18th National Award for "I
Energy Management – 2
Confederation of Indi

Presentation by ,

Kirloskar Oil Engines Li
Kagal, Kolhapur Plant

Content of the Presentat

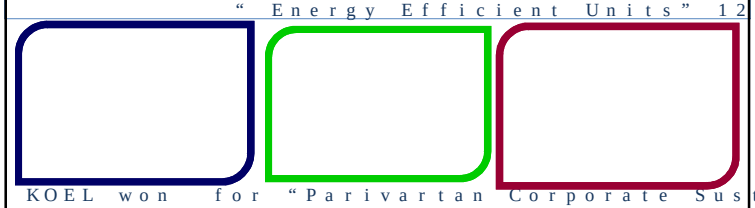
- Company profile
- Energy Saving Projects
- Innovation in projects implemented
- How close to Global best In SEC
- % Reduction in SEC w.r.t. previous yea
- Involvement of employees, monitoring a
- GHG Inventorisation
- Utilization of Renewable energy
- Utilization of waste as a fuel
- Amount of replication arising out of B Supply Chain
- Implementation of corrective / prevent certification

Green "Go" Certified Pla

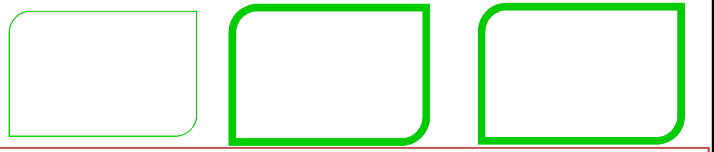
IGBC "Go–" Certified Building

Accolades & Environment

CII - National Award for "Excellence in Energy E
"Energy Efficient Units" 12-13 & 15-



KOEL won for "Parivartan Corporate Sustainabili
Resource Conservation 2 times 10-11 &



Kagal Plant and Taxlcsol beanggeed Awa2rd for year 11-12 and
award for 15-16 in State Level Energy competitio

Accolades Energy & Environme

Kirloskar Group Inter-competition A
hands of Eminent Personalities in

About Kirloskar Oil Engi

Incorporated in 1946 as a part of the Kirloskar G
engineering conglomerate, founded by the late M
involved in the manufacture of internal combust
parts, which are used for various applications
stationery power plants and construction equipn

About Kirloskar Oil Engines

Kirloskar Oil Engines Ltd

Kagal (Kolhapur) Plant

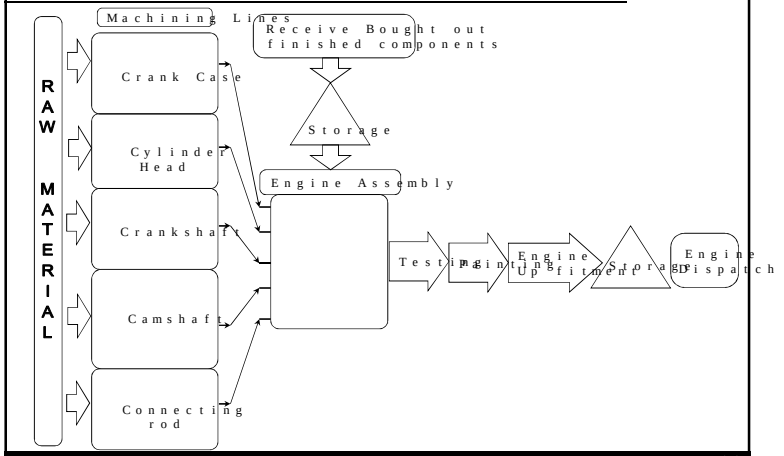
Total Employees as on date
-1181
Managers (TL, GL & UL)
-191
Operators (Team Associates)
-990

Initiatives

- 5S
- QMS, EMS & OHSAS
- ENCON
- Kaizen & POKA YOKE
- Autonomous Maintenance
- SixSigma, QC Activities
- Standardized Work

Our Values, Vision and Pro

Production Process a



KOEL adopted CII program Mission for Sustainable Grow

Specific Energy And Water Consumption
• Reduce by 3-5% every year over next ten years

Use Of Renewables Energy
• Increase by 5% every year over next ten years.

Recyclable And Enhance Recyclability Of Resources
• Increase use of resources embodied in the product.

Life Cycle Assessment Criteria For New Products.
• Incorporate Life Cycle Assessment in alternative technologies and products

Product Stewardship Program
• Promoting and managing Stewardship Program, By engaging partnership with business and communities.

Generation Of Waste & Waste Disposal
• Reduce by 3-5% every year over next ten years

GHG Emissions And Other Process Emissions
• Reduce by 3-5% every year over next ten years

Share Of Harvested Rainwater In The Overall Annual Use Of Water
• Increase by 5% every year over next ten years

Adopt Green Purchase Policy
• Adopt Green Purchase policy & incorporate clean technologies at design stage

Depletion Of Natural Capital
• Reduce by 5% every year over next ten years

KOEL - Energy Polic

Executive Chairman Shr
Kirloskar sign-ed Energ
indicates Strong Comm
from Top Management tow
ENCON

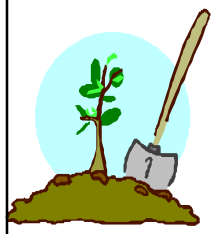
3rd Revision in repsect
Changes in Global Ene
Scenario

Doshas in Ayurveda and Pachma

Solar er
HVAC
Movemer
Wind ene
Fossil
Proces
Illumin
Electrical &
Water

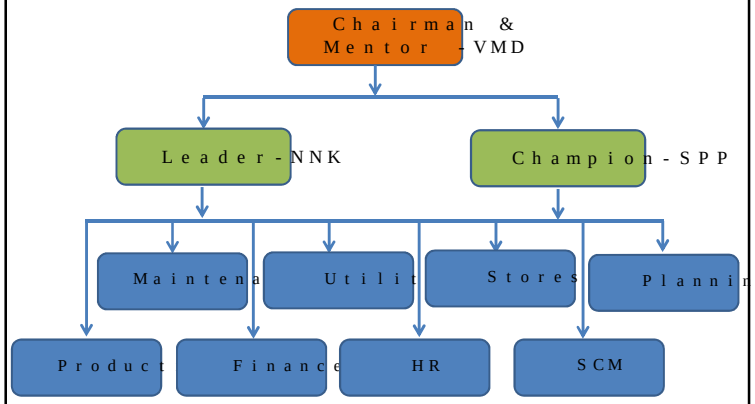
Employee Invo

Energy and Environme



Environmental & Energy Policy.
ISO 14001:2015 Certification for Environmental Management syste
GreenCoGold Certification
Green Building.
Energy Conservation.
Renewable energy.
Water Conservation.
Rain water Harvesting
Waste Recovery.
Hazardous Waste Management.
Online Energy Monitoring.
Carbon foot Print Reduction.
Sustainability Reporting.

