Burckhardt Compression

GREENCO

GreenCo Team

Compressors for a Lifetime™

Go Green Policy

Burckhardt Compression

GO GREEN POLICY

We strive to establish and sustain a positive environmental legacy for the company and for future generations through Go Green initiative.

We are committed to minimizing our overall impact on the environment while encouraging and activating environmentally responsible behavior on the part of employees, supply chain partners and other stakeholders.

We will...

- Ensure responsible use of energy throughout our business, including conserving energy, improving energy efficiency, and giving preference to renewable energy sources.
- Reduce water consumption and drive water conservation programme both within the factory premises and beyond.
- Reduce GHG emissions by identifying the sources and implementing feasible solutions, including source elimination, efficiency improvement, minimizing transportation and use of alternative fuels.
- Minimize waste in our operations through careful & efficient use of processes, materials and ensure disposal of waste safely and responsibly.
- Conserve natural resources by reusing and recycling materials, purchasing recycled materials, and using recyclable products and materials where these alternatives are available, economical and suitable.
- Purchase products with lowest environmental impact wherever feasible and encourage suppliers to pursue environment management systems and processes.
- Strive to improve / develop silent, safe & more efficient products in terms of noise, vibrations, reduced power consumption & emissions.
- Reduce use of toxic / hazardous substances in the product/process, seek substitutions and take all reasonable steps to protect the environment when such materials must be used, stored and disposed of.
- Strive to continually improve our Go Green performance and minimize the organizational & social impact by periodically reviewing our Go Green policy in light of our current and planned activities.
- Engage and inspire customers, society & interested parties by advocating Go Green initiatives through education, trainings, communication and sharing best practices.

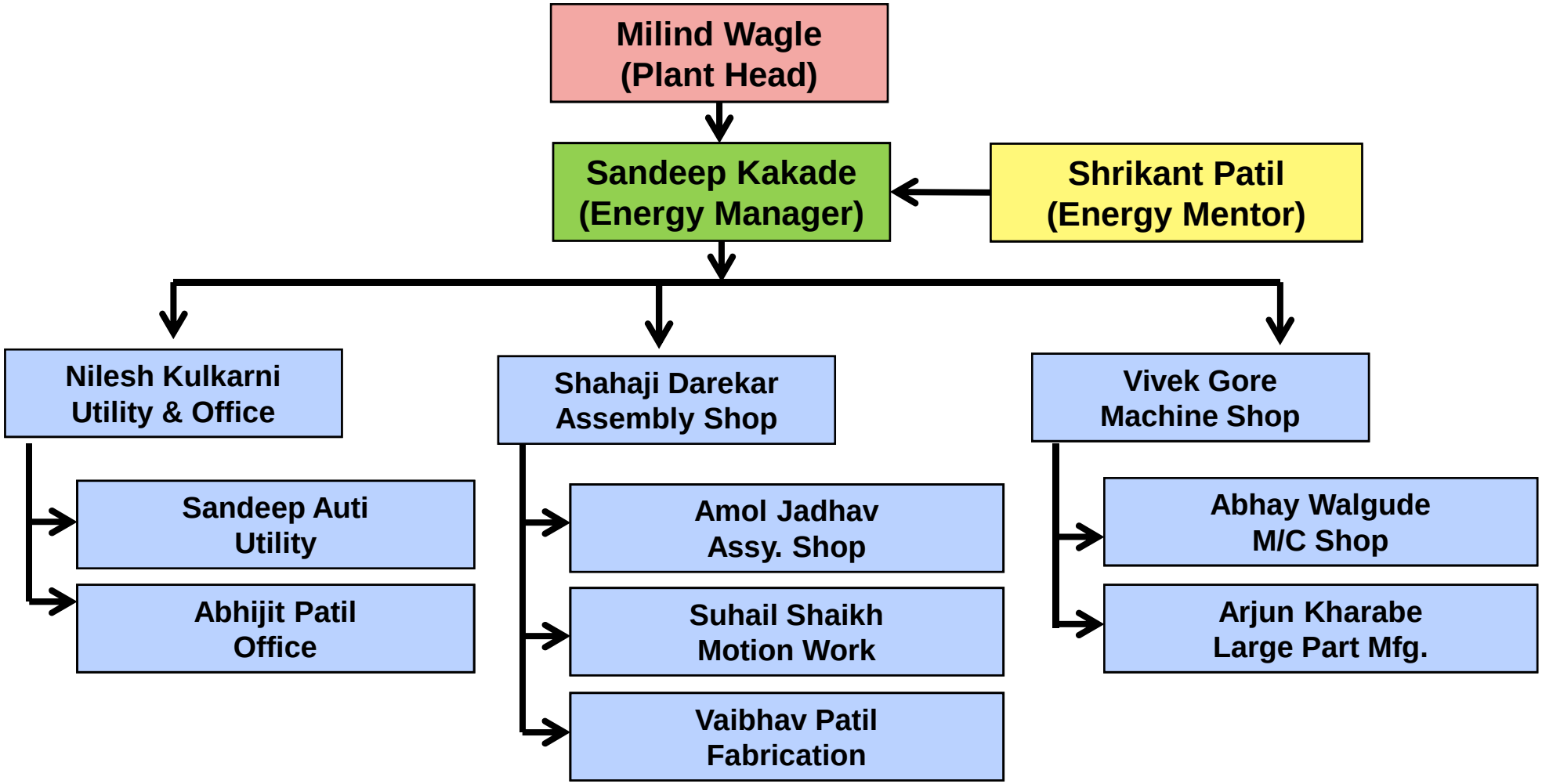
Narasimha Rao
Managing Director

Date: 01.04.2016

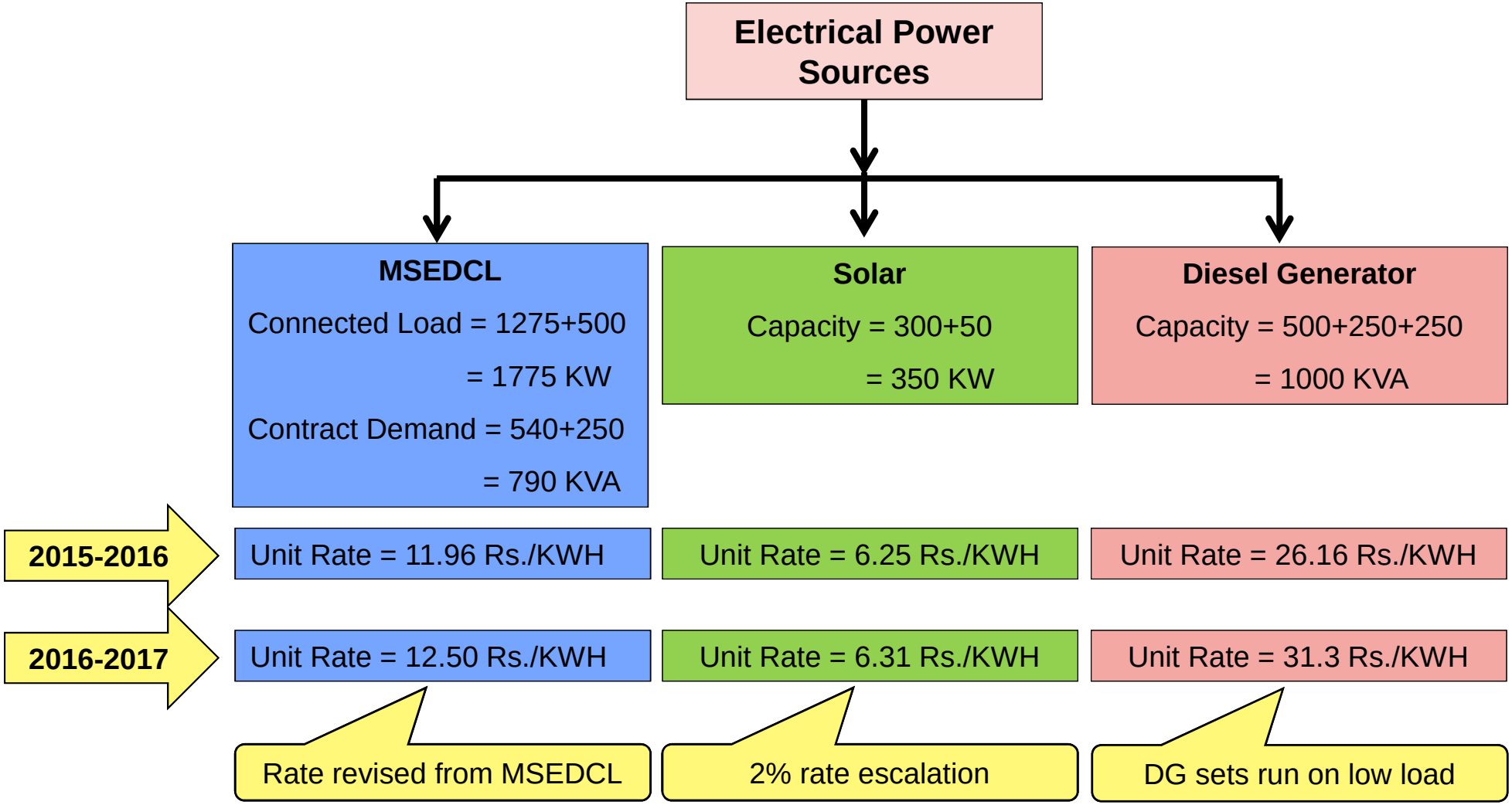
ENERGY EFFICIENCY

Energy Management Cell

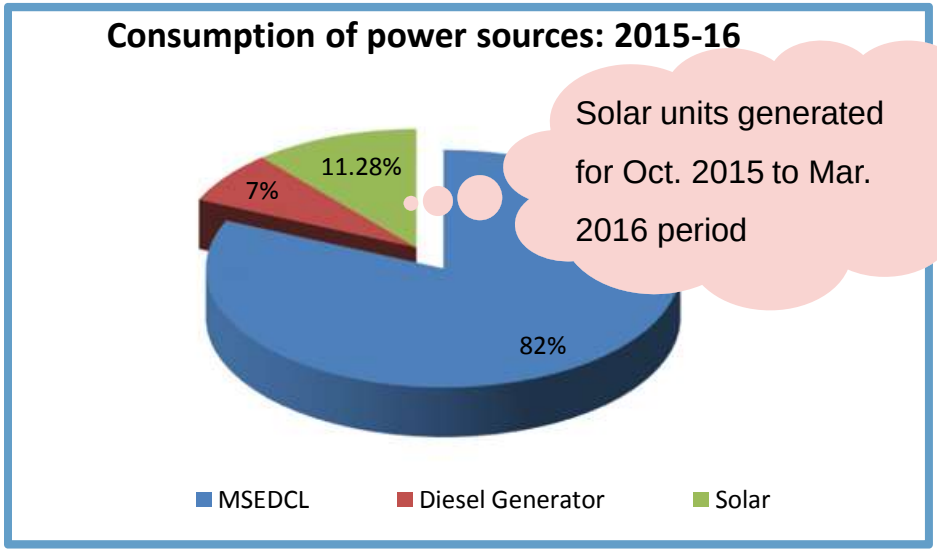
- **Organizational structure of the Energy Management Cell**

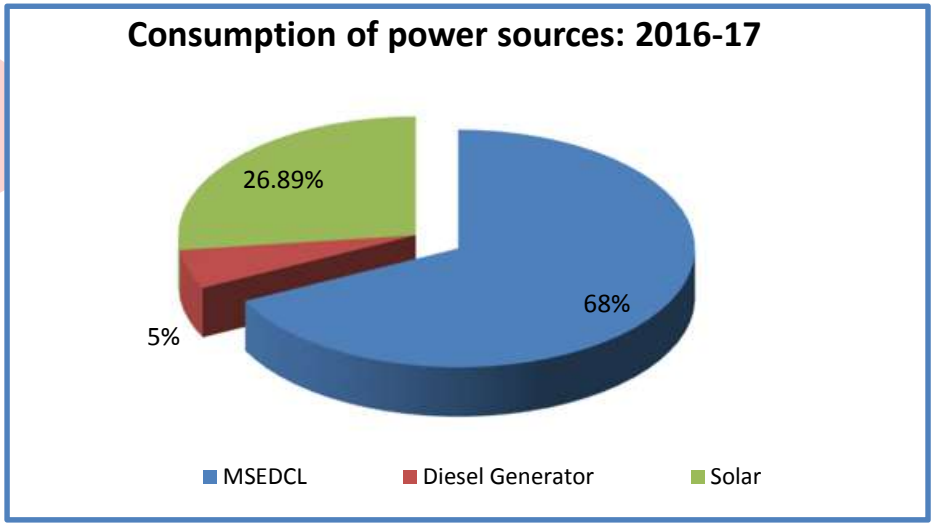


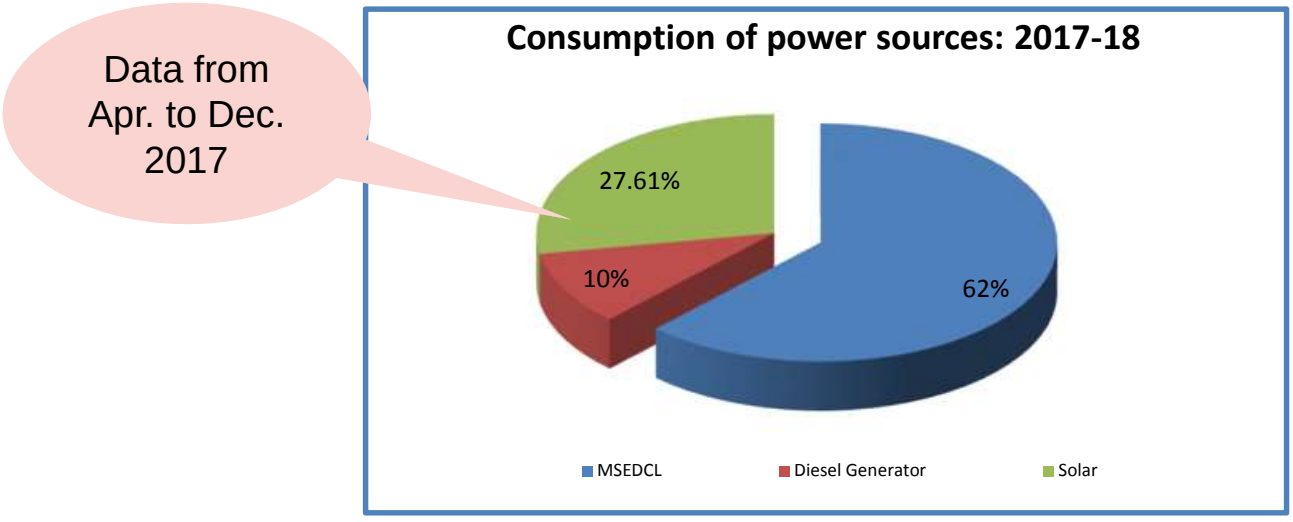
Electrical Power Source



Energy Mix

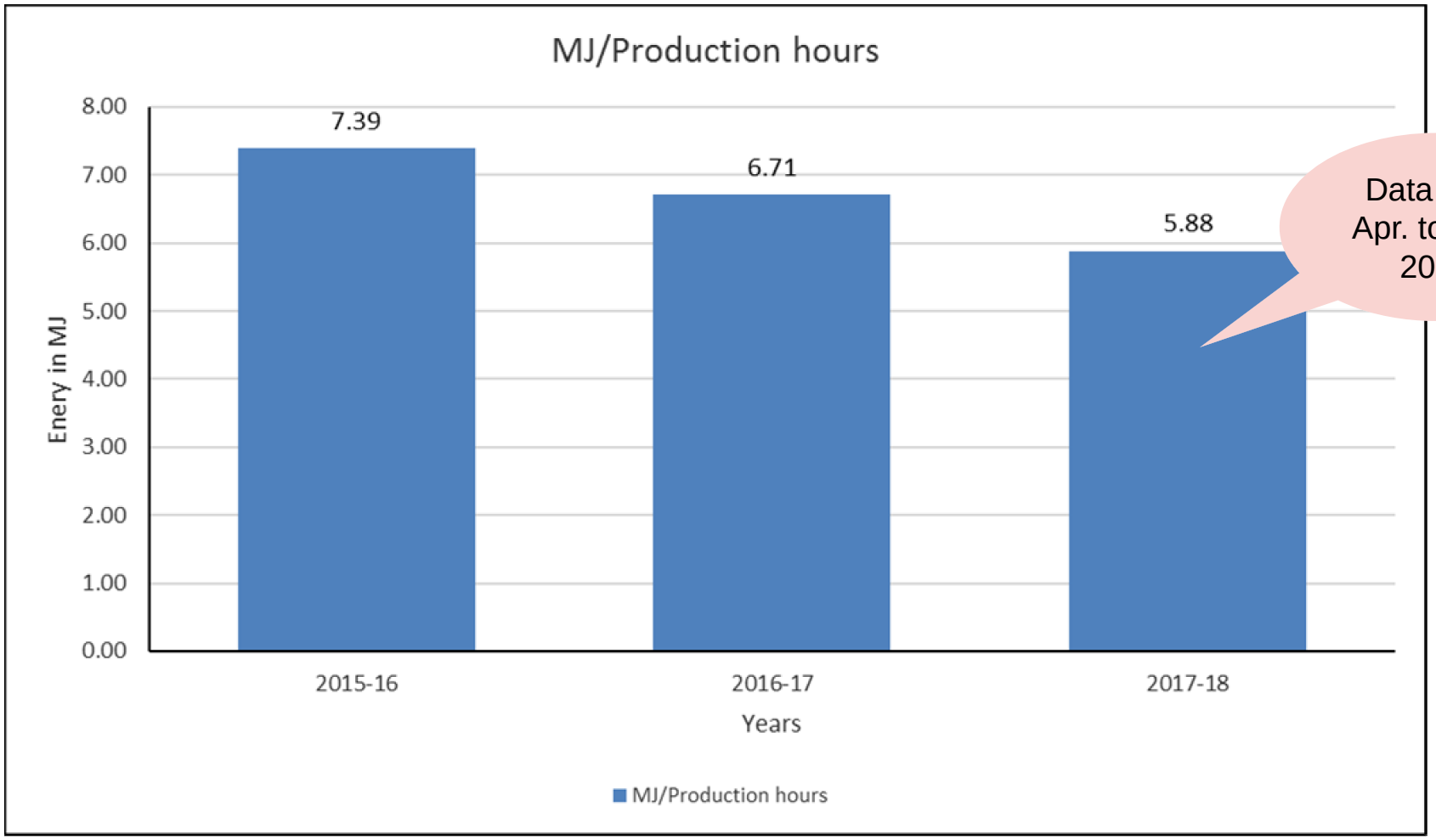

Consumption of power sources: 2015-16
Solar units generated for Oct. 2015 to Mar. 2016 period
11.28%
7%
82%
MSEDCL
Diesel Generator
Solar


