CII National Award for Excellence in Energy Management
Ambuja Cement Ltd., Nalagarh

Presented By:

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Team Members:

Gian Chand (P&QC)

Deepak Dhiman (E&I)

Vision: *To be the most sustainable and competitive company in our industry*

Presentation Contents/Take away

- Company Profile
- Plant Profile & Major Process Equipment
- H&S Performance and Awards & certification
- Specific Energy Consumption figures & Comparison with Competitors
- Project Implementation methodologies.
- Status of Last three years Energy Conservation Projects
- Major Energy conservation projects planned in 2022-23
- Major site issues having potential of energy saving
- Innovative projects
- GHG Initiatives

Company Profile

- Ambuja Cements Ltd, a part of the global conglomerate `Holcim.
- Total cement capacity of 29.65 million tonnes.(05 IPs and 08 GUs).
- Cement Products: OPC, PPC, Kawach & Ambuja Plus Roof Special
- Certified **five times water positive.**
- 3.5 times plastic negative, by burning as much as over 1.26 Lakh tonnes of plastic waste in its kilns.
- Company generates 6.5% of its energy from renewable resources.
- CSR arm ACF(Ambuja Cement Foundation) with presence in 21 locations spread across 11 states..

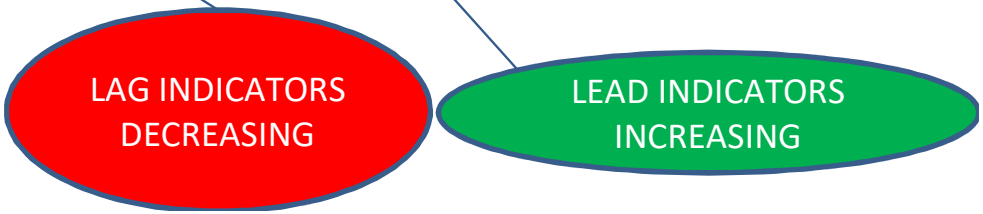
Plant Profile

- A Grinding Unit situated in Nalagarh, Himachal Pradesh (India) at an altitude of 334 mtr. Commissioned in March'2010.
- Plant rated capacity is 1.50 Million Ton per annum.
- VRM : Make Loesche -LM56.3+3C; Capacity 250TPH.
- Classifier; Make Loesche –LSKS 102 CS r.
- Bag House: Make Redycam; Designed Flow 869000 M3 /hr; Dust Loading 348 gm/M3;
- Packer: Make EEL; Two Nos; 16 Spouts double discharge 240 TPH each.
- Plant connected load :15MW; Contract Demand: 8.6MVA
- First cement plant in India certified as ISO 50001-2011.

Health & Safety Performance

LEAD INDICATORS			
	2019	2020	2021
Near Miss	31	43	58
Hazard	812	1196	1226
SOT	568	916	1120
LAG INDICATORS			
Fatality	0	0	0
LTIFR	0	2.69	0
LTI	0	1	0
MTI	0	0	1
First Aid	0	4	1

LTIFR : LTI Frequency Rate (*per million man hrs*)
LTI : Lost Time Injury
MTI : Medical Treatment Injury
*** Indicates offsite incident**



