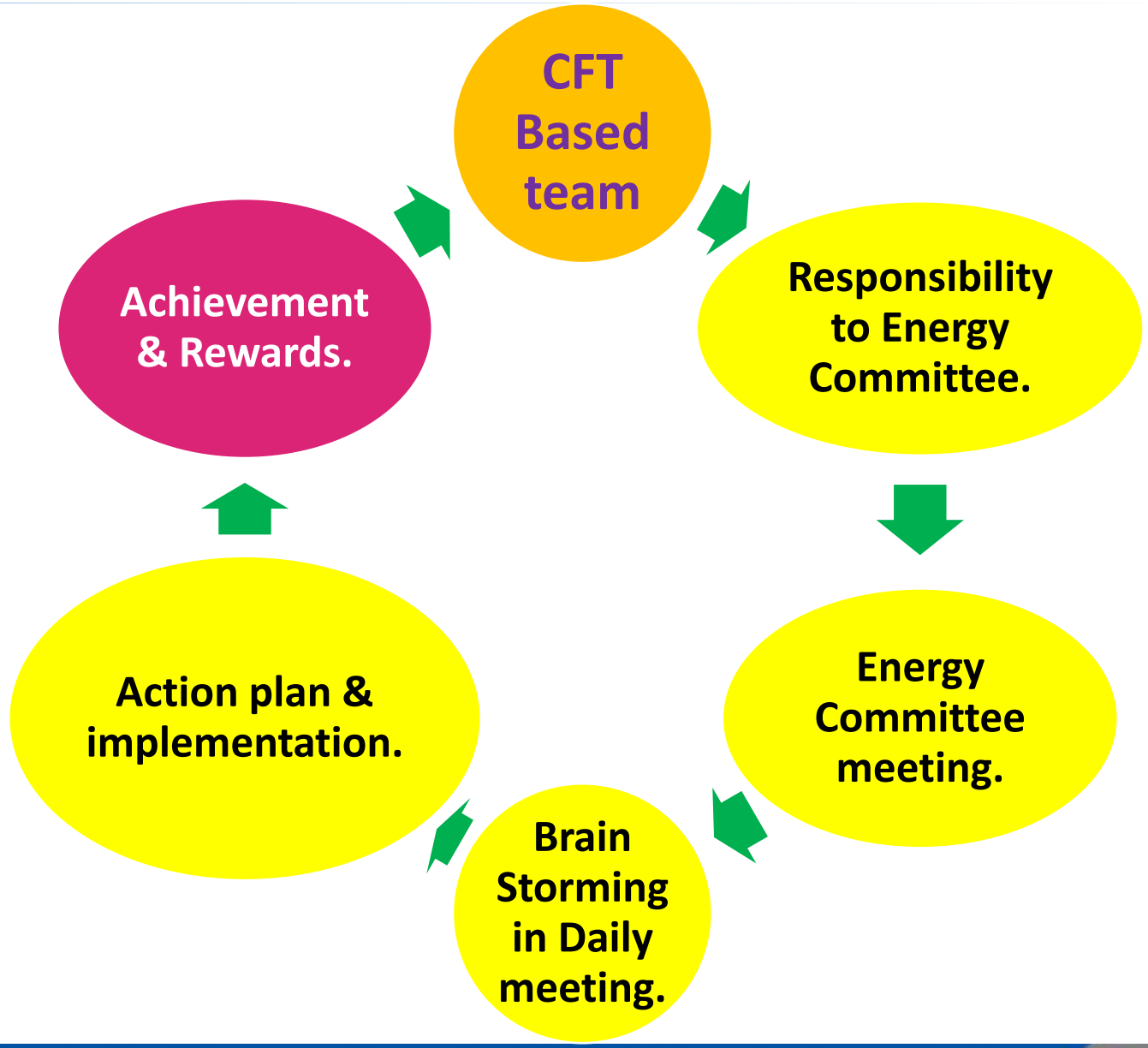
- Clinker carrying vehicles to our grinding unit are being used for transportation of Bagasse on return load.
- During FY21-22, we have executed 211 Trips on return load (2221 MT of material).

Upcoming Project which are under discussion :-

- Usages of coal trucks for supply of Clinker on return load.



