kirloskar
Oil Engines

Kirloskar Oil Engines Ltd., Large Engine Plant,
A-11/1, MIDC Ambad, Nashik- 422 010.

Index

“ENERGY PERFORMANCE REPORT”
For the Year 2020-21

Team: 1) Mr. H R Upadhye – Manager Elect. Maintenance
2) Mr. S H Chavan- Dy. Manager Mech. Maintenance

Dear Hon. Assessors,

It gives us immense pleasure to present Energy Performance Report for the year 2020-21

At KOEL Nashik Plant, conservation of energy has been given prime importance in each and every activities and is on priority since many years.
Our product range is varied from higher HP to lower HP. We set our goals, targets & Internal Benchmarks to achieve SEC.
Last few years, our average monthly consumption of electrical units & diesel has shown a downward trend which is the result of our ENCON awareness & efforts for implementation of associated activities. Comparison of the electrical units consumption with total sales figures shows consistent trends.

There is a continuous improvement towards conservation of Energy and Environment throughout the year. Periodic meetings and awareness programs are conducted to minimise the energy consumption.

Various awards & certificates grabbed on this front encouraged us to set new mile stone.

ENCON Team
KOEL, Nashik

Our Products :

- Marine DG set range

  7 KVA To 625KVA

- Defense DG set Range

  2 KVA To 200 KVA

Electrical Data of the Nasik Plant

1. ELECTRICAL ENERGY.		
1	Incoming Electrical Supply From MSEDCL.	11KV
2	Incoming HT,VCB.	630A,350MVA,11KV,CGL
3	Transformer Capacity. (One)	1500KVA,11KV/0.415KV
4	Incoming LT ACB.	3000A, 415V,L&T.
5	Standby Generator Capacity.	500KVA & 400 KVA,0.8 P.F.,KIRLOSKAR GREEN
6	Sanctioned Connected Load.	490KW
7	Sanctioned Contract Demand.	250KVA
8	Average actual Demand. FY 20-21	139 KVA
9	Average Billed Demand. FY 20-21	139 KVA
10	Average Power Factor. FY 20-21	0.993 Lag
11	Annual Electricity Cons'n (MSEDCL) FY 20-21	2,76,626 kVAh
12	Annual Generation On Standby DG Set.	2128 kVAh
13	Cost Of MSEDCL Per Unit. FY 20-21	Rs. 10.74 /-
14	Prompt Payment Discount Availed. FY 20-21	Rs. 26,888/-