Awards & Certifications

CII Green Tech Award for Water Positive

CII CSR

CII Award for Excellence in Energy Management

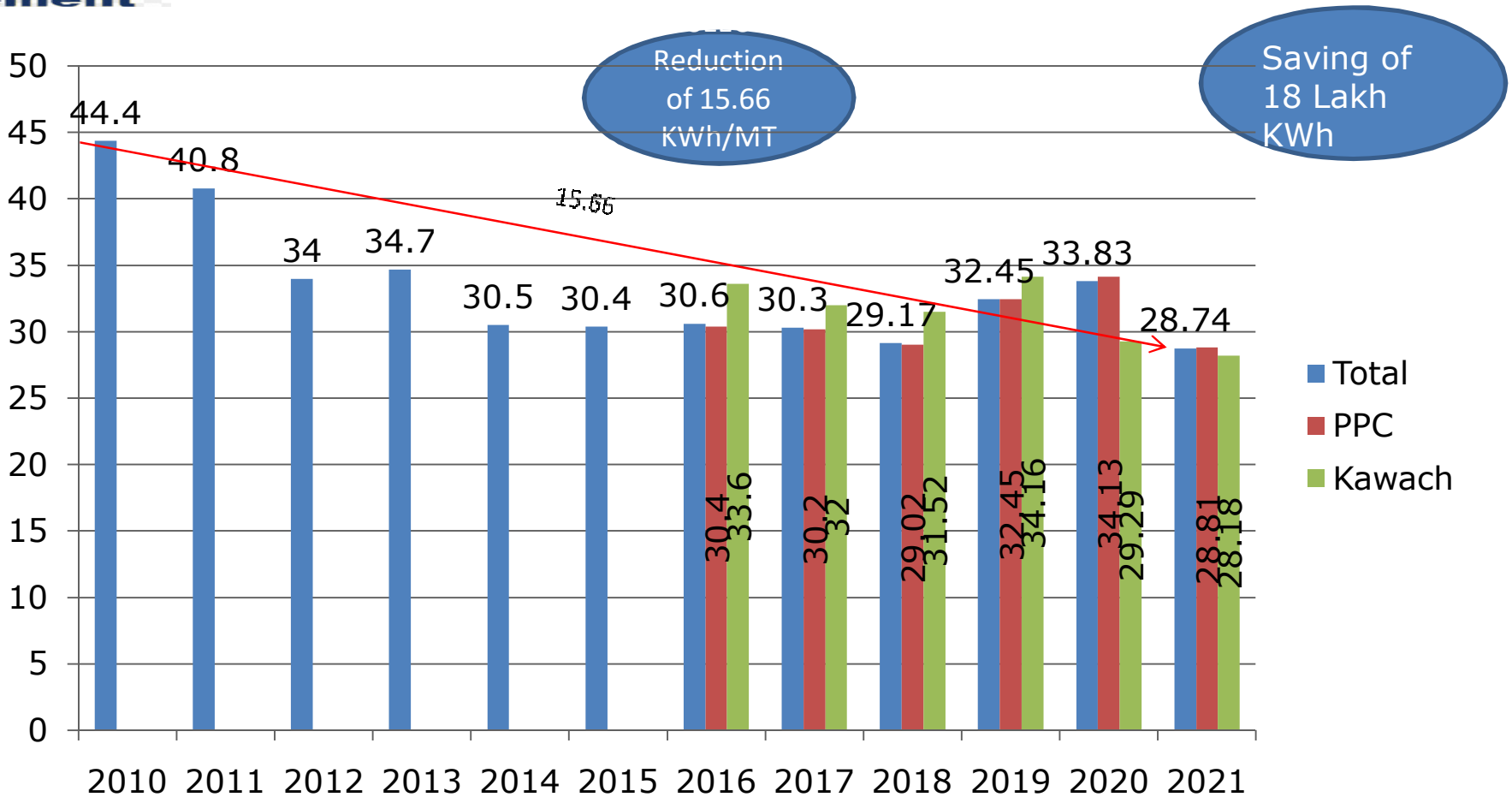
Best Plant Performance Award-ACL

Cement Budget Champion Award-ACL

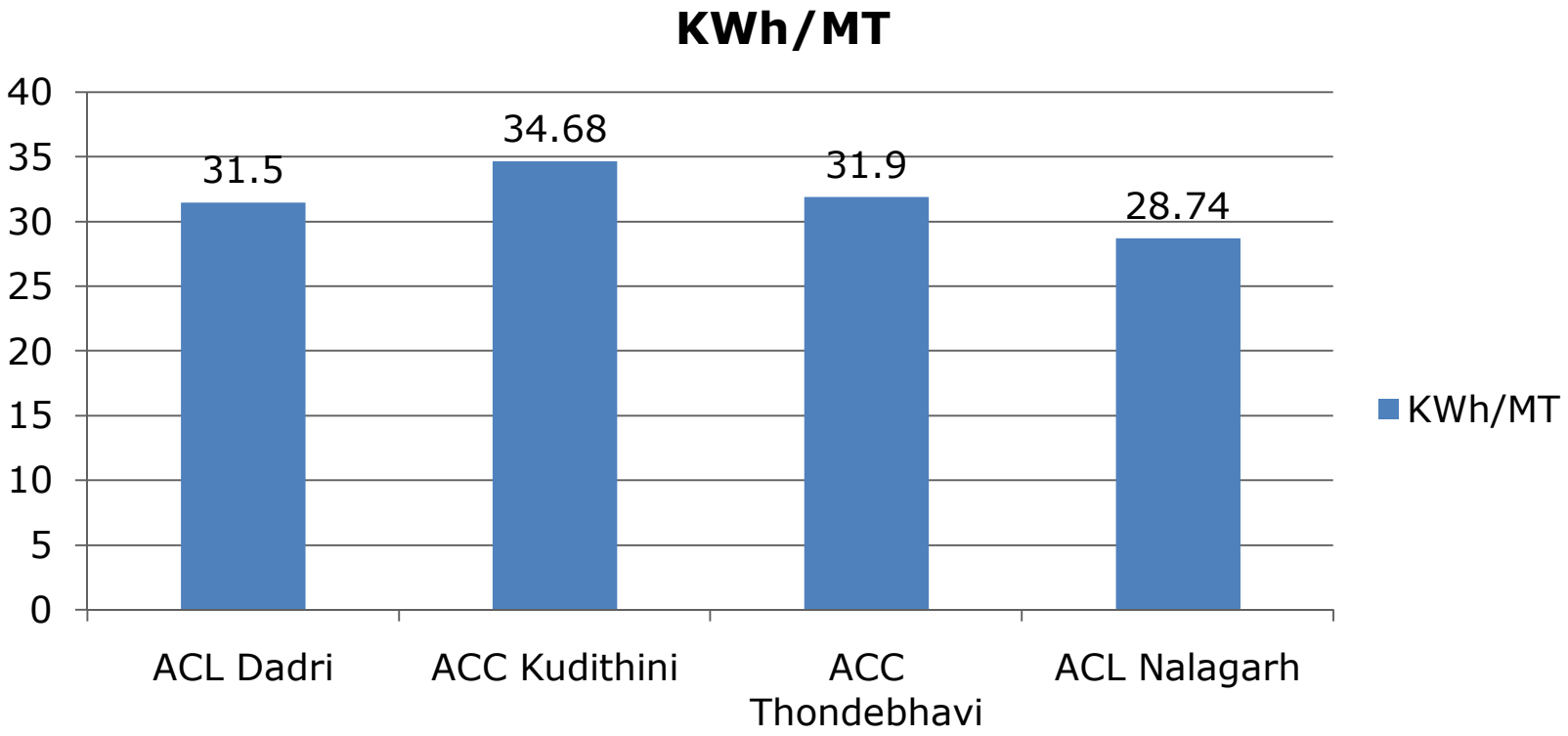
"Most Clean" Unit Award-ACL

-OHSAS 18001:2007 ; QMS (ISO 9001:2008),
-EMS (ISO 14001:2004); EnMS (ISO 50001:2011)