Consumption of power sources: 2016-17
26.89%
5%
68%
MSEDCL
Diesel Generator
Solar


Data from Apr. to Dec. 2017
Consumption of power sources: 2017-18
27.61%
10%
62%
MSEDCL
Diesel Generator
Solar

SK2

Specific Energy Consumption Trend



Target Setting

- **Specific energy consumption targets for 2017-18**

Description	2015-2016	2016-2017 Achieved	2017-2018 Target-Short	2018-2019 Target-Mid	2019-2020 Target-Long
MJ/ Production Hours	7.39	6.71	6.26	5.67	5.38
Reduction in %	Baseline	9.32 %	6.22 %	15.46 %	19.80 %

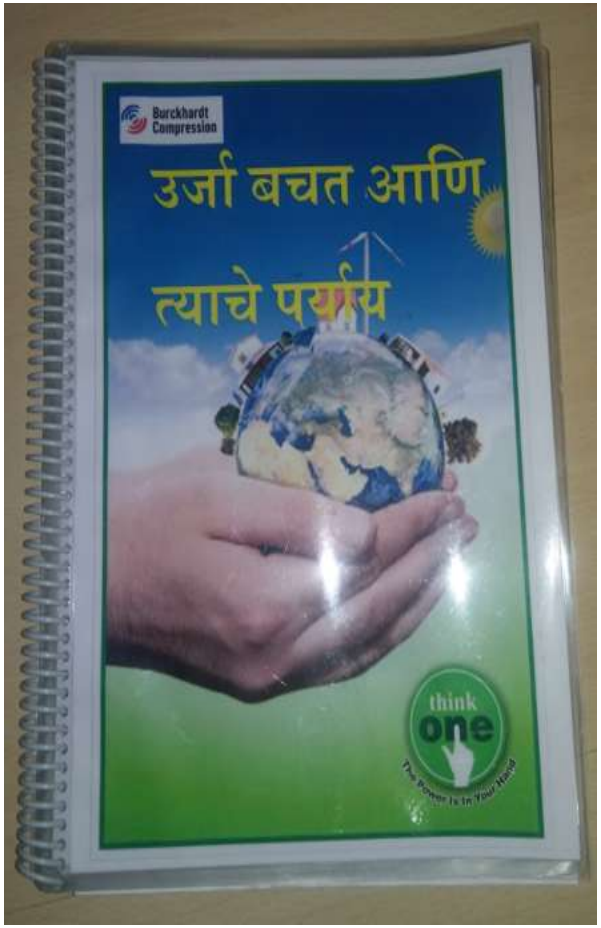
Awareness Creation & Employee Involvement

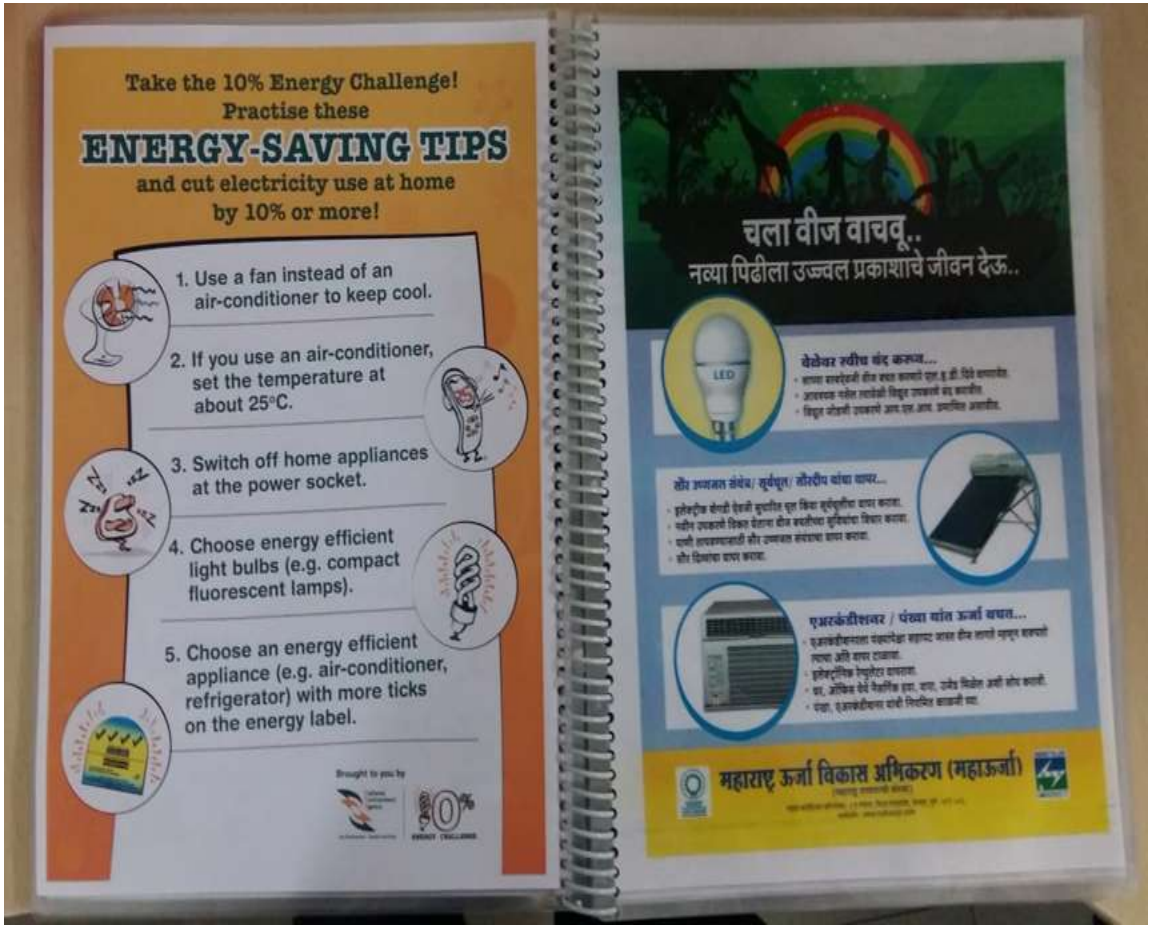
Awareness Creation & Employee Involvement 2/16

- **Tool Box Talk**

Awareness Creation & Employee Involvement 3/16

- **Energy Conservation Booklets (English & Marathi)**





Awareness Creation & Employee Involvement

- **Displays**

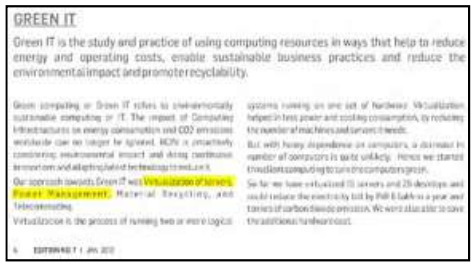
Machine: DMC63V-VMC	KW Per Hrs.	₹ Per Hrs.
Electrical consumption in no load condition & Power ON	2.50	20.00
Electrical consumption on load condition (Cycle ON)	8.50	68.00
Note: Please switch OFF the machine, If not in use.		

Awareness Creation & Employee Involvement

- **Posters**

Awareness Creation & Employee Involvement 6/16

- **Green Articles was regularly published in our Half Yearly Magazine 'Spandan'**


GREEN IT

Green IT is the study and practice of using computing resources in ways that help to reduce energy and operating costs, enable sustainable business practices and reduce the environmental impact and promote recyclability.


Greenco- Harnessing the Sun's Energy


Burckhardt Compression

Spandan

स्पंदन


GreenCo Journey towards Silver Rating


BCIN SUPPLIER MEET

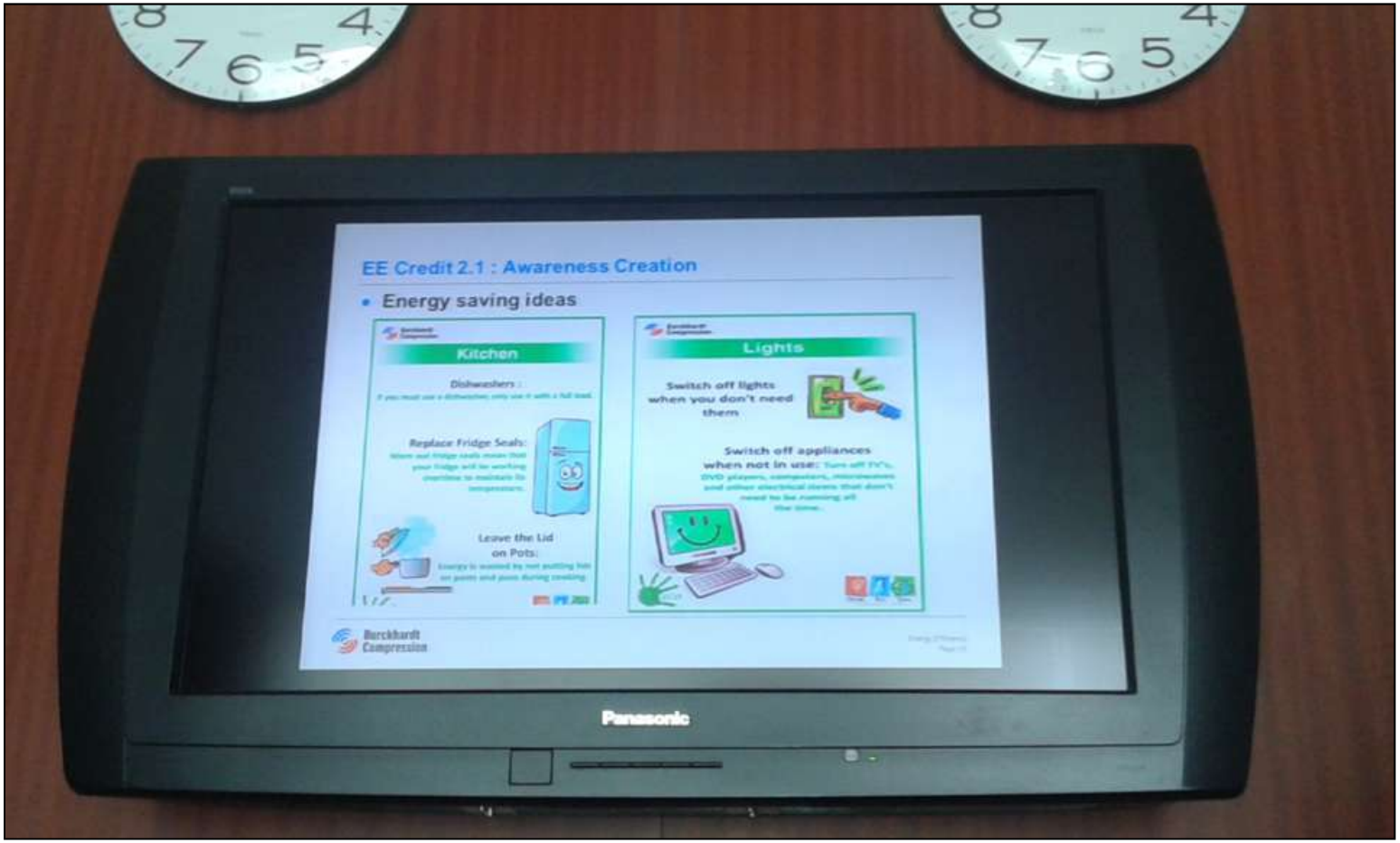
GO GREEN, THINK GREEN!


OUR LITTLE SUPPORT CAN MAKE BIG CHANGE IN SOMEONE'S LIFE...


ENERGY CONSERVATION DAY

Awareness Creation & Employee Involvement 7/16

- **GreenCo Videos**



Awareness Creation & Employee Involvement

- **Celebration of Energy conservation week**
  - **Display Energy conservation posters & banners at various locations**

Awareness Creation & Employee Involvement 9/16

- **Celebration of Energy conservation week**
  - **Energy conservation Oath**






Awareness Creation & Employee Involvement 10/16

- **Celebration of Energy conservation week**
  - **Presentation on Energy conservation at ITI Shirur**






Awareness Creation & Employee Involvement 11/16

- **Celebration of Energy conservation week**
  - **Presentation on Energy conservation at Kondhapuri School**






Awareness Creation & Employee Involvement

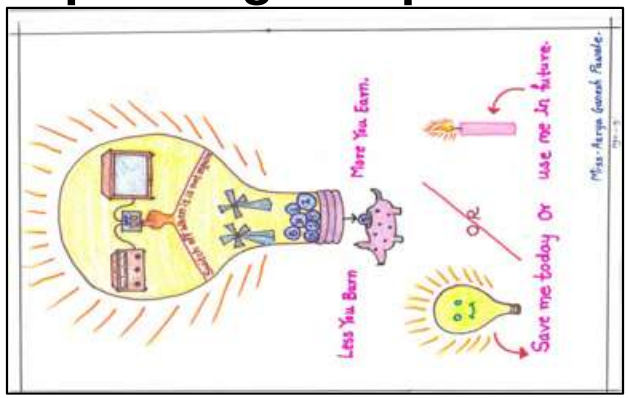
- **Celebration of Energy conservation week**
  - **Showing Energy conservation videos at Shop Floors**

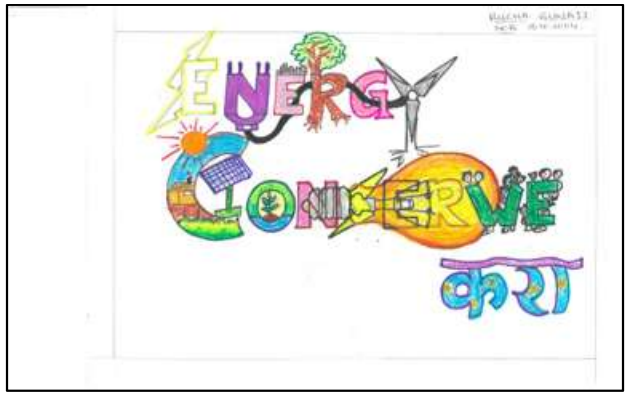




Awareness Creation & Employee Involvement 13/16

- **Celebration of Energy conservation week**
  - **Energy saving poster/painting competition for employee children's**