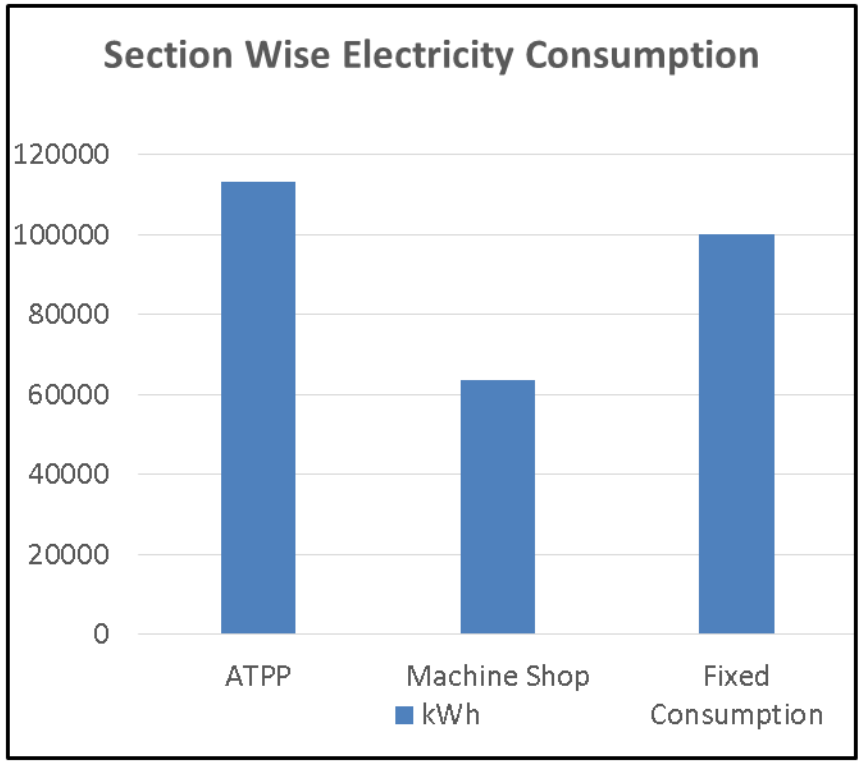
1. Energy consumption- Area specific

Energy Consumption for Production, Office Lighting & New Product Development

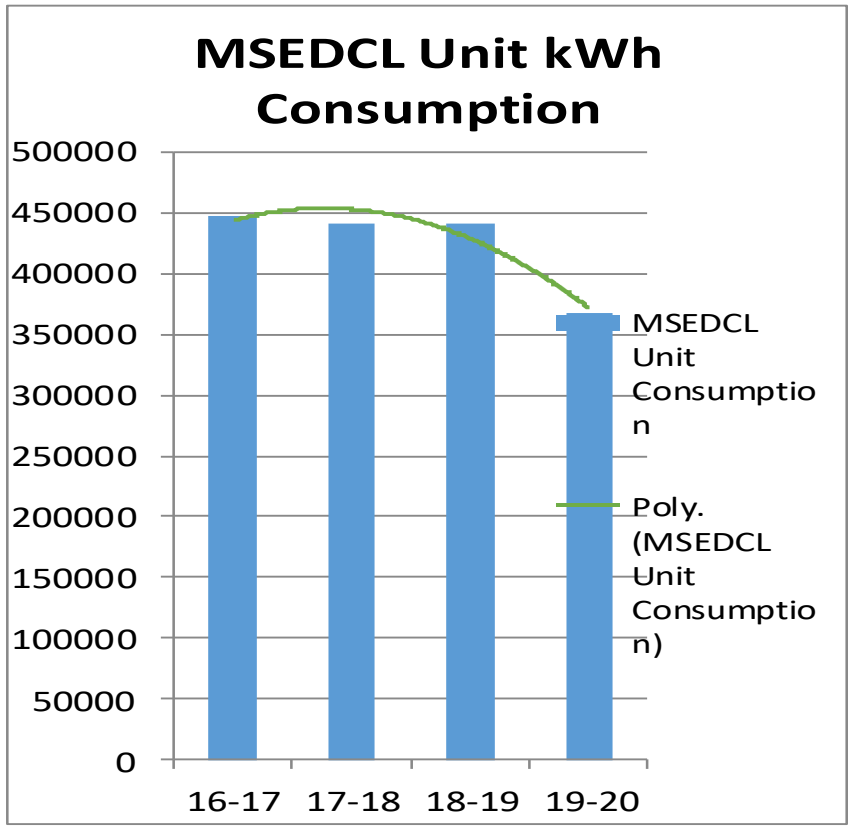
Type of consumption	Unit	FY 20-21		
		Production	Fixed Consumption	Remark
Electrical Energy	kVAh	1,76,626	1,00,000	Fixed consumed for canteen, lighting & Transformer losses .
Diesel	Litre	21,940	16,514	Fixed consumed for Improvement project and utility
Compressed Air	kWh	20,530	--	--
Water	kL	5,247	2,400	Fixed consumption 10 M3 /Day (Eight months) for Plant Gardening .

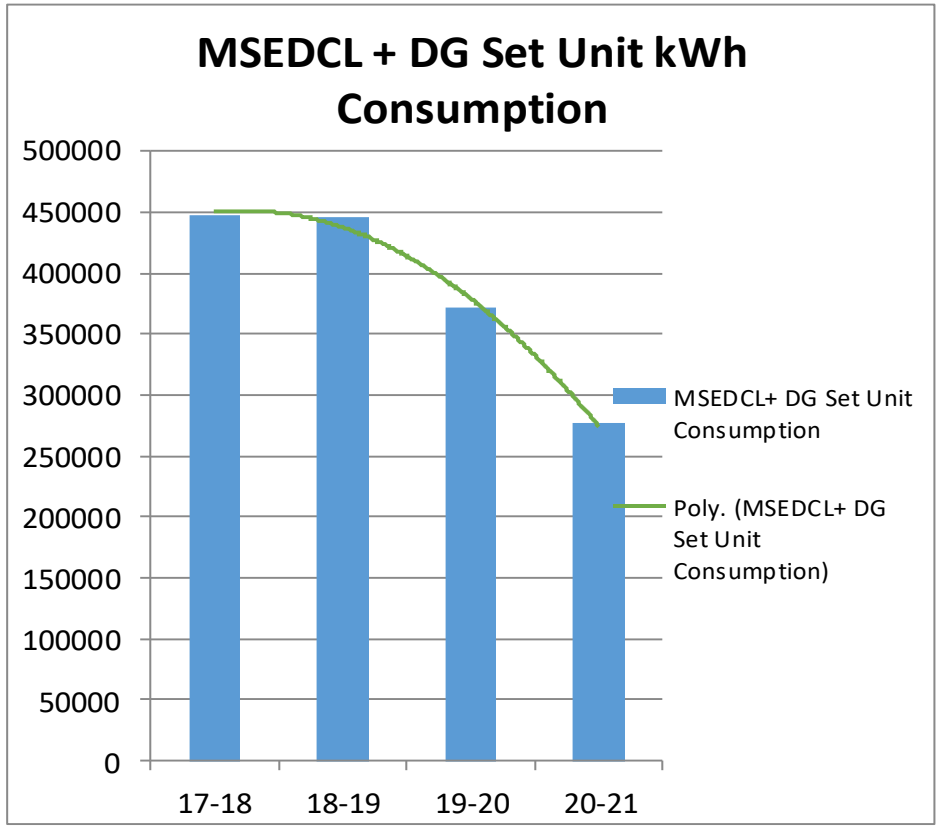
1.Electricity Consumption : Section Wise Monitoring for the year 20-21

Monitoring Area	Consumption (kWh)
ATPP	1,13,041
Machine Shop	63,585
Canteen, Factory premises Lighting , Transformer Losses	1,00,000



1. Unit consumption (MSEDCL & own Generation) for last four years





2. Specific Energy consumption- Production

SEC FY 20-21 & Target for Next FY 21-22

Type of consumption	Unit	Year 20-21		Year 21-22
		Target	Actual	Target
Electrical Energy	kVAh/BHP	7.72	6.07	5.88
Diesel	Ltr./BHP	0.86	0.85	0.82
Compressed Air	kVAh/BHP	0.79	0.79	0.76
Water	kL../BHP	0.20	0.20	0.19

2.Performance for last three years

Types of consumption	Unit	Year 17-18		Year 18-19		Year 19-20		Year 20-21	
		Target	Actual	Target	Actual	Target	Actual	Target	Actual
Power	kWh/BHP	15.39	9.67	9.37	9.21	8.93	7.96	7.72	6.07
Water	kL/BHP	0.36	0.27	0.26	0.26	0.25	0.21	0.20	0.20
Comp. Air	kWh/BHP	0.78	0.69	0.67	0.82	0.79	0.82	0.79	0.79
Diesel	Ltr./BHP	2.63	1.82	1.77	1.75	1.69	0.90	0.86	0.85

3.BENCH MARKING OF ENCON

KOEL LE, Nashik started diversification from large engine to Small & Medium FY-16-21 . Hence we measured all type of consumption & tried to optimize within these five years. So the internal benchmarks for all consumption considered for FY 20-21.

