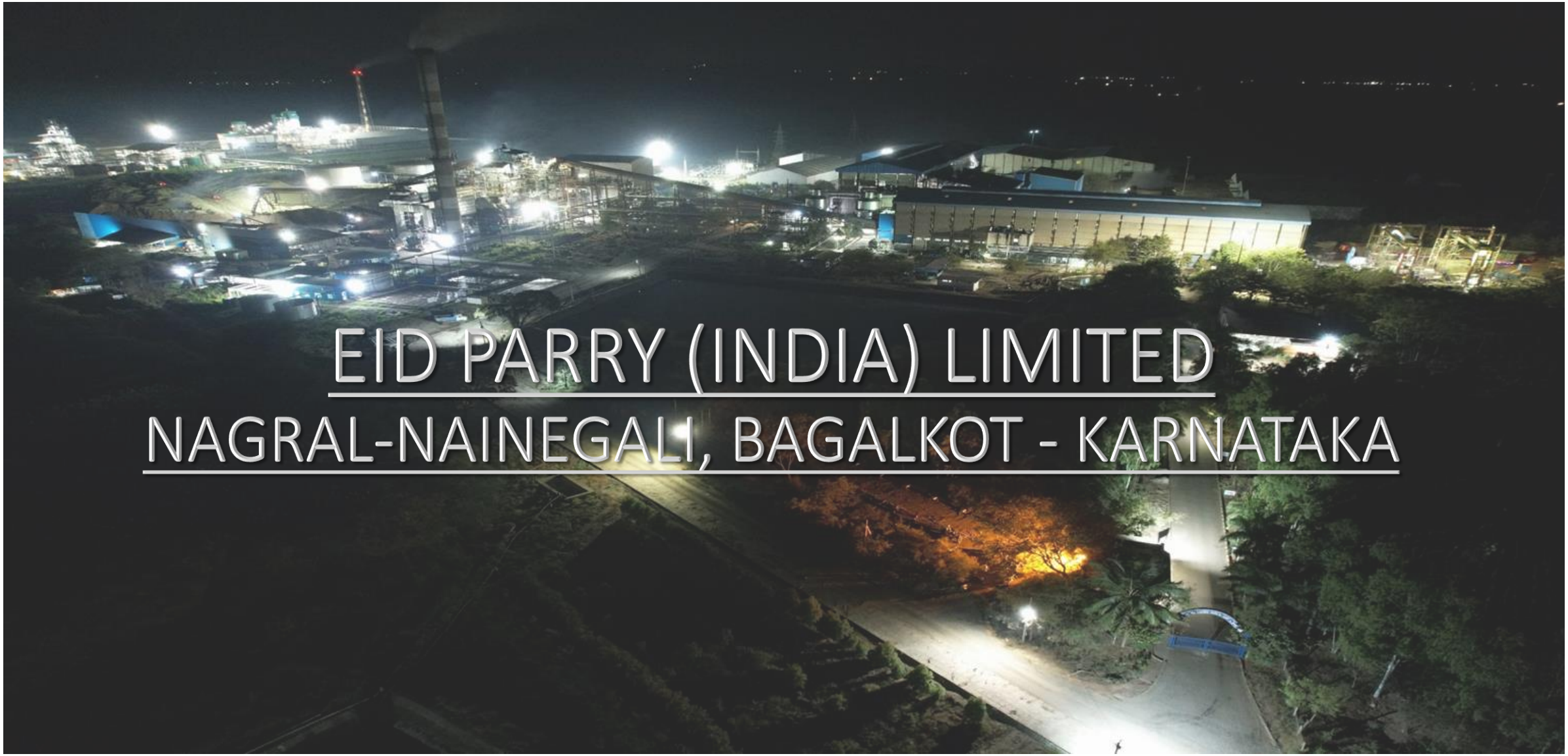
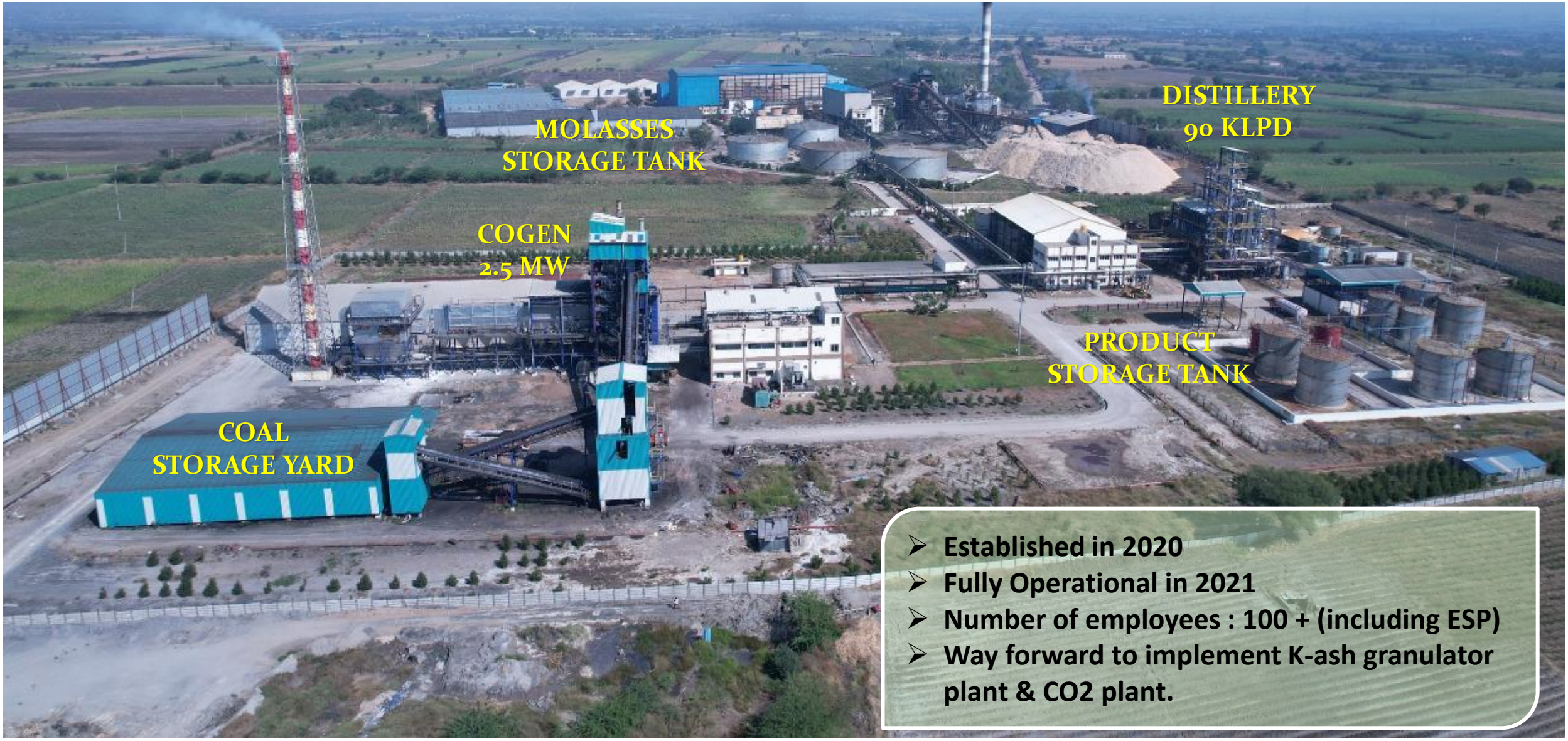

