CII National Award

for Excellence in Energy Management

INDIAN IMMUNOLOGICALS LIMITED

INDIAN IMMUNOLOGICALS LIMITED

Gachibowli Unit

Lead Presenter: Mr. D Ravi Kumar (DGM- Engineering)

Team Members: Mr. Veera Sidda Reddy (Energy Manager)

Mr. Lakshmi Narayana Rao (Manager – Electrical)

INDIAN IMMUNOLOGICALS LTD

राष्ट्रीय डेरी विकास बोर्ड
NATIONAL DAIRY DEVELOPMENT BOARD

INDIAN IMMUNOLOGICALS LIMITED

Indian Immunologicals Limited was set up by National Dairy Development Board (NDDB) in 1982 with the objective of making vaccines available to farmers at an affordable price.

IIL is the market leader in veterinary biologicals in India and operates one of the largest plant in the world for veterinary vaccines.

IIL is a major player in the human vaccine market in India, focusing on the pediatric and rabies vaccine.

Indian Immunologicals Ltd (IIL) has emerged as the world's largest manufacturer of Foot and Mouth Disease (FMD) vaccine.

IIL Exports

animal and human vaccines to more than 50 countries

Several billion doses

of vaccines sold

150+

Registered Products

Occupational Health & Safety Management OHSAS 18001:2007

Good Manufacturing Practice Certification GMP Quality

IAF INTERNATIONAL ACCREDITATION FORUM

DAkkS Deutsche Akkreditierungsstelle D-ZM-18590-01-00

TÜV NORD

SAP

www.indimmune.com

Vision and Mission

INDIAN IMMUNOLOGICALS LIMITED

Our Vision :

Shaping Global Healthcare by Spearheading the One Health Initiative.

Our Mission :

To Innovate, Produce and Market Quality Healthcare Products and Services to Improve and Extend lives.

