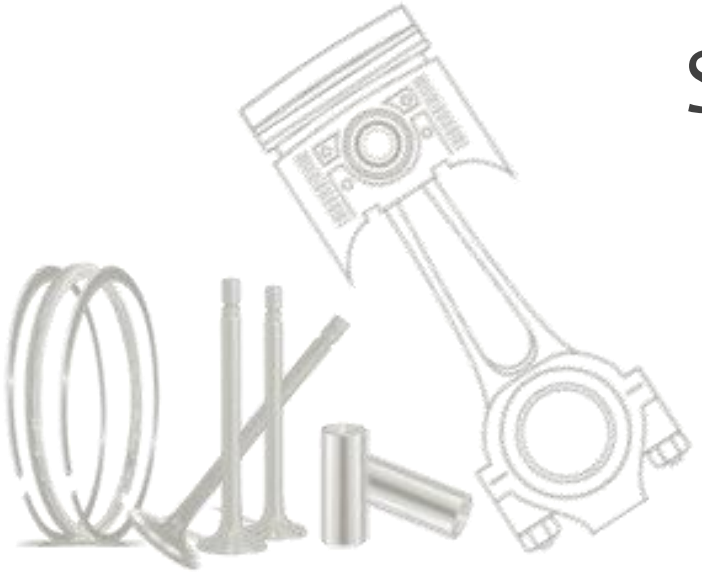
SHRIRAM

Shriram Pistons & Rings Ltd.



Introduction

Shriram Pistons & Rings Ltd.

- India's Largest Manufacturer of Pistons, Rings & Engine Valves
- Strong global presence
- Strong Technological capabilities
- Automotive & Non Automotive
  Off-highway Vehicles & Farm Equipment
- Listed on National Stock Exchange, India

Vision & Mission

World Class Company, the preferred choice of Global Automotive Customers.

Committed to all stakeholders

Environmentally sustainable

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Mother Plant : Ghaziabad

Estd. in1972

- Largest manufacturer of Pistons, Piston Rings & Engine Valves
- Annual sales- INR 3178 Cr. (FY'23-24)
- Collaboration with Global product leaders
- Products for Automotive & Non-automotive applications
- In-house Govt. recognized Tech Center
- TPM awarded company
- Third EV plant in Indore, operated from Dec'23

2nd Plant : Pathredi

Estd. In 2011

Pistons

Engine Valve

Rings

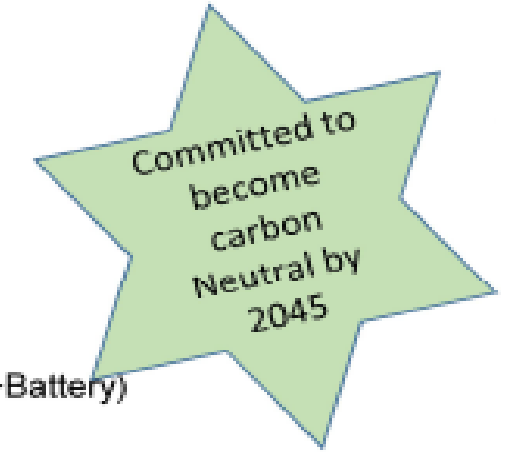
Pins

SPRL- Commitment towards GHG

Road Map to reduce GHG

GHG Inventorisation – Public disclosure thro' BRSR report & part of annual report

1. Scope 1 + Scope 2 : Inventorisation started from 21 – 22 (Base Year)
2. KPI matrix defined for capturing Data on monthly basis (on Digital Platform)
   - Energy consumption (grid power + Solar + own generation if any)
   - Water withdrawal & consumption (Process + Domestic + aux units + Gardening)
   - Waste generated & Disposed (Hazardous + Non hazardous + plastic + E-waste + Biomedical +Battery)
   - Material recycled / Reused
3. Planning to start Scope 3 emissions capturing from FY 25-26



Description	21-22	22-23	23-24
Scope 1 (TCO_2)	7650	8932	11413
Scope 2 (TCO_2)	222580	246296	232336
Total Scope 1+2 (TCO2)	230230	255228	243749
Turnover (Cr / Yr)	2093	2605	2953
Emission Intensity (TCO_2 / Cr)	110	97.97	82.54
Actual Intensity Reduction (%)		10.9%	16.3%
Target for Intensity reduction (YOY)	Base Year	10%	10%

Emission Intensity reduced by 25% over Base year

Targets over base year 2022	Target	TDC
Reduce Emission Intensity(TCO_2/Cr)	40%	2026
Increase solar Energy usage	35%	2025
Reduce Energy consumption	20%	2028
Reduce water consumption	20%	2027
Increase recycling	15%	2028
Reduce Waste generation	20%	2028
Eliminate use of plastic	100%	2028

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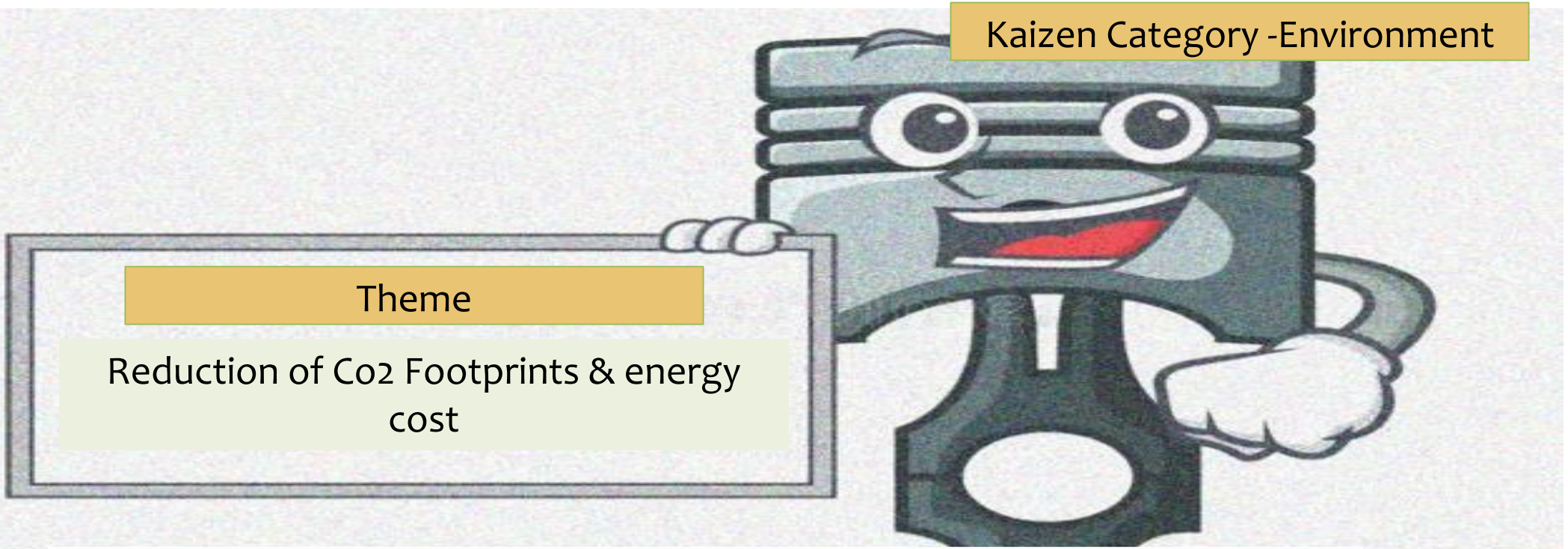
Kaizen details & Team information

