Sai

Make it
better together

Energy Management Initiatives

Sai Life Sciences Ltd., Unit 4 - Bidar, Karnataka

Representatives from Sai Life Sciences

Surya Prakash

VP - Corporate Engineering & Projects

Shrinivas Prasad

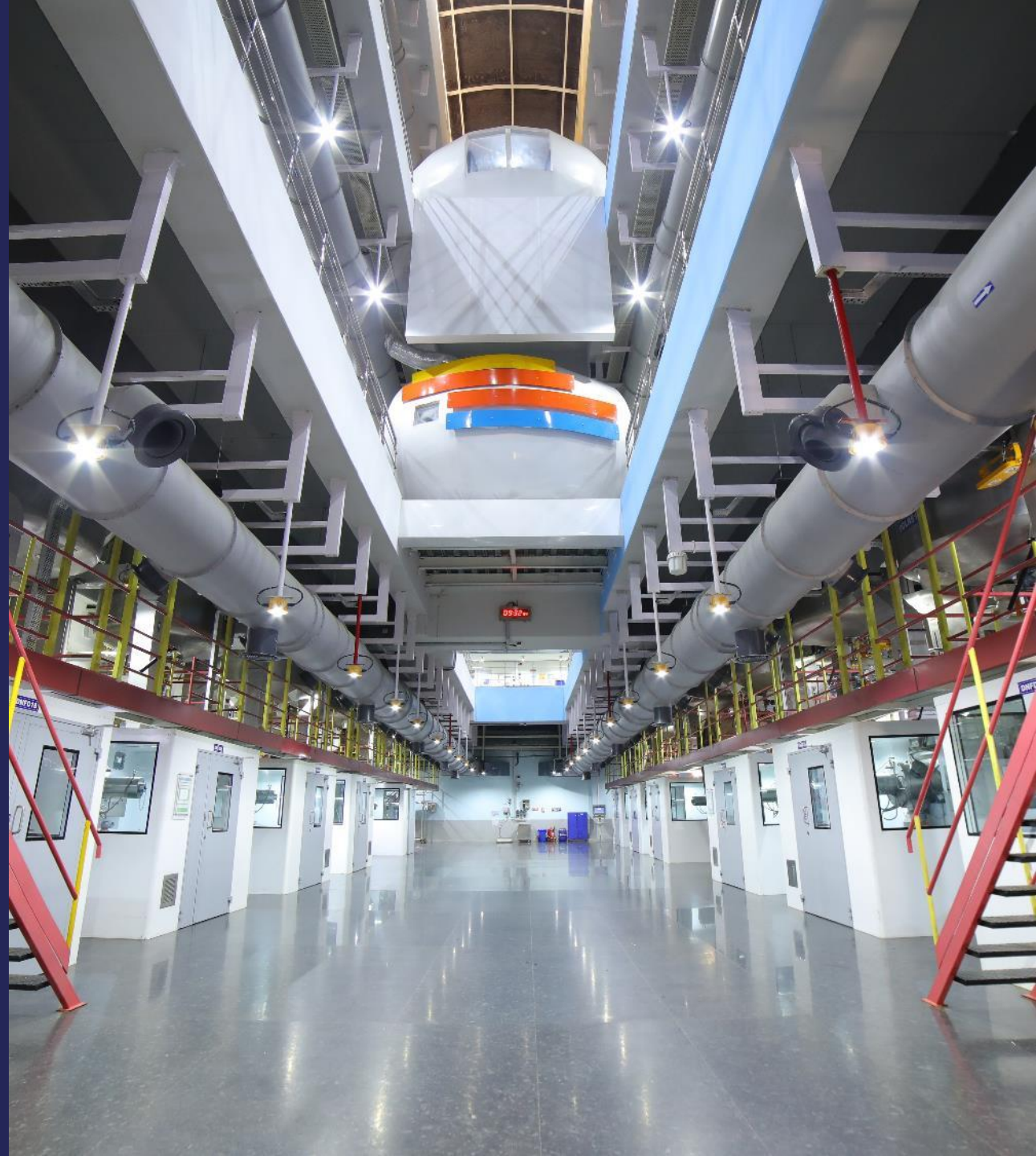
GM - Engineering

Venkatesan

Sr. Manager - Engineering

Krishna Chaitanya

Asst. Manager - Engineering



Unit 4

Bidar, Karnataka

Sai Life Sciences delivers advanced Discovery, Contract Development and Manufacturing Solutions, through a broad suite of expert capabilities across the molecular lifecycle.

Having headquarter in Hyderabad, our R&D and manufacturing facilities are built to global standards and cater to international clients. New facilities are planned for future and existing ones are expanding with state-of-the-art infrastructure.

2200+

EMPLOYEES

Strong pool of scientific talent consists of

800+	650+	300+
R&D	MANUFACTURING	QUALITY

Current facilities

Biology, Cambridge (USA)

Process R&D, Manchester

R&D, Hyderabad

Manufacturing, Bidar

R&T, Hyderabad

Biology Lab, Boston

Contd....

New facilities launched since April 2019

Additional Clean Room Facility, Bidar

Biology Lab, Hyderabad

High Potency Facility, Bidar

Additional Manufacturing Facility (200 KL), Bidar

Amidites block, Bidar

Discovery Expansion at R&T Centre, Hyderabad

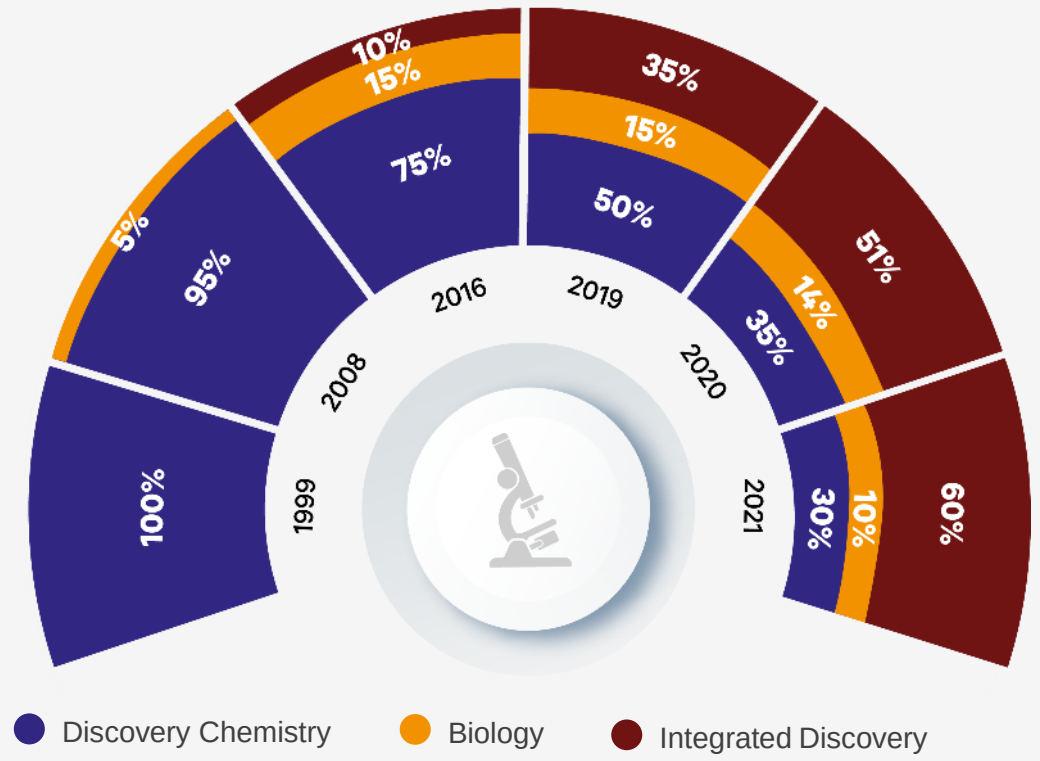
Delivering successful programs to a growing client base

Clients

2	25	33	41	55
Clients	Clients	Clients	Clients	Clients
1999	2008	2016	2019	2020

76
Clients
2021

Services



25+

programs advanced to different clinical phases (IND to Phase-III)

35+ Programs

18 months

average turnaround time from Hit/Lead to Candidate

Sai

Impact of **Covid-19**

Impact on annual production performance

- Due to adequate care, no impact on production compared to FY21
  (23% reduced FG production compared to FY21)

Impact on Specific energy consumption (SEC)

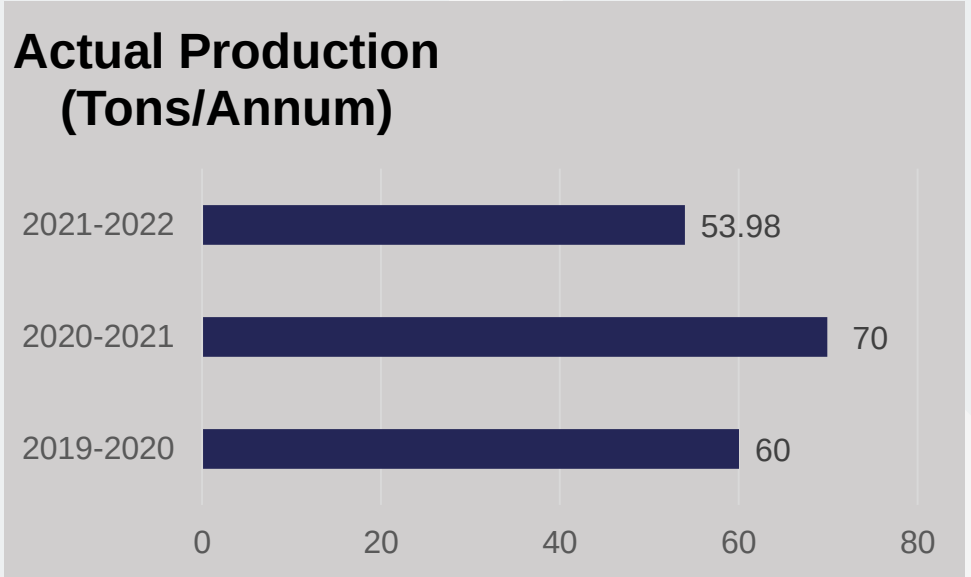
- Due to adequate care, no impact on SEC compared to FY21
  (30% increased SEC w.r.t FG production compared to FY21)