ENCON Team



Energy planning - Idea Gene

Employee Involvement & ENCON Capacity Building

SN	Training Program	Date of Training	Duration (Hrs.)	No of Participants	Faculty	Man hrs
1	CII National Energy Conservation Award	19th & 20th August 14	16	5	Hyderabad	80
2	MEDA State Level Award	20th January 14	4	5	MEDA Pune	20
3	ISO 50001 Lead Auditor Course	7th April to 11th April 14	45	2	BSI Pune	90
4	IEX Power Trading	[illegible] 13	3	5	[illegible]	15
5	Parivartan Sustainability Award	[illegible] 13	9	2	New Delhi	18
6	GreenCo Summit, Chennai	25th & 27th Jun 14	16	3	CII GreenCo team	48
7	GreenCo Meeting for TATA Motor Vi	[illegible]	[illegible]	4	[illegible]	12
8	One day workshop on Renewable energy & energy efficiency	18th February 14	6	5	MEDA Kolhapur & Department of Energy, Shivaji University	30

Employee Involvement & ENCON Capacity Building Progr

SN	Training Program	Faculty	Date of Training	Duration (Hrs.)	No of Participants	Man hrs
9	EMS & OHSAS Awareness	Mr.Nilesh Upankar	12-Sep'13		3	
10	Six Sigma Green Belt	Mr.Shailendra Rahigude	19-20-Feb'14	8	46	368
11	Six Sigma Green Belt	Mr.Shailendra Rahigude	19-20-Mar'14	8	70	560
12	Green Building Rating Systems	CII	28-29-Nov'13	16	2	32
13	EMS Legislation	Mr.Sachin Rahalkar	09-Jul'13		4	
14	OHS Legislation	Mr.Sachin Rahalkar	10-Jul'13		3	

Total man Hrs. 1897

Energy Efficiency

Celebration ENCON WEEK Every Year (14 Dec. to

KIRLOSKAR OIL ENGINES LIMITED

Energy Efficiency

Celebration ENCON WEEK Every Year (14 Dec. to 20Dec.)

Tree Plantation

Competition Response From Employees 16-17

- Poem Competition -213
- Encon Gallery competition -8
- Poster Competition –120
- Opportunities – 11
- Encon Projects - 46
- Slogan Competition -1322
- Encon Projects
- Suggestions

Total Entries

Award Function

KIRLOSKAR OIL ENGINES LIMITED

Creating Sustainabl

Mass Tree Plantation

This yea
Trees are
on the occ
World Envir
day .

Till date
Trees are
grown up
Plant pr

KIRLOSKAR OIL ENGINES LIMITED

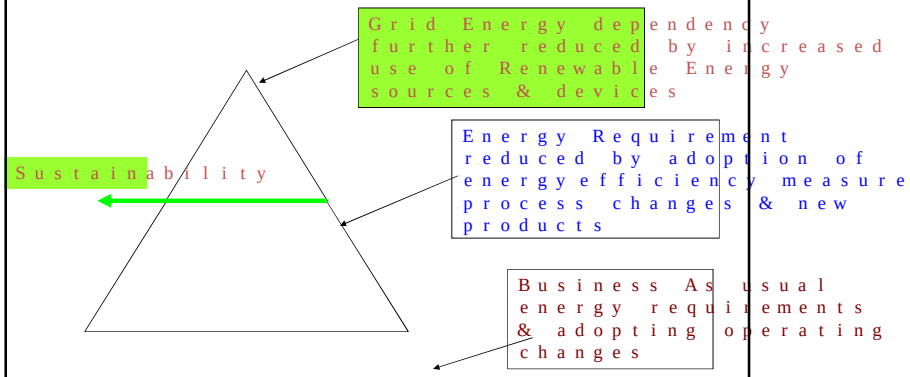
Energy Efficiency

Celebration World Environment Day

Celebration of World Environment

KIRLOSKAR OIL ENGINES LIMITED

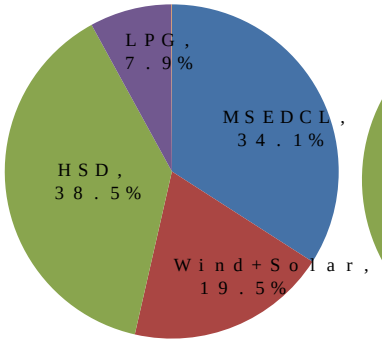
Energy Pyramid for Efficient renewable energy