Awareness Creation & Employee Involvement 14/16

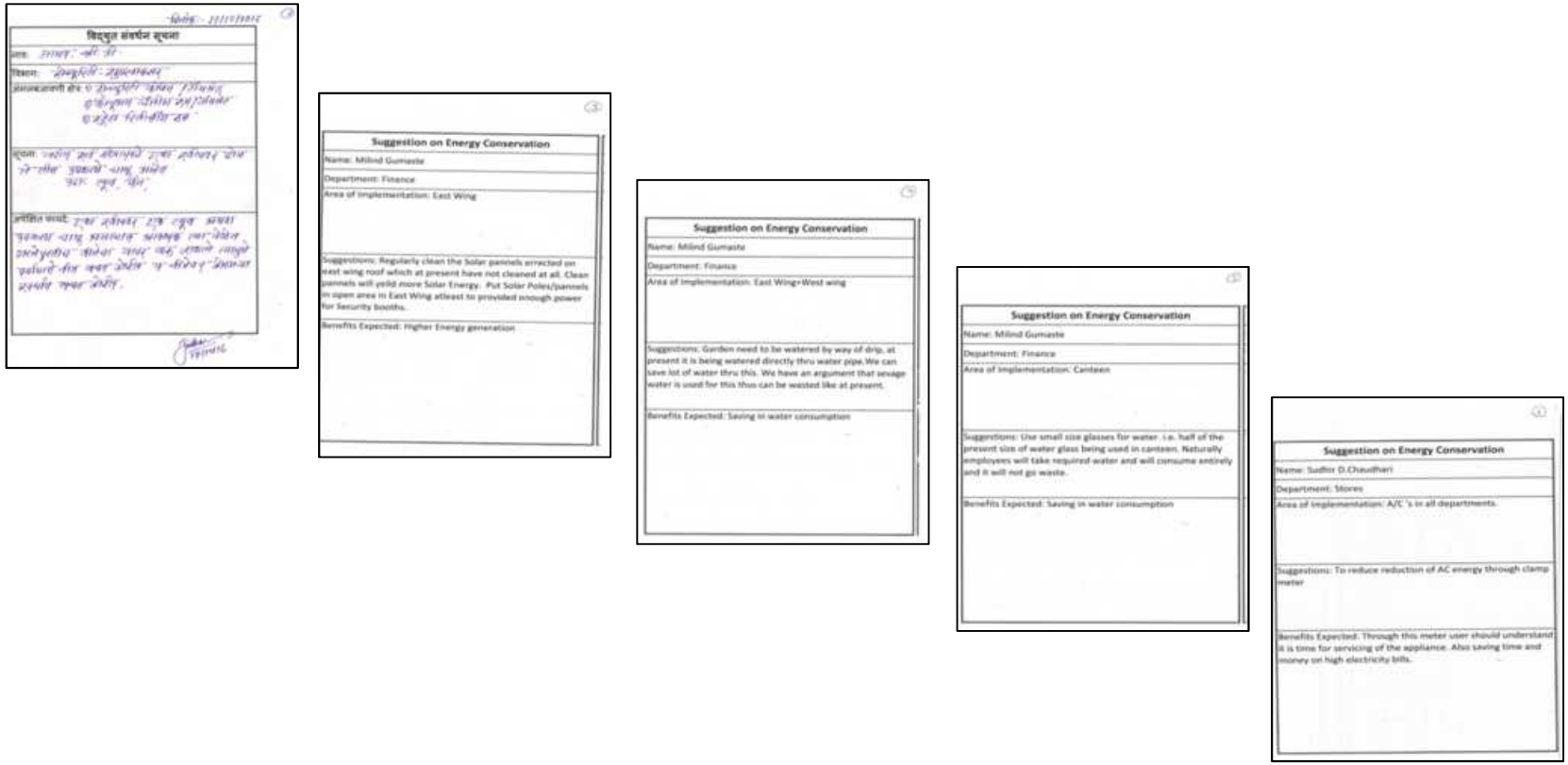
- **Celebration of Energy conservation week**
  - **Inter departmnental competition on Energy conservation**






Awareness Creation & Employee Involvement 15/16

- **Celebration of Energy conservation week**
  - **Energy saving suggestions Competition**



Suggestion on Energy Conservation
Name: Milind Gumaste
Department: Finance
Area of implementation: East Wing
Suggestions: Regularly clean the Solar pannels errected on east wing roof which at present have not cleaned at all. Clean pannels will yeild more Solar Energy. Put Solar Poles/pannels in open area in East Wing atleast to provided enough power for Security booths.
Benefits Expected: Higher Energy generation

Suggestion on Energy Conservation
Name: Milind Gumaste
Department: Finance
Area of implementation: East Wing+West wing
Suggestions: Garden need to be watered by way of drip, at present it is being watered directly thru water pipe.We can save lot of water thru this. We have an argument that sewage water is used for this thus can be wasted like at present.
Benefits Expected: Saving in water consumption

Suggestion on Energy Conservation
Name: Milind Gumaste
Department: Finance
Area of implementation: Canteen
Suggestions: Use small size glasses for water i.e. half of the present size of water glass being used in canteen. Naturally employees will take required water and will consume entirely and it will not go waste.
Benefits Expected: Saving in water consumption

Suggestion on Energy Conservation
Name: Sudhir D.Chaudhari
Department: Stores
Area of implementation: A/C 's in all departments.
Suggestions: To reduce reduction of AC energy through clamp meter
Benefits Expected: Through this meter user should understand it is time for servicing of the appliance. Also saving time and money on high electricity bills.

Awareness Creation & Employee Involvement

- **Celebration of Energy conservation week**
  - **Energy saving online quiz competition for staff**

Back

Awareness Creation - Out of fence 1/2

- **For improving the energy efficiency, we have successfully organised 7 wt. LED bulbs booths at special discounted rate**
- **BCIN employees purchased around 900 LED bulbs.**
- **90% of employees have 100% LED's at Home**

Awareness Creation- Out of fence 2/2

- **BCIN donate Solar Water heater in Shrimati Babaitai Takalkar Primary Ashram Shala, Nimgaon Mhalungi, Tal. Shirur, Pune.**

टाकळकर आश्रमशाळेस सोलर वॉटर हिटर भेट

तळेगाव ढमढेरे, ता. ७ : निमगाव म्हाळुंगी (ता. शिरूर) येथील श्रीमती बबईताई टाकळकर प्राथमिक आश्रमशाळेस कोंढापुरी येथील बुरखार्ट कॉम्प्रेशन इंडिया कंपनीतर्फे सोलर वॉटर हिटर भेट देण्यात आला. कंपनीचे व्यवस्थापकीय संचालक मिलिंद वागळे यांच्या हस्ते शुक्रवारी सोलर वॉटर हिटर आश्रमशाळेला प्रदान करण्यात आला.

कार्यक्रमाच्या अध्यक्षस्थानी शिक्षण संस्थेचे अध्यक्ष, माजी आमदार सूर्यकांत पलांडे होते. या वेळी कंपनीचे अधिकारी रघुनंदन गुणाजी, प्रसाद भिडे, दिनेश खोडे, रवींद्र शेलार, उपसरपंच महेंद्र रणसिंग, संस्थेचे पदाधिकारी व संचालक उपस्थित होते. सोलर वॉटर हिटरसाठी कंपनीतर्फे सुमारे १ लाख ६५ हजार रुपये खर्च केले आहेत.

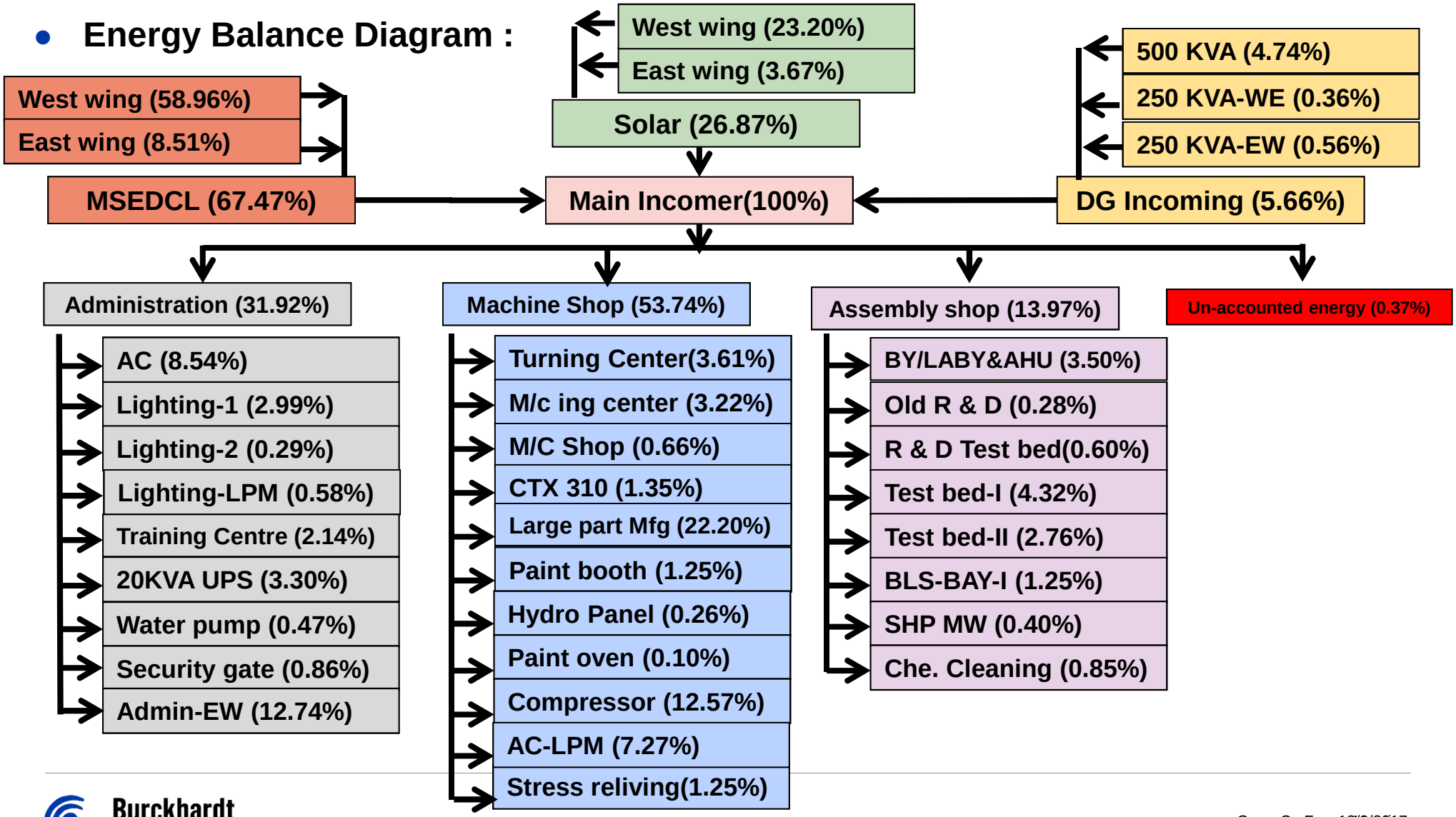
निमगाव म्हाळुंगी (ता. शिरूर) : प्राथमिक आश्रमशाळेला कोंढापुरी येथील बुरखार्ट कंपनीतर्फे देण्यात आलेला सोलर वॉटर हिटर.

"कंपनीने दिलेल्या सोलर वॉटर हिटरमुळे आश्रमशाळेतील भटक्या विमुक्तांच्या मुला-मुलींना अंघोळीसाठी गरम पाणी मिळणार आहे. दिलेल्या सुविधेचा योग्य व प्रमाणात वापर करून गोरगरीब विद्यार्थ्यांचे जीवन अधिक प्रगल्भ करण्यासाठी संस्थेतर्फे प्रयत्न करण्यात येईल," असे पलांडे यांनी सांगितले.

शिक्षण संस्थेतील विद्यार्थ्यांनी मिळविलेली राज्य व देशपातळीवरील विविध बक्षिसे व गुणवत्ता, शालेय शिस्त, स्वच्छता व टापटीपपणा आदींचे विशेष कौतुक कंपनीचे अधिकारी वागळे यांनी केले. या वेळी कंपनीतर्फे विद्यार्थ्यांना मिठाई वाटप करण्यात आली. मुख्याध्यापक सोपान कर्डिले यांनी प्रास्ताविक करून स्वागत केले. अधीक्षक झेंडे पवार यांनी आभार मानले.

Energy Monitoring & Management Systems 1/3

- **Energy Balance Diagram :**

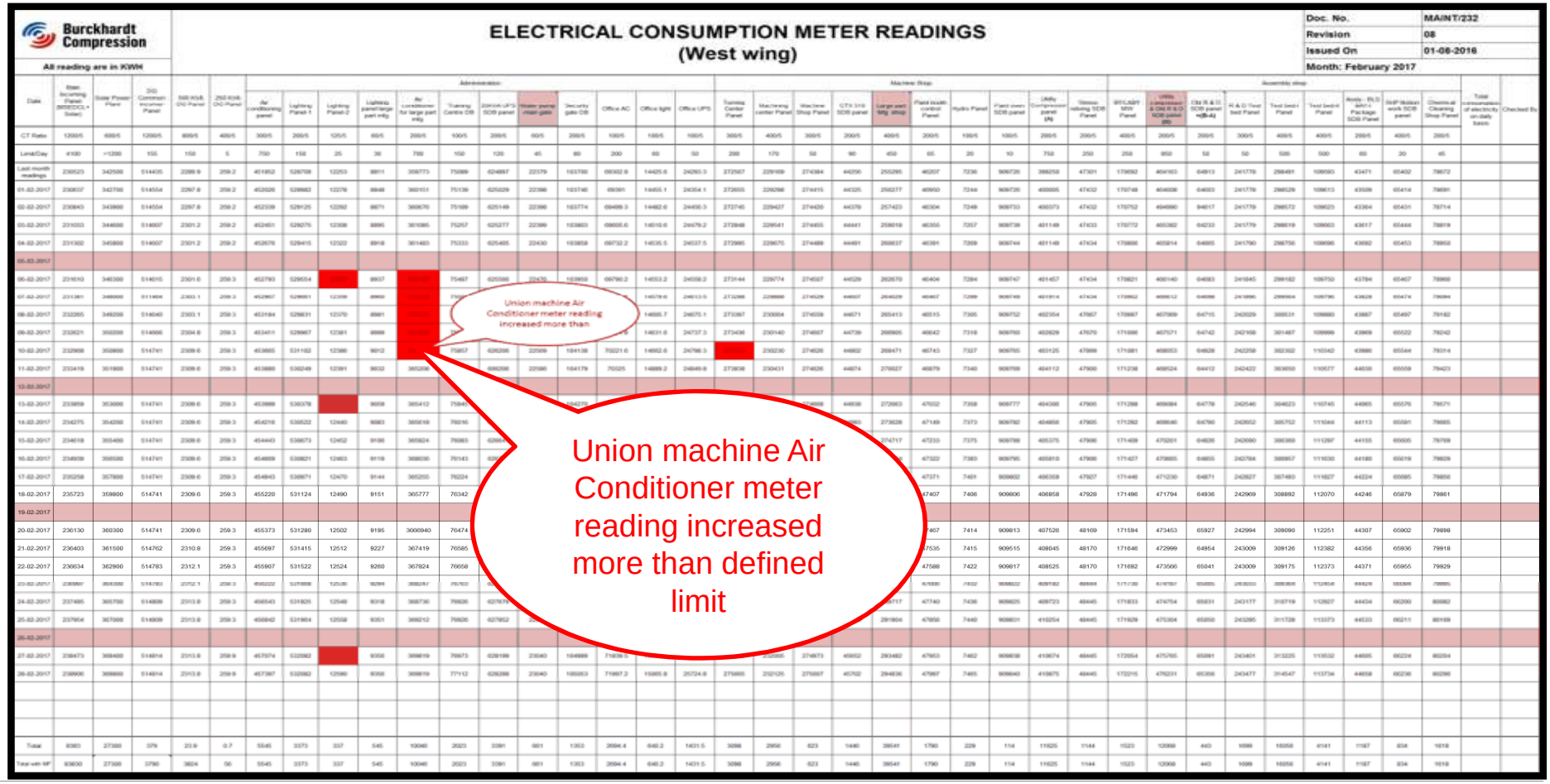


Daily Variance Analysis & Correction 1/3

- **40 Nos. of energy meters**
  - **Reasons for increase in energy consumption**
  - **Analysis carried out**
  - **Corrective action taken**

Daily Variance Analysis & Correction 2/3

- **Case Study for Union machine Air Conditioner meter reading increased more than defined limit.**



Burckhardt Compression

All reading are in KWH

ELECTRICAL CONSUMPTION METER READINGS
(West wing)

Doc. No.	MAINT/232
Revision	08
Issued On	01-08-2016
Month: February 2017	

Union machine Air Conditioner meter reading increased more than defined limit

Daily Variance Analysis & Correction 3/3

- **Case Study for Union machine Air Conditioner meter reading increased more than defined limit.**

Problem	Root Cause	Corrective Action	Planned Action
• Union m/c AC meter reading increased	• Air conditioner outdoor unit and inlet ducting joining bellow found tear out so cold air partially leak into atmosphere	• Tear out bellow opening closed by sticky rubber.	• Joining bellow should be checked & replaced if necessary, during Preventive Maintenance on quarterly basis

