CII – 22nd National Award for " Excellence In Energy Management - 2021"

1. Brief introduction on Company/Unit

Our Purpose

We Innovate Mobility Solutions With Passion To Enhance Quality Of Life

1. Brief introduction on Company/Unit

Our Products

Ultra Truck

CONSTRUCK

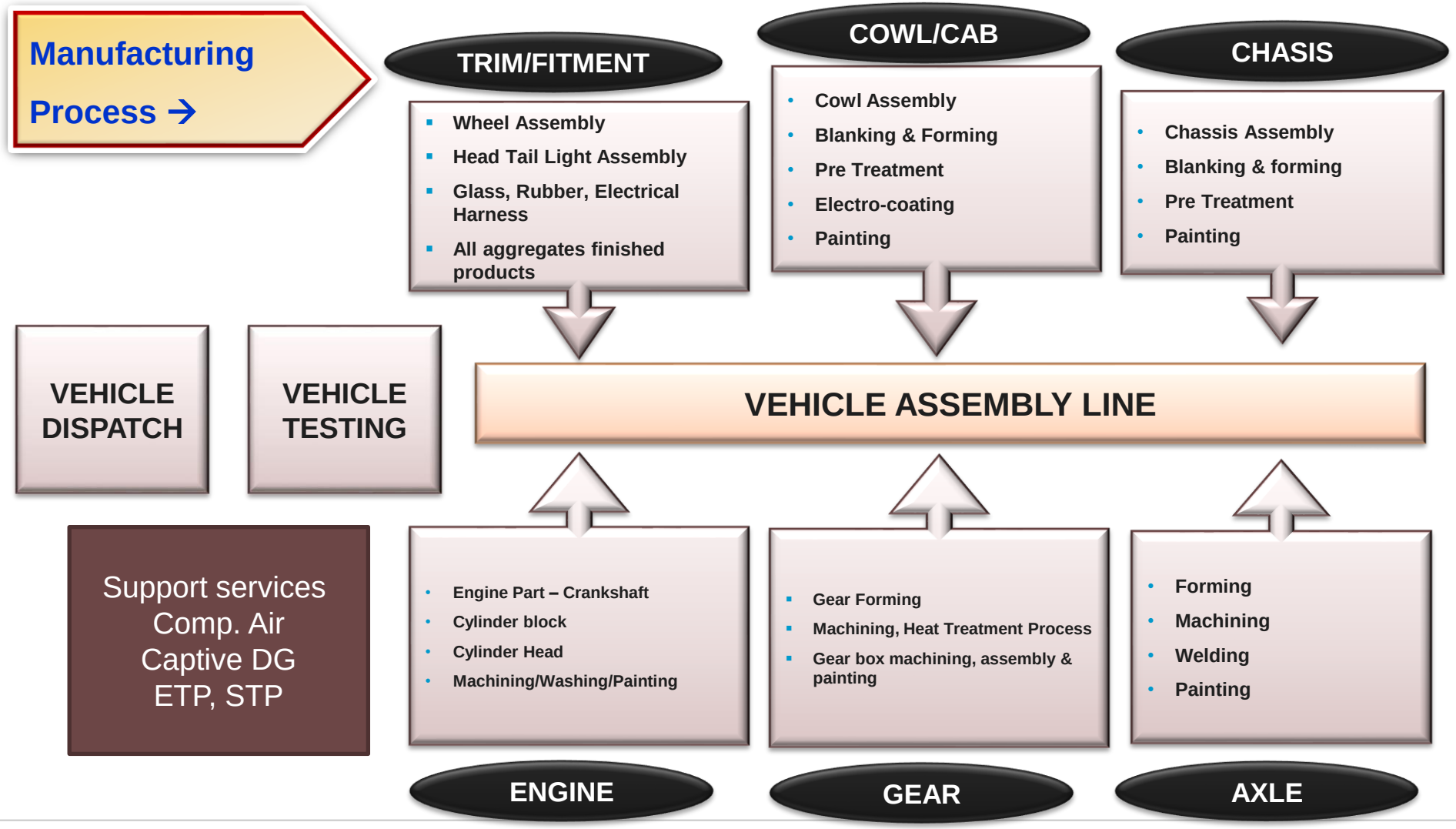
TATA Buses

Xeon Pickup

Defense Truck

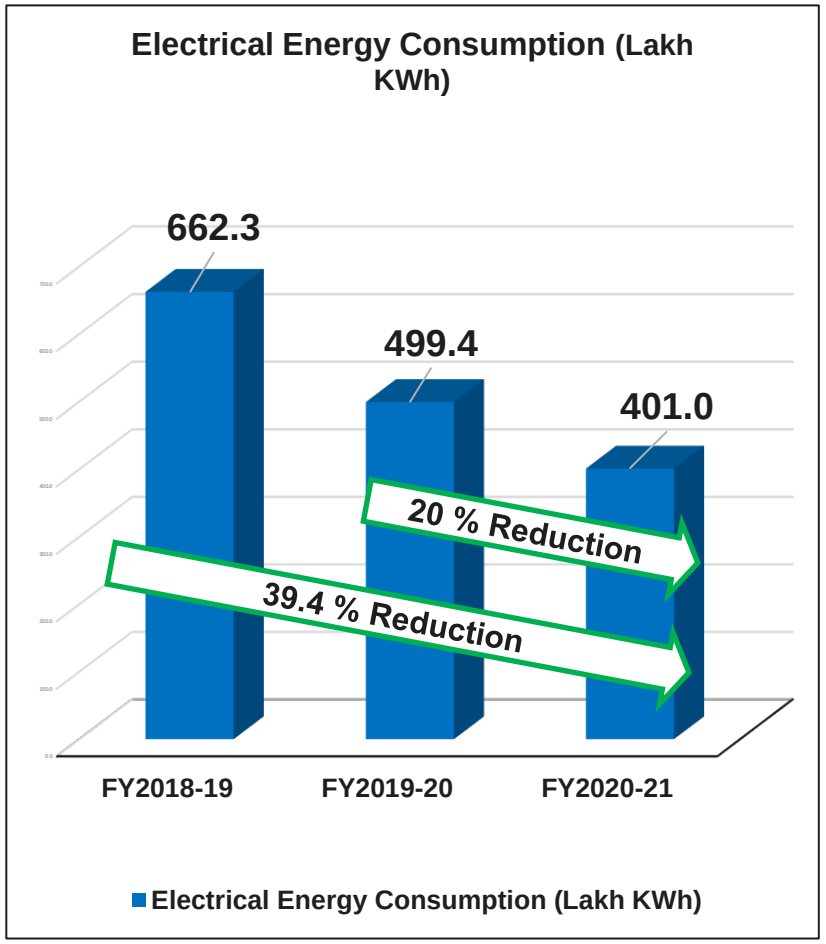
Winger

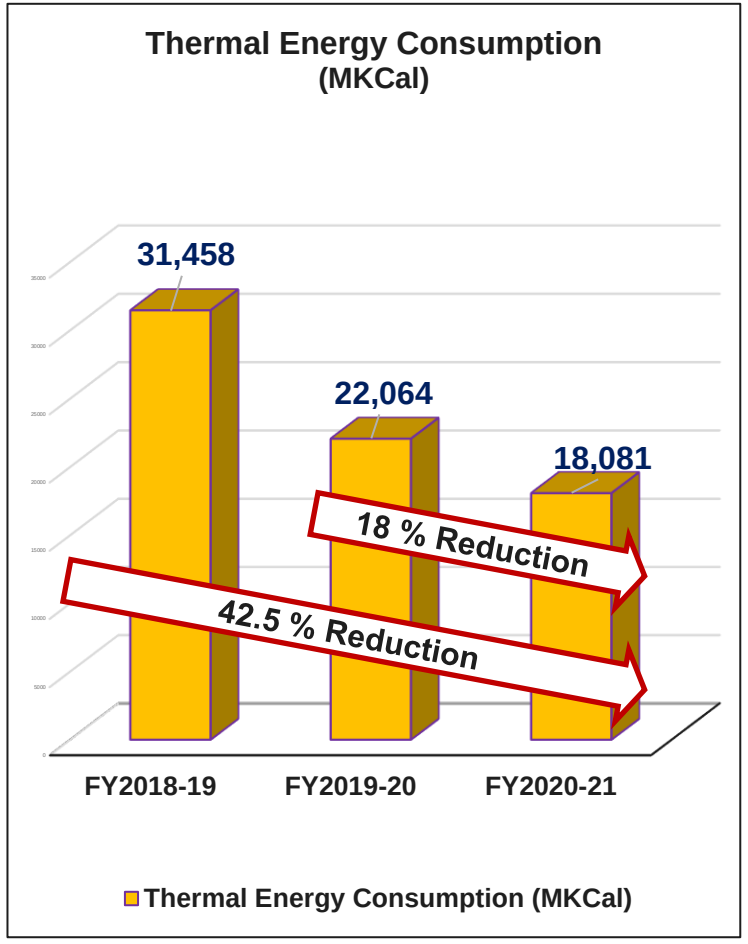
1. Brief introduction on Company/Unit

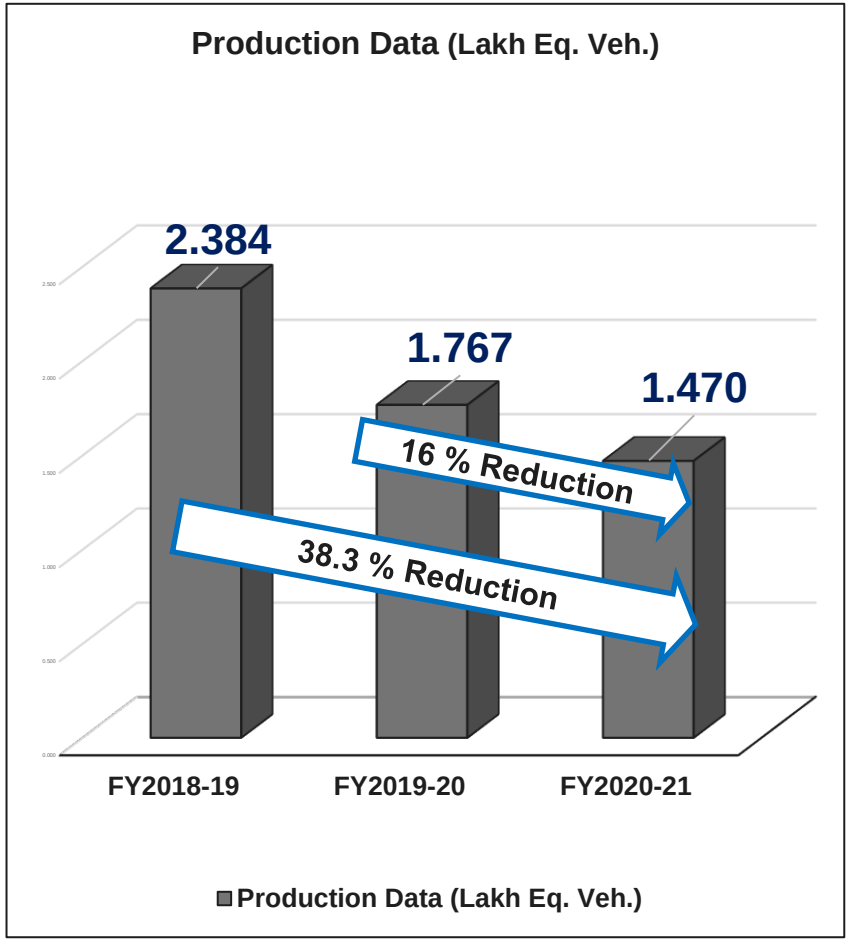


2. Energy Consumption Overview

Overall Energy Consumption and Production Data FY2018 - 2021







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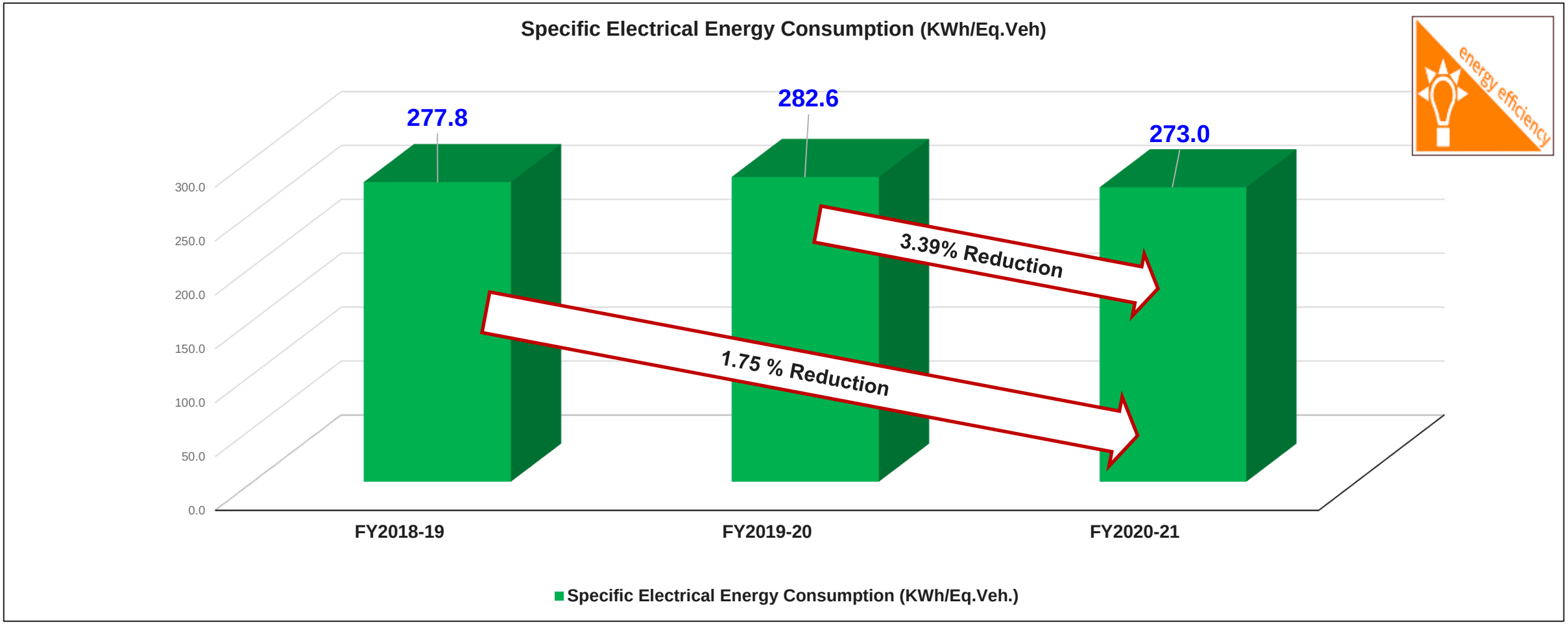
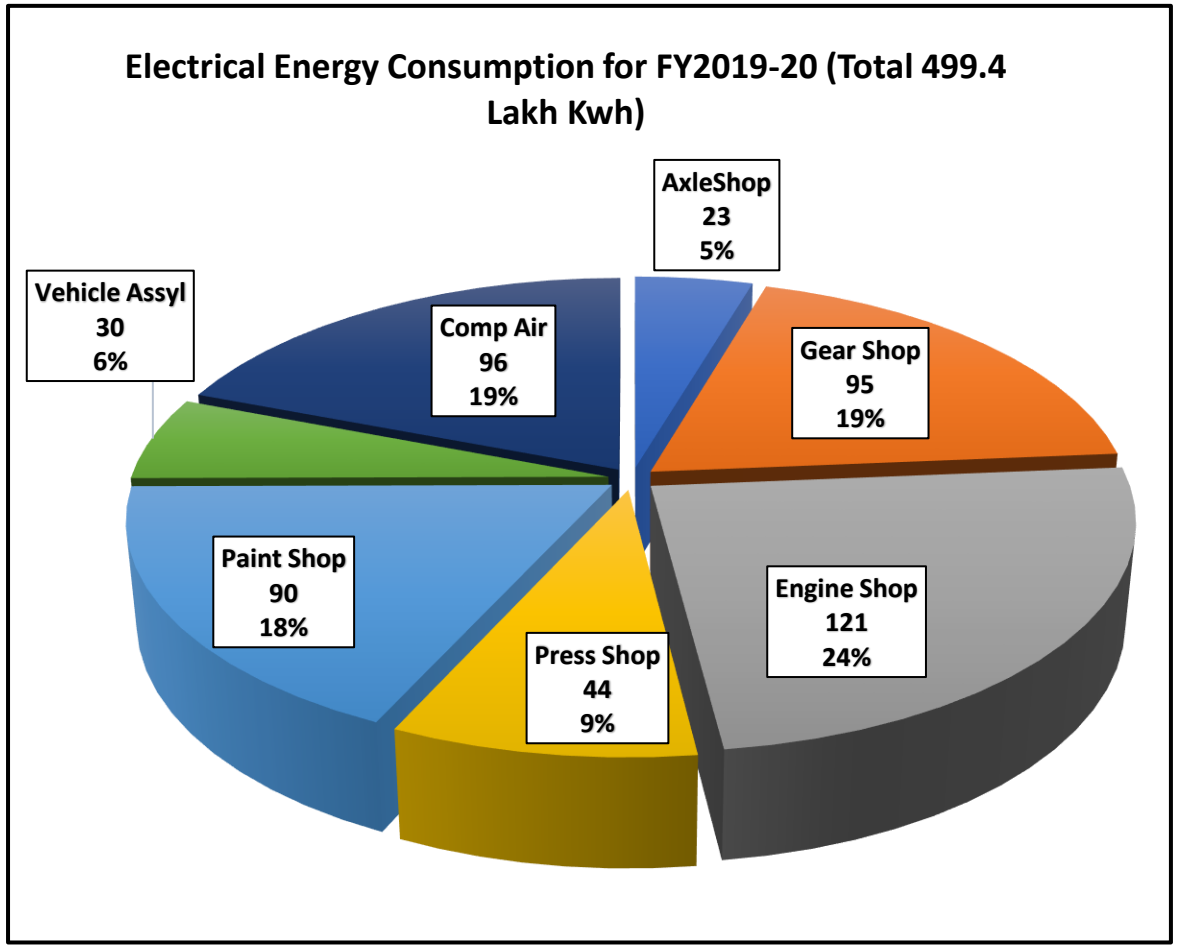
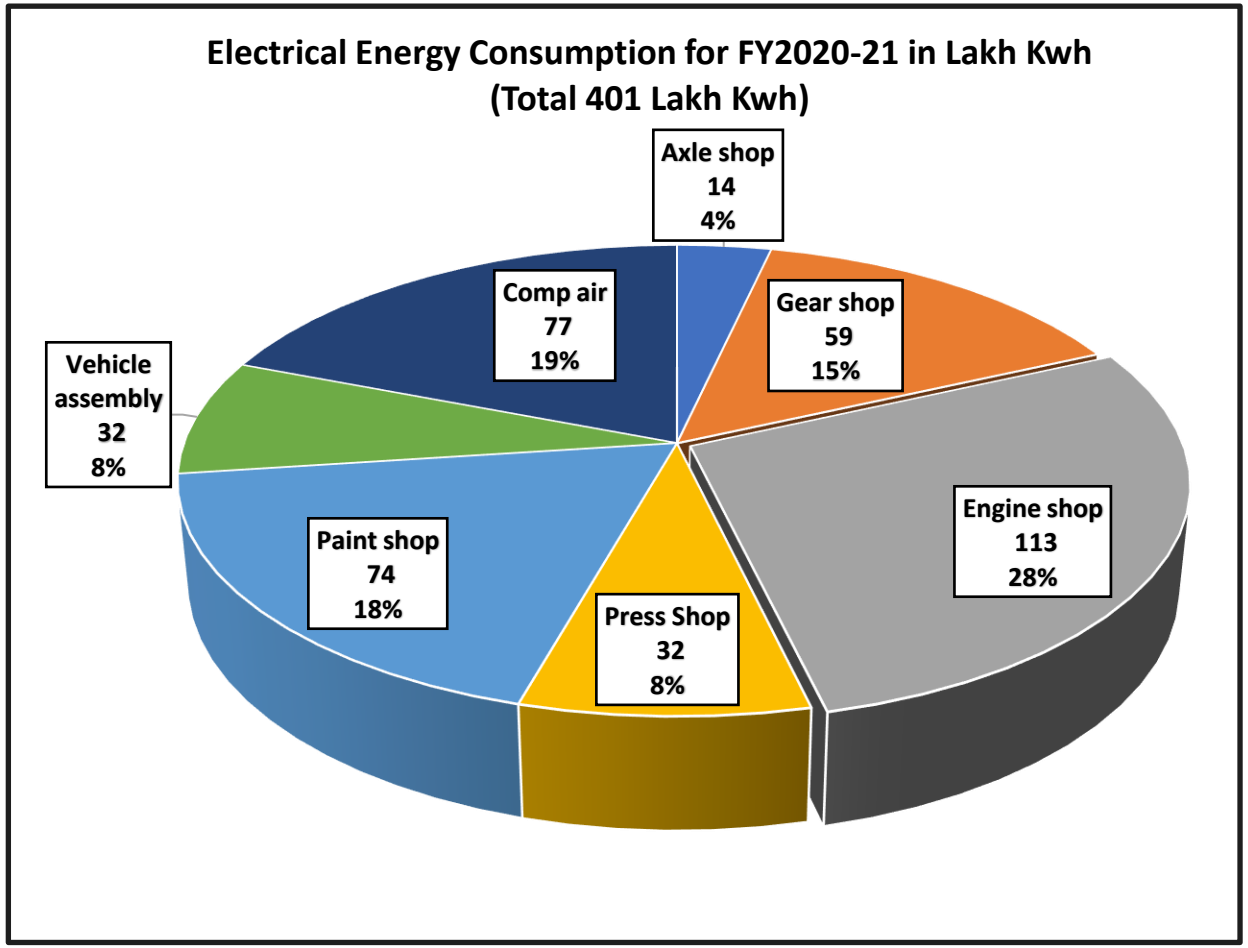