ONE HEALTH

www.indimmune.com

Facility & Major Equipment

INDIAN IMMUNOLOGICALS LIMITED

Manufacturing of Vaccines

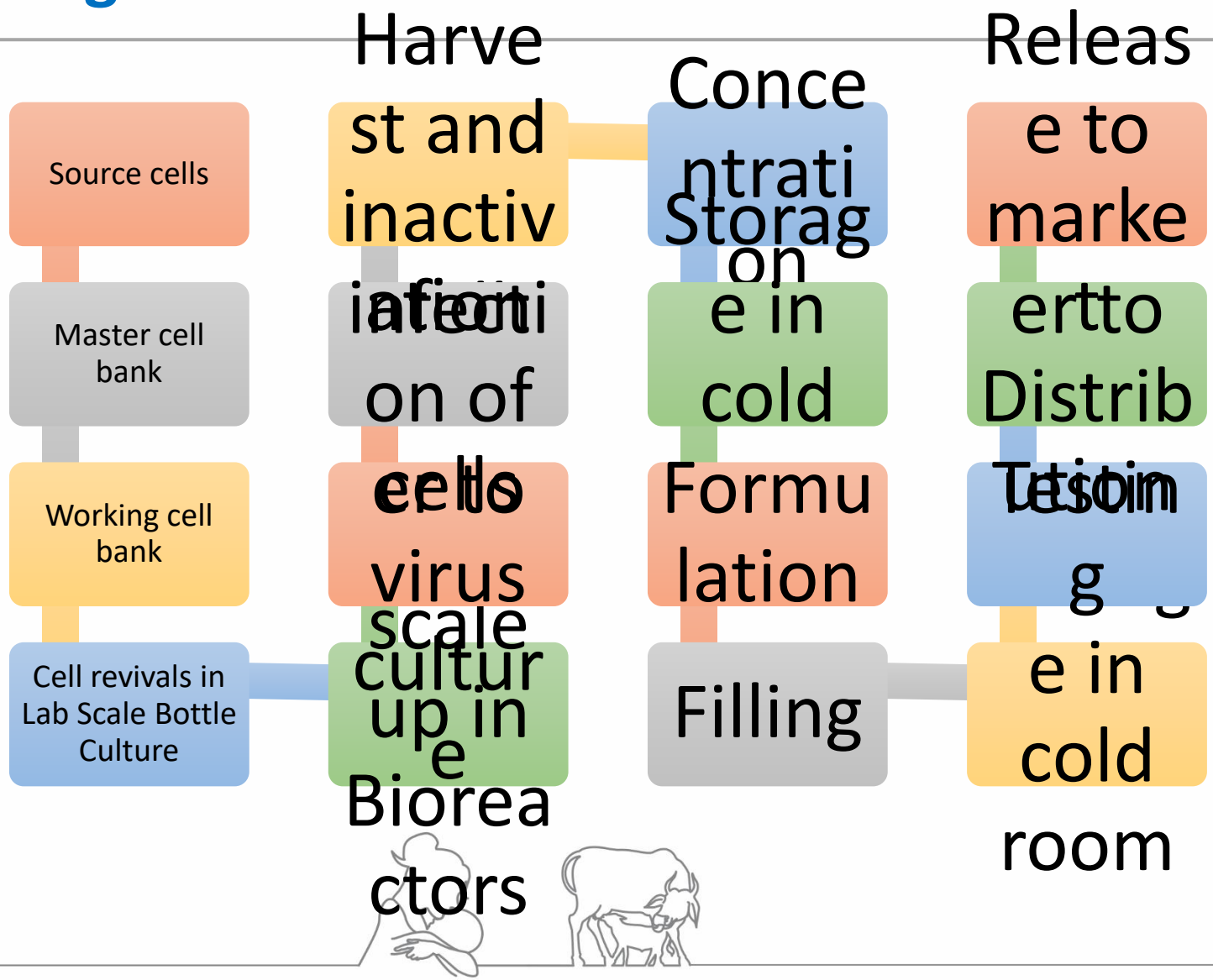
- Animal Vaccines
- Human Vaccines

25 Manufacturing blocks

100 KL+ of fermenters volume

- ❑ 50+ Fermenters
- ❑ 500+ Vessels
- ❑ 40+ Autoclaves
- ❑ Pure steam generators
- ❑ Water for Injection
- ❑ Chillers
- ❑ Cold stores

Manufacturing Process



Energy Demand & Consumption

INDIAN IMMUNOLOGICALS LIMITED

Electrical Energy

- Power Demand : 4591 KVAH
- Connected Load : 24106 H.P.
- Source of Power : Govt Power & Captive Generation
- Intensive Area : Chilling Plants , Air Compressors, Vacuum Pumps, Utility Pumps, AHU Systems

Thermal Energy

- Thermal Energy Demand 6 TPH
- Boiler Capacity 11 TPH
- Intensive Area : Process (Fermenters, Vessels, separators, centrifuge), Clean Utilities(Pure steam generator, Water for Injection), ETP (MEE & ATFD)

Energy data

INDIAN IMMUNOLOGICALS LIMITED

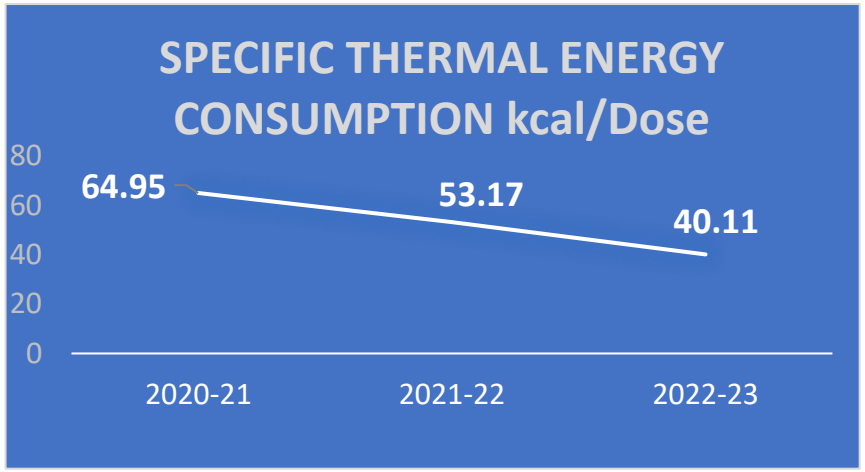
Parameters	Unit	2020-21	2021-22	2022-23
Annual Electrical Energy Consumption	million kWh	22.11	26.05	29.51
Annual Cost of Electricity Consumed	million INR	152.18	178.81	235.14
Annual Thermal Energy Consumption	million kcal	19,339.68	20,292.74	18,101.67
Annual Cost of Thermal Energy Consumed	million INR	167.63	221.59	248.38
Specific Electrical Energy Consumption	kWh/dose	0.074	0.068	0.065
Specific Thermal Energy Consumption	Kcal/dose	64.95	53.17	40.11

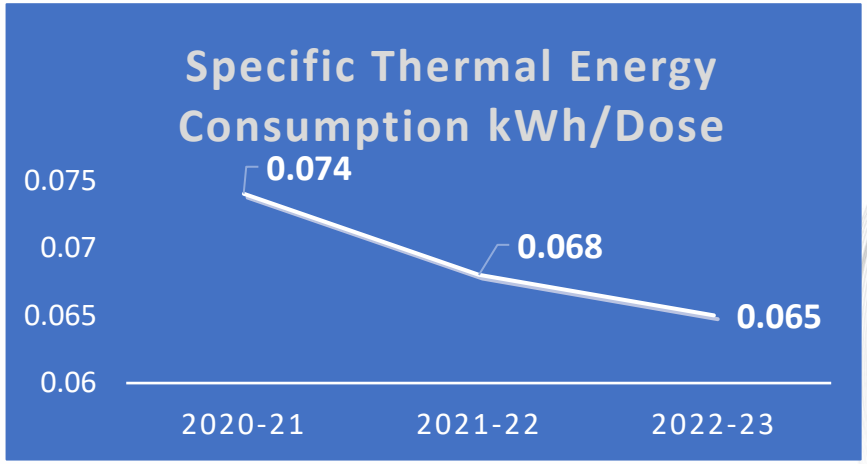
Specific Energy Consumption

INDIAN IMMUNOLOGICALS LIMITED

Parameters	2020-21	2021-22	2022-23
Specific Thermal Energy Consumption(Kcal/dose)	64.95	53.17	40.11
Variation in %	↑ -11.65	↓ 18.13	↓ 24.01