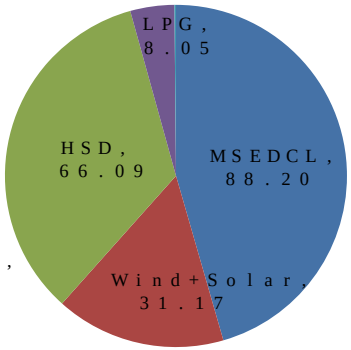
Energy ...A Re

Power & Fuel 2016-1

Share of various energy sources

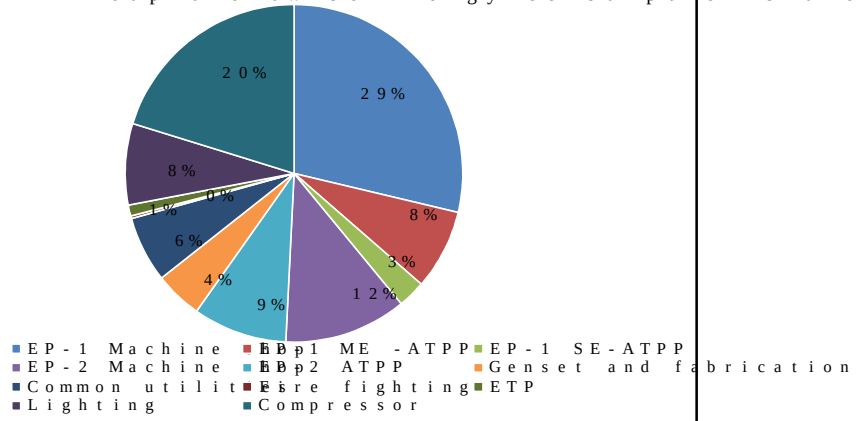


Cost of energy, Rs.M



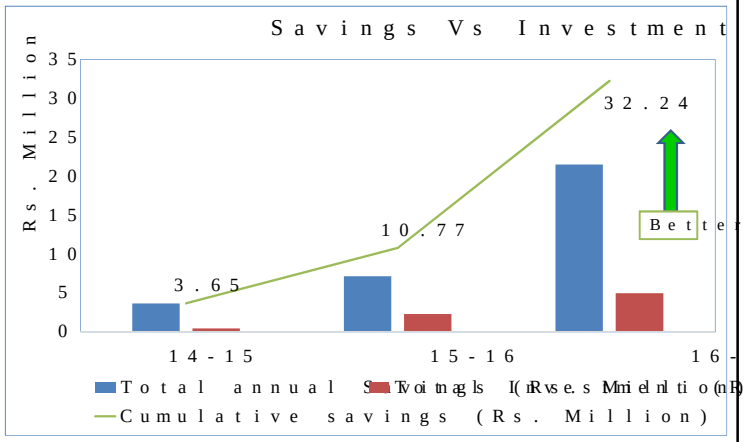
Power & Fuel 2016-17

Deaprtmentwise Energy consumption share FY16-1



Energy Conserv

Savings VS Investment FY 1



Project Summary
Energy Saving from FY 2014

Project Summary
Energy Saving from FY 2014-15

List of

M/C Shop - ENCON Project

Sr. No.	Project Title	Line Name	Possible Cost Saving in Lac.
1	To Provide electrical switch/autosenses near to the core plug pressing station on Head Line on OP-80 station	DV Cyl. Head Line	0.08
2	To save electrical power cost by providing separate hydraulic motor ON/OFF system OP40/50 Pressing machine & also provide 6R/6K cyl. head line piece flow On R810 Cylinder head line	6R/6K Cyl. Head Line	1.37 for two m/c in
3	To save electrical power cost by activating hydraulic motor in power saving mode continuously running in idle condition with 6R/6K Cylinder head WIDMA m/c on 6R6K Cylinder head line	6R/6K Cylinder Head Line	0.87 PLC logic o
4	To save electrical power cost by use 250 kg crane against 500 kg (component wt only 8 kg) on SL-90 Cy. head line	SL90 Cyl. Head Line	0.03 input conveyo
5	Reduce HA Crankcase line power consumption from 14.59 Units/Cyl. to 13 Units/Cyl		
6	Reduce HA Crankcase line Air(power) consumption cost		HA Crankcas
7	To save electrical power cost on Micromatic (OP 70) m/c		Common Ca
8	To save electrical power cost on Toyoda (OP 80A) M/c		Common Cams
9	To reduce power consumed in tool magazine indexer (OP50/60/80)		DV Cra
10	To use the washing machine coolant at room temperature instead of hot coolant whi heated up to 55 to 60 degree Celsius	DV Crankcase Line	18.12
11	To reduce power consumed in heaters at OP130 final washing machine		DV
12	To reduce power consumed by hydraulic motor at cam bush pressing machine (OP110)		
13	To save 50% electrical power cost by Utilize all washing stations by using second start to wash at time two component in single cycle (op 70)	R810 Cyl. Head Line	0.85

M/C Shop - ENCON Proje

Sr. No.	Project Title	Line Name	Possible Cost Saving in Lac.
14	To reduce power consumption on rough washing machine on 6R/HA6 Cran		
15	To reduce power cost by reducing cycle time of washing machine		
16	To reduce power cost by stopping hydronic unit of Op.40 machine at i		
17	DV CON ROD-Maintain line power consumption below 23kwh per component		
18	To reduce cycle time of Intermediate washing machine OP40 by 8 mins heater	HA6 Crankcase Line	0.39
19	To eliminate heater of continuity test machine OP140		
20	Reduce air consumption On r1040 crankcase line		R10
21	Air consumption to be reduced when APG not in use		R1
22	Power Consumption Saving on OP150 A , SL90 Lapping M/c		
23	Power Consumption Saving on OP50, Fortuna M/c		6R/H
24	Power Consumption Saving on OP140, Balancing M/c		6R/

M/C Shop - ENCON Project

Sr. No.	Project Title	Line Name	Possible Cost Saving in Lac.
1	To Reduce power cost by disconnecting mist collector on Op-85		HA C
2	To reduce washing M/C power cost by reducing frequency of component washing		
3	DV CON ROD-Maintain line power consumption below 23kwh per component		DV
4	Optimize Heating temp. (OP-80) for Final Washing on Camshaft line		
5	To save electrical power cost on Streightening (OP 40), Micromatic (OP 70), Toyoda & Washing (OP 120) M/cs	Common Camshaft Line	1.80
6	To save electrical power cost by eliminating dirty tank coolant transfer		
7	To save Compressed air cost on Horizontal Induction Hardening (OP 20), Landis (OP Micromatic (OP 70), & Radial Drilling (OP 100) M/cs	Common Camshaft Line	0.08
8	To reduce power consumption of OP100 by keeping machine in power saving mode		
9	To reduce power consumption of OP70 by rearranging tools inside the magazine in t operation sequence	HA6 Crankcase Line	0.08
10	Reduce power cost of RCH line by using single power pack for both valve seat & va pressing on op-80	R1040 Cyl. Head Line	1.50
11	Make separate ON/OFF Switch for Marposs Gauge		Crankshaft Line
12	Power consumption saving on OP180 , Final Washing m/c		DV Cranksh
13	Power consumption saving on OP100, TAL M/c		6R/HA6 Crankshaft
14	To Reduce Power consumption of hydraulic motor on OP80		WIDMA machine 6R
15	To Reduce Power consumption of hydraulic motor on v/s &		v/g pressing machine