EID PARRY (INDIA) LIMITED
NAGRAL-NAINEGALI, BAGALKOT - KARNATAKA

Sugar and Cogeneration Plant

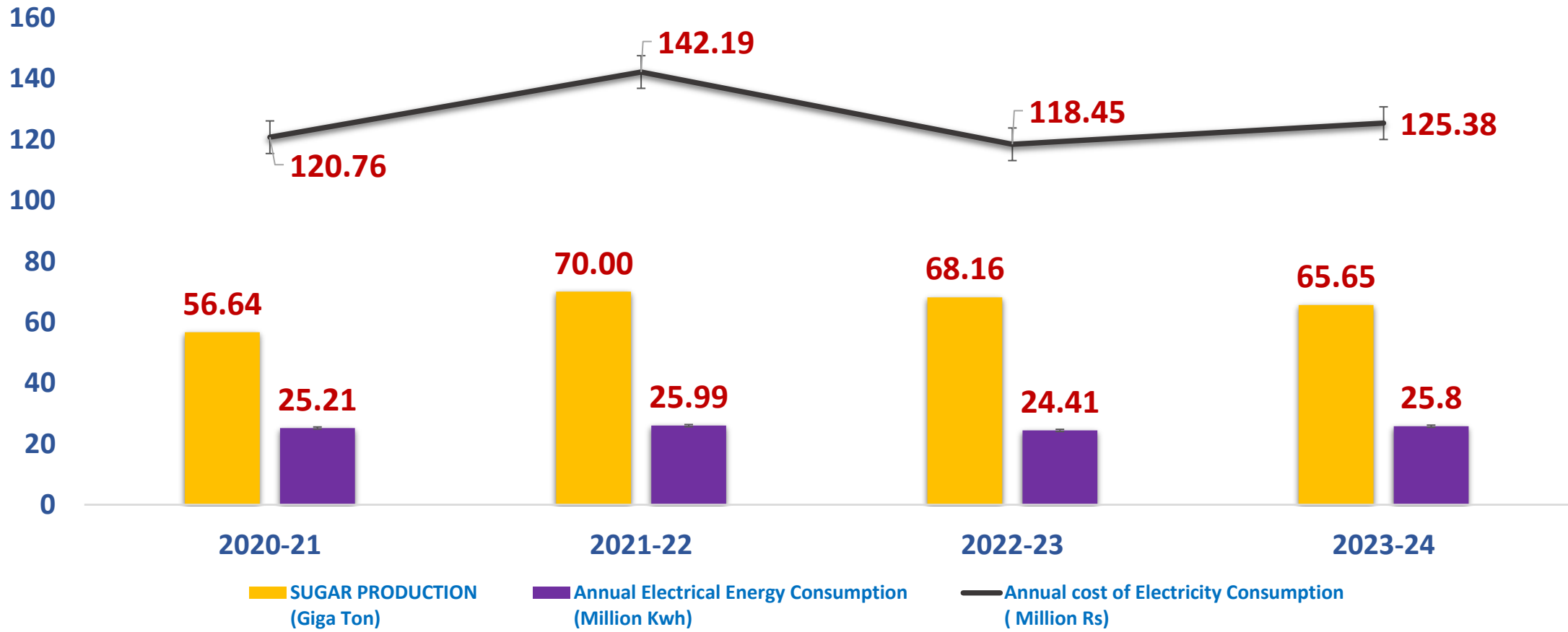
- Established in 2007
- Fully Operational in 2009
- Total area: 177.02 Acres
- Built-up area: 59.23 Acres
- Distance: 36 kms from city
- Number of employees : 400 + (including ESP)
- Trees Planted : 24000
- Lawn: 4.00 Acres
- Shrubs : 3.00 Acres