Kaizen Category -Environment



Theme

Reduction of Co2 Footprints & energy cost

Team Members

Tilak Raj

Manish Kumar

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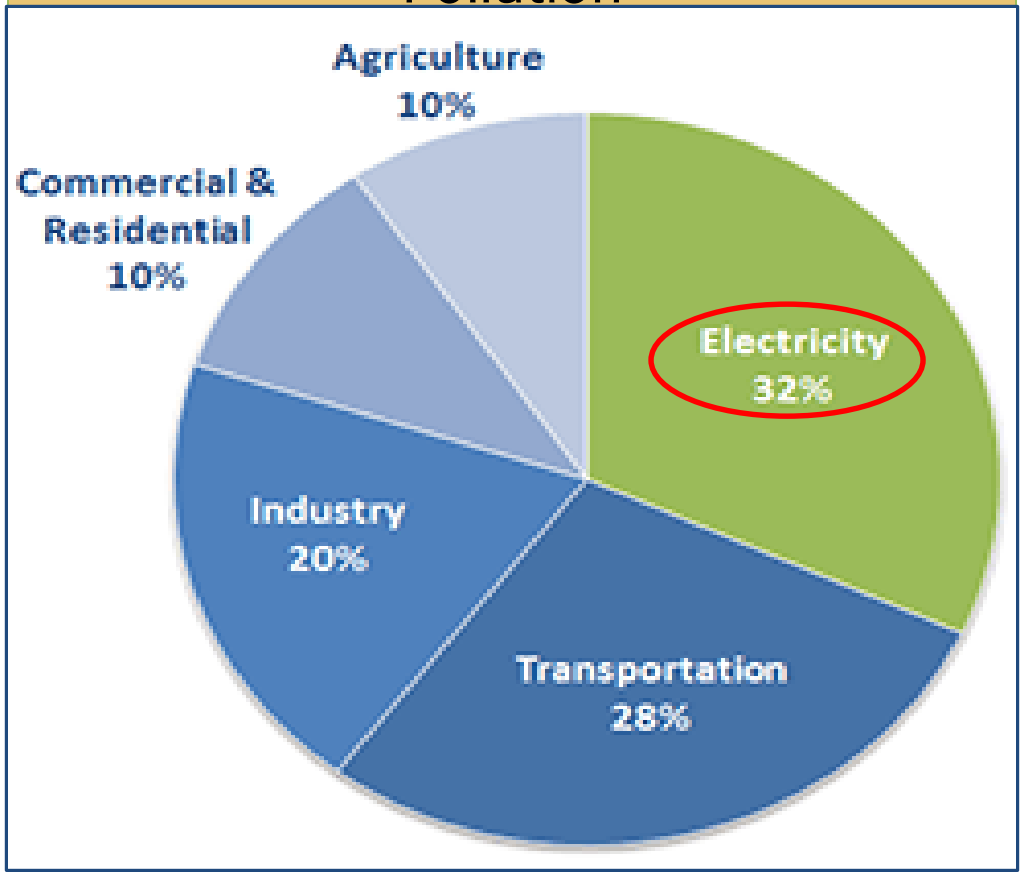
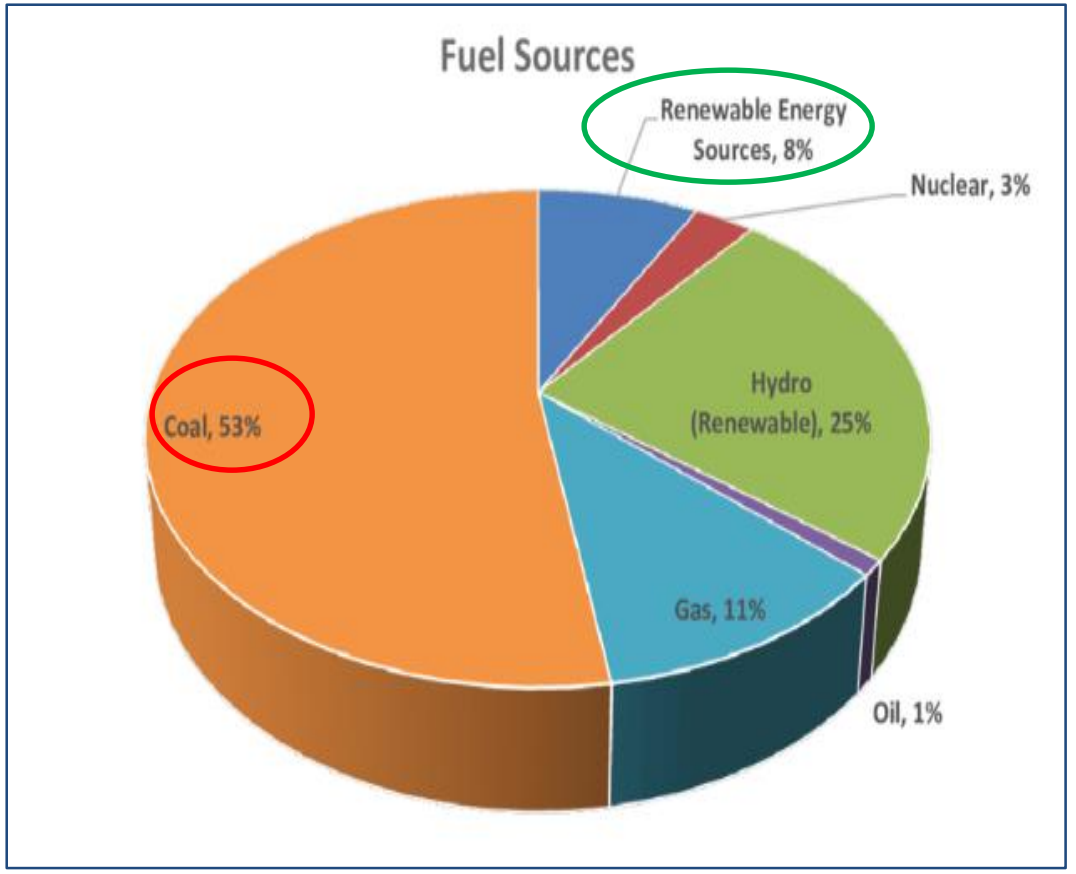
Justify the theme- Why Environment ?

Major Contributors in Environment Pollution



- Highest Environment Pollution Contributor is Electricity Generation

Electricity Generation sources



- "Coal" is the major source for Electricity Generation

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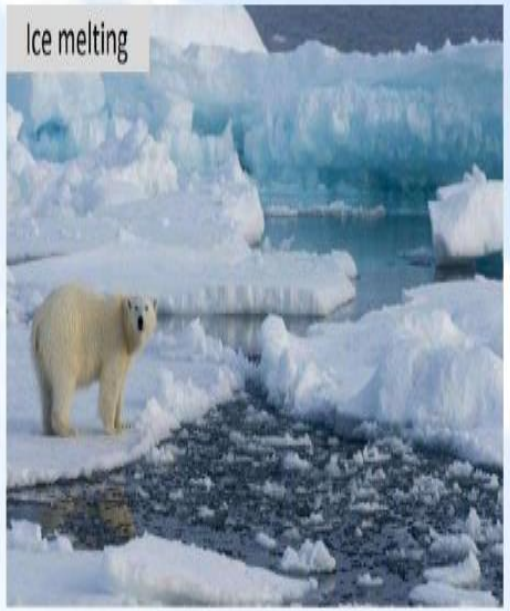
Adverse Impact on Environment

Air Pollution



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SPRL- Efforts to Protect Environment