M/C Shop - ENCON Proje

16	To Reduce Power consumption of on OP80 washing machine		
17	To Reduce Electrical Power consumption on SL90 cylinder head line by c machine work combination with cell wise time study	SL90 Cyl. Head Line	1.64
18	To Reduce Electrical Power consumption on R810 cylinder head line by c machine work combination with cell wise time study	R810 Cyl. Head Line	0.51
19	To optimize compressed air flushing time on primary washing machine & air cost with ZERO investment	SL90 Cyl. Head Line	0.97
20	To Provide electrical switch/autosenses near to the core plug pressing Head Line on OP-80 station	DV Cyl. Head Line	0.08
21	To save electrical power cost by use 250 kg crane against 500 kg cr in (component wt. only 8 kg)on SL-90 Cyl.head	SL90 Cyl. Head Line	0.03
22	To run the hydraulic motor for the time period of its actual component For rest of the time the motor should stop running	6R 6K Cyl. Head Line	0.80

M/C Shop - ENCON Project

Sr. No.	Project Title	Line Name	Possible Cost Saving in Lac.
1	Hot cure tank cleaning & DM water changing frequency is changed from once in a mo twice in a month	HA Cyl. Hed Line	0.16
2	To Reduce Power consumption cost by reducing cycle time of OP120		HA C
3	Optimize Heating temp. (OP-80) for Final Washing on Camshaft line		C
4	To reduce power consumption cost from R R14040 Crankcase line	R1040 Crankcase Line	3.63
5	To save electrical power cost on (OP 130) Gear heating machine		Commo
6	To eliminate chatter mark problem on cams for FIP camshaft		Common C
7	To reduce electrical cost by switch off the hitters while machine keep in emergen on op-70 (Final washing) R810 cylinder head line	R810 Cyl. Head Line	0.25
8	To reduce the Electrical power cost on OP-40 washing m/c on DV Cylinder head l		
9	To reduce the Op40 Cycle time by optimization of cutting parameters		D

Maintenance - ENCON Proj

Maintenance ENCON Projects

S. N.	Project Description		Annual Cost Saving Rs. In lakhs
1	Energy Saving through Hydaulic power pack optimization at Toyoda Top center - R1040 Crank case line & Crank shaft line	EP1 M/C Shop	1.4
2	Power saving of hydmotor when EMG. pressure	EP2 M/C Shop	0.11
3	Power saving of HYD power pack in idle condition	EP2 M/C Shop	0.24
4	Power saving of HYD power pack in idle condition	EP2 M/C Shop	0.25
5	Veturi effect air nozzle fitted for head valve seat press m/c line 1	EP2 M/C Shop	0.15
6	Veturi effect air nozzle fitted for head valve seat press m/c line 2	EP2 M/C Shop	0.17
7	Veturi effect air nozzle fitted for head valve seat press m/c line 3	EP2 M/C Shop	0.11
8	Veturi effect air nozzle fitted for head valve seat press m/c line 4	EP2 M/C Shop	0.16
9	Instead of two hyd motor run all HYDER pack motor/s fitted to one power pack .	EP2 M/C Shop	0.67
10	Soft start of washing motor	EP2 M/C Shop	0.2
11	Interface pneumatic foot operated foot switch to flow air to gauging system	EP2 M/C Shop	0.2
12	Instead of two 18 watt CFL bulb , 11 watt LED bulb is fitted to reduce power cost .	EP2 M/C Shop	0.05
13	6R Paintbooth water tank level optimization	Paintioning	2
14	Varsha Paintbooth water tank level optimisation	Paintioning	1.5

Maintenance - ENCON Project

15	LADDER modification on 2974 Doosan m/c for spindle cooler on /off	EP2 M/C Shop	
16	LADDER modification on 2977 Doosan m/c for spindle cooler on /off	EP2 M/C Shop	
17	Instead of two power pack only ne will be used to save the energy on 4r head valve seat press	EP2 M/C Shop	0.86
18	Reduce the power consumption of HYD MTR when Machine is in ideal condition for more then 10 min at widia m/c 6r head line	EP2 M/C Shop	0.17
19	Energy Saving through Hydaulic power pack optimization at OP-170 at Crankshaft line	EP1 M/C Shop	0.3
20	Reduce power cost of RCH line OP 40 by modification of PLC logic.	EP1 M/C Shop	
21	Reduce power cost of RCH line OP 30 by modification of PLC logic.	EP1 M/C Shop	
22	Energy saving by optimize Hydraulic power on Pressing machine RCH Op80	EP1 M/C Shop	1.4
23	LADDER modification on 2974 Doosan m/c for hydraulic cooler on /off	EP2 M/C Shop	0.06
24	Power saving of hydraulic motor when lever go to normal position	EP2 M/C Shop	1.48

Utility- ENCON Projec

S. N.	Project Description		Annual Cost saving Rs. In lakhs
1	Energy efficient lighting		Total Plant 29.19
2	Solar roof top pumping system		ETP 2.5
3	Bio gas generator		ETP 0.6
4	Rainwater Filitation plant		ETP 3.15

Innovative P

Biogas generator

- Make- KOEL
- Rating - 15 KVA
- Voltage – 230V
- Current – 62A
- Better Aesthetic
- Cost effective controller
- Connected load – EP1 and Genset

Snapshots

Biogas Generation

In house controller changeover

In hous

Highlights

Project completed within a record time o

In house manufacturing of controller

All street lights of EP1 and Genset plan

Generator

Approximate Electricity generated per an

Total carbon offset during

86 tons of CO2

Note - considering a life of 15 years

Project background

Available Natural water resource

Water sample tested

Need filitationarrangement

100% percolated water use for EP-II

100%Eliminating MIDC water for EP-II pla

Average water consumption of EP 2-70 me

MIDC water cost for EP-II per day Rs.105 3.15 lakhs

Details

Cost of Filitationplant Rs.6 Lakh

Capacity-15m3/hr

Contains Sand filter, carbon filter

pH, TDS, Turbidity and total hardne

allowed limits

Saves water cost of Rs. 3.15 Lakhs

ROI less than 24 months

Snapshot

Details-Schematic

Details

3 No of Solar PV Powered 5HP Submer
Percolated water, Lifting treated e
ETP plant airobix blower
14600 Wp Solar PV multi crystalline
System with Jalverter, Controller a
First year AMC –Free of charge
5 Years Warranty against manufactur
Controller
Total Investment with discount –Rs

