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MEDICAL CENTRE & HOSPITALS PVT LTD

COIMBATORE, TAMILNADU, INDIA

CII National Award for Excellence in Energy Management 2022

The hospital is a "State- of -the Art" Orthopaedic Trauma & Plastic Surgery unit catering to a huge population of the western zone of Tamilnadu, adjoining states and also complex trauma are referred from remote frontiers of India and other countries like Bangladesh, Nepal, Maldives,South africa etc.

OVERVIEW OF INFRASTRUCTURE	
Built up Area	48565sq.mt
No. of Beds	650
No. of OTs	38
ICU/HDU	35

The services provided by GMCH are

- Department of Plastic, Hand and Micro Surgery
- Department of Trauma, Orthopaedics and Spine Surgery
- Department of Burns Surgery
- Department of Facio Maxillary Surgery
- Department of Neuro Surgery
- Department of Radiology and Imaging
- Department of Physiotherapy
- Bone Bank , Ganga Skin Bank
- 24 Hours Blood Bank, Laboratory, Pharmacy
- 24 Hours Emergency Services-
- 24 Hours Ambulance Services
- Dietary

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HOSPITAL MILESTONES

1978	1991-2000	2000-2010	2010-2020	2020 to current
Ganga Nursing home	1991- inauguration of speciality center 1996- academic programs	2007- Shift to the new facility (420 beds) 2010 - Ganga Institute of Health sciences	2012 -NABH 2017-NABL 2019- TECA AWARD 2020 - IMCRBNQ 2020- APQO	2021 - B BLOCK EXPANSION 2021- CII AWARDS

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General outline - Electrical

SOURCE OF SUPPLY : TANGEDCO, TAMILNADU

INCOMING SUPPLY :
11 KV

SANCTIONED DEMAND :
1775 KVA

CAPACITY

Transformer capacity :
2500 KVA & 800 KVA(Standby)

Generator capacity -

2850 KVA

UPS

310 KVA FOR BACKUP DURING POWER CUT

RENEWABLE ENERGY SOURCES (WEG)

- **3.25 MW**

(1.25 MW x 2 No.s & 0.75 MW)

- **20 KW x 2 No.s**

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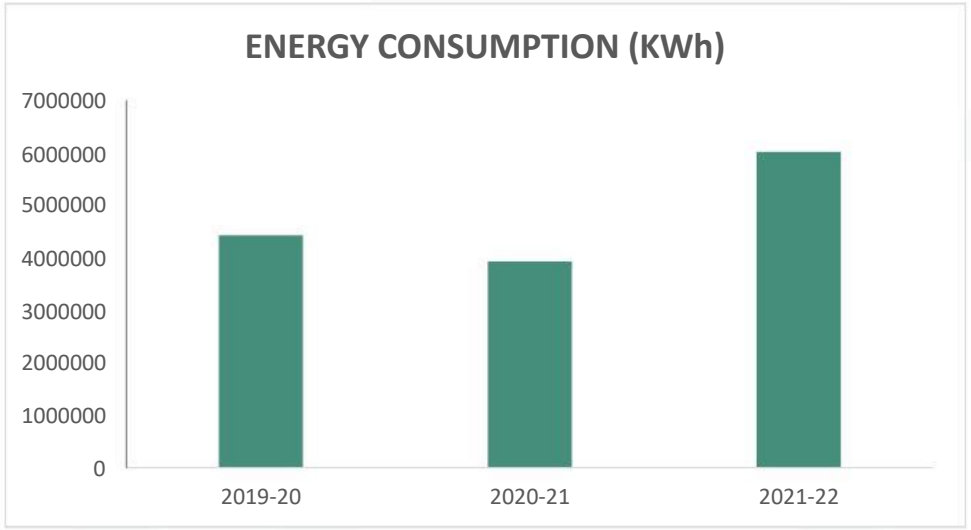
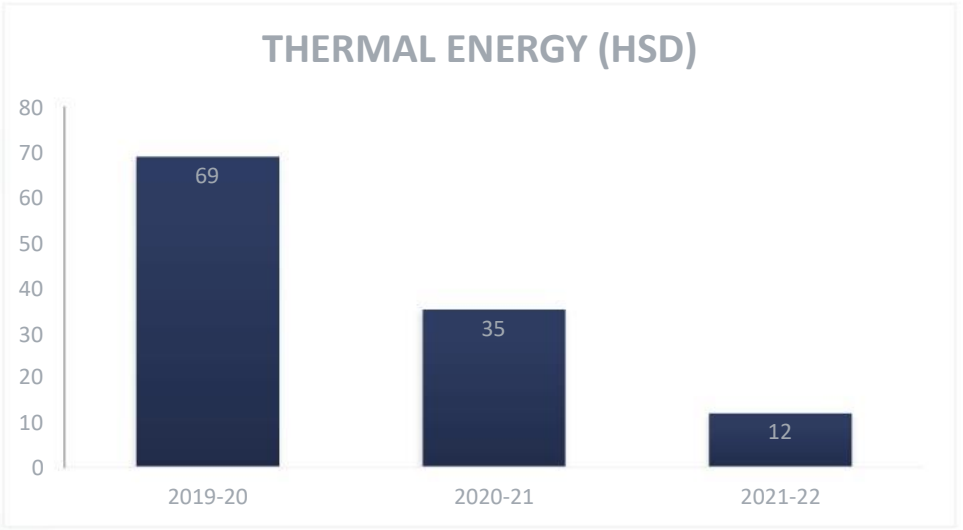
ENERGY CONSUMPTION - OVERVIEW