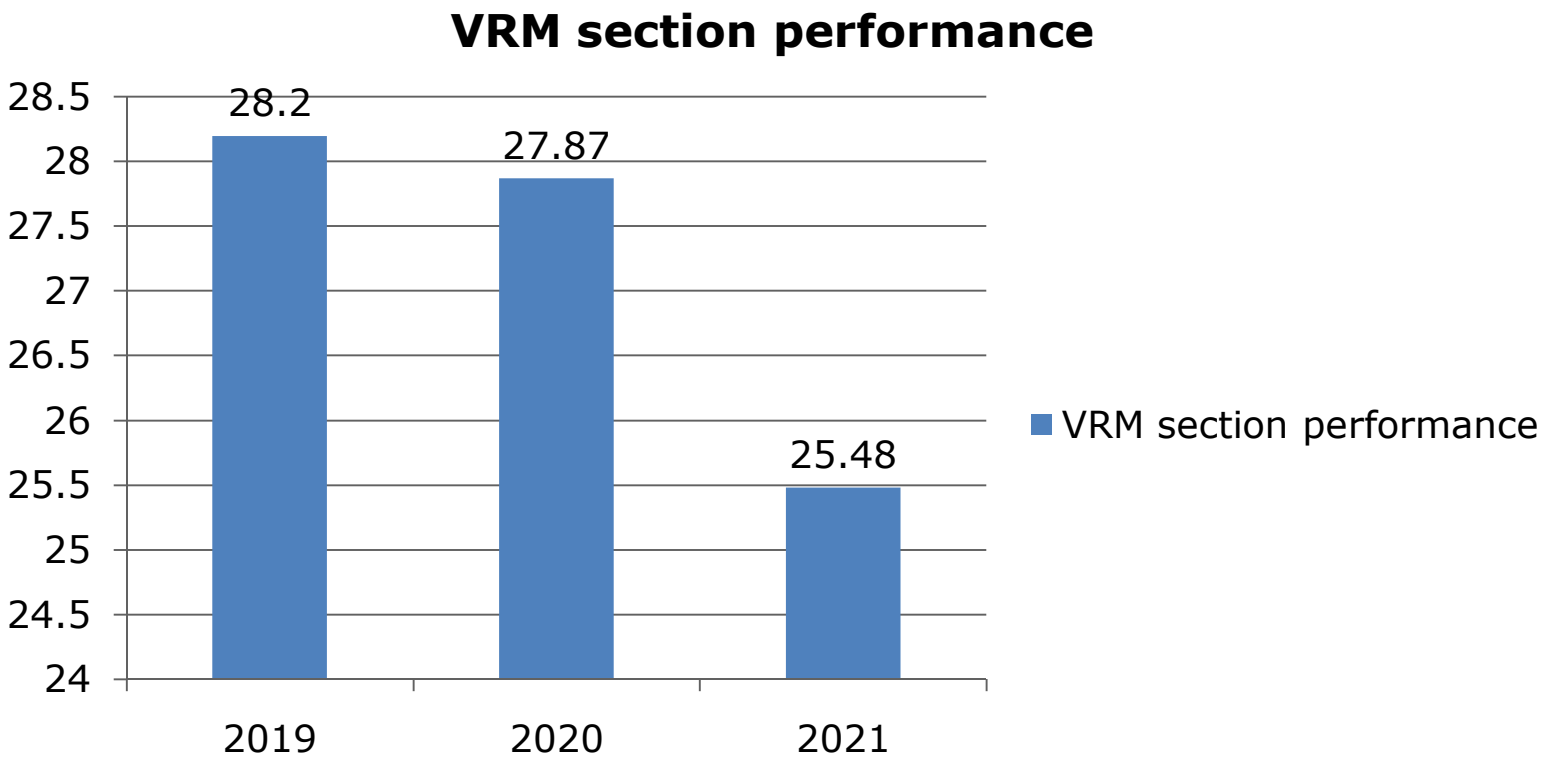
Reduction in Specific Electrical Energy Consumption figures