2. Energy Consumption Overview

Process wise Electrical Energy Consumption FY2019 - 20



Process wise Electrical Energy Consumption FY2020 - 21

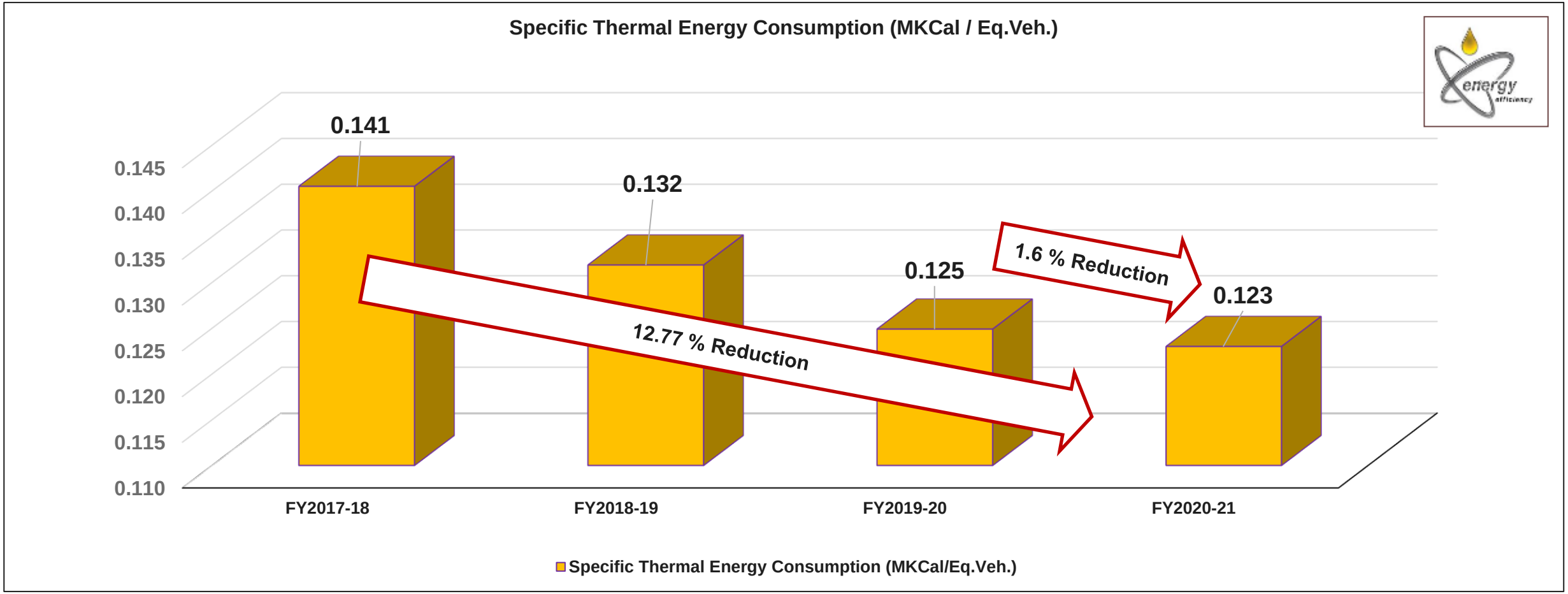


2. Energy Consumption Overview

Energy Planning FY-2021-22

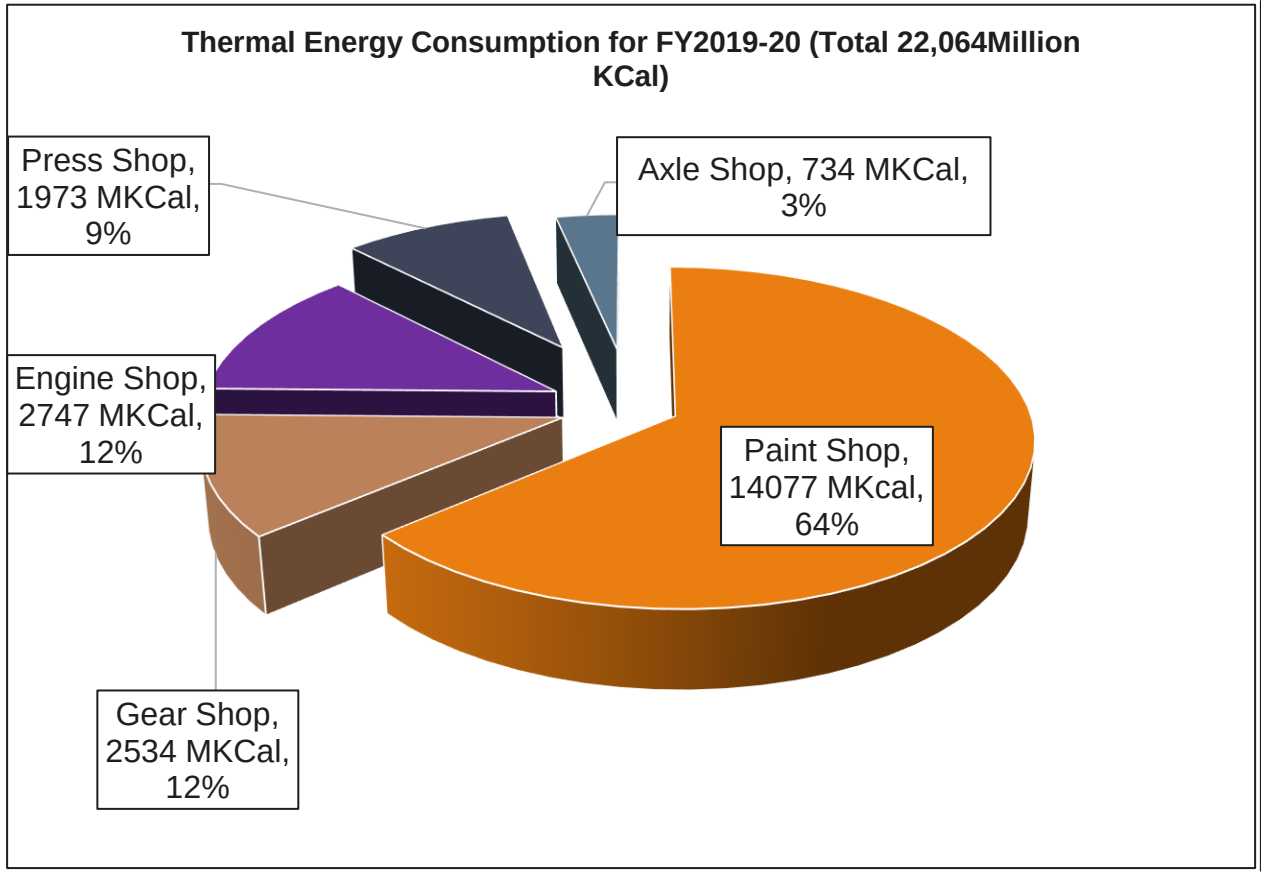
Power Rs Kwh/Eq Veh	FY 21-22 (TC)			FY 21-22 (SC) (5%)			FY 21-22 (SSC) (10%)		
Element	KWh in Lakhs	Eq Veh	Rs / Eq Veh	KWh in Lakhs	Eq Veh	Rs / Eq Veh	KWh in Lakhs	Eq Veh	Rs / Eq Veh
Axle	20	13051	153	19	13051	146	18	13051	138
Gear	85	23100	368	81	23100	350	77	23100	331
Engine	161	58057	278	153	58057	264	145	58057	250
Vehicle D	16	30540	53	15	30540	50	15	30540	48
Vehicle H	12.1	25131	48	11.5	25131	46	10.9	25131	43
E Block	46	14899	310	44	14899	295	42	14899	279
Winger	5	4096	119	5	4096	113	4	4096	107
Xenon	12	24288	49	11	24288	47	11	24288	44
J Paint	108	16837	643	103	16837	611	97	16837	579
Comp Air	107	210000	51	102	210000	49	97	210000	46
Total	**573**	**210000**	**273**	**544**	**210000**	**259**	**516**	**210000**	**246**