Type of consumption	Unit	Year 20-21
Power	kVAh/BHP	6.07
Water	KL/BHP	0.2
Comp. Air	kVAh/BHP	0.79
Diesel	Ltr./BHP	0.85

4. Savings & Investment for Last Three Years

Sr. No.	Year	ENCON Activities in Nos.	Investment in Rs.	Energy Saved		Saving in Rs.	
				Electrical (kWh)	Thermal (Ltr./BHP)	Electrical	Thermal
1	FY 2020-2021	9	1,57100	26,709	0.85	2,99,386	5,58,600
2	FY 2019-2020	12	1,87,539	24,637	0.2	3,12,642	5,18,700
3	FY 2018-2019	10	1,97,000	23,529	0.04	2,09,405	1,00,800

4. Thermal Saving

4. Activity : Thermal saving by optimization in Data logging time by implementation of SCADA system on DV & SL90 test bed.

- Before , manual system takes 15 Min time for Data logging per hour of all parameter for DV engine validation .
- After SCADA implementation, it is possible & happened only in 3 minute.
- So, Engine running for remaining 12 minutes is saved .
- Considering 570 hrs. testing of DV engine , 6840 minute ie.114 Hrs. saved.
- Hence , Thermal saving is 114 Hrs. * 70 ltr. = 7,980 Ltr.

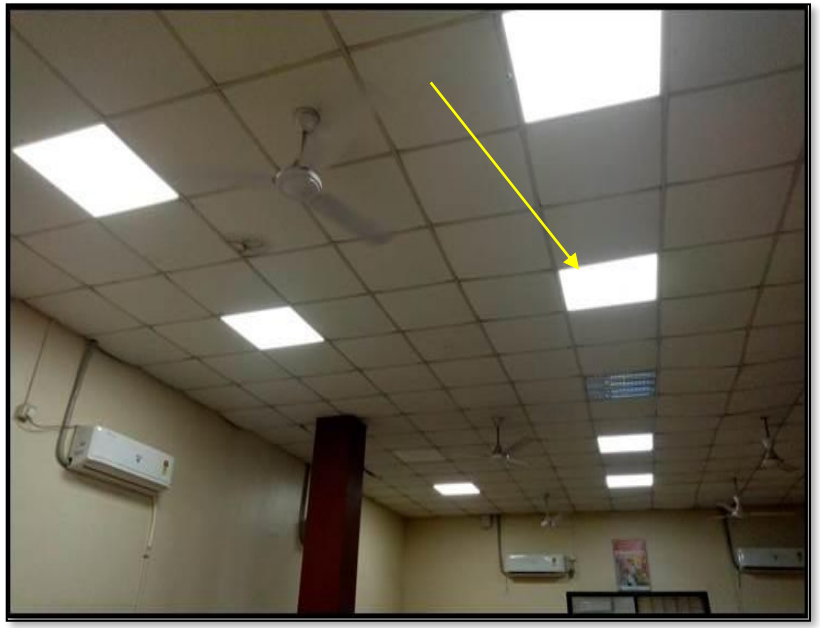
4.Highlights : FY 20-21

ENCON Projects:

SR. NO.	ACTIVITY	Investment in Rs.	Units (kWh) Saved/Year	Saving in Rs./Year	Payback Period in Year
1	Replaced **400W HPMV** with **100 Watt** high bay LED-14 Nos.	84,000	18,396	2,10,450	< 1
2	Replaced tube light of **36*2** with **36W** LED in Purchase section-12Nos	48,000	1892	21,644	2
3	Replacement of store dept. tube fitting of **100W bulb by14 W-** 3 Nos.	1000	1130	12,927	< 1
4	Replacement of office wash room **18W tube light by 10W** tube light- 2 Nos.	500	70	801	< 1
5	Installed tube light of **20W** instead of **40W** - 4nos on Security gate	1000	117	1,388	< 1
6	Replaced **150W MHL** by **70W** led -5Nos	20,000	350	4,004	5
7	Replacement of IT dept. tube fitting of **72W by 20W**- 3Nos	600	683	7,813	< 1
8	Replacement of tube light in IT section **5 X72 by 5X20** watts- 5Nos	1000	1138	13,496	< 1
9	Replacement of tube lights by **8X72 by 5X20 watts** – PE store dept.	1000	2303	27,313	< 1
	Total	**1,57,100**	**26,709**	**2,99,836**	

4.Highlights : FY 20-21

ENCON Projects:



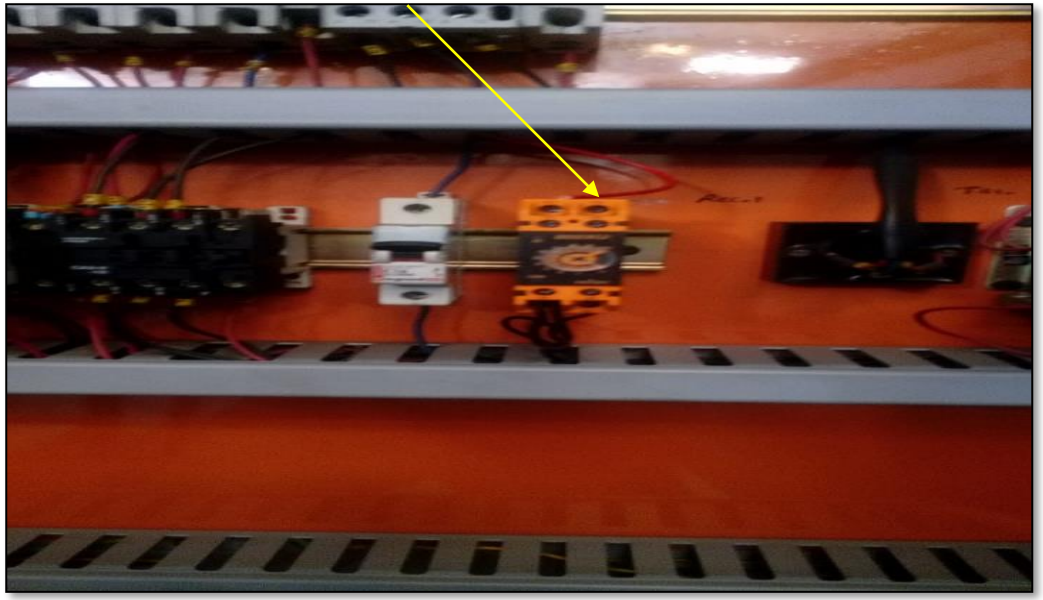
Replacement of 4* 18 W fixture by 36 W LED fixtures (12 Nos.) - Saving ₹ 21,644 /- per Yr.