Distillery Plant

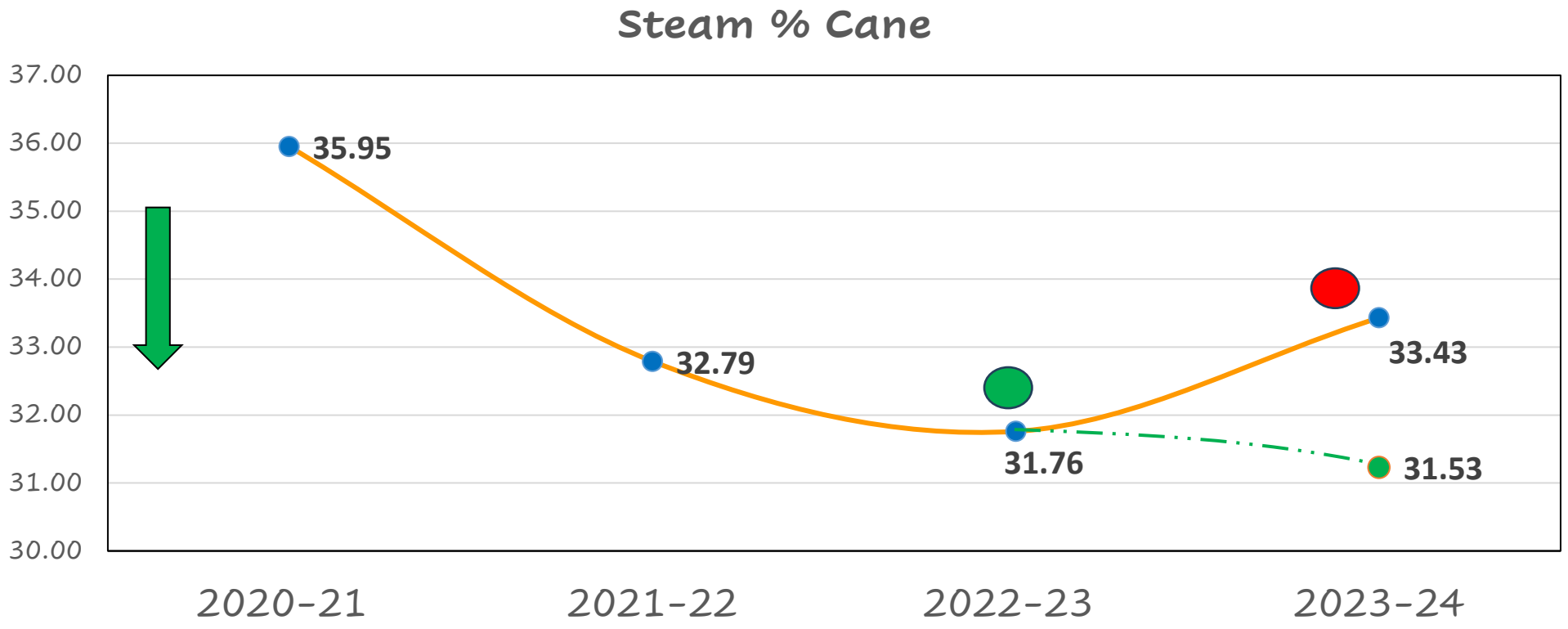


- Established in 2020
- Fully Operational in 2021
- Number of employees : 100 + (including ESP)
- Way forward to implement K-ash granulator plant & CO2 plant.

PRODUCTION & POWER CONSUMPTION



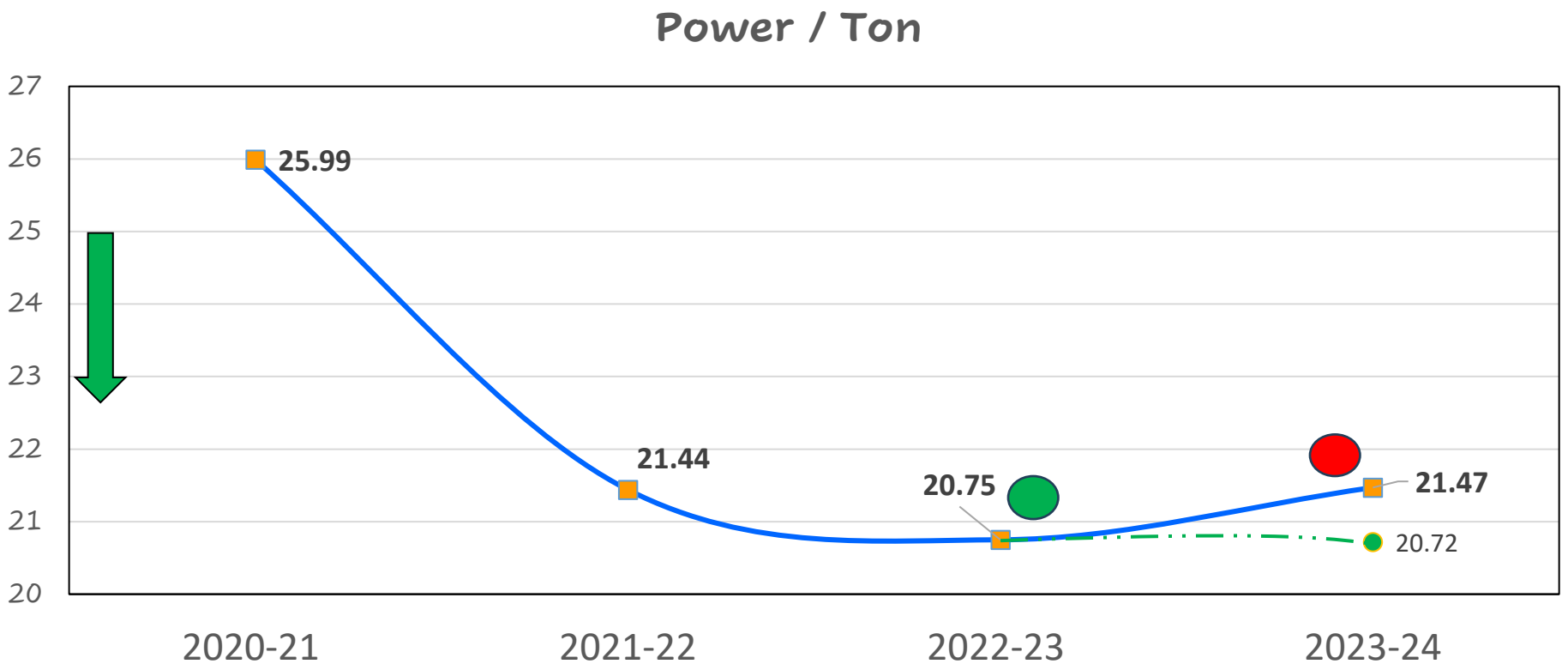
THERMAL ENERGY CONSUMTION (STEAM % CANE)



Steam % Cane Increased in 2023-24 due to operational change in C massecuite boiling

Note:- If not change in operational Steam % Cane will be in 2023-24 is 31.53%

ELECTRICAL ENERGY CONSUMPTION (KWH / MT OF CANE)



- Power per ton of Cane Increased in 2023-24 due to operational change in C massecuite boiling

- Note:- If not change in operational power/ton of Cane will be in 2023-24 is 20.72%