3. Specific Energy Consumption in Last 3 Years - Thermal

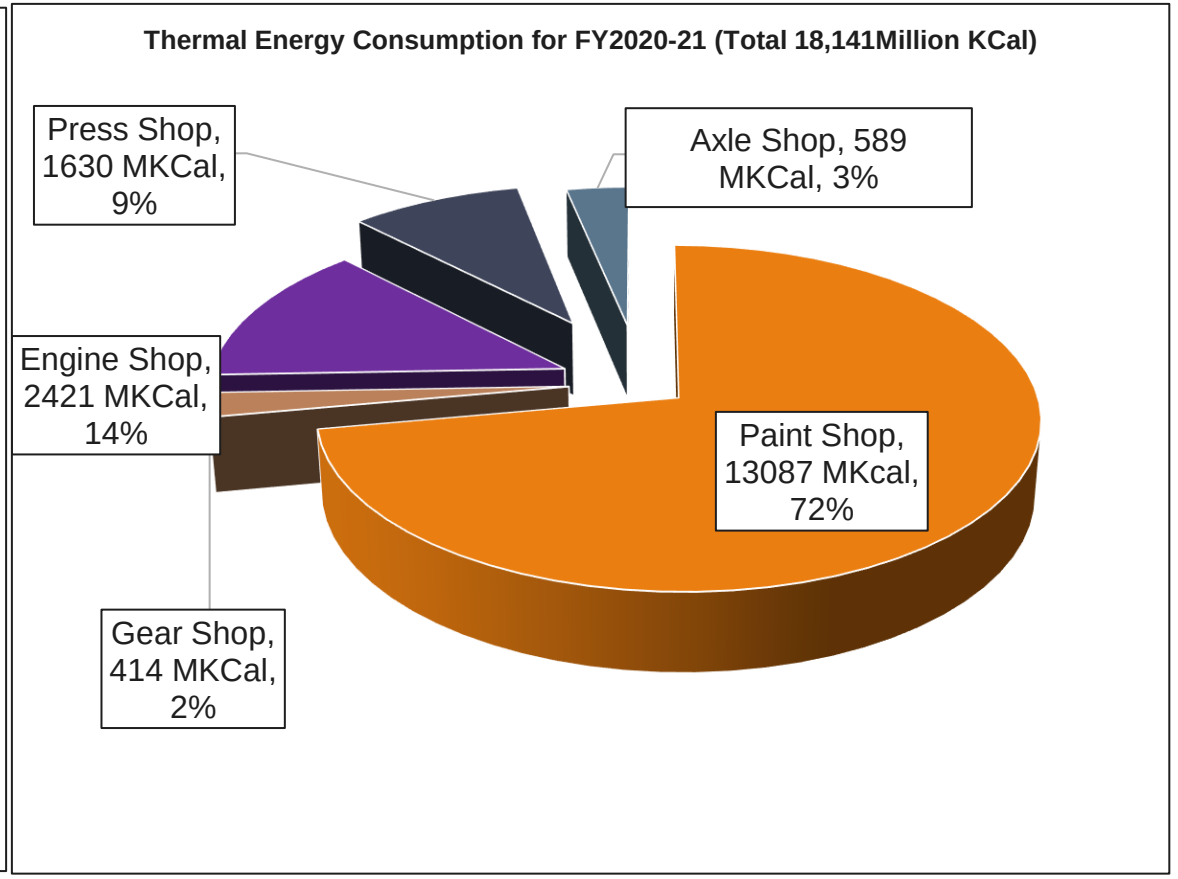


3. Specific Energy Consumption in Last 3 Years - Thermal

Process wise Thermal Energy Consumption FY2019 - 20

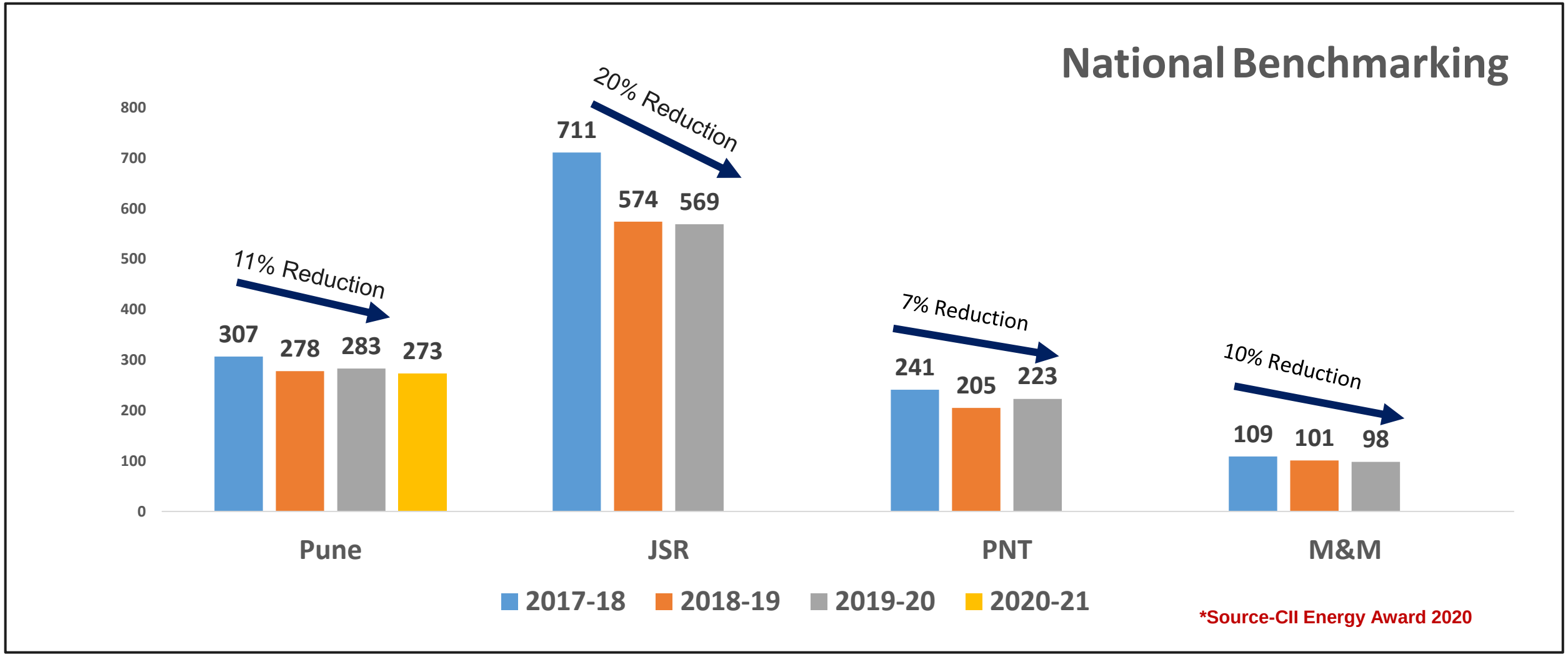


Process wise Thermal Energy Consumption FY2020 - 21

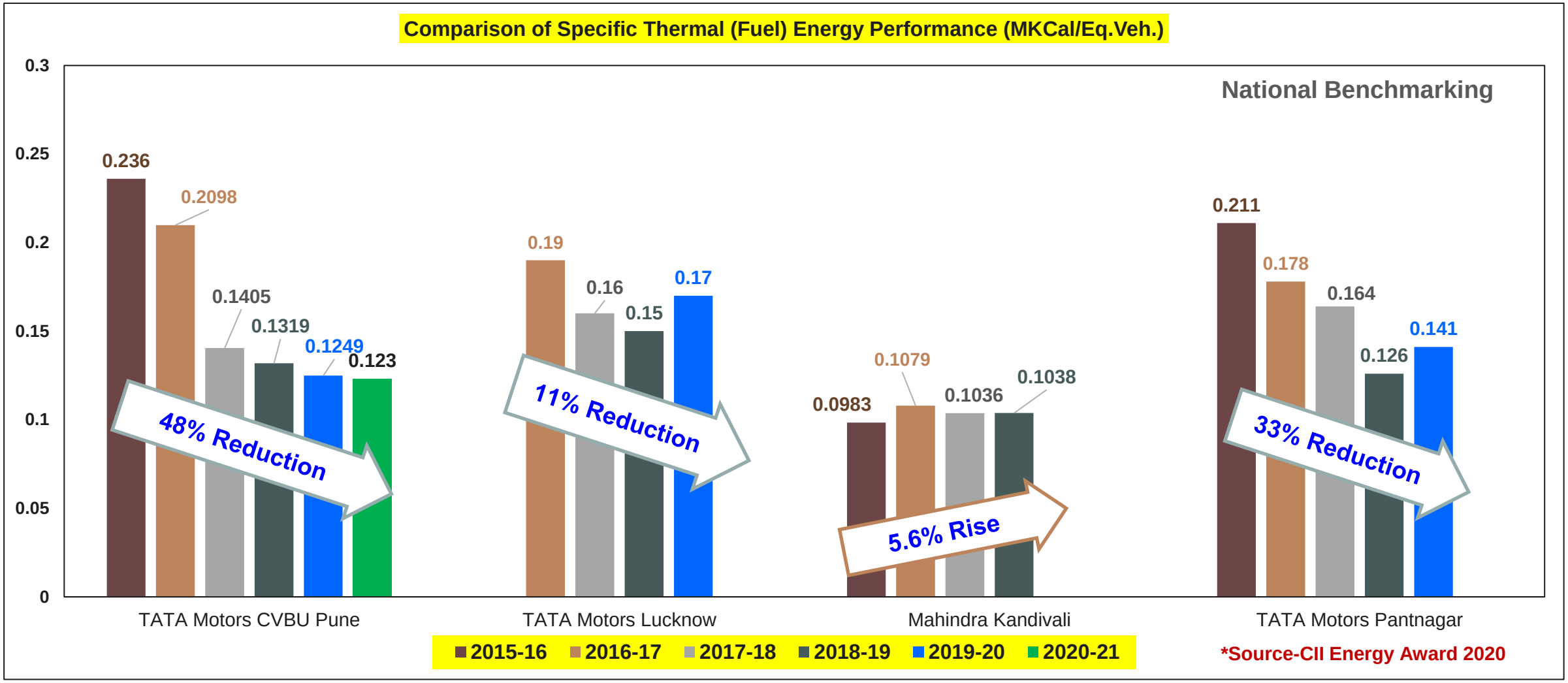


4.0 BENCHMARKING

4. Information on Competitors, National & Global Benchmark



4. Information on Competitors, National & Global Benchmark



4. Information on Competitors, National & Global Benchmark

Global Benchmark

TATA Motors CVBU Pune Energy performance is better than its Global competitors but still we would like to highlight the following aspects

- Apple to apple comparison is very difficult to compare
- Manufacturing models are different, eg. In CVBU Pune, we are having all manufacturing processes.
- Climatic conditions varies

4. Information on Competitors, National & Global Benchmark

Roadmap to achieve Benchmark / Global Best :-

TATA Motors CVBU Pune Plant will continue to refine all process to achieve Benchmark Level.

To Sustain the Best Achieved Level :-

We are following robust process of assessment of performance vis-à-vis comparative information / benchmark from different organisation and standards.

Roadmap :-

- ❑ Intelligent management-Optimise and effective use of Resources
- ❑ IOT / Machine management - Adapt Latest Technology
- ❑ Lean manufacturing and Processes Management - Innovations
- ❑ Clean resources - Maximise Renewable Energy
- ❑ GHG Management - Reduce Carbon Footprint
- ❑ Real-time Monitoring and analysis

4. Information on Competitors, National & Global Benchmark

Roadmap

• Realign the Processes • Continual process improvement	• ECO (Machines IDLE run optimization) • CNC / Robotic Technology • RTPFC – Unity PF • IoT – industry 4.0	• Sensor Technology • Process Optimization • Energy Bank Concept	• 22MW captive Wind Power + Additional 18 MW Third Party Purchase. • 4.5 MW Solar Power	
• Improve to the MOP (measurement of Performance) up to 400	• HVLS Fans • Room temp washing • Day light utilization technology.	• Conversion of LDO to NG for Pretreatment	• 75 % Achieved for CVBU Pune	
• Adapt Cleaner Fuel Eg. LDO to NG	• Lighting management and standardization.	• WHRS(Waste Heat Recovery System) in Engine Test Beds	• Signed RE100. • GHG Management - 5 Year Road Map.	
Optimize Resources	**Adapt Latest Technology**	**Innovations**	**Maximize Renewable Energy**	**Reduce Carbon Footprint**

5. Energy Saving Projects Implemented in Last Three Years

❑ **Summary of Project Implemented in Last Three Years**

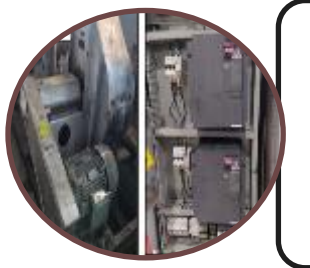
Year	No of Proposals	Investments (Rs. Million)	Savings (Rs. Million)	Payback Months
2018-19	12	18.3	23.3	9
2019-20	14	12.8	28.9	5
2020-21	20	12.4	32.5	5
Total	**46**	**43.4**	**84.7**	**7**

5. Energy Saving Projects Implemented in Last Three Years

❑ List of Major Implemented Energy Conservation Projects_**FY2020-21**

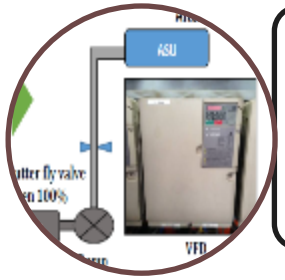
Electrical heating to CNG conversion (Total 5 Machines converted to NG)

- Energy Cost Saving → **Rs. 26.33 Lakh**
- Investment → **Nil**
- Total kwh saving → **2,82,000 kwh/Year**



REDUCING ENERGY CONSUMPTION OF PERFORMANCE TEST BED BY LOWERING SPEED OF BLOWER SPEED (16 no's VFD installed).

- Energy Cost Saving → **Rs. 27.56 Lakh**
- Investment → **Rs. 8 Lakh**
- Total kwh saving → **3,32,448 kwh/Year**



ELIMINATION OF PUMP THROTTLING AT J11/J12 PAINT SHOP(Modulation of pump flow with VFD)

- Energy Cost Saving → **Rs. 19.73 Lakh**
- Investment → **NIL**
- Total kwh saving → **2,12,585 kwh/Year**

5. Energy Saving Projects Implemented in Last Three Years

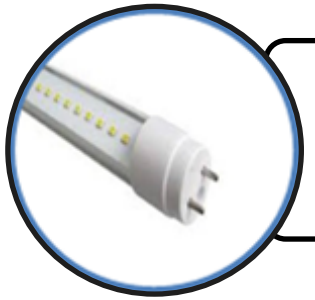
List of Major Implemented Energy Conservation Projects _ **FY2019-20**

New Technology - Replaced CL666 & installed new Cylinder Block Honing (Servo-controlled system without Hydraulics).

- Energy Cost Saving → **Rs. 5.5 Lakh**
- Investment → **Rs. 5 Lakh**

Converting Nos. of Sodium Vapour Lamps to Highbay LEDs - High bay lamps to convert to LED Qty 1579 Nos.

- Energy Cost Saving → **Rs. 106.93 Lakh**
- Investment → **Rs. 105.78 Lakh**



Conversion of 36W Tube light to 18W LED Tube - Qty 787 nos.

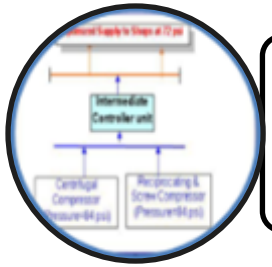
- Energy Cost Saving → **Rs. 7.89 Lakh**
- Investment → **Rs. 3.15 Lakh**

5. Energy Saving Projects Implemented in Last Three Years

❑ List of Major Implemented Energy Conservation Projects _ **FY2018-19**

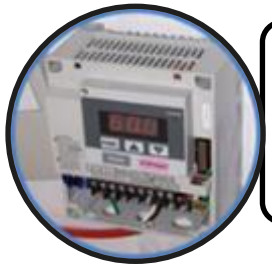
Waste Heat Recovery System Reutilization of Waste heat of flue gas of Engine Test Beds for heating water in Washing Machine.

- Energy Cost Saving → **Rs. 13.97 Lakh**
- Investment → **Rs. 25 Lakh**



Intermediate unit for Air compressor in J Paint shop.

- Energy Cost Saving → **Rs. 5.19 Lakh**
- Investment → **Rs. 5 Lakh**



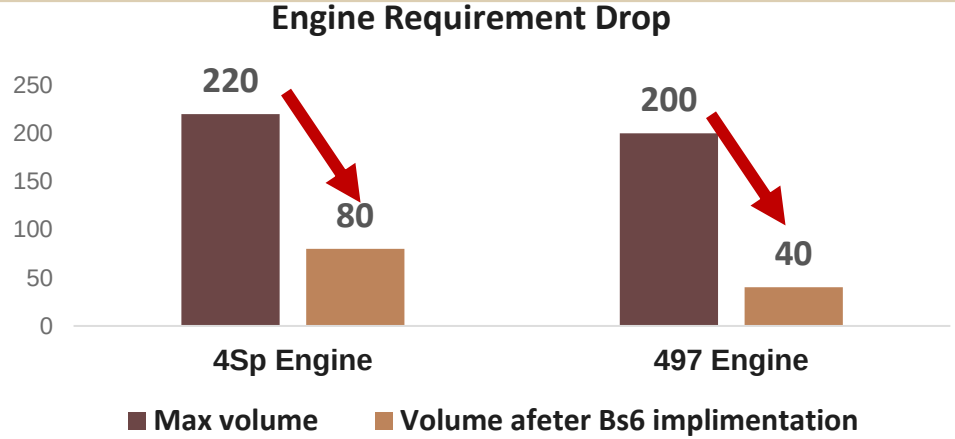
Installation of VFD's for Blowers & Pumps.

- Energy Cost Saving → **Rs. 1.62 Lakh**
- Investment → **Rs. 0.3 Lakh**

6.Innovations

6. Innovation No 1 - Accommodation of 497 & 4SP Engine assembly facility for effective utilization.

Effective utilization of existing asset of BS4 after BS6 Compliance



Impact of reduction in Bs4 Requirement

- Utilization of manpower
  - MOP Reduction
- Variable conversion cost
  - Utility & VIC
- Maintenance cost

Team Formation

- Engine manufacturing team
- Support service team –Maintenance and Utility
- Technical service team
- Software Team

Feasibility study

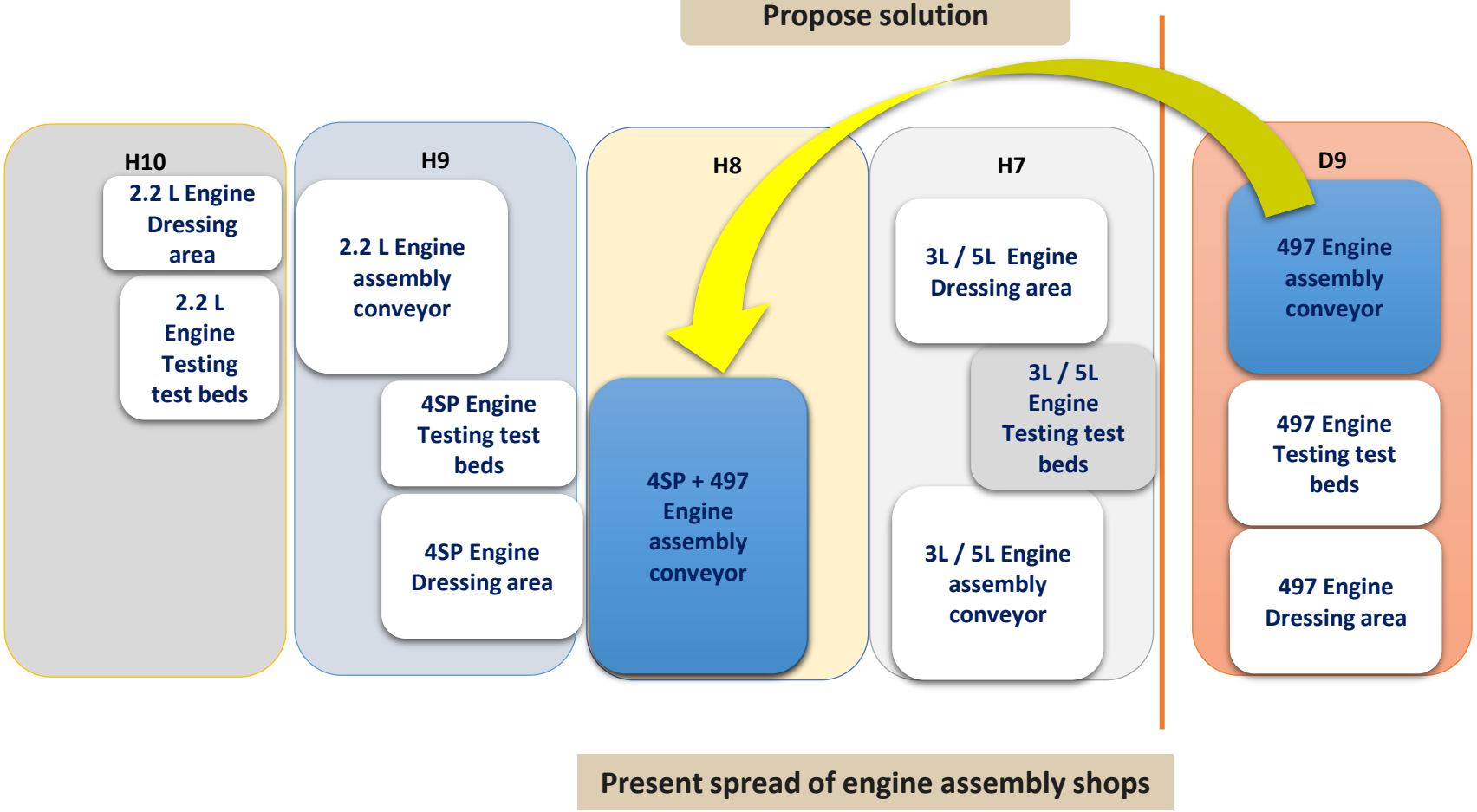
- Feasibility of Merging 497 at H7 / H8 / H10
- Infrastructure requirement
- Deployment of manpower
- Utility & VIC cost reduction

6. Innovation No 1 - Accommodation of 497 & 4SP Engine assembly facility for effective utilization.

Objectives – Desired Outcome

- MOP increase from 300 to 420.
- Utility cost Power and fuel cost reduction by 30% - 40%
- VIC (Variable indirect cost)Cost reduction by 30% - 40%