400 W MHL replaced with 100 W LED (14 Nos) in shop floor Saving - ₹ 2,10,450/- per Yr.

4.Highlights : FY 20-21

ENCON Projects:

Replacement of Rain test Facility 15 HP pump by 12.5 HP submersible pump, Saving of :- Rs. 13,596/-



Installation of Timer in ETP which reduces ON time of 0.74 kW blower and Saving:- ₹ 6,807/- per Yr.

4.Highlights : FY 20-21

WATERCON Projects:

Reuse of ETP processed water for gardening with the help of drip irrigation @ 5-6 KL per day

Installation of water saving sprinkler nozzle for water taps - Saving 300 ml water per use

Note:- Now we are using waterless urinals

5. Renewable Energy Source

1. SOLAR LAMPS IN FACTORY PREMISES. TOTAL 9 NOS. 	2.NATURAL AIR: USE OF TURBO VENTILATORS AND TRANSPARENT SHEETS THROUGHOUT FACTORY ROOF. 
3. DAYLIGHT LIGHT PIPE SYSTEM IN SUB-ASSLY & CE AREA. 	4. SOLAR WATER HEATER IN CANTEEN. 

6. Utilisation of waste material

1) Plastic Waste Management :

KOEL has finalized the Govt. Authorized recycler for Plastic Scrap

KOEL Nashik, plastic waste is @ 50 kg/month

Plastic recycler converts plastic waste into Granules these are used for Road purpose .

2) Zero waste discharge plant:

KOEL, Nashik is a zero waste water discharge plant; with treatment facility for effluent and sewage.

ETP Plant of Capacity 20 m3 /day , all treated water is utilized for Plant Gardening purpose.

Average daily treated effluent is @ 5 m3.