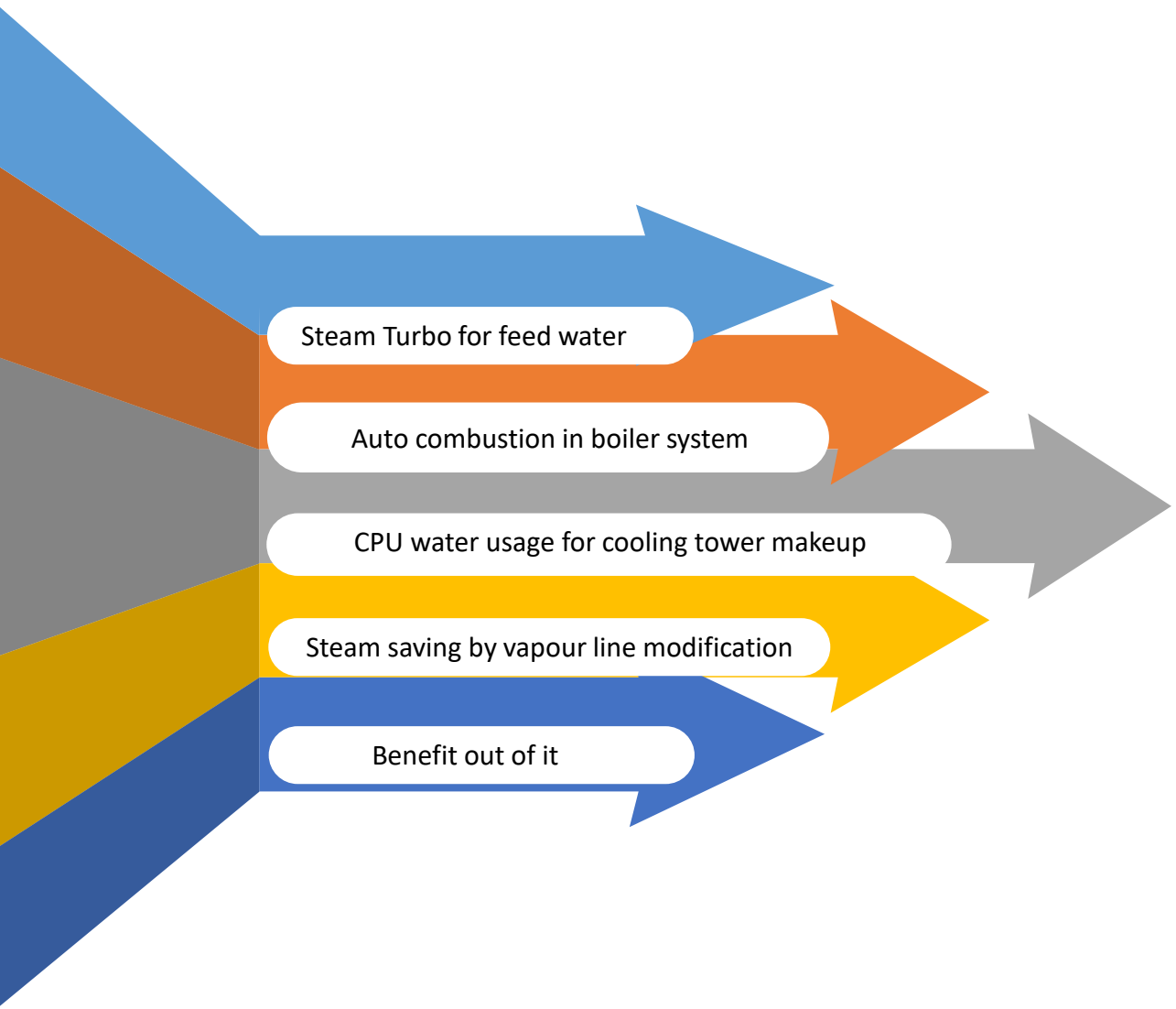
COMPARISON WITH GLOBAL BENCHMARKS

PARAMETERS	NATIONAL BENCHMARK	GLOBAL BENCHMARK	E.I.D PARRY - BAGALKOT
Specific Thermal Energy Consumption	38-40 %	38% As per ISSCT proceedings 2005	31.76 %
Specific Electrical Energy consumption	28 kWh / Ton of cane	27-28 kWh/ton of cane As per NFCSF	20.75 Kwh

ENERGY CONSERVATION ACTIVITIES – FY 2021 to 2024

Sl. No	YEAR	TITLE OF PROJECT	ANNUAL ENERGY SAVING in (Lakhs)
1	2021-22	Injection Pump Upgradation to meet header pressure	55.10
2	2021-22	Common Condensate for individual condensing water line	10.31
3	2022-23	Double Curing Machine Upgradation by screen adjustment	16.60
4	2022-23	Reduction of delta T in Cogen cooling tower	68.32
5	2023-24	Upgradation of A Centrifugal from DC motor to AC motor	26.60

Best Practices in Sugar Plant @ Bagalkot



Steam turbo for Boiler feed water pump operation

- 480 Kw/hr. Power saving
- Steam to deaerator thru turbo
- Steam turbo have less maintenance than HT motors.
- Helps during dark out (Water scar in boiler)

CPU water usage for cogen cooling tower

- 25 M3/hr. River water usage reduced by taking treated water from (CPU) Condense polishing unit water to makeup cooling tower blowdown

Auto combustion system in boiler

- Steam fuel ratio increased from 2.0 to 2.25 and it Regulates the combustion and ensures strong fuel savings.
- 1 Ton of bagasse= 2.25 T of steam

Steam Saving 35.95 to 33.43

- Change in syrup heating from first vapour to second vapour
- Third vapour for pan (Making 3rd body floating
- Use of flash vapour heat recovery- Internally designed cigar to use condensate flash heat

