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Amara Raja Batteries Limited, Chittoor

WELCOME

23rd National Award for Excellence in Energy Management 2022

23rd - 26th August'22

Team members:

Subhash M, General Manager & HOD - Centre Of Excellence

Vinaya Sagar K.B – Head, Energy management

Kumara Swamy K – DGM, Power Distribution

Our Group Vision

Our Group Vision

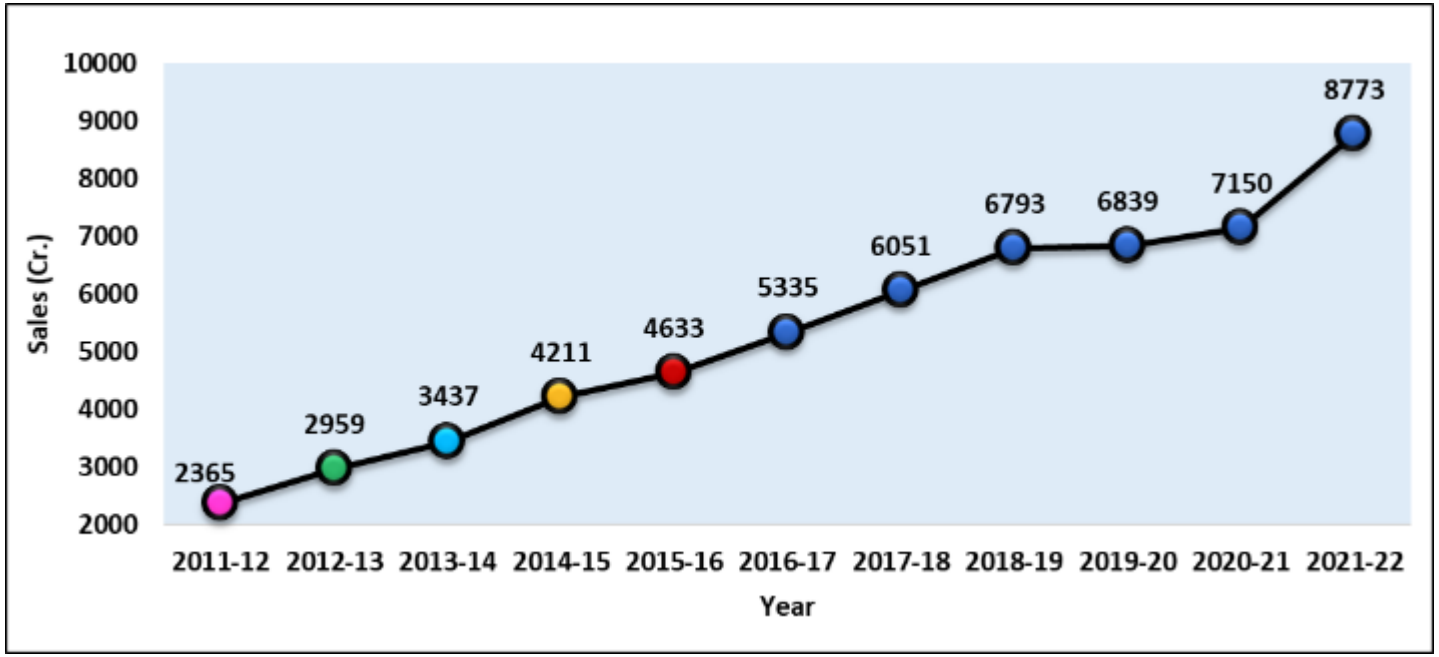
Through the Amara Raja Way,

We will continually redefine business to

Deliver High Social Impact,

By anticipating Future Trends,

Building preferred Brands and leveraging Talent & Technology.



Dr. Ramachandra N Galla

Founder

Mr. Jayadev Galla

Co Founder & Chairman

Mr. Harshavardhana G

Executive Director

Lead Acid Biz.

Mr. Vikramadithya G

Executive Director

New Energy Biz.

Milestones of ARBL

1990 — LVRLA Battery Division

2001 — ABD-1 Battery Division

2008 — SBD-1 Battery Division

2014 — MVRLA Battery Division

2015 — ABD-2 Battery Division

2016 — TBD Battery Division

2019 — SBD-2 Battery Division

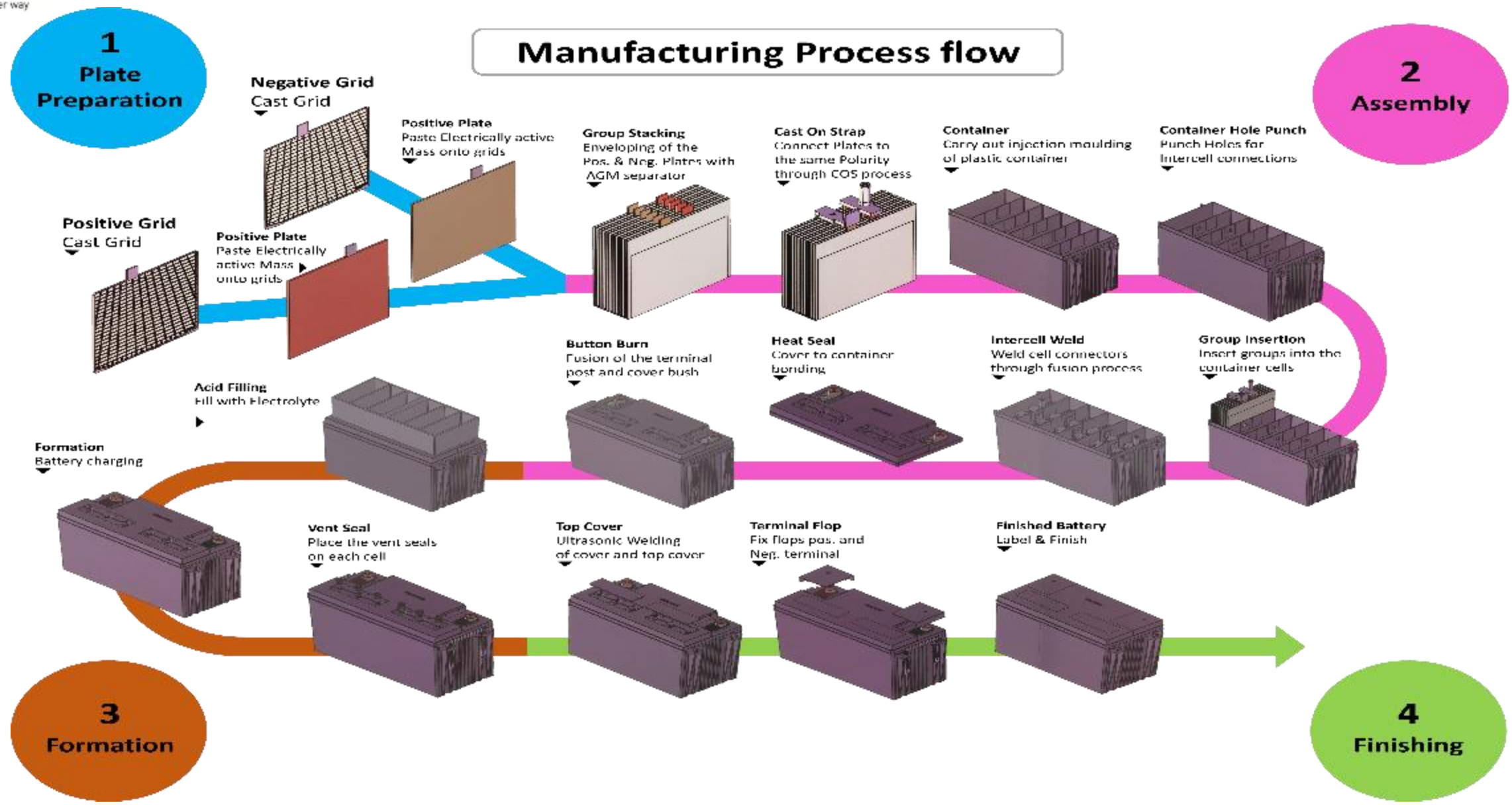
2021 — ABD-3 Battery Division

2021 — Advanced Stamped Grid

Up coming plants:

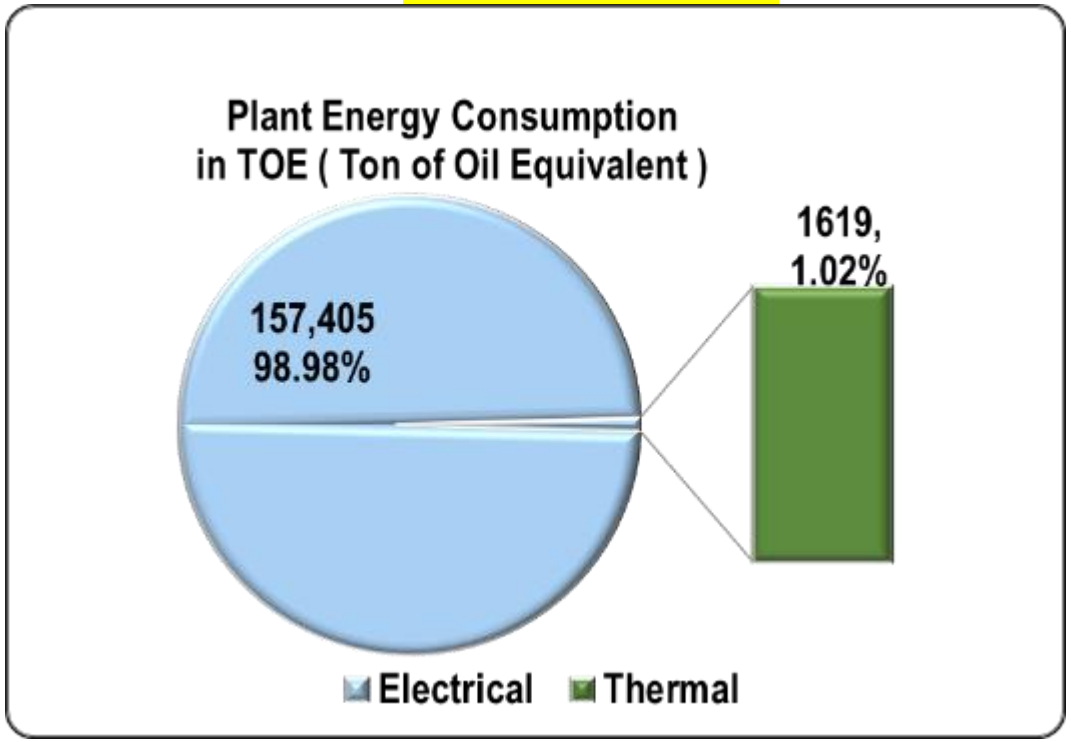
- Smelting Plant
- Motive Power Plant

Battery Manufacturing Flow Diagram



Energy Consumption Overview

Energy Sources



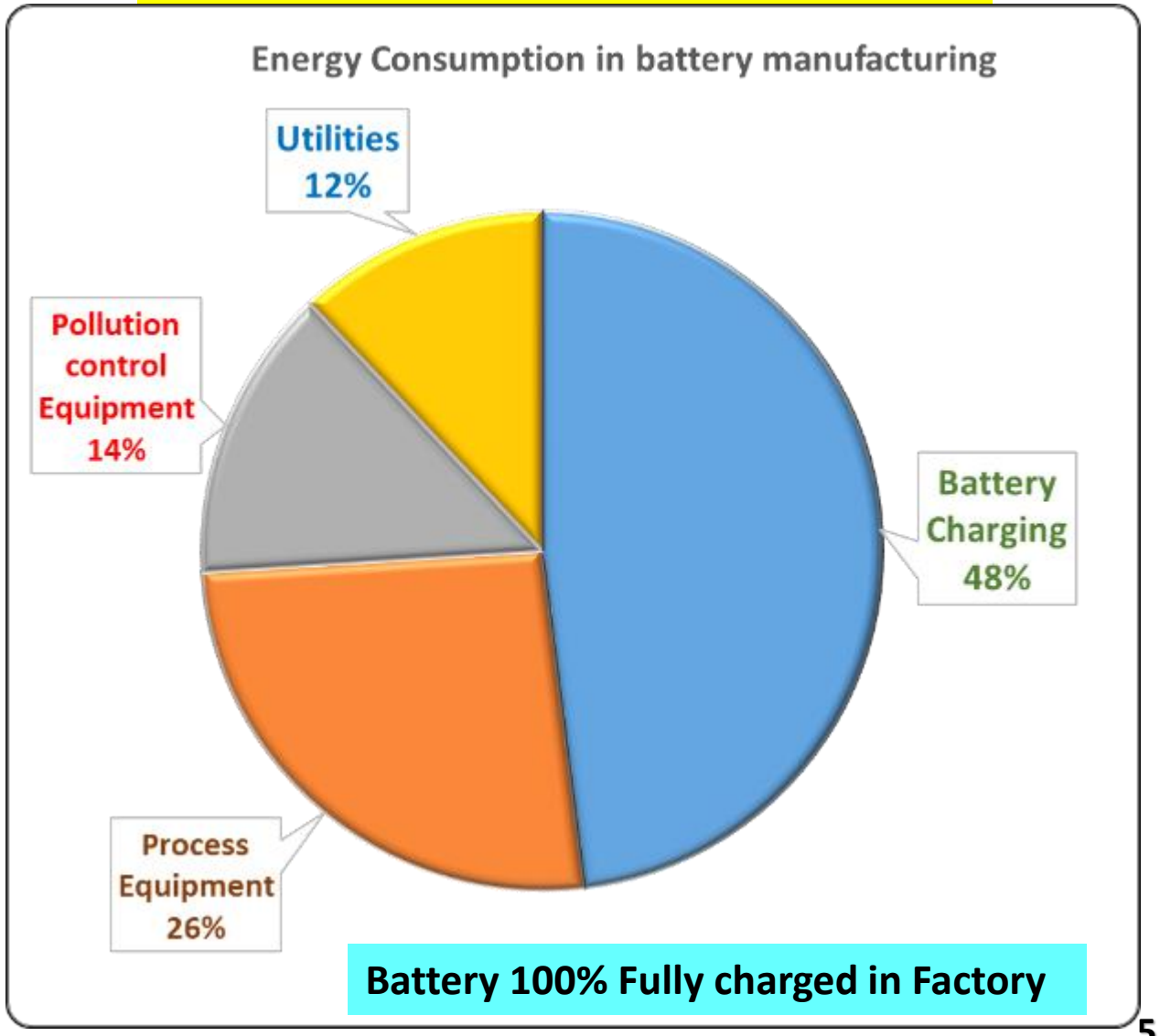
Electrical

- 183.03 Mn Units
- 1,57,405 TOE

Thermal

- 1,619 TOE (HSD, LPG, Acetylene)

Energy Consumption in Battery Manufacturing



Battery 100% Fully charged in Factory

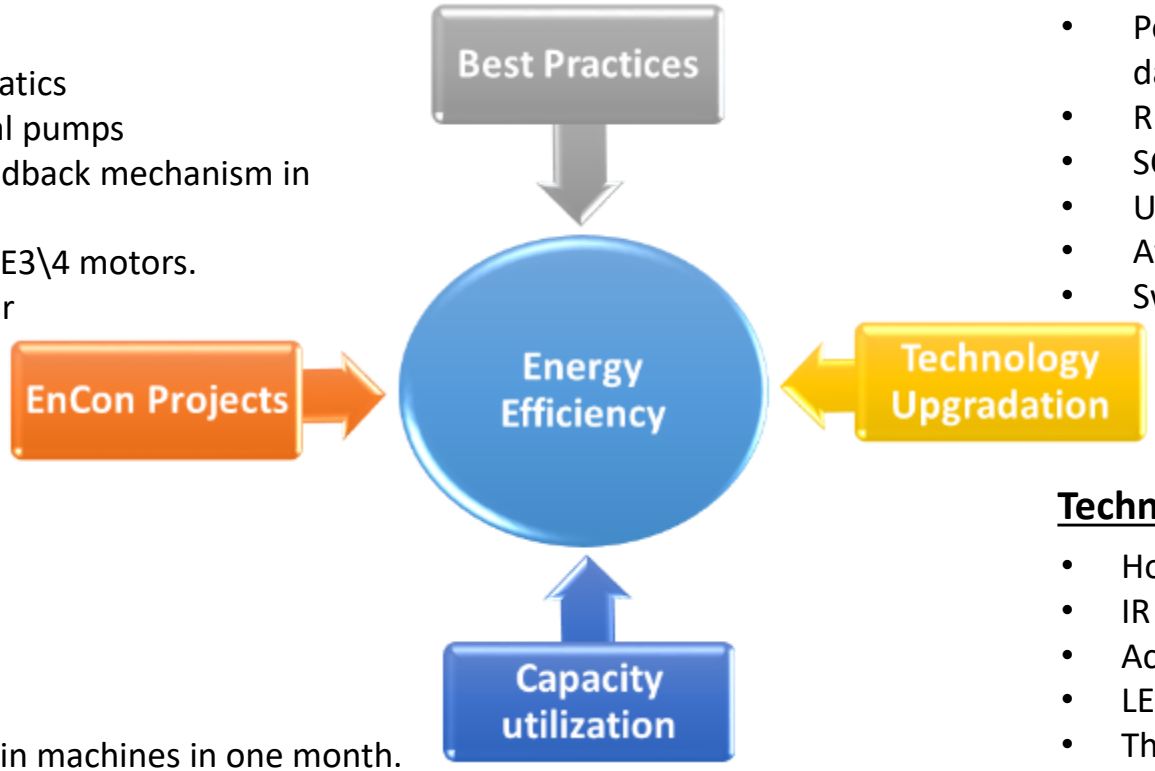
Amara Raja Model of Energy Conservation

EnCon projects:

- Lead pot size Optimization
- Improved Heater Controls
- Roof top solar systems
- LED Lighting across the plants
- Electrical Vibrators in place of Pneumatics
- Replacing AODD pumps with Electrical pumps
- High efficiency Water pumps with feedback mechanism in WRS and Cooling towers
- Replacement of normal motors with IE3\4 motors.
- Optimum utilization of Compressor air
- Reduction of Skin temperature.
- Heat recovery from Compressors
- Auto descaling of chillers.
- IR Heaters for Flash dryers.

Off Peak load scheduling :

- Operate the Acid Chillers during OFF peak hrs and store for Peak hour consumption.
- Operate the water pumps to fill the overhead tanks.
- Formation Rework process in OFF Peak hours



Best Practices:

- Always run both reactors connected to single lead pot
- Switch off Flash dryer during pasting machine stoppages.
- Periodical checking of healthiness of damper controls
- Run lead pots at lower band of specification.
- SCR Parameters fine tuning in COS lead pot.
- Use all circuits in a charger.
- Avoid manual bypassing of WRS water.
- Switch off lights when not required..