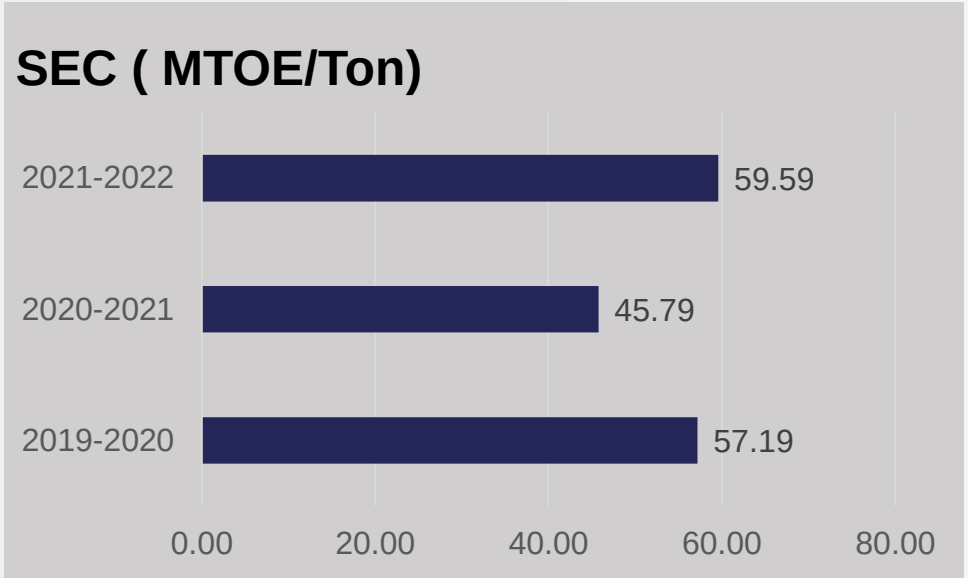
Measures taken by the plant / unit to address the challenges

a) Initiatives undertaken to improve energy performance of Utility areas
b) Energy efficiency improvements undertaken
c) Initiatives undertaken to improve capacity utilization

Impact on COVID 19 on Energy Efficiency

a) High in the productivity against the FY21 projections.
b) Impact on the energy conservation projects implementation due to travel restriction by technology providers.

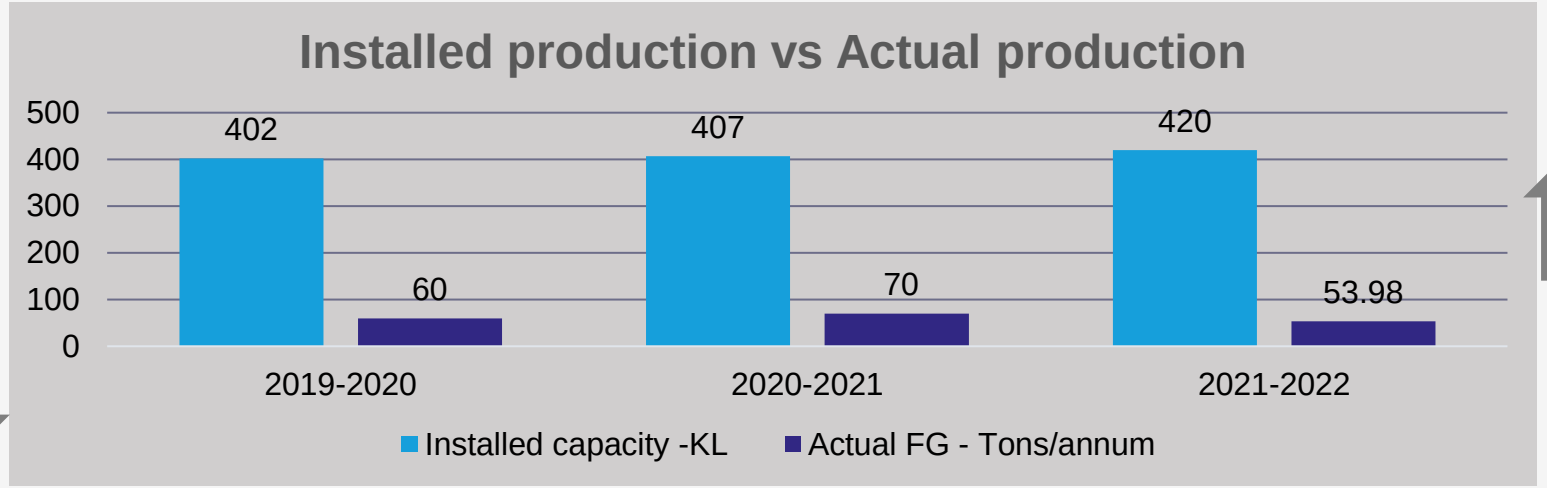




1.Installed Capacity vs. Actual Production vs. Energy

Production Overview

FY 2019 to FY 2022
4.47 % – Installed capacity
10.03 % – FG production



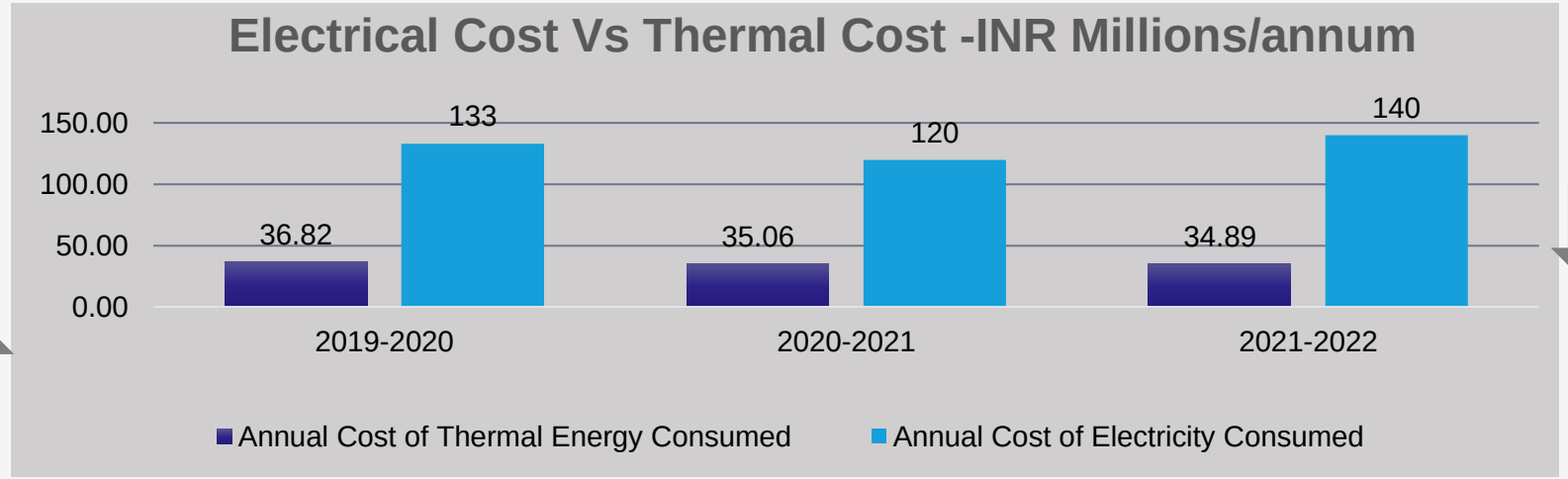
FY :2021 to FY2022

Nominal hike in installed capacity (3.19%)

Reduction in –FG production (22.88%)

Energy Cost Overview

FY 2019 to FY2022
5.24 % (Thermal)
5.26 % (Electrical)



FY 2021 to FY2022

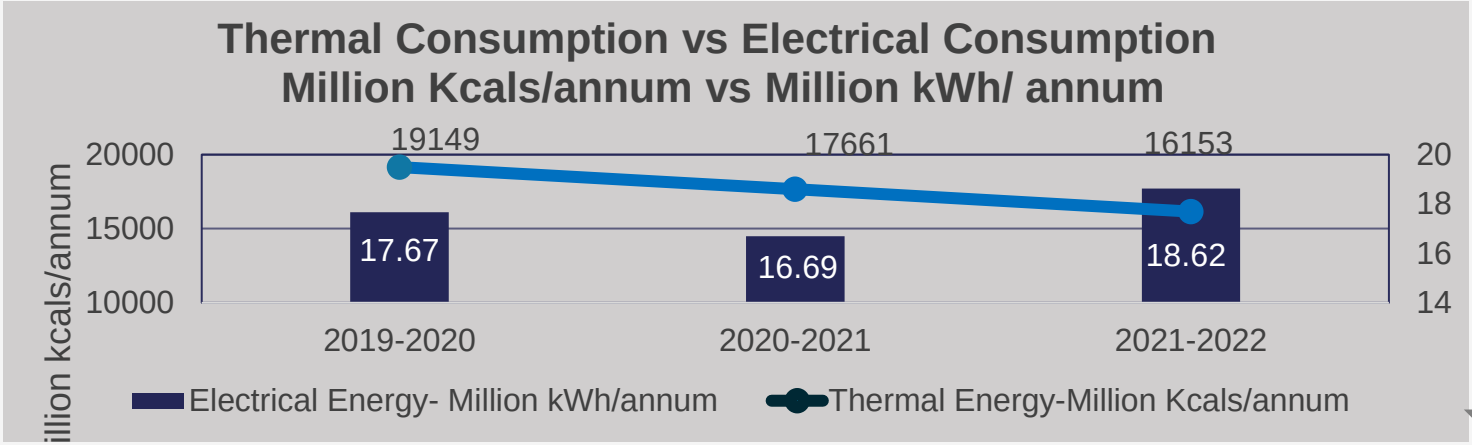
0.5% drop in Thermal
16.66% high in Electrica

1.1 Energy Consumption Vs SEC-Thermal & Electrical

Energy Consumption Overview

FY2019 to FY2022

15.64 % (Thermal)
5.37 % (Electrical)