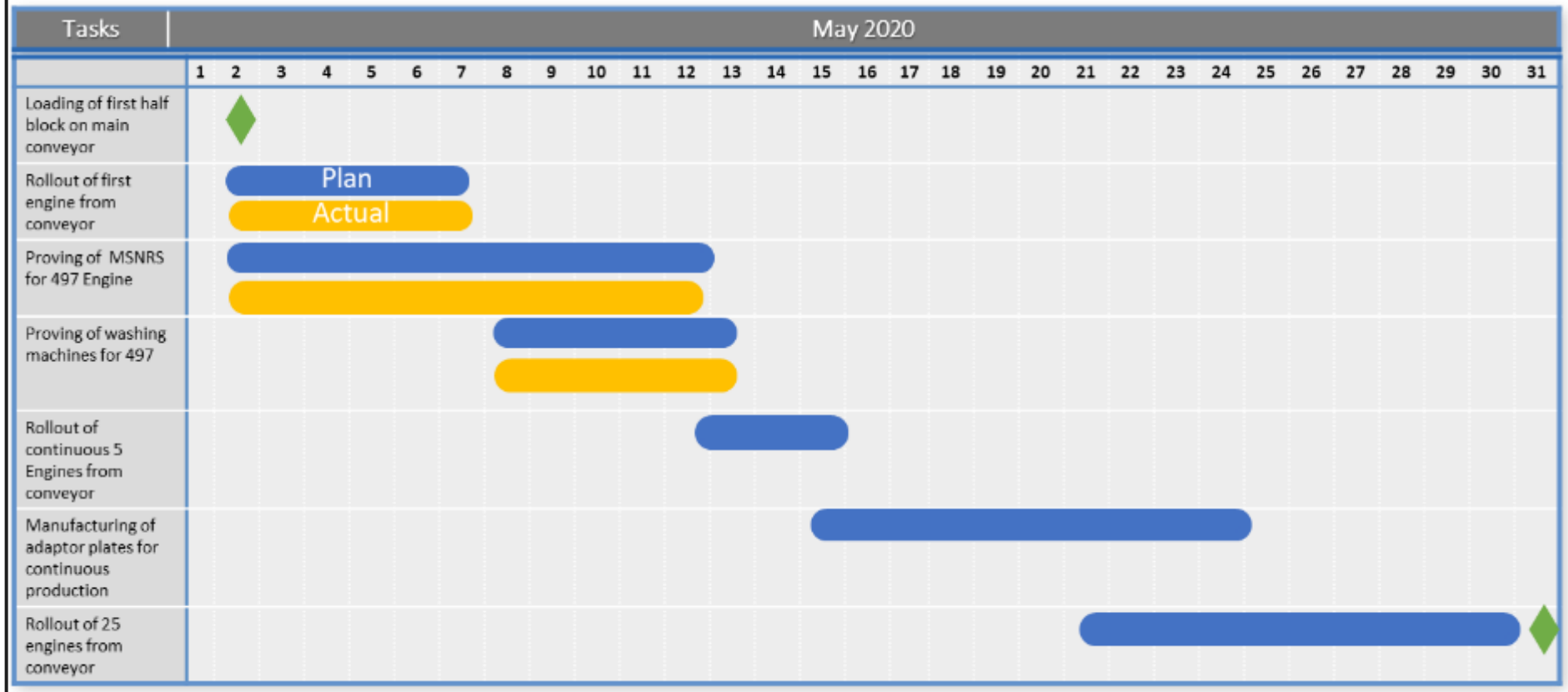
Propose solution



Present spread of engine assembly shops

6. Innovation No 1 - Accommodation of 497 & 4SP Engine assembly facility for effective utilization.

Implementation strategy

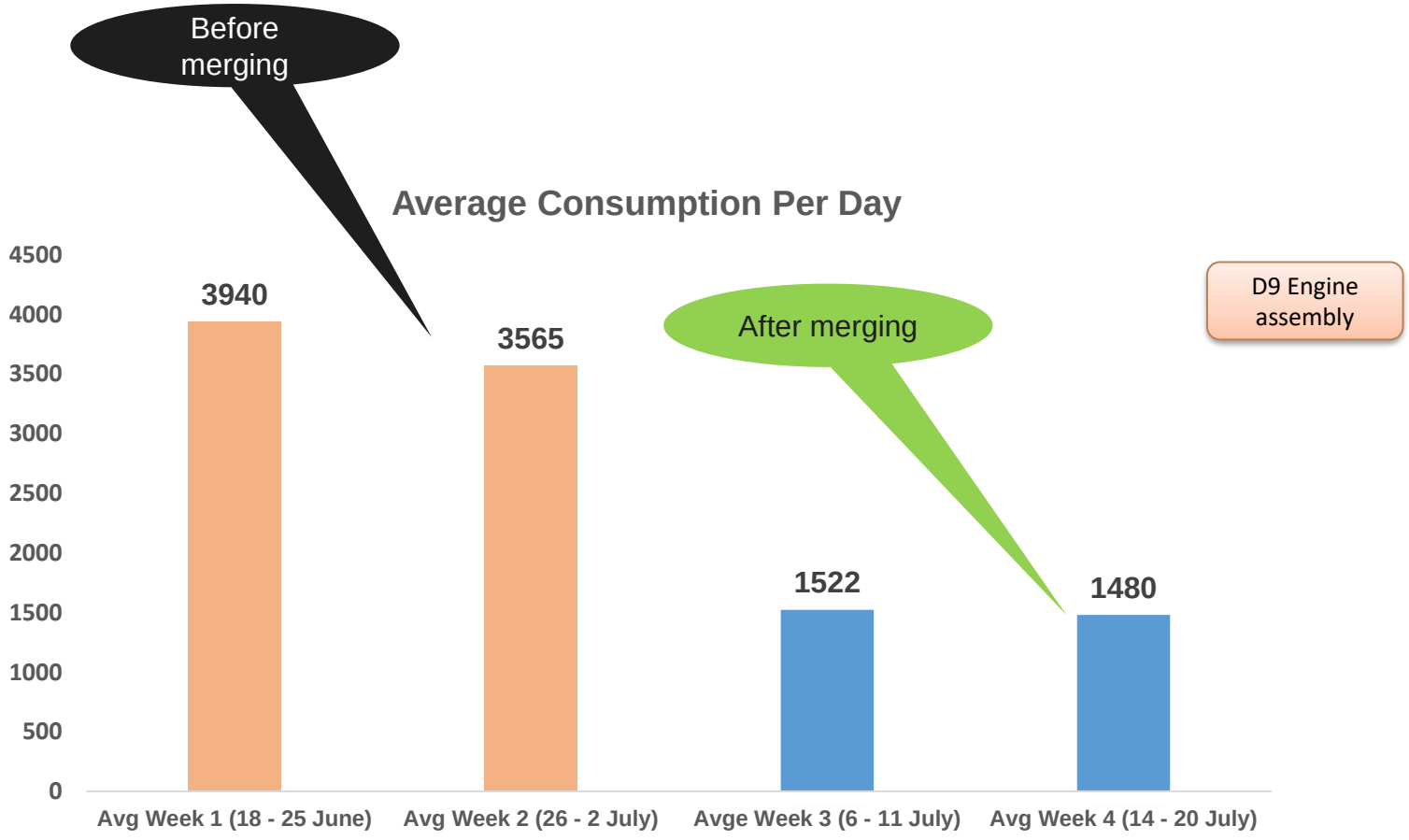


Merging of 497 & 4SP Engine, all activities are carried out in-house by TML team

Implementation done during COVID-19 lockdown period

Zero investment project - As all the available recourses are used for successful implementation.

6. Innovation No 1 - Accommodation of 497 & 4SP Engine assembly facility for effective utilization.



Benefits

Disconnected
Saving

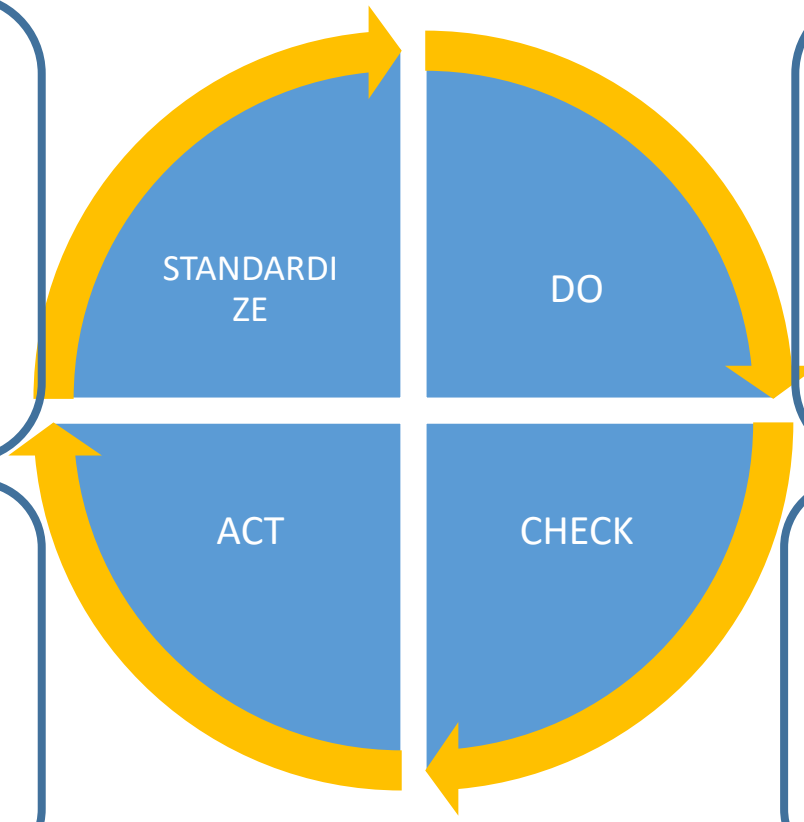
Power for Air conditioning	Air conditioning switched off	Power saving -
Power for washing machines and other equipment's in assembl	Washing machines and other equipment's switched off	Power saving -
Air Supply for washing machines and other equipment's in assembly	Air Supply switched off	Compressed Air saving
CNG Supply for washing machine	Washing machines switched off	CNG saving -

Total units saved 6.4 lakh kwh/Year

6. Innovation –Project 2 : "Non working day fix power consumption reduction."

SDCA FOR NWD CONSUMPTION REDUCTION (Block Closure) – Pune CV

- Non Working Day Plan of Each Factory as per business emergencies & exigencies requirement. Prior PH approval is mandatory.
- Shiftwise Measurement Standard.
- Derived a 2x2 Matrix for understanding the Power Consumption on Non Working Days.
- According to Number of Non Working days Standard Consumption Pattern is derived & allotted Target.
- Standard template for capturing Shiftwise working and approximation of consumption of each area.
- Shift in-charge for Block Closure and non working days.
- Fixed time for compressed air availability across the plant for equipment trial after PM.



- Blockwise target defined and communicated to all factories by considering their NWD Plan as per Plant Head Approval.
- Planned Shutdown of Heat Treatment for effective reduction in consumption.
- Downtake Valve of Compressed Air of Non Working Area of each factory has been made OFF.
- Deployed each factory coordinator to identify energy waste.

- From Data analysis, reason for Higher Consumption identified & corrective actions taken for further Block Closures.
- E.g. Deployment plan for portable compressor unit instead of Centralized Compressor.
- No work No Air message from Plant Head Office.
- Plant Head Office Approval for any last minute emergencies & exigencies requirements.
- Learnings are captured for next Block Closure.

- Audit is carried out by Factory coordinator in their Area along with Energy Cell.
- Compressed Air Dept. maintain the Air consumption data of each Block.
- Shiftwise & Area wise consumption is monitored against target.
- Comparing the Consumption of Non Working Days.

6. Innovation – Project 3 : "Innovative approach for Press power consumption reduction ."

Consumption reduction for Cushion application during process run

- 1700 Ton Press is used for press component long member punching and forming operation
- Punching operation does not required cushioning
- Dies are different for punching and forming operation.
- While doing the forming operation cushioning is used for forming the long member
- For cushion operation 22 kw motor is running continuously throughout the cycle at 50Hz
- Total 9 Nos of 22 kw motors are used for Press

Earlier 22KW cushion motor up/down both running at 50Hz.
Current at 50HZ – 18.9A

6. Innovation – Project 3 : "Innovative approach for Press power consumption reduction ."

SOURCE OF IDEA

VCC Power & Fuel CLT - Idea Status (Implemented & In pipeline) - GEAR

Sr No	Idea Description	Cost Pillar	Idea Origin	Idea Origin Plant	Category	Main Lever Identified
1	CB air charging time more Compressed air to be run in C shift	Power	Factory Level	Pune	Power	Reduce
2	Hitachi line washing machine to be kept off during change over	Power	Factory Level	Pune	Power	Reduce
3	MCF interlock with machine control ON	Power	Factory Level	Pune	Power	Reduce
4	Shot Blasting traightening m/c outlet conveyor interlock with plate presence at entry gate	Power	Factory Level	Pune	Power	Reduce
5	Elimination of IDLE running of motor.	Power	Factory Level	Pune	Power	Alternate
6	Shot Blasting M2 outlet conveyor interlock with plate presence at entry gate	Power	Factory Level	Pune	Power	Reduce
7	5100T Press Mechanical joint of Pinch roller with inlet conveyor - Pinch roller motor elimination	Power	Factory Level	Pune	Power	Eliminate
8	Deburring area - Solenoid valve installation in main incoming air line	Power	Factory Level	Pune	Air	Eliminate
9	All Equipment - switch Off from PP after use	Power	Factory Level	Pune	Power	Eliminate
10	Shop floor T/L & Fans - Switch off after use	Power	Factory Level	Pune	Power	Eliminate
12	Oil schemer to be kept off	Power	Factory Level	Pune	Power	Eliminate

6. Innovation – Project 3 : "Innovative approach for Press power consumption reduction ."

- Feasibility is checked and application study and impact of idea and effect on equipment parameters
  - Cycle Time / Productivity
  - Quality impact
  - Machine health
  - Any adverse effect of idea implementation.

- Detailed study is carried out with respect to all above points. following alternative evaluated
  - Reduction of speed by mechanical modification.
  - Reduction of speed by changing motor at required speed.
  - Reduction of speed by providing VFD.
- First two solution are not feasible due to space constraints and requirement of operation.
- Reduced speed motor will not allow variation in speed.

- Observation of Press Cushion parameter
- Cushion operation is come in to picture during ram stroke for forming operation during that time only cushion motor required high torque and power at rated frequency.
- Cycle time for forming operation is 60 sec.
- Timing required for maintaining the power torque is 3 to 4 sec at rated frequency 50 Hz.
- Remaining 55 sec motor is IDLE and continuous running at 50 Hz.

6. Innovation – Project 3 : "Innovative approach for Press power consumption reduction ."

- As a POC Concept we have implemented one VFD for cushion motor application .
  - Electrical circuit is designed and modification done in existing electronics circuit.
  - When motor is at 50 hz forming operation is done.
  - During idle run reduced frequency of motor at 30 Hz for remaining 55 sec and confirmed that machine operation working satisfactory.
  - Due to this idea 18300 kwh/anum saving is confirmed.

- Based on this innovatiove Idea we have identified total 15 no's of opportunity in press shop factory.
- Horizontal deployment is planned during year 2021-22.

Now cushion motor running at 50Hz in up time & 30Hz in down & idle time.
Current at 30HZ – 15.3A

6. Innovation –Project 4 : "Room Temperature washing for Gear shop."

Journey Towards Innovation

2017-18

MUDA ELIMINATION

- Put glass wool and cover it by aluminium cladding
- Put heat resistant paint
- Apply thermal insulation blanket-

2018-19

INDIRECT TO DIRECT SOURCE

- Use of NG Gas burner instead of Electricity Heater.
- It involves Cost Benefit as well as less tCO_2 is generated

2019-20

USED OF WASTE HEAT

- Waste Heat Recovery System installed.
- Engine Testing Heat used for heating Washing Machine water

2020-21

ELIMINATING USE

Using Cold Washing Chemicals instead of heated water to wash the components

6. Innovation – Project 4 : "Room Temperature washing for Gear shop."

We have Two different types of heating process for washing machines.

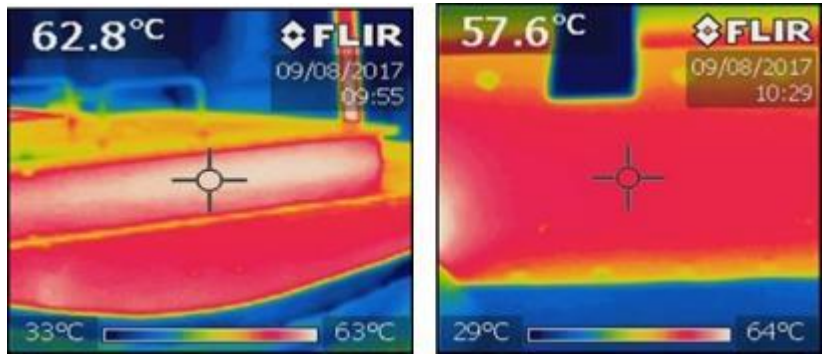
- Electrical Heating Process.
- Natural Gas heating Process.

- There are total 15 Nos washing machines in gear factory with Natural gas heating.
- All washing machines are installed 10 years back.
- All these machine are used to wash the components of gears.
- The flow Pipes and heater or burner area is insulated, but tank containing hot water tank were not insulated.
- The Skin temperature of the tank is in between 50 to 70^0C.
- This leads to huge heat loss for all washing machines resulted in loss of heat dissipation.