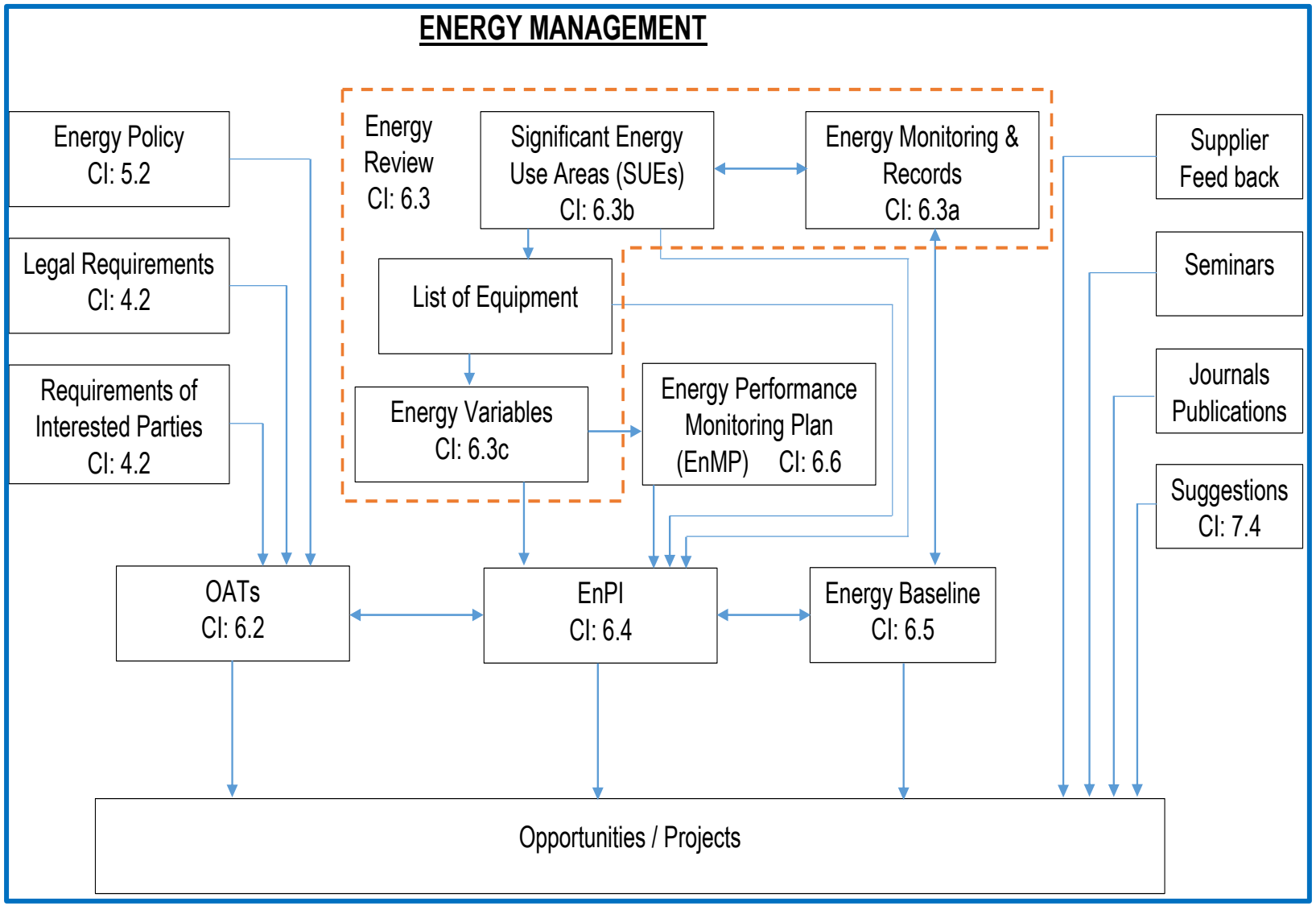
Capacity Utilization:

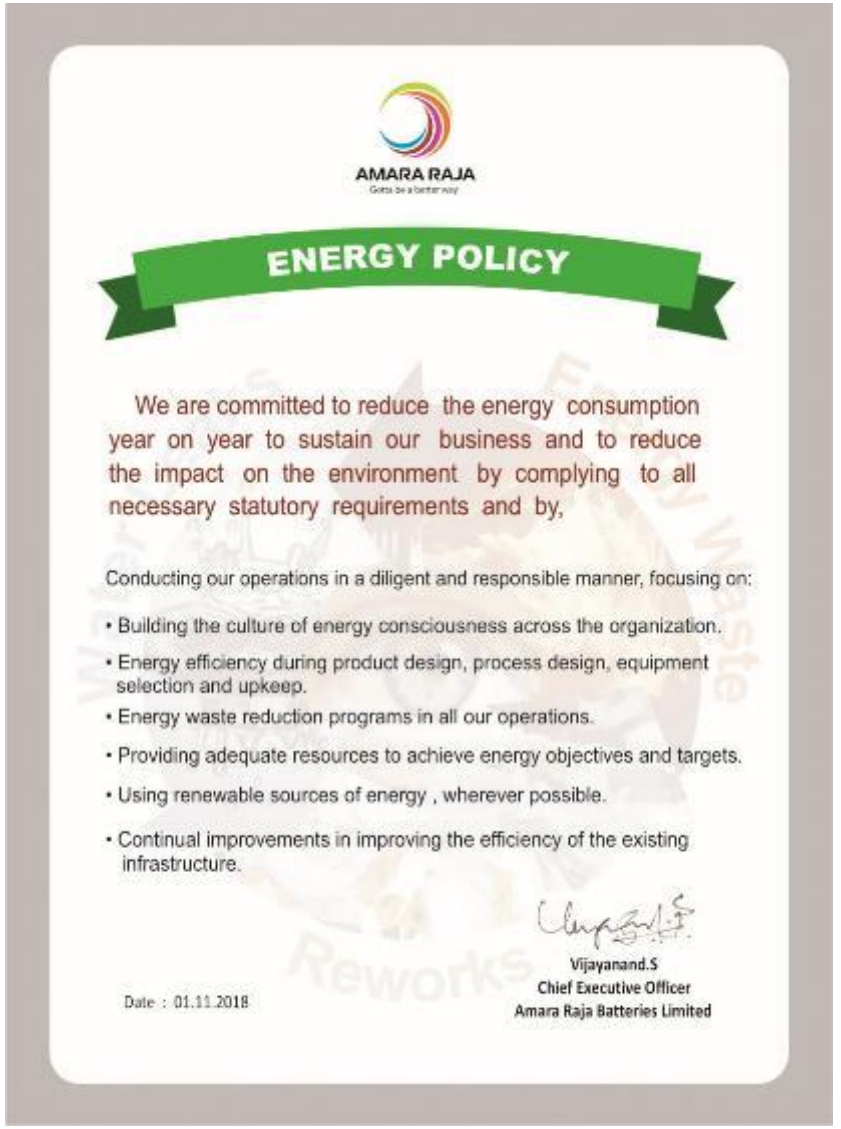
- Reduce number of Restarts in machines in one month.
- Trail run energy to be capitalized till 50% capacity is achieved.

Technology Upgradation:

- Hot Water Based Heating system for Ovens
- IR heaters For Flash Driers
- Active Harmonic Filters
- LED Lighting across the plants
- Thermal Energy Storage
- Brush Less DC Fans for AHUs & FA systems
- Auto Descaling systems of Chillers

ISO 50001:2018 Methodology for Energy Efficiency





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ENERGY POLICY

We are committed to reduce the energy consumption year on year to sustain our business and to reduce the impact on the environment by complying to all necessary statutory requirements and by,

Conducting our operations in a diligent and responsible manner, focusing on:

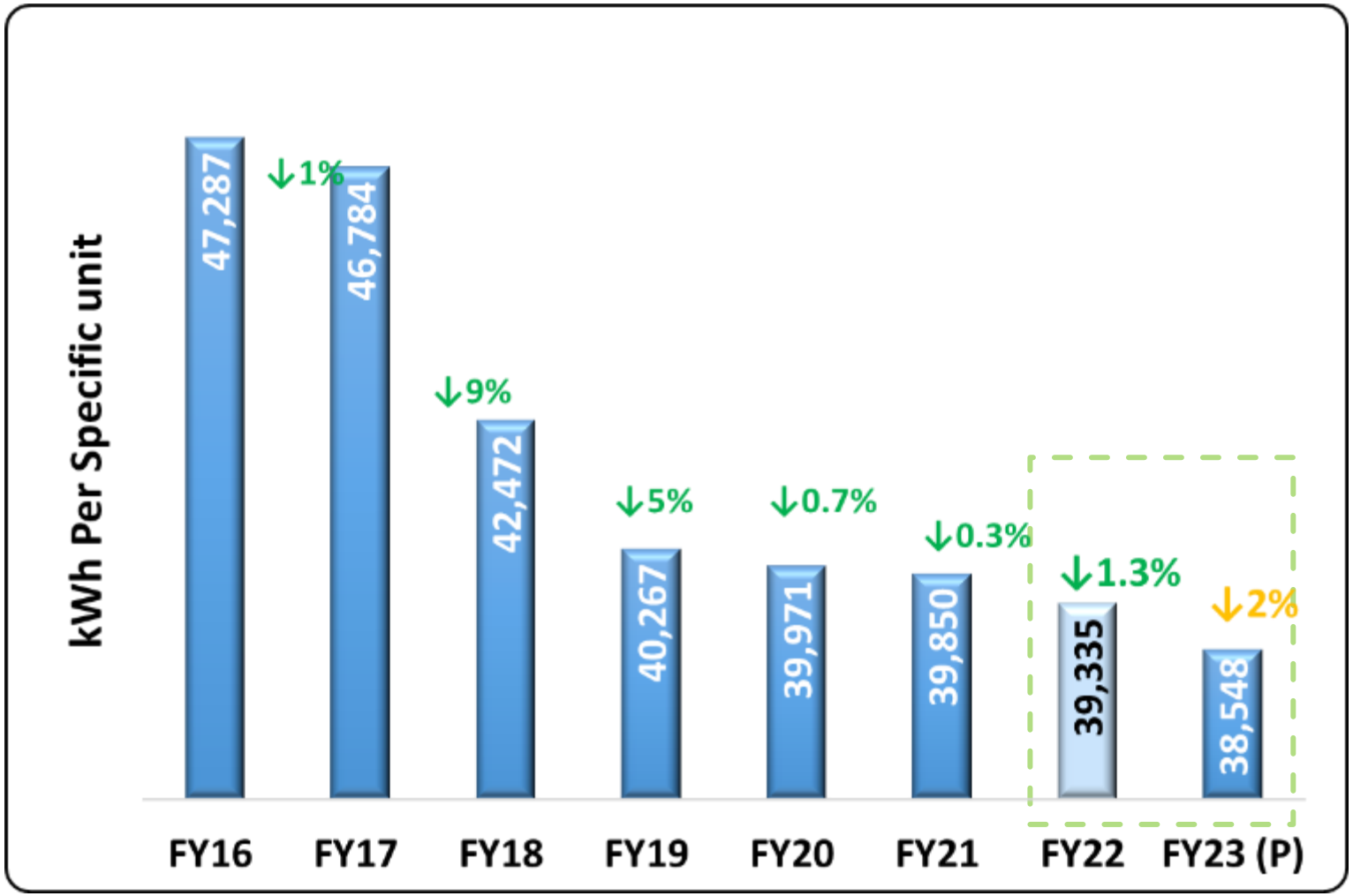
- Building the culture of energy consciousness across the organization.
- Energy efficiency during product design, process design, equipment selection and upkeep.
- Energy waste reduction programs in all our operations.
- Providing adequate resources to achieve energy objectives and targets.
- Using renewable sources of energy , wherever possible.
- Continual improvements in improving the efficiency of the existing infrastructure.