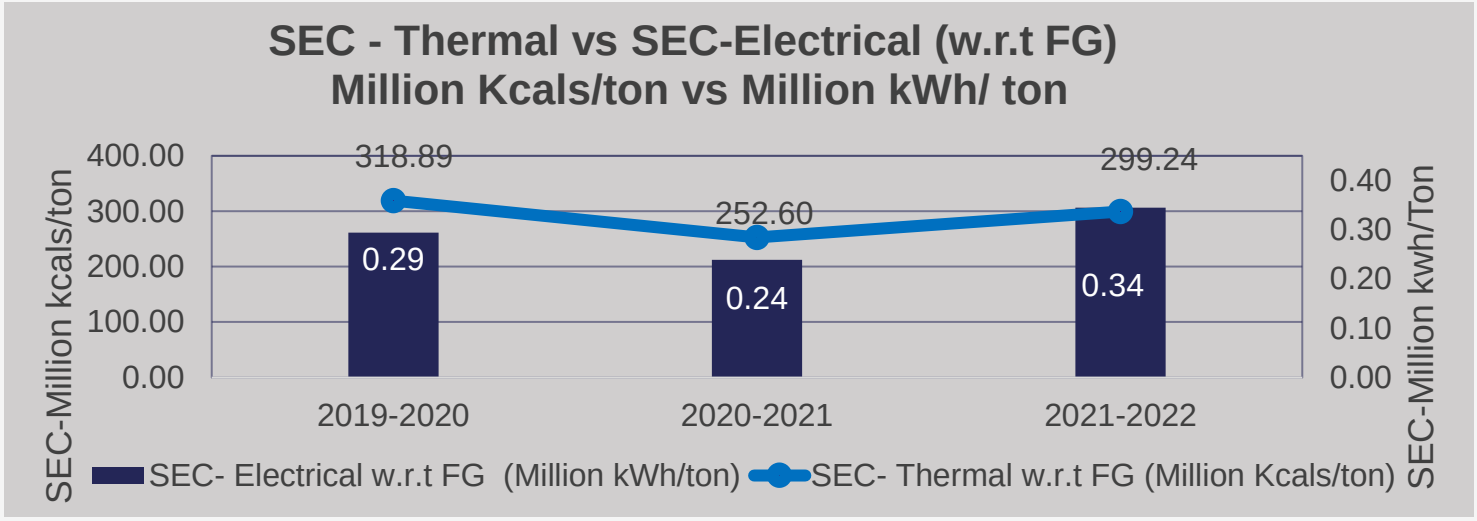
FY2021 to FY2022

8.50% drop in Thermal
11.56% high in Electrica

Energy Cost Overview

FY2019 to FY2022

6.16 % (Thermal-SEC)
17.24 % (Electrical-SEC)



FY2021 to FY2022

18.46% high in Thermal-SEC
41.66% high in Electrical-SEC

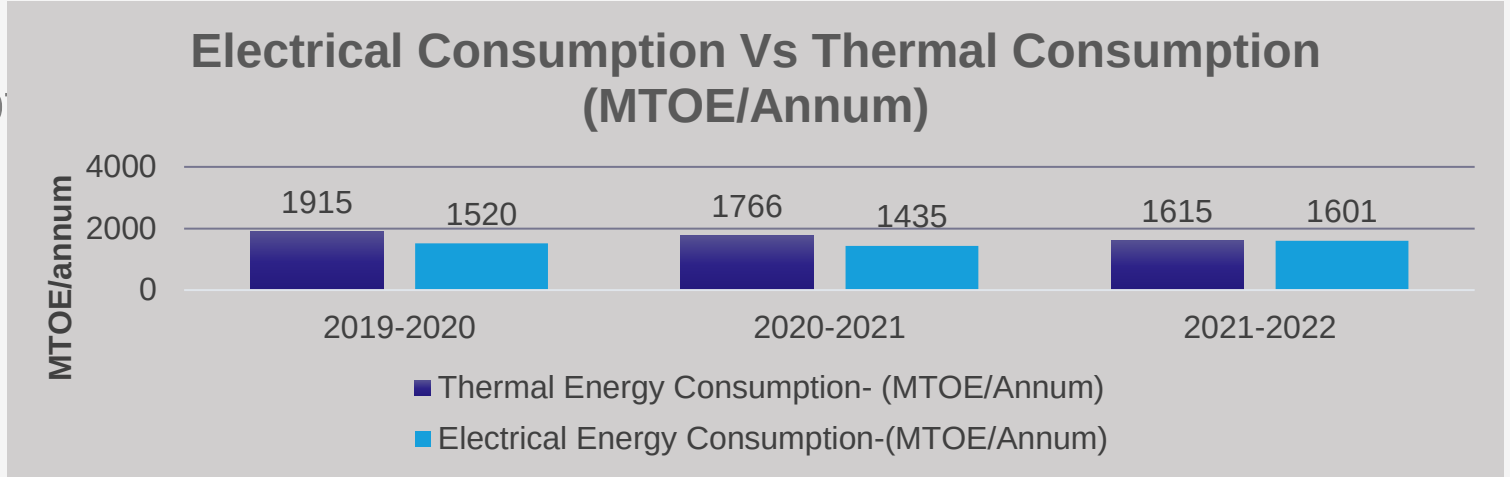
1.2 Energy Consumption & SEC variations w.r.t MTOE

Energy Consumption Overview

FY2019 to FY2022

15.66 % (Thermal)

5.32 % (Electrical)



FY2021 to FY2022

8.55 % drop in Thermal

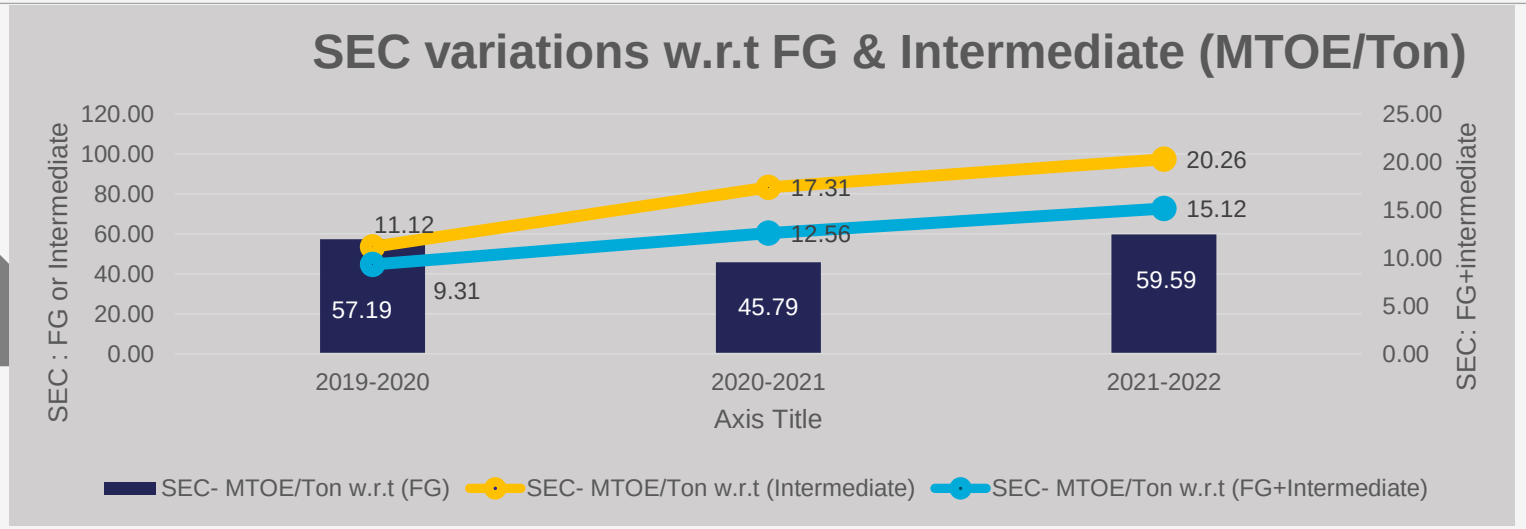
11.56 % high in Electrical

SEC Variations

FY2019 to FY2022

4.19 % w.r.t FG

6.40 % w.r.t Intermediate



FY2021 to FY2022

30.13 % w.r.t FG

20.38 % w.r.t Intermediate

2. List of Major Encon projects planned for FY23

	Integration of SF-4D in between PB-04 & PB-06	Centralization of air compressor with distribution lines.	Cooling tower fan retrofit with FRP.	Replacement with Energy Efficient pump in PB-06 -3 Nos	ETP blower retrofit from twin lube blower to screw blower
Status	Aug-2022 Under Progress	Aug-2022 Under Progress	Nov-2022 Under progress	Nov-2022 Under progress	Dec-2022 Under progress
Savings	0.8 Million kWh/annum	1.65 Million kWh/annum	0.88 Million kWh/annum	0.73 Million kWh/annum	1.47 Million kWh/annum
Investment	Rs. 1 Million	Rs.2.10 Million	Rs.1.50 Million	Rs.0.9 Million	Rs.2.82 Million

Contd....

Sai

2.1 List of Major Encon projects planned for FY23

	Conversion of AHU conventional blowers to EC Blowers	Replacement of centrifugal pump with PPP for steam condensate at New MEE Plant.	VFD Installation for PB-07 & Warehouse AHUs	Total Projects 16 Nos Planned Out of 16 EnCon Projects 16 Nos Planned
Status	Dec-2022 Under progress	Dec-2022 Under progress	Jan-2023 Under progress	FY23
Savings	0.32 Million kWh/annum	0.59 Million kwh/annum	0.39 Million kWh/annum	9.89 Million kWh/annum
Investment	Rs. 0.62 Million	Rs.1.04 Million	Rs.0.7 Million	Rs.15.18 Million

Sai

3. Last Three Years Projects

2021-22

4 Nos Proposals

Investment: Rs. 2.79 Million
Savings: Rs. 3.68 Million
ISO 50001: 2018 Audit Completed in April-22 and Received Certificate on July-22

2020-21

10 Nos Proposals

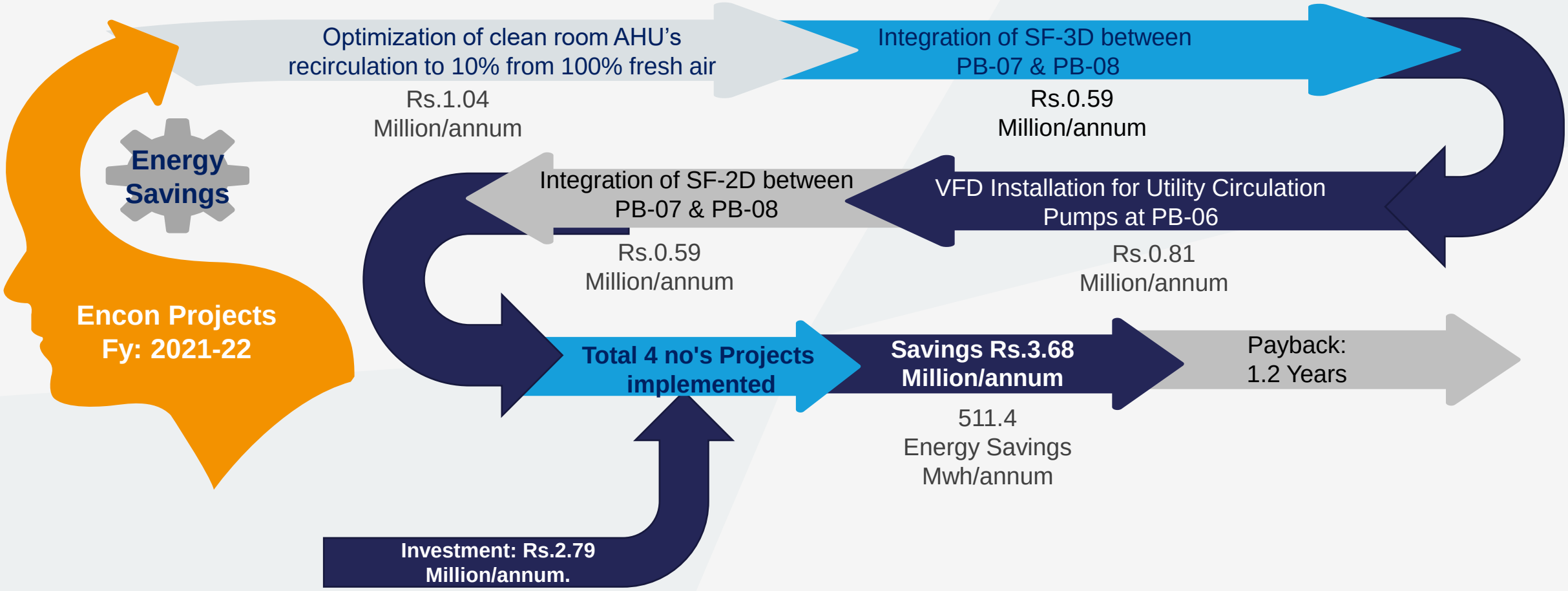
Investment: Rs. 2.39 Million
Savings: Rs. 9.64 Million
Initiated ISO 50001: 2018 – Jan-2021