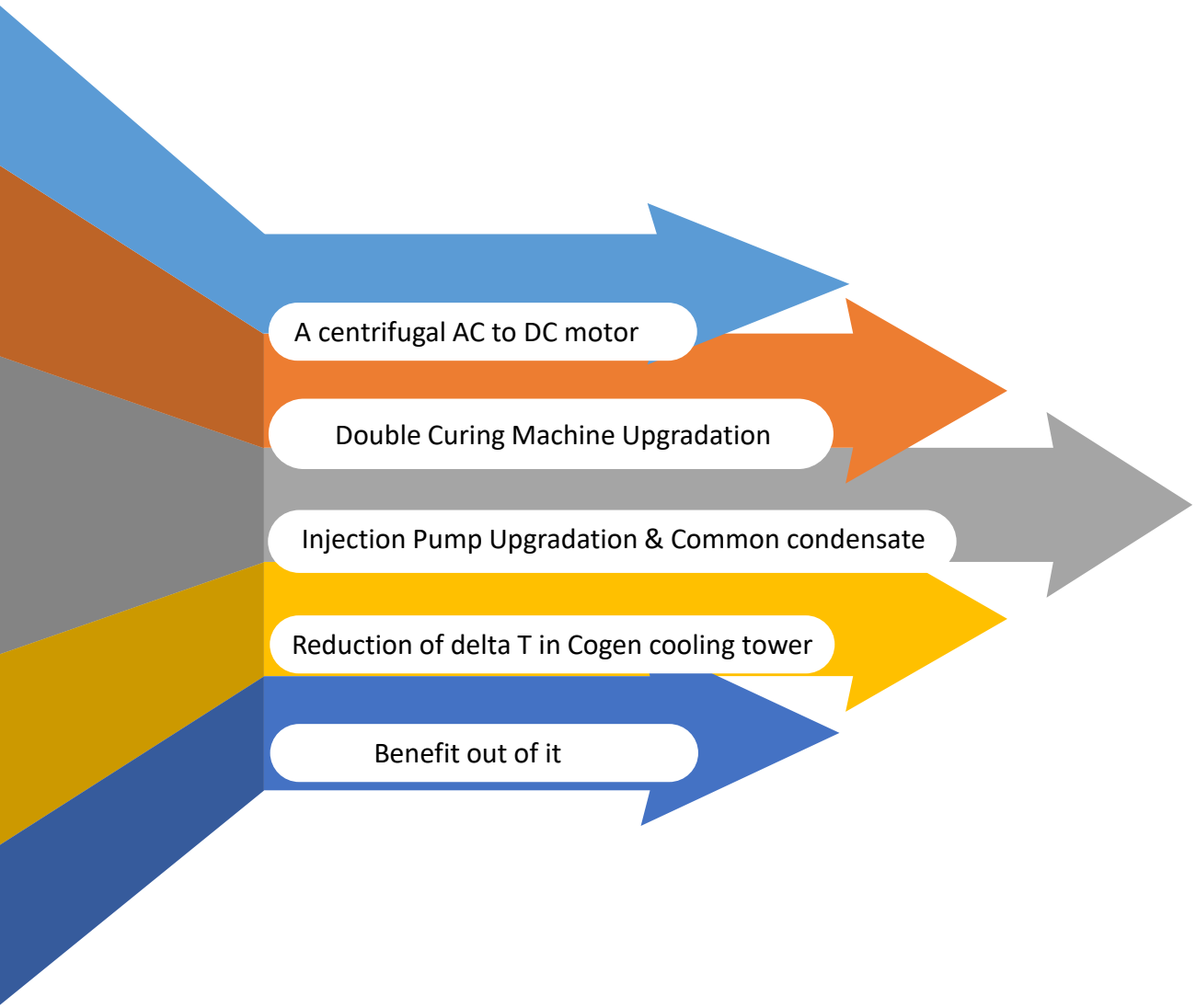
Turbo Feed Pump Workout Estimation

SL no.	Description	UOM	Turbo pump running	Turbo pump not running	Remark
1	**Turbo steam consumption**	Tons/hr	3	0	
2	Steam generation	Tons/hr	97	100	
3	PRDS steam to process	Tons/hr	11	14	
4	Steam through turbine	Tons/hr	86	86	Design turbine through Max.85 TPH
5	SP steam consumption-main turbine		5.56	5.56	
6	Power generation	MW/HR	15.47	15.47	
7	Cogen internal consumption	MW/HR	1.17	1.65	
8	Sugar inhouse power consumption	MW/HR	5.73	5.73	
9	Exportable power	MW/HR	8.57	8.09	
10	Returns @ Rs.4.58/Unit	Rs	39239.73	37041.33	
11	More income/hr	Rs	**2198.4**		
12	More income/day	Rs	**52761.6**		

Steam Reduction Initiatives

S. No.	Particular	Achieved reduction	Job done
1	Use of flash heat recovery	0.80%	Internally designed cigar to use condensate flash heat
2	Re arrangement of juice heaters	0.20%	1- increase in the condensate quantity for duplex juice heater.
			2- three stage heating of raw juice.
			3- two stage heating of clear juice heater
			4- use of 1st condensate for SHWW heating (using PHE)
3	3rd Vapour for Pan	1%	Making 3rd body floating to use 3rd vapour for B Conti and grain pan.
4	Effective Use of E boiler	0.10%	Modification in Sulphur coil and condensate withdrawal to use e boiler effectively

Key Initiatives from 2021-22 to 2023-24



Upgrading DC to AC A-batch motor

- Increased cycles per hour.
- Regenerative drive gives power payback.
- TEFC motor have less maintenance than DC motors.

Injection Pump & Common condensate

- No of Running equipment's reduced & increased energy conservation
- Operational & maintenance difficulty eliminated.

Double curing machine Upgradation

- Operating capacity increased from 12 MT to 15 MT on same power consumption and color reduction from 2360 IU to 623 IU

Auxiliary power

- Colling tower FRP fill Opti grid instead wooden fills
- Temperature control taken in DCS, and power consumption reduced from 8.45% to 7.54%

Injection Pump Upgrading:

- Split Casing pump have been replaced with Centrifugal MF pump of High Capacity with same Motor.
- Old Pump = 1600 m^3/Hr.
- New Pump = 2120 m^3/Hr.
- Previously - 4 pumps X 160 Kw load = 640 kw/Hr.
- Presently - 3 pumps X 160kw/Hr. = 480 kw/Hr.

Power Saving /Hr. = 160 kw approx.

SEASON SUGAR OPERATION	DAYS	146.00
Power saving	Kwh	560640.00
Power cost per Kwh FY 2021-22	Rs	4.80
Annual electrical cost saving	Rs Lakhs	26.91
Bagasse required for 1 MW generation	MT	2.51
Annual thermal bagasse saving	Million Kcal	3.238
Annual thermal bagasse cost saving	Rs Lakhs	28.20
Total annual cost saving	Rs Lakhs	55.10
Invest made for pump upgradation	Rs Lakhs	15.00

Common Condensate Upgrading:

- Previously up to 2020-21 Individual condensate pumps – 5 no's X 15 kw = 75 Kw/Hr.
- Presently from (2021-22) Single Condensate pump running – 1 no X 45kw = 45kw/Hr.

Power Saving/Hr. = 24 Kw/Hr.

Note- 80% of motor load considered

No of days sugar operation	Days	146.00
Power saving	Kwh	105120.0
Power cost per Kwh **FY 2021-22**	Rs	4.80
Annual electrical cost saving	Rs Lakhs	4.04
Bagasse required for 1 MW generation	MT	2.51
Annual thermal bagasse saving	Million Kcal	6.07
Annual thermal bagasse cost saving	Rs Lakhs	5.27
Total annual cost saving	Rs Lakhs	9.31
Invest made for pump upgradation	Rs Lakhs	5.00

Double Curing Machine Upgradation:

- Previously Special-B Curing capacity = 12MT
- Upgraded to Double Curing-Conti = 15MT

After Basket adjustment in Double curing machine,

- B – Conti Motor Capacity – 110 KW
- Number of B- Conti machine Running reduced from 3 nos to 2.5 nos.