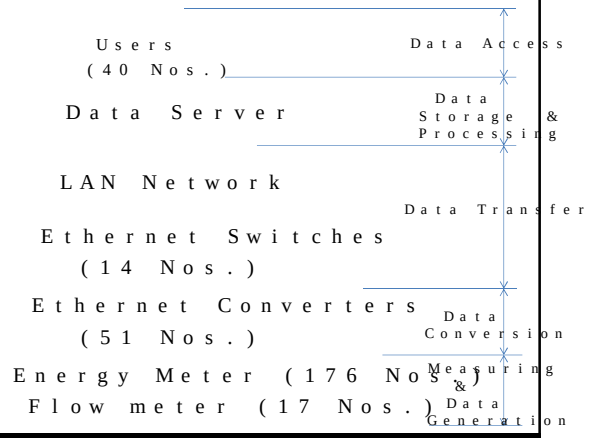
Cost-Benefit Analysis

Modules wattage to be use		4800 to 5100
No. of Unit		3 nos.
Per day Avg. clear Sunlight		n, 5.5 hr.
Required Area		1323 Sq. f
Electricity Generation (per year)		29510
Project cost		1611000 Rs.
Accelerated Tax depreciation @ 80%		1288800
Cost of energy generated per year @ Rs. 8.50		25

Electricity generated per annum –29510 k
Life of System -15 years
Total carbon offset during 376 tons of CO2

Specific Energy

Energy Monitoring System-Inf



Energy Monitoring Sy

System Outcomes & Reports

KIRLOSKAR OIL ENGINES LIMITED

Energy Monitoring System

Daily Energy Cons

Daily Losses

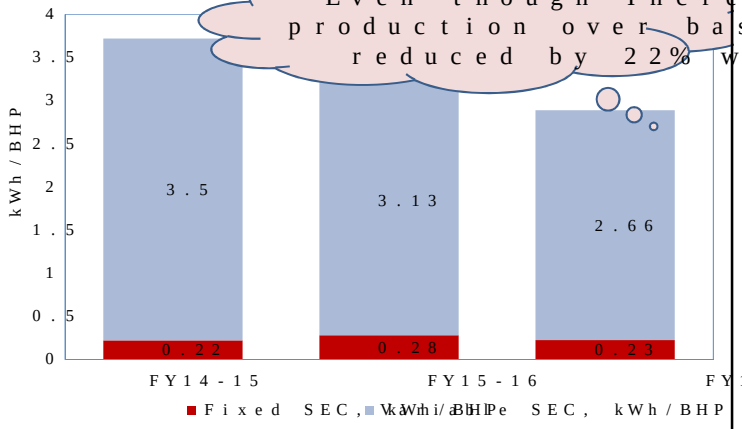
Meter Sta

GHG Emission

KIRLOSKAR OIL ENGINES LIMITED

Specific Electrical Energy
(kWh/BHP)

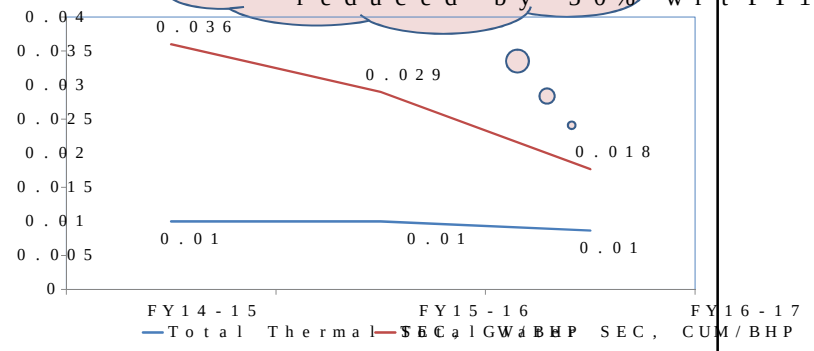
Even though Increase in
production over base load
reduced by 22% wrt FY14



KIRLOSKAR OIL ENGINES LIMITED

Specific Thermal Energy Consu
(GJ/BHP)

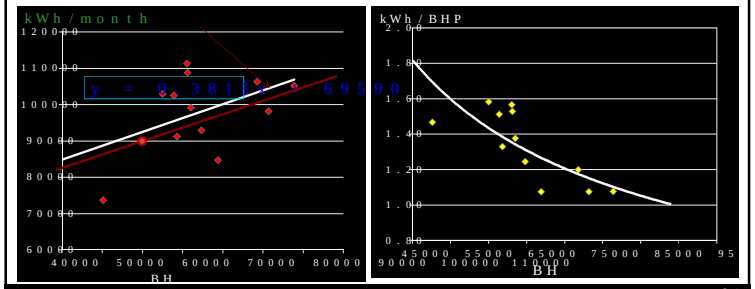
Even though Increase in load a
production over base load, Wate
reduced by 50% wrt FY14-15



KIRLOSKAR OIL ENGINES LIMITED

Method of arriving at

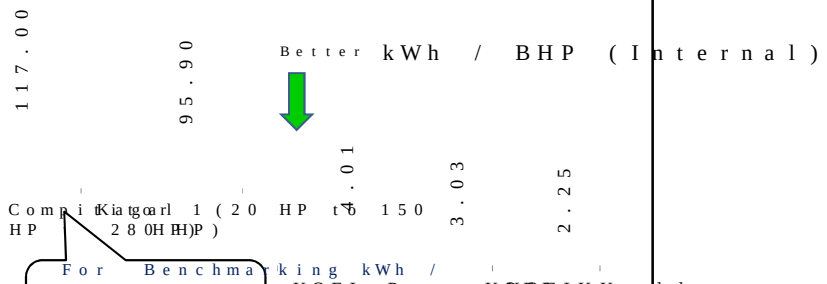
Practice of regression analysis followed i
SEC targets.
Help in forecasting, monitoring, targetin
planning.
Decision of continuing or stopping prod
energy consumption can be justified



KIRLOSKAR OIL ENGINES LIMITED

Benchmarking (National)

Energy Consumption per Engine (ATP)