Before

Washing Machine Tank

Skin temperature of the System



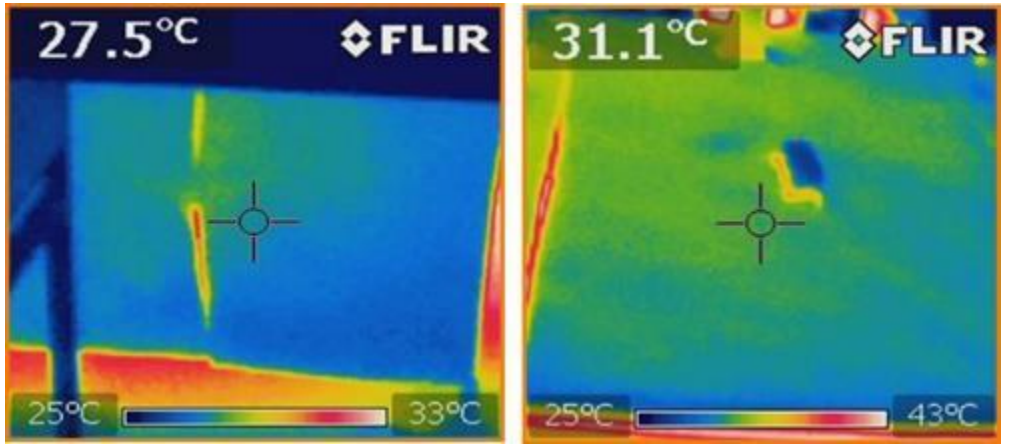
Thermal Imaging Before:

6. Innovation – Project 4 : "Room Temperature washing for Gear shop."

How to reduce heat loss ?

Options Evaluated

- Put glass wool and cover it by aluminum cladding – Required Additional cost
- Put heat resistant paint – Required additional cost
- Apply thermal insulation blanket- Required additional cost
- Apply room temp washing – No additional cost



Skin temperature of the System After conversion to room temp washing 25 to 35

SAVING OF 1677 $MTCO_2$ eq

Total Fuel saving in SCM by conversion of room temperature washing machine is 70000 SCM

6. Innovation – Project 5 - 220KV SWITCH YARD UPGRADATION.

Opportunity Base Innovation： 220KV Switch yard Upgradation

6. Innovation – Project 5 – 220 kv Switch Yard Upgradation

CONTROL & RELAY PANEL - CRP

OLD CRP PANEL

NEW CRP PANEL

Replacement of Old Electromechanical relay protection system replaced by numerical relay system.

- Numerical relay are based on microprocessor based technology, so achieved better power system reliability and stability.
- More Sensitivity and scalable.
- System Fault Oscillography and SER Data availability for Electrical system fault analysis.
- Power system can be digitally Communicated & Control through remote monitoring system.
- Advanced protection Features all in One box – Compact sizing.
- Flexibility & Multi function capability.
- High Speed acting & Fast resetting.
- Data History and Self Diagnosis.

6. Innovation – Project 5 – 220 kv Switch Yard Upgradation

EHV SF6 BREAKER UPGRADATION

PNEUMATIC OPERATED BREAKERS

ELECTRICAL OPERATED BREAKERS

Replacement of Old pneumatic operated Circuit breakers by advanced Electrical operated breakers.

- Electrical operated breaker avoided all installation required for compressor air system.
- **Energy Saving by eliminating compressor operations.(43000 Units per year)**
- Reduced in required maintenance.
- Smooth in Operations.
- Increased Lifespan of equipment.
- Better reliability as compared with Pneumatic operated breakers
- Increased operational Safety.

6. Innovation – Project 5 – 220 kv Switch Yard Upgradation

EHV ISOLATOR

OLD ISOLATOR

NEW ISOLATOR

Replacement of aged EHV Isolator by New technology EHV Isolator.

- Isolator with figure type contact obtained better contact resistance
- Obtained increase power reliability
- Obtained better operation safety
- Smooth in Operations.
- Increased Lifespan of equipment.

6. Innovation – Project 5 – 220 kv Switch Yard Upgradation

NIFPS PROTECTION FOR TRANSFORMER

NIFPS SYSTEM IN 220 KV SUBSTATION

Installation Of NIFPS System for 220 KV Transformer.

- Adherence to Electrical requirement.
- Electrical operational Safety & Transformer safety System improved. It prevent the Transformer from explosion.
- Nitrogen Gas is inert and does not react with transformer oil.
- It is completely Non-Toxic & Non-hazardous.
- It provides best cooling effect to the oil inside the Transformer.
- Forms insulating layer of N2 Blanket on top surface of the oil.
- Less Cost of Installation & Maintenance.
- Environment Friendly.
- Best System for the Areas of water Scarcity.

7.Energy Saving Projects

7.Energy Saving Project 1

Operation	Opportunity	Action taken	Results
Over Head HIGHBAY Lamp.	Electrical Power consumption reduction through LED conversion of old conventional sodium vapor and T5 Lamps.	1.Removal of Sodium vapor lamp and T5 Lamp. 2.Installation Of LED lamps. 3.Auction Of old conventional Lamp fittings.	❑ Energy Saving = **19.13 lakh kwh / Year** ❑ Annual Savings in ₹ = **₹ 178 Lakhs**

Before

After

7.Energy Saving Project 1

CVBU PUNE SUMMARY FOR LED HIGHBAY STANDARDIZATION PROJECT

Standardization High Bay LED DATA Auto Division					
Block (C,D,E,H,E,RATP/APD/LOAD Boady)	Old Sodium Vapour High bay- Lamp QTY	Optimised LED Quantity	LED high bay Installation	Total Investment in Lakhs	Total Saving in Lakhs
Total Auto	3443	2309	2309	138	178

HIGH BAY LED KWH ANNUUAL SAVING DATA				
OLD High Bay Consumption Per Day kwh	LED consumption Per day	KWh Saving Per day	KWH saving Annually	Rs Lakh Saving Annually
10,033	2,309	7,696	19,10,828	178

Results- Annual KWH Saving through LED High bay standardization **Project is 19.10 Lakh Kwh** Which compensates **Sunday Consumption** for Entire CVBU Pune Plant.

7.Energy Saving Projects - 2

Electrical heating to CNG conversion

Operation	Opportunity	Action taken	Results
BK 301 – 3.3L Intermediate Robot Washing machine ,Pre honing ,Post honing washing machine.	Electrical Power consumption reduction through Electrical to NG conversion of total 5 no's washing machine.	1.Elimination of electrical heating 2.Provision of NG burner and blower made and machine converted to NG heating.	❑ Total Energy Saving Per Year =2,82,000 **kwh /annum** ❑ Annual Savings in ₹ = **₹ 26.33 Lakhs**

Before	After
	

7.Energy Saving Project - 3

Optimization of Paint Booth supply and exhaust fan consumption in recess time.

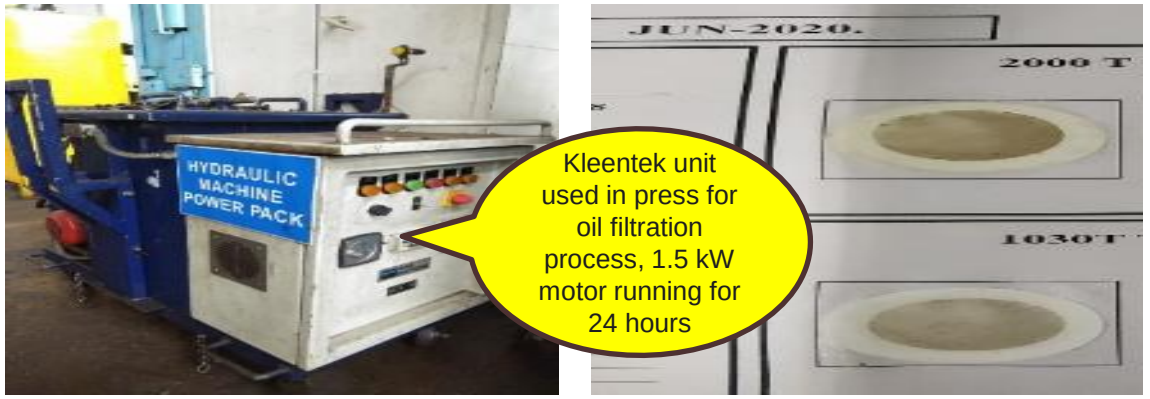
Operation	Opportunity	Action taken	Results
Booth Positive Air velocity Maintain, by using Supply & Ex. Fan.	In Lunch Time, Tea Time, or No Load Condition Paint Booth Supply & Ex Fan was run idle in low frequency.[30 Hz to 36 Hz]	In Lunch Time, Tea Time, or No Load Condition Paint Booth Supply & Ex Fan frequency Optimization done up to 0 Hz.	❑ Energy Saving = 137250 **kwh /Annum** ❑ Annual Savings in ₹ = **₹ 10.43 Lakhs** ❑ Investment = **0 Rs'**
Before		**After**	
In Lunch Time, Tea Time, or No Load Condition Paint Booth Supply & Ex Fan was run idle in low frequency.[30 Hz to 36 Hz]		In Lunch Time, Tea Time, or No Load Condition Paint Booth Supply & Ex Fan frequency Optimization done up to 0 Hz.	

7. Energy Saving Projects 4

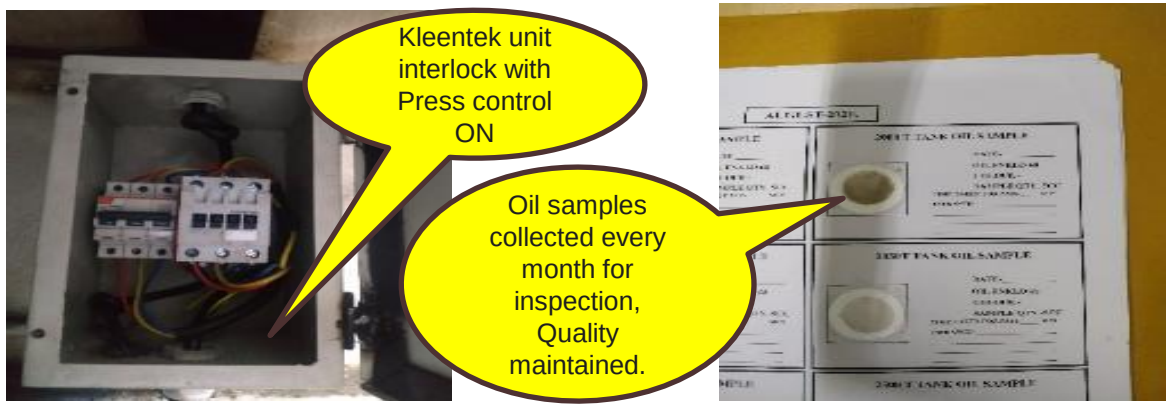
Optimization of Kleentek machine power consumption.

Operation	Opportunity	Action taken	Results
5100T, 2000T, 1030T, 1000T & 2500T Press total 7 no Kleentek machine running continuously for 24hrs for oil filtration.	Kleentek machine to be turned off when press is not running i.e. m/c to be interlocked with press control ON.	Kleentek machine on/off interlocked with press control ON.	❑ Energy Saving = 65688 **kwh /Annum** ❑ Annual Savings in ₹ = **₹ 6.10 Lakhs** ❑ Investment = Nil

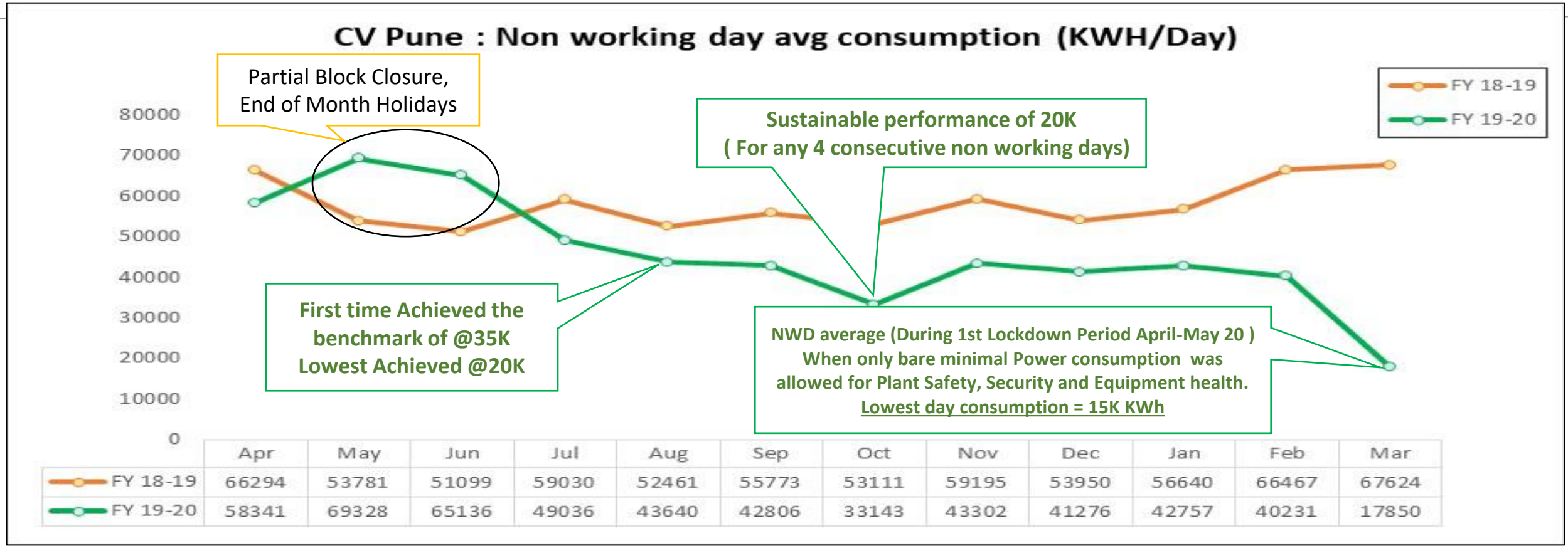
Before



After



CV PUNE : NON WORKING DAY AVERAGE CONSUMPTION (KWH/DAY)



	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
FY 18-19	66294	53781	51099	59030	52461	55773	53111	59195	53950	56640	66467	67624
FY 19-20	58341	69328	65136	49036	43640	42806	33143	43302	41276	42757	40231	17850

Various Energy Saving Ideas are implemented focusing on reduction in Fixed Load Consumption.

- Conversion of High Bay Sodium Vapour Lamp into LEDs.
- Also BS6 & New Machine Try-out was done during Manufacturing wherever possible.
- Complete Shutdown of Critical Machine Trials taken and implemented.

8. Utilization of Renewable Energy Sources

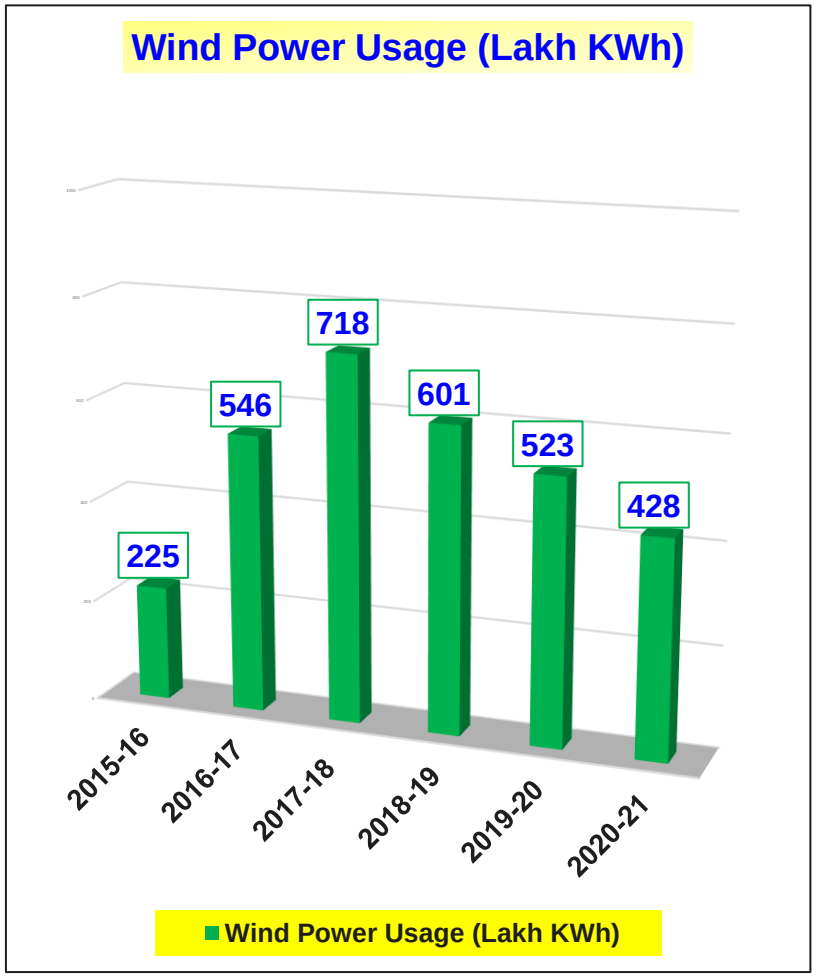
Renewable Energy

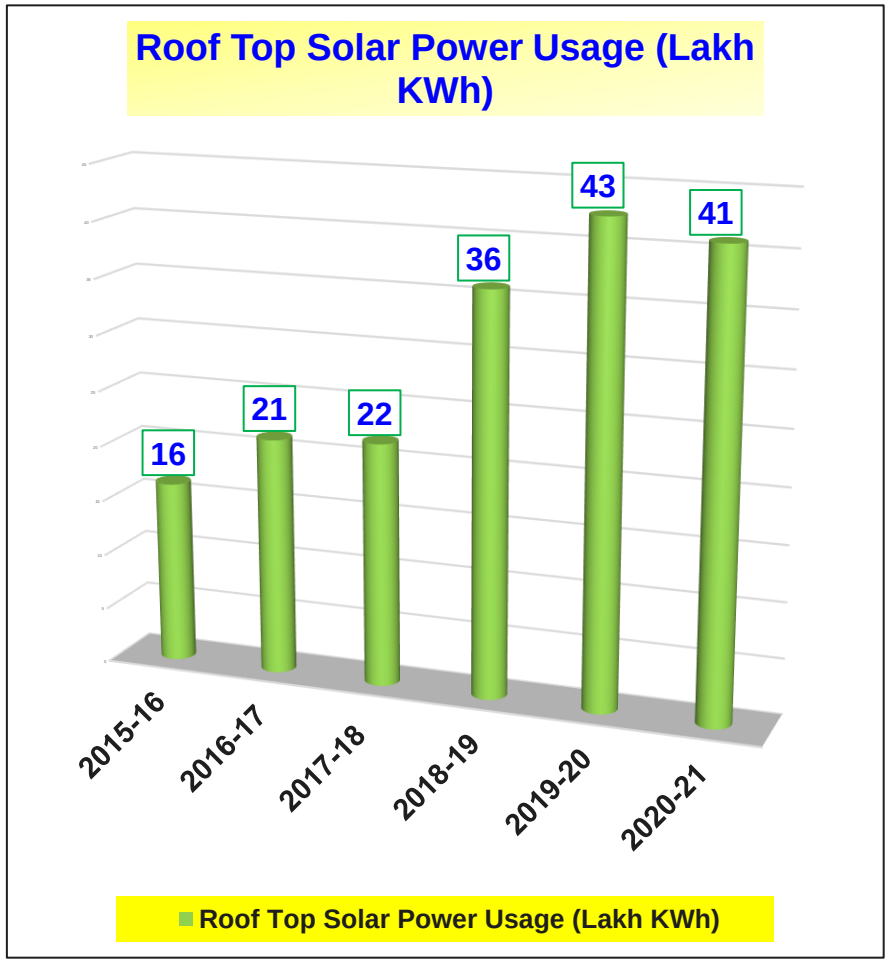
8. Utilization of Renewable Energy Sources