2019-20

10 Nos Proposals

Investment: : Rs. 0.44 Million
Savings: Rs. 3.03 Million
Based on CII energy audit conducted: Dec 2018

4. List of Encon projects implemented FY2021-22



5. Innovative Projects Implemented

Optimizing Clean room AHUs

Integration of SF-2D CT

Category-D: Optimizing of Clean room AHUs, Savings: 10.40 Lakhs/Annum

Category-D: Integration of SF-2D (Cooling Tower), Savings: 5.95 Lakhs/Annum

Sai

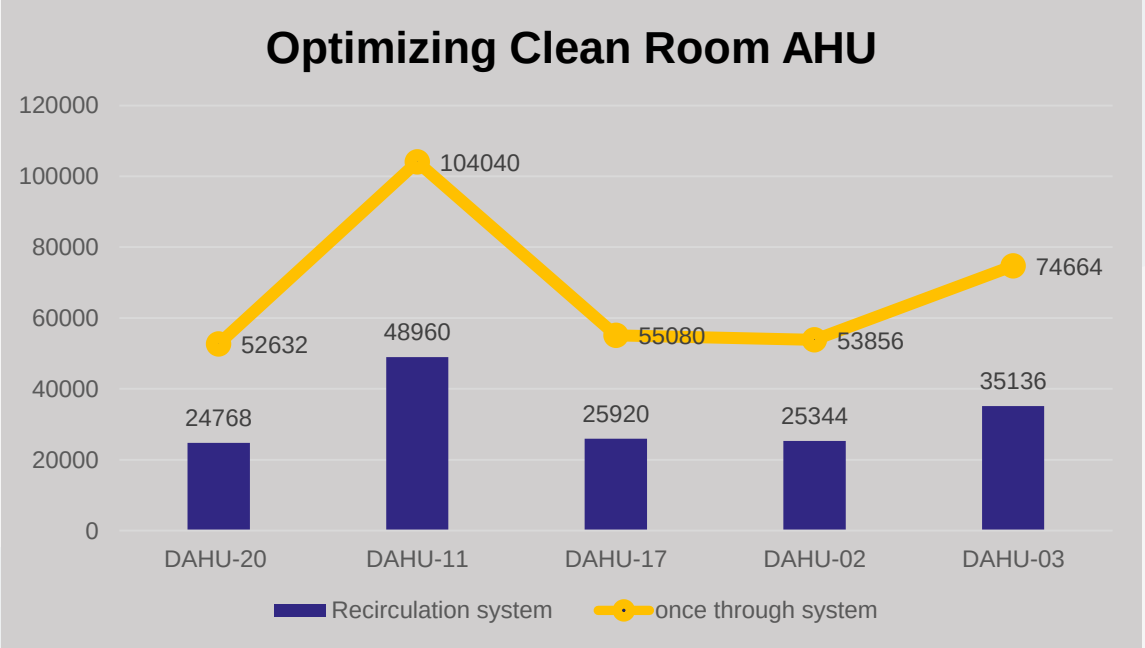
5.1 Innovative Project-1 (Optimizing Clean Room AHU)

Before

- Clean room AHUs are once through system and operating with separate exhaust unit.

After

- Optimizing clean room AHUs recirculation to 10% from 100% fresh air. Energy consumption of Exhaust units is the direct savings.



Savings Attained in Rs: 10.40 Lakhs/Annum

Sai

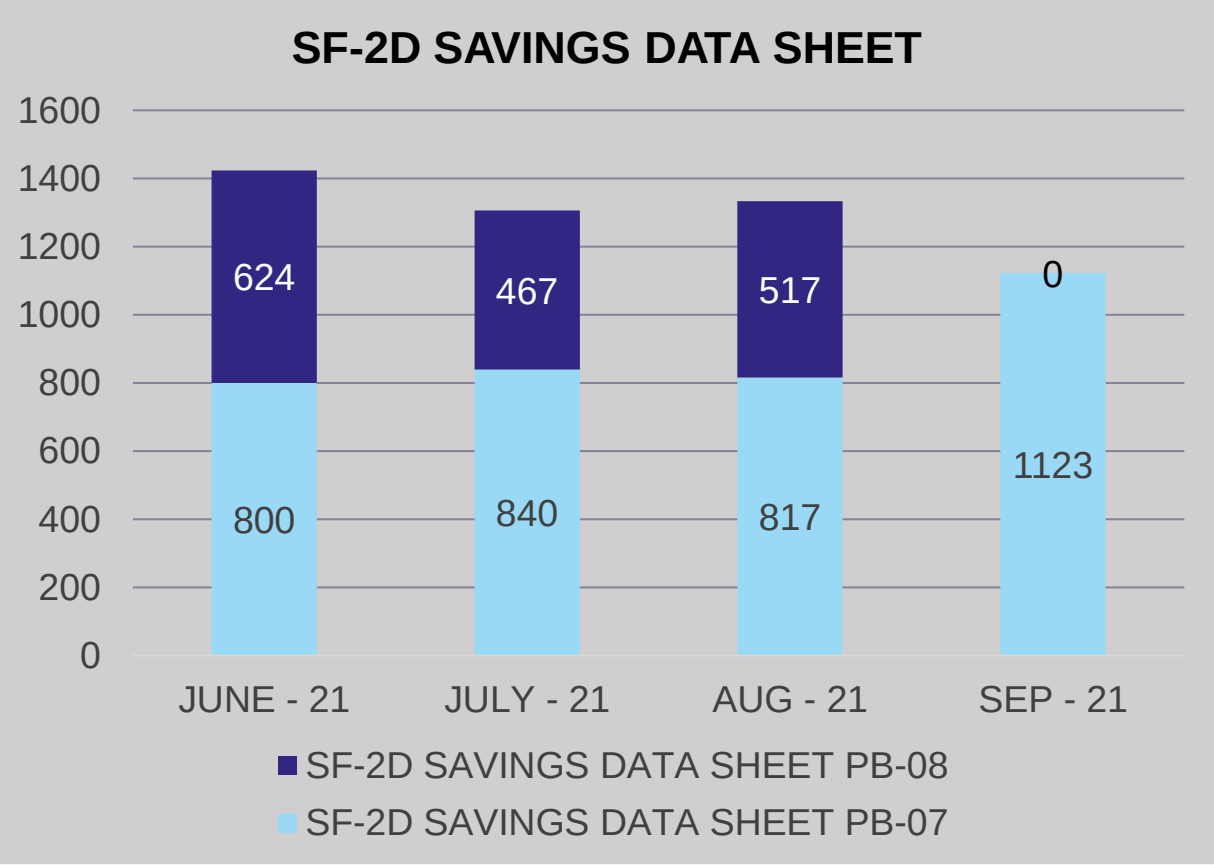
5.2 Innovative Project-2 (Utility Integration)

Before

- Individual utility SF-2D(NMT 30 °C) is in operation for PB-7 & PB-8
- No Interconnection of headers from PB-8 to PB-7.

After

- Based on the load conditions either of the SF-2D utility in PB-07 or PB-08 are in operation.
- Interconnection provided between the headers of PB-07 & PB-08.



Savings Attained in Rs: 5.95 Lakhs/Annum

Sai

6. Utilization of Renewable Energy

Renewable Energy by third party PPA

FY20:

21%- Renewable

FY21:

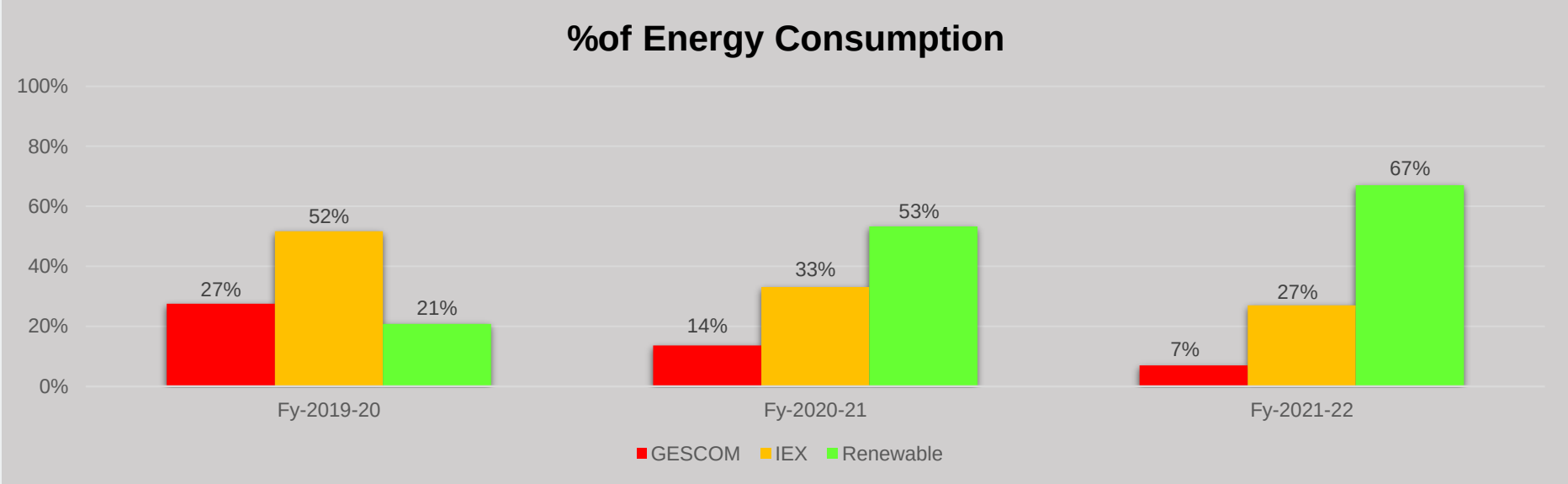
53%- Renewable

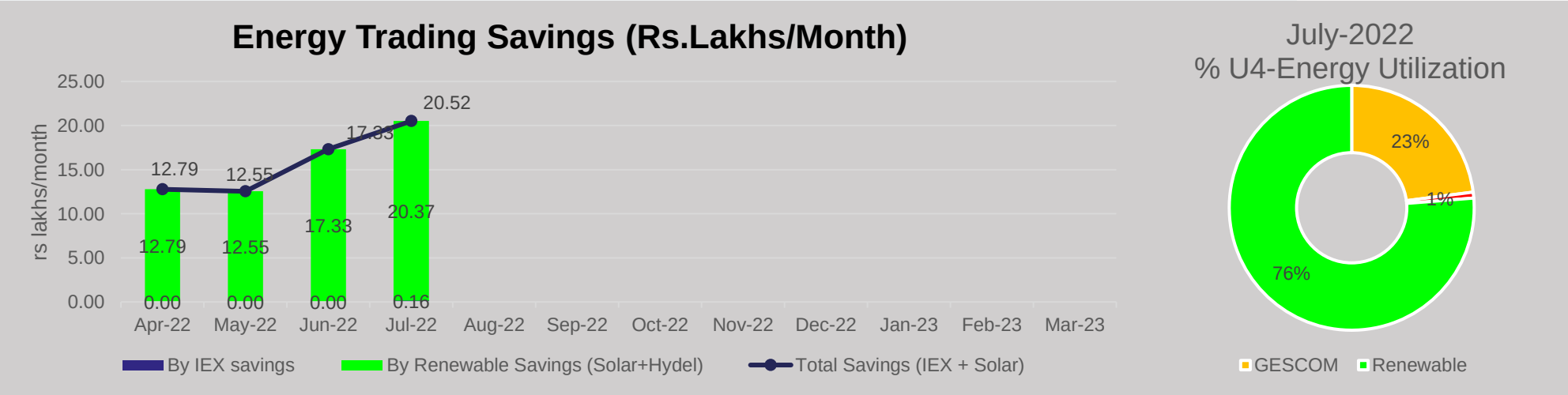
FY22:

67%- Renewable

YTD July 22:

76 % -Renewable





Unit IV

7. Waste Utilization & Management

Environmental performance

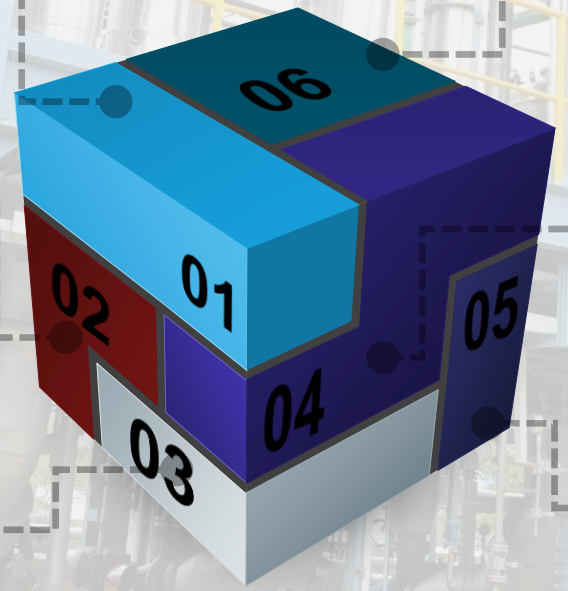
	2019-2020	2020-2021	2021-2022
Land Filling	0%	0%	0%
Co-Processing	100%	100%	100%

Other initiatives at plant level

13% increase in Water recycling (YOY)

24% Reduction in water requirement (YOY)
By using ETP RO permeate for utility

11% Overall Operational cost reduction at ZLDS. (YOY)



88% Environmental Tours Compliance in FY21

0% **Waste to landfill in 20**21

7% Increase in ZLD Energy Consumption (YOY)

Unit IV

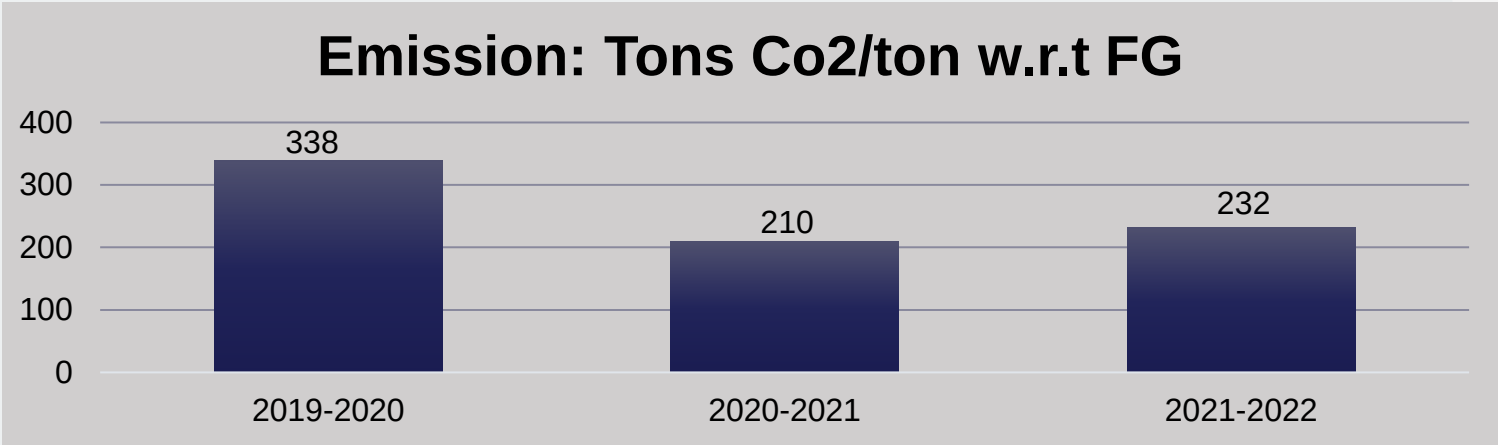
8. Co2 Emissions

At Sai Life Sciences, we are committed to playing our part towards a more sustainable future.
As a company committed to a healthier tomorrow, we understand our responsibility towards socio-economic development, climatic change mitigation, resource conservation and reduce Co2 emissions.

Sustainability @ Sai

FY :2019 to 2022

31.36% drop in Co2 emissions w.r.t FG



FY2021 to FY2022

10.5% increased in Co2 emissions w.r.t FG

CO2 emission conversion considered as below

a) Electrical-Grid : 820 kg CO2/MWh
b) HSD fuel : 2.67 kgCO2/lit
c) Coal : 1816 kgCO2/ton
d) Furnace Oil : 2.93 kgCO2/lit

Source: IPPC/ ghg protocol

Towards Environment norms (Air quality, SOx, NOx, etc.)					
Sl.No	**Type of system installed**	**Supplier**	**Investment Rs.Millions**	**Operating Cost (Rs in Millions)**	**Running Hours**
1	Bag filter & cyclone separator for 10 TPH & 5TPH boiler	Thermax	2.5	0.25	8160
2	Scrubbers 13 Nos	Chemplast / Yen Plas	2.95	0.23	8272
3	Coal Dust suppression system	SN engineering	0.45	0.1	8160

Unit IV

9. Green Supply Chain Management

SCM @ Sai

Green SCM Policy

Sustainability is the integral part of business

Paperless office

100% RFQ, GMP pro, LMS

Use of biodegradable

For packing materials, raw materials, intermediates.

Partners segmentation

SWOT analysis for vendor identification.

Contd....

Unit IV

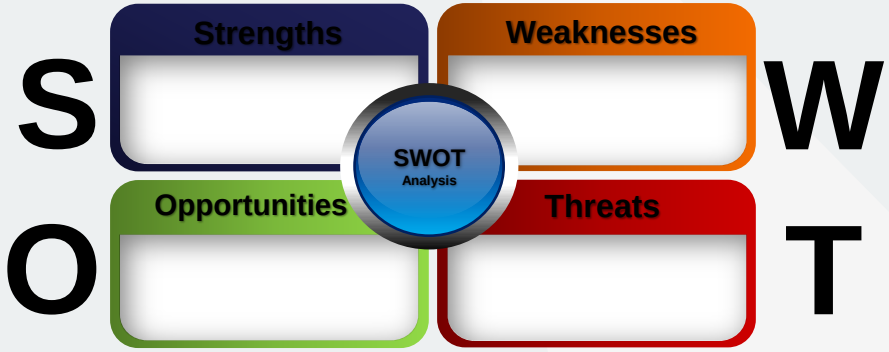
9.1 Green Supply Chain Management

SCM @ Sai

Vendor Assessment methodology:

We at Sai, perform Vendor SWOT analysis of key projects,

- Covering HSE aspects (Health, Safety and Environment)
- Technical expertise **(SOP revised-FY21),**
- Statutory & regulatory compliance,
- Infrastructure & Quality Management Systems.



- We also take help from Third party agencies for vendor assessment e.g. D&B, PWC, Meritor etc.