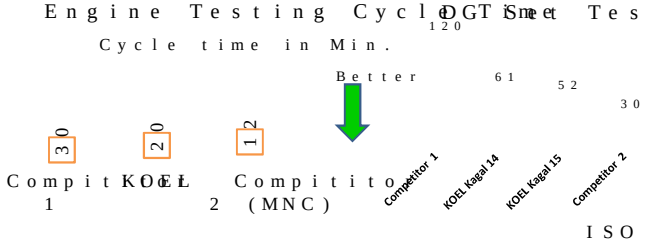


* Source Data : MEDA

KIRLOSKAR OIL ENGINES LIMITED

Benchmarking (Interna

Engine Testing Cycle Time



Compitito 1
KOEL
Compitito 2 (MNC)

DGT Test Testing Time

ISO 50001 EnMS Certification
Initiated

Adoption of new technologies
Trials

Data Analysis and prioritization
Initiated

Advanced EMS for Data Analysis
Installed

Involvement of People
Initiated

Certified Lead Auditor - EnMS
- Santosh Parab
- Nitin Kulkarni

KIRLOSKAR OIL ENGINES LIMITED

Renewable En

KIRLOSKAR OIL ENGINES LIMITED

Offsite Renewable (Green) Proj

Windmi and Sc Units	Renewa Energy (FY 13	Renewa Energy (FY 14	Renewa Energy (FY 15	Renewa Energy (FY 16	Target FY17-18
kWh Unit	6,069	17856	36,88	58,07	50
% of Energ consum	51.01	11.50 SEM M Insta	23.00 SEM M Insta	36%	

FY17-

The share of renewable energy in total ele
This has resulted into tremendous savi

On-Site Renewable (Green) Projects

Solar Steam G Canteen –On

1 kW Solar with LED L –On SIt

PV Pagas Plant mps fo n ETP e

Capacity: 350 kg / Day @ 2 bar pressure

No of Dish: 8
Area: 315 Sq. Meter

Alternative for Convention Cooking
Equivalent LPG Consumption Reduction: 25 kg / Day

Plant Capacity 25-30 CUM/ Day
Biogas Generation Approx. 15 CUM/day
Manure Generation Approx. 10 kg / Day

On-Site Renewable (Green) Proj

Biogas Gene

Solar Rooftop

Capacity: 12 KV
All street l
Genset plant
powered by B
Generator

Capacity: 3 N
Lifting Perc
Lifting trea
drip irrigat
airobix blowe

Capacity: 15ps CUM/hr
System uses harvest
and percola feed
Rainwater, filters
used for processes

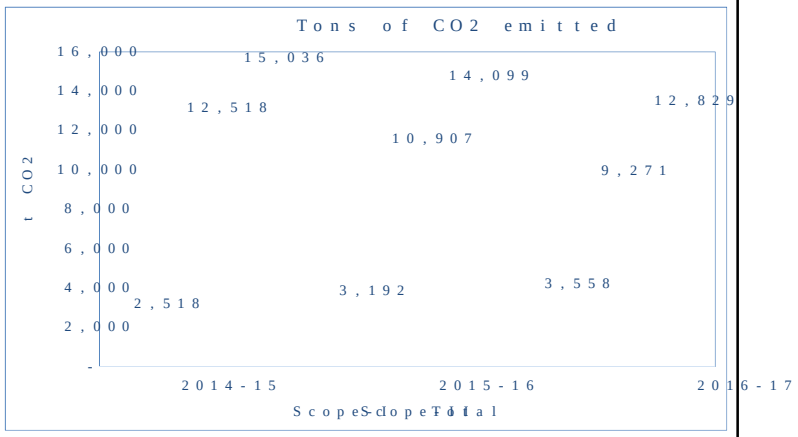
GHG Inventor

Kagal Plant – Analysis

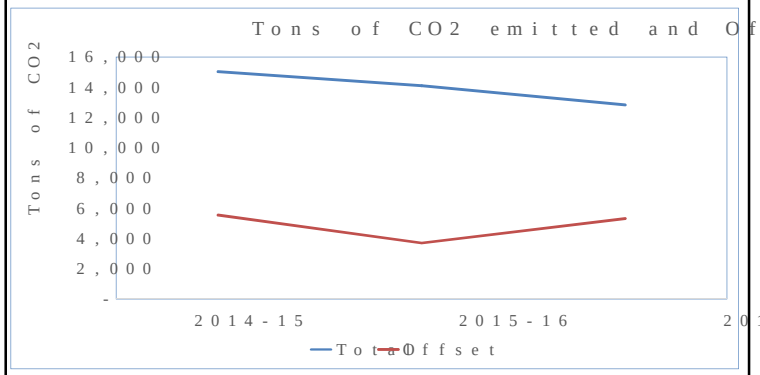
Carbon Foot Print Report Data - Kagal Plant

Sr. No.	Source		Scope	Unit	Consumption			GHG E		
					FY14-15	FY15-16	FY16-17	FY14-15	FY15-	
1	HSD		1	kl	728	972	1,13	1,91	2,55	2,99
2	LPG		1	kg	5,2	184,8	162,4	525	554	487
3	FO		1	kl	27	28	26	80	85	79
4	Compact 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 =							2,	3,	3,
	Scope 2									
1	Electricity Purcha		sed	kWh	3,72	112,95	10,16	12,	10,	9,
	Total Scope 2 =							12,	10,	9,
	Offset									
1	Electricity Renewable		1	kWh	78	3,68	5,80	1,	3,	5,
2	Biogas			m	35,	5,	6,	1	1	1
3	Solar			of kg	20,	28,	31,	0.	0.	0.

Kagal - GHG Emission (tCO2)



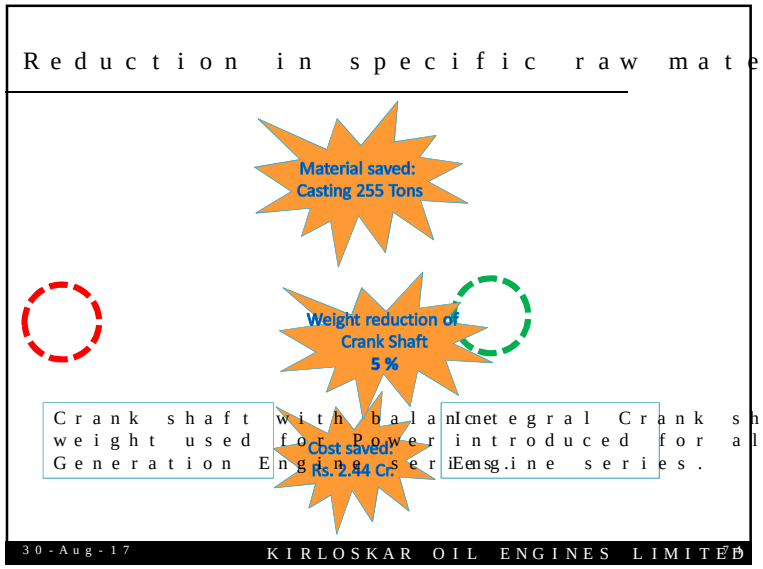
Kagal – Total emission V



The manufacturing facility at Kagal has shown 9.3 compared to year FY15-16. This positive impact is ar through open access.