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ENERGY CONSUMPTION OVERVIEW (SEC/EPI)

Energy Consumption Overview (SEC / EPI)

Parameter	2019 - 20	2020 - 21	2021 - 22
KWH	4430172	3928366	6021129
Built up Area in Sq.Mtr	24128	24128	48565
No.of Beds	500	500	650
Average Occupancy	80%	80%	80%
SEC in KWH / Sq.Mtr	**184**	**163**	**124**
KWH / Bed	**8860**	**7857**	**9263**

Note : Area increases due to expansion & renovation of hospital buildings.

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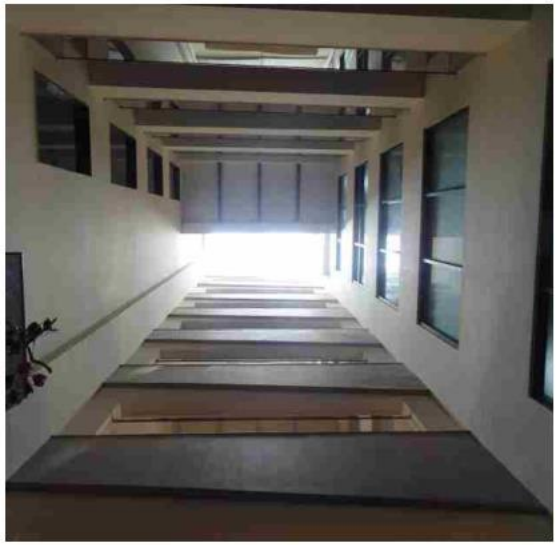
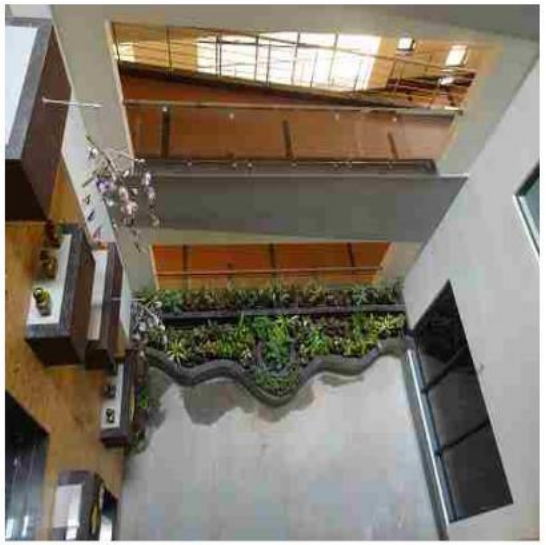
ENERGY CONSUMPTION OVERVIEW
(ARCHITECTURAL FEATURES – NATURAL LIGHTING)