(i.e., 12 hrs/day 1 machine stopped)

- Motor capacity utilized is 90kw/hr
  - Previously – 3no X 90kw = 270kw/hr
  - Presently- 2.5no X 90kw = 225kw/hr

Power Saved/Hr = 45 Kw/hr

No of days sugar operation	Days	142.00
Power saving	Kwh	153360.0
Power cost per Kwh **FY 2022-23**	Rs	5.60
Annual electrical cost saving	Rs Lakhs	8.59
Bagasse required for 1 MW generation	MT	2.49
Annual thermal bagasse saving	Million Kcal	0.88
Annual thermal bagasse cost saving	Rs Lakhs	8.03
Total annual cost saving	Rs Lakhs	16.60
Invest made for pump upgradation	Rs Lakhs	10.0

Auxiliary power reduction: by delta-T improvement

- Power Saving is possible because of the Renovation of Cooling Tower with FRP fill Opti – Grid instead of wooden fills.
- Due to that the Δt got increased almost 6^{o} C to 8^{o} C. The efficiency of cooling increased.
- CT fan motors speed control taken in cascade mode with temperature feedback.

Description	Unit	2021-22	2022-23
MCW Motor capacity	Kw	220	220
CT Fan Motor capacity	Kw	45	45
MCW Motor capacity utilization	Kw	300	150
CT Fan Motor capacity utilization	Kw	105	70
No of MCW motor running	Nos	2	1
No of CT Fan motor running	Nos	3	2
Total Motor Power Saving	**Kw**	**0**	**185**

No of days sugar operation	**Days**	**142.00**
Power saving	Kwh	630480.0
Power cost per Kwh FY **2022-23**	Rs	5.60
Annual electrical cost saving	Rs Lakhs	35.31
Bagasse required for 1 MW generation	MT	2.49
Annual thermal bagasse saving	Million Kcal	3.62
Annual thermal bagasse cost saving	Rs Lakhs	33.01
Total annual cost saving	**Rs Lakhs**	**68.32**
Invest made for pump upgradation	**Rs Lakhs**	**33.0**

A MACHINE UPGRADATION FROM DC TO AC MOTOR

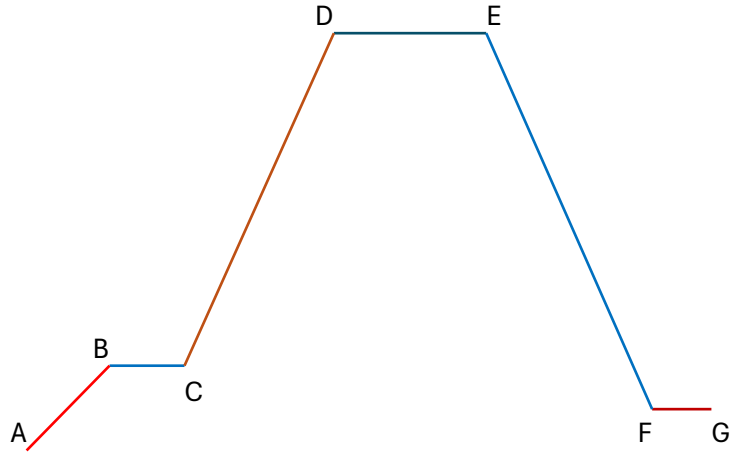
- **A Batch Centrifugal machine with DC motor have been upgraded with AC motor to achieve.**
  - To Improve the No. of cycles/hr
  - To reduce the power consumption. (i.e., By using Re-Generative VFD ACS880-14-505A) & AC motor Avg. Power consumption/cycle = 2.4 kw.
  - To eliminate the maintenance cost in DC motors. (e.g., Carbon brush, Commutator, etc.,)

Description	Unit	2022-23	2023-24
DC Motor capacity	Kw	145	145
AC Motor capacity	Kw	-	250
Motor capacity utilization	Kw	145	250
AC Motor Power Saving	Kw	-	27.1
No of motor running	Nos	4	3
No of Cycles/Hr	Nos	16-18	21-24
Total Power Saving	**Kw**	**0**	**81.30**

No of days sugar operation	**Days**	**142.00**
Power saving	Kwh	253981.0
Power cost per Kwh FY **2023-24**	Rs	5.60
Annual electrical cost saving	Rs Lakhs	12.70
Bagasse required for 1 MW generation	MT	2.60
Annual thermal bagasse saving	Million Kcal	1.52
Annual thermal bagasse cost saving	Rs Lakhs	13.89
Total annual cost saving	**Rs Lakhs**	**26.60**
Invest made for Motor upgradation	**Rs Lakhs**	**62.0**

Upgraded A centrifugal machine from DC to AC Motor:

➢ **A Batch Centrifugal machine time comparison & No. of cycle actual calculation from field.**



A - B - C	CHARGING ZONE
C – D	ACCELERATION ZONE
D – E	SPINNING ZONE
E – F	RETARDATION ZONE
F – G	PLOUGHING ZONE

Sl.NO	OPERATION DESCRIPTION	UNIT	BATCH CENTRIFUGAL MACHINE						
			A1	A2		A3		A4	
				IDEAL	LOAD	IDEAL	LOAD	IDEAL	LOAD
1	A -- B	Sec	10	6	4	6	4	6	4
2	B -- C	Sec	18	8	16	8	19	8	18
3	C -- D	Sec	45	30	31	30	40	30	41
4	D -- E	Sec	30	7	20	7	20	8	20
5	E -- F	Sec	50	28	30	28	39	26	39
6	F -- G	Sec	50	38	39	25	27	24	26
8	TOTAL TIME FOR 1 CYCLE	Sec	203	117	140	104	149	102	148
9	NUMBER OF CYCLES / HR	No's	17.73	30.77	25.71	34.62	24.16	35.29	24.32
10	CURRENT LIMIT	%		100%		100%		100%	
11	MAX ACCELERATION CURRENT	AMPS		450		450		450	
12	MAX DE-ACCELERATION CURRENT	AMPS		470		470		471	
	PERFORMANCE INCREASED	%		41.50	30.00	48.00	25.50	49.00	26.00
	A1- DC A centrifugal machine		A2-A3-A4-AC A centrifugal M/c			**A3 & A4 are in Interlock**			

Energy conservation Projects way forward..

Energy Management System	Energy Management System (EMS) is a structured approach to managing and optimizing energy use in organizations, buildings, or industrial processes.
Renewable Energy Integration	Solar Photovoltaics (PV) is a technology to be implemented; that converts sunlight directly into electricity using semiconductor materials. It's a cornerstone of renewable energy systems due to its scalability, decreasing costs, and environmental benefits.
Harmonic Distortion	Intended to Reduce Harmonic Distortion Passive Filters, Active Filters and Harmonic Filters in VFDs.
Improving power factor by installing capacitor bank	A capacitor bank helps correct power factor by compensating for the lagging reactive power caused by inductive loads, such as motors and transformers.