Waste Reduction,

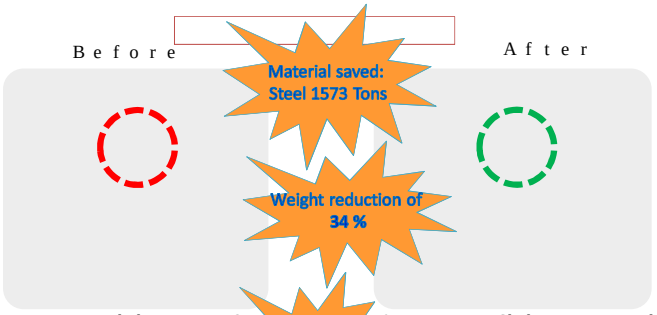
Reduction in specific raw material consump



Crank shaft with balance weight used for Power Generation Engine.

Integral Crank shaft introduced for all PG Engine series.

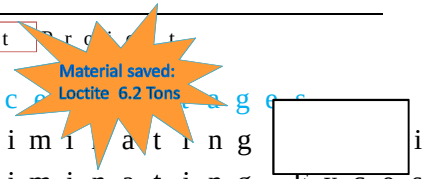
Reduction in specific raw material c



MPI Building 165 [illegible] 125 m x 180 m : St steel excluding [illegible] MT. Structural consumed was 27 [illegible] 49% of 4.82 kg/Sq. ft. It construction cost. [illegible] consumption 7.35 kg/sq. ft.

Reduction in specific raw/hazardous mater

1. Sealant Product



A. Reduce wastage

1. By Eliminating [illegible] ing cycle.
2. By eliminating [illegible] ss Wastage in Sealant Bucke

B. Optimization By Six sigma Method

1. Reducing Bid size.
2. Converting Manual Application Method t[illegible]ine.

Replacement of raw materials by recy material

Reduction of 'K Cool Coolant using Wate

5000 lit / mon ... need to be t...

Material saved:
Water -65000 Lit
Coolant-65000 Lit

Geo-Guard chemical introduced which require 150 lit / month

Cost saved:
Rs. 40.5 Cr.

A ... plementation of the projec ... portation as well ETP process

Recyclability / Biodegradability of the pr

Use of Treated Oil

Oil recycled
88 %

Cost Saved:
Rs 4.87 Cr.

Recyclability / Biodegradability of

Use of Recycled Hydraulic Oil

Oil recycled
100 %

Cost Saved:
Rs 0.65 Cr.

Reduction in specific raw material consump recycling.

Material saved: Steel
2580 Tons

RM Consumption Thro... Elimination.

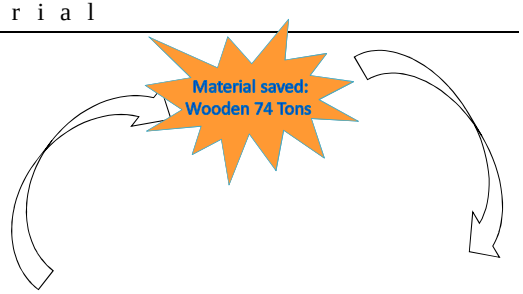
Out of that flywhe... end side two removed & scrapped at customer end.

To avoid the RM co... side foots welded on returnable sk...

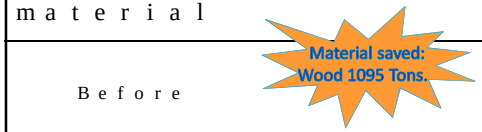
Cost saved:
Rs. 2.00 Cr .

Engines supplied with four transportation foots.

Initiatives taken to reduce the cons
material



Initiatives taken to reduce the consumptio
material



Before

After

Varsha Engines supplied with Wooden Packing was disposed.

Varsha Engines supplied with Corrugated box packing.

Government r

Government rebates

Government incentives and Other cost reduction initia

Parameter	UOM	Saving FY 14-15	Saving FY 15-16	Saving FY 16-17	Saving FY 2017-18 Till
PF Rebate	Rs Lakhs	78.58	74.15	61.04	14.62
Prompt Payment discount	Rs Lakhs	11.41	10.23	8.02	
Kagal OA Benefit	Rs Lakhs	1.64	18.44	50.47	22.9

Replication ar practices on Gr

Closely Working with Associate for improving their Ecologica

Treating internal group companies as our

Formed internal energy and water audit t location

Completing bi-annually energy and water

Status for FY 16-17

- Total no of projects identified-30
- Approximate savings potential-Rs. 60 Lakhs
- Approximate investment required-Rs. 12.5 Lak

Energy Audits of Assoc for improving their Energ

Sr. No	Supplier Name	Audit Name	Conducted during year	Duration (Hr.)
1	KMW Kagal	Energy Audit	2016-17	8 Hr.
2	KOEL Nashik	Energy Audit	2016-17	8 Hr.
3	Jadhav industries	Energy Audit	2016-17	8 Hr.
4	Sound castings Pvt. Ltd.	Energy Audit	2015-16	8 Hr.
5	Victor Enterprises	Energy Audit	2015-16	8 Hr.
6	Sanmati CNC Engineering Works	Energy Audit	2014-15	8 Hr.
7	K & K Foundry	Energy Audit	2015-16	8 Hr.
8	Shriram Foundry	Energy Audit	2014-15	8 Hr.
9	Alpha Founders	Energy Audit	2014-15	8 Hr.
10	Suyash Iron & Steel Pvt. Ltd.	Energy Audit	2016-17	8 Hr.