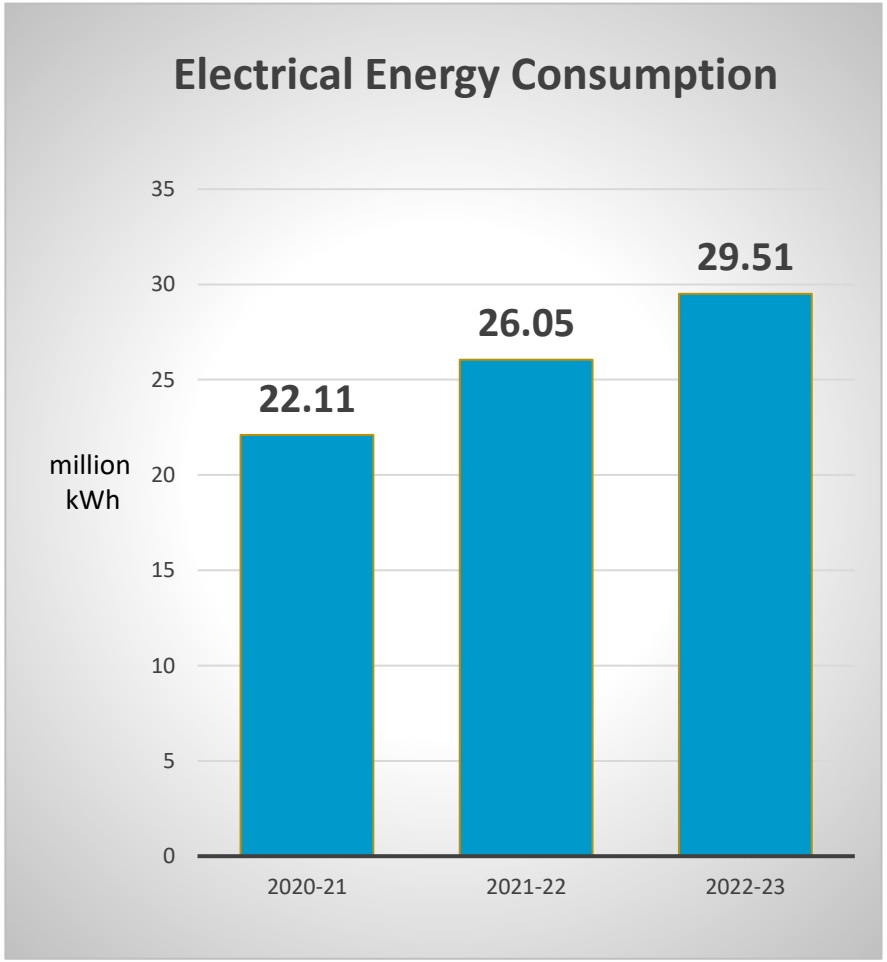
Parameters	2020-21	2021-22	2022-23
Specific Electrical Energy Consumption(kWh/dose)	0.074	0.068	0.065
Variation in %	↑ -7.24	↓ 8.1	↓ 4.41