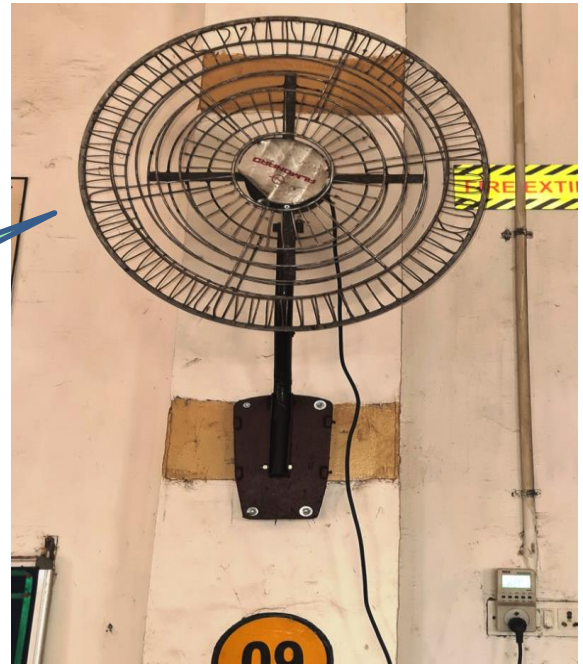
Sr. No.	PARTICULAR	Reduction of Co2(TON) FY 2022- 2023	Reduction of Co2(TON) FY 2023- 2024	Reduction of Co2(TON)- Apr to FY 2024- 2025	Actual Total CO2 Reduction (TON)- Till Dec'24	Total MWH saving Till Dec'24
1	Plant shop floor 822 fans technology conversion with BLDC fans in energy saving .	69.50	196.95	89.60	356.051	378.8
2	Energy Efficient BLDC (having Brushless Direct Current Motors) wall mounted 400mm sweep fans to replace existing conventional fans in office areas / cabins, across the Factory. (Total fans- 414 nos.)	20.921	0	0	20.921	22.257
3	Replacement of Conventional blowers in 14 no. Air Washers with EC Fan	0	0	245.434	245.434	261.1
4	Replacing 30 No. LED based Street Lights with Solar lights	0		7.926	7.926	8.402
5	Replacement of 700 Nos. Conventional Office light of 56 Watt with 25-Watt LED's	24.93	55.846	0	80.776	85.932
6	Replacement of 350 Nos. Conventional shop floor light of 216 Watt with 60 Watt LED	196.48	157.90	0	354.380	377
7	Replacing 15 KW capacity Condenser water pump with 7.5 KW for 190 TR Chiller	0	37.224	0	37.224	39.6
8	Rooftop Solar plant for Renewable energy	0	0	613.798	613.798	675.1
	Yearly CO2 reduction (TON)	311.831	447.92	956.762	1716.51	1848.19

Project no.1 – Energy Savings in 600 mm size, Wall mounted fans of Shop floor

Average power consumption of existing Air Circulating Fans, which is almost 1.6% of total monthly plant energy consumption, works out to 112450 KWH / Month, considering 190W / Hour / fan, with total 822 fans in all the shop floor & service areas & considering 8 months of effective usage.

BEFORE

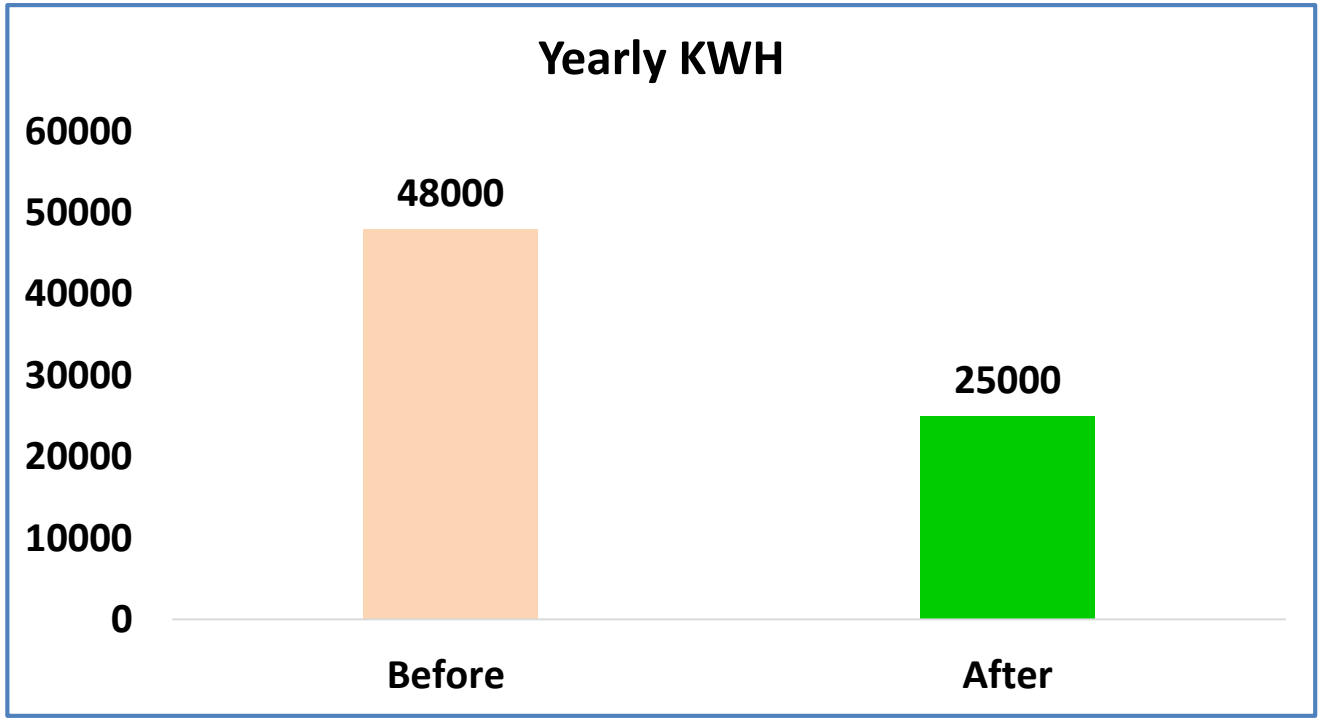
AFTER



Action Taken: Replacement of Shop Floor fans with BLDC fan

2. Project no. 2 - 400 mm size, Wall mounted fans of all Offices

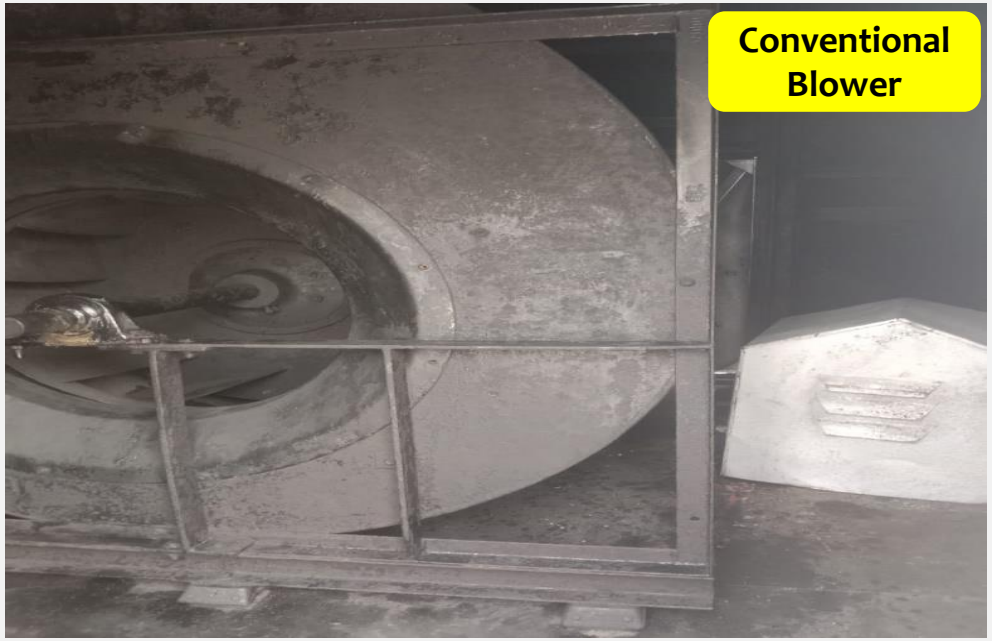
We have replaced 414 nos. 16" size wall mounted fans of various offices with BLDC fans. The running load of conventional fan was 60 Watt whereas for BLDC fan it is 32 Watt, which has resulted in energy saving of 23000 KWh/year.