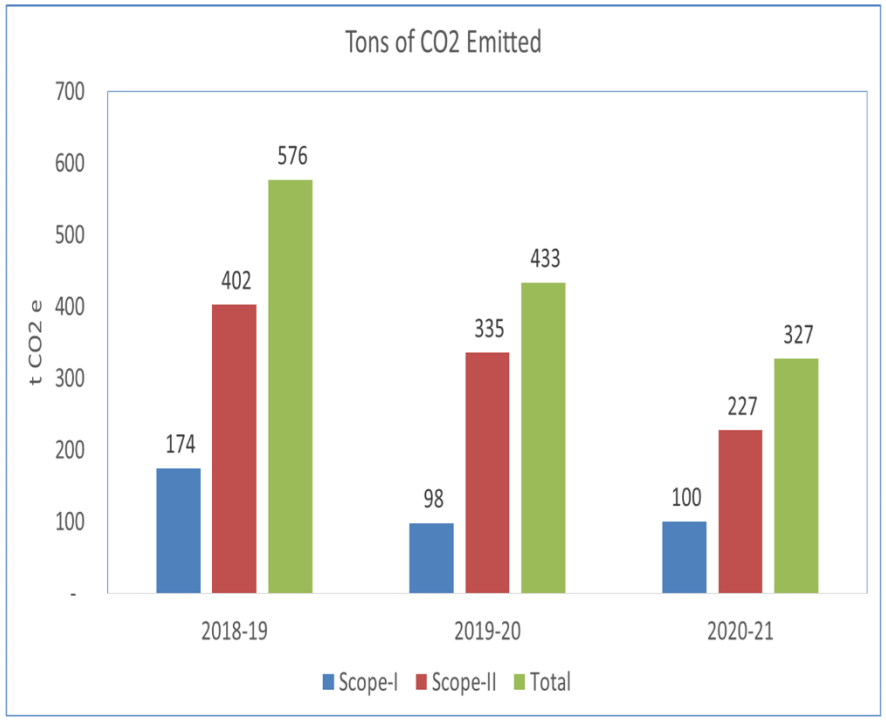
7. GHG Emission

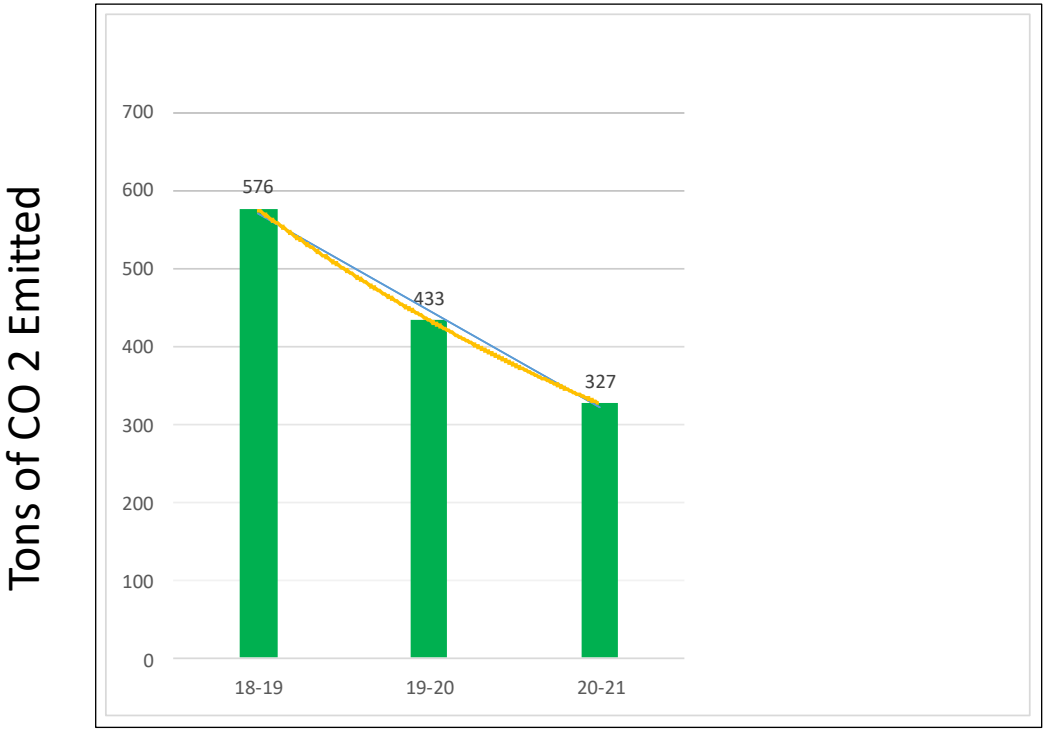
Carbon Foot Print Report Data

Sr. No.	Source	Scope	Unit	Consumption			GHG Emission (tco2)		
				FY18-19	FY19-20	FY20-21	FY18-19	FY19-20	FY20-21
1	HSD	1	kl	66.31	37.25	38.84	174.10	97.80	99.82
2	LPG	1	kg	-	-	-	-	-	-
3	FO	1	kl	-	-	-	-	-	-
4	Compressed Natural Gas (CNG)	1	SCM	-	-	-	-	-	-
5	CO2 for cutting	1	kg	-	-	-	-	-	-
6	CO2 for welding	1	kg	-	-	-	-	-	-
7	CO2 in fire extinguisher	1	kg	-	-	-	-	-	-
	Total Scope 1 =						174	98	100
	Scope 2								
1	Electricity Purchased	2	kWh	440,780	3,67,441	2,76,626	402	335	227
	Total Scope 2 =						402	335	227
	Offset								
1	Electricity Renewable		kWh	-	-	-	-	-	-
2	Biogas		m3	-	-	-	-	-	-
3	Solar		kg of steam	-	-	-	-	-	-

7. GHG Emission

Tons of CO2 emitted		
FY 2018-19	**FY 19-20**	**FY 20-21**
576	433	327





8.Encon efforts at Vendors end

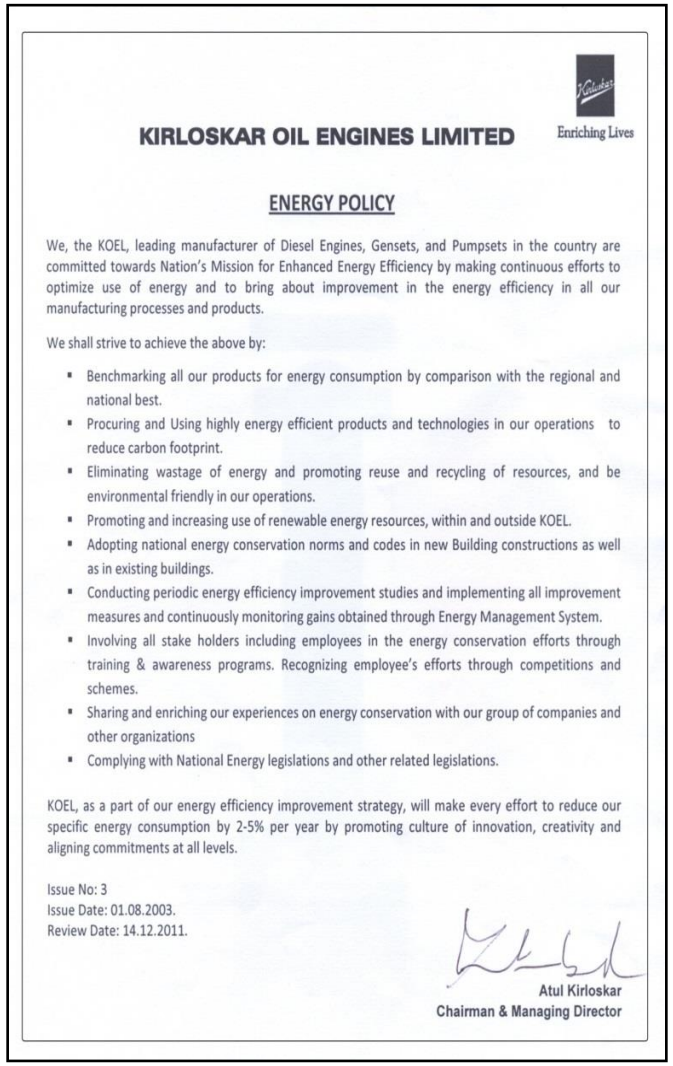
- Following initiatives taken at M/s United Heat Transfer P Ltd. Nashik,

  - Ventilators working on natural draft are fixed on the roof top, which maintains internal temperature & saving electrical energy.

  - Usage of transparent sheet for roofing , reducing consumption of light at shop floor, resulting in saving of electrical energy.

  - All internal lighting are fitted with LED, reducing the power consumption.

9. Energy and IMS policy



KIRLOSKAR OIL ENGINES LIMITED

Enriching Lives

ENERGY POLICY

We, the KOEL, leading manufacturer of Diesel Engines, Gensets, and Pumpsets in the country are committed towards Nation's Mission for Enhanced Energy Efficiency by making continuous efforts to optimize use of energy and to bring about improvement in the energy efficiency in all our manufacturing processes and products.