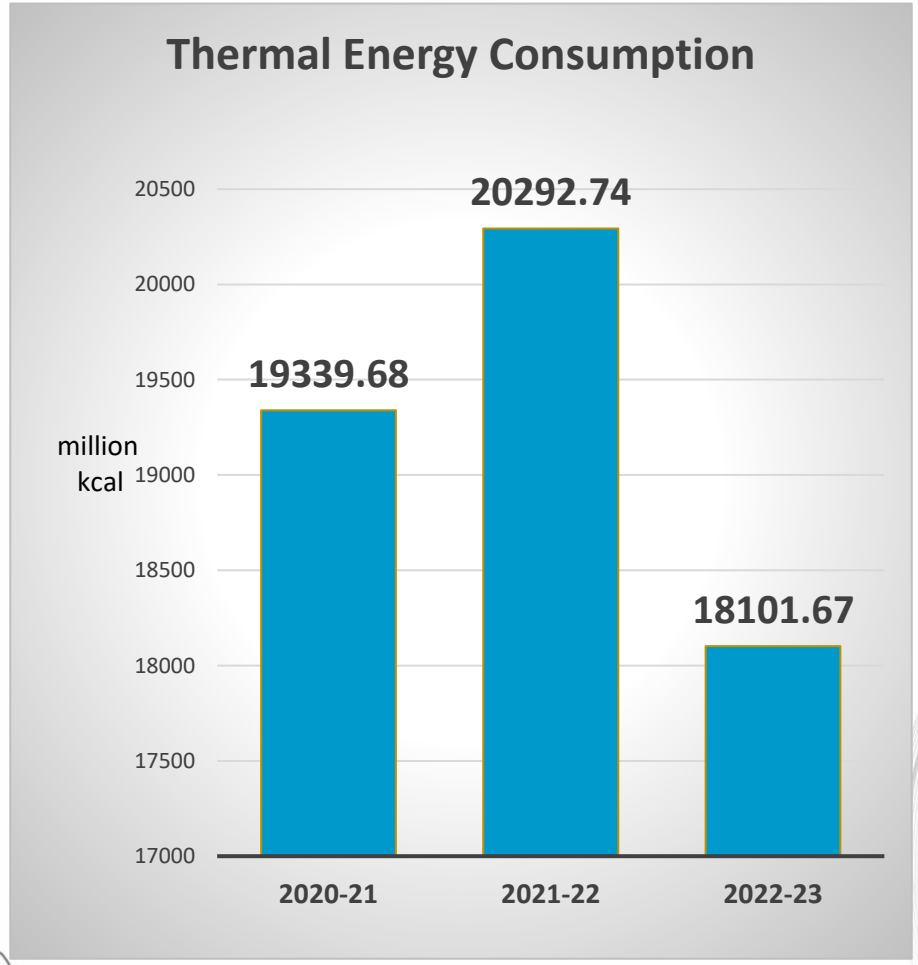




Energy consumption

INDIAN IMMUNOLOGICALS LIMITED





Production data

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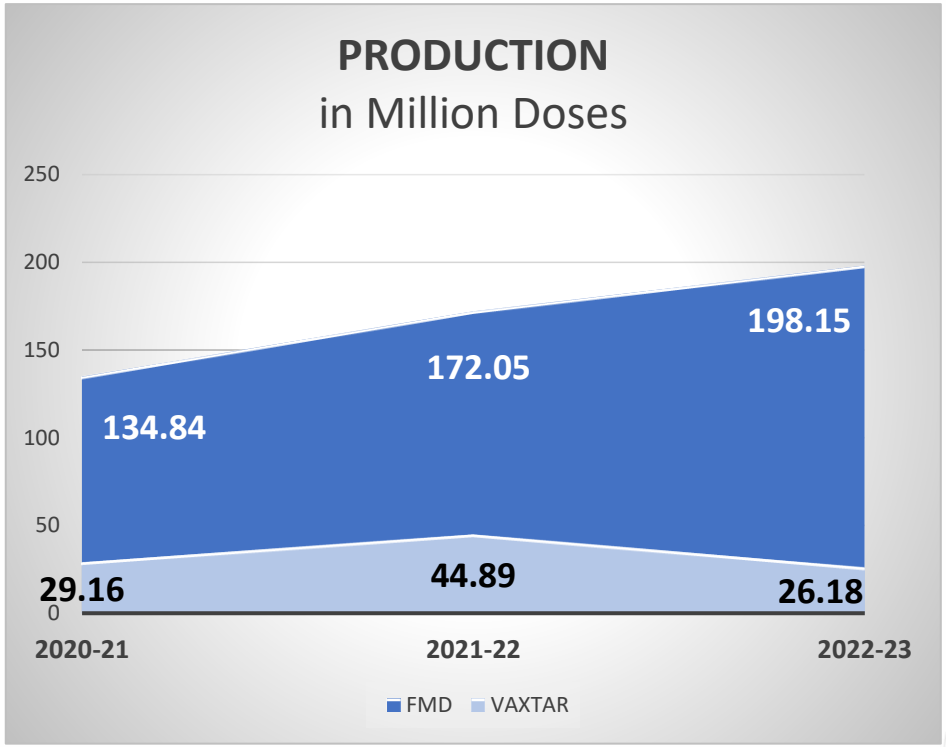
PRODUCT	2020-21 Million doses	2021-22 Million doses	2022-23 Million doses
FMD	134.84	172.05	198.15
VAXTAR	29.16	44.89	26.18



Benchmarking

- FY 2023-24 targeted benchmark was based on FY 2022-23 actuals energy consumption.
- We have targeted to reduce Thermal energy consumption by 10% and Electrical demand by 5%
- We can achieve the targeted benchmark by installing new PNG boiler and effective implementation of energy saving activities and with continuous monitoring of load demand.

Energy Saving projects implemented in the last three years

INDIAN IMMUNOLOGICALS LIMITED

Year	No of Energy saving projects	Investment (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million Kcal)	Total Savings (INR Million)	Payback period (in months)
2020-21	7	7.455	0.39	297.76	5.53	17
2021-22	6	2.05	0.768	180.71	7.4	4
2022-23	7	16.4	2.71	39.477	23.56	9

List of encon projects planned 2023-24

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S.no	Title of Project	Annual Electrical Saving (Million kWh)	Annual Thermal Saving (Million Kcal)	Investment (Rs in Million)	Comment
1	Installing new 6TPH PNG fired boiler in place of existing HSD fired 3TPH boilers(2nos.)	0	2700	25	
2	Voltage stabilization	0.25	0	0	
3	Replacing HSD fuel with piped Natural gas in 5TPH boiler	0	1810	25	
4	HT dedicated line for plant	0.3	0	90	will reduce DG running hours
5	Active harmonic filters installation at load ends(MCC)	0.03	0	1	
6	Replacing existing blowers with BLDC/EC Blowers for AHU	0.1	0	1.5	

Installing new 6TPH PNG fired boiler in place of existing HSD fired 3TPH boilers(2nos.)