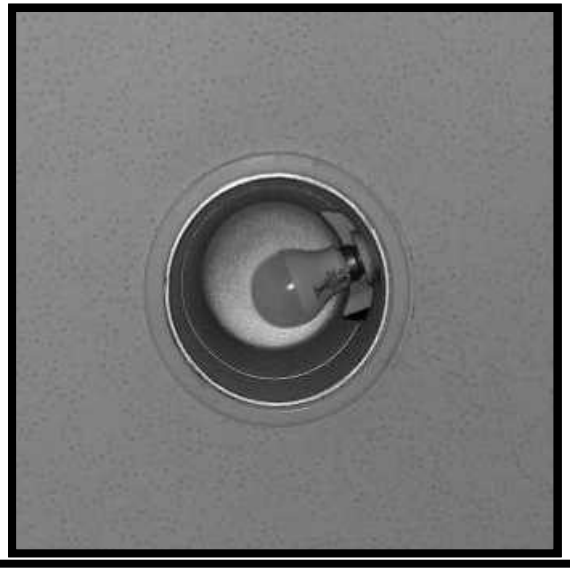
Energy Saving Projects

- **Project title: Sodium Vapor street lights replaced with LED lights**

Before	After
	
125 watt metal halide high bay lights installed	60 watt LED high bay lights installed (17 Nos.)
Annual Energy saving = 7767 KWH, Annual cost saving = Rs. 0.97 Million Investment = 0.94 Million, Payback = 0.96 Years	

Energy Saving Projects

- **Project title: Office CFL spot light fittings retrofitted with LED fittings**

Before	After
	
36 & 18 watt CFL spot light fittings installed	7 watt CFL spot light fittings installed (60 Nos.)
Annual Energy saving = 1710 KWH, Annual cost saving = Rs. 0.21 Million Investment = 0.12 Million, Payback = 0.57 Years	

Energy Saving Projects

- **Project title: East wing 2'X2' office CFL lights replaced with LED lights**

Before	After
	
72 watt CFL 2'X2' office lights fittings installed	34 watt LED 2'X2' office lights fittings installed (54 Nos.)
Annual Energy saving = 4924 KWH, Annual cost saving = Rs. 0.62 Million Investment = 0.52 Million, Payback = 0.84 Years	

Energy Saving Projects

- **Project title: Metal Halide high bay lights replaced with LED**

Before	After
	
400 watt metal halide high bay lights installed	119 watt LED high bay lights installed (75 Nos.)
Annual Energy saving = 75852 KWH, Annual cost saving = Rs. 0.83 Million Investment = 1.01 Million, Payback = 1.2 Years	

Energy Saving Projects

- **Pneumatic air gun replaced with Trans vector nozzles guns**

Before	After
	
Pneumatic air gun used for cleaning	Trans vector nozzles type of guns used for cleaning (05 Nos.)
Annual Energy saving = 4800 KWH, Annual cost saving = Rs. 0.043 Million Investment = 0.015 Million, Payback = 0.35 Years	

Energy Saving Projects

- **Separate air ring blower provided for ETP aeration**

Before	After
	
Air used for aeration process from regular air compressor	Separate air ring blower provided for ETP aeration
Annual Energy saving = 26712 KWH, Annual cost saving = Rs. 0.142 Million Investment = 0.075 Million, Payback = 0.53 Years	

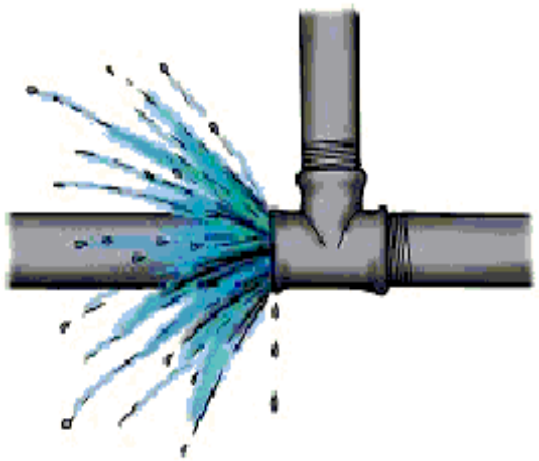
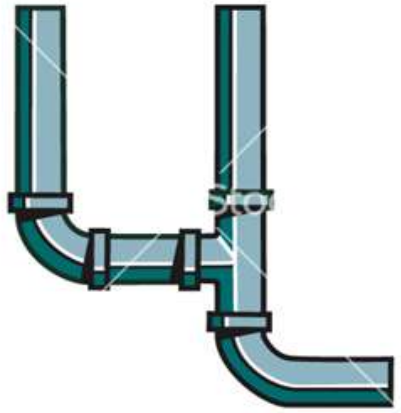
Energy Saving Projects

- **Star-Delta starters replaced with VFD**

Before	After
	
Star-Delta starters used to run blower motors	VFD used to run blower motors
Annual Energy saving = 123586 KWH, Annual cost saving = Rs.1.112 Million Investment = 0.467 Million, Payback = 0.42 Years	

Energy Saving Projects

- **All possible air leakages arrested from air line**

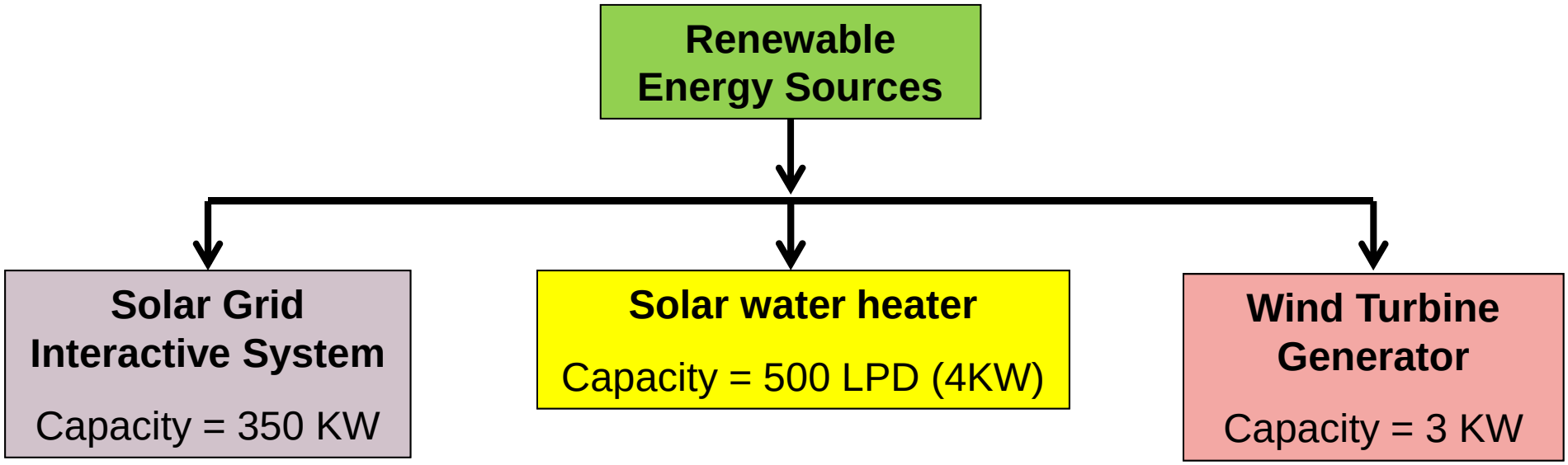
Before	After
	
Air leakages from various pipe joints	All possible air leakages arrested after Ultrasonic leak inspection
Annual Energy saving = 20635 KWH, Annual cost saving = Rs. 0.186 Million Investment = 0.042 Million, Payback = 0.22 Years	

Energy Awards

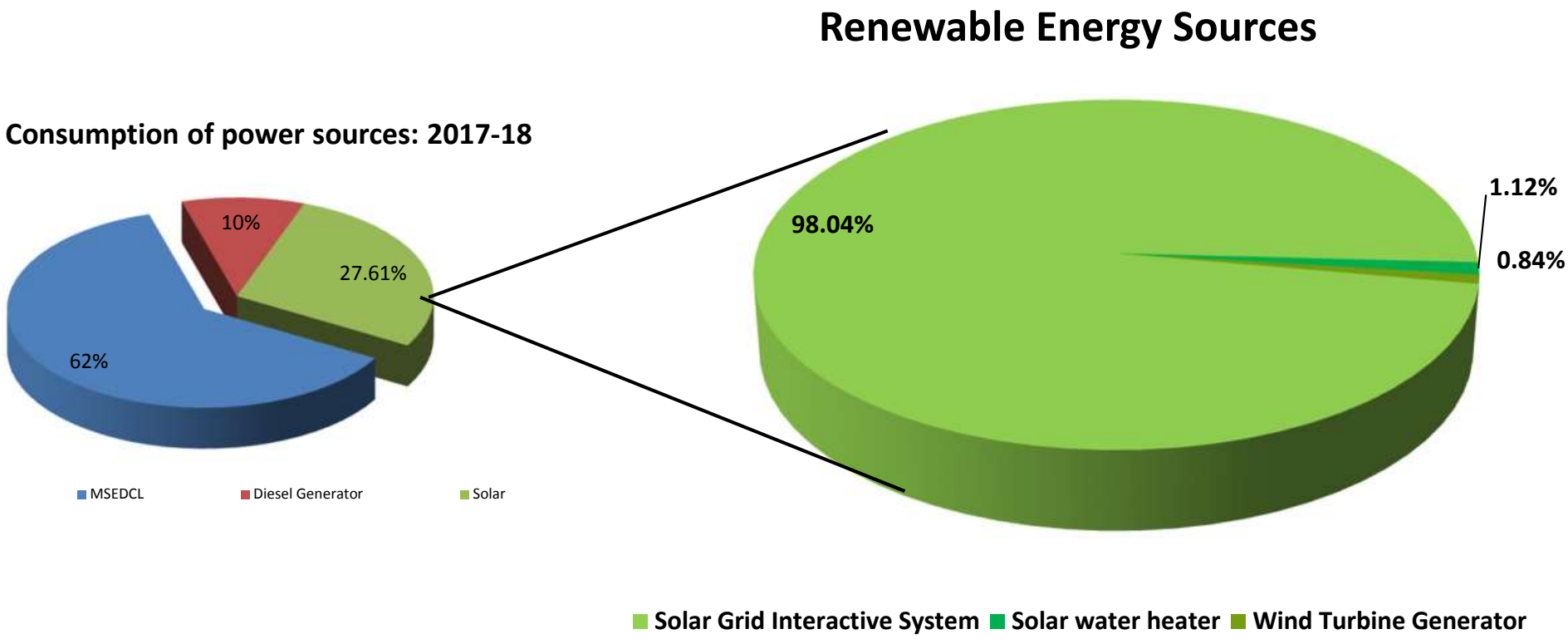
- **We are winner of SEEM National Energy Management Award 2016.**
  - **Category : Industries**
  - **Sector : Engineering**
  - **Position : Silver**

RENEWABLE ENERGY

Renewable Energy Source:



Renewable energy Scenario:



Energy Saving RE Projects

- **350 KW Grid interactive solar system installed**

Before	After
MAHARASHTRA STATE ELECTRICITY BOARD	
Electrical Input power source from MSEDCL	Electrical Input power source from Solar (Renewable energy source)
Annual Energy saving = 511000 KWH, Annual cost saving = Rs.1.533 Million Investment = 0.000 Million, Payback = 0.00 Years	

Energy Saving RE Projects

- **MSEDCL power replaced with wind turbine power**

Before	After
MAHARASHTRA STATE ELECTRICITY BOARD	
MSEDCL power is used for electric load.	Wind turbine is used for electric load.
Annual Energy saving= 10800 KWH, Annual cost saving= Rs. 0.0972 Million Investment = 0.325 Million, Payback = 3.34 Years	