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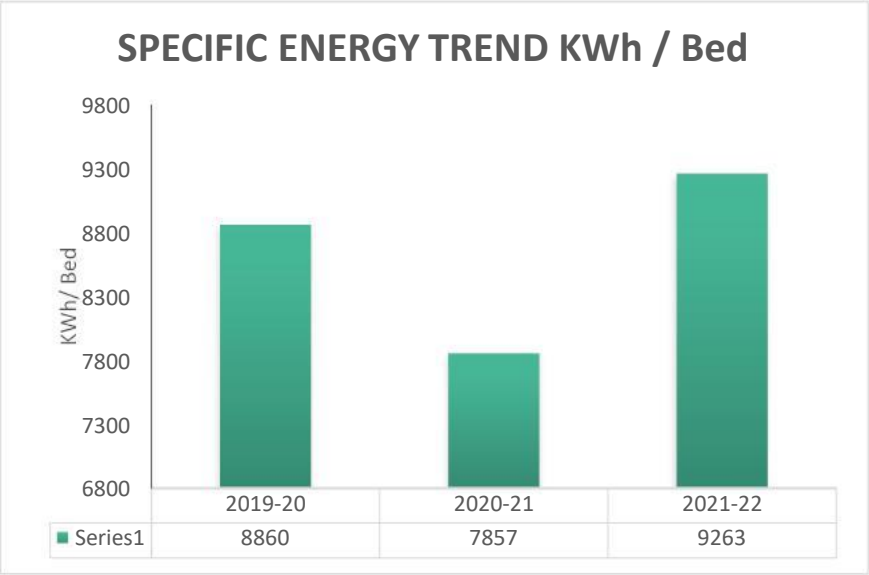
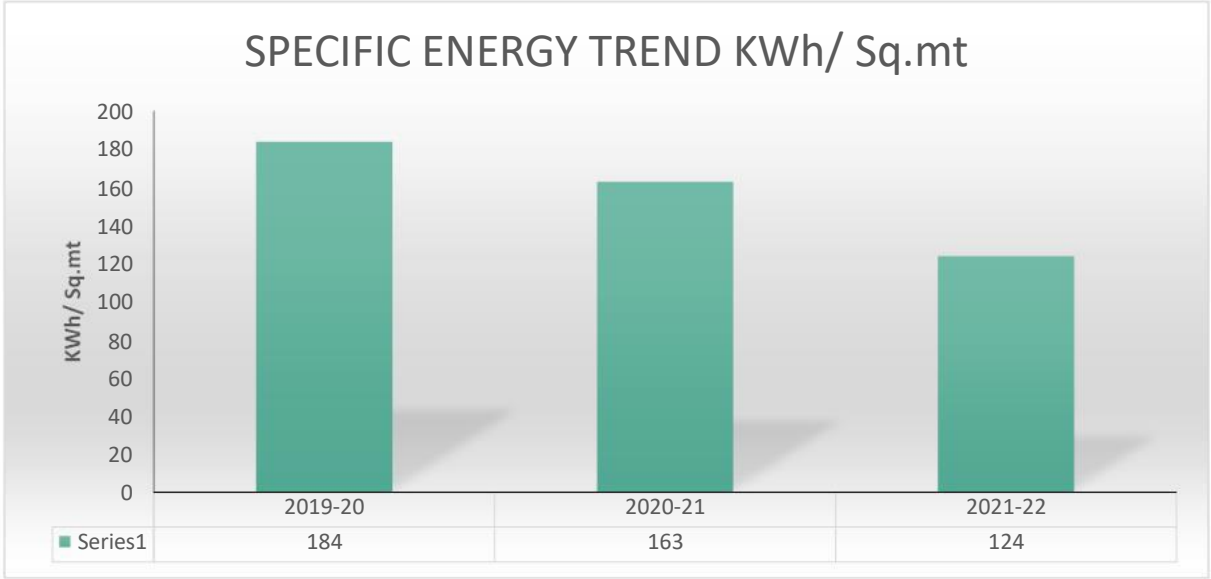
SPECIFIC ENERGY TREND