Action Taken: Replacement of Office area fans with BLDC fan

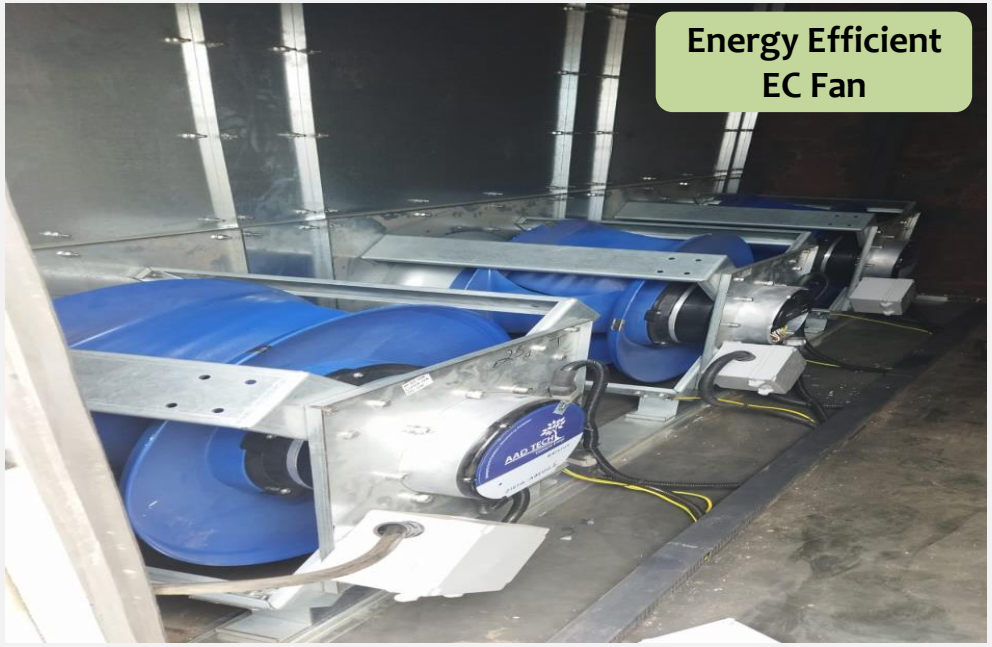
Project no.-3 – Energy Saving in Air Washers

BEFORE



1. High Power cons'n and heavy maintenance work
2. Corroded blower due to Foundry environment
3. Low Power factor : 0.6 to 0.8
4. Avg. running Load : 10 KW
5. Driven by motor with Belt. Motor being rewinded few times

AFTER



1. Low Power consumption and less maintenance work
2. Replaced with New EC Fan
3. High Power factor : close to Unity
4. Avg. Running Load : 5.1 KW
5. Direct coupled. No belt

Action Taken: Replacement of Conventional Blower with EC fan

Project no. 5 & 6 – Energy saving in conventional lights

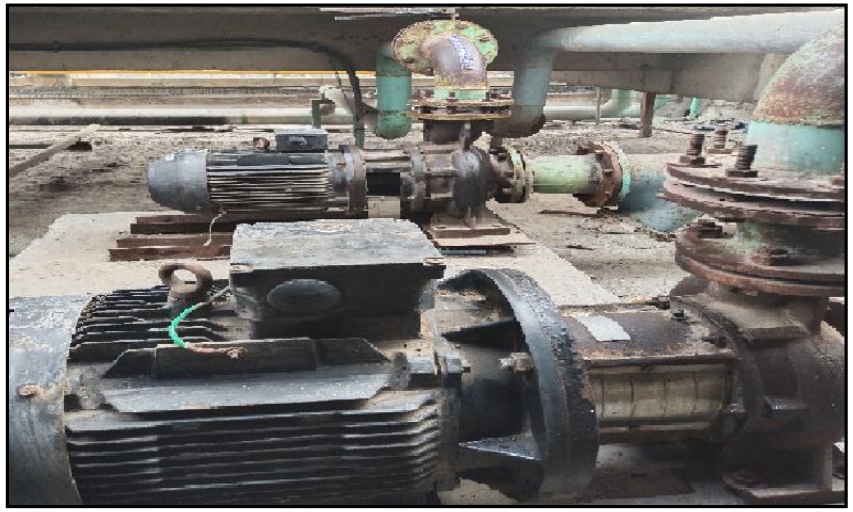
Replaced 700 no. of 56 watt conventional lights with 25 watt LED lights in offices. Similarly replaced 350 nos. of conventional lights of 216 watt with 80 watt LED lights in shop floor.