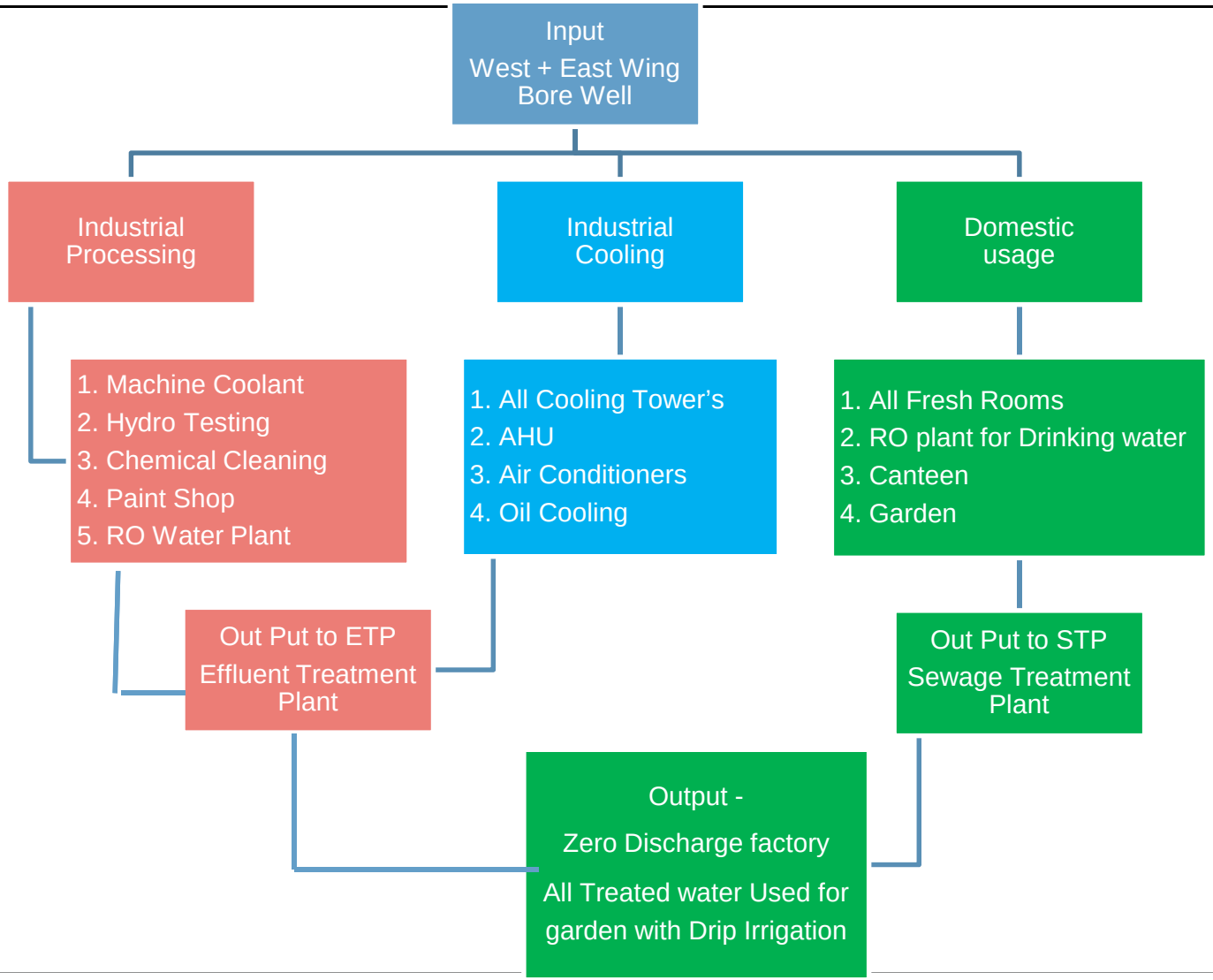
Energy Saving RE Projects

- **MSEDCL power replaced with Solar water heater**

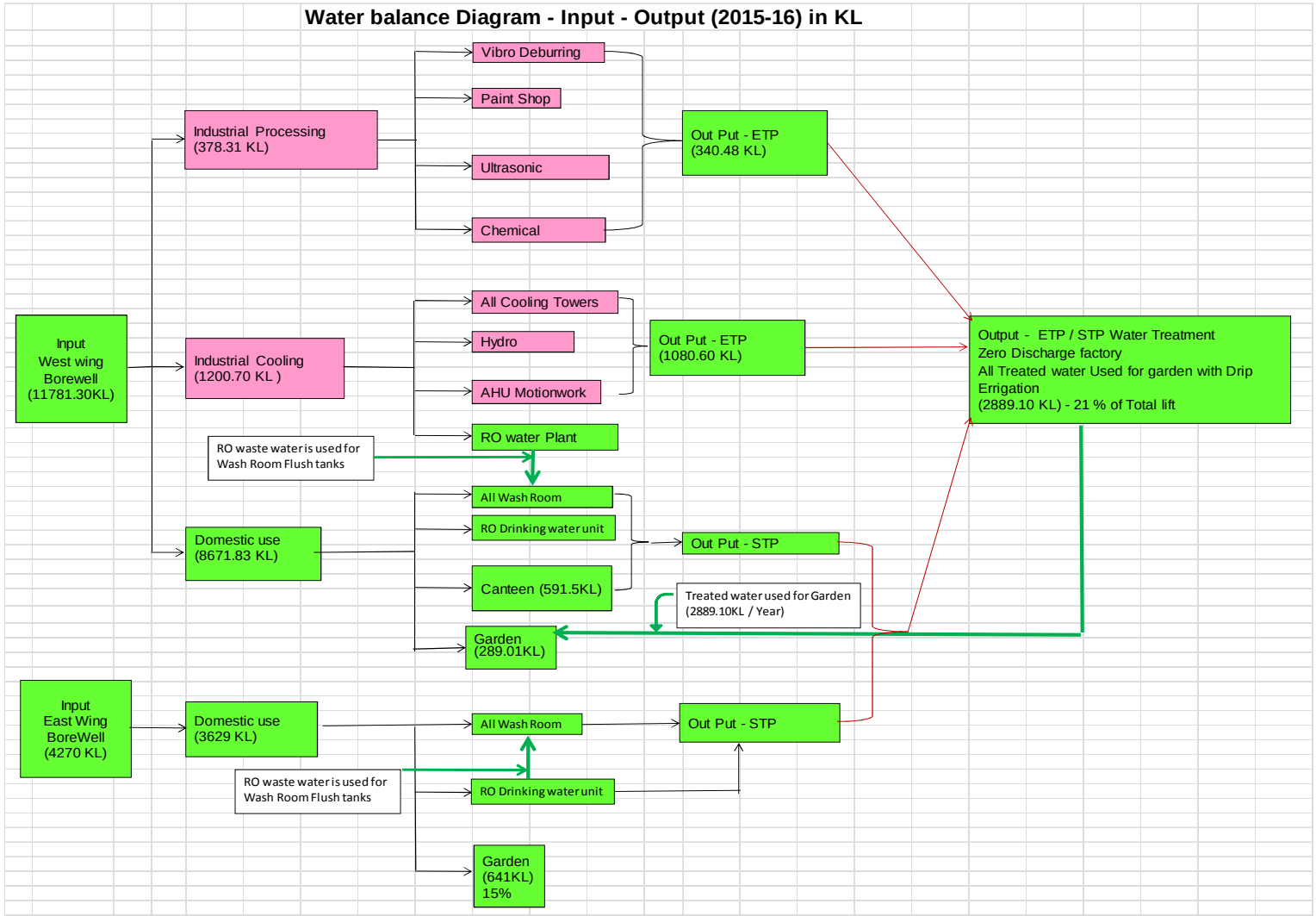
Before	After
MAHARASHTRA STATE ELECTRICITY BOARD	
MSEDCL power is used for Water heating.	Solar is used for water heating.
Annual Energy saving= 4800 KWH, Annual cost saving= Rs. 0.0432 Million Investment = 0.03 Million, Payback = 0.69 Years	

WATER CONSERVATION

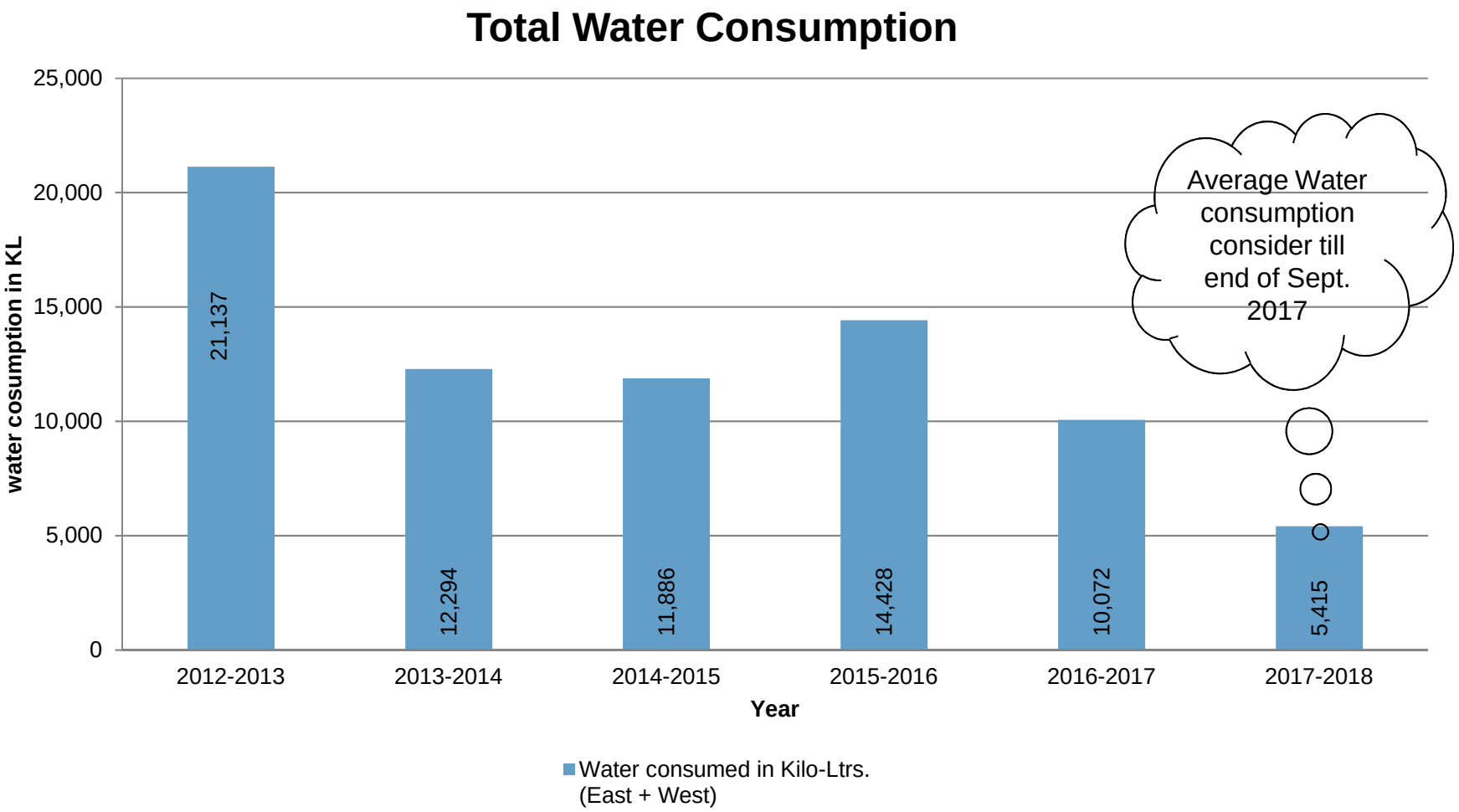
Water Source at BCIN –
Block Diagram of Water Input - Output matrix



Water Balance Diagram

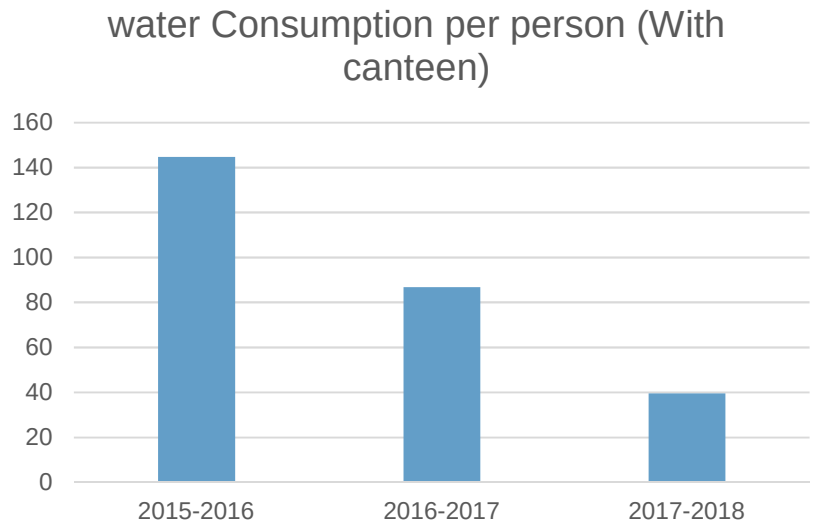


Total Water Consumption Trend



Water Source – Domestic Water Consumption / Person

Total Water Consumption / Man-day				
S.N.	Years	Water Consumption including canteen	No. of Man-days	water Consumption per person (With canteen)
1	2015-2016	11874	82013	145
2	2016-2017	7135	82189	87
3	2017-2018	1668	42162	40



Daily water Monitoring Format

WATER CONSUMPTION METER READING
(WEST WING)

Document No.	MAINT/213
Revision no.	06
Issued on	01-08-2016
Month: March 2017	

All reading are in Kilo- Ltrs

	Incoming Water						Industrial Processing			Industrial Cooling						
Date	Water consumed from Main Gate Bore well (A)	Water consumed from Backside Bore well (B)	Water consumed from East wing Bore well (C)	Water lift from Under Ground tank (D)	Union building rain water harvesting (E)= (D-A-B-C+P)	Total water lift from Ground (F) =(A+B+C+E)	Paint Booth (G)	Chemical Cleaning Shop (H)	Total Water consumed for Industrial Processing (I) =(G+H)	Cooling Tower - 1 (Test bed canopy) (J)	Cooling Tower - 4 (Honing M/c) (k)	AHU-1 & 2 (Near DG sets) (L)	AHU-3 (Above Utility-I) (M)	RO plant for machine shop (N)	Total Water consumed for Industrial Cooling (O) =(J+K+L+M+N)	Canteen (P)
Per day/ per cycle Avg. Cons. Trigger	23.50	0.00	0.00	18.00	0.00	23.50	Daily = 0.5 Cycle = 18	1.00	Daily = 1.5 Cycle = 18	2.00	0.50	2.00	0.10	2.00	6.60	5.50
Last month reading	3930.00	6.00	2184.30	18984.00	0.00	6120.30	692.02	486.77	1178.79	1241.99	0.59	446.14	9.68	2742.01	4440.41	6724.00
01-03-2017	3961.00	6.00	2184.30	19010.00	0.00	6151.30	692.69	491.89	1184.58	1245.02	0.59	446.14	9.68	2744.01	4445.44	6727.00
02-03-2017	3961.00	6.00	2184.30	19010.00	0.00	6151.30	692.69	192.00	884.69	1245.02	0.59	446.14	9.68	2746.00	4447.43	6727.00
03-03-2017	4002.00	6.00	2184.30	19106.00	0.00	6192.30	692.69	493.01	1185.70	1250.45	0.59	446.14	9.68	2754.01	4460.87	6738.00
04-03-2017	4020.00	6.00	2184.30	19118.00	0.00	6210.30	692.69	494.01	1186.70	1252.01	0.59	446.14	9.68	2755.01	4463.43	6743.00
05-03-2017																
06-03-2017	4055.00	6.00	2186.00	19167.00	0.00	6247.00	692.69	497.16	1189.85	1252.01	0.59	446.14	9.68	2761.00	4469.42	6759.00
07-03-2017	4065.00	6.00	2186.00	19178.00	0.00	6257.00	692.69	497.16	1189.85	1252.01	0.59	446.14	9.68	2761.00	4469.42	6763.00
08-03-2017	4085.00	6.00	2186.00	19203.00	0.00	6277.00	692.69	498.16	1190.85	1254.01	0.59	446.14	9.68	2763.00	4473.42	6766.00
09-03-2017	4097.00	6.00	2186.00	19224.00	0.00	6289.00	692.69	500.16	1192.85	1256.10	0.59	446.14	9.68	2770.00	4482.51	6770.00
10-03-2017	4099.00	6.00	2186.00	19239.00	0.00	6291.00	692.69	500.16	1192.85	1256.10	0.59	446.14	9.68	2770.00	4482.51	6773.00
11-03-2017	4110.00	6.00	2186.00	19255.00	0.00	6302.00	692.69	500.16	1192.85	1256.10	0.59	446.14	9.68	2770.00	4482.51	6773.00
12-03-2017																
13-03-2017	4162.00	6.00	2186.00	19277.00	0.00	6354.00	692.69	502.01	1194.70	1256.10	0.59	450.01	9.68	2779.00	4495.38	6782.00
14-03-2017	4190.00	6.00	2186.00	19286.00	0.00	6382.00	692.69	502.01	1194.70	1256.10	0.59	450.01	9.68	2784.00	4500.38	6782.00
15-03-2017	4232.00	6.00	2186.00	19310.00	0.00	6424.00	692.69	502.01	1194.70	1256.10	0.59	450.01	9.68	2784.00	4500.38	6788.00
16-03-2017	4276.00	6.00	2186.00	19342.00	0.00	6468.00	692.69	502.16	1194.85	1256.10	0.59	450.01	9.68	2786.00	4502.38	66791.00
17-03-2017	4280.00	6.00	2186.00	19355.00	0.00	6472.00	692.69	502.16	1194.85	1256.10	0.59	450.01	9.68	2788.00	4504.38	6795.00
18-03-2017	4298.00	6.00	2186.00	19365.00	0.00	6490.00	692.69	502.16	1194.85	1256.10	0.59	450.01	9.68	2790.00	4506.38	6801.00
19-03-2017																
20-03-2017	4300.00	6.00	2186.00	19407.00	0.00	6492.00	693.10	503.16	1196.26	1256.10	0.59	450.01	9.68	2797.00	4513.38	6801.00
21-03-2017	4326.00	6.00	2186.00	19443.00	0.00	6518.00	693.10	503.16	1196.26	1256.10	0.59	450.01	9.68	2800.00	4516.38	6828.00
22-03-2017	4362.00	6.00	2186.00	19465.00	0.00	6554.00	693.10	503.16	1196.26	1256.10	0.59	450.01	9.68	2802.00	4518.38	6828.00
23-03-2017	4381.00	6.00	2186.00	19490.00	0.00	6573.00	693.10	504.16	1197.26	1256.10	0.59	450.01	9.68	2802.00	4518.38	6828.00
24-03-2017	4395.00	6.00	2186.00	19511.00	0.00	6587.00	693.10	506.16	1199.26	1256.10	0.59	450.01	9.68	2802.00	4518.38	6830.00
25-03-2017	4402.00	6.00	2186.00	19522.00	0.00	6594.00	693.10	507.16	1200.26	1256.10	0.59	450.01	9.68	2804.00	4520.38	6833.00
26-03-2017																
27-03-2017	4458.00	6.00	2186.00	19597.00	0.00	6650.00	693.10	507.16	1200.26	1256.10	0.59	450.01	9.68	2819.00	4535.38	6838.00
28-03-2017																
29-03-2017	4495.00	6.00	2186.00	19635.00	0.00	6687.00	693.10	538.10	1231.20	1256.10	0.59	450.01	9.68	2820.00	4536.38	6850.00
30-03-2017	4521.00	6.00	2186.00	19680.00	0.00	6713.00	693.10	553.10	1246.20	1256.10	0.59	450.01	9.68	2823.00	4539.38	6857.00
31-03-2017	4548.00	6.00	2186.00	19715.00	0.00	6740.00	693.10	556.10	1249.20	1256.10	0.59	455.10	9.68	2825.00	4546.47	6860.00
Total Consumption	618.00	0.00	1.70	731.00	0.00	619.70	1.08	69.33	70.41	14.11	0.00	8.96	0.00	82.99	106.06	136.00
N																