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BENCHMARK

National Benchmark

Bench Mark 2021 - 22		
Top 5 Hospitals	KWH / Sq.Mtr / Year	KWH / Bed / Year
Competitor 1	102	11508
GANGA HOSPITAL	**124**	**9263**
Competitor 2	181	
Competitor 3	204	
National Benchmark	200	

International Benchmark

Bench Mark 2021 - 22		
Top 5 Hospitals	KWH / Sq.Mtr / Year	KWH / Bed / Year
Competitor 1	205	
GANGA HOSPITAL	**124**	**9263**
Competitor 2	225	
Competitor 3	263	
International Benchmark	205	

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MONITORING OF DEPARTMENT WISE POWER CONSUMPTION - ONLINE EMS

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HVAC MONITORING AND CONTROL

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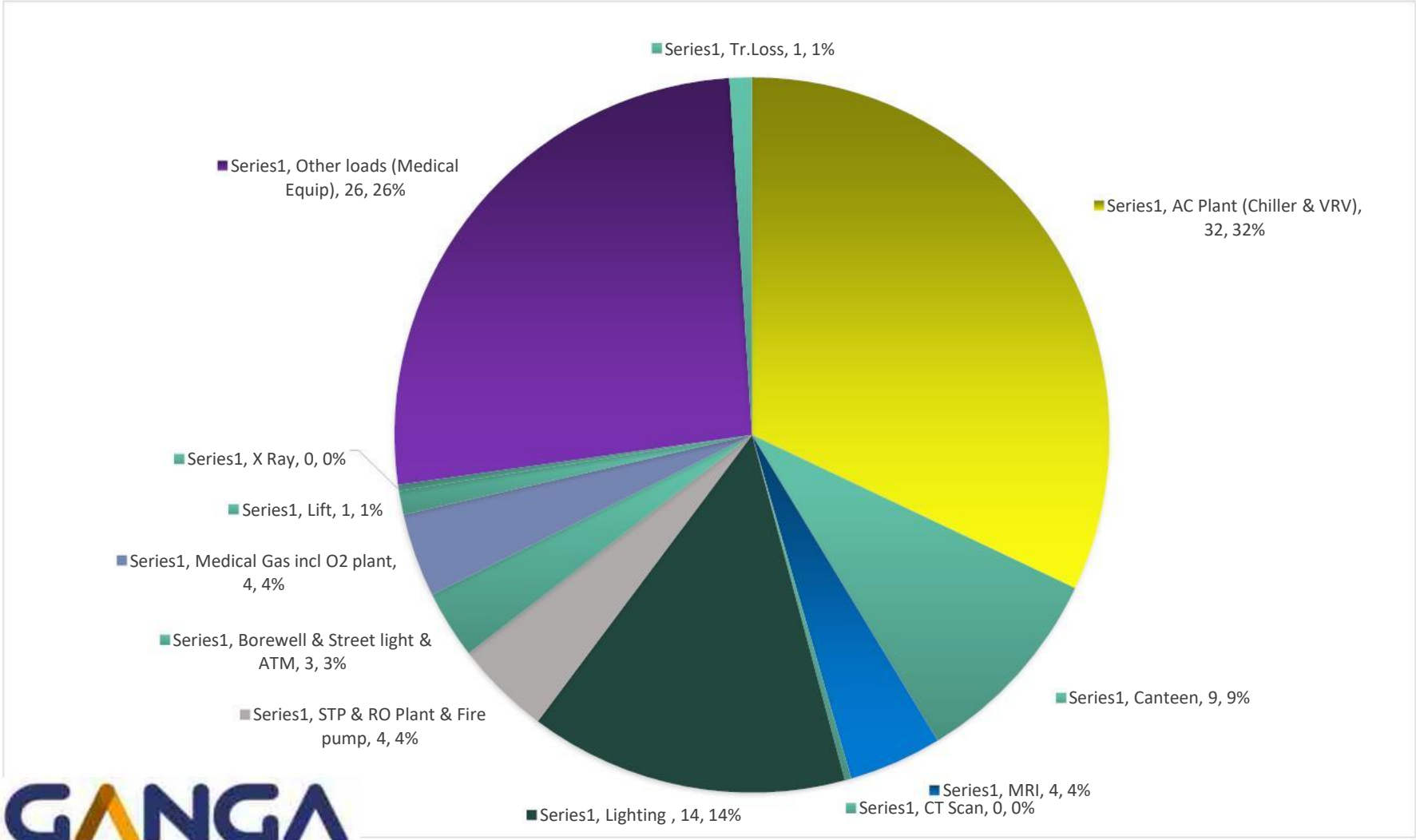
ELECTRICAL LOAD DISTRIBUTION