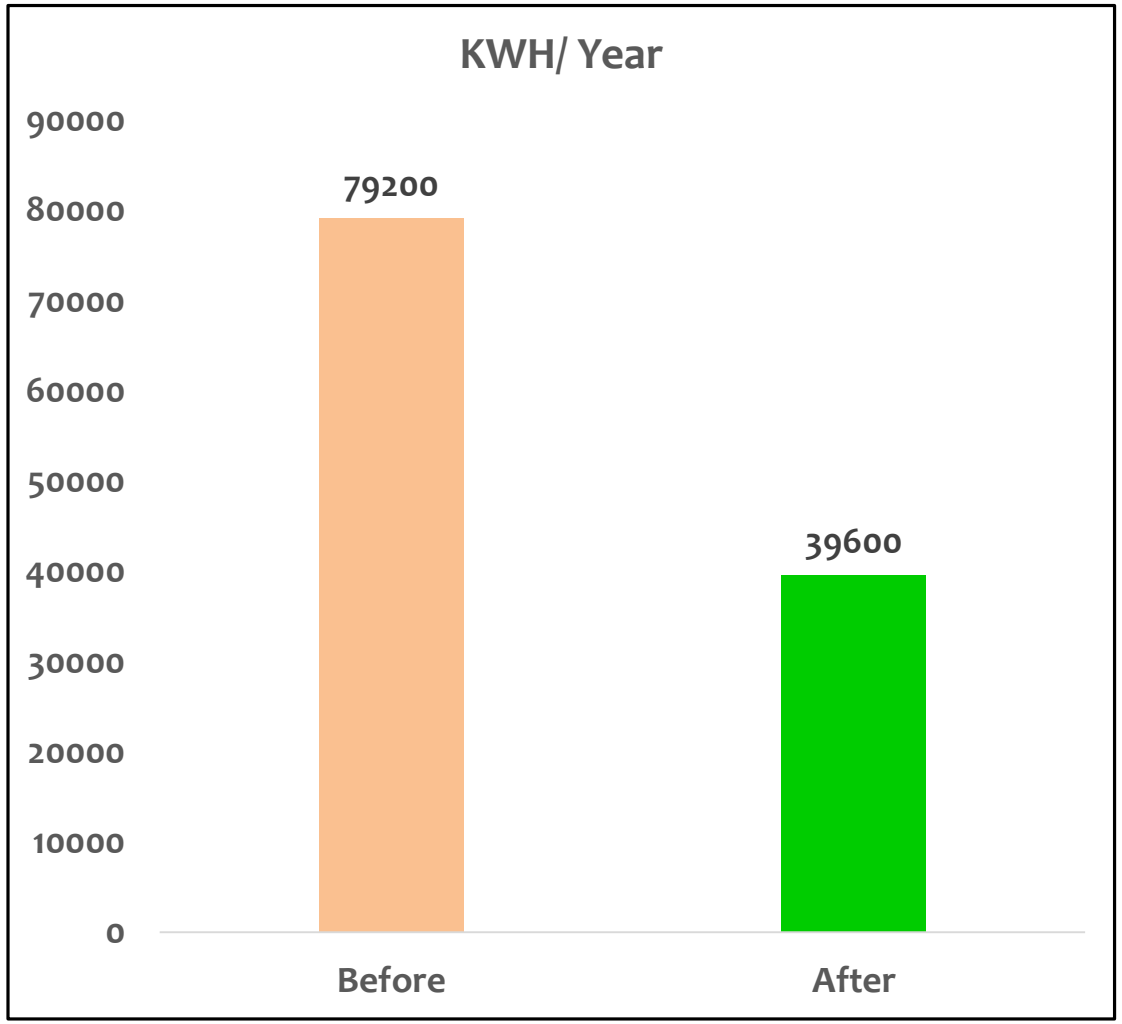
Before

After

Project no. 7- Energy Saving in Chiller system

We have 190 TR capacity Water cooled chiller for Air conditioning. The condenser water pump for this chiller was of 15 KW capacity with 28 Mtr. head. We replaced it with 7.5 KW pump having 16 Mtr. head but having same flow capacity. This has resulted in energy saving of 39000 KWH per year





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SPRL Thinking Behind– why need renewable energy source?

Opt. a Alternate Renewable energy Power source

Reduce carbon emission content.

To reduce dependency on Fossil fuels

To reduce Energy Cost

Selection of Renewable source theme

Options Evaluated

Wind mill- Discarded due to space limitation & not feasible as per geographical location

Solar Energy- Considered basis feasibility & atmospheric condition

Kaizen Details

ROOF-TOP SOLAR PROJECT :
On the roof of Engine Valve & Pin Plant

1	Solar Plant Capacity	1.9 MWp DC/ 1.5 MWp AC Investment: INR 7.2 Cr **Target Yearly Generation – 26.50 lac KWH** **ROI- (7 - 8 years)**
2	Plant Type	Hybrid
3	Location of Plant	Pathredi (Rajasthan)
4	Status of Plant	Operational from Aug-2024
5	Expected CO_2 saving (Reduction)	**26,50,000*0.91 = 2412 Ton/Year**

- We have total 90k Sq.M Roof top area under which we have installed solar at 15k Sq.M **(16.67%)**

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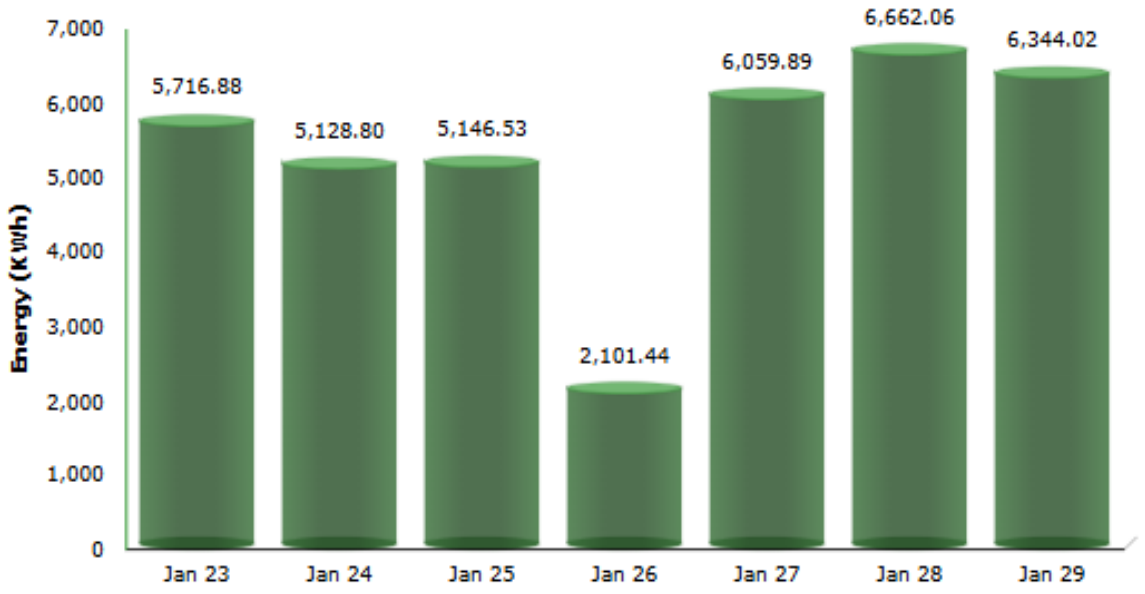
Solar Generation Portal

Plant | Inverter | SMB | Meter | Block Diagram

Panel | Table

547.57	3.94	73.47	-	1500.000	1900.080	520.76 Ton	63.51 Lacs
IRR (W/M²)	INS (KWh/M²/Day)	Day PR (%)	Month PR (%)	AC Capacity (KW)	DC Capacity (KWp)	(CO_2)	Savings (INR(₹))

Plant Line Graph | Week Energy Chart | Solar Gen ×



Source Data | Connected Source: GRID_METER_HT | ON

Voltage(VLL)	130908.20 V	Voltage(VLN)	75582.20 V
*Day Import	70,087.68 KWh	Total Import	16,477,376.51 KWh
*Day Export	0.00 KWh	Total Export	0.00 KWh
Total Current	96.38 A	PF	1.00
Average Current	32.13 A	Active Power	7,254.00 KW
Frequency	49.83 Hz	Apparent Power	7,281.00 KVA
Start Time	06:00:30 H:M:S	End Time	14:55:30 H:M:S