Sl.No	Projects Implemented	Investment Made (Rs In Million)	Benefits Achieved
1	Renewable Power Purchase agreement	70.61	INR saving 16.31 Rs. million & 10045Tons Co2 emissions reduction (67% in FY22)
2	Cargo consolidation		INR saving 1.1 Million & converted from road transport to Rail transport , thus reduced 600 KMs road transport to 47 Nos consignments

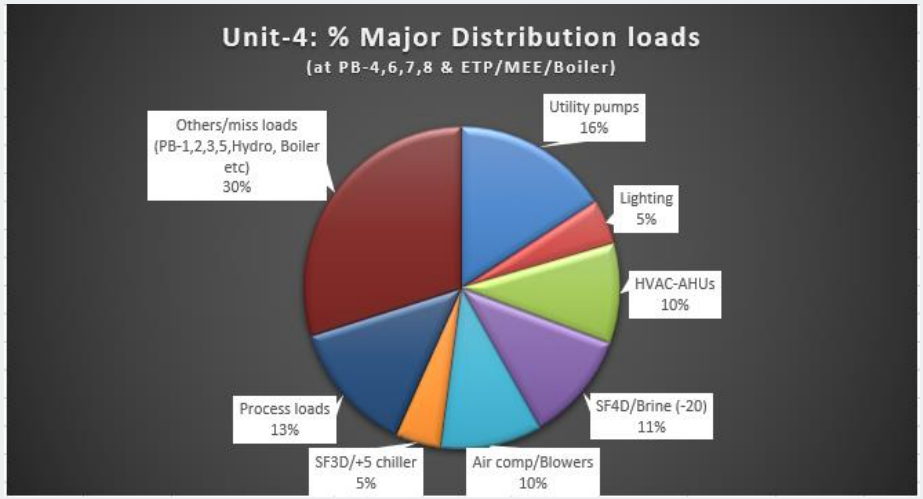
Sai

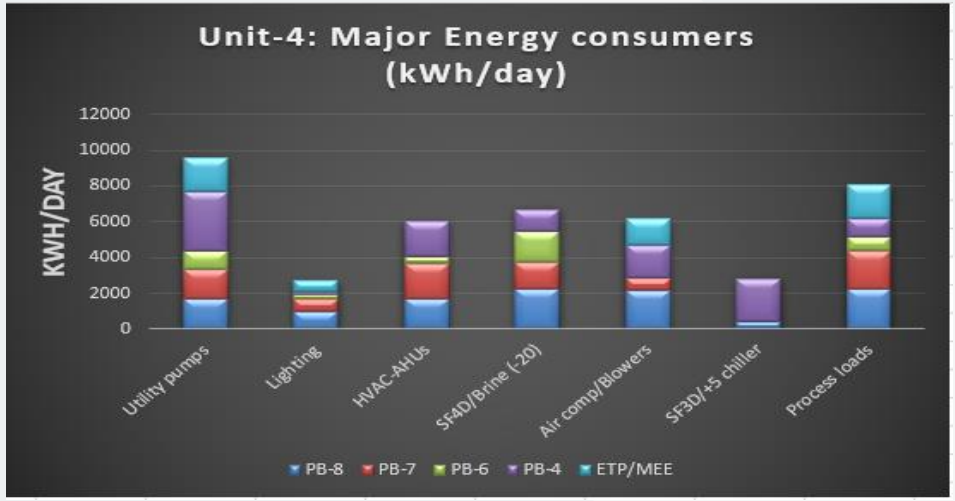
Unit IV

10. Energy Monitoring (Electrical vs Thermal)

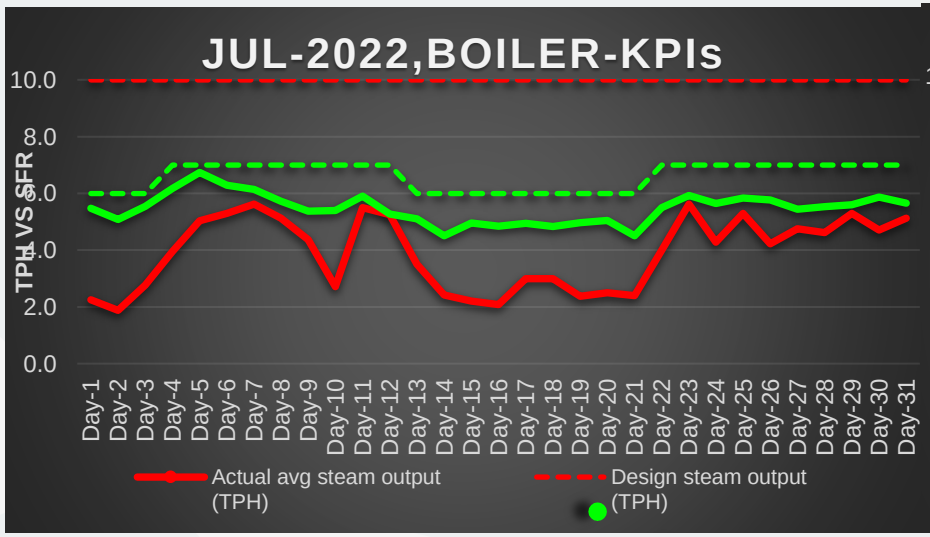
Energy Mapping

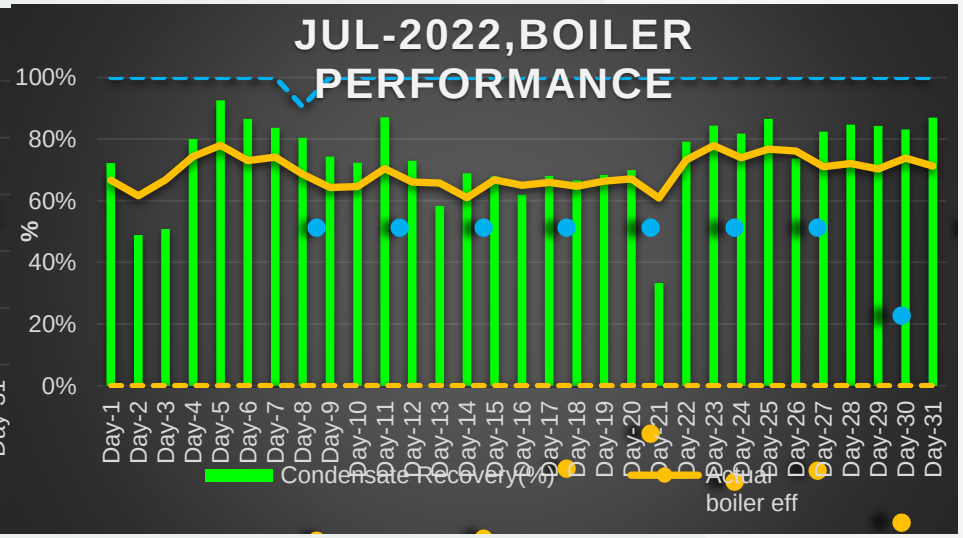
1) Unit-4 – Electrical
   a) Utility – 60%
   b) Process – 15 %
   c) Miss Energy- 25%
   (MEE/Boiler/Admin/WH)





2) Unit-4 – Thermal
   a) Process- 25%
   b) MEE Operation- 75 %

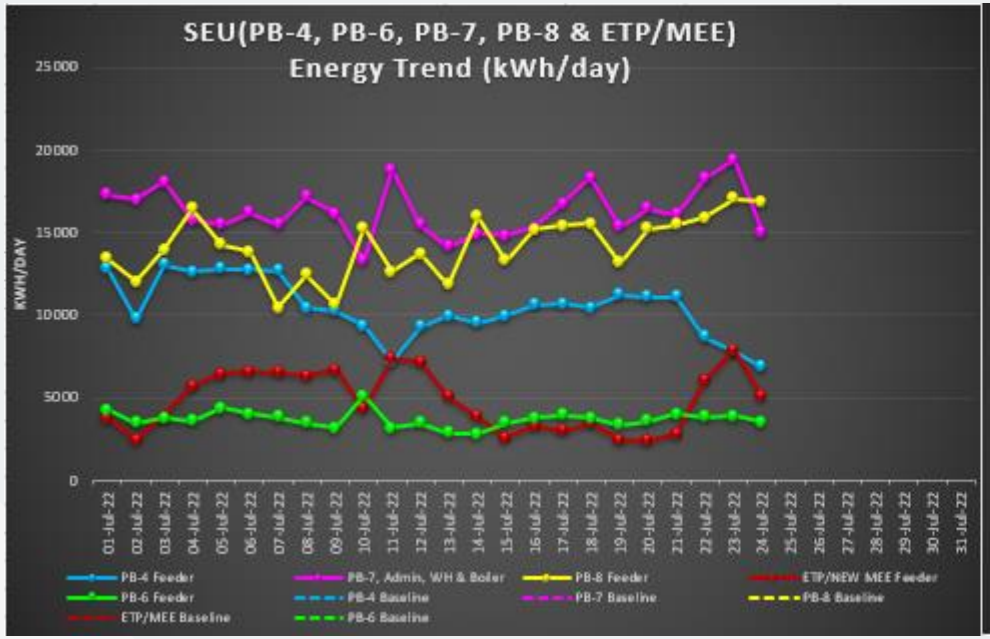


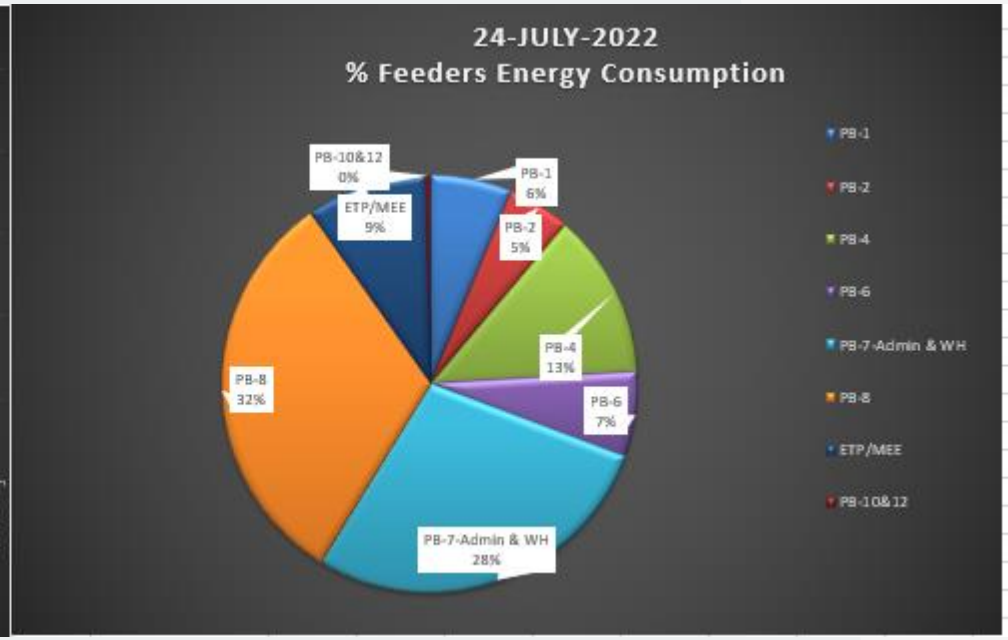


Sai

Unit IV 10.2 Energy Monitoring

Energy Review
@ Sai





Weekly & Monthly Energy Review to discuss on capex approvals, status of energy projects

Mr. Vinayak Phadnis	- Associate Vice President	(Plant Head)
Mr. Shrinivas Prasad	- General Manager	(HOD-Engineering)
Mr. Sekhar	- Deputy Manager	(Utility-Engineering)
Mr. Venkatesan	- Sr.Manager	(Electrical-Engineering)
Mr. Surya Prakash	- Vice President	(Corporate- Engineering & Projects)
Mr. Krishna Chaitanya	-Asst. Manager	(Electrical-Engineering)

Sai

Unit IV

10.4 Sustainability Initiatives & Energy Awareness

Energy Review @ Sai

- Green Chemistry : Adoption of green chemistry principles in process development
- As per the standards GRI (Global Reporting Initiative) started publishing sustainability report .
- Green belt development program (4600 Nos Tree Plantation in Fy-22)
- Energy Efficiency Awareness programs/Trainings
- Daily Shop floor Effectiveness Team (SET & AET meeting) to track Energy KPIs, Energy Conservation Action points, Kaizen Projects.