Electrical Load Distribution	
AC Plant (Chiller & VRV)	32
Canteen	9
MRI	4.2
CT Scan	0
Lighting	14
STP & RO Plant & Fire pump	4
Borewell & Street light & ATM	3.1
Medical Gas incl O2 plant	3.8
Lift	1.1
X Ray	0.3
Other loads (Medical Equip)	26.2
Tr.Loss	1

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Energy Savings / Cost Reduction Proposals for the year 2021 - 23

S.No	Block	Department	Energy Conservation Proposals	Quantity	Expected Units Savings		Expected Amount Savings		Approx. Amount Spent in Rs.	Payback period in Months	Remarks
					Per Day	Per Month	Per Day	Per Month			
1	A	A/C Plant	Replacement of Conventional AHU's with VFD operated AHU's (or) AHU motor & blower over hauling	9	70	2100	3988	119640	450000	4	We noticed 9 AHU's taken higher current above 100%
2	A	Plumbing	Electrical operated heat pump in the place of hot water boiler & individual water heaters in AAA rooms (18 rooms). (1200 ltrs HSD consumed per month)	1	54	1620	4054	121608	2400000	20	Completed
3	A	Electrical	IE4 motors for Cooling tower motors , STP blowers & canteen blowers (or) Cooling tower motor & other blowers servicing	4	25	750	210	6300	350000	56	
4	A	Electrical	Centralised UPS for OT's and other loads,since the existing UPS consumes more power for charging and discharging and also needs for battery replacement.	4	204	6120	3849	115470	2500000	22	Eaton Make UPS
5	A	Electrical	Replacement of 28W BLDC (Brush Less Direct Current) fan in the place of normal 55W fan.	100	65	1944	544	16330	270000	17	Atomberg or Havells make BLDC fan Rs.2700/-
6	A	Electrical	Solar panels in car parking (Near ATM 30 KW panel & opp to Canteen 20 KW panel)	2	170	5100	1428	42840	2200000	51	Veast Solar
7	B	Electrical	Solar for lightings in B Block 2nd floor terrace (25 KW panel)	1	85	2550	714	21420	1100000	51	
8	B	Electrical	Additional Maximun Demand 200 KVA to be obtained form TNEB, to avoid penalty (from 500 KVA to 700 KVA)	-	-	-	-	70000			Completed
9	B	Electrical	Online Energy Monitoring system to be connected in all panel feeders.	60	200	6000	1680	50400	300000	6	
			Total	-	873	26184	16467	564008	9570000	-	-

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Encon Projects Implemented 2019-20 to 2021-22

Year	No.of Energy savings Projects	Investments (INR million)	KWH Savings (million KWH)	Thermal Savings (million Kcal / MTOE)	Savings (INR million)	Impact on SEC - Electrical
2019 - 20	3	0.34	0.14	0	0.03	6
2020 - 21	13	0.4	0.3	0	0.4	13
2021 - 22	3	0.8	0.34	0	0.43	13

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ENCON PROJECTS 2021 - 22

Centralised UPS instead of multiple UPS connected.