We shall strive to achieve the above by:

- Benchmarking all our products for energy consumption by comparison with the regional and national best.
- Procuring and Using highly energy efficient products and technologies in our operations to reduce carbon footprint.
- Eliminating wastage of energy and promoting reuse and recycling of resources, and be environmental friendly in our operations.
- Promoting and increasing use of renewable energy resources, within and outside KOEL.
- Adopting national energy conservation norms and codes in new Building constructions as well as in existing buildings.
- Conducting periodic energy efficiency improvement studies and implementing all improvement measures and continuously monitoring gains obtained through Energy Management System.
- Involving all stake holders including employees in the energy conservation efforts through training & awareness programs. Recognizing employee's efforts through competitions and schemes.
- Sharing and enriching our experiences on energy conservation with our group of companies and other organizations
- Complying with National Energy legislations and other related legislations.

KOEL, as a part of our energy efficiency improvement strategy, will make every effort to reduce our specific energy consumption by 2-5% per year by promoting culture of innovation, creativity and aligning commitments at all levels.

Issue No: 3
Issue Date: 01.08.2003.
Review Date: 14.12.2011.

Atul Kirloskar
Chairman & Managing Director

Enriching Lives

KIRLOSKAR OIL ENGINES LIMITED
A Kirloskar Group Company

QEHS POLICY

Quality, Environmental, occupational Health and Safety
We, at Kirloskar Oil Engines Limited (KOEL) are engaged in manufacturing of I.C. Engines, Generating Sets, Pumpsets and Agricultural Farm Equipment.
We strongly believe that it is the duty of everyone working in KOEL to implement this policy in their area of activities.

We are committed to:

- Delight customers through Quality Products & Services complying with all applicable requirements and cost effective research, technology development, manufacturing and sales
- Continually improve the effectiveness of Integrated Management System
- Ensure all applicable EHS legislations are complied to protect environment & health
- Prevent pollution, injuries & ill health due to our activities, products and services
- Collaborate with employees and all stakeholders for protecting Environment, Health & Safety
- Conserve & minimize use of natural resources used for our activities, products and services
- Promote recycling of raw materials and use of renewable energy wherever possible
- Minimize use of hazardous material, chemicals & generation of hazardous waste

We will communicate this policy to all employees & contractors and make it available to public & interested stakeholders on request

30th June 2020

Sanjeev Nimkar
Managing Director & Occupier

9. Energy Conservation Team

Sr. No.	NAME		DESIGNATION / DEPT.
1	Mr. P.A. Joshi	Guide & Mentor	DGM, Plant Head
2	Mr. H. R. Upadhye	Energy Secretary	Manager, P.E & C.E.
3	Mr. S. H. Chavan	Member	Dy. Manager, Plant Engg.
4	Mr. V. M. Kulkarni	Member	Manager, Basic Engg.
5	Mr. P. S. Patil	Member	AGM, A.T.P.P.
6	Mr. G. M. Vadnere	Member	Senior Officer, F&C
7	Mr. R. S. Borse	Member	Dy. Manager, P&A
8	Mr. P.N. Pachkudave	Member	Dy. Manager, Materials
9	Mr. P. M. Kulkarni	Member	Manager, ME
10	Mr. W. T. Patil	Member	Manager, QA
11	Mr. S .Kumar	Member	Team Member, Plant Engg.
12	Mr. N. T. Gharate	Member	Team Member, Production
13	Mr. P. R. Yashod	Member	Team Member, ATPP

9. Energy Measurement Activities

Sr.No.	Activity	Frequency	Responsibility
1	Energy Meter Reading.(MSEDCL) & DB	Daily	Electrician
2	Energy Meter Reading.(ETP)	Daily	Operator
3	Review Of Energy Consumption,P.F.,M.D	Daily	Plant Engg. Manager
4	Review Of Implementation Status (ENCON Projects)	Quarterly	ENCON Team LEBG

9. Summary - Electricity Bill FY 20-21

Sr. No.	Month	Unit Consumption in kVAh	Avg . P.F.	Billed Demand	Bill in Rs.	Prompt Payment Discount
1	April	9679	0.987	140	38150	968
2	May	19051	0.993	140	152660	1,905
3	June	24384	0.993	140	198540	2,438
4	July	22800	0.992	138	316410	2,280
5	Aug	22039	0.992	138	306920	2,203
6	Sept	21524	0.992	138	302110	2,152
7	Oct	26409	0.993	138	272310	2,641
8	Nov	22289	0.993	148	243730	2,229
9	Dec	21282	0.99	138	231080	2122
10	Jan	26107	0.99	138	278550	2122
11	Feb	27992	0.987	138	295080	2719
12	Mar	33070	0.989	138	337580	3109

Avg. Electricity unit kWh consumption per month : 23,052 kVAh

9. Awareness Programs

- Display of Energy Policy at various locations
- Display of Newspaper articles per month , Photos, Presentation etc.
- Sharing of Energy conservation bulletin to KOEL managers on mail per month.
- Awareness among department employees by ENCON Team members.
- Display of Energy Conservation information stickers at appropriate places.
- Competition of Energy Conservation slogans and posters at LE, Nashik.
- Competition of Energy Conservation slogans, posters, poems & projects at K Group level.
- Celebration of National Energy Conservation Day and Week(14th Dec. and 14th to 20th Dec.)
- Distribution of LED Emergency Lamp to ENCON Competition participants- 35 Nos
- In house lectures by prominent speakers to all employees.