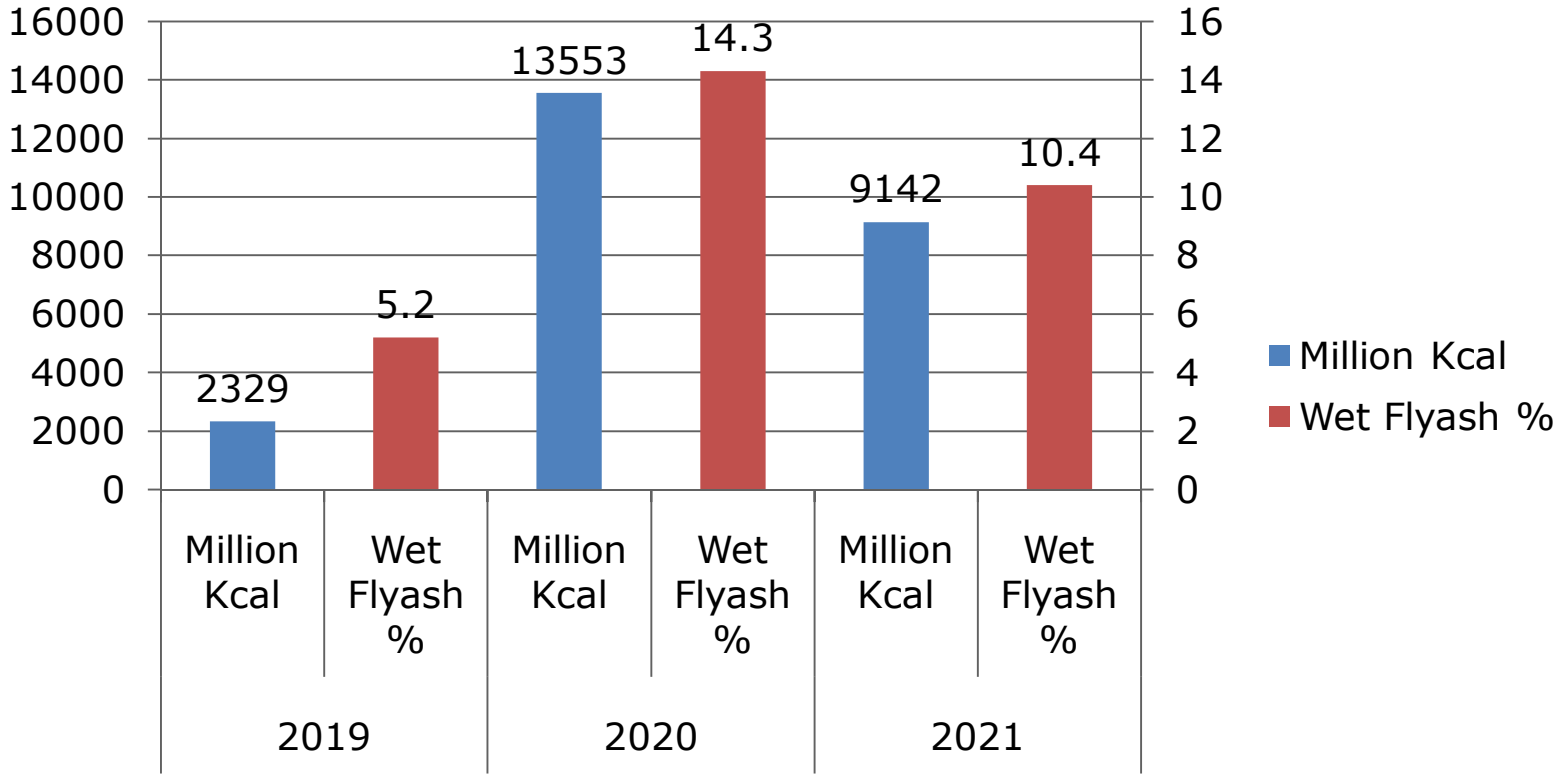
SEEC Benchmarking with peers



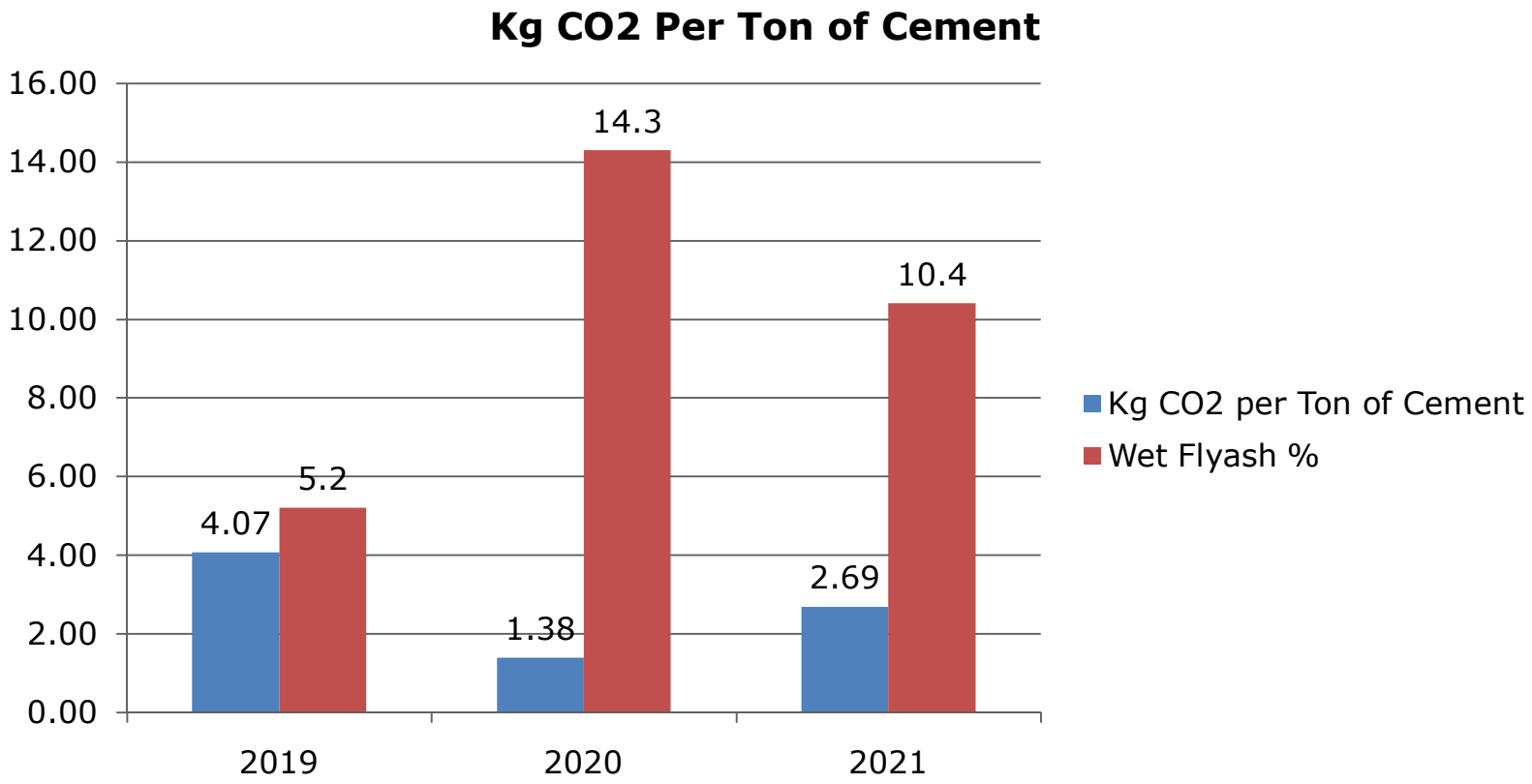
VRM Section Performance



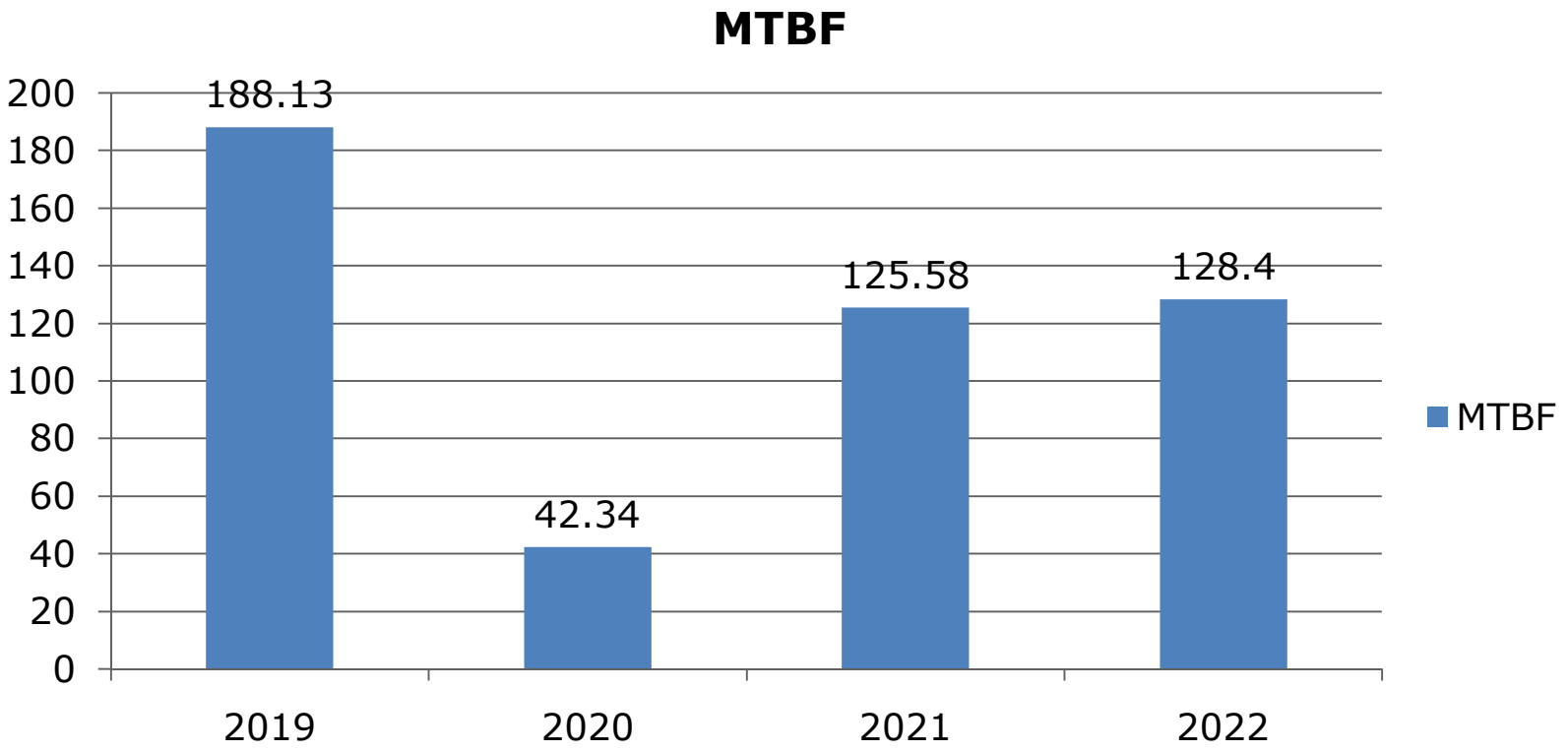
Specific Energy(Thermal) Consumption figures