Team Work, Employee Involvement & Monitoring :-



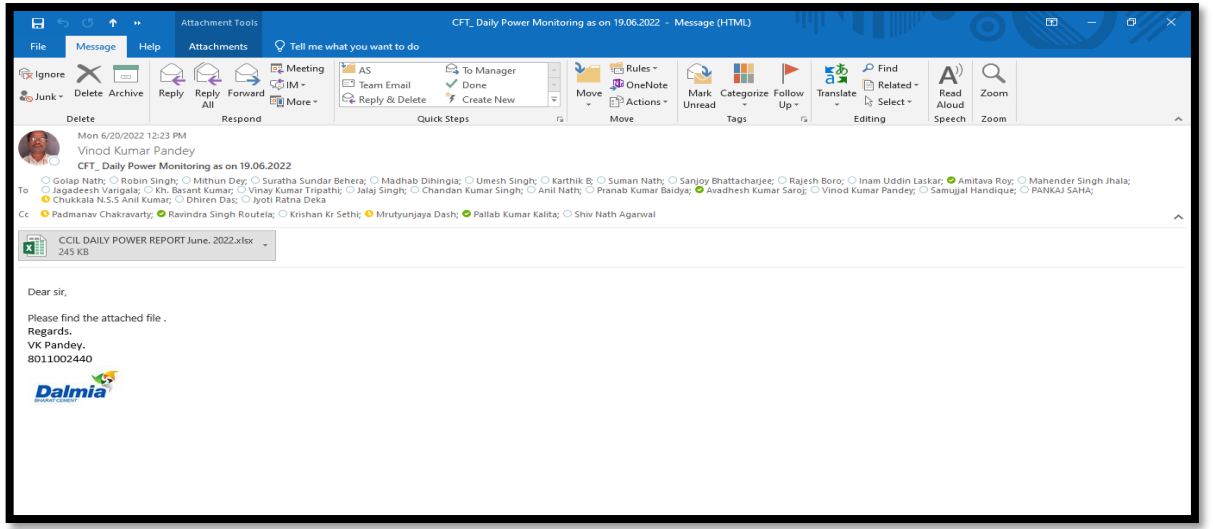
Team Work, Employee Involvement & Monitoring :-

- Daily power consumption report circulation (Drive Wise) to all concern.
- Daily review of power consumption detail during production meeting chaired by Unit Head.
- Energy committee meeting & review.
- Daily Circulation of Specific power consumption to all concern along with historical data.
- Idea collection through drop box, review & implementation.
- Energy audit (Internal & external).
- Onsite & off site training as per training calendar.
- Approval of capex/opex on priority for all Energy Saving project / initiatives.

Team Work, Employee Involvement & Monitoring :-

	KWH	Avg KW	Running Hrs	Production	SPC, KWH/T of Material	SPC, KWH/T of Clinker
ASEB	**191500**					
KILN						
Kiln Main Drive(400KW)	8608	359		3330	2.58	2.58
PH FAN (1260KW)	24595	1025		3330	7.39	7.39
RABH FAN (725KW)	8520	355		3330	2.56	2.56
COOLER FAN (1329KW)	16232	676		3330	4.87	4.87
AUX	18720	780		3330	5.62	5.62
TOTAL KILN POWER	**76675**		**24.00**	**3330**	**23.03**	**23.03**
RAW MILL						
Raw mill main motor drive (2500KW)	38152	2035		5409	7.05	10.58
Raw mill fan motor drive (2100KW)	38560	2057		5409	7.13	10.69
Raw Mill separator (120KW)	1609	86		5409	0.30	0.45
AUX	9378	500		5409	1.73	2.60
TOTAL RAWMILL POWER	**87699**		**18.75**	**5409**	**16.21**	**24.32**
COALMILL						
Coal Consumption				449		
COAL MILL MAIN DRIVE (410KW)	6068	345		460	13.19	1.78
COAL MILL FAN DRIVE (350KW)	6041	344		460	13.13	1.77
AUX	2311	132		460	5.02	0.68
TOTAL COALMILL POWER	**14420**		**17.57**	**460**	**31.35**	**4.23**
CRUSHER						
Crusher Main Drive (840KW)	3185	422		6171	0.52	0.70
AUX	1834	243		6171	0.30	0.40
TOTAL CRUSHER POWER	**5019**		**7.55**	**6171**	**0.81**	**1.10**

Sample



Awareness Rally :-

Implementation of ISO 50001 :-

intertek
Total Quality. Assured.