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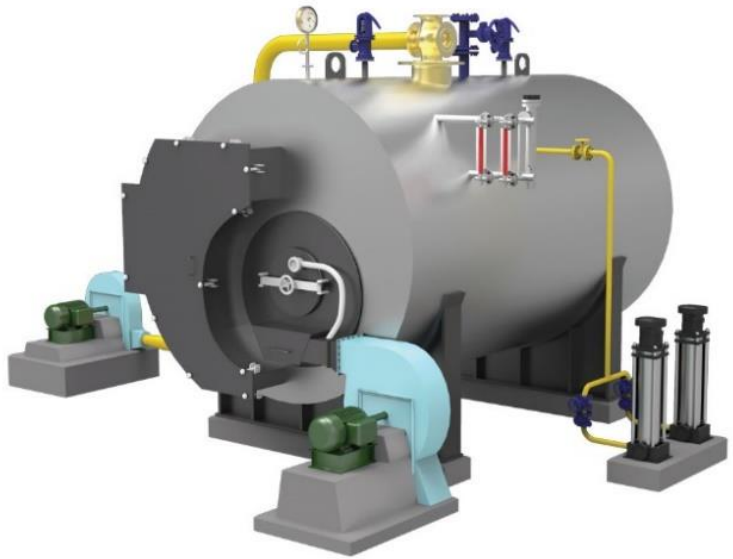
- Actual steam load per hour is 6 TPH
- Two boilers (5+3 TON) are in operation to meet the requirement resulting in high fuel consumption.

To reduce the fuel consumption new Energy efficient 6TPH HSD cum PNG fired boiler to be installed in place of the existing HSD fired 3TPH boilers (2nos.) to reduce fuel consumption cost.

- Initial investment made of 25 million.
- Annual Thermal Saving of 2700 (Million Kcal) will be saved.
- Annual Cost saving – 10 million.
- ROI- 30 months.



6TPH PNG FIRED BOILER

Replacing HSD fuel with piped natural gas in 5TPH boiler

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- PNG is a safer and distributed through closed piped loop to boiler feed with uninterrupted supply
- Environment friendly
- Low maintenance cost
- Piped Natural Gas is a safe fuel. In case of leakage, PNG being lighter than air, disperses in the air easily.
- Cost of HSD is ₹110 / L whereas PNG is ₹ 48 / Standard cubic meter
- Initial investment made of 25 million.
- Annual Thermal Saving of 1810 (Million Kcal) will be saved.
- Annual Cost saving – 30 million.
- ROI- 12 months.

5 Ton boiler

ENCON 2020-21

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Title of Project	Annual Electrical Saving (kWh)	Annual Electrical Cost Saving (Rs million)	Annual Thermal Saving		Annual Thermal Cost Saving (Rs million)	Total Annual Savings (Rs million)	Investment Made (Rs million)	Payback (Months)
			Quantity	Unit of Measurement				
Automation of all PW/WFI storage tanks so that during sterilization the steam can be controlled & avoid loss of steam.	0	0	2,365.68	litres	0.19	0.19	1.7	108
New auto blowdown valve fixed for 5TPH Boiler	0	0	30,852	litres	2.53	2.53	0.5	3
Existing tube light fittings replaced with LED fittings in plant	10,174	0.07	0		0	0.07	0.35	60
VFD arranged for Media area AHU	8395	0.06	0		0	0.06	0.055	11
VFD's arranged for Condenser pumps	2,00,607	1.46	0		0	1.46	0.2	2
VFD arranged for MSS AHU	19,246	0.13	0		0	0.13	0.05	5
Replacement of old Transformers- 02nos with OLTC Distribution Transformers (AH Plant)	1,27,872	1.02	0		0	1.02	4.6	55