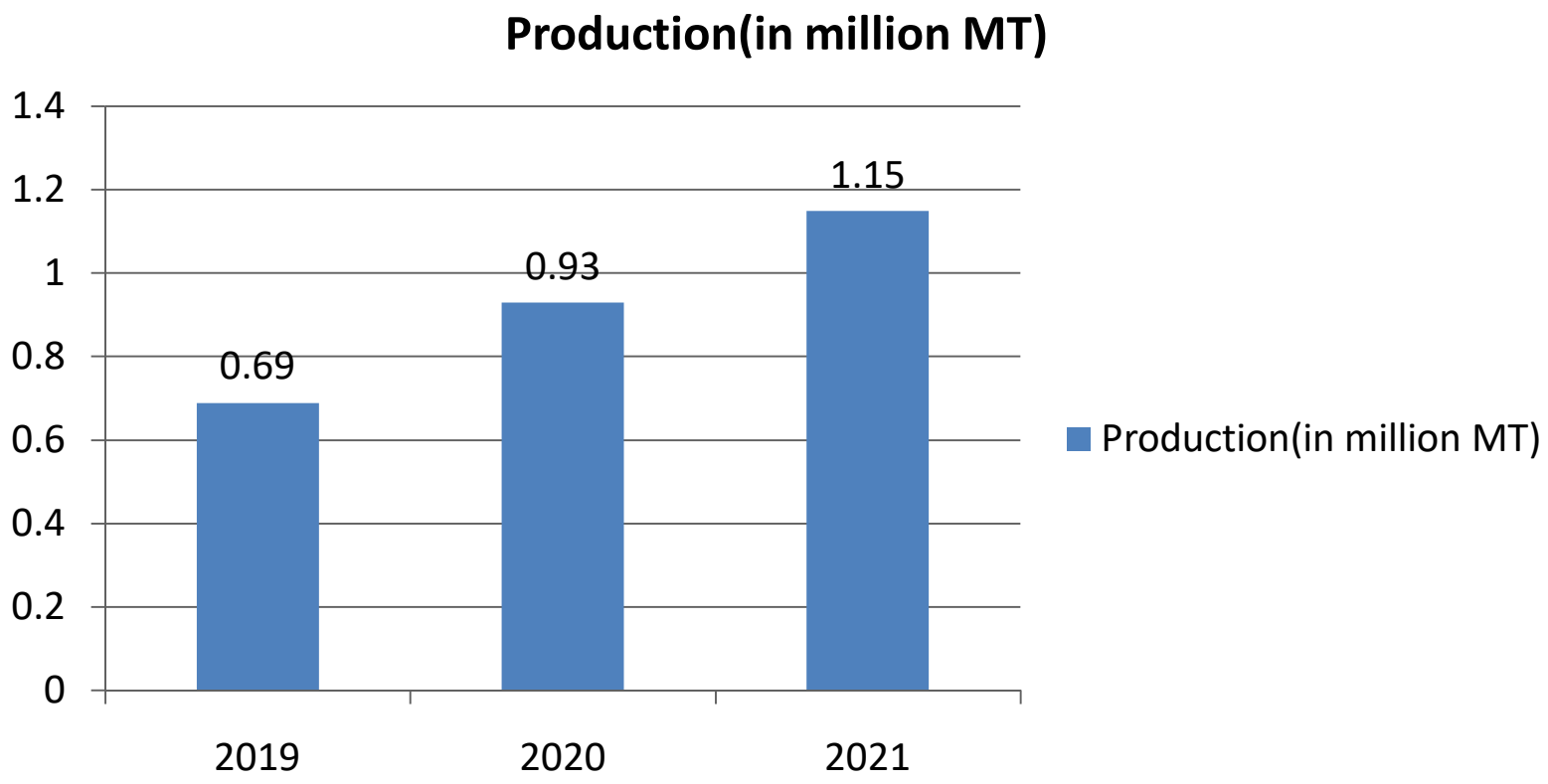
Emission of Kg CO2 per Ton of Cement



MTBF (Hrs)



Production – Year wise (Million ton)



Project Implementation methodologies-Energy Management Division

Alok Sharma
(Certified Energy Manager
DGM-E&I)

Raj Garg
(P&QC)

Deepak Dhiman
(E&I)

Harjeet Singh
(PM cell)

Pritam Pal
(Mechanical)

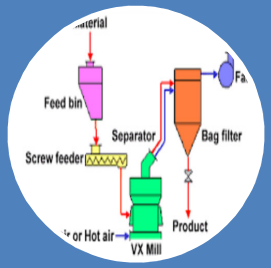
Harcharan
Singh (P&QC)

Jaspreet Singh
(Mechanical)

- Perform daily power analysis
- Conduct internal energy audits and ensure implementation of the audit points.
- Evaluate new ideas,
- Implement new initiatives

Project Implementation methodologies-Energy Circles

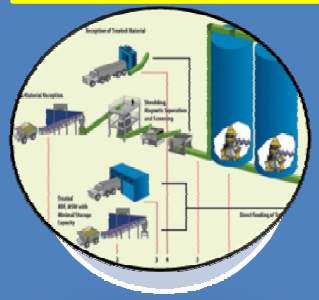
Energy Circle - 1



VRM Mill Section

02 Members

Energy Circle - 2



Raw Material Handling Section

02 Members

Energy Circle - 3

Utilities & Lighting Section

01 Member

Energy Circle - 4

Packing Section

01 Member

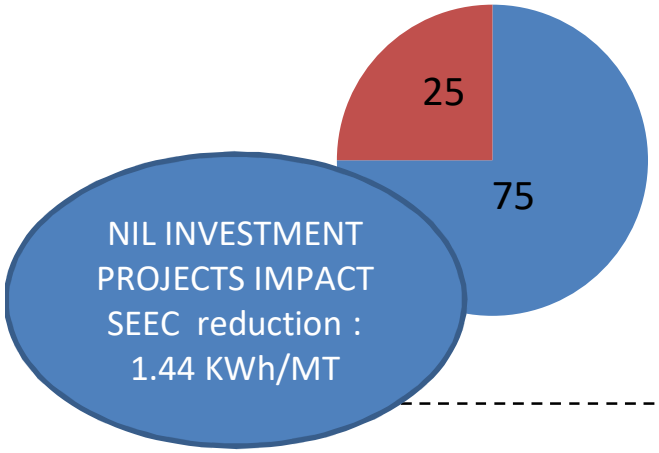
- Daily Energy Observation Tour(EOT) to observe any abnormality
- Ensure timely compliance of points identified
- Analyze idle running of equipment operation