Water conservation by Recycling - Water consumption against the target 2023-24

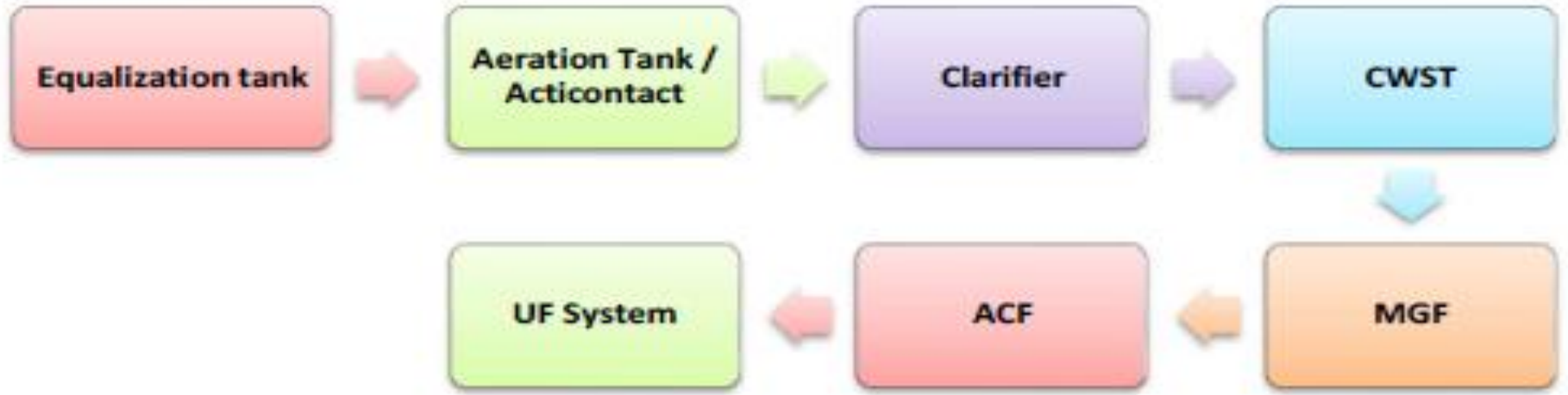
Units	2022-23 Consumption in KL	2023-24 Target in KL	2023-24 Target in % Vs 2022-23	2023-24 Consumption in KL	% Reduction
Nellikuppam	277244	259416	-6.4%	263468	-5.0
Pugalur	92204	111882	21.3%	126183	36.9
Sivaganga	133385	131119	-1.7%	130239	-2.4
Oonaiyur	82994	78844	-5.0%	44117	-46.8
Saveriyarpuram	27192	26784	-1.5%	25359	-6.7
Haliyal	452447	361958	-20.0%	422030	-6.7
Bagalkot	**577305**	**548440**	**-5.0%**	**404579**	**-29.9**
Ramdurg	89579	62705	-30.0%	75725	-15.5
Sankili	404015	341298	-16.0%	326181	-19.3
TOTAL	**2136365**	**1922446**	**-10.0%**	**1817881**	**-14.9**

Note:- Bagalkot plant achieved 30% of Fresh water saving.

FOCUS ON ENVIRONMENT

CPU INSTALLATION

- Amount invested for project : 3.50 crores.
- Plant installed and commissioned : Nov-2021
- Capacity of plant : 1440 m3/day.
- Supplier : M/s.Muruguppa Organo Water Solution - Chennai

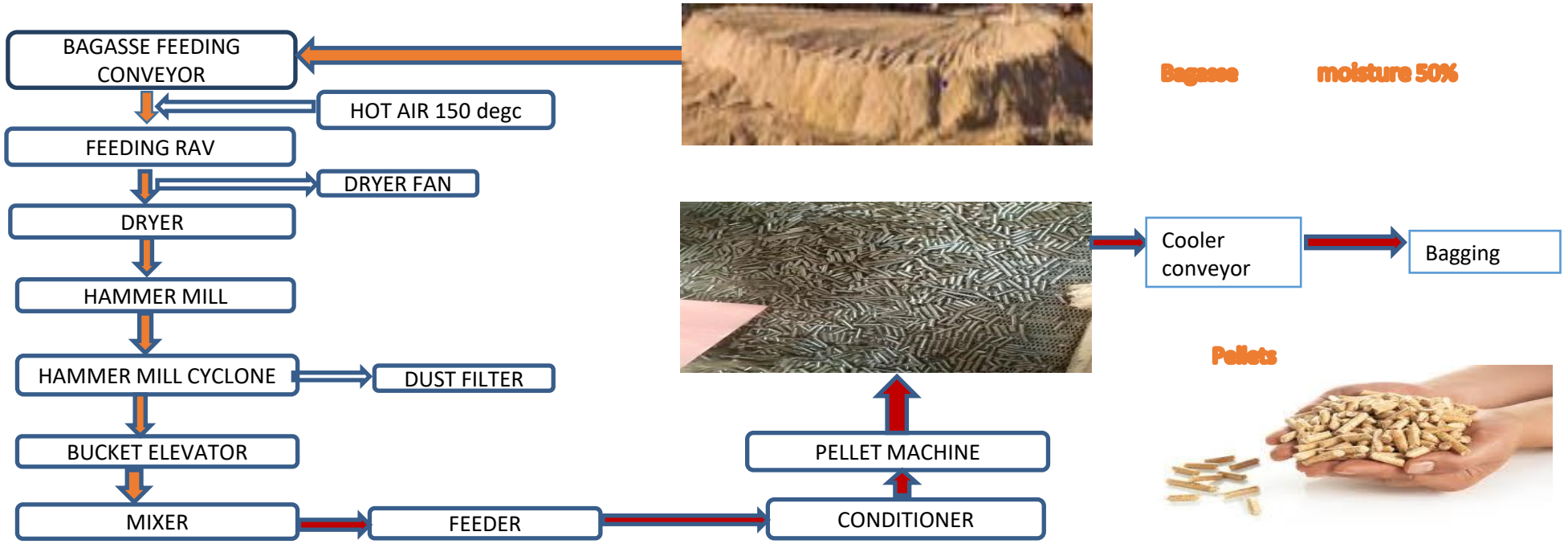


Tangible & Intangible Benefits:

- The condensate generated from sugar plant of 44000 cu.m is treated in last year and recycle back to the Sugar & Cogen process.
- The Equivalent amount of raw water withdrawal is reduced.
- The treatment and disposal of water is controlled.