	Domestic consumption (cont.)					Sewage generated					Gardening water			Trade effluent	Domestic effluent	
Date	Solar grid interactive system (Q)	Office Block (R)	Security gate bathroom (S)	All bathroom (T) =(R-H-L-M-AB)	Total water used for Domestic (U) =(P+Q+S+T)	Septic tank 1 (Shop floor toilets) (V)	Septic tank 2 (Office toilets) (W)	Septic tank 3 (Canteen & security toilets) (X)	Septic tank 4 (East wing office toilets) (Y)	Total sewage generated (Z) =(V+W+X+Y)	Raw water for Garden (Near Cooling tower-1) (AA)	Raw water for Garden (Near four wheeler parking) (AB)	Treated water from ETP outlet/ Gardening water (AC)	Primary Industrial Treated Effluent (Treated Effluent from ETP) (AD)	Treated Effluent from STP (AE) =(AC-AD)	Electricity used for ETP in KW
Per day/ per cycle Avg. Cons. Trigger	Daily = 0 Cycle = 15	5.00	1.00	2.00	Daily = 8 Cycle = 23	4.50	2.00	7.00	6.00	19.50	1.00	1.00	23.50	3.50	20.00	15.00
Last month reading	54.22	2344.10	245.01	1249.50	8272.73	1620.00	335.10	3038.10	521.60	5514.80	408.01	152.01	32155.00	634.00	31521.00	6143.00
01-03-2017	55.11	2347.10	246.10	1246.29	8274.50	1624.00	335.10	3038.10	521.60	5518.80	410.51	153.10	32163.10	634.00	31529.10	6146.00
02-03-2017	55.22	2350.10	246.10	1547.18	8575.50	1624.00	335.10	3040.10	521.60	5520.80	411.51	155.10	32170.10	634.00	31536.10	6150.00
03-03-2017	56.10	2355.10	274.01	1250.17	8318.28	1624.00	340.10	3040.10	521.60	5525.80	411.51	156.10	32177.00	638.02	31538.98	6154.00
04-03-2017	56.10	2355.10	274.01	1249.17	8322.28	1630.00	340.10	3040.10	521.60	5531.80	411.51	156.10	32185.10	638.02	31547.08	6157.00
05-03-2017																
06-03-2017	56.10	2430.10	274.17	1314.68	8403.95	1636.00	340.10	3055.10	521.60	5552.80	411.51	162.44	32191.00	640.00	31551.00	6161.00
07-03-2017	56.10	2435.10	274.17	1319.68	8412.95	1636.00	340.10	3066.10	521.60	5563.80	411.51	162.44	32198.10	640.00	31558.10	6165.00
08-03-2017	56.10	2440.10	274.17	1323.68	8419.95	1636.00	340.10	3065.10	521.60	5562.80	411.51	162.44	32195.10	640.00	31555.10	6169.00
09-03-2017	56.10	2445.10	274.17	1323.68	8423.95	1636.00	340.10	3070.10	521.60	5567.80	411.51	165.44	32202.10	640.00	31562.10	6172.00
10-03-2017	56.10	2445.10	274.17	1323.68	8426.95	1636.00	340.10	3070.10	521.60	5567.80	411.51	165.44	32209.50	640.00	31569.50	6177.00
11-03-2017	56.10	2445.10	274.17	1323.68	8426.95	1636.00	340.10	3070.10	521.60	5567.80	411.51	165.44	32215.10	640.00	31575.10	6179.00
12-03-2017																
13-03-2017	56.95	2462.10	276.01	1330.39	8445.35	1693.00	345.10	3080.10	521.60	5639.80	415.11	170.01	32225.10	640.00	31585.10	6183.00
14-03-2017	56.95	2465.10	276.01	1333.39	8448.35	1693.00	345.10	3085.10	521.60	5644.80	415.11	170.01	32230.10	640.00	31590.10	6185.00
15-03-2017	56.95	2470.10	281.01	1338.39	8464.35	1693.00	345.10	3090.10	521.60	5649.80	415.11	170.01	32237.00	640.00	31597.00	6189.00
16-03-2017	56.95	2474.01	285.01	1342.15	68475.11	1693.00	345.10	3090.10	521.60	5649.80	415.11	170.01	32245.00	640.00	31605.00	6190.00
17-03-2017	56.95	2478.10	285.10	1346.24	8483.29	1693.00	345.10	3090.10	521.60	5649.80	415.11	170.01	32252.00	640.00	31612.00	6194.00
18-03-2017	56.95	2483.10	287.10	1351.24	8496.29	1693.00	345.10	3100.10	521.60	5659.80	415.11	170.01	32259.00	640.00	31619.00	6196.00
19-03-2017																
20-03-2017	56.95	2517.00	289.89	1362.05	8509.89	1693.00	360.10	3100.10	544.90	5698.10	421..12	192.10	32264.00	640.00	31624.00	6198.00
21-03-2017	56.95	2521.00	290.01	1366.05	8541.01	1697.00	360.10	3100.10	544.90	5702.10	421..13	192.10	32271.00	640.00	31631.00	6102.00
22-03-2017	56.95	2525.00	290.10	1369.15	8544.20	1697.00	360.10	3100.10	544.90	5702.10	421..14	193.00	32280.00	640.00	31640.00	6203.00
23-03-2017	56.95	2530.00	290.10	1370.05	8545.10	1697.00	360.10	3110.10	544.90	5712.10	421..15	196.10	32285.00	640.00	31645.00	6209.00
24-03-2017	56.95	2535.00	297.01	1373.05	8557.01	1697.00	360.10	3110.10	544.90	5712.10	421..16	196.10	32292.00	640.00	31652.00	6216.00
25-03-2017	56.95	2540.00	298.10	1377.15	8565.20	1697.00	360.10	3110.10	544.90	5712.10	424.12	196.00	32298.00	640.00	31658.00	6220.00
26-03-2017																
27-03-2017	56.95	2550.00	299.10	1383.05	8577.10	1700.00	360.10	3110.10	544.90	5715.10	428.12	200.10	32306.00	640.00	31666.00	6222.00
28-03-2017																
29-03-2017	56.95	2560.00	299.10	1351.96	8558.01	1710.00	365.10	3110.10	544.90	5730.10	429.12	210.25	32311.00	650.00	31661.00	6228.00
30-03-2017	56.95	2565.00	300.10	1341.11	8555.16	1715.00	365.10	3110.10	544.90	5735.10	430.12	211.10	32316.00	650.00	31666.00	6231.00
31-03-2017	56.95	2580.00	300.10	1348.02	8565.07	1715.00	365.10	3110.10	544.90	5735.10	430.12	211.10	32321.00	650.00	31671.00	6234.00
Total Consumption	2.73	235.90	55.09	98.52	292.34	95.00	30.00	72.00	23.30	220.30	22.11	59.09	166.00	16.00	150.00	91.00

Total Water consumed (I+O+U+AA+AB) = 550.01 | Total water regenerated (AC) = 166.00

	Incoming Water	Industrial Processing	Industrial Cooling	Domestic consumption	Sewage generated	Gardening water	Trade effluent	Domestic effluent
Total Water Consumption Per Day	22.13	2.51	3.79	10.44	7.87	6.72	0.57	5.36
Total Water Consumption Limit Day		5.00	7.00	24.00				
Excess Water Consumption Limit Day		-2.49	-3.21	-13.56	7.87			

Projects/activities :

- **Arrested underground leakages. Water pipes taken above ground.**

Projects/activities :

- **Sprinklers & Drip irrigation**



Projects/activities :

- **RO waste water used for toilet flushing**

Projects/activities :

- **Push cocks with nozzles**

Projects/activities :

- **Waterless urinals**

Projects/activities :

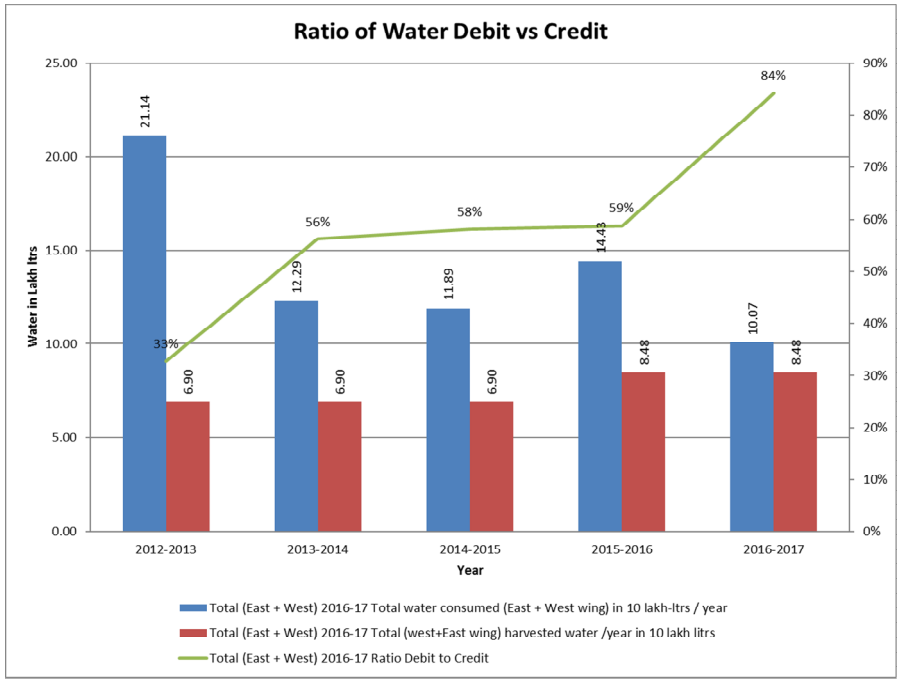
- **Reuse of ETP/STP treated water for Gardening**

Projects/activities :

- **Automation of water pump operations – eliminate overflow**

Water Index

- Water Index – 84% for year 2016-2017(Water Credit to Debit Ratio)
- Border line area of compound, Guest Parking, Bus parking in front of gate is not covered.(16%)
- Overall 84% RWH potential area is captured.



Total (East + West) 2016-17

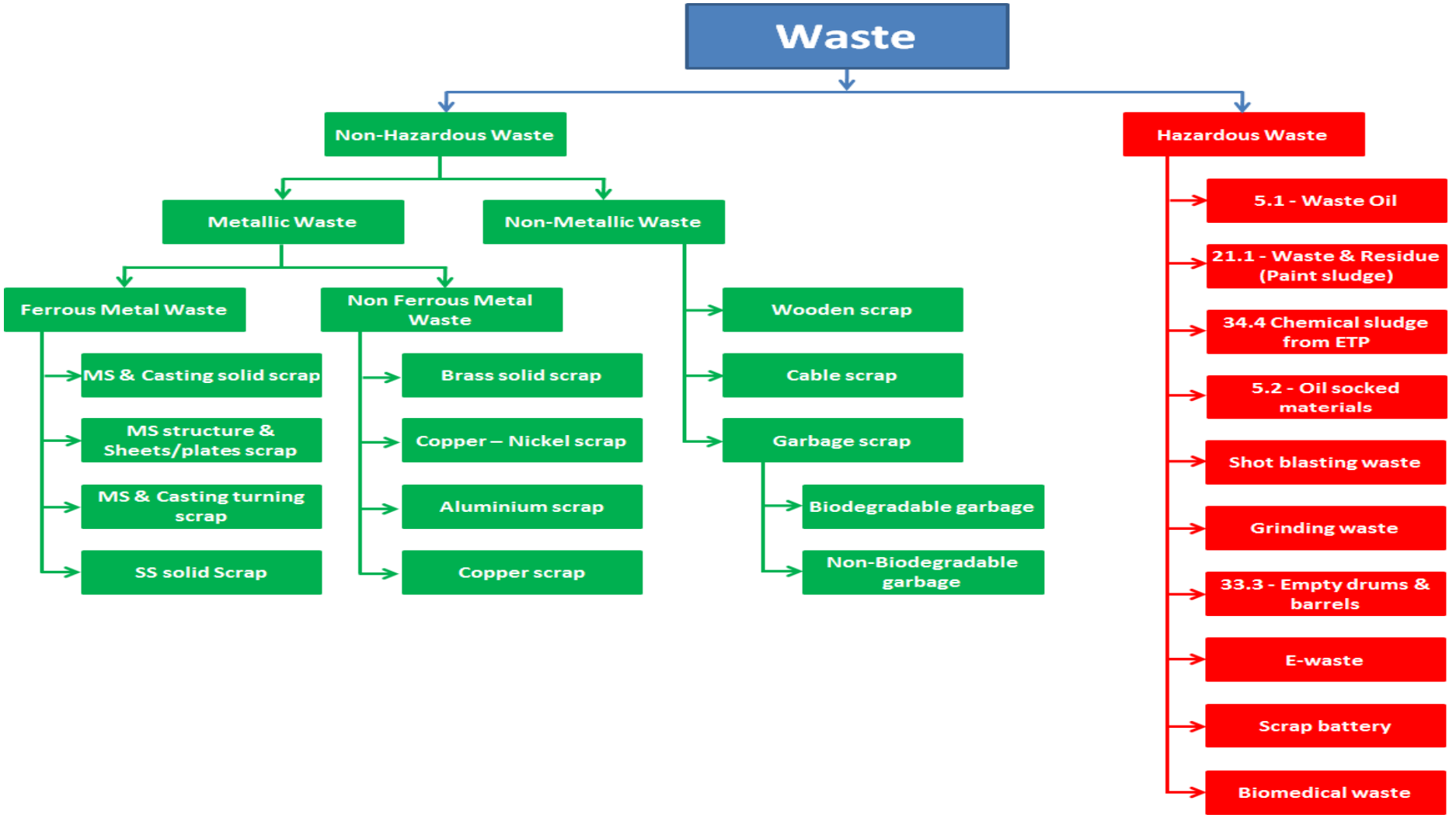
Year	Total water consumed (East + West wing) in 10 lakh-ltrs / year	Total (west+East wing) harvested water /year in 10 lakh litrs	Ratio Debit to Credit
2012-2013	21.14	6.90	33%
2013-2014	12.29	6.90	56%
2014-2015	11.89	6.90	58%
2015-2016	14.43	8.48	59%
2016-2017	10.07	8.48	84%

Rainwater Harvesting - Facilities

World Water Day – 22nd March

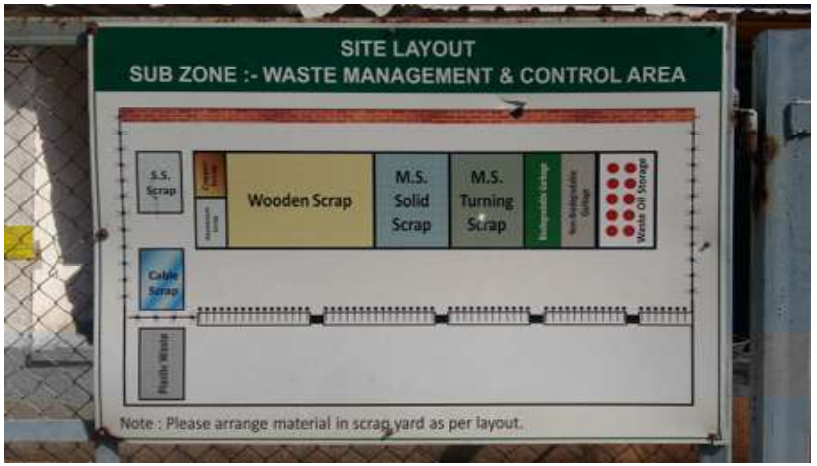
WASTE MANAGEMENT

Types of Wastes



Waste Management – Collection Mechanism

Waste Management – Storage with awareness display



Action Plan & Resources Allocation

Project name	Proposed Budget in INR	Status	Expected benefits
Magnetic Sweeper	10,000	Completed	Eliminate iron grit waste
Domestic effluent separator	4,00,000	Completed	Reduction in hazardous ETP sludge
Bio gas Plant	1,10,000	Offer received	Eliminate land filling by food waste.
Recycle of plastic waste	Nil	Proposal received work going on	Environment protection
Reuse of Oil soaked Cotton waste	2,00,000	Supplier Evaluation in Process	Reduce hazardous waste
Use of Paint Sludge for Brick	Nil	Preliminary state	Reduce hazardous waste

Solid Waste Management – Hazardous

Sr. No.	Year	Total production hours	Total quantity of hazardous waste generated	Specific waste disposed
1	2015-2016	648688	14584	0.022
3	2016-2017	657512	13103	0.019 13.64% reduction (compare with 15-16)
3	2017-2018 **(Till Sept.17)**	361300	4889	0.013 40.90% reduction(compare with 15-16)

Solid Waste Management – Hazardous recycling

Sr No	Year	Total quantity of hazardous waste generated	Total quantity of hazardous waste recycled	% recycling
1	2015-2016	14584	5135	35.20 %
2	2016-2017	13103	5678	43.33 %
3	2017-2018	4889	2195	55.10 %

Solid waste management –Non Hazardous

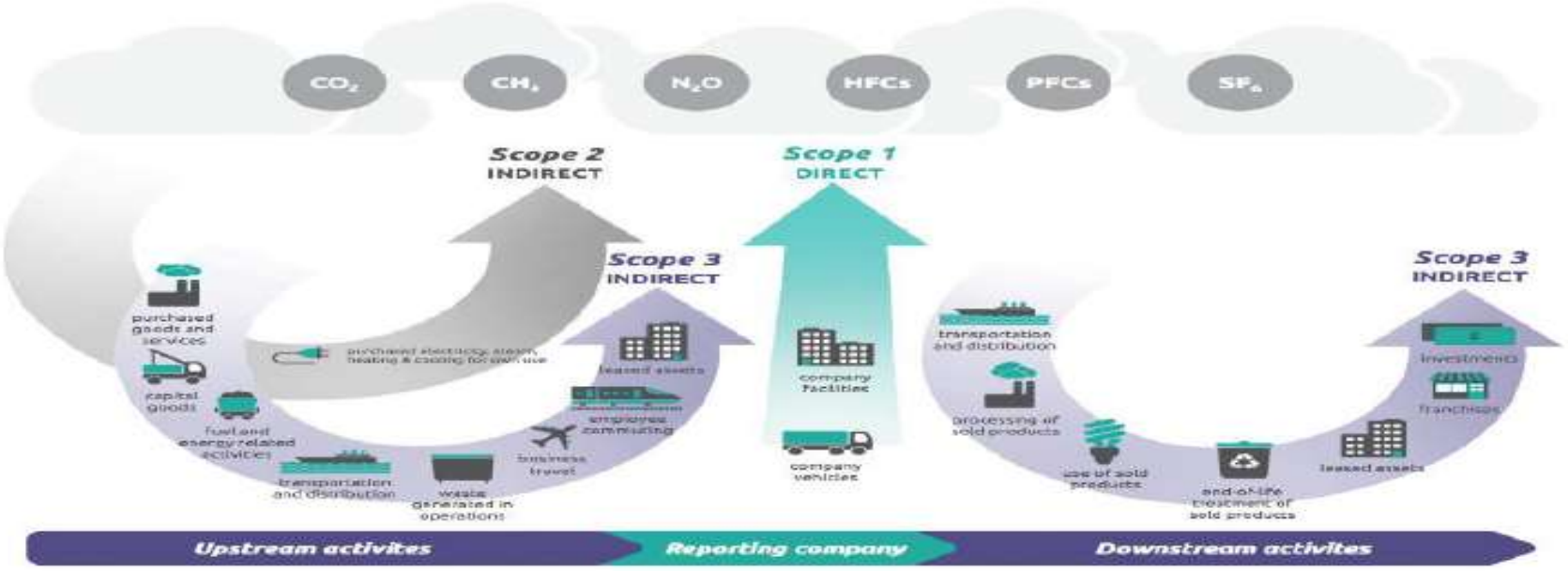
Sr. No.	Year	Total production hours	Total quantity of non hazardous waste generated	Specific waste disposed
1	2015-2016	648688	159529	0.24
2	2016-2017	657512	127446	0.19 21% reduction (compare to base year 15-16)
3	2017-2018 **(Till Sept.17)**	361300	71782	0.19 21% reduction (compare to base year 15-16)