Energy Conservation projects undertaken in last three years

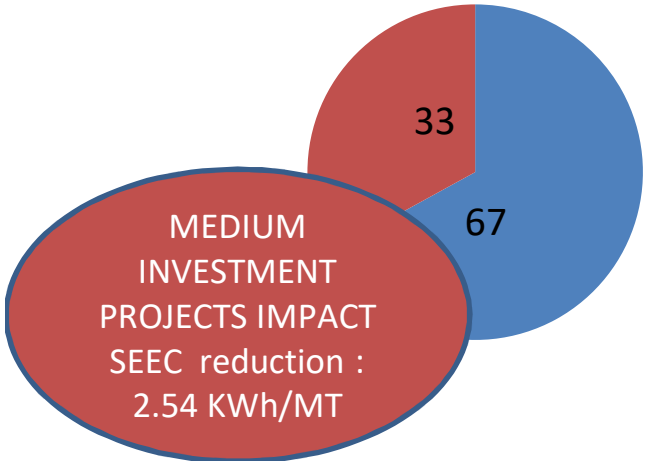
PROJECTS IN LAST 3 YEARS

YEAR	No. of Proposals	Investments(in million INR)	Savings(in million INR)	Pay Back (in Months)
2019	4	0.337	0.232	17.41
2020	3	0.385	2.89	1.6
2021	13	2.901	8.254	4.22

Summary : ENCON Efforts



- No. of NIL investment projects
- No. of Medium investment projects



- Saving from NIL investment projects
- Saving from medium investment projects

Energy Conservation Projects (Summary for last 3 years)

No investment

- No of project implemented : 9
- Saving Kwh/T of Cement : 1.44
- Saving in INR, Lakh : 67

Medium Investment

- No of project implemented : 12
- Saving Kwh/T of Cement : 2.54
- Saving in INR, Lakh : **48**

SUMMARY OF PROJECTS IN 2019

YEAR	Description of Projects
2019	Installation of VFD for flyash tippler bag filter fan to optimize fan speed with loading and unloading operation
2019	Optimization of AC operation.
2019	Replacement of HPSV light with LED lights(=100).
2019	Optimization of pressure for compressor.

Total Energy units saved in 2019(in Lakh KWh): 0.91

Saving in terms of KWh/MT: 0.13

SEEC reduction:
0.13KWh/MT

SUMMARY OF PROJECTS IN 2020

YEAR	Description of Projects
2020	Replacement of 11KW motor with 5.5KW in belt conveyors(=4 nos.).
2020	Replacement of conventional lights with LED lights(=150).
2020	Optimization of running of Gypsum group.

Total Energy units saved in 2020(in Lakh KWh): 6.37

Saving in terms of KWh/MT: 0.68

SEEC reduction:
0.68 KWh/MT

SUMMARY OF PROJECTS IN 2021

YEAR	Description of Projects
2021	S roller removal from VRM.
2021	Optimization of flow at bag filter suction point
2021	Optimization of Gypsum & wet flyash group bag filter with moisture i.e stopping bag filter when moisture in gypsum.
2021	Optimization of clinker extraction drives with switch over modes.
2021	Optimization of DFA bin aeration blowers.
2021	Optimization of drives to avoid idle running.

SUMMARY OF PROJECTS IN 2021

YEAR	Description of Projects
2021	Interlocking cooling tower operation with mill gearbox temperature.
2021	VFD installation in rotary screen.
2021	Reject belt operation controlled with level sensor.
2021	Installation of VFD in cement silo bag filter fan.
2021	Replacement of conventional lights with LED lights(=100 nos.)
2021	VFD installation in compressor.
2021	Installation of VFD in Bag Filter fans.

Total Energy units saved in 2021(in Lakh KWh): 18.35

Saving in terms of KWh/MT: 1.59

SEEC reduction:
1.59 KWh/MT

Last three years Major Energy Conservation Projects

Sr. No.	Description of Projects	Energy Saving Lakh KWH	Annual Saving INR Lakh	Investment INR Lakh
1	Installation of VFD in cement silo bag filter fan	0.36	1.62	2
2	Installation of VFD in compressor	3.96	17.82	14.41
3	Replacement of DOL started bag filter fan with VFD	1.48	6.66	8.1
4	Installation of VFD for flyash tippler bag filter fan to optimize fan speed with loading and unloading operation	0.182	0.819	2.17

Total Annual Energy saving : 5.98 Lakh KWh

Projects having NIL Investment

Sr. No.	Description of Projects	Energy Saving Lakh KWH	Annual Saving INR Lakh
1	Optimization of flow of bag filter fan after suction point	2.325	10.5
2	Optimization of Gypsum & wet flyash group bag filter i.e stopping bag filter fan when moisture in material is high.	1.98	8.9
3	Optimization of DFA bin aeration blower	0.65	2.9
4	Optimization of compressed air pressure	0.40	1.989

Projects having NIL Investment

Sr. No.	Description of Projects	Energy Saving Lakh KWH	Annual Saving INR Lakh
5	Optimization of AC operation	0.30	1.34
6	Reject belt operation controlled with level sensor	0.25	1.13
7	Optimization of drives to avoid idle running	1.56	7

Total Saving of Energy Units(in Lakh KWh): 7.465

Saving in terms of (in Lakh INR): 33.759

Energy Units saved: 7.465 Lakh KWh

Major Encon Projects planned in 2022-23

Sr. No.	Description of Proj	Annual ing (INR	Investment (INR Lakh)
1	Direct clinker fe from clinker t hopper.		20
2	Installation Bag Filter.		40
3	Installation House Fan .		150
4	Direct unloadi Flyash silo with arrangement.		80

Investment: INR 290 Lakh
Target Energy Saving:
- 17 Lakh KWh
- 5 Lakh KWh
- 12 Lakh KWh
- 1.11 Lakh KWh

INNOVATIVE PROJECT UNDERTAKEN

Removal of S roller from VRM

➢S Rollers removed from VRM. Mill cross sectional area increased resulted into decrease of air velocity at mill inlet. It reduced the flow restriction to Bag House Fan which resulted in reduction in bag house power consumption.

➢Team Efforts: Arranging feedb[illegible]een implemented. Planning & then execution at site.