Technology	Type of Energy	Onsite/ Offsite	Installed Capacity (MW)	Generation (million kWh)	% of overall electrical energy
Wind Power	Electrical	Offsite	21.95MW + 18 MW	29.949	74.68 %
Solar PV	Electrical	Onsite	3.8 MWp	3.673	9.16 %

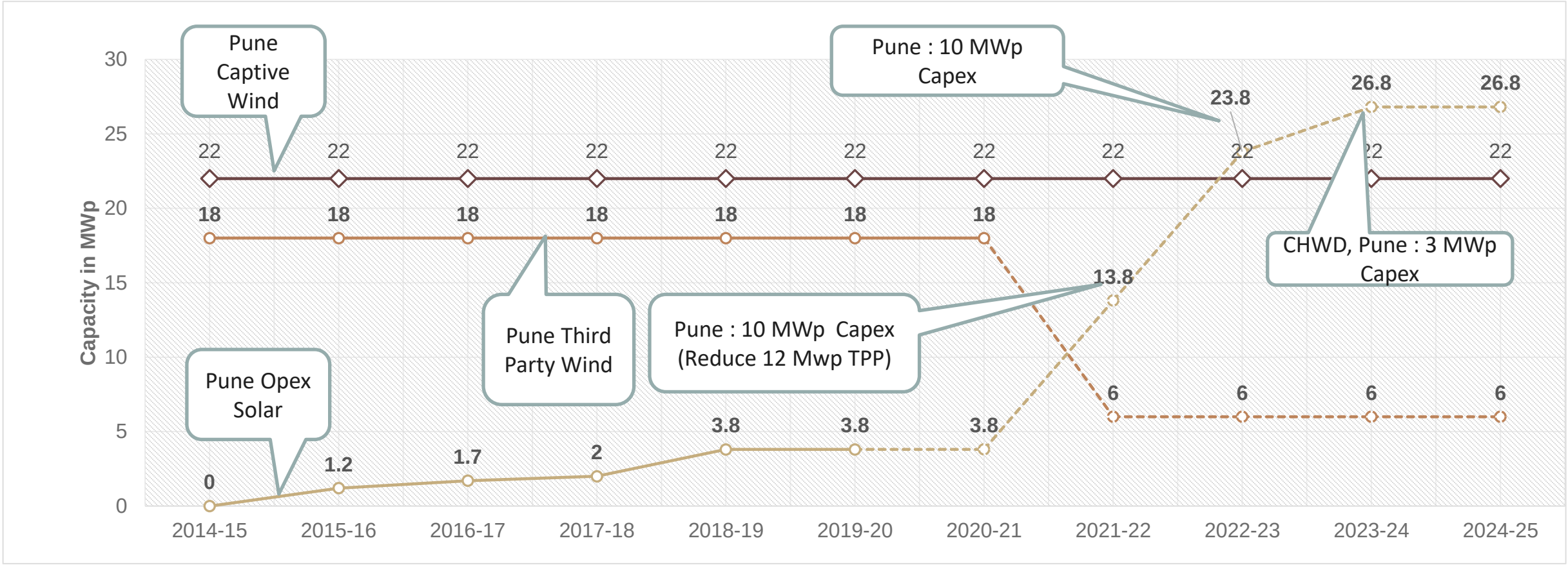
Technology	Type of Energy	Onsite/ Offsite	Installed Capacity	Usage (million kCal)	% of overall thermal energy
Solar Water Heating System	Thermal	Onsite	36,250 LPD	463	2.49 %

8. Utilization of Renewable Energy Sources





8. Utilization of Renewable Energy Sources-Glide Path



- 10 MW + 10 MW Captive Solar Plant proposed for Pimpri & 3 MW Captive Solar Plant proposed for Chinchwad.
- 12 MW of PPA Wind Power will be discontinued after start up of 10 + 10 MW Captive Solar Plant for Pimpri
- Total RE Capacity at CV Pune will be 55 MW (Captive Wind + Captive Solar). Expected yearly RE Power will be @ 7 Crs / Year

9. Waste Utilization and Management

Waste Utilization and Management

9. Waste Utilization and Management

No	Type of waste generated	2018-2019	2019-2020	2020-2021	Disposal method
		Quantity of waste generated (MT/year)	Quantity of waste generated (MT/year)	Quantity of waste generated (MT/year)	
1	Grinding sludge	172.743	116.485	87.83	Landfill after treatment
2	Phosphating sludge	51.590	32.870	13.14	Landfill after treatment
3	Paint sludge hazardous kachara	974.945	316.840	234.55	Incineration
4	Waste oily Scum	52.360	3.760	15.14	Incineration
5	Spent Resin	0.620	1.520	0.86	Incineration
6	Asbestos	6.026	0.024	5.75	Landfill
7	Glass wool	6.680	1.410	0.75	Landfill
8	Chimney soot	2.060	0	0.33	Incineration
9	FRP Waste	12.560	4.230	0.72	Landfill
10	Shot blasting dust	12.480	15.960	7.94	Landfill after treatment

9. Waste Utilization and Management

No	Type of waste generated	2018-2019	2019-2020	2020-2021	Disposal method
		Quantity of waste generated (MT/year)	Quantity of waste generated (MT/year)	Quantity of waste generated (MT/year)	
11	ETP-Industrial sludge	77.600	133.290	355.95	Landfill after treatment Through Authorised MPCB
12	ETP-Domestic sludge	56.700	2.500	10.02	Landfill after treatment
13	Nickel + Al catalyst	0.030	0	0.38	Landfill
14	ERC pattern waste	44.848	31.140	14.82	Incineration
15	HFO sludge	10.340	0	0	Incineration
16	Door, Roof liner	32.200	15.040	4.8	Landfill
17	Broken Tube lights	11.760	1.020	0.99	Landfill after treatment
18	Paint sludge - MPCB Regd. Re-cycler	61.160	44.834	61.91	Recycle
19	Paint sludge - MPCB Regd. Re-cycler	0	100.800	84.76	Recycle

9. Waste Utilization and Management

key initiatives taken for enhancing waste utilization.

1.Paint sludge converted in to usable Paints.

2.VFH (Value From Hazardous waste)

- Effective Segregation
- Elimination of waste at generation source
- Use of waste for value Creation
- Reuse and Recycle the waste

3.WCEP (World Class Environment Practice) – 4 Year Action plan.

4.Biogas Plant - Entire canteen waste is converted into biogas.

5.Compost Pit for Canteen waste treatment – (excess canteen waste if any)

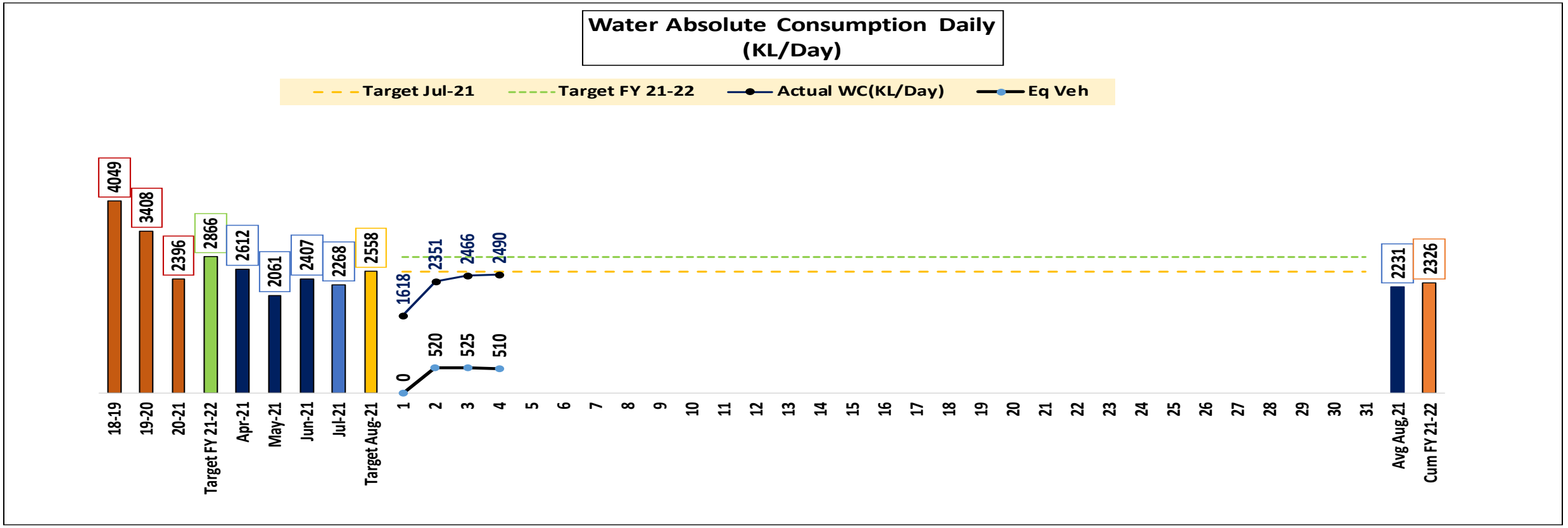
6.ZLD – Zero Liquid Discharge plant – (Treated water used for garden & horticulture water demand.)

7.Solid waste Segregation

8.OCEMS – on line continuous effluent monitoring system for ETP & STP

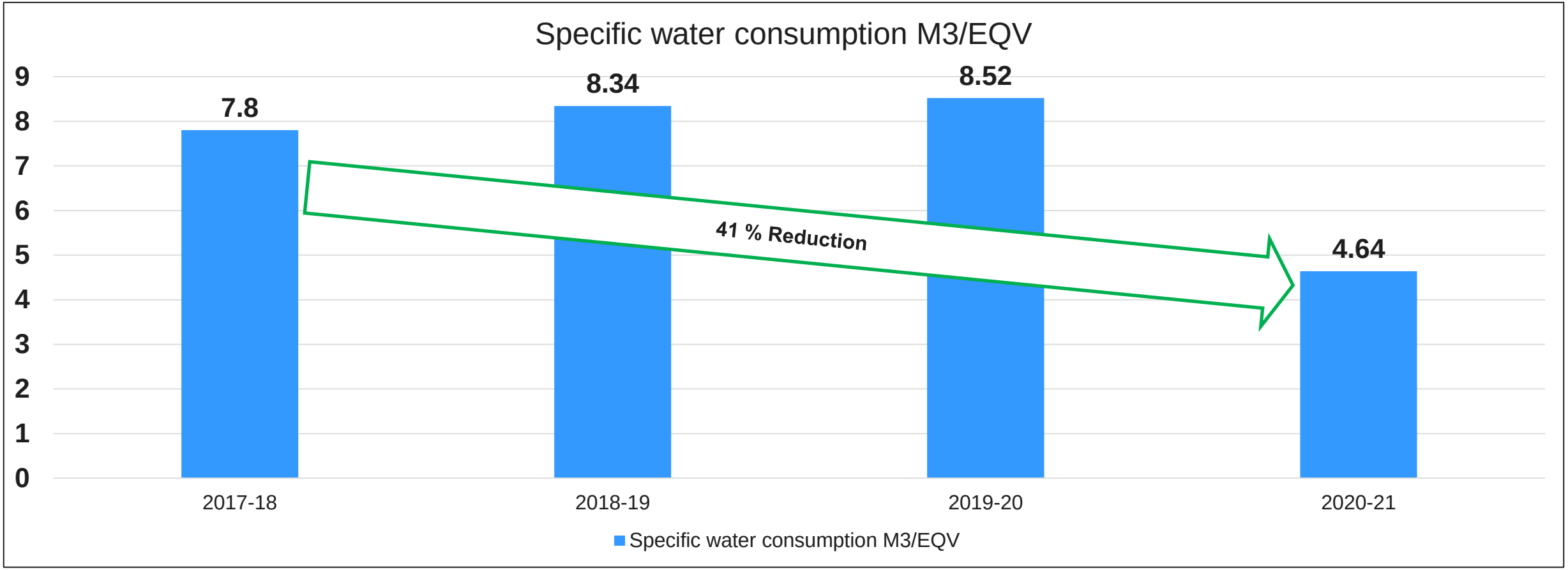
10.Water Consumption Status

10.Water Consumption Status



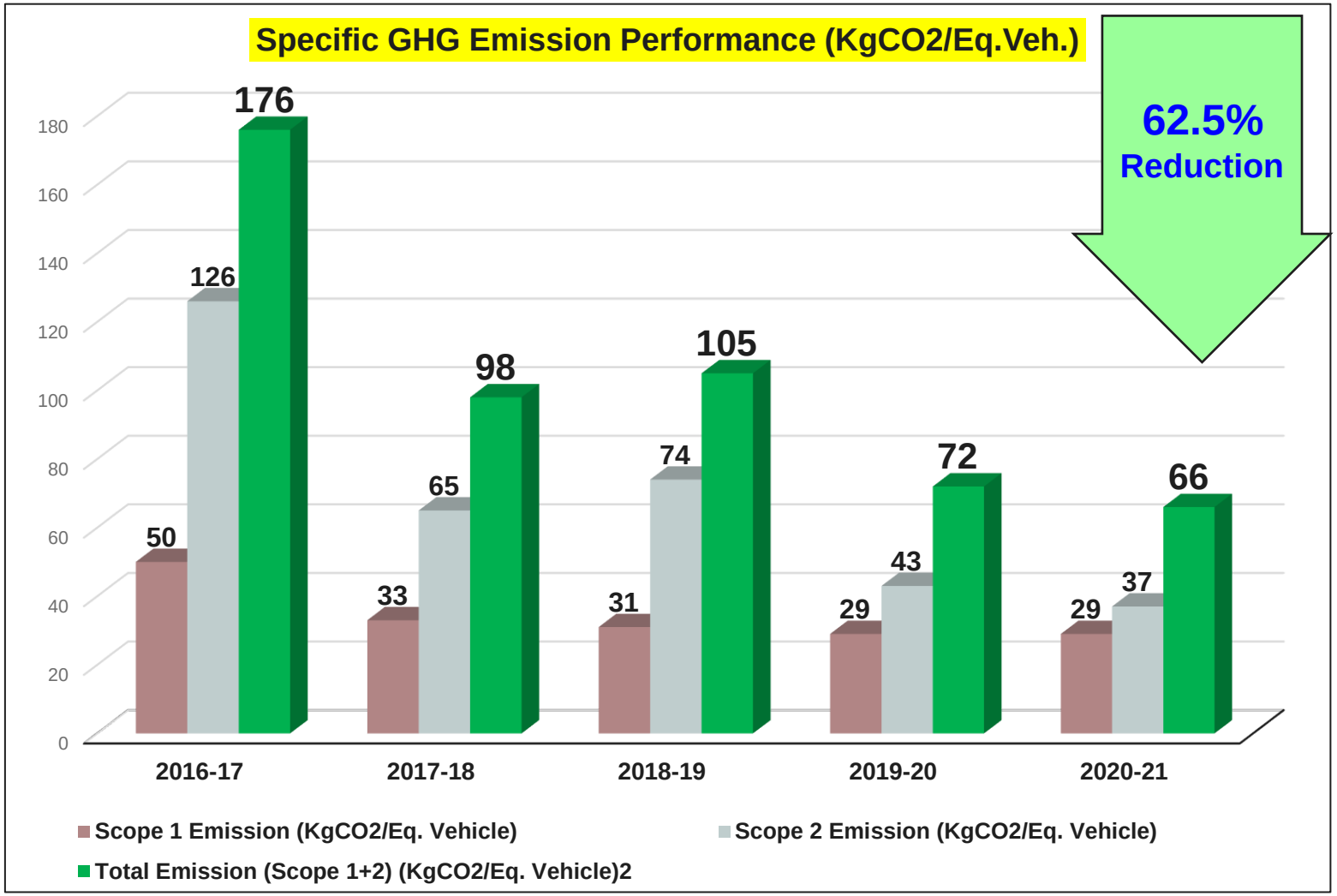
CFT formed for Water consumption reduction at plant Level.
2.5 KM Old underground headers line replaced with above ground.
IoT base Consumption monitoring is planned for individual block.
Headers are planned at shop level.