9. Awareness Programs

Celebration of “Energy Conservation Day & Week” Program details

- Oath Ceremony: Factory Manager delivered the ENCON oath to all employees.
- ‘ENCON WEEK’ display board by team members at the gate.
- ENCON prizes based on ENCON theme such as LED Emergency lamp given to ENCON competition winners.(35Nos)

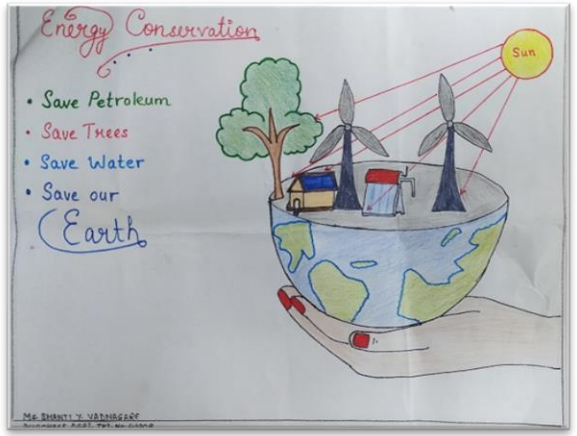
Oath Ceremony

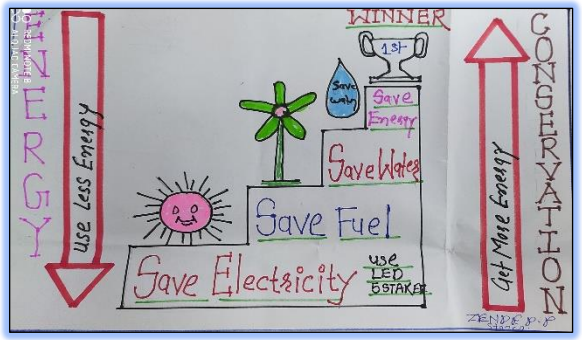
ENCON Week Banner on Main Gate

9. Awareness Programs

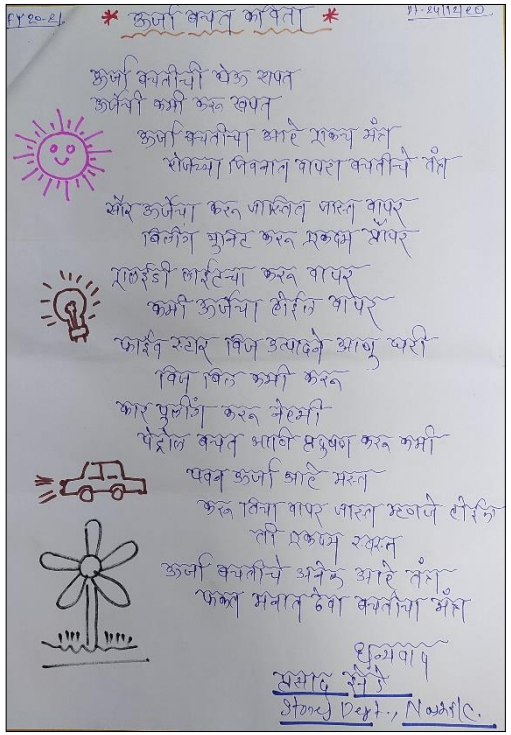
Competition held for employees - Slogans, Posters, Poems, Projects, Employees participated in the competition , following are some of the examples:

Poster

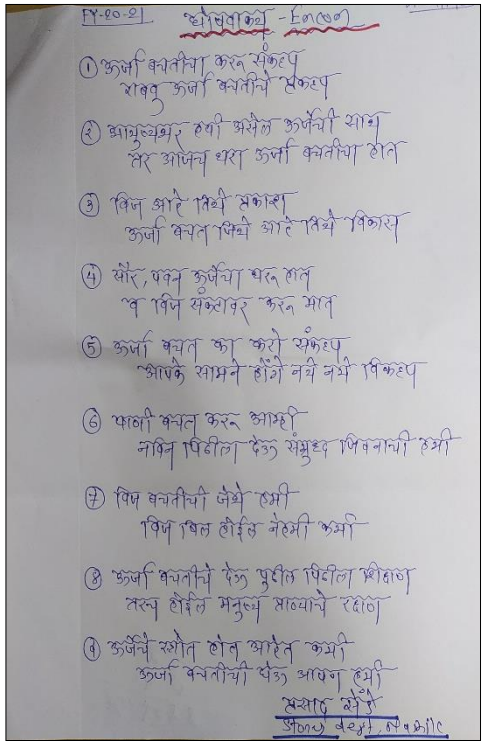




Poem



Slogan



9. Information sharing

- Sharing of information via E-Mails among employees.
- Circulations of Magazine, Brochure, Leaflets of trainings attended.
- Access of BEE and MEDA web site – www.energymanager.com,www.mahaurja.com
- Information from agencies like Technocrats etc.
- Information sharing within K group companies and others.
- Visit to various sites where ENCON projects implemented successfully , ENCON Team visited to near by companies such as Crompton Greeves, Bosch , Unitech , Siemens etc .

10. Green- Co Team - Nashik

Green Co Forum, 29th August 2019: 1500 hrs. – 1700 hrs.

Thermax Limited, Thermax Learning Centre, Chinchwad Plant- Meeting attended for overall inputs

Sr. No.	NAME		DESIGNATION / DEPT.	Performance parameter
1	Mr. Pareshkumar Joshi	Guide & Mentor	DGM, Plant Head	
2	Mr. H. R. Upadhye	Green-c0Secretary	Manager, P.E & C.E.	Energy Efficiency /Renewable Energy
3	Mr. S. H. Chavan	Member	Dy. Manager, Plant Engg.	Water Conservation /Greenhouse Gas Emission
5	Mr. P. P. Zende	Member	Dy Manager , Stores	Material Conservation, Recycling and Recyclability
6	Mr. V. M. Kulkarni	Member	Manager, Product Engg.	Innovation for Environment
7	Mr. P. S. Patil	Member	Sr. Manager, ATPP	Product Stewardship & Life Cycle Aspects
8	Mr. G. M. Vadnere	Member	Senior Officer, Finance	Financer
9	Mr. B R Borse	Member	Dy Manager, P&A	Green Infrastructure & Ecology
10	Mr. A. P. Patil	Member	Sr. Manager, Sourcing	Green Supply Chain
11	Mr. P. M. Kulkarni	Member	Manager, ME and Production	Product Stewardship & Life Cycle Aspects
12	Mr. W. T. Patil	Member	Manager, QA	Innovation for Environment
13	Mr. S .Kumar	Member	Team Member, Plant Engg.	Practical Implementation &monitoring
14	Mr. N. T. Gharate	Member	Team Member, Production	Practical Implementation &monitoring
15	Mr. P. R. Yashod	Member	Team Member, ATPP	Practical Implementation &monitoring

11. ADOPTION OF NEW/ ENERGY EFFICIENT TECHNOLOGY

Theme : To reduce the cycle time of machining of integral cooler cover from Mazak machine(79.68kWh) to Hyundai (32kWh) machine.