➢Impact it created: Red[illegible] Annual energy units saved: 2.13lakh KWh; S[illegible]

SEEC reduction : 0.19 KWh/MT

➢Replication potential: Rep[illegible]use is possible.

Optimization of Dam Ring Height

➢Dam Ring Height reduces from 370 to 320mm: It reduces the material residence time in VRM which further lowers the load on the main drive.

➢Team Efforts: No. of trials taken on various sizes.

➢Impact it created: 100KW load reduces per hour. SEEC reduction 0.37KWh/MT.

➢Replication potential: Po

SEEC reduction of 0.37 KWh/MT

Optimization of Bag Filter fan flow

➢Optimization of Bag filter fan flow by adjusting min. required velocity(from average 20 m/s to 13 m/s) near venting suction points. It resulted into reduction of power consumption in 26 bag filters.

➢Team Efforts: Collecting required data from site.

➢Impact it created: Average p rgy saving: 6.66 lakh KWh. SEEC saving: 0.58 KWh/MT

➢Replication potential: In

SEEC reduction of 0.58 KWh/MT

Optimization of BF of Gypsum and WFA Group

➢Optimization of Gypsum & WFA group i.e stopping Bag filter fan when moisture is high. With this running hours of fan reduced. It resulted into reduced electrical energy consumption. Also, it reduced maintenance frequency of the equipment.

➢Team Efforts: Feedback from site patroller regarding such types of potential areas.

➢Impact it created: Bag filter fan stopped: 3nos ;Annual energy saved: 2.04 lakh KWh; SEEC impact: 0.18 KWh/MT