Vijayanand.S
Chief Executive Officer
Amara Raja Batteries Limited

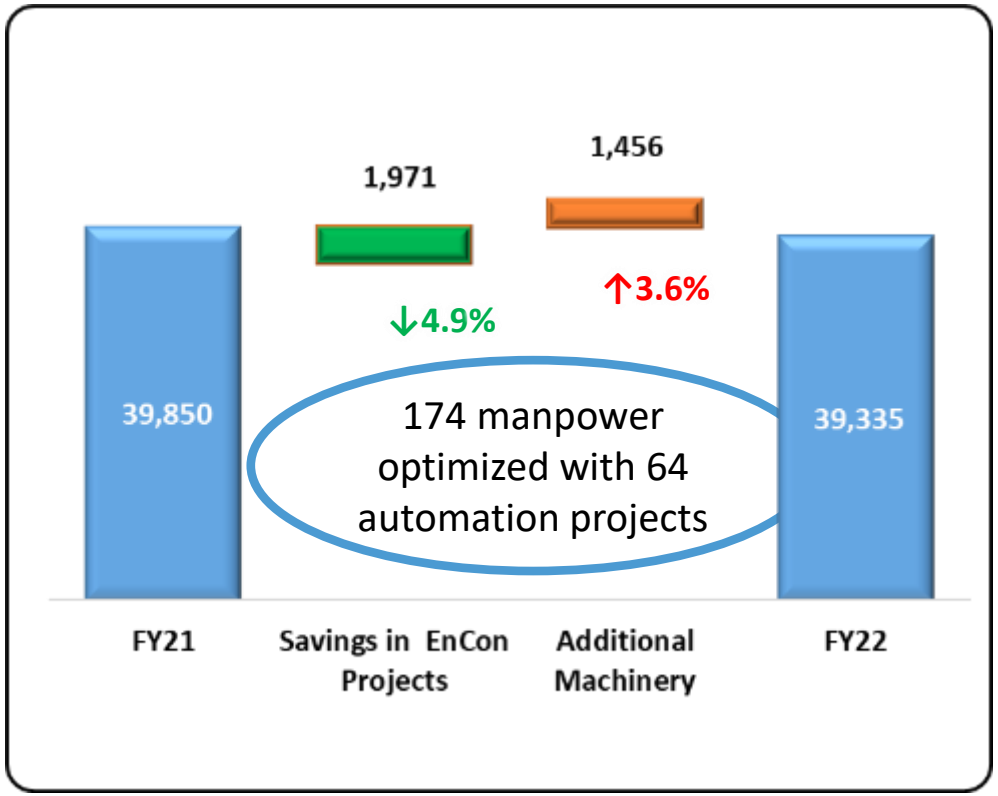
Date : 01.11.2018

Specific Energy Consumption

Sp. Energy Consumption per Specific unit



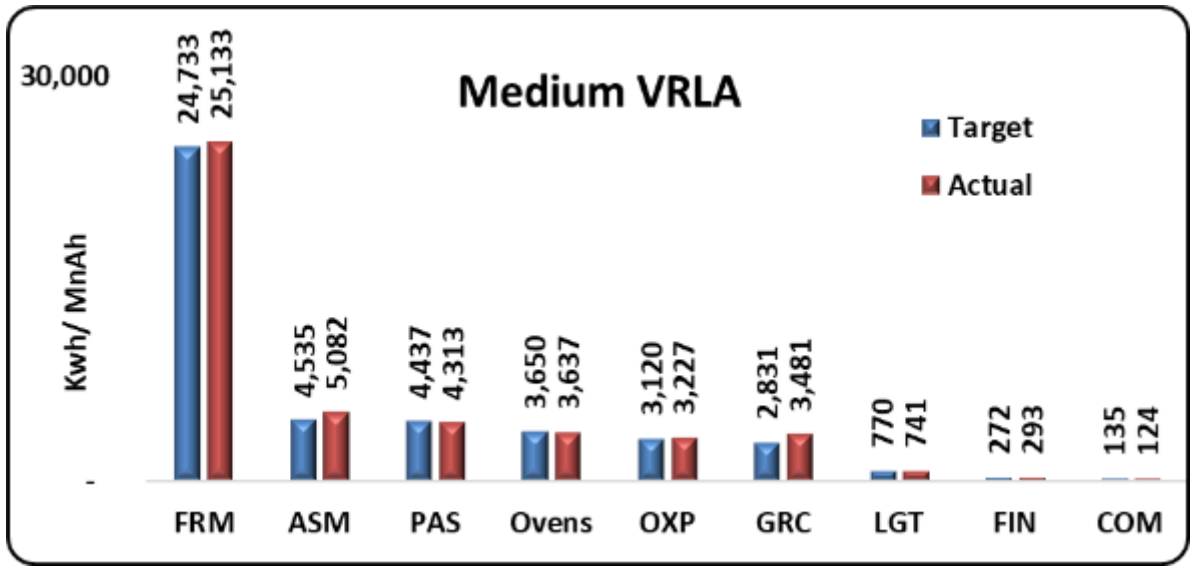
SEC Contribution

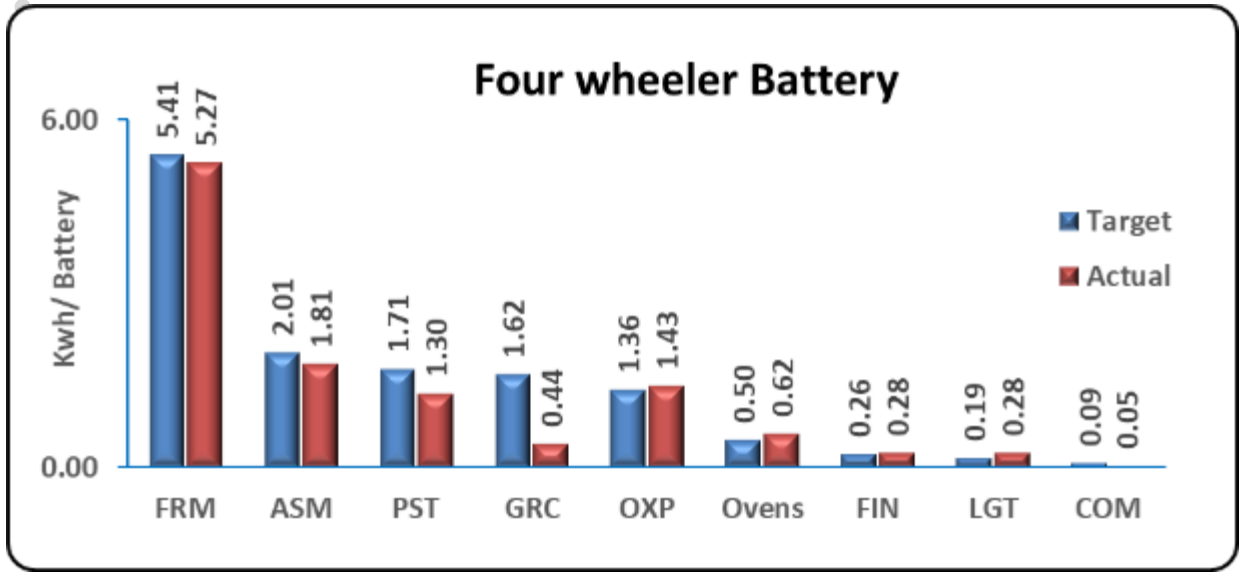


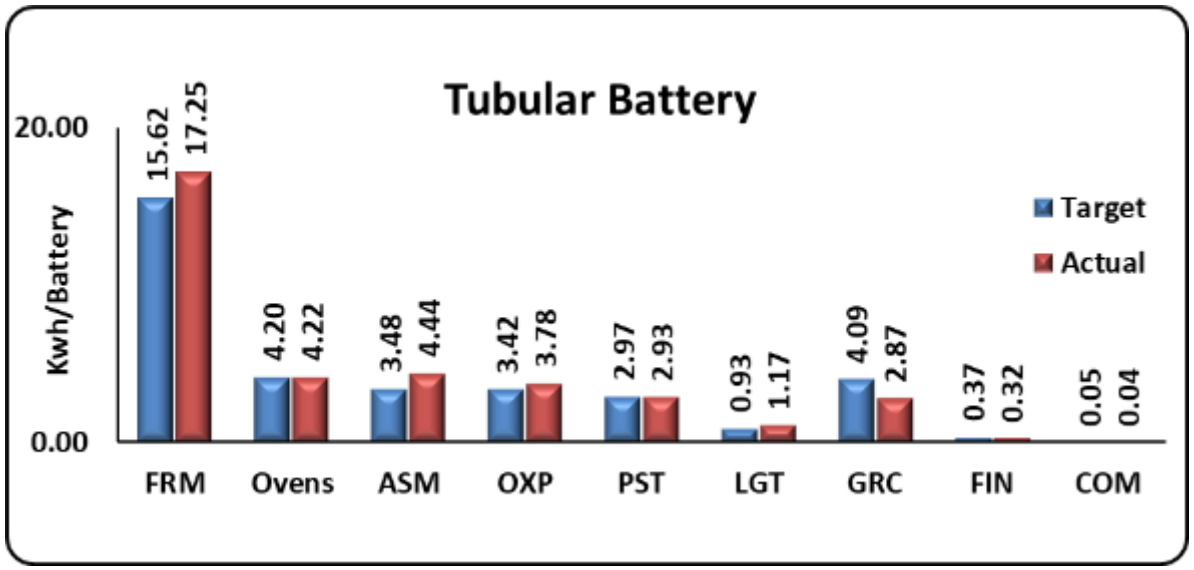
SP. Energy Reduction

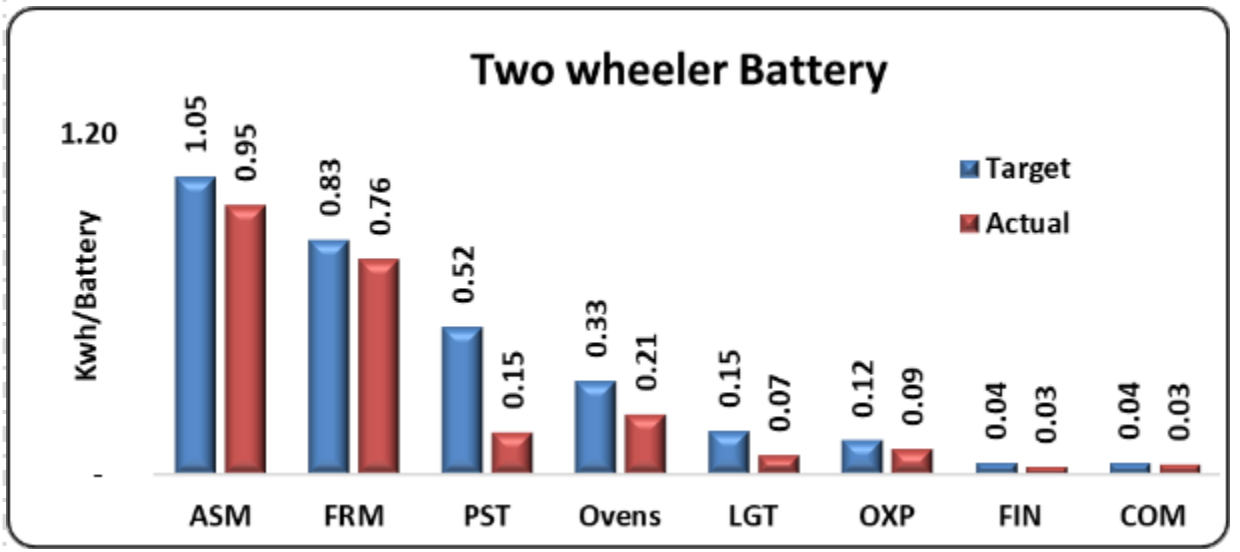
FY 16-22 :- 16.8 %

SEC of Significant Energy Use Areas









ISO 50001:2018 Methodology for Energy Monitoring

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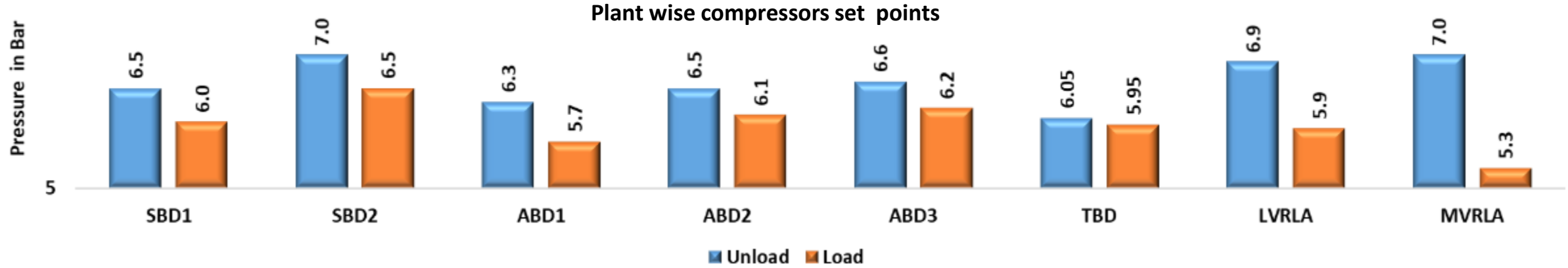
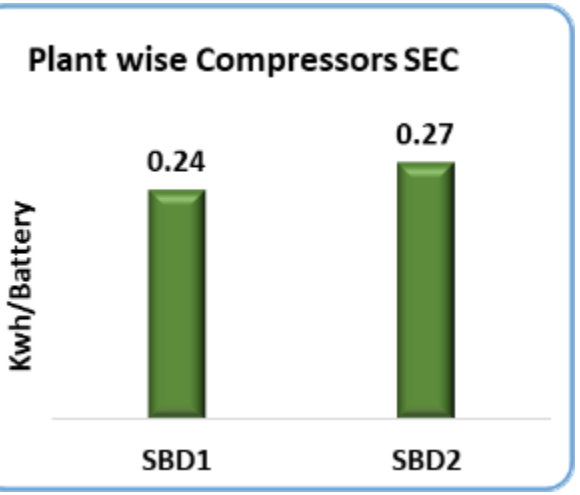
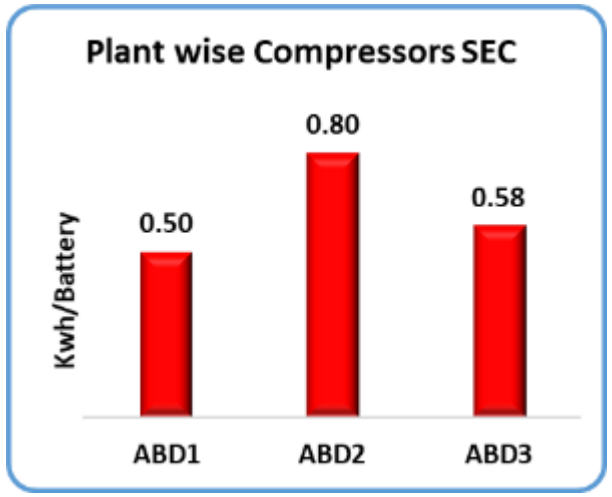
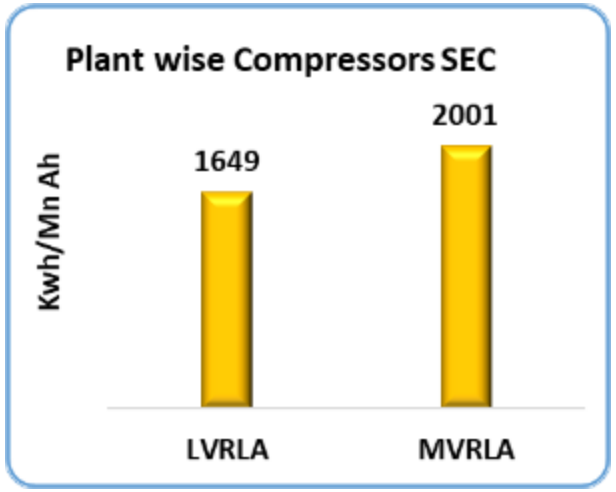
Interplant Comparison of SEC of Equipment

Compressors









Savings :

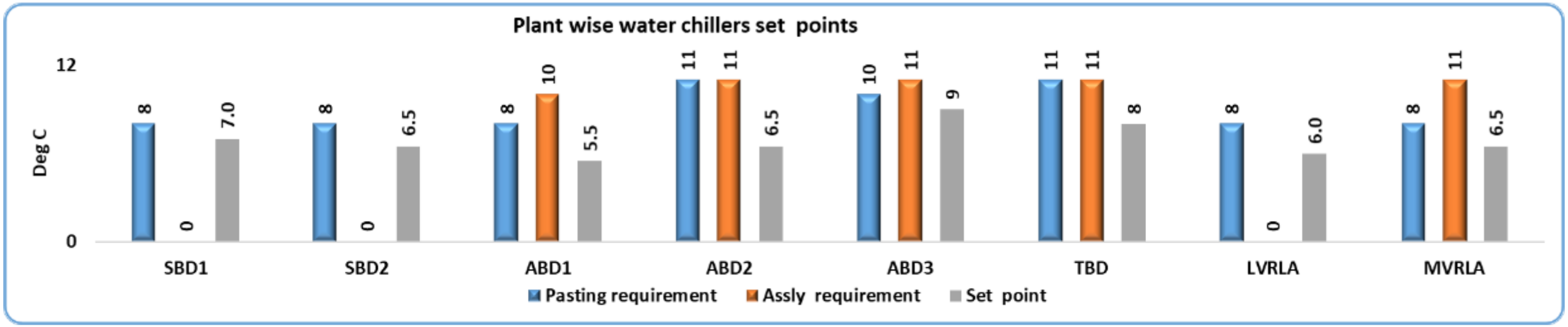
2.75 Lack kwh/Yr.

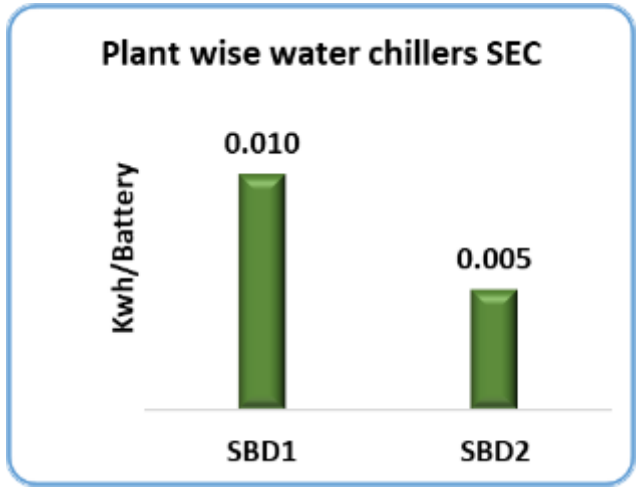
Note : TBD Plant Compressors SEC is : 4.40 Kwh/Battery

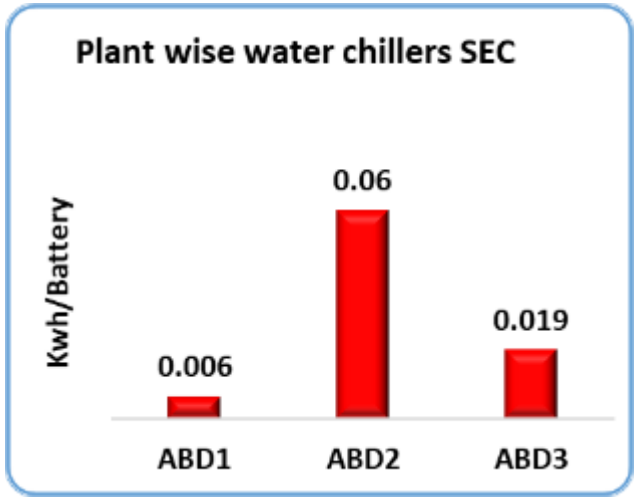
ISO 50001:2018 Methodology for Energy Monitoring

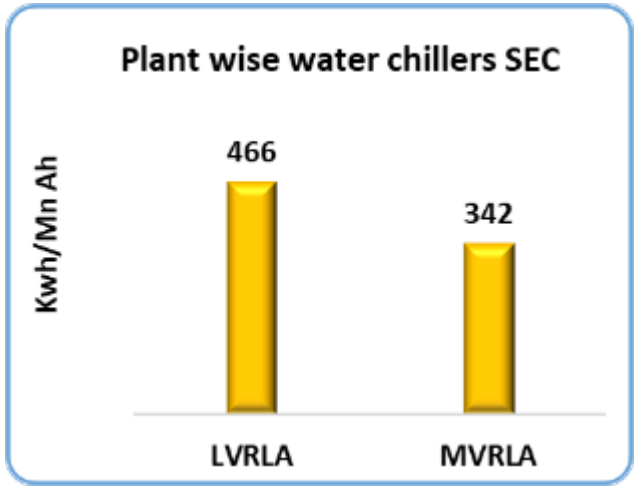
Interplant Comparison of SEC of Equipment

Water chillers







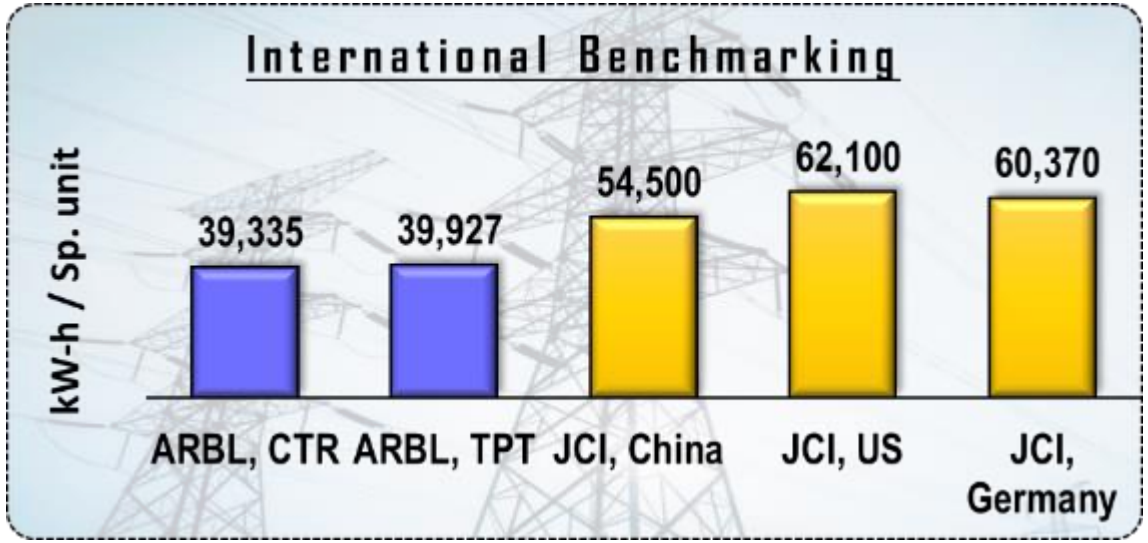


Savings :

2.1 Lack kwh/Yr

Note : TBD Plant water chiller SEC is : 0. 07 Kwh/Battery

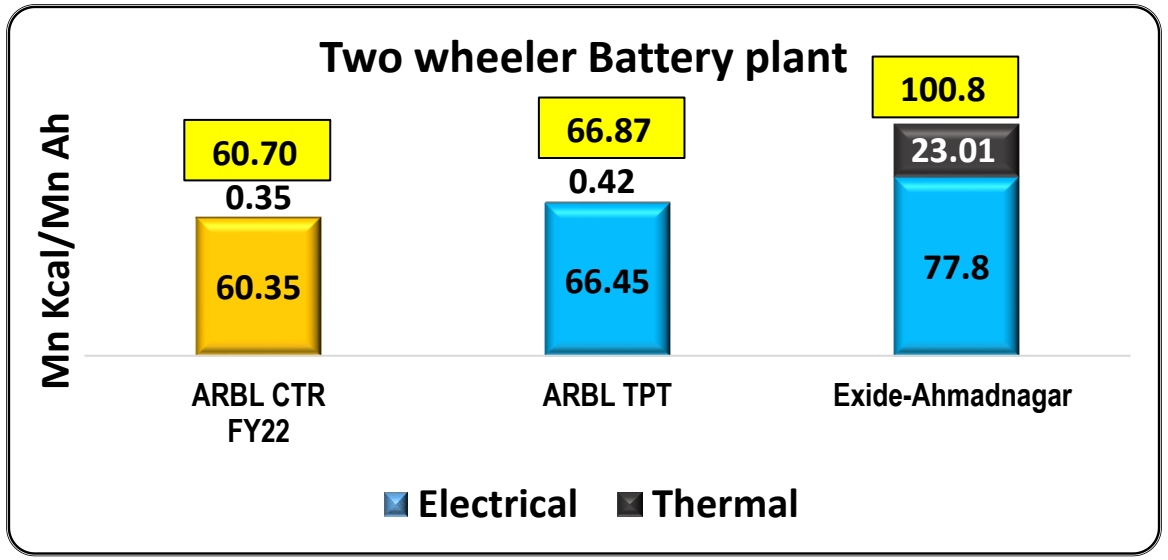
Energy Benchmarking

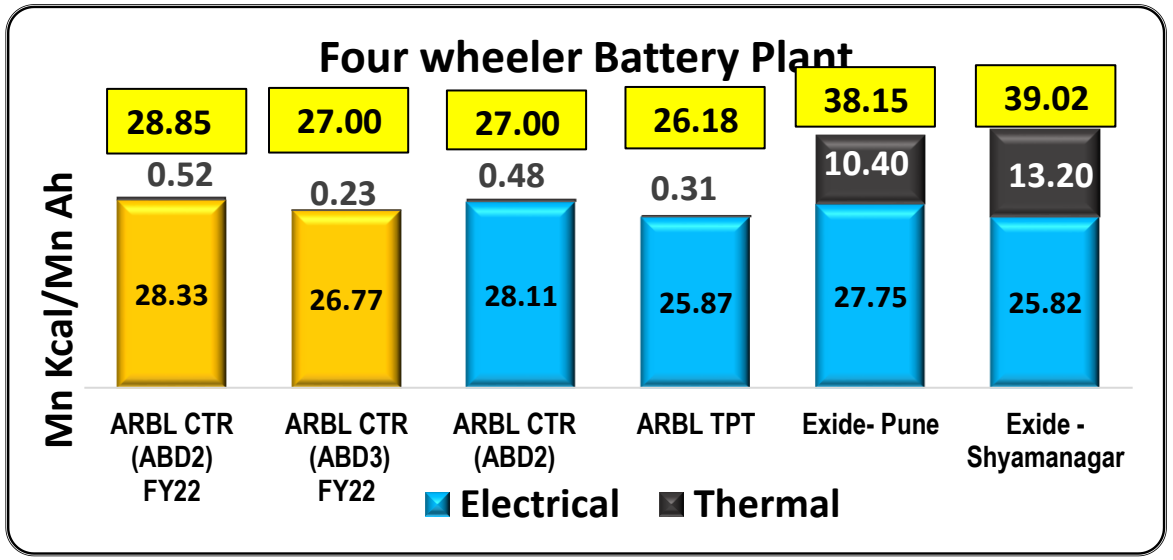


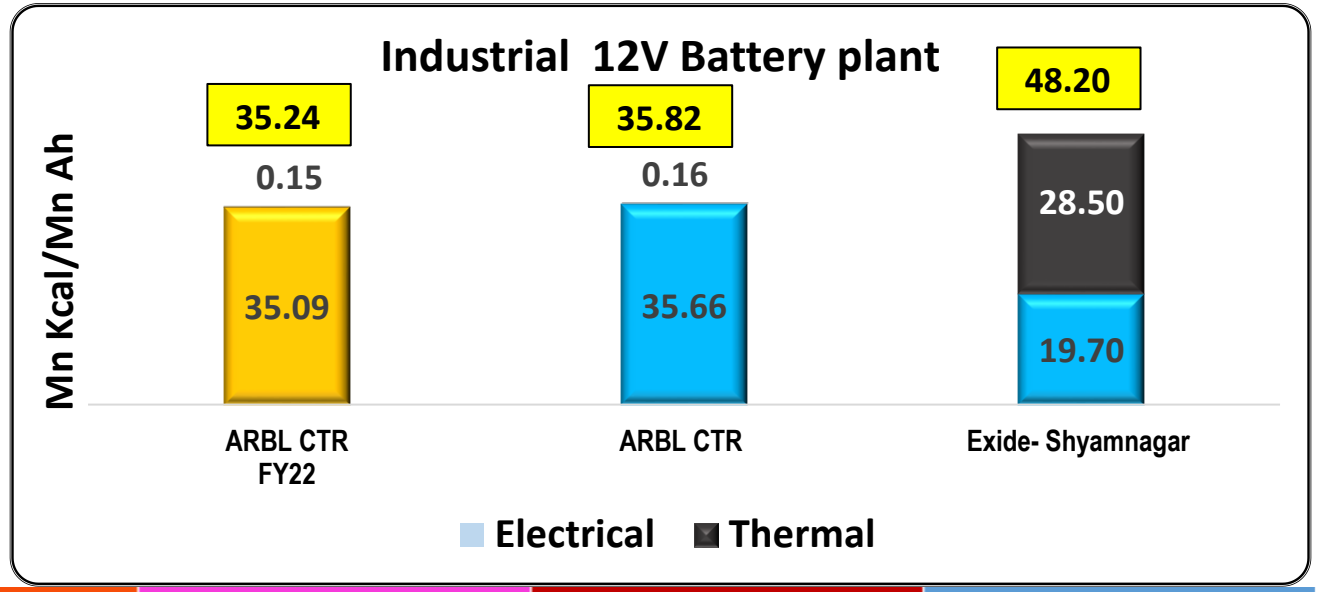
Further Focusing on..