Replacement of old Transformers-02nos with OLTC 2 MVA Transformers

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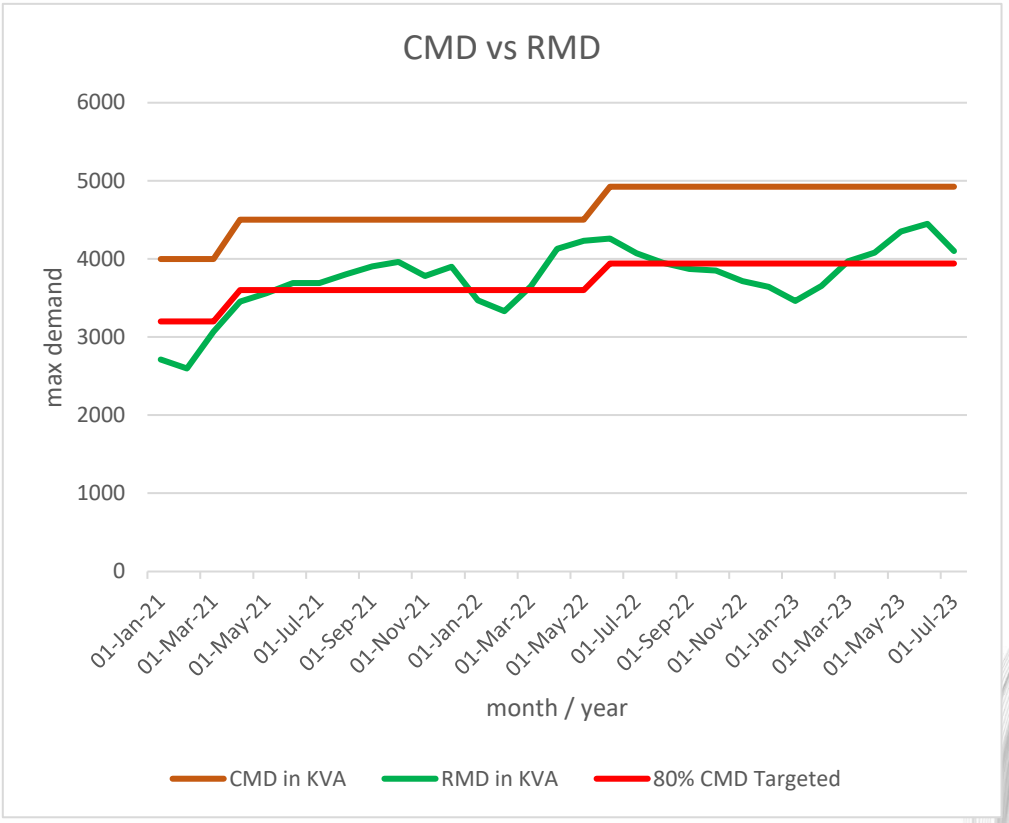
TRANSFORMERS ENERGY SAVINGS		
1	Old Transformers without OLTC 2 MVA 33/0.433KV losses at 68% loa d in KW	16
2	New Distribution Transformers wit h OLTC 2 MVA 33/0.433KV losses a t 68% load in KW	8.6
3	Total Savings in KW/hr	7.40
4	Annual Savings for 2 transformers in KW	1,27,872
5	Monetery Savings for 2 transformers in INR	10,22,976



Auto Blowdown system for 5TPH Boiler

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Manual blow down: Existing manual blowdown of steam occurs with certain time frame based or manually , measurement based on the parameter to reduce the TDS, conductivity, silica etc. TDS level is maintained within the 2500 to 3000ppm. In Manual blowdown, blowdown valve is opened for a short period of time, the time being based on a thumb rule such as "twice in a shift for 30 sec".

AUTOMATIC BLOWDOWN

Auto Blowdown : It is a continuous blowdown of the steam to be done automatically for maintaining the TDS level within the acceptance criteria. Although some quantity of steam is always wastes by the blow down. always the concentration level of the water is maintained in the boiler. By this method the efficiency or steam fuel ratio of the boiler can be improved., time for blowdown per shift is 10 sec.

Type of blowdown	Time (s) for Blowdown / month	Water drained (L) / month	HSD Oil saved / month	Cost saving per 1 liter HSD oil = 14 L of water evaporation / month
Manual	5,400	54,000	NA	NA
Auto	1,800	18,000	2,571.43	2,08,285

SURFACE BLOWDOWN

ENCON 2021-22

INDIAN IMMUNOLOGICALS LIMITED

Title of Project	Annual Electrical Saving (kWh)	Electrical Saving (kW)	Annual Electrical Cost Saving (Rs million)	Annual Thermal Saving		Annual Thermal Cost Saving (Rs million)	Total Annual Savings (Rs million)	Investment Made (Rs million)	Payback (Months)
				Quantity	Unit of Measurement				
Condensate recovery from fill&finish in P11 block	0	0	0	0.219	million Kcal	0.25	0.25	0.6	29
New condensate recovery pump installed at Antigen B9 block	0	0	0	0.219	million Kcal	0.25	0.25	0.6	29
Shifting of Capacitor banks at MCC Panels Load centre area (HH Plant)	3,55,472	2.542	0	0		0	2.542	0.6	3
Dismantling of Exhaust fan at AH plant 1. Capacitor panel room 2. Laundry	3,892	0.028	0	0		0	0.028	0	0
R&D block MCC Panel Unbalanced Load balancing	45,644	0.326	0	0		0	0.326	0	0
Shifting of Capacitor banks at MCC Panels Load center areas (AH Plant)	3,63,840	2.606	0	0		0	2.606	0.8	4

Condensate recovery from P11 & B9 Blocks

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- Installed new condensate recovery pumps (PPPPU) to collect & pump the steam condensate to boiler feed water tank.
- Initial investment made of 1.2 million.
- Annual Cost saving – 0.49 million.
- ROI- 29 months.