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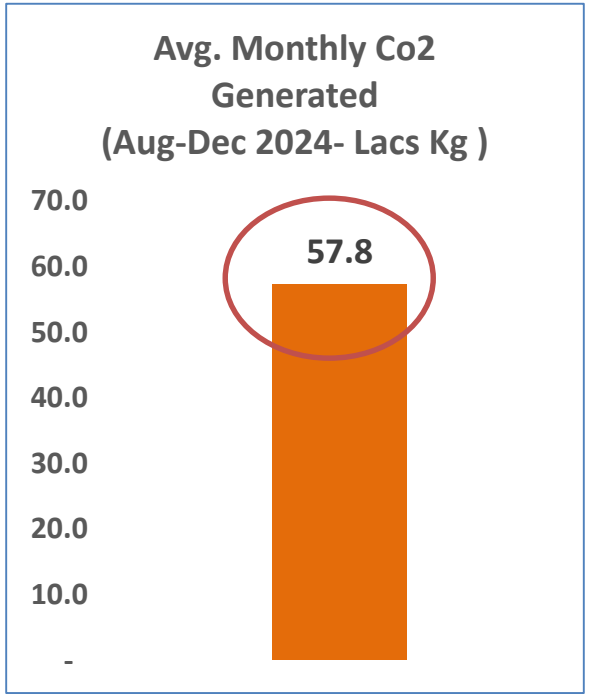
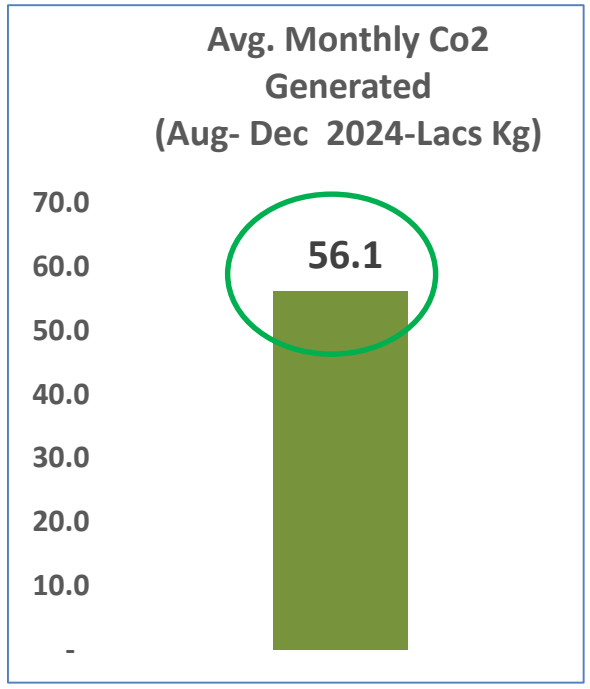
Kaizen Benefit Evaluation- After Using Solar Power from Roof top Solar

BEFORE



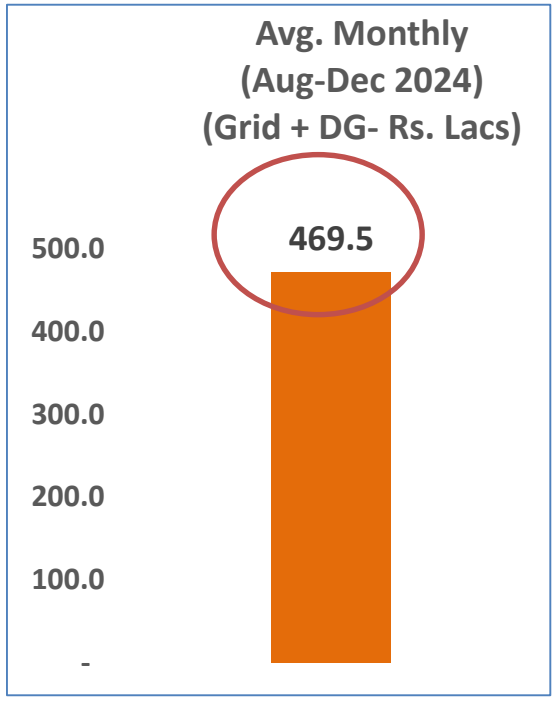
Carbon Footprint **used to Generate 63.54 Lakh KWH**

AFTER



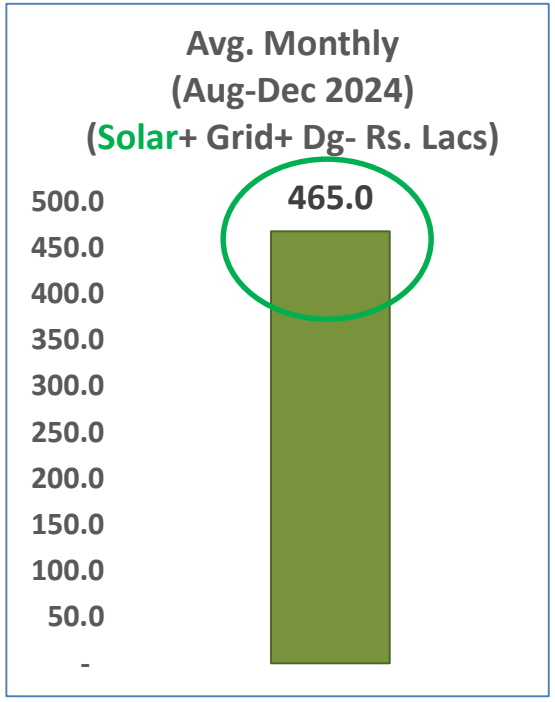
Co2 Footprint **used to Generate 63.54 Lakh KWH**

BEFORE



Energy Cost

AFTER



Energy Cost reduced

LIMITATIONS

1. Only Fossil fuel based energy production source available.
2. High carbon emission usage contribution due to non-renewable source used.
3. High Electricity bill due to high Grid cost.

BENEFITS

1. Green fuel energy source available by using solar energy.
2. Reduction in carbon emission by **2.5-3%** monthly after usage of solar energy.
3. Reduction in energy cost by **0.96%** monthly after usage of solar energy.

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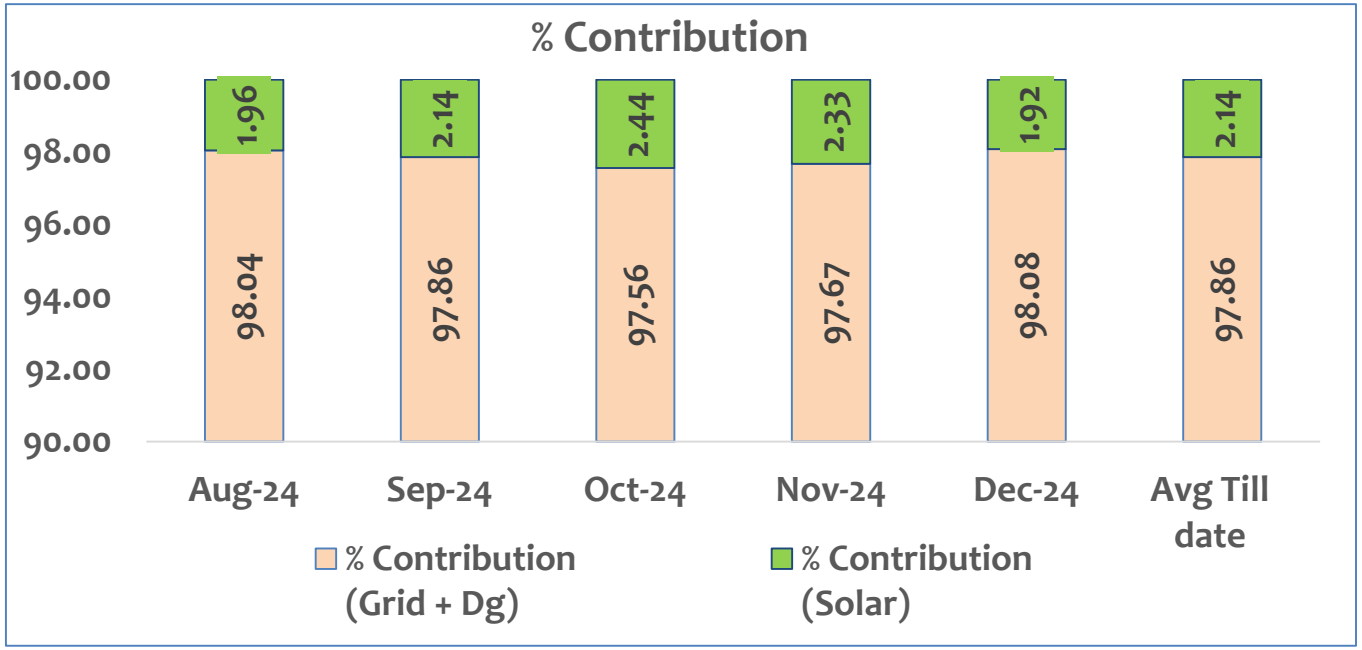
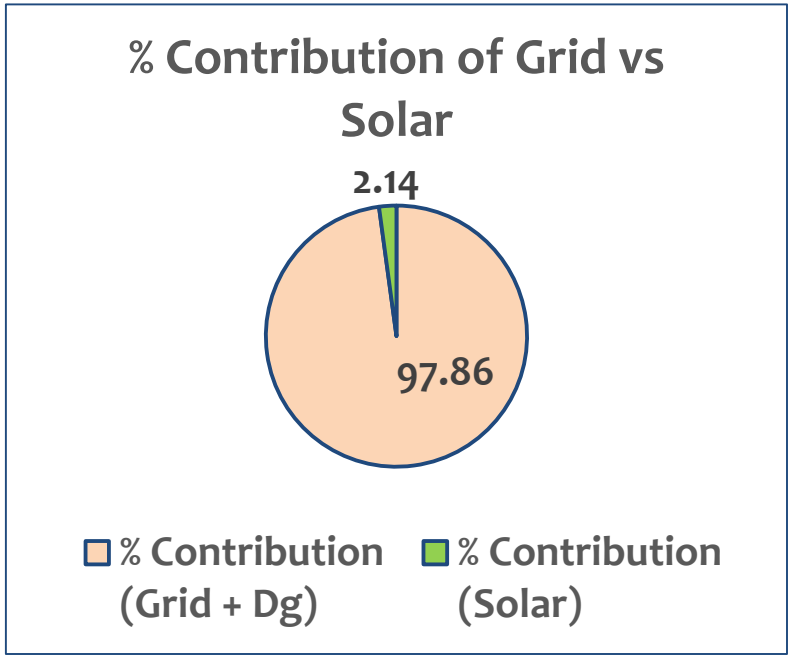
Till Dec-24