- Addition of renewable energy
- IGBT technology rectifiers
- Heat recovery systems
- Process optimization
- Punched grid technology
- Lead pot design modification
- IIOT 4.0

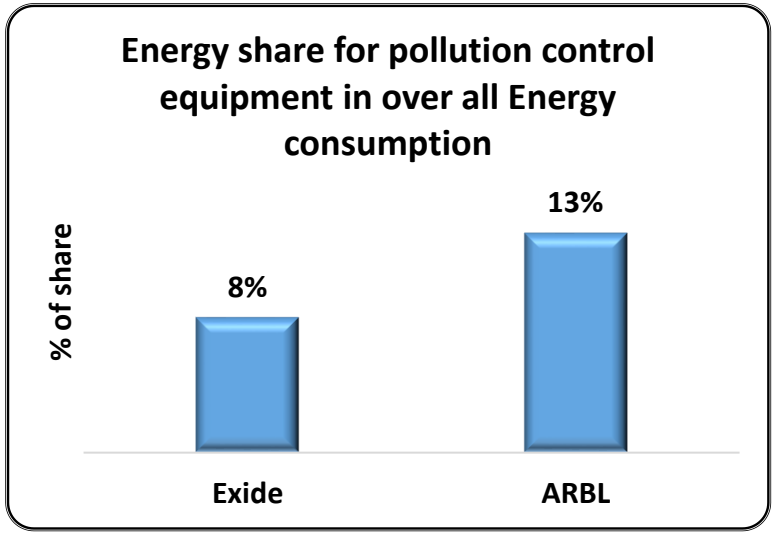
Product wise Energy Benchmarking

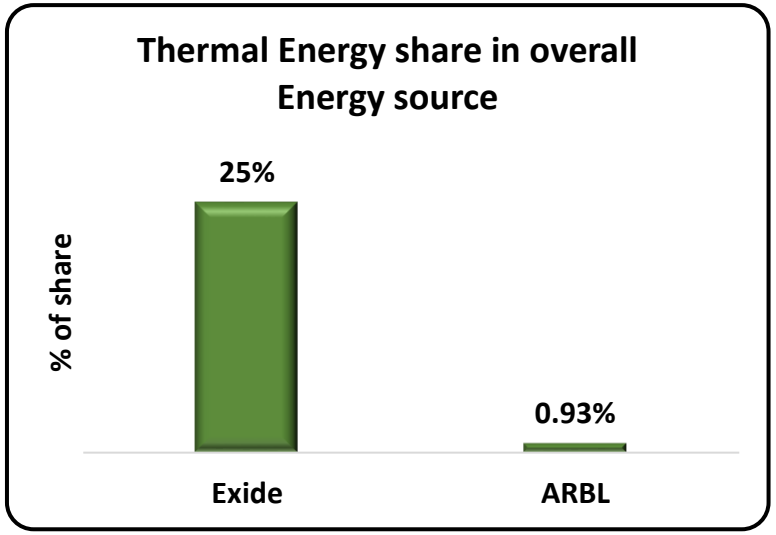






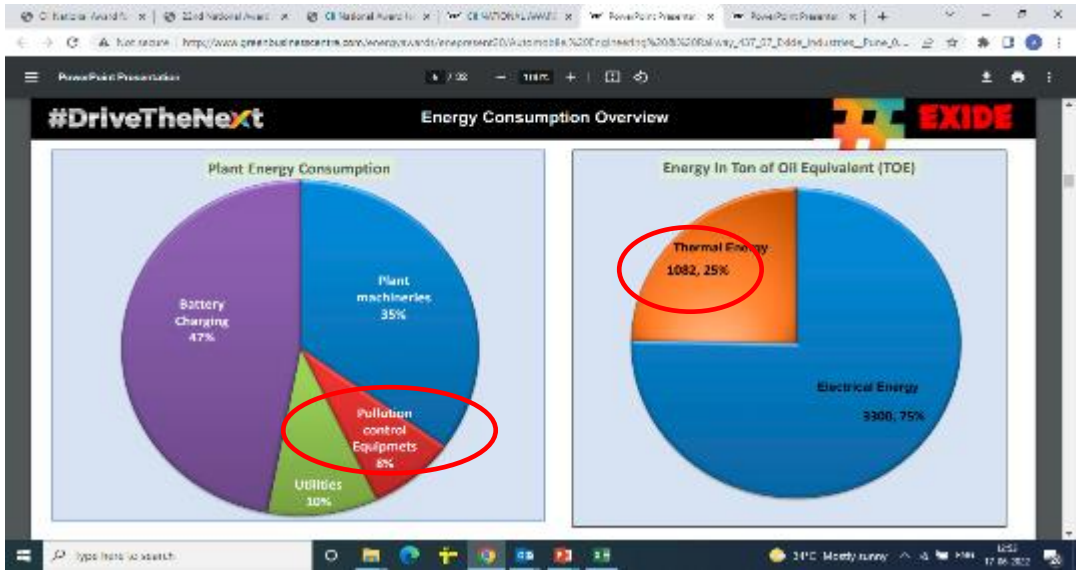
Bench Marking – Pollution control Equipment

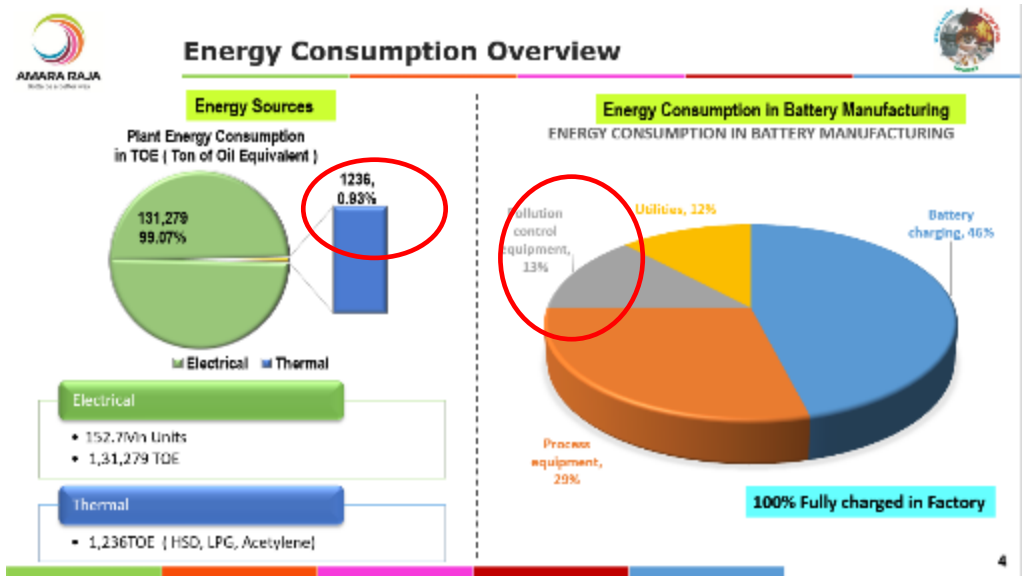




- ARBL pollution control equipment are
  - Lead related pollution controls.
- Exide Pollution control equipment may include
  - Lead related pollution controls
  - Thermal energy sources related controls.

This shows the commitment of ARBL towards Environment.





Ongoing Energy saving projects for FY'23

List of Ongoing Energy saving projects - FY'23 Amara Raja Batteries Ltd - Chittoor					
S No	Title of project	Annual savings in Kwh	Annual savings in Mn Rs	Investment in Mn Rs	Pay back in months
1	Replacement of contractor with SCR Zero cross over in ABD2 Grid casting aging oven.	44,875	0.27	0.02	1
2	Replace with direct coupling in place of belt drives for Wet scrubbers - 4 no's in in ABD2	52,500	0.32	0.40	15
3	Replacement of Centrifugal blower with BLDC fans in ABD2 Pasting Fresh Air systems	342,400	2.05	3.10	18
4	Separation of DE syetem-1 lines with pneumatic damper in ABD2 Grid casting & Pasting sections.	74,488	0.45	0.03	1
5	Install direct driven EC motors for Charger AHUs (BLDC) - 6 no's in ABD2	136,080	0.82	1.20	18
6	Replacement of Centrifugal blower with BLDC fans in ABD2 Assembly Fresh Air systems	302,400	1.81	3.60	24
7	Elimination of Formation Dumper washing tunnel blowers - 4 no's in ABD2	57,600	0.35	0.20	7
8	Replace with direct coupling in place of belt drives for FE Systems - 2 no's in ABD2	52,500	0.32	0.50	19
9	Replace existing conventional lamps with LED in ABD2 Assembly section	77,293	0.46	1.15	30
10	Install Compressor Air Consumption monitoring Kit for Air Compressors in ABD2	72,000	0.43	0.60	17
11	Day light sensor provide in ABD2 PLP, Assembly & Formation and Finishing sections	7,100	0.04	0.01	3
12	Ovens SCR's Fine tuning & optimization in ABD2	78,100	0.47	0.00	-
13	Install heat recovery system in Compressor's for heat transfer to Amenities' in ABD2	61,200	0.37	1.10	36
14	Finishing section Washing machine blowers & Web sealing blowers controls Contactor replace with SCR in ABD2	50,400	0.30	0.32	13
15	Replacement of contractor with SCR Zero cross over in ABD2 COS lead post 5 no's	24,120	0.14	0.3	21
16	Upgradation of Pasting line 4 flash drier SCR drive in ABD2	99,900	0.60	0.8	17
17	Skin temperature reduction in ABD2 Grid casting and Strip Casting lead pots	140,220	0.84	1.0	15

Ongoing Energy saving projects for FY'23

List of Ongoing Energy saving projects - FY'23 Amara Raja Batteries Ltd - Chittoor					
S No	Title of project	Annual savings in Kwh	Annual savings in Mn Rs	Investment in Mn Rs	Pay back in months
18	Replacement of SCR with SCR Zero cross over in MVRLA Grid casting lead pots	144,000	0.86	0.9	13
19	Replacement of SCR with SCR Zero cross over in MVRLA Oxide plant lead pots	10,800	0.06	0.06	11
20	Skin temperature reduction in Assembly COS lead pots 5nos in MVRLA	28,800	0.17	0.20	14
21	Replacement of SCR with SCR Zero cross over in MVRLA Assembly COS lead pots	48,600	0.29	0.06	2
22	Install direct driven Electronically communicated motor-1 no's (BLDC- EC) for charger AHU's in MVRLA	145,800	0.87	1.80	25
23	Replace with direct coupling in place of belt drives for FE Systems - 4 no's in MVRLA	56,592	0.34	0.06	2
24	Replacement of Centrifugal blower with BLDC fans in MVRLA Assembly Fresh Air systems - 6 no's	125,280	0.75	1.5	24
25	Installation of New IGBT chargers in place of 360V/30A old chargers (>15 years) in formation in MVRLA	552,960	3.32	11	40
26	Replace AODD pumps with energy efficient centrifugal pumps (IE3) in MVRLA	94,580	0.57	0.2	4
27	Replace old Acid chiller with new 2000LPH,42TR snow cool Acid chiller in MVRLA	151,200	0.91	2.89	38
28	Provide Insulation for Oxide plant and Grid casting Lead pot Hood in MVRLA	129,500	0.78	1.6	25
29	Skin temperature reduction in TBD Spine Casting lead pot - 1 no's	35,000	0.21	0.04	2
30	SCR fine tuning for Grid casting gravity lead pot in TBD	98,000	0.59	0	-
31	Lead level optimization for Grid casting lead pot in TBD	152,500	0.92	0	-
32	Skin temperature reduction in TBD Grid Casting lead pot	31,500	0.19	0.2	10
33	Replacement of contactor control with SCR zero cross over control for spine casting heaters - 9 no's in TBD	126,000	0.76	0.90	14
34	Skin temperature reduction in TBD Spine Casting lead pots - 6 no's	80,400	0.48	0.42	10

Ongoing Energy saving projects for FY'23

List of Ongoing Energy saving projects - FY'23 Amara Raja Batteries Ltd - Chittoor					
S No	Title of project	Annual savings in Kwh	Annual savings in Mn Rs	Investment in Mn Rs	Pay back in months
35	Skin temperature reduction in TBD Oxide plant lead pots - 2 no's	135,000	0.81	0.20	3
36	Replace pneumatically operated vibrators with electrically operated vibrators in silos ,Day tanks in TBD	42,457	0.25	0.260	12
37	Install direct driven Electronically communicated motor-12 no's (BLDC- EC) for charger AHU's in TBD	330,250	1.98	2.60	16
38	Replace AODD pumps with energy efficient PP centrifugal pumps (IE3) at ETP	187,500	1.13	0.60	6
39	Install IFC (Intelligence flow control) system for Compressors in TBD	172,000	1.03	0.95	11
40	Auto descaling system provided for 110 TR chillers	86,400	0.52	0.75	17
41	Install Capacitor banks at SDB level for Maintain Power factor in TBD	105,000	0.63	1.10	21
42	Replace pneumatically operated vibrators with electrically operated vibrators in TBD	128,446	0.77	1.20	19
43	optimization of temperature & Relative humadity for Ovens in SBD2	184,680	1.11	0.00	-
44	Elimination of BM machine DE motor in ASM Lines in SBD2	122,500	0.74	0.00	-
45	Replace pneumatically operated vibrators with electrically operated vibrators at silos	45,723	0.27	0.28	12
46	Roof top solar installation in ASG plant 1.82 MW	,649,920	15.90	84.84	64
47	Installation solar P V Panels to Sky lights on Roof top solar at MVRLA plant 718KWp	1,045,408	6.27	40.38	77
48	Roof top solar installation in walk ways ARGC plants 0.6 MW	873,600	5.24	23.99	55
49	Installation solar P V Panels to Sky lights on Roof top solar at ARGC plants 0.8 MW	1,164,800	6.99	37.29	64
	Total for 2022-23	**10,958,372**	**65.75**	**230.56**	**42**

Statistics on EnCon Projects

Year	No of Projects	Investment (in Mn RS)	Savings (in Mn RS)	Payback (in Years)
FY20	47	256.65	62.01	4.1
FY21	37	341.85	57.10	6.0
FY22	49	123.95	55.03	2.4

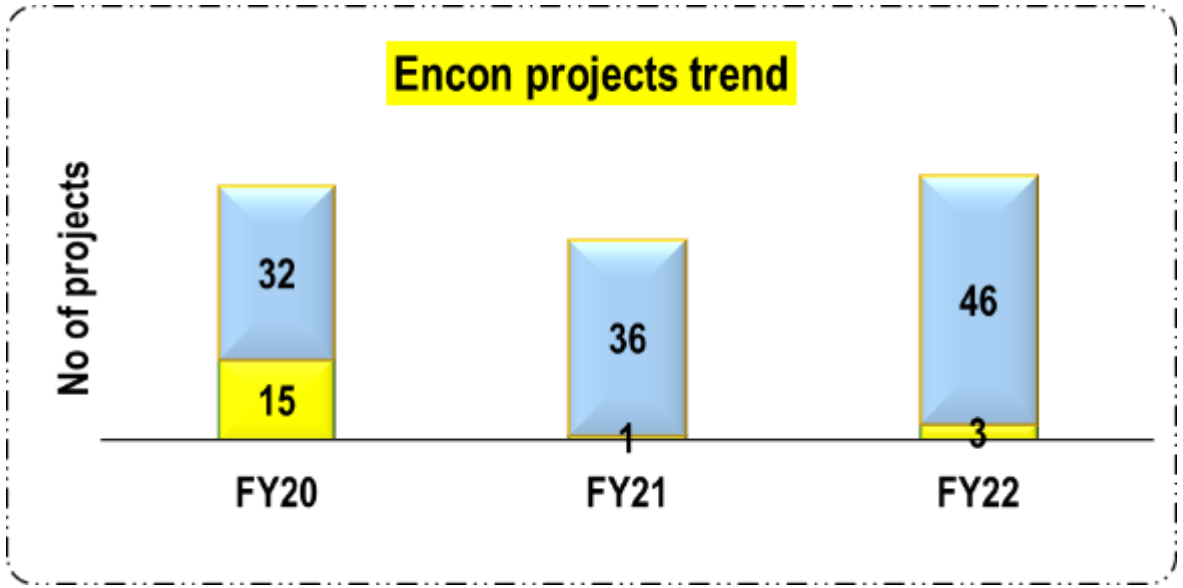
With Solar PV Projects

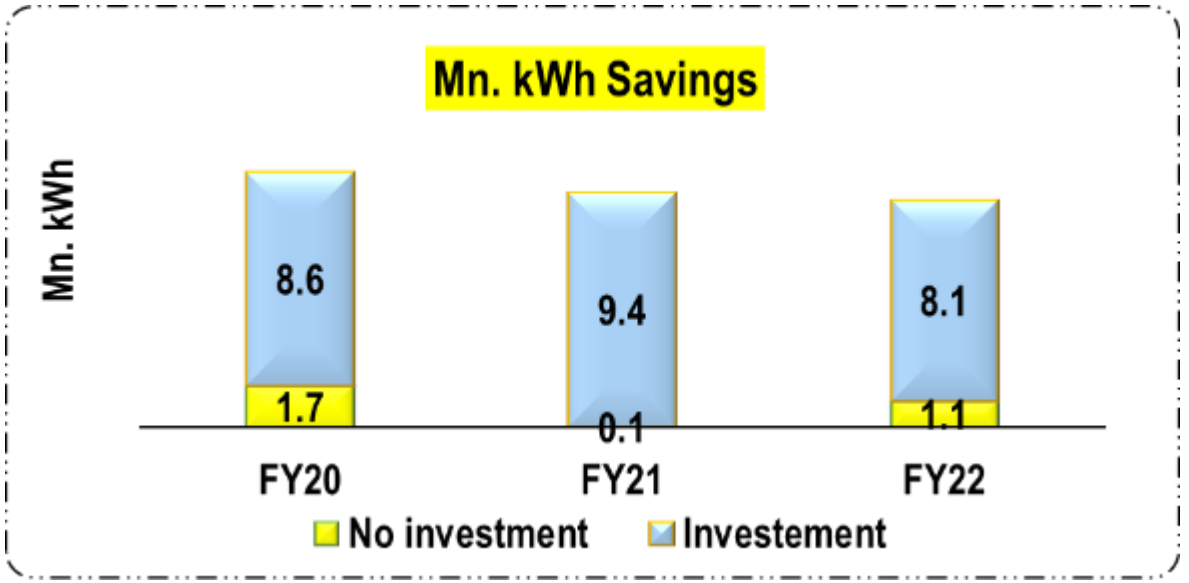
With out Solar PV Projects

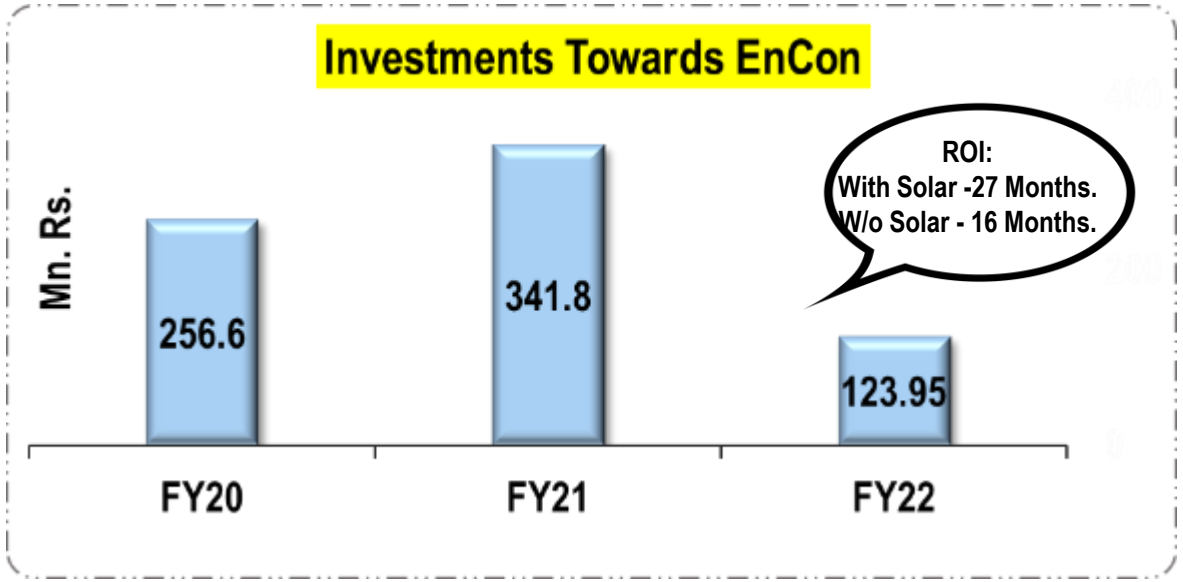
Year	No of Projects	Investment (in Mn Rs)	Savings (in Mn RS)	Payback (in Years)
FY20	44	9.65	29.23	0.3
FY21	34	11.85	13.87	0.8
FY22	47	58.59	43.51	1.2

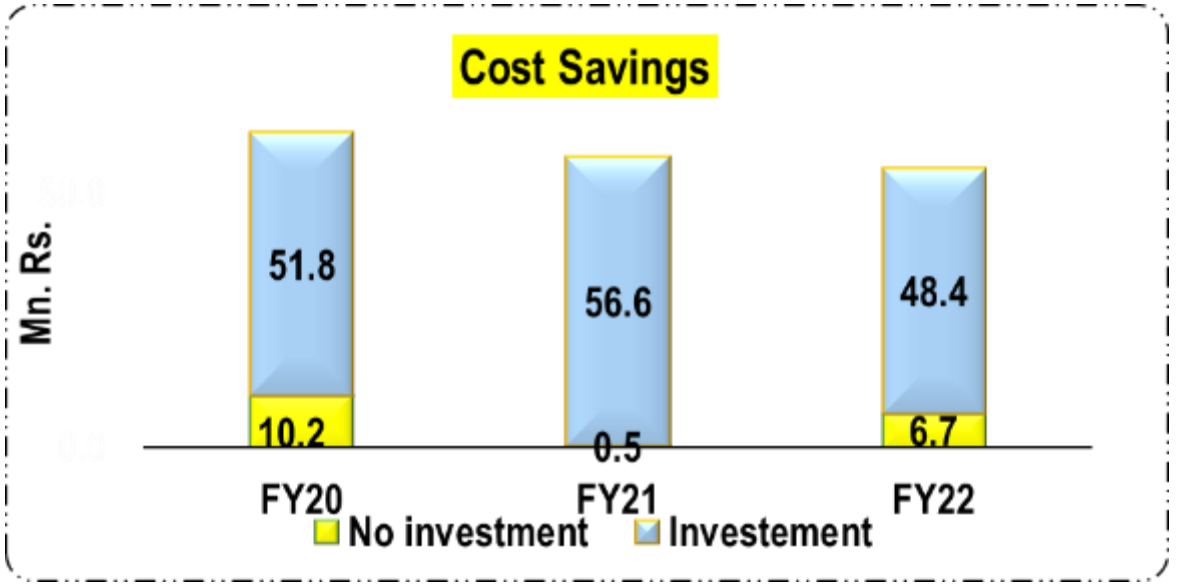
500% increase in Non-Solar projects

Statistics on EnCon Projects

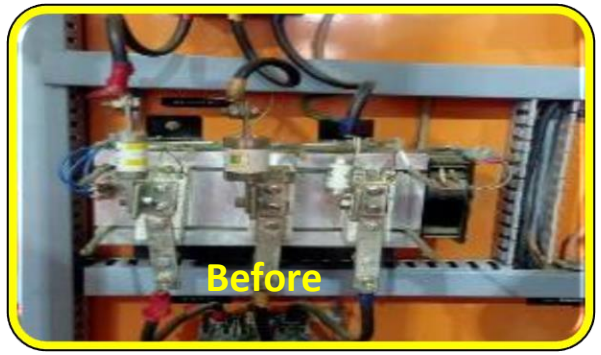








Energy Saving Projects Implemented



Project : 01
Replace Thyristor control SCR in place of contactor for PDC machine lead

Concept :Energy optimization trough thyristor changed from phase angle to Zero crossing SCR

Savings :
- Cost Saving:Rs0.26 Mn
- Investment :Rs0.12 Mn
- ROI = 0.5 Yrs.