Condensate recovery in KL / year	Energy saved million Kcal/year	Condensate recovery cost million/year
4,380	0.219	0.49

CONDENSATE RECOVERY PUMPS (PPPPU)

ENCON 2022-23

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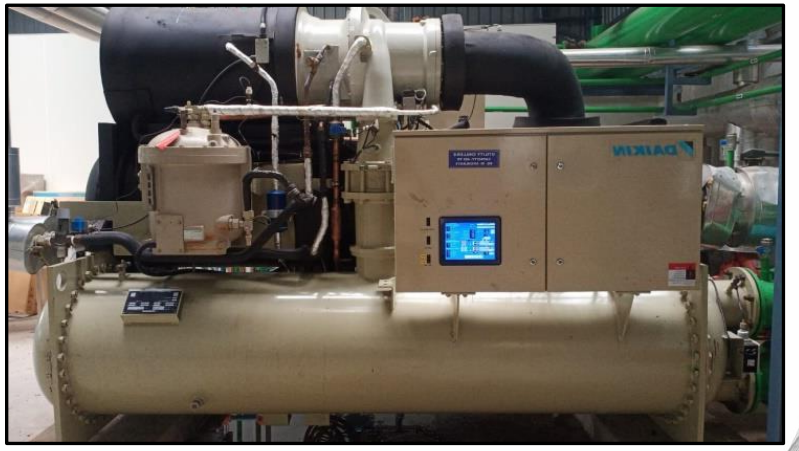
Title of Project	Annual Electrical Saving (kWh)	Annual Electrical Cost Saving (Rs million)	Annual Thermal Saving		Annual Thermal Cost Saving (Rs million)	Total Annual Savings (Rs million)	Investment Made (Rs million)	Payback (Months)
			Quantity	Unit of Measurement				
Operating new energy efficient chiller 450TR by switching off old 300 TR chiller	1,58,752	1.27	0	0	0	1.27	7	67
Operating new energy efficient chiller 350TR by switching off old 250TR & 150 TR chillers	4,20,480	3.36	0	0	0	3.36	7	25
Reduced the RMD spikes	2,326	0.5	0	0	0	0.5	0	0
Stopped air cooled chiller and lined up from water cooled chiller	1,52,886	1.22	0	0	0	1.22	0.1	1
Installed heat exchanger for heating feed water in boiler	0	0	4404	litres	0.54	0.54	0.1	3
Replaced old pumps with new energy efficient pumps in refrigeration plant	81,768	0.65	0	0	0	0.65	1.2	23
Shifting of capacitor banks at MCC panel load center areas	20,12,876	16.02	0	0	0	16.02	1	1

Energy savings by installing 450 TR water cool chiller

INDIAN IMMUNOLOGICALS LIMITED

- Operating new energy efficient 450TR centrifugal chiller with VFD in place of 300 TR chillers(2nos) with soft starter
- This 450TR chiller has auto tube cleaning system which will increase efficiency.
- Installed energy efficient (IE2) condenser pumps to reduce electrical loads.

Title of Project	Annual Electrical Saving (kWh)	Annual Electrical Cost Saving (Rs million)	Investment Made (Rs million)	Payback (Months)
Operating new energy efficient chiller 450TR by switching off old 300 TR chiller	1,58,752	1.27	7	67



450 TR WATER COOLED SCREW CHILLER

Auto Tube Cleaning System

Energy savings by installing 350 TR water cool chiller

INDIAN IMMUNOLOGICALS LIMITED

- Installed Freon 134A refrigerant based 350 TR screw chiller with VFD in place of Ammonia based refrigerant chiller (250 + 150TR).
- Ammonia is a carcinogenic in nature requires additional maintenance & storage.
- Freon 134A is a non carcinogenic refrigerant , copper is used as transfer medium , low in maintenance and compact in design.

350 TR WATER COOLED SCREW CHILLER

Title of Project	Annual Electrical Saving (kWh)	Annual Electrical Cost Saving (Rs million)	Investment Made (Rs million)	Payback (Months)
Operating new energy efficient chiller 350TR by switching off old 250TR & 150 TR chillers	4,20,480	3.36	7	25

Energy savings from plate heat exchanger.

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- Installed a Plate Heat Exchanger at boiler feed water line to pre heat the feed water by using the raw steam as heat exchange medium to reduce fuel burning cost.
- **Feed water temperature & HSD oil consumption without Heat Exchanger**

Feed water Temperature (°C)	HSD oil consumption (KL) / day	Steam Generated / day
55	6.8	96 Tons

- **Feed water temperature & HSD oil consumption with Heat Exchanger**

Feed water Temperature (°C)	HSD oil consumption (KL) / day	Steam Generated / day
81	6.3	98 Tons

- Initial investment made of 0.1 million.
- ROI-2.22 months.