Waste Management Projects

- **Major projects undertaken:**
  - **Replacement of plastic tea cups by ceramic cups for individual use**
  - **Re use of transportation box for sub contractors**
  - **Recycling of rejected castings at supplier site**
  - **Monitoring of waste food at canteen**
  - **Using nails to bolted wooden box.**
  - **Recycling of plastic waste.**
  - **Use of STP sludge for gardening.**
  - **Reuse of ETP sludge, Shot blasting waste, Paint sludge, Grinding waste for brick making.**
  - **Reuse of oily cotton waste after washing**

GREENHOUSE GAS EMISSION

Introduction - GHG Emission Sources

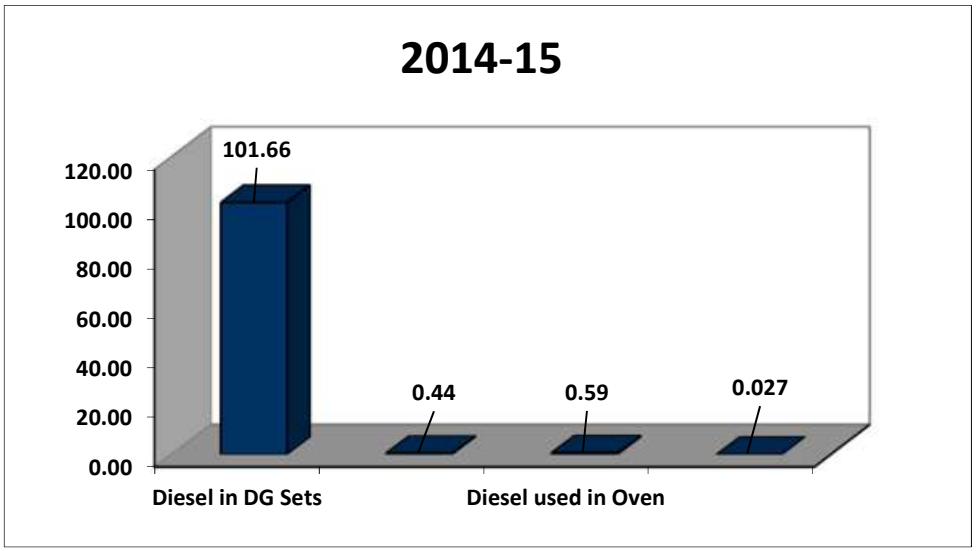


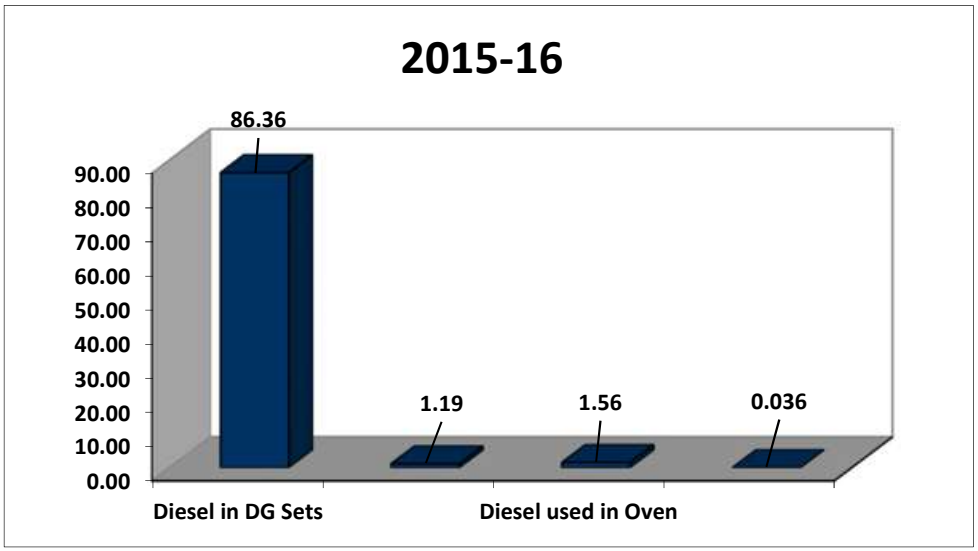
- **Scope II**
  - Indirect GHG Emissions
    - Electricity from grid ,
    - Green power -offset
- **Scope I**
  - Direct GHG Emissions
    - Diesel in DG set ,
    - Oven,
    - Forklift,
    - CO2 extinguisher
- **Scope III**
  - Other indirect GHG Emissions
    - Business travels,
    - Material movements in & out,
    - Employee commute

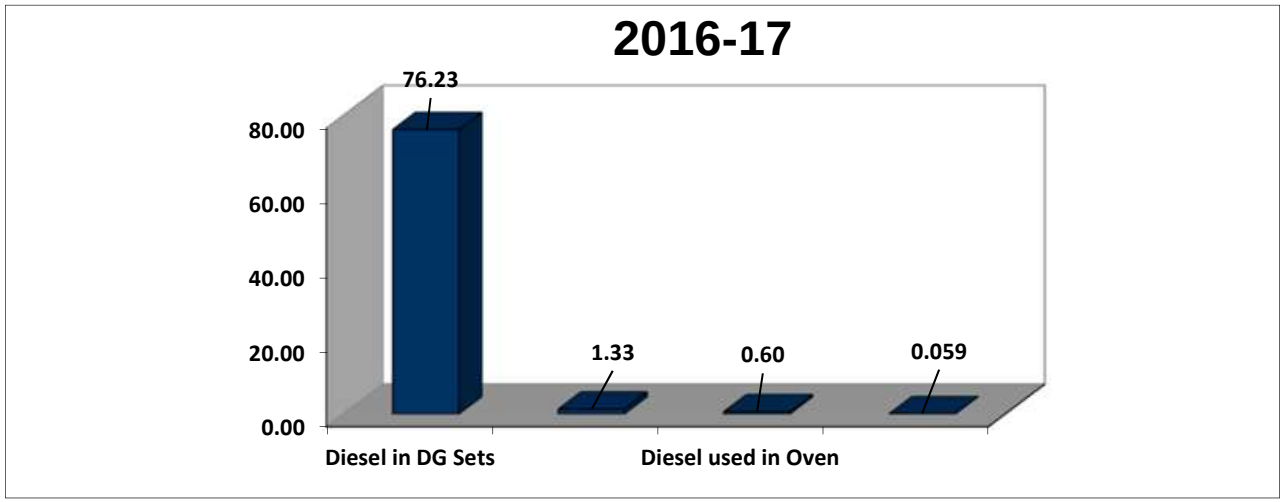
GHG Emission Inventorization

	FY14-15	FY15-16	FY16-17
Scope 1	**102.72**	**89.15**	**78.22**
Scope 2	**881.39**	**810.33**	**428.65**
Total scope1 + scope 2 ton of CO_2 eq.	**984.11**	**899.48**	**506.86**
Total Production Hours	**575,376**	**648,688**	**657512**
Kg CO_2 equivalent / production hours	**1.71**	**1.39**	**0.77**

GHG Emission Inventorization Scope 1

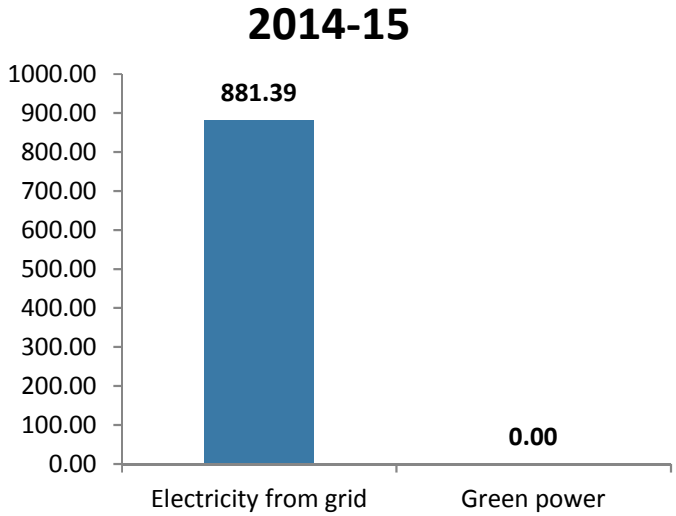


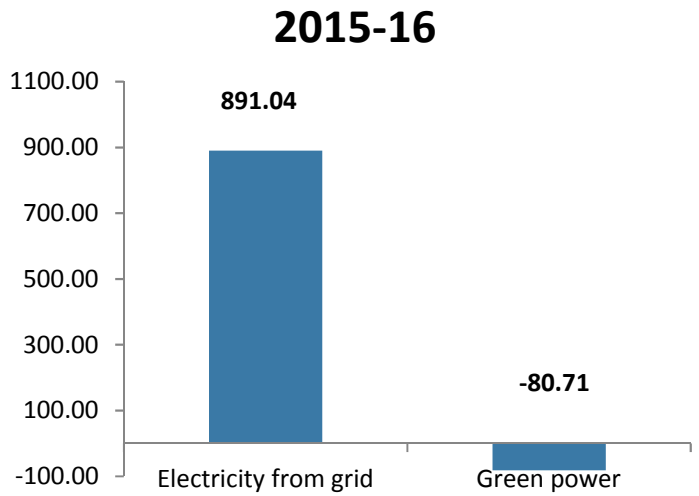


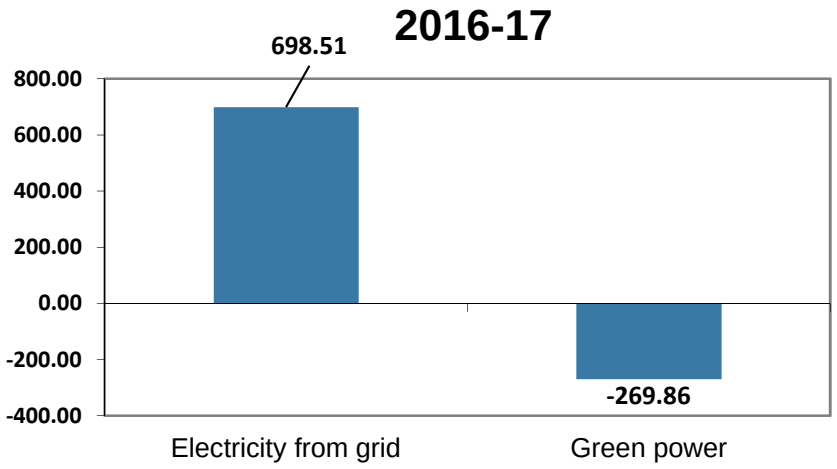


Figures in tons CO2 equivalent

GHG Emission Inventorization Scope 2



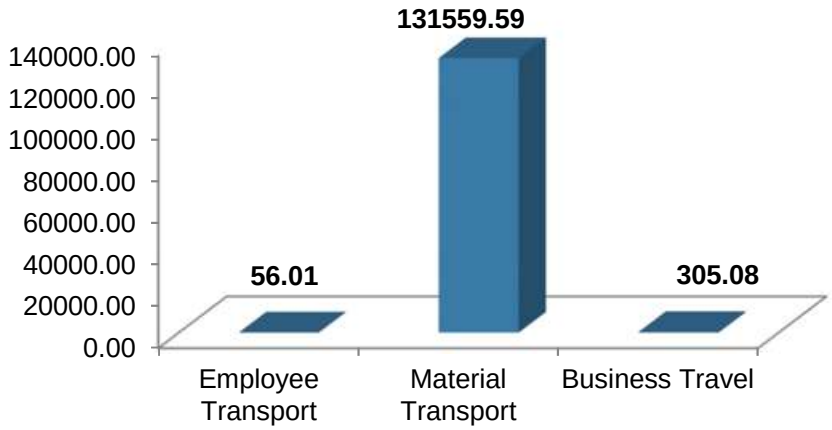




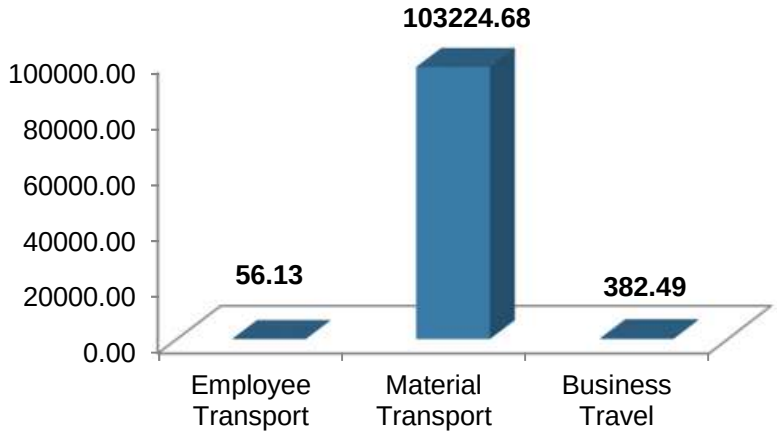
Figures in tons CO2 equivalent

GHG Emission Inventorization Scope 3

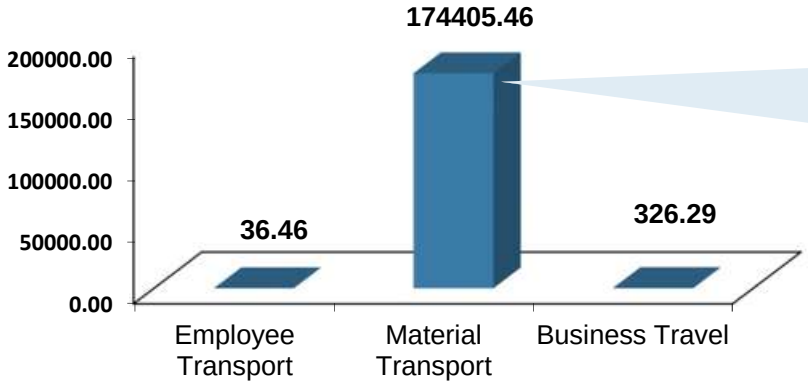
2014-15



2015-16



2016-17



Because of Increase in turnover from 120 to 168 Cr. and customer specific imported supplier requirement

Figures in tons CO2 equivalent

GHG Management System

- **Data collection excel sheet available for each parameter**
  - **e.g.**
    - Electricity consumption & analysis
    - Diesel consumption & analysis
    - Material movement