HD : 0.98 Mn Rs

Project : 02
Power factor improvement in plant SDBs level.

Concept : Existing power factor at SDBs level 0.89 lag. To improve P.F to 0.99 installed fixed capacitor bank (100 Kvar).

Savings :
- Cost Saving = 0.18 Mn
- . Investment =0.14 Mn
- ROI = 0.7 Yrs.

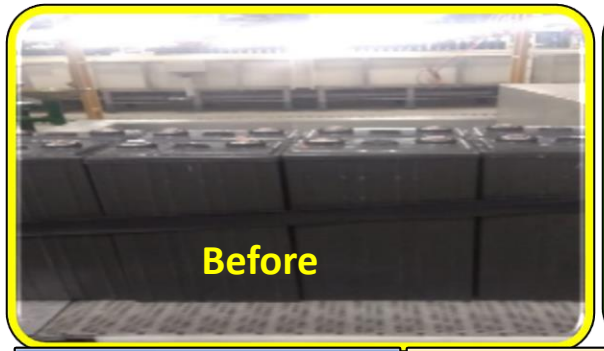
HD : 1.1 Mn Rs

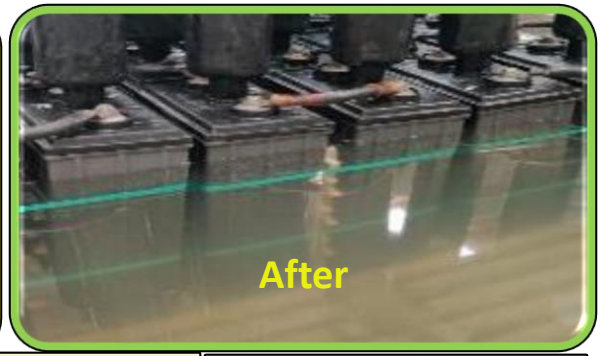
Project : 03 install Auto descaling system (Automatic condenser tube cleaning) for water chillers

Concept :140TR Water chiller approach Temperature reduced from 10 to 4 deg. By installing automatic ball tube cleaning system.

Savings :
- Cost Saving = 0.26 Mn
- . Investment =0.8 Mn
- ROI = 3 Yrs.

HD : 1.18 Mn Rs





Project :04
Reduction of 1st CD (Capacity discharge) Failures in formation process.

Concept :provided packing pads between cell to cell and improving water circulation for rework energy to maintain with in spec to reduced CD failures

Savings :
- Cost Saving = 0.35 Mn
- . Investment =0.2 Mn
- ROI = 0.6 Yrs.

HD : 0.89 Mn Rs

Energy Saving Projects Implemented

Project : 05
Install VFD (Variable frequency control drive) for Fresh Air Systems

Concept : FA system motor speed control automation, If amp.Temp is 27 to 32 Deg, motor will run @30 Hz , 33 to 35 Deg, @35 Hz, and >35.1 will run @40 Hz.

Savings :
- Cost Saving = 0.9 Mn
- . Investment =0.05 Mn
- ROI = 1 Yrs.

HD : 2.68 Mn Rs

Project : 06
Replacement of old water chiller with twin compressor Water chiller.

Concept : Existing water chiller was out dated and single compressor, which consumes high energy. Replaced with twin compressor .

Savings :
- Cost Saving = 0.48 Mn
- . Investment = 1 Mn
- ROI = 2 Yrs.

HD : 1.82 Mn Rs

Project : 07
Replaced centrifugal blowers with BLDC Motor in Fresh air system.

Concept :: centrifugal blower with belt driven induction motor 22.5KW, Replaced with direct driven EC fan technology powered by DC motor

Savings :
- Cost Saving = 0.36 Mn
- . Investment =0.6 Mn
- ROI = 1.6 Yrs.

HD : 2.2 Mn Rs

Project : 8
Replaced Formation old Chargers with IGBT chargers (technology upgradation) .

Concept : SCR based chargers (>25 years old) are used in formation section due to this charger efficiency is low (62%). installed IGBT Based Converters to 92% efficiency.

Savings :
- Cost Saving = 1.4 Mn
- . Investment =5.2 Mn
- ROI = 3.7 Yrs.

HD : 4.6 Mn Rs

Energy Saving Projects Implemented

Project : 09
Pasting Chillers upgradation from Semi hermetic to Screw compressing system

Concept : Semi hermetic compressing system life reduced and model absolute. Replaced with Screw compressing system

Savings :
- Cost Saving = 0.75 Mn
- . Investment =2.7 Mn
- ROI = 3.5 Yrs.

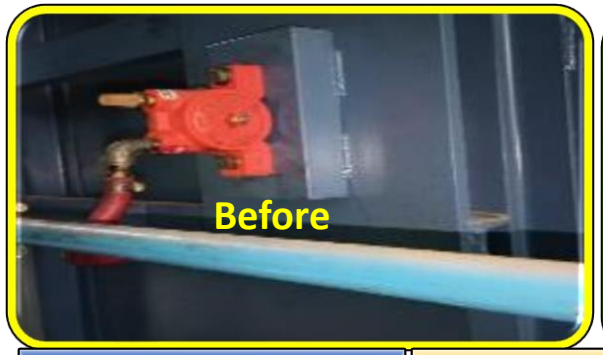
HD : 2.1 Mn Rs

Project : 10
Skin temperature reduction in lead pots by providing insulation.

Concept : Provided nanogel insulation jacket material For lead pot to avoid heat escaping and control heater switching on time

Savings :
- Cost Saving = 0.25 Mn
- . Investment =0.25 Mn
- ROI = 1 Yrs.

HD : 0.98 Mn Rs



Project : 11
Replaced pneumatically operated vibrators with electrically operated vibrators at silos

Concept : : in Plant all vibrators are working o compressor air, replaced with electrical vibrators (14 nos) in PLP areas

Savings :
- Cost Saving = 0.23 Mn
- . Investment = 0.05 Mn
- ROI = 0.3 Yrs.

HD : 1.78 Mn Rs

Project : 12
Timer installation for plant lighting & utility rooms.

Concept: In day time in plant required lights only in ON condition. Remaining lights are in OFF & utility rooms lights OFF through timers controllers.

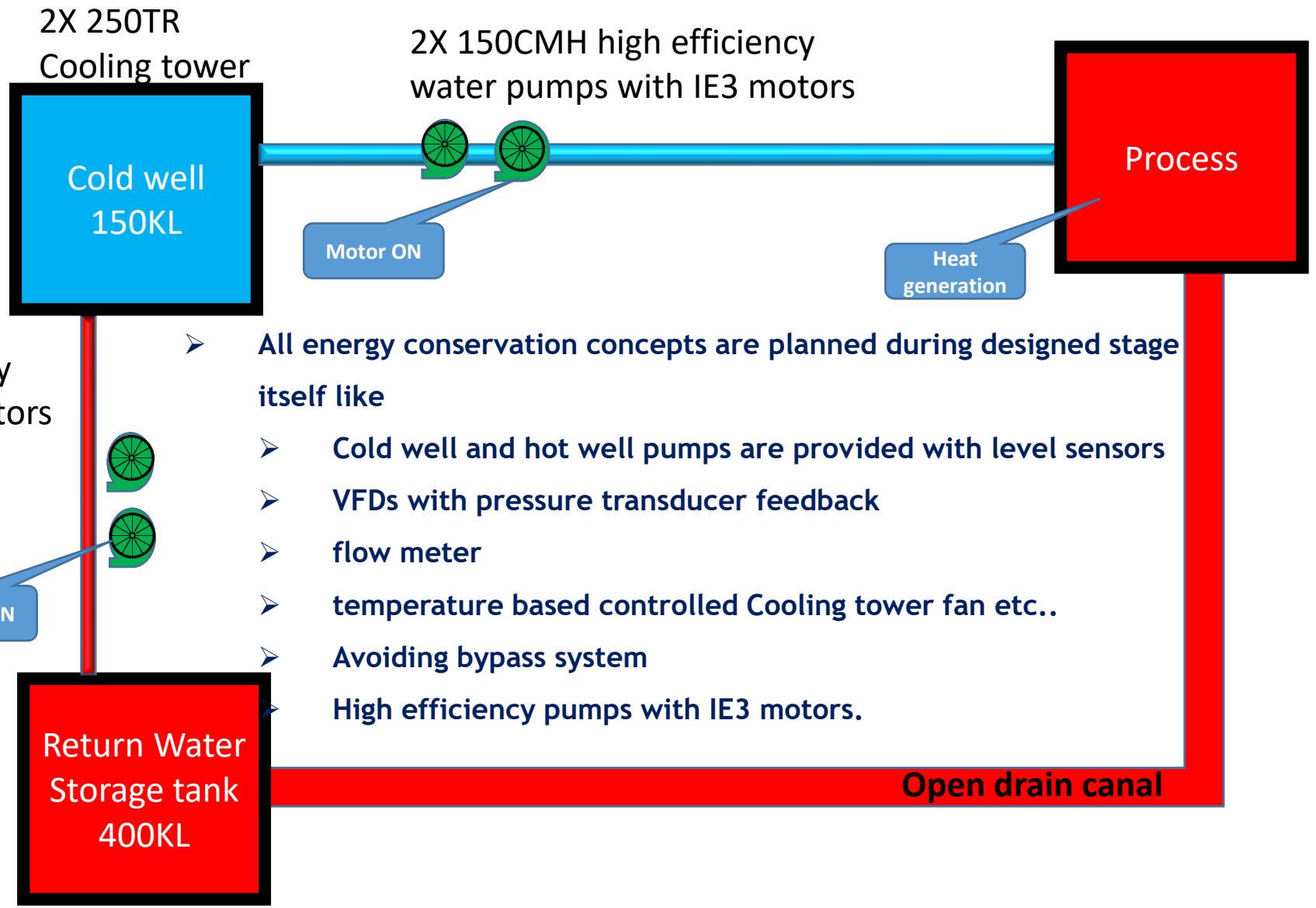
Savings :
- Cost Saving = 0.08 Mn
- . Investment =0.2 Mn
- ROI = 2.5 Yrs.

HD : 0.54 Mn Rs

Innovative Project :

Avoiding Cold well pumps in cooling tower by providing priming pots

Conventional WRS



- All energy conservation concepts are planned during designed stage itself like
  - Cold well and hot well pumps are provided with level sensors
  - VFDs with pressure transducer feedback
  - flow meter
  - temperature based controlled Cooling tower fan etc..
  - Avoiding bypass system
  - High efficiency pumps with IE3 motors.

Innovative Project :
Avoiding Cold well pumps in cooling tower by providing priming pots

Design Data

- Cooling tower: 2X250TR
- Hot well tank capacity: 400KL
- Cold well tank capacity: 300KL.
- Primary pumps (Hot well to cold well) :
  Flow:150M3\Hr., Head:38M
  high efficiency water pumps with IE3 motors.
  (2 running + 1standby)
- Secondary pumps Cold well to Process:
  Flow:150M3\Hr., Head:15M
  high efficiency water pumps with IE3 motors
  (2 running + 1standby)

Existing setup

- Water Recirculation System(WRS) is a major energy use area in the process of battery charging area.
- This WRS is designed for 120% plant capacity to run at 45degC to cater during peak summer of the region
- With our experience in old plants, we found WRS is not working to its full capacity for 50% of time. Temperature in the hot well is less than 30degC, for 50% of time out of 8760 hrs (365days X 24hrs) in a year, which is sufficient for our process.

Innovative Project :
Avoiding Cold well pumps in cooling tower by providing priming pots

➢ **Innovation:**

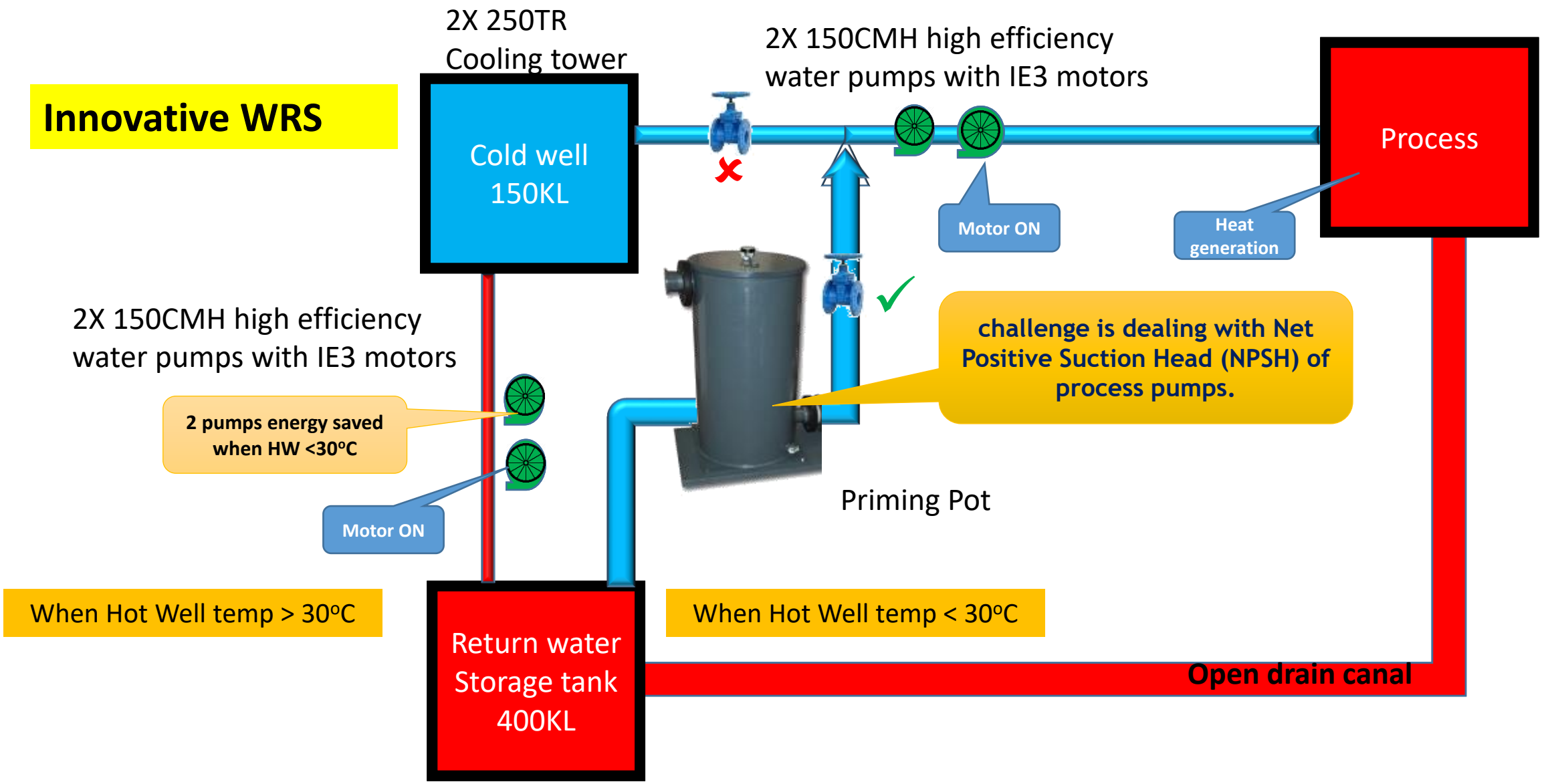
However, hot well pumps are required to pump water to cold well, since our process pumps are from cold well. We found some opportunity here to save energy.

When water is less than 30degC in hot well, Process pumps can directly pump water from hot well instead of cold well thereby avoiding hot well pumps. Here, the challenge is dealing with Net Positive Suction Head (NPSH) of process pumps.

To mitigate this issue, we connected separate line from hot well to Process pump suction points with valves and introduced priming pots in process pumps and Whenever temperature is less than 30degC, hot well pumps are switched OFF and process pumps are run with suction from hot well through priming pots, there by eliminating the NPSH issue.

Innovative Project :

Avoiding Cold well pumps in cooling tower by providing priming pots



Innovative Project :
Avoiding Cold well pumps in cooling tower by providing priming pots

Benefits :

Investment –Rs.50,000

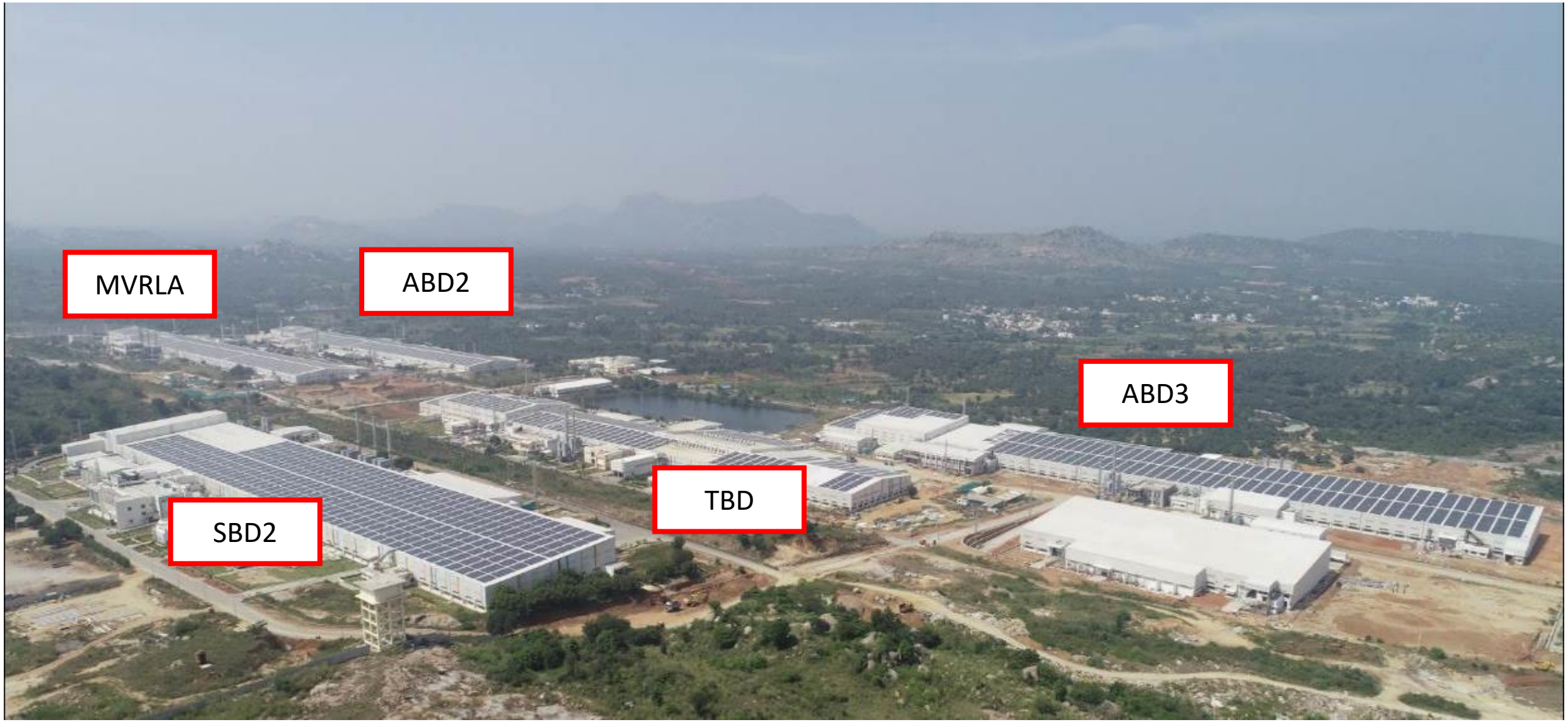
Energy Savings – 60,000 kwh.