Empowerment to Supplier Partner

Session on Importance of Solar and need of time elabora
SCM, KOEL, Dated:-18/08/2016, Attended by 34 Part
34 Nos. Of Participants from 15 Suppliers

External Faculty on Board

Mr. Unmesh Jagtap, MS (Solar Energy), Universi
& Mr. Navin Singh, Director, Finance - Ino-Solar ela

Remedies for expectations of Suppl

Expectations of the Supplier Partners from the Ses
session, which were addressed during the interact

Closely Working with Asso
for improving their Ecolo

Creating Awareness of Society
Environmental Aspects

Creating Awareness of Environmental Aspects

Soc

- Kirloskar Vasundhara Film Festival Program is conducted every year where presence o new Program Theme is decided & entire program base
  FY 17-18 - "Save River, Save Life"
  FY 16-17 - "Smart and" sustainable – It's my ci
- Sustainabi lity reporting

Sr. no.	Year	Frequency	Principles
1	Sustainability Report 2009-10	Annually	GRI
2	Sustainability Report 2010-11	Annually	GRI
3	Sustainability Report 2011-12	Annually	GRI
4	Sustainability Report 2012-14	Biannually	GR
5	Sustainability Report 2014-16	Biannually	GR
6	Sustainability Report 2016-17	Annually	GRI

Sept. 17

Results – Associate's Energy P

- JMD highlighted the concern of energy audit
- Selected based on energy consumption
- Best Practices Implemented to Associates (Audits
- Average 10-12% reduction in energy and cos
- Internal competitions for vendors to be or

Environmental

Environmental Performance

Sr No.	Analysis Treated	UOM	MPCB Consented Effluent Limits	Actual values FY 14-15	FY 15-16	FY 16-17	FY 17-18 Till July-17
1	PH	-	5.5-9.0	7.60	7.43	7.09	7.39
2	Suspended Solids	mg/lit	100	15.49	27.17	16.08	16.80
3	Chlorides	mg/lit	600	182.35	214.17	134.47	171.02
4	Sulphates	mg/lit	1000	17.48	14.30	26.49	19.14
5	TDS	mg/lit	2100	776.25	685.33	721.67	707.00
6	BOD	mg/lit	100	13.71	16.61	10.8	7.78
7	COD	mg/lit	250	64.72	70.67	57.19	44.68
8	Oil & Grease	mg/lit	10	<5	<5	<5	<5

New Expansion Buildings with Environmental Improvem

Natural Day light utilization
High Compressor HT motor
Oil free with low lo... Transformers
Low loss Electrical Panels
Energy Saving Lighting
Inbuilt power fac... Transformer with New

New Expansion Buildings with Environmental Improvements

Compressor Suction from Outside Room For High Efficiency
Localized Lighting, where High level Lux Requirement
Eliminates Usage Of Chemicals For Cooling Towers By Ulita Sound
LED illumination
Low Pressure Drop Air Dryers With Zero Air Loss Condensate Drains
Intelligent air flo... controller

Certificat

Integrated Management System (ISO 9001, 14001 & 18001) Audi

ISO 9001:2015		ISO 14001:2015 OHSAS 18001 :2007	
Clause Number	Numbers of Observations	Clause Number	Numbers of Observations
5.3	1	4.3.1	2
6.1	2	4.4.2	1
6.1.1	3	4.4.6	3
7.1.4	1	6.1.2	3
7.2	2	7.2	1
7.4	1	8.1	3
7.5	2		-----
7.5.3	3		-----
7.6	1		-----
8.1	3		-----
8.5.2	1		-----
9.1.1	3		-----
9.2.2	1		-----
9.3.3	1		-----

There were no NC's related to any Environmental or Energ... NC's & OFI's are related to Documentations improvement i... Management System which we have adopted.

EnconWay Ah

Energy Forecasting FY 17-18

Energy forcasting FY 201718 Kagal 1 Plant

ITEM	Apr 16	May 16	Jun 16	Jul 16	Aug 16	Sep 16	Oct 16	Nov 16	Dec 16	Jan 17	Feb 17	Mar 17	T
Genset BHP	58,785.50	61,262.00	51,037.50	59,137.50	62,316.00	67,433.50	55,227.00	71,046.50	66,442.50	71,767.00	6		
Specific Electricity Consumption kWh/	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6		
Gense	152	159	132	153	162	175	143	184	172	186	162	304	2090
Medium Engines BHP	74,445.00	279,328.50	258,570.50	278,275.00	275,342.00	290,851.00	278,837.50	308,804.00	305,624.50	348,270			
Specific Electricity Consumption kWh/	3.19	3.19	3.19	3.19	3.19	3.19	3.19	3.19	3.19	3.19	3.19		
Medium En	876	891	824	887	878	927	889	985	974	1110	1069	1244	1156
Small Engines BHP	10639	9844	7700	9537	12097	9704	9600	10983	9776	1177	14310	15561	130928
Specific Electricity Consumption kWh/	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64		
Small En	600	555	434	537	682	547	543	619	551	630	807	877	738
EP II BHP	132,977.40	142,565.40	123,041.20	148,008.40	145,391.40	150,514.40	142,832.40	160,562.40	164,219.40	199,860			
Specific Electricity Consumption kWh/	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99		
EP 2	264	283	244	294	289	299	284	319	326	397	388	467	3860
Fixed Energy kWh	129815	133962	108742	102150	102215	98798	95514	99184	94508	100313	106519	131006	1303126
Total kWh KP1	1483404	1523578	1354663	1491930	1500134	1556194	1466976	1650453	1624534	1858649	1807806	2234972	
Open ACESS UNITS (kWh)		552379	552379	552379	552379	552379	552379	552379	552379	552379	552379	552379	
MSEDCL units (kWh)		931024	971199	802284	939531	947754	1003815	914597	1098074	1072154	1306270	1255427	
MSEDCL Unit	8	8	8	8	8	8	8	8	8	8	8		
Open Acess Unit rate			8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Electricity ADP for KP1 in Rs.			12327798	12669148	11233938	12400243	12468945	12946272	12188219	13747159	13526933	1	

ENCON Projects FY 17-1

Trials of New Innovative pro

- Battery operated forklift
- Plastic waste to Fuel oil conversion
- Additives for fuel
- Elimination of Heaters for Washing machi
- ISO 50001 implementation
- Load rescheduling to avail TOD benefit
- Implementation of energy efficient venti conventional air conditioning units

Thank You....

Sustainability@Kirloskar.com