Sai Make it better together

Sustainable Development Goals

April 01, 2019

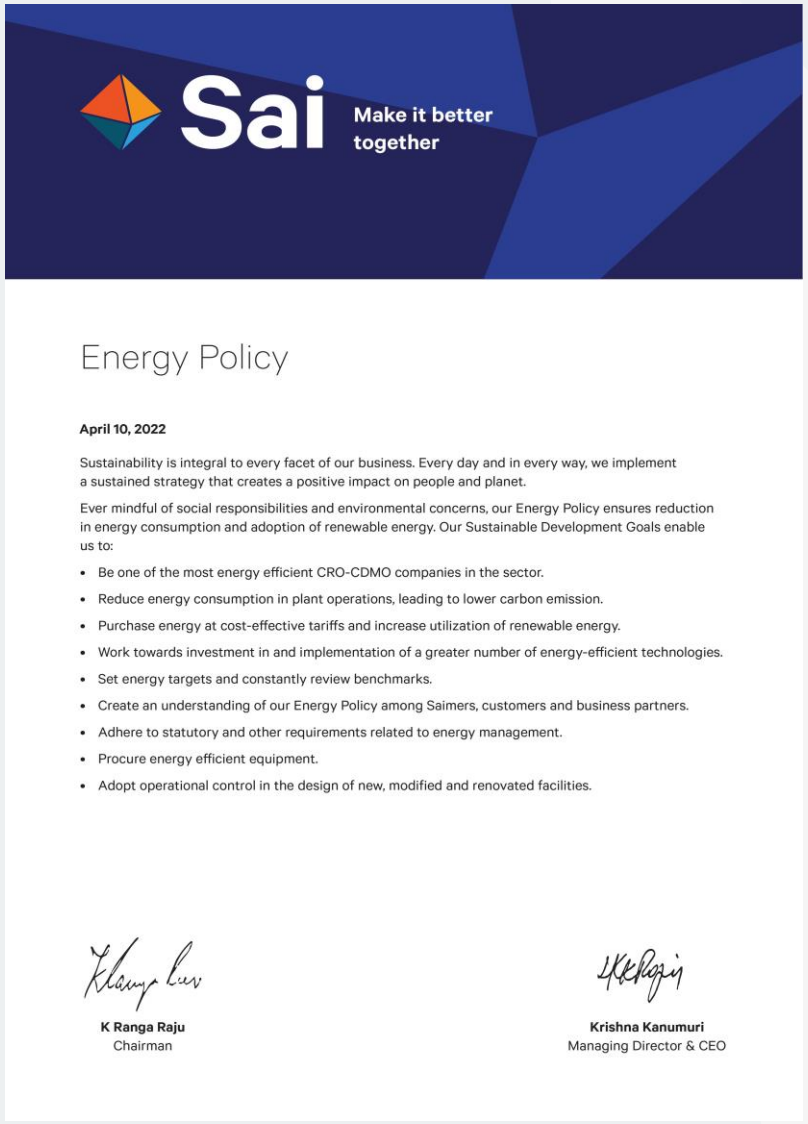
At Sai Life Sciences, we are committed to playing our part towards a more sustainable future. As a company committed to a healthier tomorrow, we understand our responsibility towards socio-economic development, climatic change mitigation and resource conservation.

Considering FY 2019 as the baseline year, by the end of FY 2022 we commit to:

- Reduce specific water consumption by 10%
- Reduce specific greenhouse gas emission by 10% and replace 10% of our overall energy requirement with renewable sources
- Reduce specific hazardous waste generation by 10% and recycle 70% of hazardous waste through co-processing and alternate reuse
- Create more opportunities for women and increase the percentage of women employees in total workforce to 12%
- Provide education and create livelihood for 1500 people from financially and socially less privileged communities through our CSR programmes
- Provide free medical screening to 10,000 people through our healthcare programmes
- Perform competency profiling and risk assessment for all critical raw material suppliers

Krishna Kanumuri
Managing Director & CEO

Sivaramakrishnan Chittor
Chief Operating Officer



Sai Make it better together

Energy Policy

April 10, 2022

Sustainability is integral to every facet of our business. Every day and in every way, we implement a sustained strategy that creates a positive impact on people and planet.

Ever mindful of social responsibilities and environmental concerns, our Energy Policy ensures reduction in energy consumption and adoption of renewable energy. Our Sustainable Development Goals enable us to:

- Be one of the most energy efficient CRO-CDMO companies in the sector.
- Reduce energy consumption in plant operations, leading to lower carbon emission.
- Purchase energy at cost-effective tariffs and increase utilization of renewable energy.
- Work towards investment in and implementation of a greater number of energy-efficient technologies.
- Set energy targets and constantly review benchmarks.
- Create an understanding of our Energy Policy among Saimers, customers and business partners.
- Adhere to statutory and other requirements related to energy management.
- Procure energy efficient equipment.
- Adopt operational control in the design of new, modified and renovated facilities.

K Ranga Raju
Chairman

Krishna Kanumuri
Managing Director & CEO

Sai

Unit IV

10.5 Few Kaizen Projects

Energy Review @ Sai

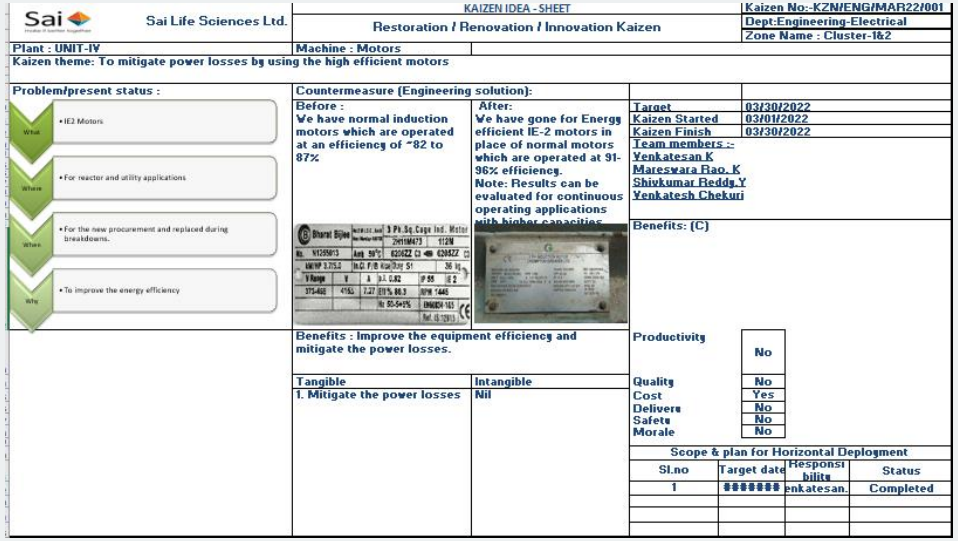
FY21:

Total Nos of Kaizen : 13 Nos

a) Completed : 13 Nos

b) Under implementation : 0Nos

c) Under approval : 0 Nos



Sai Life Sciences Ltd.

KAIZEN IDEA - SHEET

Restoration / Renovation / Innovation Kaizen

Kaizen No:-KZN/ENG/MAR22/001

Dept:Engineering-Electrical

Zone Name : Cluster-1&2

Plant : UNIT-IV

Machine : Motors

Kaizen theme: To mitigate power losses by using the high efficient motors

Problem/present status :

What: • IE2 Motors

Where: • For reactor and utility applications

When: • For the new procurement and replaced during breakdowns.

Why: • To improve the energy efficiency

Countermeasure (Engineering solution):

Before : We have normal induction motors which are operated at an efficiency of ~82 to 87%

After: We have gone for Energy efficient IE-2 motors in place of normal motors which are operated at 91-96% efficiency. Note: Results can be evaluated for continuous operating applications with higher capacities

Target 03/30/2022

Kaizen Started 03/01/2022

Kaizen Finish 03/30/2022

Team members :-

Venkatesan K

Mareswara Rao. K

Shivkumar Reddy.Y

Venkatesh Chekuri

Benefits: (C)

Benefits : Improve the equipment efficiency and mitigate the power losses.

Productivity No

Quality No

Cost Yes

Delivery No

Safety No

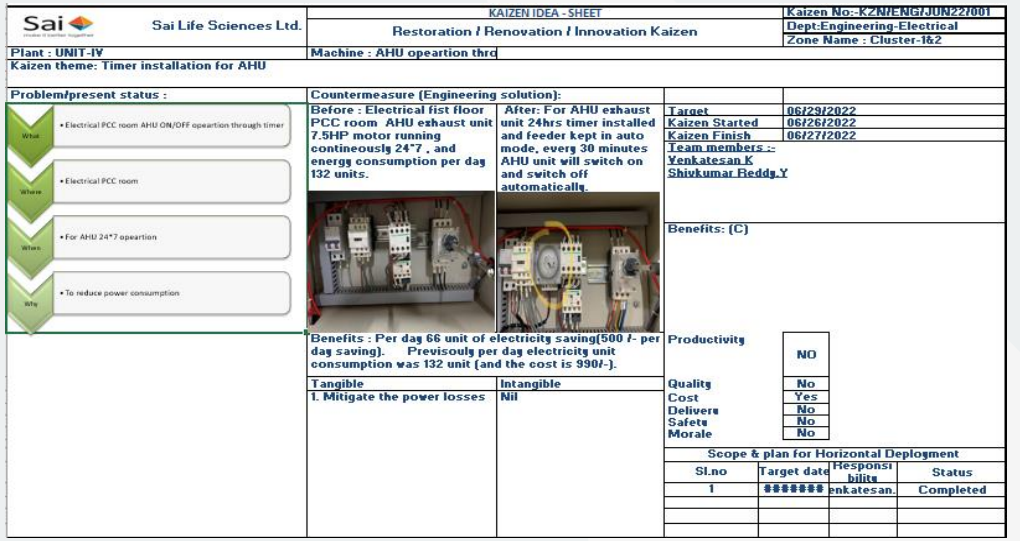
Morale No

Tangible: 1. Mitigate the power losses

Intangible: Nil

Scope & plan for Horizontal Deployment

Sl.no	Target date	Responsibility	Status
1	*******	Venkatesan.	Completed



Sai Life Sciences Ltd.