Cost Savings –Rs.4,00,000

Horizontal deployment

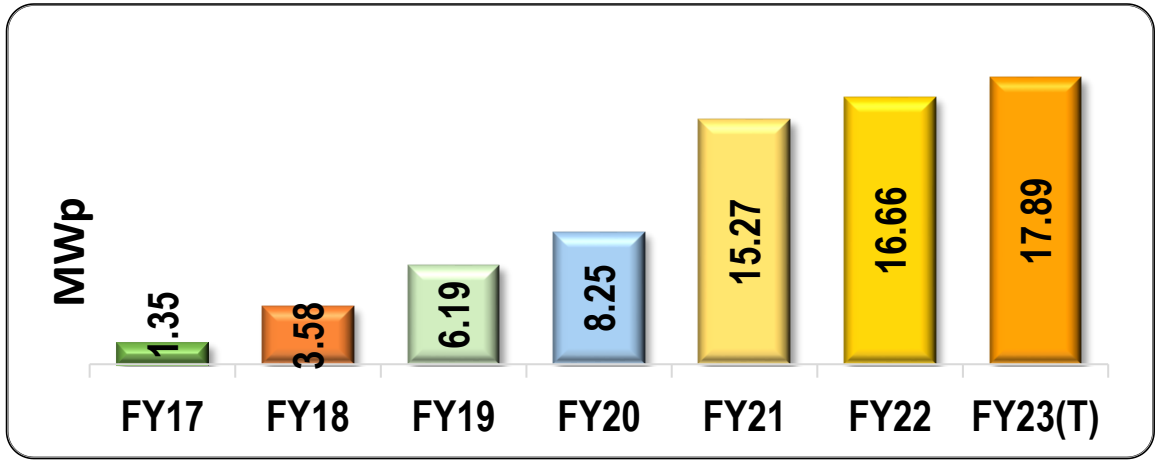
Plants	Energy savings (Kwh)	Total Cost savings (Mn Rs.)
6	3,60,000	2.40

Renewable Energy Roof Top Solar Panels

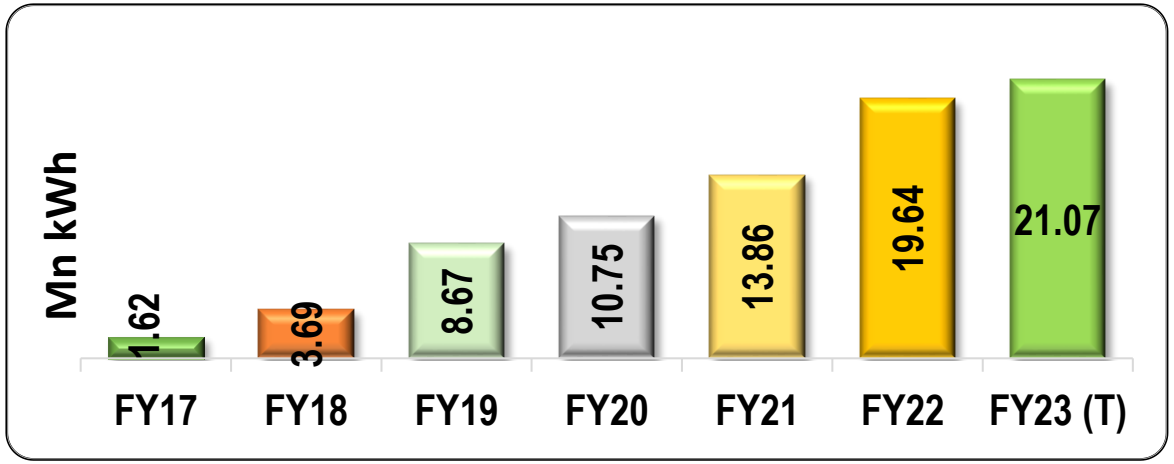


Renewable Energy

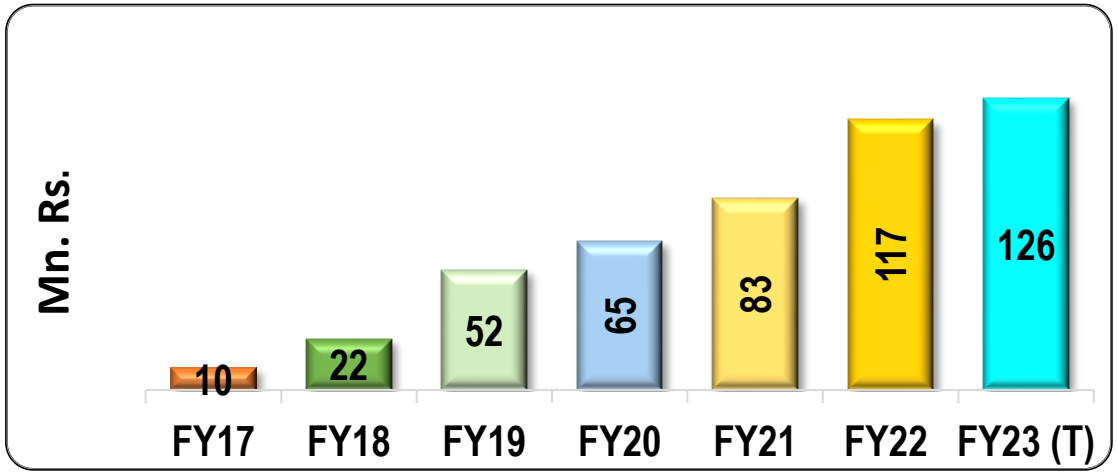
Installed Capacity



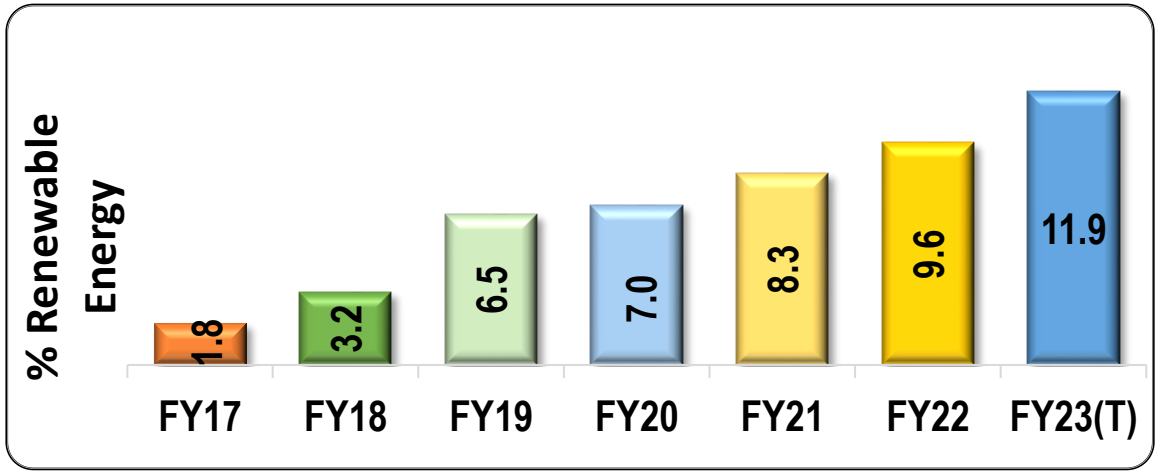
Power Generation



Renewable Energy Savings



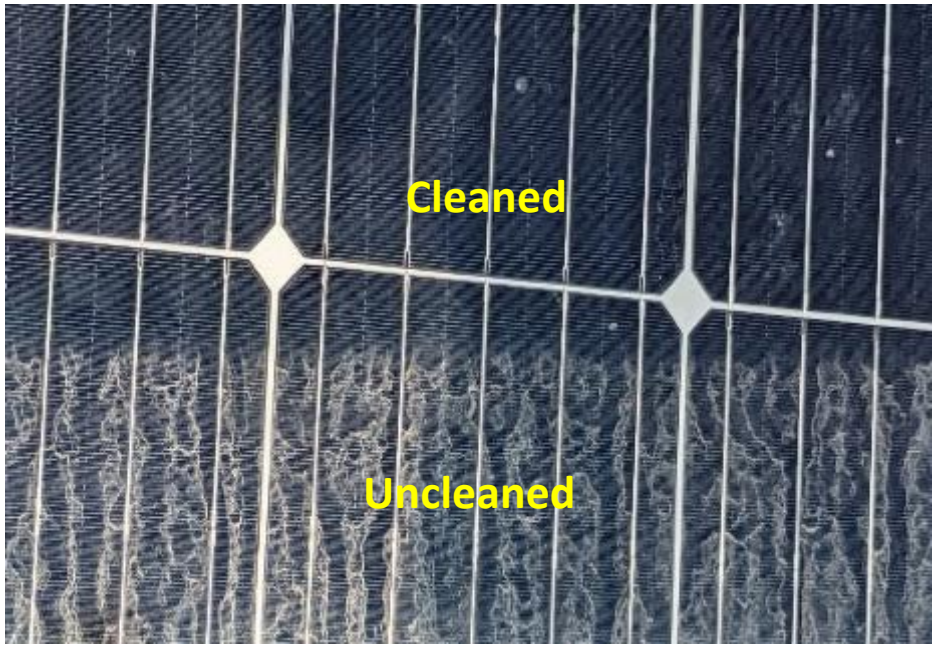
Renewable Energy share in Overall Energy



- CO_2 Emission Avoided :- 16,121 MT , SO_2 Emissions Avoided :- 11,500 MT

Automatic Solar panel Cleaning robot

Task: To autonomously clean the solar panels, waterless and scheduled



Investment : Rs 2.34 lacks

Savings in one Plant:

- 150 KL RO water saved per month
- 10 Man days saved per month
- 10,000 kwh additional solar generation

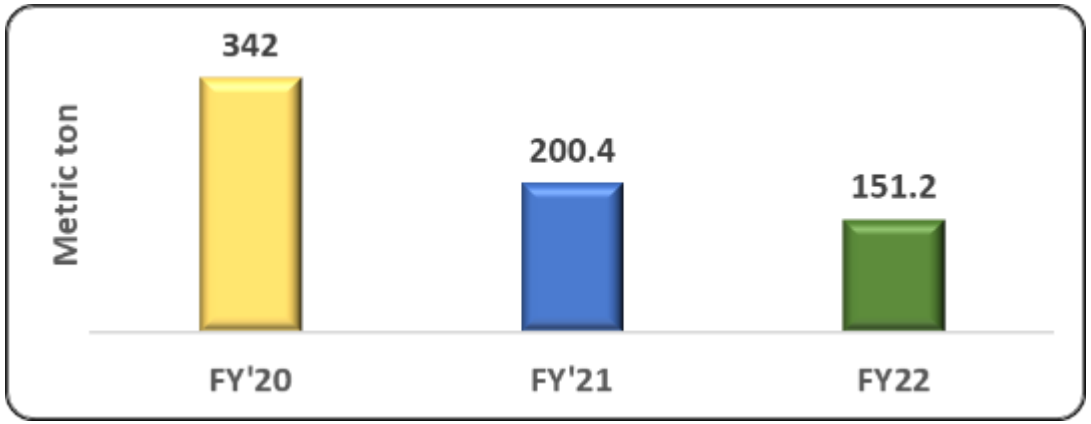
Advantages
• Reduction of risky cleaning job for roof-top/ parking
• Dry cleaning operation i.e. saving of water (ARGC) • No water scaling in panels
• Self charging through preinstalled solar panels on robot during daytime
• Consistent cleaning efficiency for installation
• Scheduled cleaning operation up to 3 hours in one charge of 6 hours
• Manpower optimization
• Can increase the frequency of cleaning from 15 to 7 days/panel
• Regular cleaning will Increase in overall energy generation
• IIoT enabled Remote monitoring & Control

Green field project-Solar Park

Off-Site 50 Mwp Solar Park integration by FY'23

Waste Utilization & Management

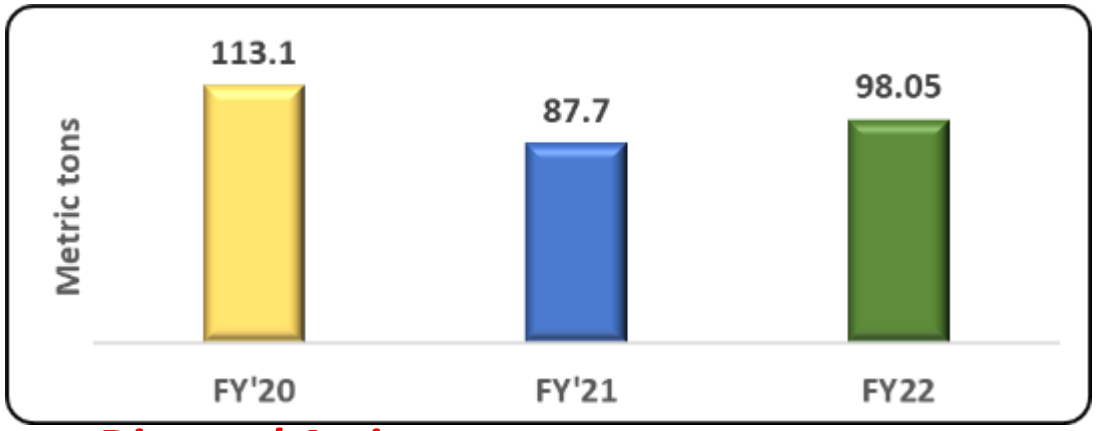
Wood Waste



Disposal Action:

for Boilers in Galla Foods (Amara Raja Gr. Co.)

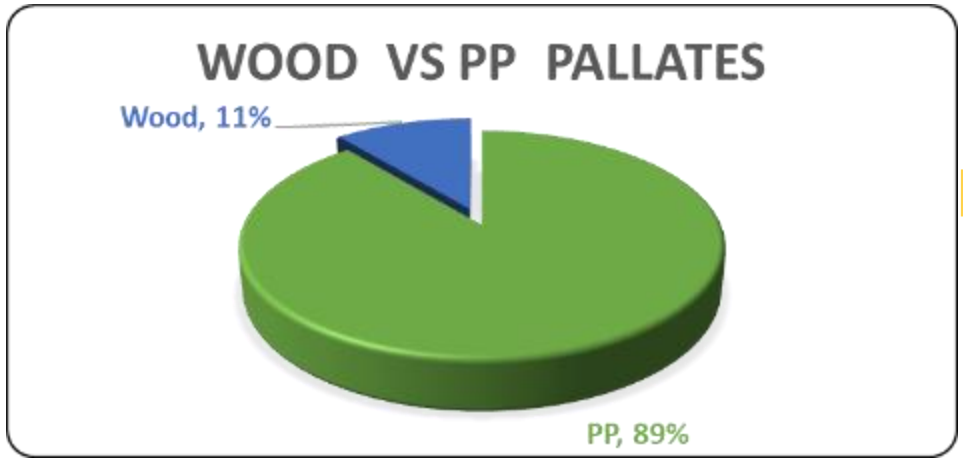
Canteen Food Waste



Disposal Action:

for composting and then for gardening

Way forward
To reduce wood consumption

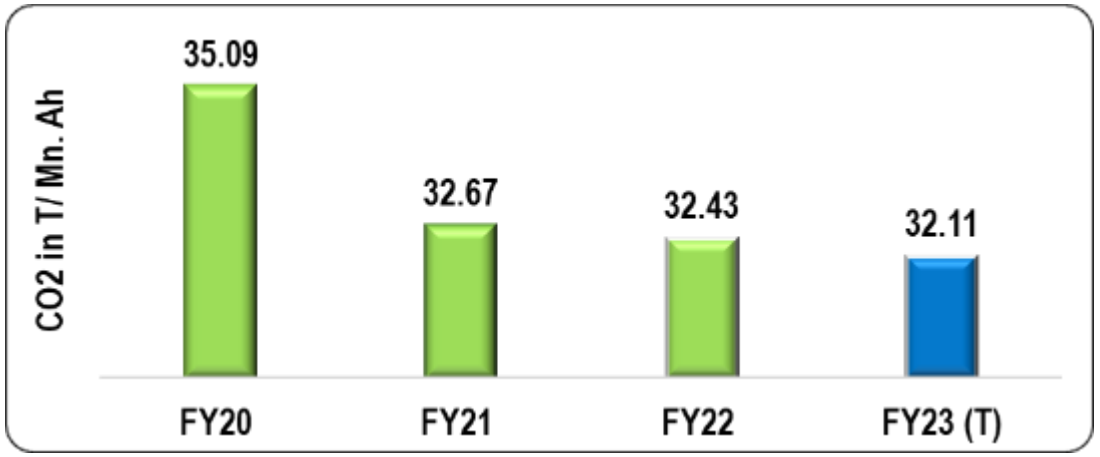


100% PP Pallets by FY 24

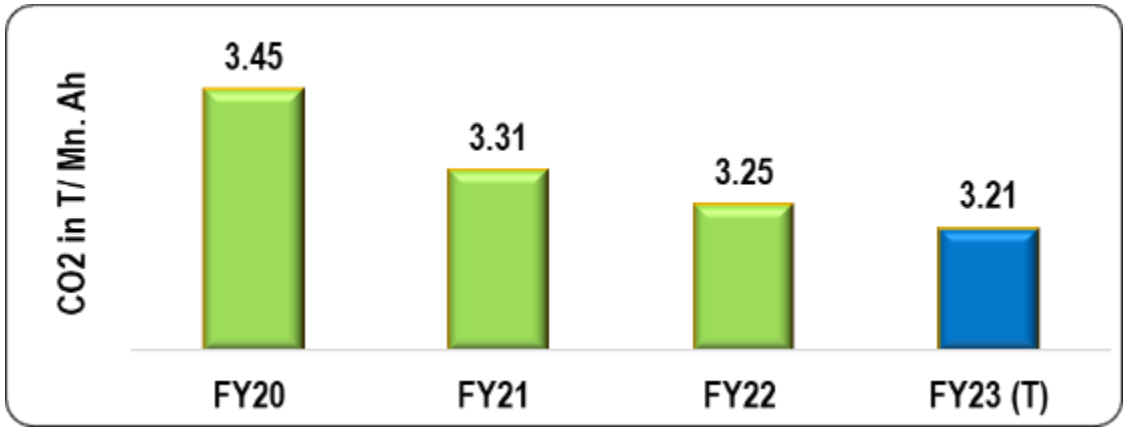
Green House Gas (GHG) Inventorization

Scope 1: Direct GHG Emissions

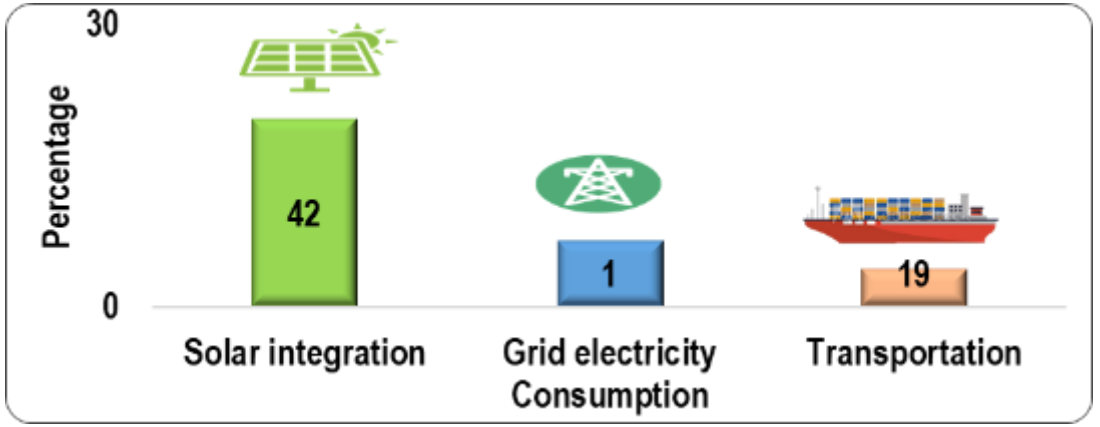
Scope 2: Electricity Indirect GHG Emissions



Scope 3: Other Indirect GHG Emissions



GHG emissions reduction percentage FY22



* 50 MW OFF Site Solar Power, which is scheduled for commissioning in FY'23, is not Considered..