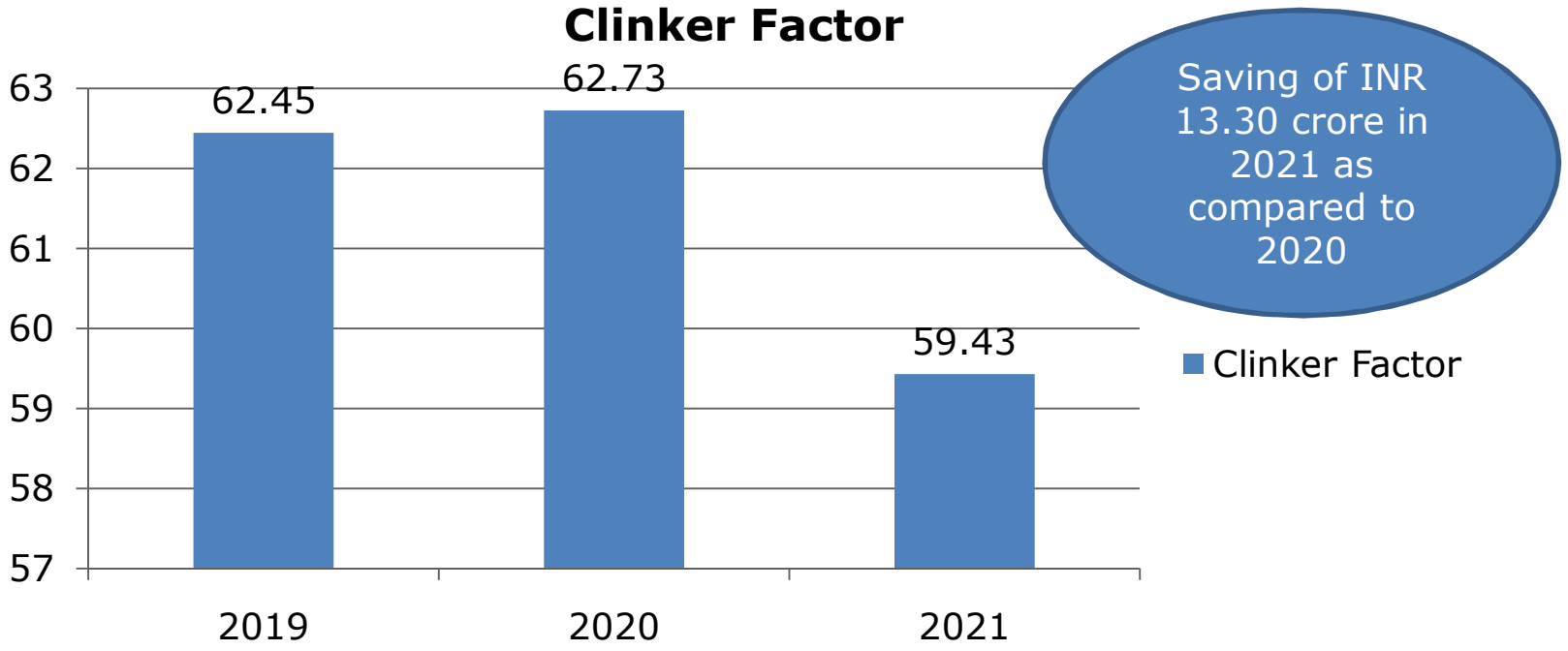
➢Replication potential

SEEC reduction of 0.18KWh/MT

OTHER INITIATIVES REDUCING SEEC

Air blaster at Gypsum Crusher

Benefits for the Plant in Year 2021-Unit Nalagarh

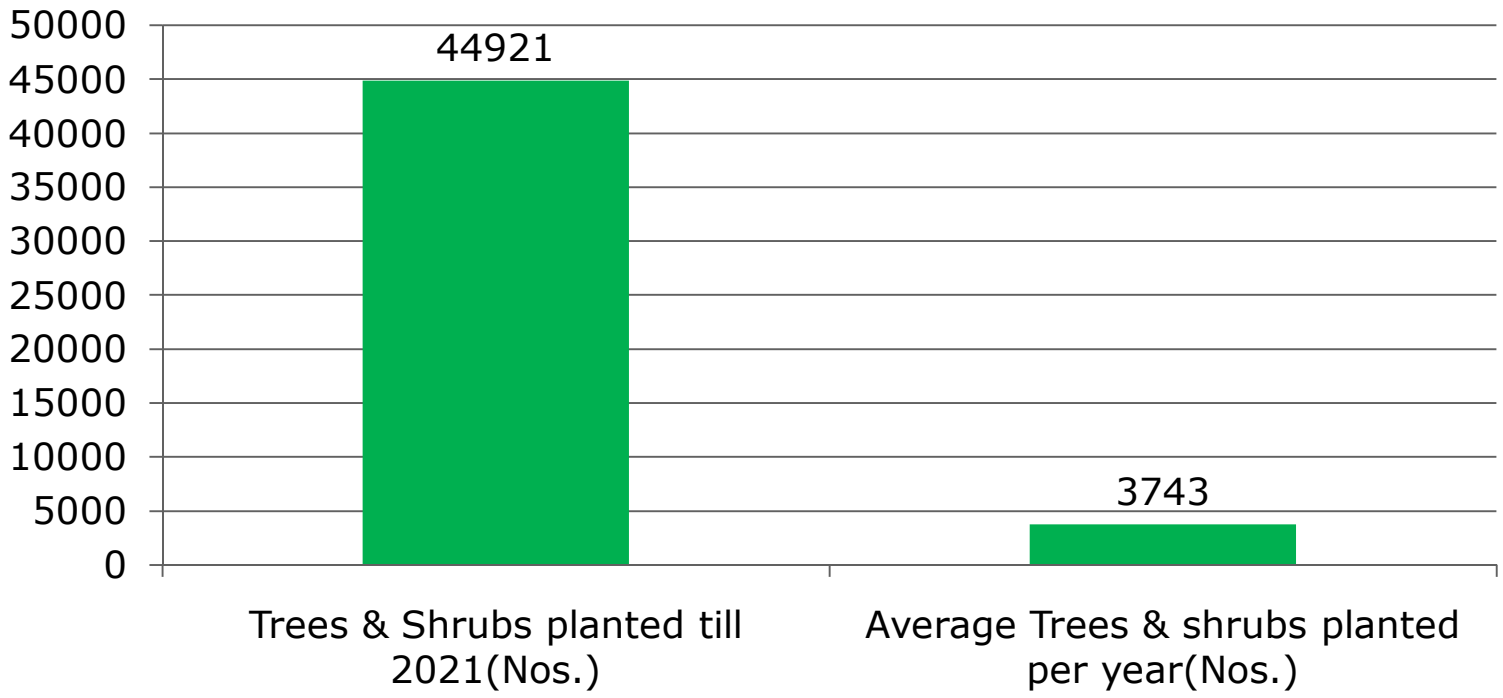


Saving of Rs 13.30 cr in 2021 as compared to 2020 by reduction of Clinker Factor.

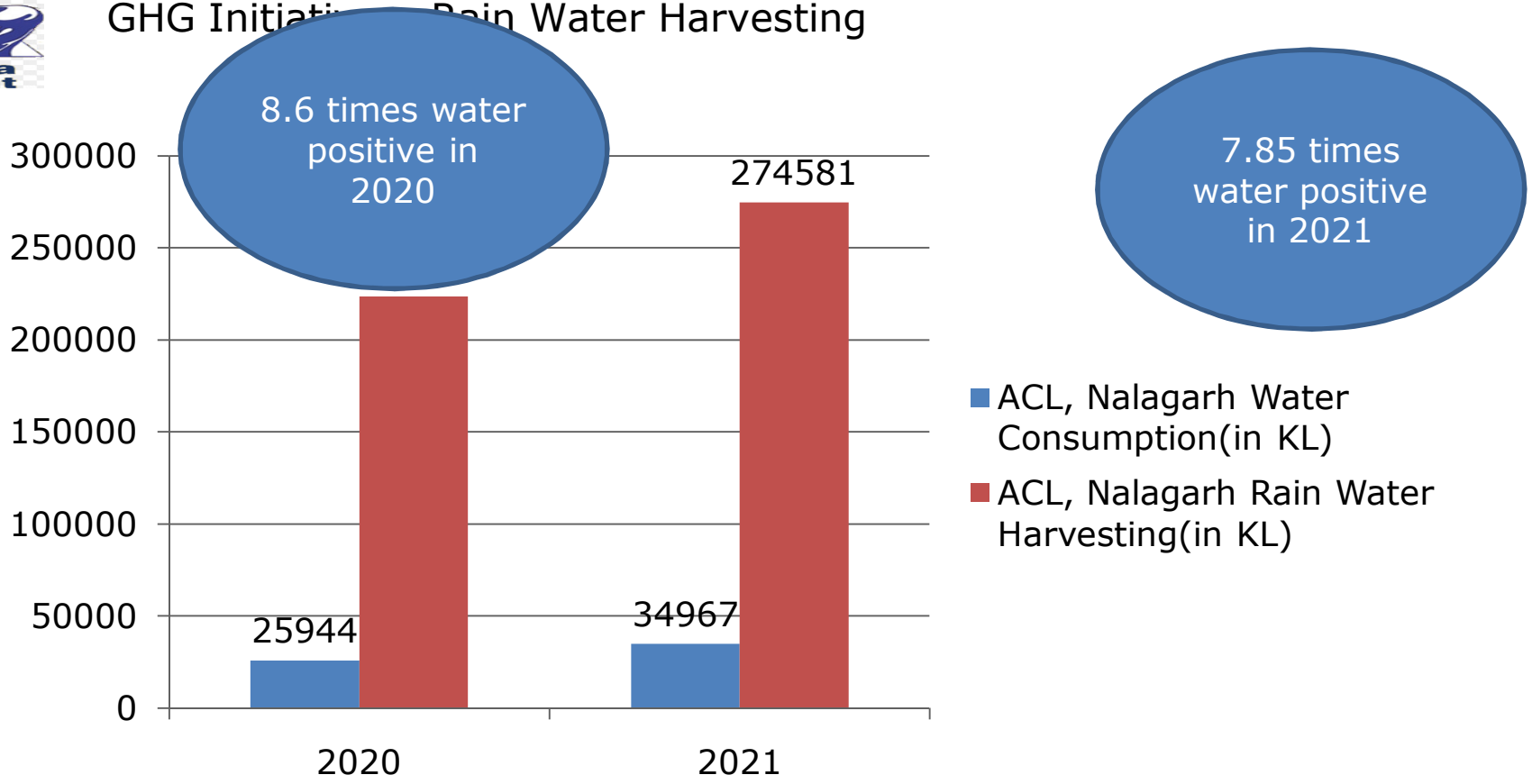
Green Supply chain Management

- Regular optimization of routes of finished goods transportation to optimize the fuel consumption.
- Motivating transporters to deploy bigger vehicles.
- Procurement of only 5 Star rated appliances, only IE3 efficiency motors etc

GHG Initiative _ Plantation Data



GHG Initiati… Rain Water Harvesting



8.6 times water positive in 2020 and 7.85 times water positive in 2021

GHG Initiative _ Plant Area: 29Hectare ; **Green Area : 35.51 %**

Total Area:
29 Hectares
Green Area: 35.51%


I CAN.
Coming Together is a Beginning.
Keeping Together is Progress.
Working Together is Success.
Any Questions?

Thanks !!!