Reduction in Energy Usage from Grid





Solar Power Utilised

6.75 (Lacs Kwh)

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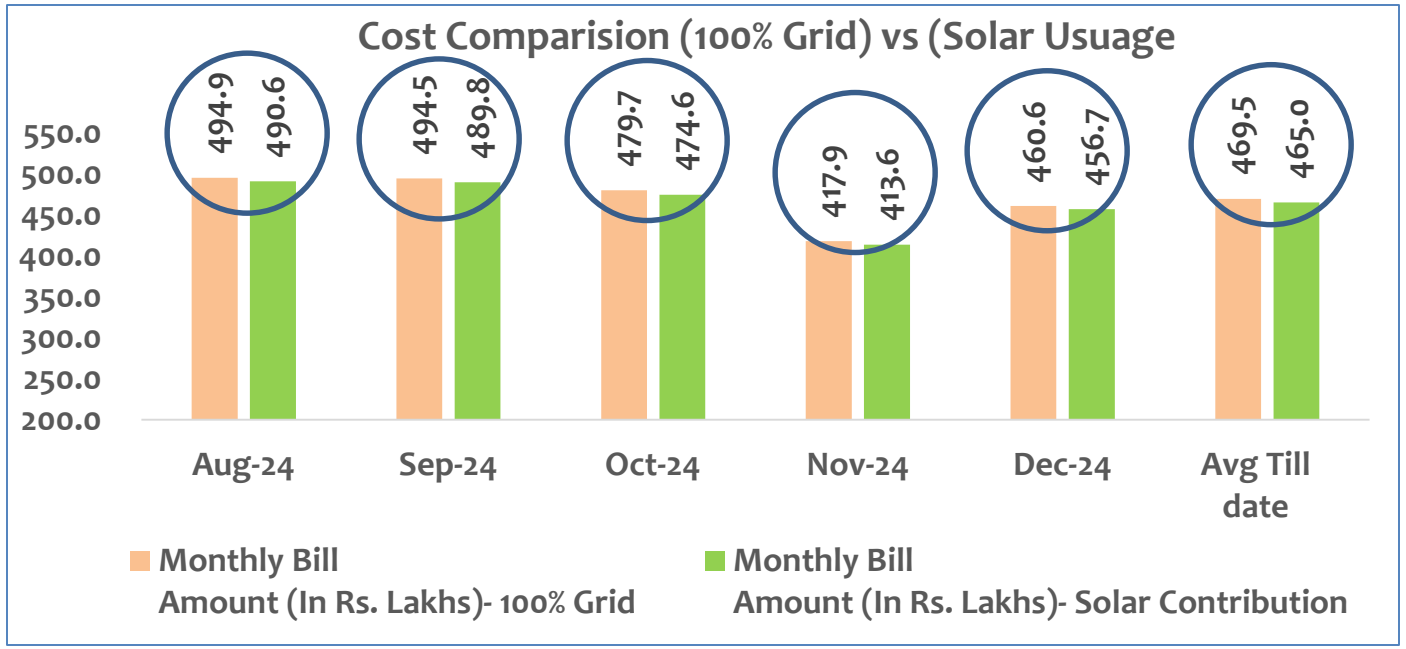
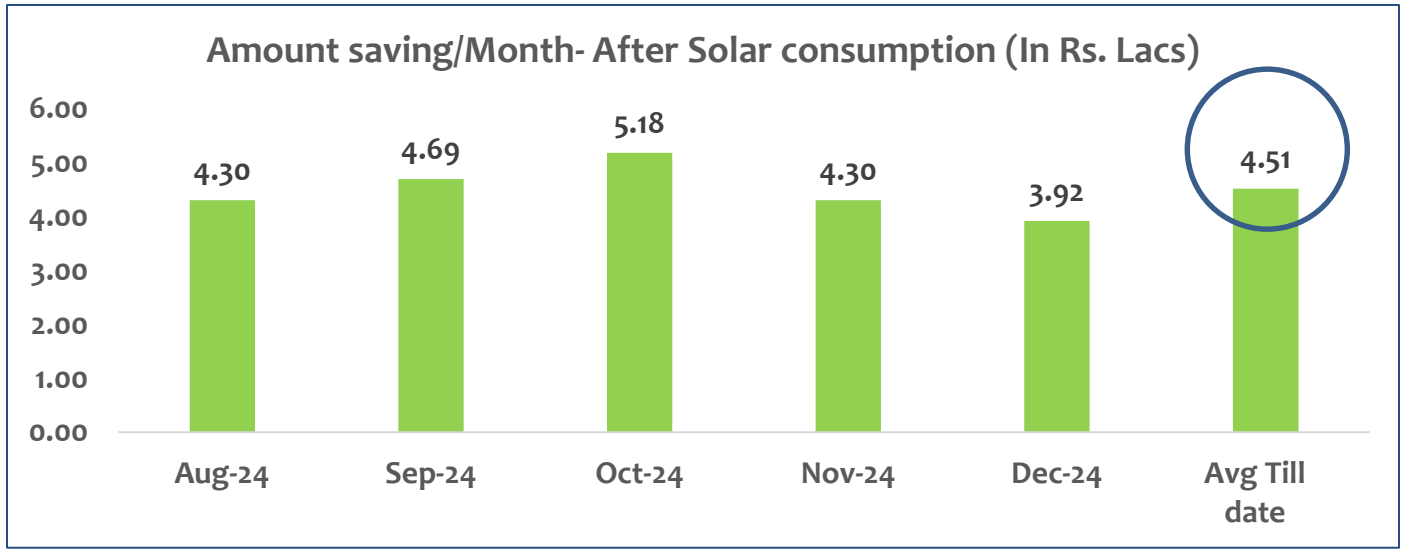
Till Dec-24