Machine : Hyundai HMC **Area : Machine Shop**

Present Status :
1. Machine of integral cooler cover machining on Mazak CNC machine
2. Cycle time of integral cooler cover machining on Mazak machine is 572 minutes.
3. Power rating of Mazak machine is 79.68 kWh
4. Energy required on Mazak machine for IC cover is 473.94 kWh
5. Energy cost of IC cover on Mazak machine is Rs. 4218.13“.

Countermeasures :
1. Machine of integral cooler cover machining on Hyundai CNC machine
2. Cycle time of integral cooler cover machining on Hyundai machine is 575 minutes.
3. Power rating of Hyundai machine is 32 kWh
4. Energy required on Hyundai machine for IC cover is 306.56 kWh
5. Energy cost of IC cover on Hyundai machine is Rs. 2728.38“

Benefits :
Total Yearly Saving in kWh =6,862
Total Yearly Saving in Rs = 61,079

Team: Mr. R.L. Buwa , Mr. P.N. Bodake

11. New energy saving Equipments and Devices

- LED Indicators – On Panels.
- Star Rated Air conditioners – In offices, test bench etc.
- Energy Efficient Motors – On rotary & dunking washing machines.
- VFD Drives – On cranes & machines.
- Solar Water Heater at staff quarters & in canteen.
- Battery Operated Stackers.
- Automatic Power Factor Controller.
- Thyrolux Welding Machine.
- Welding Fume Extractor.
- Electrical Actuator - On fluid valve.
- Oil Skimmer – On CNC machines.
- Ultrasonic Sensors – On pump controlling system.
- Turbo Ventilators – On roof sheets.
- Air-Co Saver for Air Conditioner
- Motion Sensor for offices & Washrooms
- LED Lamps in shops, street light

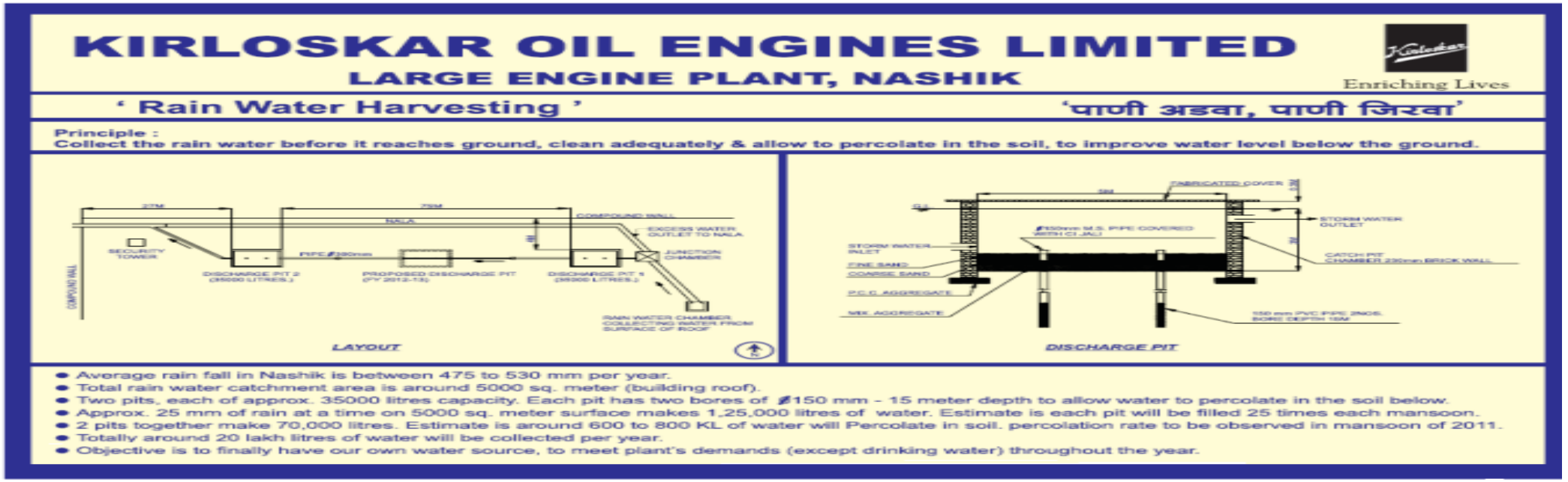
12. Projects Forecasted

1. Roof top solar plant installation up to **250kWp** Capacity.
2. Power recovery unit (regenerative loading)
3. Replacement of High Bay Sodium Vapor Lamp of **400W to 100W** with LED in Machine Shop Section
4. Replacement of **72 Watt Tube light fixture to 36 Watt LED** lights in offices.
5. Use of **Star rated Inverter type Air conditioner** in office area.
6. Replacement of **High HP pump/motors** with efficient **Low HP pump/motors**.

Rain Water Harvesting

From year **2011 – 21** Rain water percolated in the soil is **200 Lacs Ltrs** .
through Rain Water Harvesting Tank.

Before installing of rain water pits we had not found water points. , Presently we have 9 identified water point in our Factory premises for Boring purpose. Now, we are waiting for boring approval in premises from MIDC.



Participation & Special Achievements

FY	K Group	MEDA	BEE	CII
2019-20	--	Certificate of Excellence	--	--
2018-19	2nd Prize	**1st** in SME (13th State Level)	Certificate of Merit	Excellent Energy Efficient Unit
2017-18	2nd Prize	Certificate of Excellence	--	
2016-17	1st Prize	**1st** in SME (12th State Level)	--	

Thank You

https://koel.kirloskar.com