Plate Heat Exchanger installed at boiler feed water line

Energy savings by installing energy efficient pumps in refrigeration plant

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- Replaced old pumps with new energy efficient pumps (IE3) in refrigeration plant
- Initial investment made of 1.2 million.
- Running with old pumps Condenser pumps 2Nos,Primary Pump 1Nos,Secondary pump 1 Nos

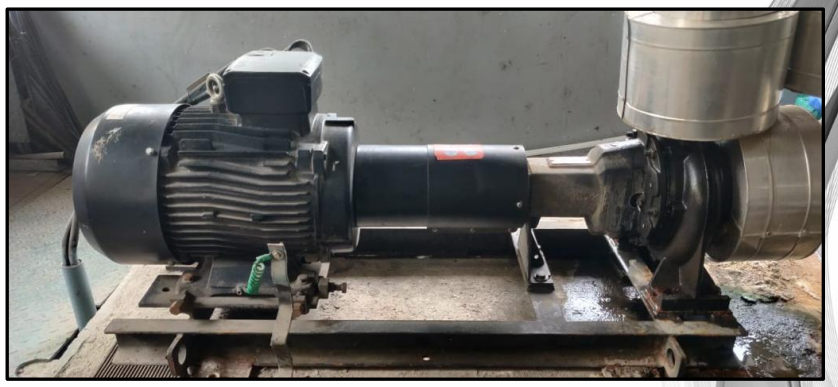
Pumps running hours/year	Pumps KWH/year	Pumps Power cost million/year
2,920	2,57,456	21.67

- Running with new Energy Efficiency condenser pumps 2 Nos, Primary Pump 1 Nos, Secondary pump1 Nos

Pumps running hours/year	Pumps KWH/year	Pumps Power cost million/year
2,920	1,96,545	16.54

- ROI- 23 months.
- Ataining min of 20 % energy saving .

REPLACED CONDENSOR PUMPS WITH ENERGY EFFICIENT MOTORS.



REPLACED PRIMARY & SECONDARY PUMPS WITH ENERGY EFFICIENT MOTORS.

GHG Emissions

INDIAN IMMUNOLOGICALS LIMITED

Year	Scope 1 emissions (tCO2e)	Scope 2 Emissions (tCO2e)	Total GHG Emissions (tCO2e)
2020-21	5,782	18,794	24,576
2021-22	6,067	22,143	28,209
2022-23	5,412	25,089	30,501

60% of our site being maintained with green belt.
CSR we are in with GO Green Cuttack programe .

Corporate Social Responsibility

INDIAN IMMUNOLOGICALS LIMITED

IIL donates oxygen generation plant to TIMS, GachibowliIIL had facilitated the setup of an oxygen generation plant at Telangana Institute of Medical Sciences (TIMS), Gachibowli. The cost of the plant is Rs 1 crore.

IIL for Fight Against Corona

The pandemic of COVID-19 has posed serious challenges on the health and economic security of millions of people in India & worldwide. During these testing times, IIL joined hands with the nation in fighting against CORONA VIRUS. IIL and its staff had contributed a sum of Rs.2 Crores and Rs.33 Lakhs towards 'PM CARES' fund. IIL and its staff are proud to extend support and stand in solidarity with the nation in every aspect possible.

Gift Milk Program in coordination with NDDB Foundation for Nutrition (NFN)

In support of Gift Milk Programme of NDDB Foundation for Nutrition, IIL is providing additional nutritional supplementation to school children. Under this scheme, fortified flavoured milk is distributed to the students in Govt. schools adopted by IIL. Over 2500 school going children from Telangana and Tamil Nadu are benefitted through this activity.

Operation Gouraksha

Under Operation Gouraksha, IIL provides deworming and vaccination to cattle in nearly 115 goushalas with a population of 90000 destitute animals spreading across 12 states.

Corporate Social Responsibility

INDIAN IMMUNOLOGICALS LIMITED

❑ **Project Calf Health & Nutrition Programme (CHANP)**

Project CHANP is initiated by IIL with the aim of providing health and nutrition supplementation (mineral mixture fortified with vitamins) for a year to 500 selected female calves in the age group of 1 to 1.5 years in the goushalas.

❑ **Adoption of Government Schools**

Most of the Government Schools in India have been neglected, ignored and poorly maintained. These factors discourage the children from joining the school, thereby depriving children of their Right to Education. Keeping this in view, IIL has adopted two Government Schools in the vicinity of its Karakapatla facility in Hyderabad, Telangana. IIL is providing infrastructure and basic facilities including support in the mid-day meal programme. As a result of IIL's intervention, the strength of the children in the adopted schools have been doubled within a few years. The schools have also won awards at the district level.

❑ **Support for Stray Animal Welfare – Utkarsh Global Foundation**

IIL extended support to Utkarsh Global Foundation, Pune, an NGO involved in the welfare of stray animals by providing food, medical attendance, and adoption. IIL is providing support by providing the Antirabies vaccine - 6000 doses and multicomponent vaccine - 3000 doses per annum to give protection against deadly diseases.

❑ **Project "GO Green"– Cuttack**

Pilot Project for Manure Management, known as Project Go GREEN is planned in the areas of OMFED, Cuttack, Odisha. The aim of the project is to enhance the earning potential of Dairy Farmers. and is expected to benefit approximately 100 dairy households with 2 to 5 cattle. Upon successful completion of this Pilot Project, IIL wishes to increase the scope of Project "Go Green" to other areas of Odisha / other states of India.

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Thank You