BAGASSE PELLET PLANT

- Amount invested for project : 3.0 crores.
- Plant installed and commissioned : Aug-2020
- Capacity of plant : 60 Tons/day.
- Supplier : M/s.Hitech Engineers – New Delhi.



Tangible & Intangible Benefits:

- Replacement of fossil fuels like coal with bagasse pellets.
- During offseason the surplus bagasse will be consumed, where the bagasse flying will be avoided.

K-ASH GRANULATION PLANT

- Amount invested for project : 1.50 crores.
- Plant installed and commissioned : Feb-2022
- Capacity of plant : 35 Tons/day.
- Supplier : M/s.Jaipur Bio Fertilizer – Jaipur.

Tangible & Intangible Benefits:

- Recovering Resources from Industrial Waste.
- Avoiding the Environmental issues creating by storing of fly ash.
- Becoming Alternate for MOP Fertilizer

RAIN WATER SEGREGATION SYSTEM

- Amount invested for project : 0.50 crores.
- Plant installed and commissioned : Jan-2022
- Contractor : M/s.Nivins Infra – Chennai.

Tangible & Intangible Benefits:

- The rain water flowing from farmer field will be segregated, which flowing inside the plant premises.
- Avoiding the huge flow of water entering into the process area.

Greenery Development

- Ever highest tree planting of 24000 nos. done during 21-22 FY to comply with KSBCB – CFO & EC conditions.
- Nearby farmers encouraged to plant cane by providing supports like land ploughing, water for irrigation.
- About 80 to 100 Acres of farmer land available for treated effluent irrigation.

ENVIRONMENT MONITORING & COMPLIANCES

Effluent Treatment Plant operation:

- Well operated and values within KSPCB norms
- No deviations observed by RO-KSPCB during periodical visits
- ETP - Online monitoring system connected to CPCB server
- 15 days storage facility made as per KSPCB direction
- Treated water utilized in cane farm as well to the nearby farmers on obtaining consent letter.

Stack Emissions:

- Boiler ESP – 1 & 2 - Mechanically strengthened to suit enhanced steam generation.
- ESP – Third field installed to comply with KSPCB norms.
- Distillery stack monitoring system is connected to CPCB server.

Monitoring Details:

Monthly once monitoring the followings parameters by NABL accredited lab of M/s.MSV Analytical Laboratories - Belgum.

- Ambient Air quality in different locations.
- Noise level monitoring.
- Stack emission monitoring in distillery chimney.
- Water sample analysis in sugar ETP & Distillery RO permeate.

Project **"NANNEER"** Way Forward

FOOT NOTE

Project Nanneer: Water, water everywhere .... to drink and to sow

Nandini.sengupta@timesgroup.com

It's a back-to-basics solution for parched lands. During the lockdown, the Murugappa Group, through group company EID Parry and the AMM Foundation, began a CSR project on water sustainability called Project Nanneer. The aim was to rejuvenate seven water bodies in Sivaganga and Pudukkottai, two of the most water-deficient districts in Tamil Nadu. With Coimbatore-based NGO Siruthuli as implementation partner, the group started the project in late 2021; most of the work was done in the summer of 2022.

A year on, Project Nanneer provides relief to close to 2,000 farming families, ensuring an incremental 1 billion litres of water in the local water ecosystem, up from just 200 million litres. Its target: Two billion litres in the next 12 months and 10 billion litres by 2026.

For the Murugappa Group, this is both good business and good community service. The group has a close connect with the farming community thanks to companies such as EID Parry and Coromandel International. "Farmers are central to where we are as an organisation today," says EID Parry CEO Muthu Murugappan.

Project Nanneer water storage: Farmers can now cultivate their land

"EID Parry has some acreage under algae production in Sivaganga and Pudukkottai. In summer, the acreage reduces because of water scarcity as this region is monsoon fed. We were looking for ways to run the farms in perpetuity and also do something for this arid part of the state given that the group's ancestry comes from this region," he says. With Project Nanneer increasing water storage, farmers can now cultivate their land twice, sometimes even three times a year.

The project is repairing existing water bodies and rainwater harvesting structures to increase storage. The districts of Sivaganga and Pudukkottai are home to numerous water bodies called ooranis and kanmais, besides temple tanks. However, many of these once-large bodies of water have diminished in size and capacity over time, because of the build-up of silt and a lack of maintenance. "We are strengthening bunds, cleaning channels, desilting, introducing islands, removing vegetation, creating a biosphere for birds and other animals and working with communities," says Murugappan. At the Vadakudipatti and Chettiyan kanmais, 3,000 tree saplings have been planted as bio fencing. The 10 islands created from desilted soil are being developed as bird habitats.

MUTHU MURUGAPPAN | CEO, EID Parry

Sivaganga and Pudukottai have been selected in the first phase. After a detailed watershed management study of 5 km radius from Oonaiyur village, two water bodies in Sivaganga (Vadakudipatti kanmai, Chettiyan kanmai) and five in Pudukkottai district (Kaana kanmai, Raayar kanmai, Parangudi tank, Oonaiyur big tank and Oonaiyur drinking pond) are being rejuvenated. In the next phase, the project will be extended to other districts where the group has a footprint. "Already Karur, Erode and Cuddalore districts have shown interest and we will expand there in the next 12 months," says Murugappan. "There is also talk of other districts such as Ranipet, Hosur and coastal Andhra Pradesh showing an interest in Project Nanneer."

Currently entirely funded by the AMM Foundation, the project will look for partners as it expands its footprint. "We would like to take this project to locations across the country where we have business installations. We will broad base the funding across stakeholders the group works with as they are already eager to participate in Project Nanneer," says Murugappan.

NANNEER MAKES A DIFFERENCE

- Seven lakes with an area of 250 acres identified for desilting and five lakes restored in 2022-23
- Rise in water holding capacity up to 1 billion litres

1,825 families benefited

1,250 acres of cultivation helped

3,000 native trees planted in the bunds

- Perennial water supply for livestock
- Islands and bio fencing in the bunds attract many migratory birds

With project "NANNEER" our aspiration is to reach **10 Billion Liters** of "Water Under Management" by **2026**

Project "**NANNEER** For Example

Before - 0

After – 21.47 Million Liters

CII Assessors visited the Project site

Thank you !