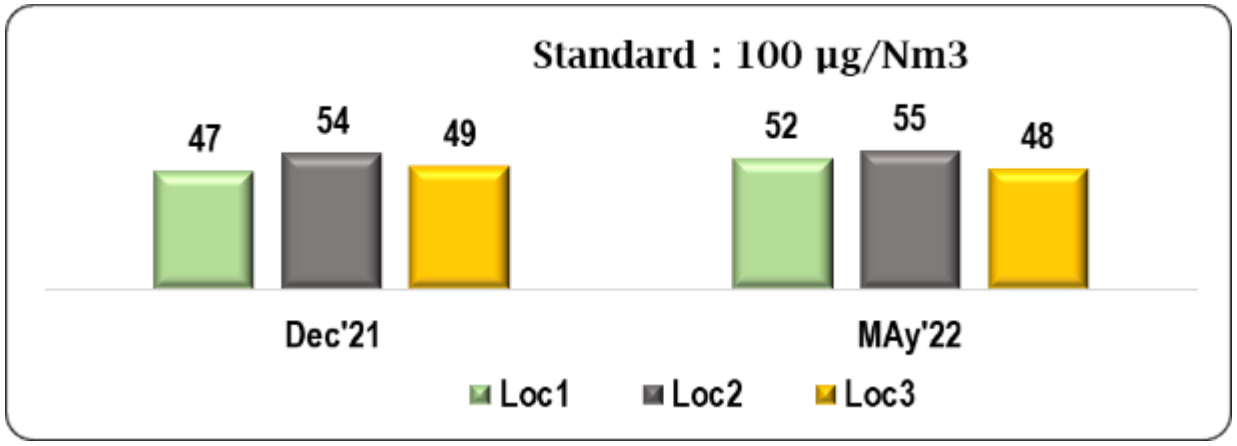
Emissions - Air quality monitoring

Dust extraction system with HEPA Filters

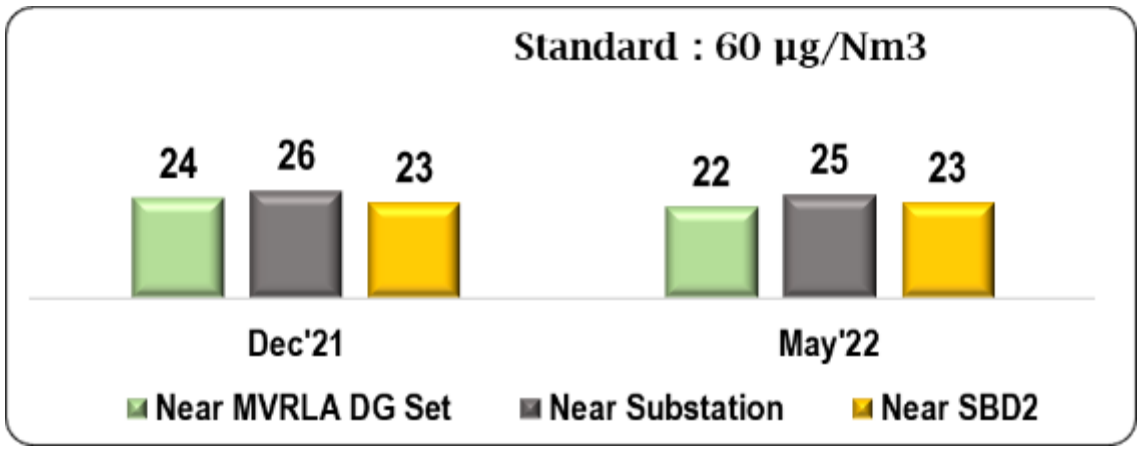
Fume extraction system with Wet Scrubbers

Continuous Ambient Air Quality monitoring Station (CAAQMS)

Ambient Air Quality - PM10 (in µg/Nm3)



Ambient Air Quality - PM2.5 (in µg/Nm3)



Zero Liquid Discharge plant (ZLD)

ZLD Plant capacity : 280 KLD

Boiler Room

Water boiling

Recovered storage tank

Chemical storage Room

Multi grade sand filter

ZLD plant Process Equipment's

- Collection and Equalization tank Capacity : 160 KL
- Reaction tank Capacity : 10 KL
- Flocculation tank Capacity : 10 KL
- High rate solid contact clarifier tank capacity : 50 KL
- Clarifier water tank Capacity : 50 KL
- Multi grade filter flow : 17.5 M^3/hr.
- UF feed tank Capacity : 25 KL
- Ultra filtration flow : 14 KL/hr.
- Reverse Osmosis flow : 14 KL/hr.
- Sludge storage tank : 14 KL/hr.
- Boiler Capacity : 1 Ton/hr.
- Multiple effect evaporator : 40 KLD
- Agitated twin film dryer : 6.3 KLD
- Recovered storage water tank : 140 KL

Centralized Effluent treatment Plant (CETP)

CETP capacity : 150 KLD

Lime slurry tanks-1&2

Sludge storage tank

Multi Grade sand filter

Treated water storage tank

CETP Process Equipment's

- Clarifier water tank Capacity : 90 KL
- Poly Electrolyte tank-1 : 500 Ltrs
- Poly Electrolyte tank-2 : 500 Ltrs
- Collection tank capacity : 90 KL
- Reaction Tank Capacity : 530 KL
- Lime slurry preparation tank-1 : 2500 Ltrs
- Lime slurry preparation tank-2 : 2500 Ltrs
- Sludge storage tank
- Clarifier effluent collection tank
- Multi grade filter flow : 30 M^3/hr.
- Treated water storage tank : 10 KL

Green Supply Chain policy

Policy Broadly Covers

Ethical Practices

- Integrity and Ethics
- Human Rights
- Accountability and Transparency
- Legal and Regulatory Compliance

Social Responsibty

- Responsible Conduct with Stakeholders
- Health and Safety
- Local Community Development

Quality Focused

- Quality Management System
- Facility and Machinery
- Good Manufacturing Practices and Quality Controls

Environment Management

- Green Products and Processes
- Reduce, Reuse and Recycle
- Adopting Green Initiatives and Practices

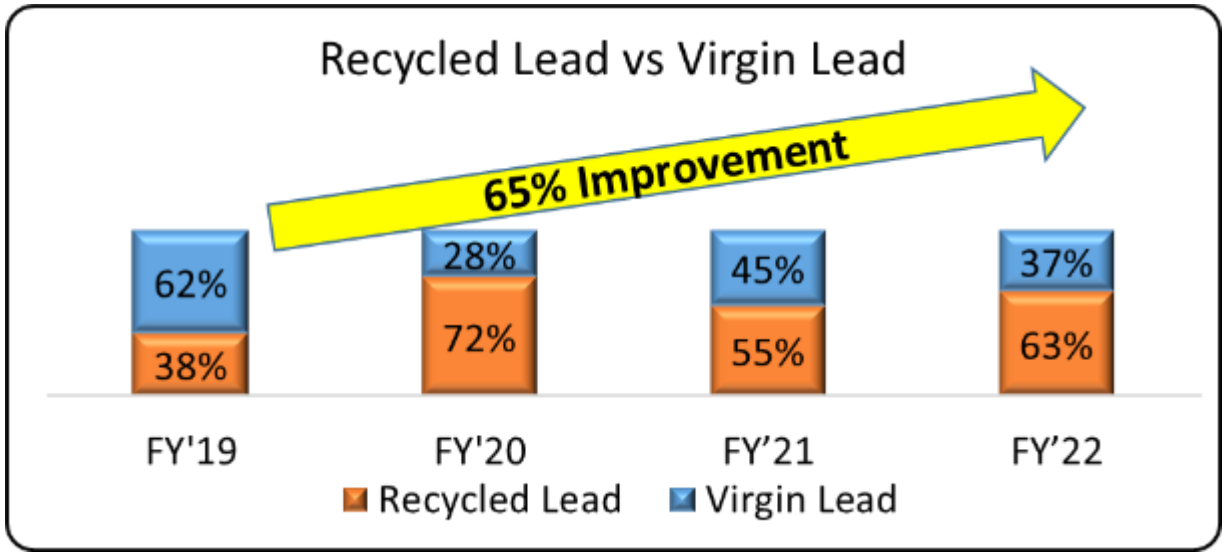
This Policy outlines our expectations with regards to……

- ✓ Ethics,
- ✓ Business integrity,
- ✓ Human rights,
- ✓ Health and safety,
- ✓ Environment, the local community and quality of product and operations.
- ✓ We will periodically review the policy to ensure that it continues to help us move towards our vision.

Green Supply Chain

Recycled Lead Vs Virgin Lead

Amara raja Batteries Ltd , is now part of Working Group (WG) under World Economic Forum's Global Battery Alliance, (whose mission is to improve health environment and minimising economic impact from used lead acid batteries manufacturing and recycling) has been primarily focusing on reducing the number of used batteries recycled by informal sector.



Customer Ratings

Ford
- Q1 Award – Highest award

Honda
- Satisfactory – Highest rating

Renaults
- Excellent – Highest rating

TVS Motors
- Platinum – Highest Rating

Mahindra& Mahindra
- Excellent- Highest Rating

Renault Nissan
- L1 – Highest rating

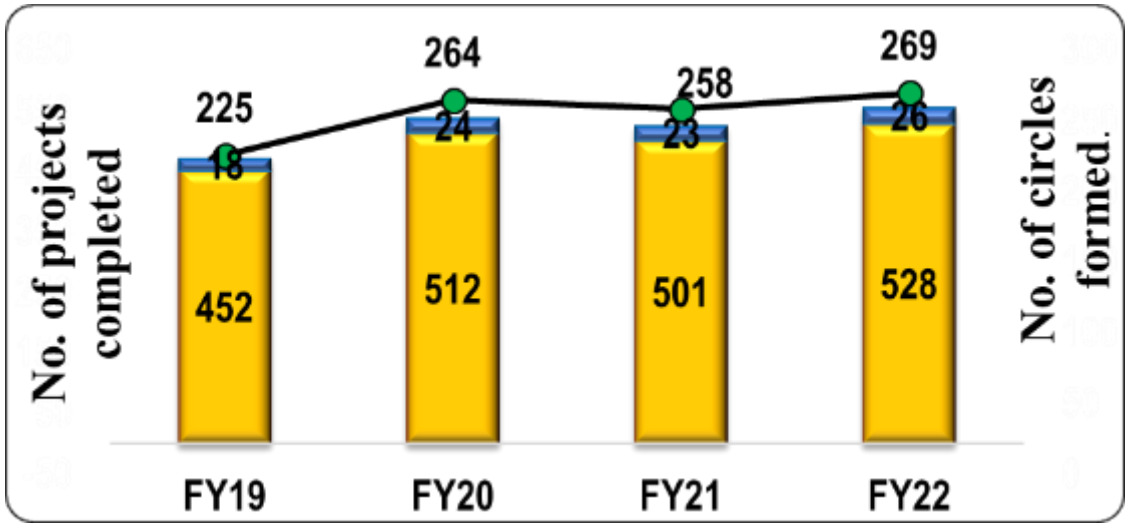
ARBL Green Supply Chain management- Criteria & Initiatives FY'22

Amara Raja sets up EV battery charging stations to promote E-vehicle usage

TEI &Team Work /Operator level

Best QCC Teams

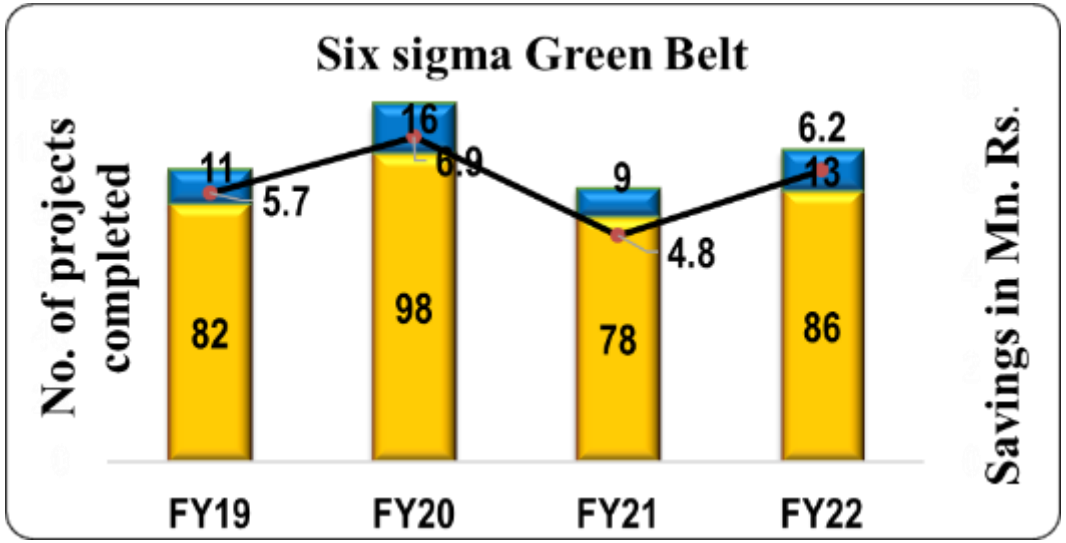
Quality control circles (QCC)



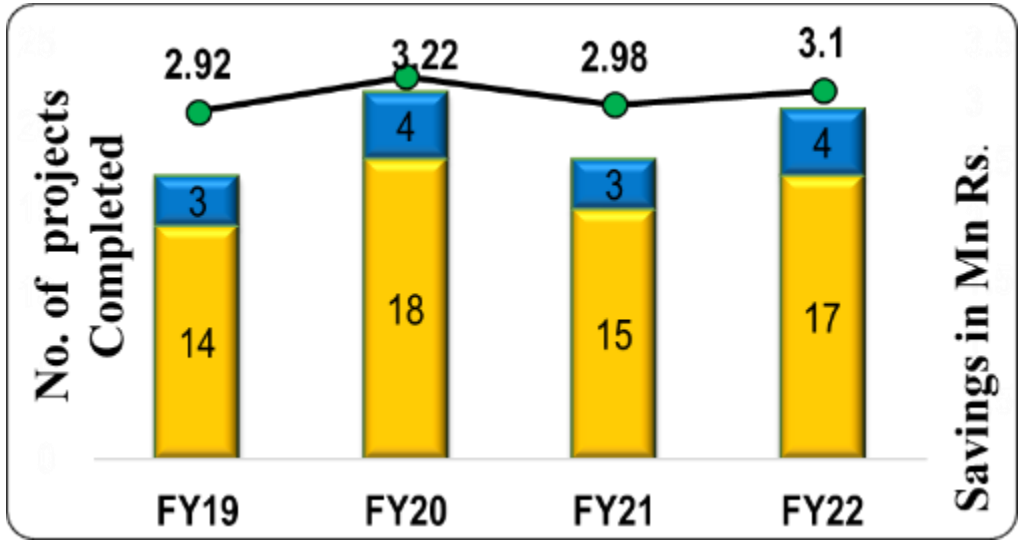
Group discussion on identifying Energy variables