CERTIFICATE
OF REGISTRATION

This is to certify that the management system of:

Calcom Cement India Limited

Main Site: 16 KM, Jamunanagar, Umrongso-788931, Assam, India

has been registered by Intertek as conforming to the requirements of:

DIN EN ISO 50001:2018

The management system is applicable to:

Manufacturing of Cement Clinker

The EnMS covers all energy consumed by the company.

Certificate Number:
2021-0116858

Initial Certification Date:
13 August 2021

Date of Certification Decision:
13 August 2021

Issuing Date:
13 August 2021

Valid Until:
12 August 2024

DAkkS
Deutsche Akkreditierungsstelle
D-ZM-16055-01-00

Calin Moldovean
President, Business Assurance

Intertek Certification GmbH, Marie-Bernays-Ring 19a, 41199 Mönchengladbach, Germany

Intertek Certification GmbH is a DAkkS accredited Certification Body with accreditation no. D-ZM-16055-01-00

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CCIL-USO	ENERGY MANAGEMENT MANUAL	ISSUE NO.	CCIL/EnMS/F63-01
TITLE	ELECTRICAL ENERGY REVIEW REPORT	REVISION NO	00
		DATE	1/11/2019
SECTION NO	EnM : ERR	PAGE NO.	Page 1 of 15

ENERGY MANAGEMENT TEAM

Sl No.	Name	Function	Responsibilities
1	Ravindra Singh Routela, Chairman, EnMS Team	Technical Head	Policy making
			To provide necessary resources
			To support the implementation and coordinate
2	Golap Nath- MR: IMS	Process	To support the implementation and coordinate
			Promote awareness among the employees
			To report to Top management
3	Mrutyunjaya Dash - Team Leader	Electrical & Instrumentation	To conduct energy review in the sections
			To implement energy objectives and targets
			To report to Top management
4	K K Sethi, Team Member	Mechanical	To conduct energy review in the sections
			To implement energy objectives and targets
			Coordination with Team Leader (TL)
5	Pallab Kumar Kalita, Team Member	Operation	To review on the objectives & targets
			Promote awareness among the employees
			To report to Top management
6	Amitava Roy, Team Member	Quality Control	To review on the compliance of rules/act
			Promote awareness among the employees
			Coordination with Team Leader (TL)
7	Arun Kumar, Team Member	Commercial	To procure material keeping in view of the Energy policy
			Promote awareness among the employees
			Coordination with Team Leader (TL)

- Identification of Key initiatives for Energy Consumption.
- Regular review at site team & audit (Internal & External).
- Implementation & reward.

Learning from CII Energy Award or any other award program :-

- ✓ Installation of temperature sensor at Cooling tower.
- ✓ FRB fan blades for Kiln shell cooling fan.
- ✓ Interlocking of Shell cooling fan with Kiln shell temperature.
- ✓ HR Paint inside Calciner to get saving on heat consumption.
- ✓ Water spray Nozzle upgradation in PH down comer water spray.
- ✓ Intelligent Flow Controller to maintain compressed air pressure.
- ✓ Removal of louver damper from Fans – Cooler fan.
- ✓ Installation of Belt tear monitoring arrangement.

Award, acknowledgement & major achievement :-

National Award “ENERGY EFFICIENT UNIT” on 2017

5S “Gold Award from QCFI” on 2018

5S “Platinum Award from ABK AOTS” - Sustenance on 2019

5S “Platinum Award from QCFI” on 2019

5S “Platinum Award from ABK AOTS” on 2018

Mines Environment & Mineral Conservation Week 2018-19
IBM North East Region

Award, acknowledgement & major achievement :-

CSR Activity :-

CSR Activities : -

Observations by NABARD :

Amount Sanctioned	: 237.98 Lakhs
Rating	: Excellent
Average Survival Rate	: 86%
Family Covered	: 500 Nos
Area Covered	: 500 Acres

Thank You