Installing heat water pump by removing of individual room heaters 18 No.s

Replacement of CFL to LED Lightings

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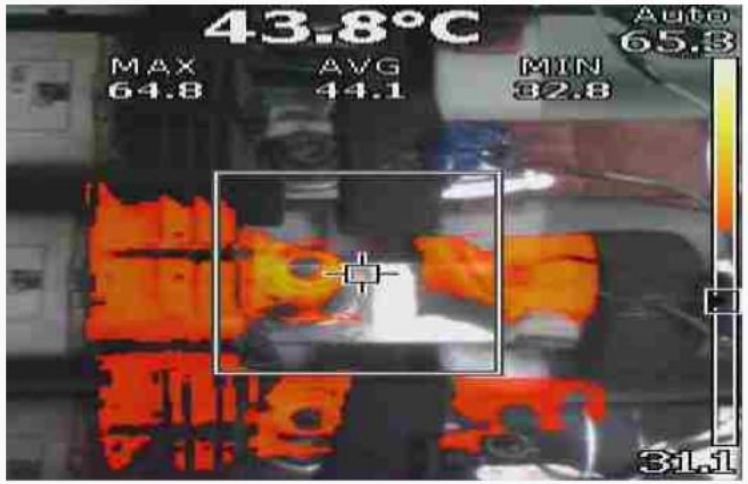
CONTINUAL IMPROVEMENT – THERMOGRAPHY STUDY



By using Thermal Imager – SSB incomer FSU one phase hot spot noticed due to loose connections and temperature goes to 65 deg in 'Y'phase. After attending the loose connections , temperature reduced to 43 deg.

By using Thermal Imager – 20 KVA UPS back side hot spot noticed due to Cooling fan temperature goes to above 100 deg. After replacing the cooling fan , temperature reduced to 40 deg.

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CONTINUAL IMPROVEMENT – ELECTRICAL AUDIT

Transformer and transformer bus duct corossion formed - cleaned and repainted

SSB - cleaned and repainted

All earth pits SS bolt and nuts fixed for better earthing

Identification stickers pasted for switches, regulators, fans & light fixtures.

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RENEWABLE ENERGY SOURCES- WEG

			
MAKE	PIONEER WINCON	SUZLON	SUZLON
CAPACITY	0.75MW	1.25 MW	1.25 MW
TOWER TYPE	LATTICE	TUBULAR	TUBULAR
LOCATION	TIRUNELVELI	TIRUNELVELI	PALLADAM
YEAR	2020	2010	2012

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RENEWABLE ENERGY SOURCES -WEG

Renewable Energy Sources (WEG)						
Year	Technology (Electrical)	Type of Energy	On site / Off site	Installed capacity (MW)	Generation (million KWH)	% of overall electrical energy
2019 - 20	WEG	RENEWABLE	Off site	2.5	2.96	62
2020 - 21	WEG	RENEWABLE	Off site	3.25	2.99	79
2021 - 22	WEG	RENEWABLE	Off site	3.25	4.43	75
Savings in Power cost due to WEG	**2019 - 20**		**2020 - 21**		**2021 - 22**	
	44%		**51%**		**59%**	

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RENEWABLE ENERGY SOURCES - SOLAR

Year	Technology (Electrical)	Type of Energy	On site / Off site	Installed capacity (MW)	Generation (million KWH)	% of overall electrical energy
2019 - 20	PV - Rooftop	Solar	On site	0.05	0.02	1
2020 - 21	PV - Rooftop	Solar	On site	0.05	0.02	1
2021 - 22	PV - Rooftop	Solar	On site	0.05	0.02	1