10.Water Consumption Status



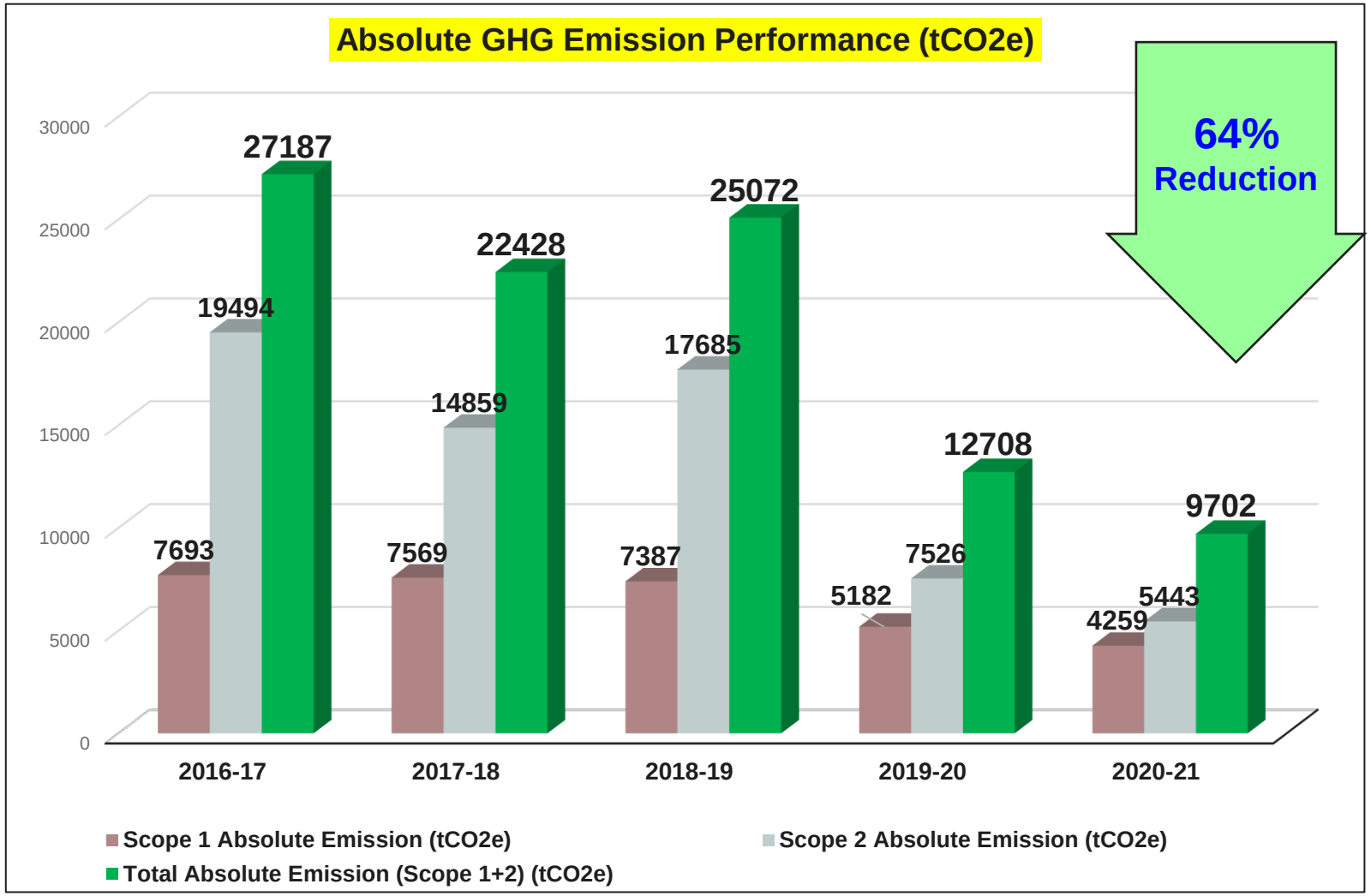
New Facility added for BS6 in the year 2019-20

11. GHG Inventorisation



Scope	Emission Sources Considered
Scope 1 Emissions	Fuel consumed for - Process Heat Generation - Process Use - Canteen - Engine Testing - Power Generation - Internal Vehicle movement
Scope 2 Emissions	Purchased Electricity excluding renewable energy
Scope 3 Emissions	WIP

11. GHG Inventorisation



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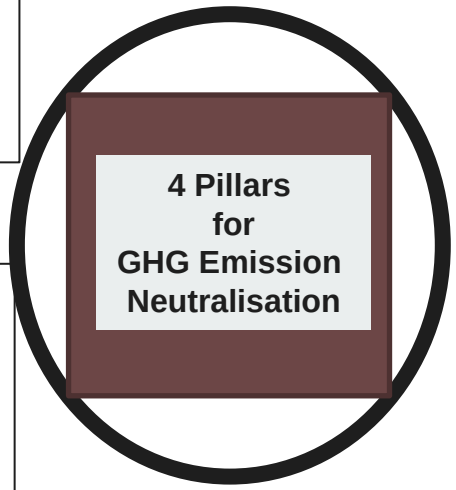
Scope 2 Emissions	Purchased Electricity excluding renewable energy
Scope 3 Emissions	WIP

11. GHG Inventorisation : Action Plan for CO_2 Emission Reduction:-

4 Pillars of Neutralising GHG emission

- **Green Power Purchase**
  - \+ Quick gain
  - \+ Manage Business variability
  - \- Recurring add-on Power Purchase expenses

- **EnCOn Projects for Power consumption reduction**
  - \+ Mid & Long term gain
  - \+ Continuous process
  - \+ Reduces Power consumption permanently
  - \+ Improves Operation Efficiency & reduces cost impact
  - \- Controlled by Idea generation & Technology availability /Maturity
  - \- Capex requirement



- **Captive RE / RE100** (Wind, Solar)
  - \+ Mid & Long term gain
  - \+ Reduces Power Purchase cost
  - \- Controlled by Regulation
  - \- Capex requirement

- **EnCOn Projects for Fuel consumption reduction**
  - \+ Mid & Long term gain
  - \+ Continuous process
  - \+ Reduces Fuel consumption permanently
  - \+ Improves Operation Efficiency & reduces cost impact
  - \- Controlled by Idea generation & Technology availability /Maturity
  - \- Capex requirement

Action Plan for CO_2 Emission Reduction:-

Maximise use of Renewable Energy (Wind Power & Solar Power) with in regulatory framework

1) Captive Wind Power through Open Access

2) Third Party Wind Power through Open Access

3) On-site Rooftop Solar Power Plant.

4) Science Base Target for CO_2 Emission Reduction

Short Term Target : As per MERC order and MSEDCL Circular, we are process to procure RE power to achieve the GHG emission target set at Plant Level , Company & Group Level.

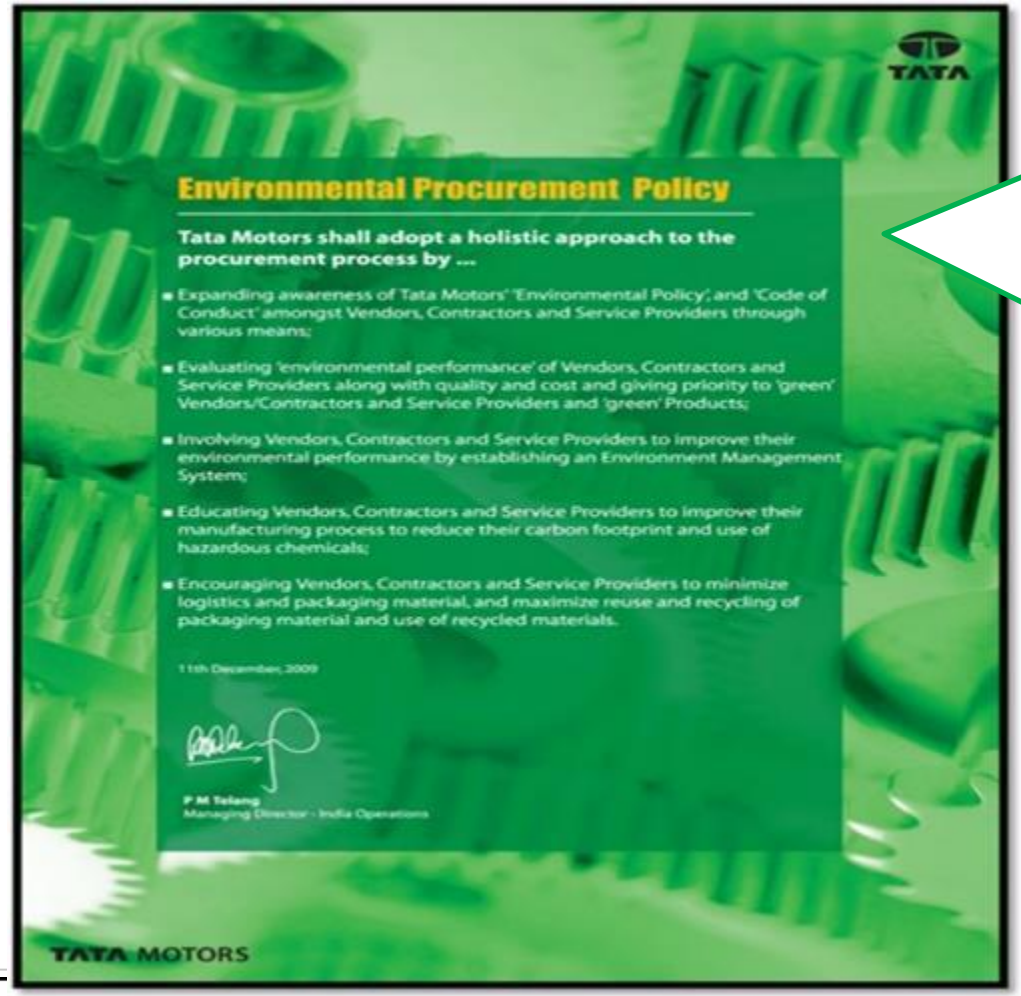
Long Term Target : To install Offsite 25MWp Group Captive Solar Power Plant.

12.GREEN SUPPLY CHAIN

GREEN SUPPLY CHAIN

12. Green Supply Chain Management

Green Purchase Policy :-

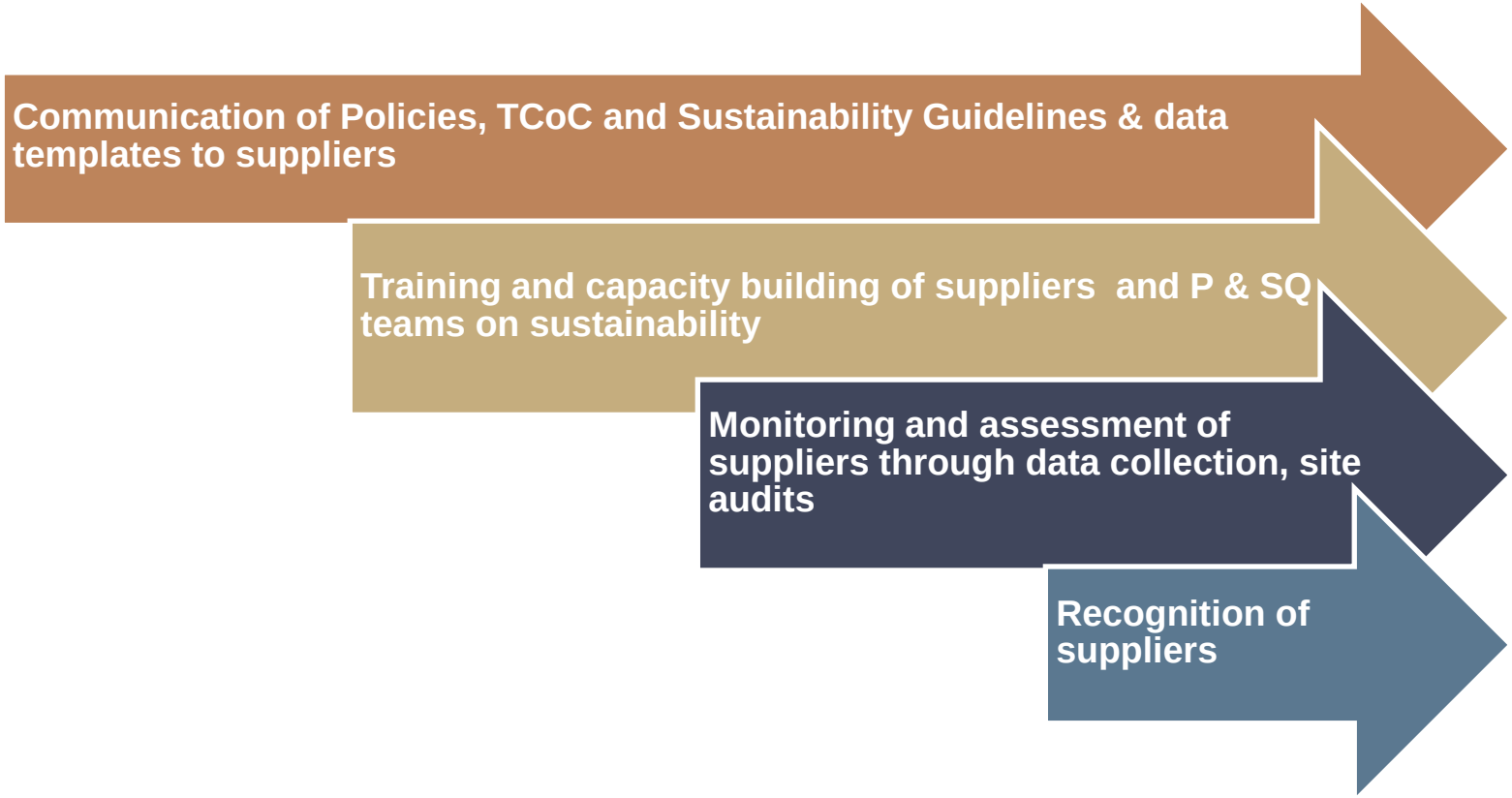


Our **Environmental Procurement Policy** aims at;

- Awareness of **TML Environmental Policy & TATA Code of Conduct** amongst suppliers;
- Environmental performance evaluation and priority to “Green Suppliers”;
- **Encouraging suppliers to improve environmental performance** and implement **EMS;**
- **Reduce carbon footprint** and use of hazardous substances;
- Minimize logistics and packaging material, Maximize reuse and recycling.

12. Green Supply Chain Management

Supplier Evaluation/audit :-



Sustainability Guidelines for Suppliers were prepared covering key topics;

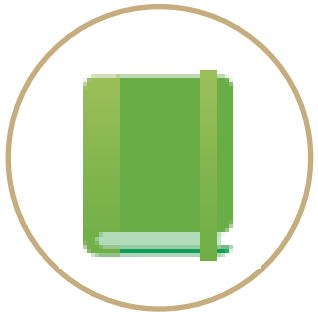
- ✓ Governance
- ✓ Legal Compliance
- ✓ Tata Code of Conduct
- ✓ Management System Certifications
- ✓ Environment & Climate Change
- ✓ Health & Safety
- ✓ Labor & Human Rights
- ✓ Transparency & Reporting

12. Green Supply Chain Management

Supplier Evaluation :-GREEN CONSIDERATIONS IN CAPITAL EQUIPMENT PURCHASE

Step 1	Step 2
Request For Quotation Supplier submits following information for the proposed solutions ▪ Power Consumption ▪ Fuel consumption ▪ Air consumption ▪ Consumables required ▪ Green features : ▪ Hibernation mode if machine is non-operational ▪ Provision for monitoring of Power consumption and raising alarm in case power consumption is higher than set values. ▪ Cycle time	**Evaluation of equipment based on Green criteria** ▪ Machines are compared feature to feature and if any of the feature is missing supplier is asked to include the feature and send a fresh offer. ▪ Once both the machines are at par on the feature then energy requirement , green features are compared and evaluation made.

12. Green Supply Chain Management



Green Procurement Policy

Education and awareness

Resource Conservation through SCM Systems

Efficiency Improvement Program for Suppliers

Resource Intensity Reduction in Supply Chain

Baseline and target for reduction of Supplier's Resources Consumption

Year on Year Reduction Targets for suppliers :

Parameter	Short Term	Medium Term	Long Term
Energy, Water, Waste	3%	5 %	5-10 %

12. Green Supply Chain Management

Supplier Evaluation/audit :-

Every year workshops on "Sustainable Supply Chain Initiative" are organized for our suppliers across locations, to create awareness on the importance of sustainable value chain and to communicate our Sustainability Guidelines and Baseline data template. Till FY 2021, we have organized around 32 workshops, covering 600 plus suppliers.