KAIZEN IDEA - SHEET

Restoration / Renovation / Innovation Kaizen

Kaizen No:-KZN/ENG/JUN22/001

Dept:Engineering-Electrical

Zone Name : Cluster-1&2

Plant : UNIT-IV

Machine : AHU opeartion thrd

Kaizen theme: Timer installation for AHU

Problem/present status :

What: • Electrical PCC room AHU ON/OFF opeartion through timer

Where: • Electrical PCC room

When: • For AHU 24*7 opeartion

Why: • To reduce power consumption

Countermeasure (Engineering solution):

Before : Electrical fist floor PCC room AHU exhaust unit 7.5HP motor running contineously 24*7 , and energy consumption per day 132 units.

After: For AHU exhaust unit 24hrs timer installed and feeder kept in auto mode, every 30 minutes AHU unit will switch on and switch off automatically.

Target 06/29/2022

Kaizen Started 06/26/2022

Kaizen Finish 06/27/2022

Team members :-

Venkatesan K

Shivkumar Reddy.Y

Benefits: (C)

Benefits : Per day 66 unit of electricity saving(500 /- per day saving). Previsouly per day electricity unit consumption was 132 unit (and the cost is 990/-).

Productivity NO

Quality No

Cost Yes

Delivery No

Safety No

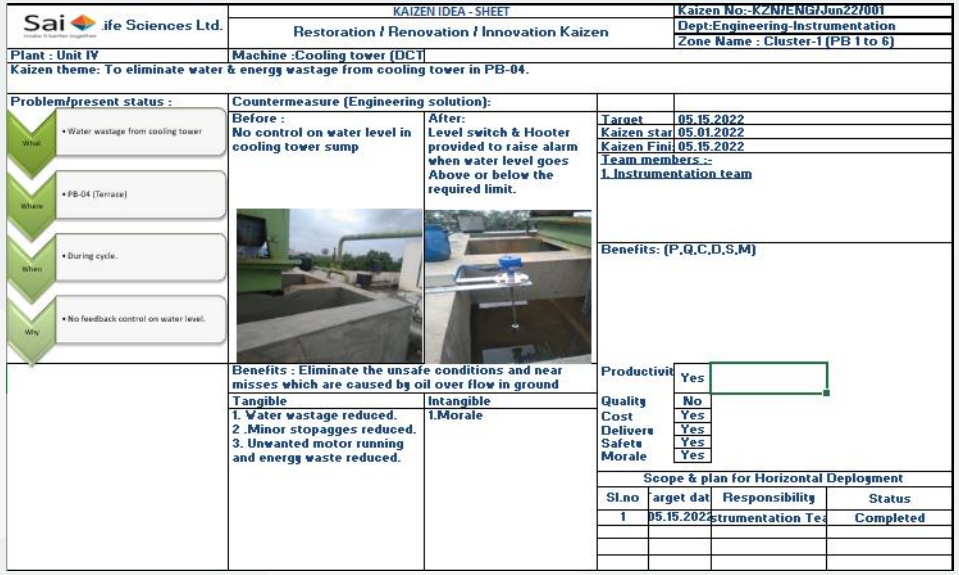
Morale No

Tangible: 1. Mitigate the power losses

Intangible: Nil

Scope & plan for Horizontal Deployment

Sl.no	Target date	Responsibility	Status
1	*******	Venkatesan.	Completed



Sai ife Sciences Ltd.

KAIZEN IDEA - SHEET

Restoration / Renovation / Innovation Kaizen

Kaizen No:-KZN/ENG/Jun22/001

Dept:Engineering-Instrumentation

Zone Name : Cluster-1 (PB 1 to 6)

Plant : Unit IV

Machine :Cooling tower (DCT)

Kaizen theme: To eliminate water & energy wastage from cooling tower in PB-04.

Problem/present status :

What: • Water wastage from cooling tower

Where: • PB-04 (Terrace)

When: • During cycle.

Why: • No feedback control on water level.

Countermeasure (Engineering solution):

Before : No control on water level in cooling tower sump

After: Level switch & Hooter provided to raise alarm when water level goes Above or below the required limit.

Target 05.15.2022

Kaizen star 05.01.2022

Kaizen Fini 05.15.2022

Team members :-

1. Instrumentation team

Benefits: (P,Q,C,D,S,M)

Benefits : Eliminate the unsafe conditions and near misses which are caused by oil over flow in ground

Productivit Yes

Quality No

Cost Yes

Delivery Yes

Safety Yes

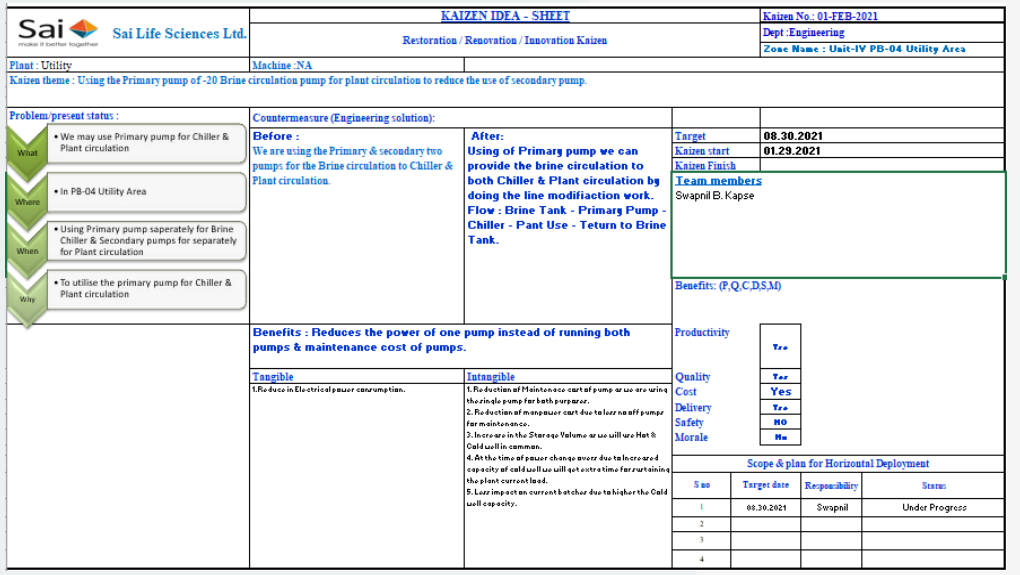
Morale Yes

Tangible:
1. Water wastage reduced.
2 .Minor stopagges reduced.
3. Unwanted motor running and energy waste reduced.

Intangible: 1.Morale

Scope & plan for Horizontal Deployment

Sl.no	Target dat	Responsibility	Status
1	05.15.2022	strumentation Tea	Completed



Sai Life Sciences Ltd.

KAIZEN IDEA - SHEET

Restoration / Renovation / Innovation Kaizen

Kaizen No.: 01-FEB-2021

Dept :Engineering

Zone Name : Unit-IV PB-04 Utility Area

Plant : Utility

Machine :NA

Kaizen theme : Using the Primary pump of -20 Brine circulation pump for plant circulation to reduce the use of secondary pump.

Problem/present status :

What: • We may use Primary pump for Chiller & Plant circulation

Where: • In PB-04 Utility Area

When: • Using Primary pump saperately for Brine Chiller & Secondary pumps for separately for Plant circulation

Why: • To utilise the primary pump for Chiller & Plant circulation

Countermeasure (Engineering solution):

Before : We are using the Primary & secondary two pumps for the Brine circulation to Chiller & Plant circulation.

After: Using of Primary pump we can provide the brine circulation to both Chiller & Plant circulation by doing the line modifiaction work. Flow : Brine Tank - Primary Pump - Chiller - Pant Use - Teturn to Brine Tank.

Target 08.30.2021

Kaizen start 01.29.2021

Kaizen Finish

Team members

Swapnil B. Kapse

Benefits: (P,Q,C,D,S,M)

Benefits : Reduces the power of one pump instead of running both pumps & maintenance cost of pumps.

Productivity Yes

Quality Yes

Cost Yes

Delivery Yes

Safety NO

Morale No

Tangible: 1.Reduce in Electrical power consumption.

Intangible:
1. Reduction of Maintenance cost of pump as we are using the single pump for both purpose.
2. Reduction of manpower cost due to less no off pumps for maintenance.
3. Increase in the Storage Volume as we will use Hot & Cold well in common.
4. At the time of power change overs due to Increased capacity of cold well we will get extra time for sustaining the plant current load.
5. Less impact on current batches due to higher the Cold well capacity.

Scope & plan for Horizontal Deployment

S no	Target date	Responsibility	Status
1	08.30.2021	Swapnil	Under Progress
2			
3			
4			

Sai

Unit IV

10.6 Energy Management Road Map

Energy Management Approach @ Sai

- Improving energy efficiency at Sai Life Group level
- Transforming the energy management to a system driven approach.
- Brainstorming on energy conservation activities.
- Enhancing investment in new energy efficient technologies.
- Involvement of Saimers in Energy Management activities.
- Energy Policy : Rolled out April-2022
- ISO 50001:2018 Energy Management Certification : 16-July-22

Sai

Unit IV
Achievements

Certification, recognition and achievements

Silver medal

Achieved score of 48, improvement from previous year

ISO 14001 & 45001

Corporate office, R&D and Manufacturing facilities are now IMS certified

CII- 21st National Energy Management Award 2020

Energy Efficient Unit-2020

CII EHS Excellence Awards 2019

Twin win - 5 star rating in EHS excellence and runner up in Pharma category

Golden Peacock

Winner of Golden Peacock National Quality Award 2020

SCMPro forums IPLF Awards 2020

SCM shines with awards in Supply Risk & Supplier Relationship Management

Silver medal

Achieved score of 63, improvement from previous year

ISO 50001:2018

Unit-04, Bidar is ISO 500001 Certified Unit

CII- 22nd National Energy Management Award 2021

Energy Efficient Unit-2021

CII EHS Excellence Awards 2020

5 star rating in EHS excellence in Pharma category

Golden Peacock

Winner of Golden Peacock Award - Training – 2021

CII-SR EHS Excellence Awards 2021

Thank You

Surya Prakash
VP-Corporate Engineering & Projects
surya.p@sailife.com
Contact: +91-7675989710

Shrinivas Prasad
GM- Engineering
shrinivasprasad.a@sailife.com
Contact: +91-8008556803

Venkatesan.K
Sr. Manager-Engineering
venkatesan.k@sailife.com
Contact: +91-9148146271

Krishna Chaitanya. N
Asst. Manager-Engineering
krishnachaitanya.n@sailife.com
Contact: +91-6366537922

Sai

Make it better together