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CO2 EMISSION REDUCTION

Parameter	2019 - 20			2020 - 21			2021 - 22		
	Units Savings	Amount Savings in Rs.	CO2 Reduction (MT)	Units Savings	Amount Savings in Rs.	CO2 Reduction (MT)	Units Savings	Amount Savings in Rs.	CO2 Reduction (MT)
Solar Generation Roof top	**22300**	**133800**	**19**	**21598**	**129588**	**18**	**22454**	**133601**	**19**
Wind Energy Generator	**2967841**	**18017774**	**2523**	**2990759**	**17417662**	**2542**	**4426700**	**26604467**	**3763**
Total	**2990141**	**18151574**	**2542**	**3012357**	**17547250**	**2561**	**4449154**	**26738068**	**3782**

0.85 Kgs CO2 per kwh

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CO2 EMISSION REDUCTION – BATTERY OPERATED AMBULANCE

FUEL SAVINGS / YEAR -

350 LTRS PETROL

COST SAVINGS / YEAR - Rs.37000/-

CO2 REDUCTION / YEAR –

1 MT

(2.3 KG/ 1LTR)

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WASTE MANAGEMENT

Food Waste Management

2.5 ton per month manure for vegetable farm

Sewage treatment plant

Sewage is pretreated before its let to environment

Treated water used for gardening

Bio- Medical Waste Management

Stringent protocols on segregation, Handling and final disposal of BMW.

Anesthesia Gas Scavenging system

Nerve blocks technique is used to reduce release of Green house gases

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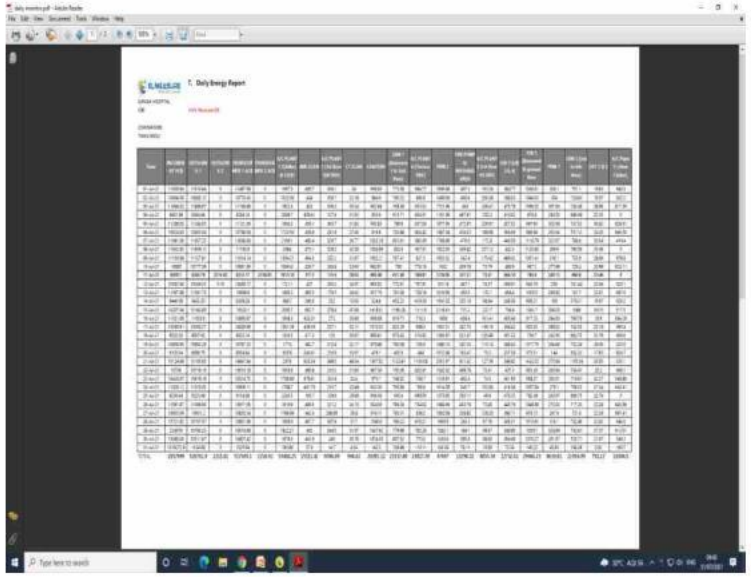
TEAM WORK & MONITORING

AWARENESS PROGRAMME FOR ENERGY CONSERVATION FOR ALL CATEGORIES OF STAFF – INCLUDED IN THE HOSPITAL INDUCTION - ORIENTATION



ONLINE EMS MONITORING – DAILY DEPARTMENT WISE POWER CONSUMPTION DISCUSSED IN DAILY DEBRIEFINGS

DAILY ELECTRICAL DEPARTMENT MEETING CONDUCTED BY ELECTRICAL HOD , DISCUSSED DAY TO DAY ACTIVITIES , ENERGY CONSERVATION ,DEPT WISE POWER CONSUMPTION ,ETC..

KEY LEARNINGS

"BEST ENERGY CONSERVATION AWARD 2018-19" FROM TECA – TAMILNADU ELECTRICITY CONSUMERS ASSOCIATION

"CII NATIONAL ENERGY MANAGEMENT AWARD 2021 – ENERGY EFFICIENT UNIT

- Knowledge about Best Industry practices
- Current level of performance


Thank
You