Reduction in Energy Cost (In Rs. Lacs)





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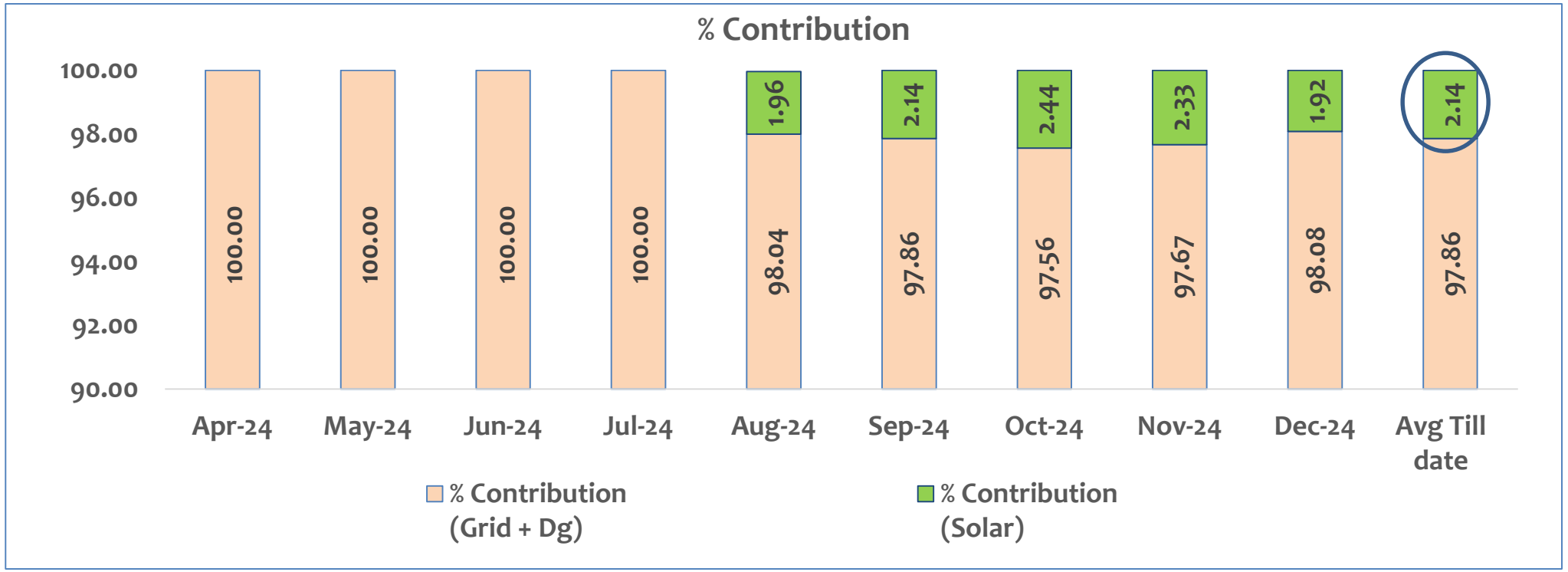
Till Dec-24 | Reduction in Carbon Footprint



Reduced CO2 footprint

6,13,798 Kg

Dated: 09-01-2025	Company Name & Address	MM/YY	Sr.No.
Kaizen Description Sheet	Name: Shriram Pistons & Rings Ltd. Address: Pathredi Plant.	2025	15
P Q C D S M IT — Energy — Environment			

Kaizen Theme: Reduction of Co2 Footprints & energy cost

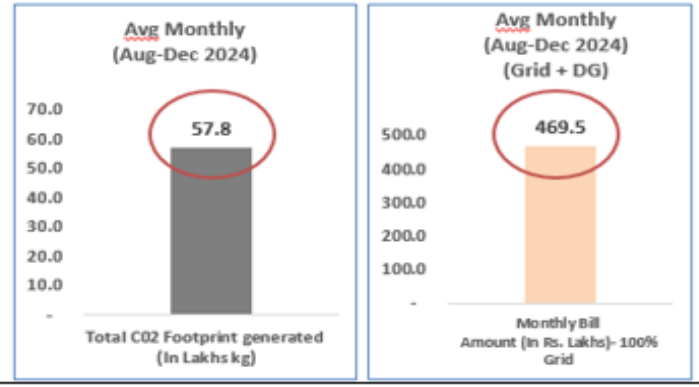
Implemented Area:
Shiram Piston Bhiwadi (EV & pin)

Implemented By:

Problem/Present Status:

1. Only Fossil fuel based energy production source available.
2. High carbon emission usage contribution due to non-renewable source used.
3. High Electricity bill due to high Grid cost.

Before: Improvement (Photograph/video)



Results/Benefits (After implemention)

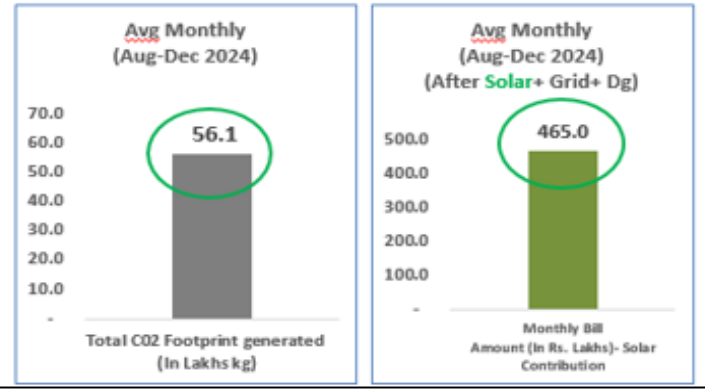
1. Green fuel energy source available by using solar energy.
2. Reduction in carbon emission by 2.1% monthly after usage of solar energy.
3. Reduction in energy cost by 0.95% monthly after usage of solar energy.

Cost Saving:

Saving unlocked 22.39 /Year (In Rs. Lacs)

Real Root Cause Identification:

After: Improvement (Photograph/video)



Standardization:

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2	Plant Type	Hybrid
3	Location of Plant	Pathredi (Rajasthan)
4	Status of Plant	Operational from Aug-2024
5	Expected CO2 saving (Reduction)	26,50,000*0.91 = 2412 Ton/Year

Root Causes:	Fosssil fuel used as single power source
Idea to eliminate root cause	Use of Solar energy in place of conventional fuel
Action Taken	Reduced conusmption of fossil fuel by Solar Power

How many places this Kaizen can been deployed horizontally:

Ghaziabad plant.

Team Name: QC team Suraj **Registration/Entry No.:**_____ **Dated:**_____ **Sign:**_____

Team Members 1. Mr. Tilak Raj **2.** Mr. Manish Kumar **3.**

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Kaizen is never ending process……

Way Forward

01 Increment in usage of Solar energy up to 50%

(TDC: 2026)

02 RECD installation at DG

(TDC: 2026)

03 Conversion of IE1/IE2 motor with IE5 class

(TDC: 2026)

04 Replacement of Old AC's with Inverter type 5 star AC's

(TDC: 2026)

Solar Power Utilised

6.75 (Lacs Kwh)

Saving unlocked (In Rs. Lacs)

22.39

% Solar Contribution

Avg. 2.14 %

Reduced CO_2 footprint

6,13,798 Kg

COMPANIES IN GROUP

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