TEI & team work/Supervisor level

Sis sigma Green Belt projects

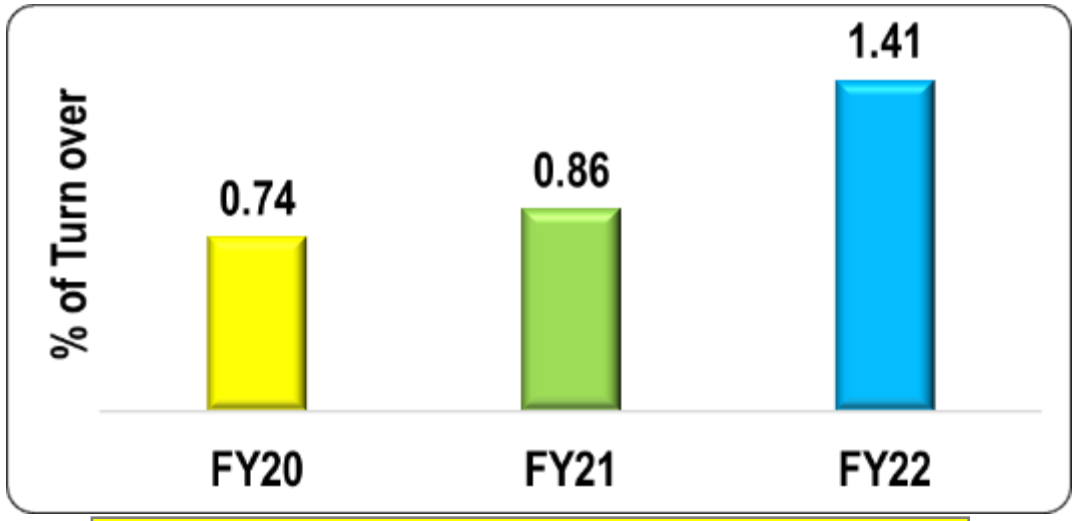


Six sigma Black Belt

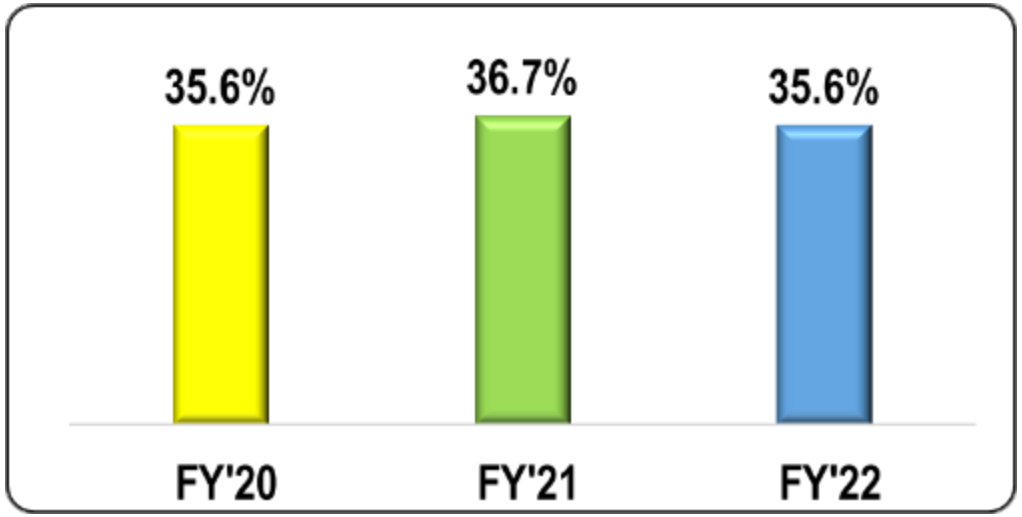


TEI & team work/Middle Management Level

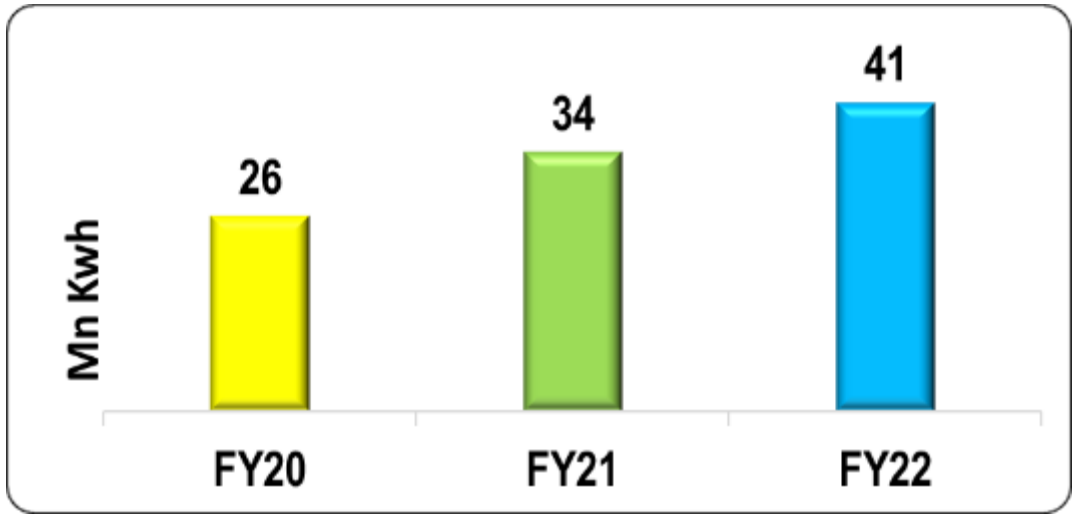
Investment for EnCon as % of turnover



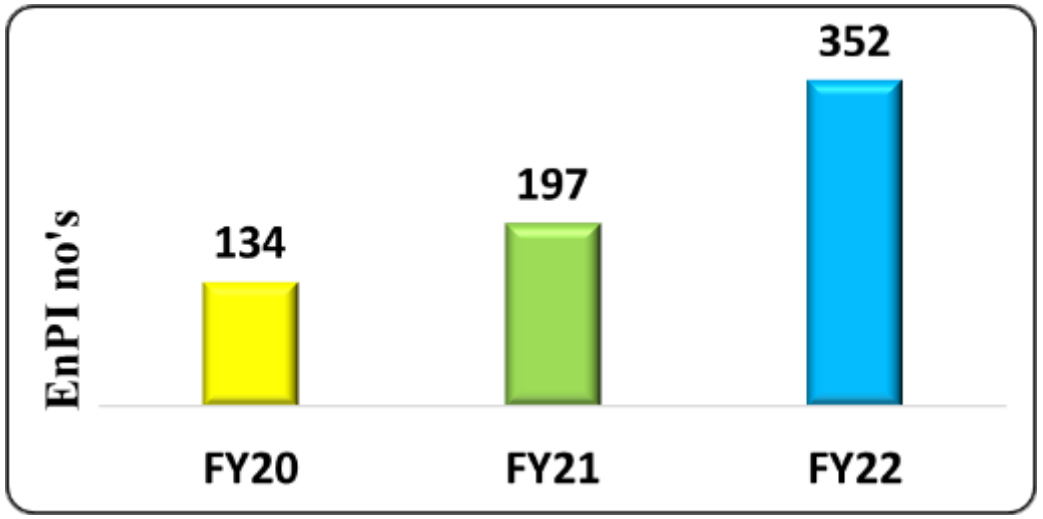
Energy Cost as % of Conversion cost



Cumulative Energy savings



Energy performance Indicators EnPI's

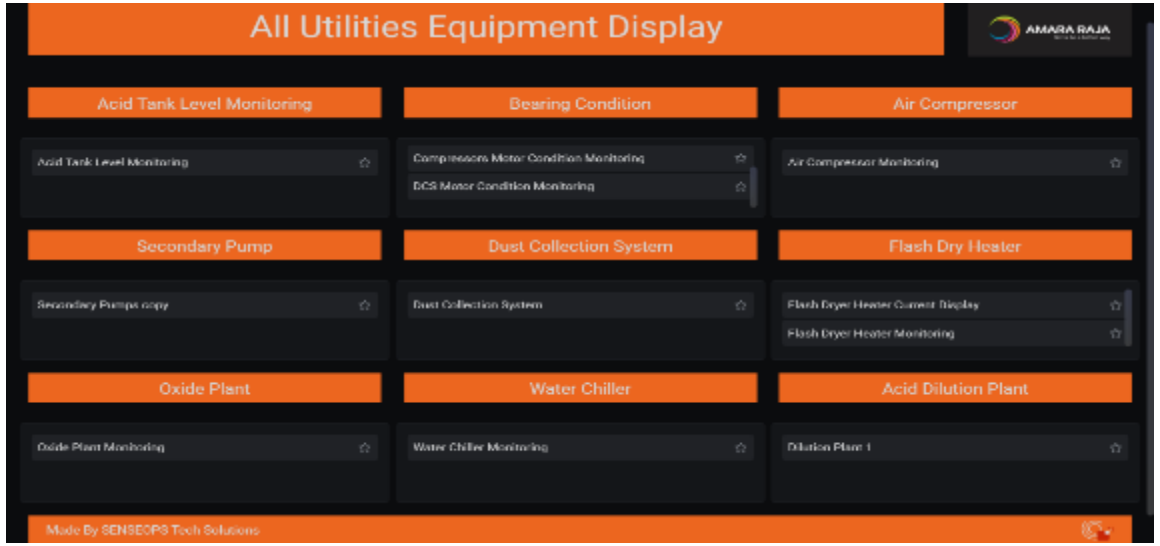


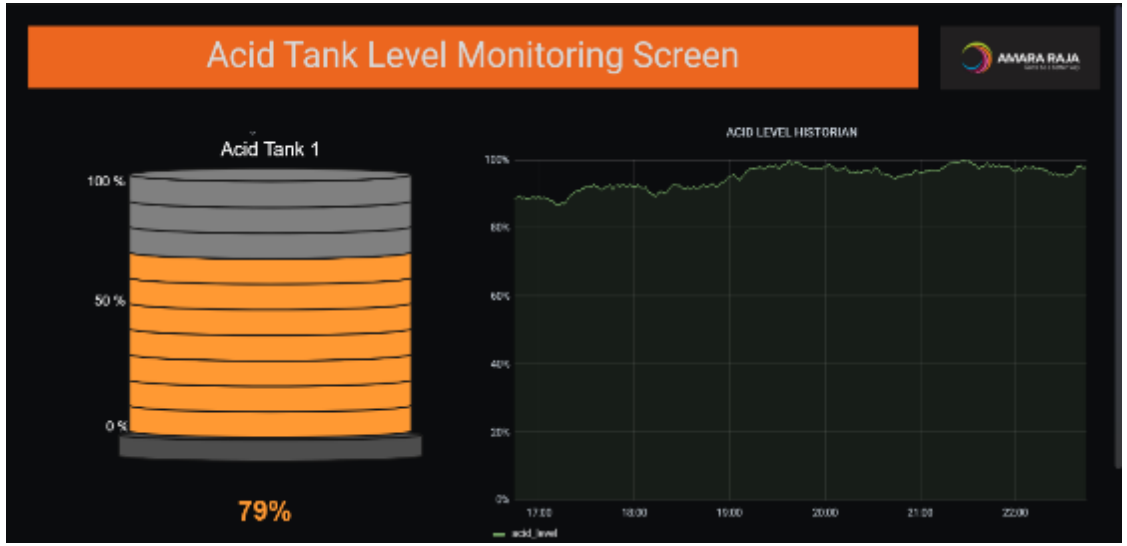
Learnings from the Summit

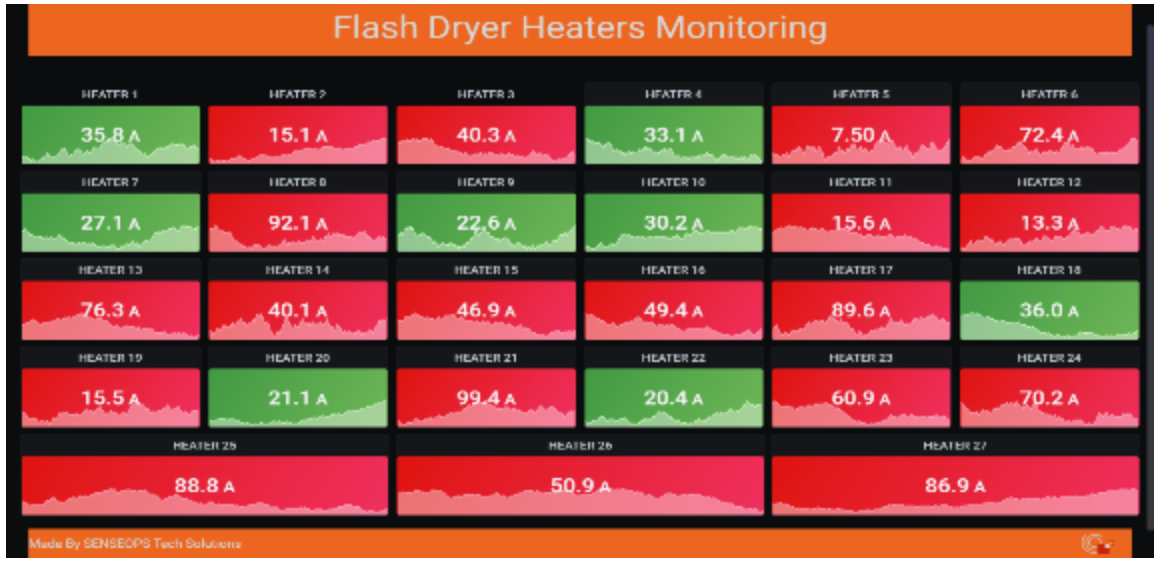
Sl. No	Concept
1	MY place – My pride Ownership among teams
2	Robot for solar panel cleaning
3	Static transfer switch during power change over
4	Gravity roller conveyor
5	Compressor air leakage checking at defined frequency
6	CNG vehicles for Goods transportation
7	Classification of energy based on fixed and variable loads
8	Hybrid heat pump
9	Six Sigma project for Energy target setting.
10	Office AC accumulator
11	Pneumatic tools replaced with Battery operated.
12	Semi fixed and semi variable loads identification
13	Ductless Air conditioners

IIOT to enhance our operational efficiency

Dash Boards for Equipments

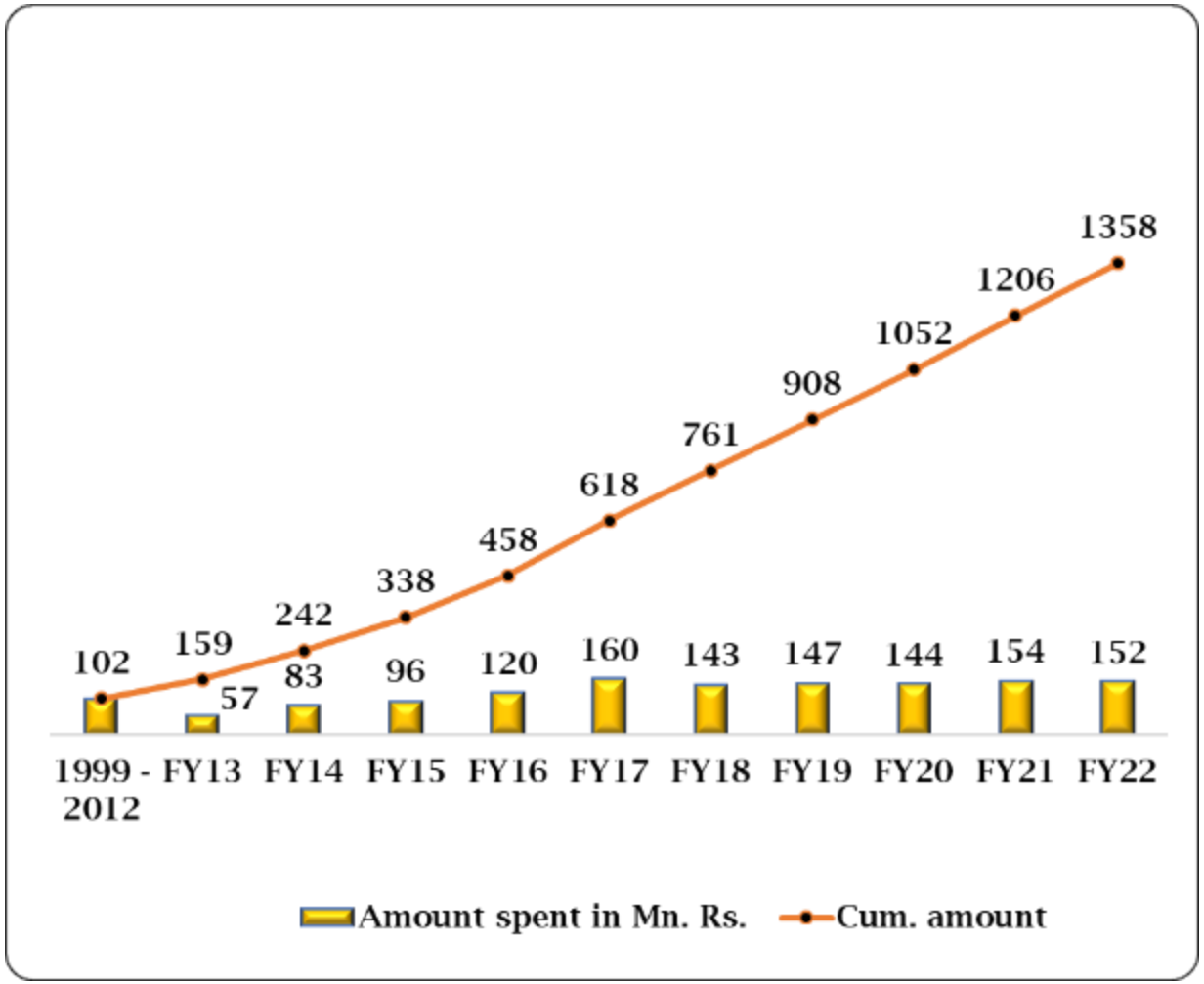




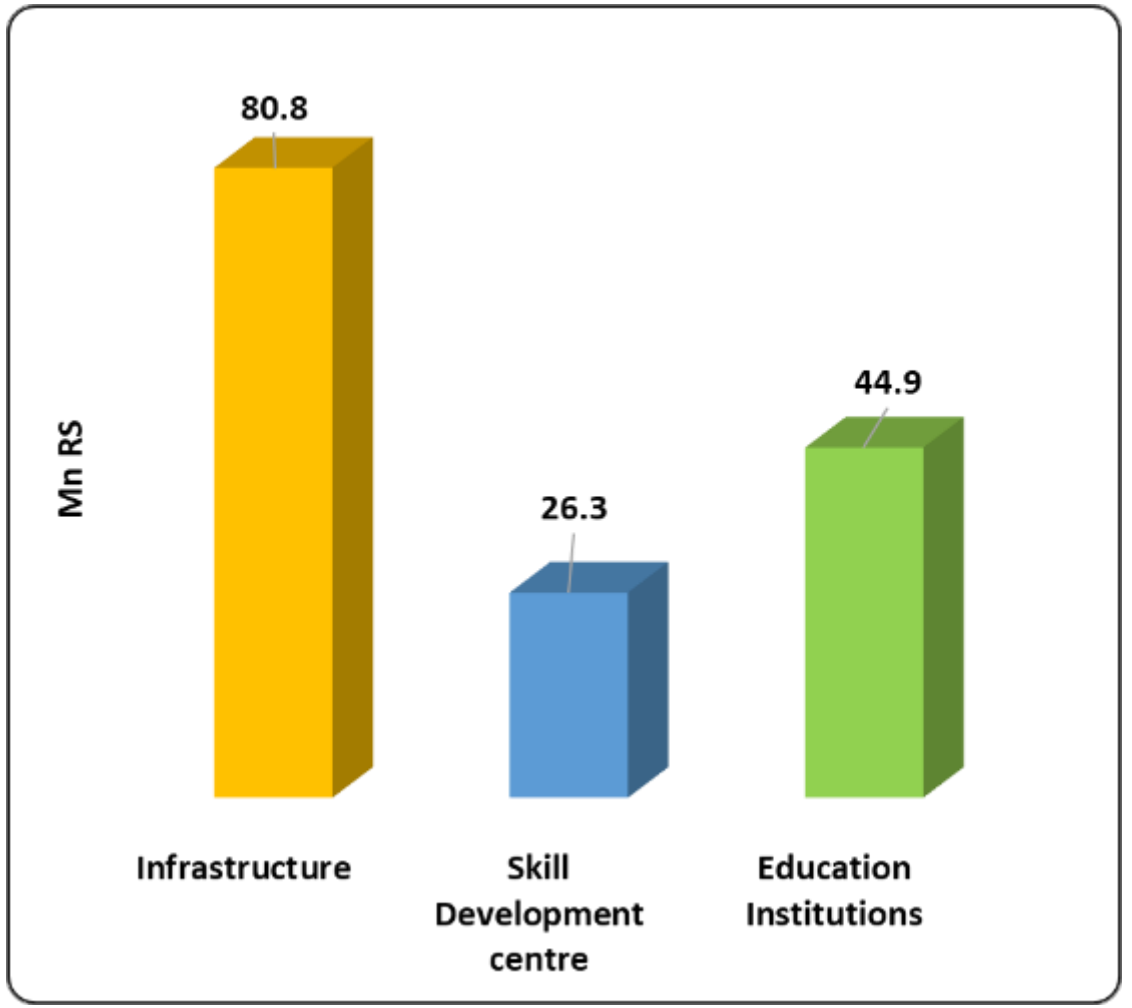


CSR Initiatives

Amount Spent for CSR Activity



CSR - Activity Wise Distribution



CSR Initiatives - Committed to Skill India.

Supporting Unorganized sector

- Enhancing the skills of youth in rural area.
- Short term courses
- Distribution of tool kits worth Rs 15 lakhs for 100+ Electricians, AC Mechanics, Plumbers, Carpenters
- Training of matriculated youth from rural India to help them inculcate life and job skills.

Skill Development centre

- State of the art Skill development centre
- Long term courses with stipend
- More than 10+ batches comprising of 1200+ students.
- 100% placement

CSR Initiatives

RAJANNA TRUST

All Companies in Amara Raja Group contribute towards CSR Activities,

2% of Profits (or) 0.2% of sales whichever is higher, much before it became a law in the year 2014..

Other initiatives

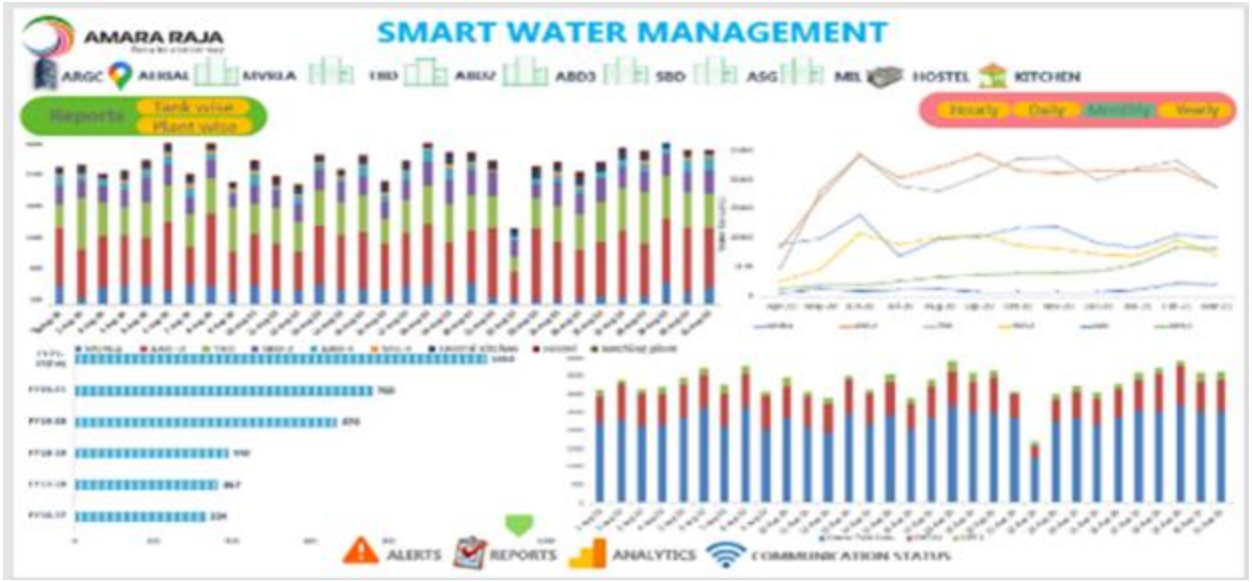
National safety day celebrations

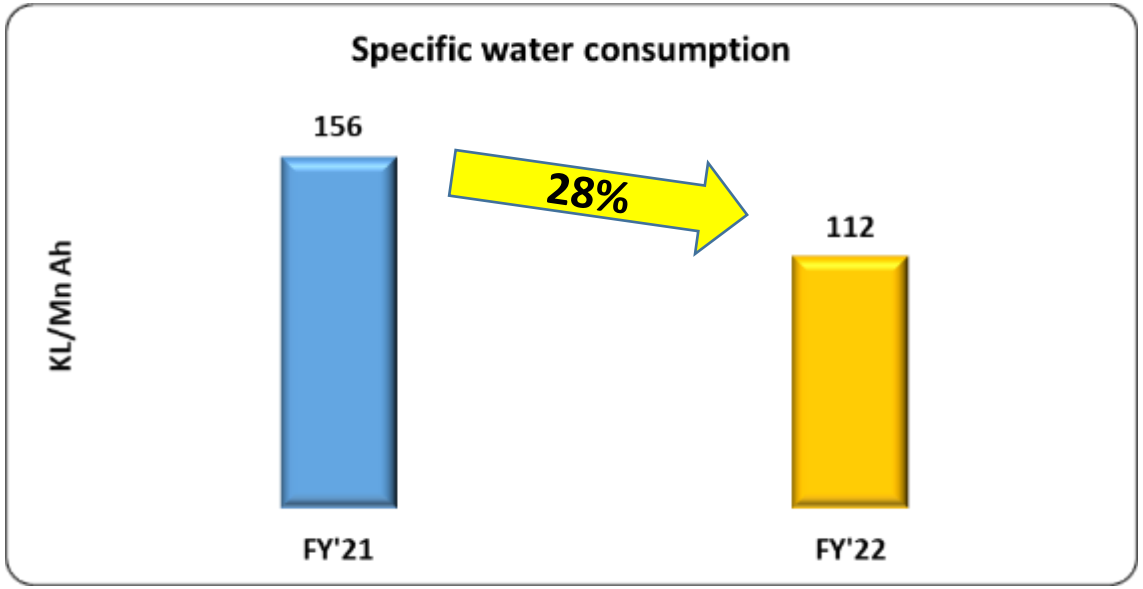
National safety day celebrations

World Earth day celebrations

World water day celebrations

Water Management system





Awards and Accolades

EHS Gold award-Sectoral topper in Auto components

Prestigious recognition Award for ICQCC

India's first Green Hydrogen fuel station

Consistent high performance quality Award

Awards and Accolades

Supply chain Management Award in Excellence Reverse logistics & transport optimization

Platinum award in 6sigma Black Belt

International Convention on QCC Awards

Amara Raja believes in .....

Gotta be a Better Way

For feedback

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Thank you