A	B	C	D	E	F	J	K	M	N	O	P	Q	R
PO Num	It	PO Date	Delivery D	Y	Material Docur	endo	Vendor Name	KM	Mode of transpo	Material Cod	weight in K	Total weig	Material Desc.
248894	10	04/07/2015	04/30/2015	2015	76118406	101335	Burckhardt Compression (Japan) Ltd.	6633	SEA	129085123501J	0.2	3	Hex Bolt M20 x 120/44 Gr 8.8(NBin)
250668	10	05/25/2015	06/25/2015	2015	76124929	101335	Burckhardt Compression (Japan) Ltd.	6633	SEA	129072007000J	1	25	Bar Dia 70mm SUS304(NBin)
253893	10	08/03/2015	08/10/2015	2015	76128539	101335	Burckhardt Compression (Japan) Ltd.	6633	SEA	129000801603	0.03	0.72	Piston Ring Dia 125mm(NBin)
253893	20	08/03/2015	08/10/2015	2015	76128539	101335	Burckhardt Compression (Japan) Ltd.	6633	SEA	129000804103	0.25	5.5	Piston Ring Dia 42 mm(NBin)
253893	30	08/03/2015	08/10/2015	2015	76128539	101335	Burckhardt Compression (Japan) Ltd.	6633	SEA	129000805005	0.01	0.53	Piston Ring Dia 25mm(NBin)
253893	40	08/03/2015	08/10/2015	2015	76128539	101335	Burckhardt Compression (Japan) Ltd.	6633	SEA	129000800803	0.04	0.32	Piston Ring Dia 165mm(NBin)
253893	50	08/03/2015	08/10/2015	2015	76128539	101335	Burckhardt Compression (Japan) Ltd.	6633	SEA	129000804705	0.01	0.07	Piston Ring Dia 28mm(NBin)
253893	60	08/03/2015	08/10/2015	2015	76128539	101335	Burckhardt Compression (Japan) Ltd.	6633	SEA	129000804103	0.25	8.75	Piston Ring Dia 42 mm(NBin)
253893	70	08/03/2015	08/10/2015	2015	76128539	101335	Burckhardt Compression (Japan) Ltd.	6633	SEA	129000801203	0.035	0.245	Piston Ring Dia 140mm(NBin)
253893	80	08/03/2015	08/10/2015	2015	76128539	101335	Burckhardt Compression (Japan) Ltd.	6633	SEA	129000801903	0.032	0.64	Piston Ring Dia 110mm(NBin)
253893	90	08/03/2015	08/10/2015	2015	76128539	101335	Burckhardt Compression (Japan) Ltd.	6633	SEA	129000803603	0.01	0.19	Piston Ring Dia 50 mm(NBin)
253785	10	07/29/2015	09/16/2015	2015	76146665	104013	Exheat Industrial Ltd.	7361	SEA	189300	6	24	Air heater
253785	20	07/29/2015	09/16/2015	2015	76146665	104013	Exheat Industrial Ltd.	7361	SEA	189300	6	96	Air heater
250864	110	05/29/2015	07/31/2015	2015	76124931	101907	Prognost Systems GmbH	6806	SEA	002358584H29	0.3	3	FILTERMAT FOR CABINET FAN
250864	120	05/29/2015	07/31/2015	2015	76124931	101907	Prognost Systems GmbH	6806	SEA	002358584H30	0.3	3	FILTERMAT FOR PC-SIDE FAN 1
250864	30	05/29/2015	07/31/2015	2015	76124931	101907	Prognost Systems GmbH	6806	SEA	002358584H21	0.03	0.03	VELOCITY SENSOR WITH PLUG
250864	40	05/29/2015	07/31/2015	2015	76124931	101907	Prognost Systems GmbH	6806	SEA	002358584H22	0.3	0.3	PROXIMITY PROBE WITH CONN
250864	60	05/29/2015	07/31/2015	2015	76124931	101907	Prognost Systems GmbH	6806	SEA	002358584H24	0.03	0.03	PRESSURE SENSOR WITH PLU
250864	70	05/29/2015	07/31/2015	2015	76124931	101907	Prognost Systems GmbH	6806	SEA	002358584H25	0.08	0.08	TI1 CARD FOR PHASE/SPEED RE
250864	80	05/29/2015	07/31/2015	2015	76124931	101907	Prognost Systems GmbH	6806	SEA	002358584H26	0.08	0.08	AI1 CARD FOR ACC. & VALOCITY
250864	90	05/29/2015	07/31/2015	2015	76124931	101907	Prognost Systems GmbH	6806	SEA	002358584H27	0.08	0.08	AI2 CARD 4-20MA FOR PR. & TEI
250864	100	05/29/2015	07/31/2015	2015	76124931	101907	Prognost Systems GmbH	6806	SEA	002358584H28	0.08	0.08	AI3 CARD FOR DYNAMIC POSITI
250864	50	05/29/2015	07/31/2015	2015	76124931	101907	Prognost Systems GmbH	6806	SEA	002358584H23	0.5	0.5	SIGNAL CONVERTER FOR PROX

GHG Management Systems

- **GHG Monitoring System : MS Excel Tool**

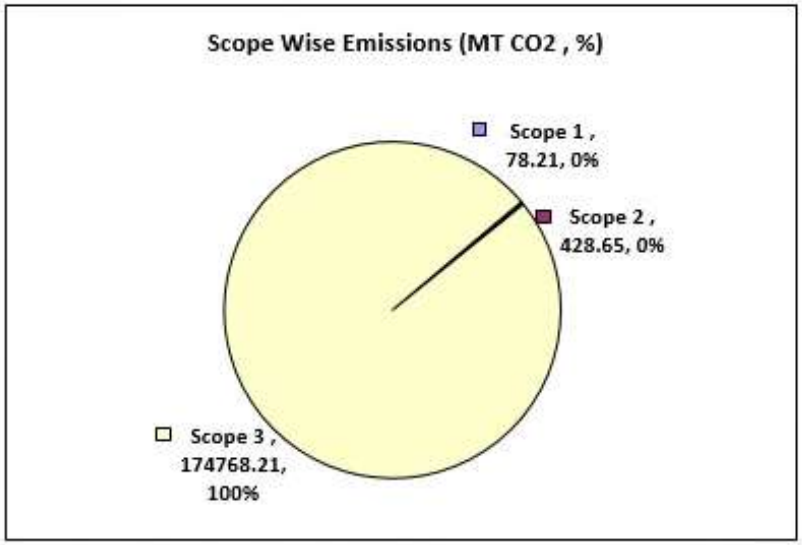
Scope of Emissions	2014-15	2015-16	2016-17	Unit	Percentage share
Scope 1	102.72	89.15	78.21	Tons CO2 eq	0.04
Scope 2	881.39	810.33	428.65	Tons CO2 eq	0.24
Scope 3	131920.67	103663.30	174768.21	Tons CO2 eq	99.71

Total Emissions	######	######	175275.07	Tons CO2 eq
Scope 1 and Scope 2	984.11	899.48	506.86	Tons CO2 eq
Production	575,376.00	648,688.00	657,512.00	
Specific emissions	1.71	1.39	0.77	Kg CO2 eq/ unit

Scope 1	102.72	89.15	78.21	Tons CO2
Diesel in DG Sets	101.66	86.36	76.23	Tons CO2 eq
Diesel used in Forklift	0.44	1.19	1.33	Tons CO2 eq
Diesel used in Oven	0.59	1.56	0.60	Tons CO2 eq
CO2 fire extinguisher top up	0.027	0.036	0.059	Tons CO2 eq

Scope 2	881.39	810.33	428.65	Tons CO2
Electricity from grid	881.39	891.04	698.51	Tons CO2 eq
Green power	0.00	-80.71	-269.86	Tons CO2 eq

Scope 3	131920.67	######	174768.21	Tons CO2
Employee Transport	56.01	56.13	36.46	Tons CO2 eq
Material Transport	131559.59	103224.68	174405.46	Tons CO2 eq
Business Travel	305.08	382.49	326.29	Tons CO2 eq



GHG Emission Intensity Reduction

Parameter	2014-15	2015-16	2016-17
Scope 1	**102.72**	**89.15**	**78.22**
Scope 2	**881.39**	**810.03**	**428.65**
Total = Scope1 + Scope2	**984.11**	**899.48**	**506.86**
Production Hours	**575376**	**648688**	**657512**
Kg CO2 eq. / production hours	**1.71**	**1.39**	**0.77**
% Reduction (Scope 1& 2)		**54.9 %**	

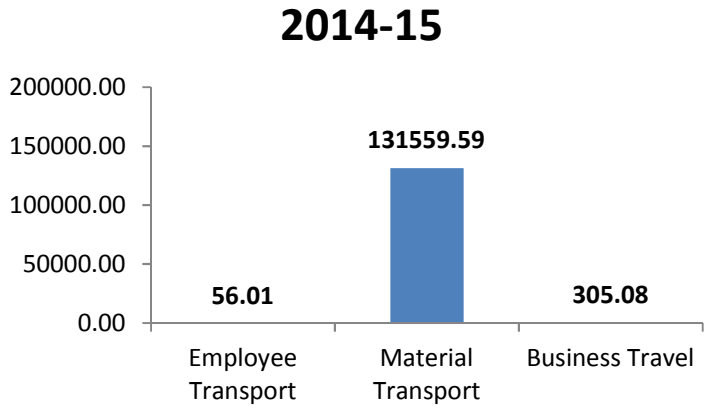
GHG Credit 5 – Carbon Neutral Approach

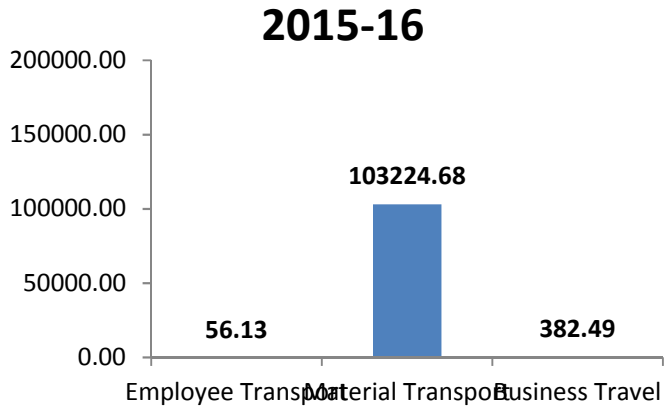
Non GHG intensive industry

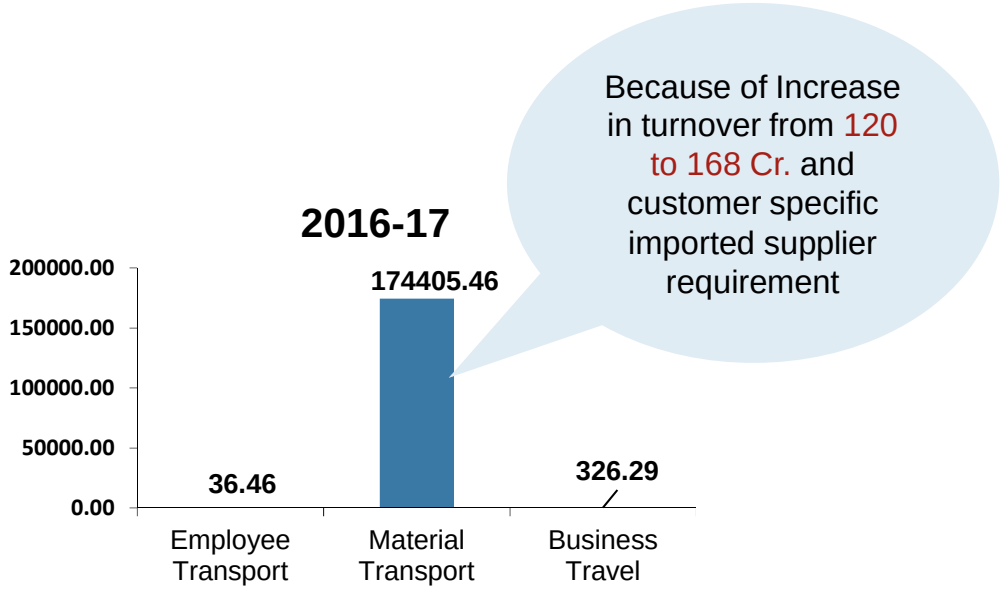
Steps taken towards being carbon neutral or positive				
Description	**Total Units consumed (Apr'16 to Mar'17)**	**Renewable units generated (Apr'16 to Mar'17)**	**Percentage reduction**	**Total GHG emission / carbon offset Kg CO2 eq.**
Use of Renewable Energy sources	**851841**	**329103**	**38.6%**	**269864**

Last year 26.7 %

Scope 3 Inventorization

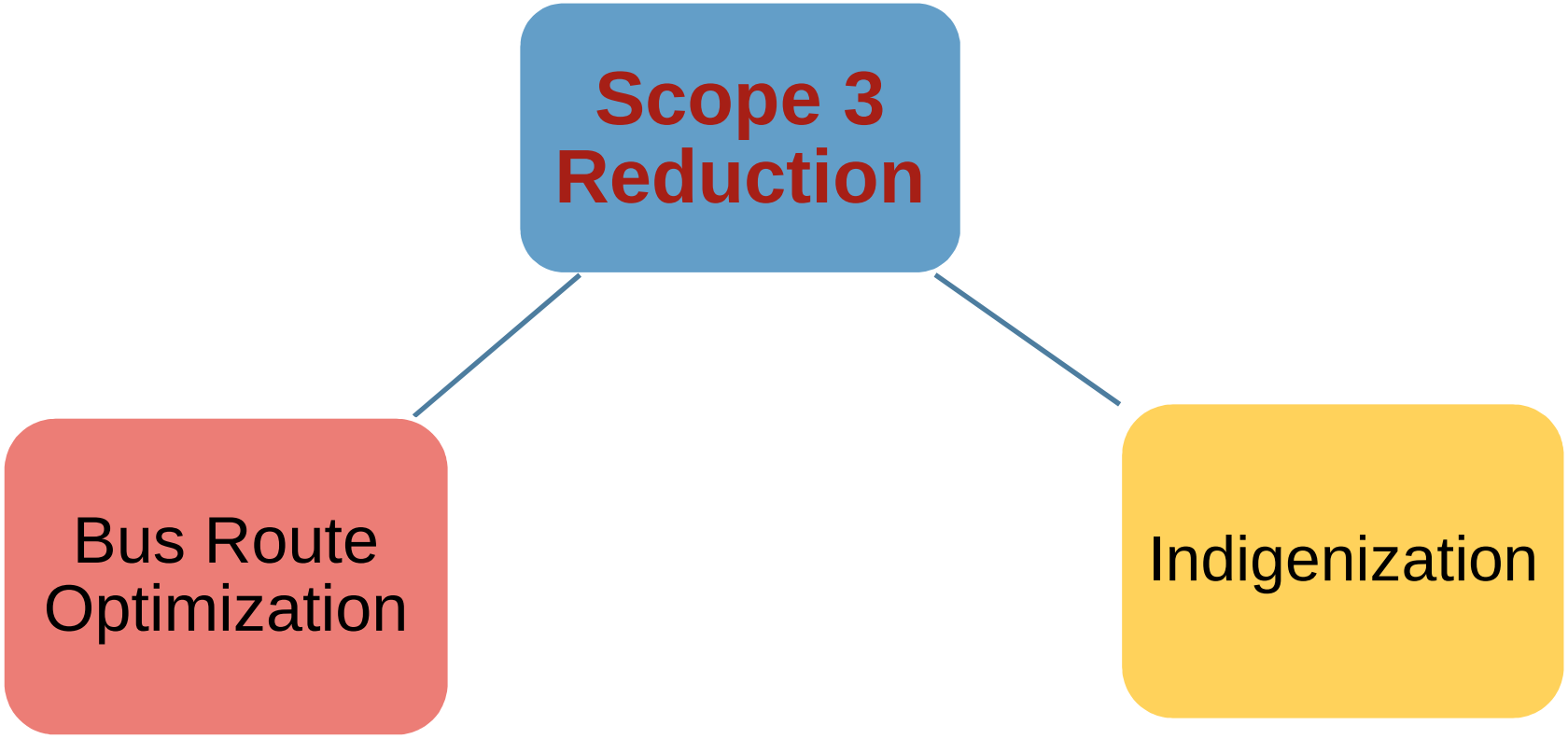






Figures in tons CO2 equivalent

Action Plan for achieving GHG Emission targets (Scope 3)



% Reduction in GHG Emission (Scope 3)

Major GHG Actions planned for achieving scope 3 Emission targets

Area for energy saving	Total No	Total ton CO2 eq. emission saving	Plan for work	Status
Indigenization by developing local parts	15	755.9	2017-18	Implemented
Bus route optimization for decreasing commute	1	0.36	2016-17	Implemented

Scope 3 GHG Emission Intensity Reduction

Parameter	2014-15	2015-16	2016-17	2016-17 (Normalized)
Scope 3	131920.67	103663.30	174768.21	136783.66
Production Hours	575376	648688	657512	627192
Ton CO2 eq. / Production hours	0.229	0.159	0.262	0.218
% Reduction (Scope 3)	4.8 % (Normalized)			

Because of Increase in turnover from 120 to 168 Cr. and customer specific imported supplier requirement

Scope 3 Reduction

- **Scope 3 Intensity reduction due to indigenization**

Year	2014-15	2015-16	2016-17
Ton CO2 eq. reduction due to Indigenization	1370.0	2.4	755.9

Year	2014-15	2015-16	2016-17
No. of items indigenized	17	16	15
Distance in KMs reduced	477600	218300	2847890
Weight of parts In ton	1.81	0.007	0.168

Scope 3 Reduction

Intensity reduction due to employee commute to office

- **One bus eliminated by clubbing employees into other buses**
- **Total saving 24000 Km (2016-17)**
- **Saving in 2016-17 : 0.36 Eq. Tonnes of CO2 emission**

Burckhardt Compression

Compressors for a Lifetime™