Workshop @ Pune


Workshop @ Lucknow


Workshop @ Jamshedpur

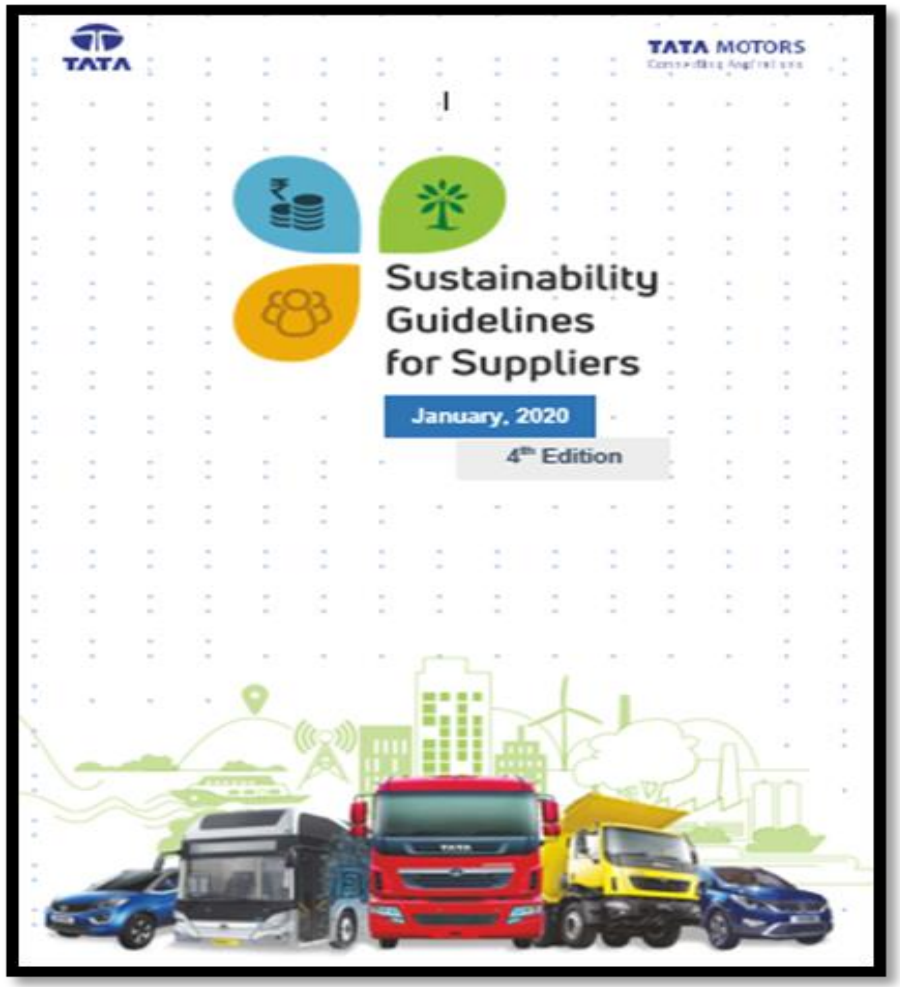

Workshop @ Pantnagar

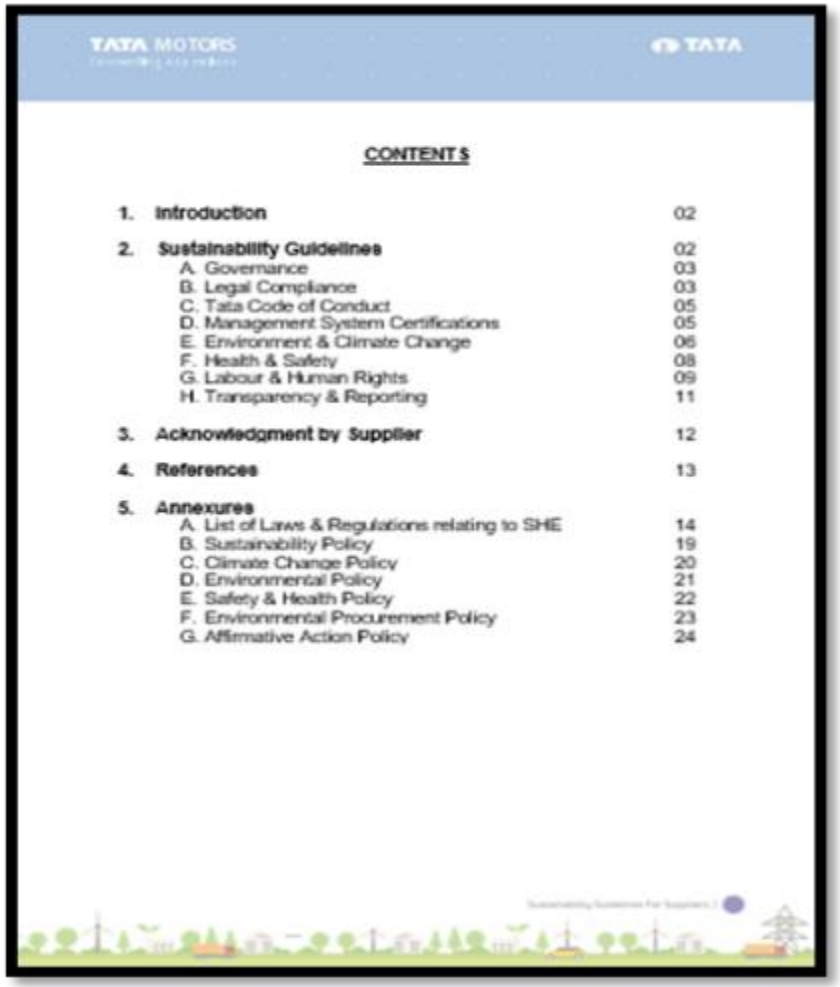

Workshop @ Pune


Workshop @ Dharwad

12. Green Supply Chain Management

Sustainability Guidelines for Suppliers :-





TATA MOTORS TATA

CONTENTS

12. Green Supply Chain Management

Suppliers Evaluation/audit:-

Supplier site assessment involves verification of backup documents for data shared in baseline data template and a site round. Observations made during the assessment will be subsequently shared with supplier for closure. Based on criticality of observations, supplier will be categorized under RED, YELLOW, GREEN or BLUE band. In FY 2021, due to COVID-19 scenario, virtual assessments were carried out.

Child labor Prohibition Act displayed @ supplier site, Jamshedpur

Rain water harvesting @ supplier site Jamshedpur

Female workforce @ supplier site, Dharwad

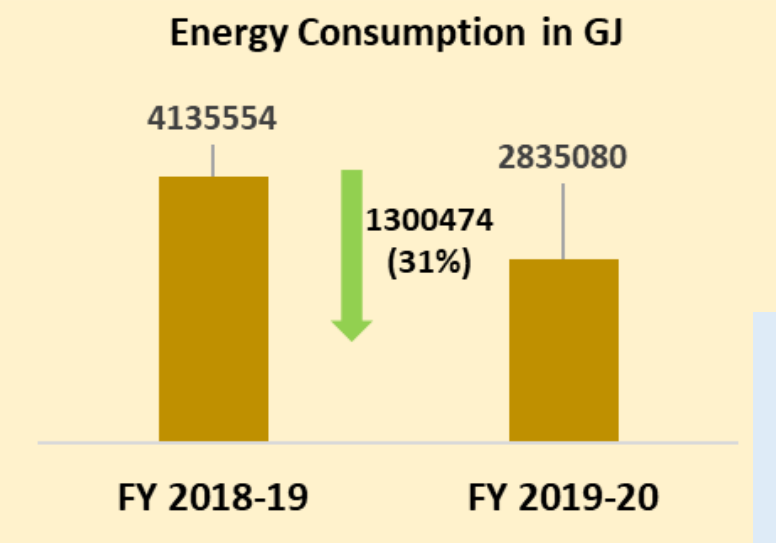
ETP @ supplier site, Sitarganj

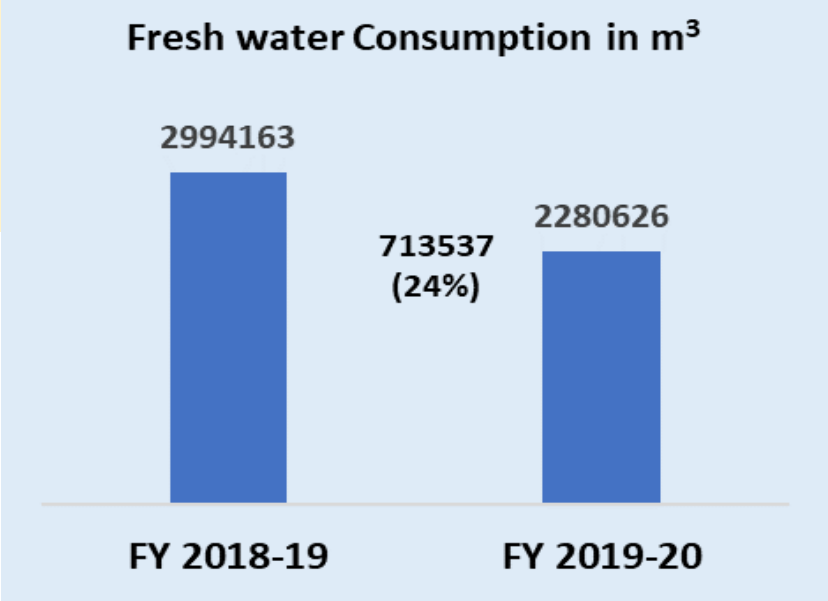
Designated fuel storage @ supplier site, Lucknow

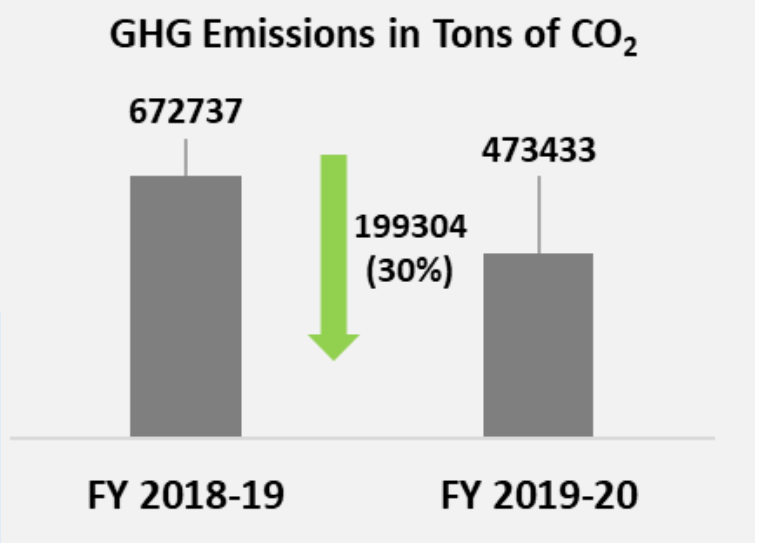
Safety curtains @ supplier site, Pune

12. Green Supply Chain Management

Benefits Achieved :- Reduction in Resource Consumption







10. Green Supply Chain Management

Benefits Achieved :- Rooftop Solar Power Generation Plant

Solar Panels @ supplier site, Dharwad

Roof top solar supplier site, Gurgaon

Roof top solar supplier site, Pune

More Than 2MWp Roof Top Solar at Supplier END

Roof top solar @ supplier site, Pune

Roof top solar @ supplier site, Bangalore

Roof top solar @ supplier site, Pune

10. Green Supply Chain Management

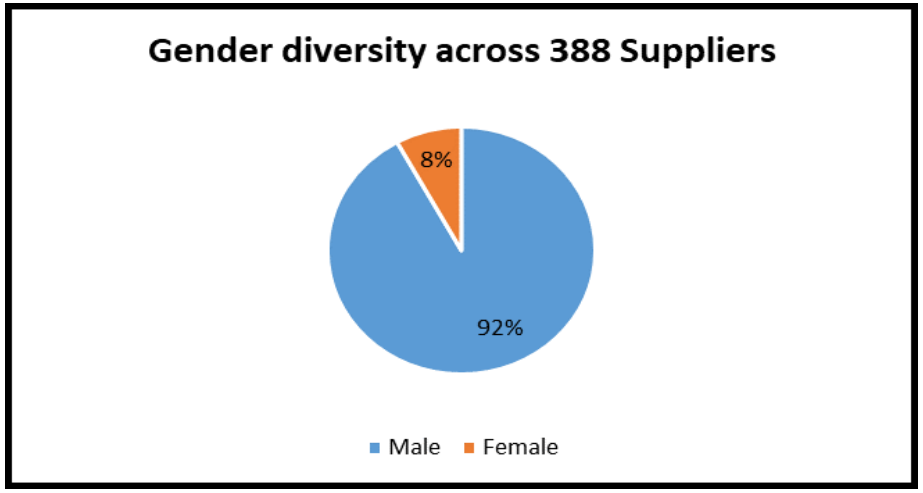
Benefits Achieved :- Rain Water Harvesting System

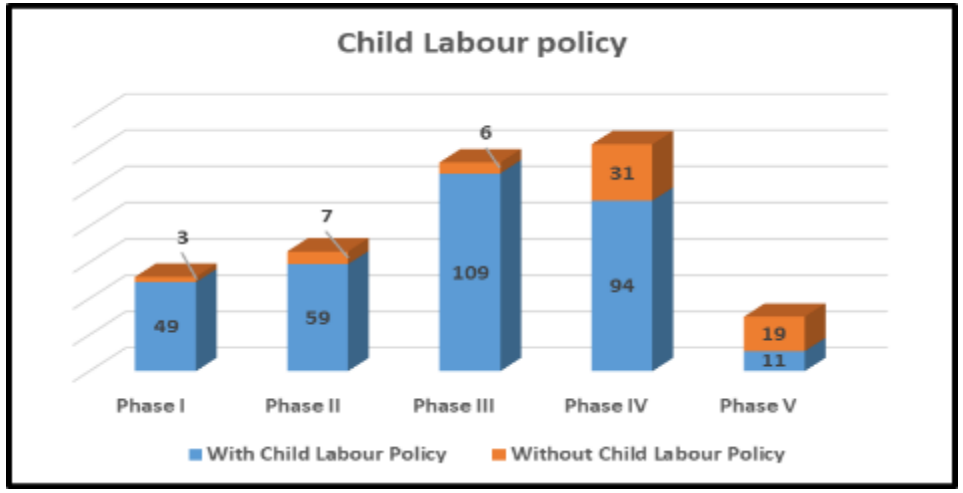
Rain Water Harvesting System @ Ramkrishna Forgings Ltd., Jamshedpur

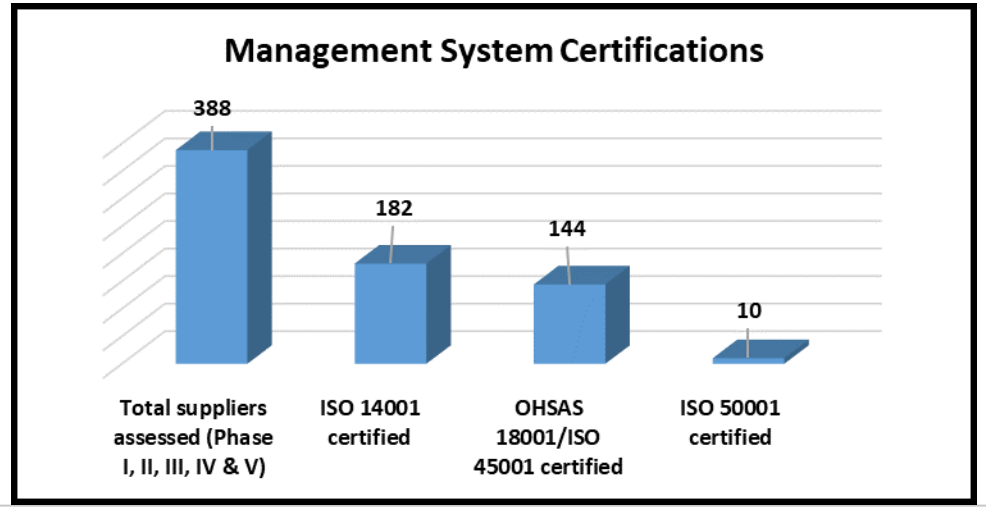
Rain water harvesting system capable of collecting **50,302** cum of rain water in a year.

10. Green Supply Chain Management

Benefits Achieved :- Social & Governance Benefit







10. TEAM WORK

Employee Involvement

11. Team Work, Employee Involvement & Monitoring

2.Review meeting chaired by Plant Head.

Hierarchy of Energy Management System

Energy Team	
Champion	Mr Nitin Tilak
LCV Factory	Mr Dhananjay Shahane
ICV Factory	Mr Nagoji Patil
Xenon Factory	Mr Ravi Phadnis
Engine Factory	Mr Girish Kulkarni Mr Sunil Chavan Mr Sanjay Gaikwad
Gear Factory	Mr. Raju Ghadage
Axle Factory	Mr Prabhakar Khairnar Mr Balasaheb Pawar
E Block Factory	Mr Pankaj Thaman
Paint Shop Factory	Mr Sachin Kasture
Foundry Grey Iron	Mr Pankaj Patil
Foundry Aluminium	Mr Sandip Takavane
AC & R & Compressor	Mr Mahindra Hingase
MRS & DG House	Mr Milind Mench
ETP, WTP, & Haz Waste	Mr Bhausaheb Patil
CPED Chinchwad	Mr Vinod Yadav
Production Engineering	Mr. Vineet Rana
Auto Projects	Mr Asit Pandya
ERC	Mr Mahesh Chougule
Training	Mr Sushil Warang
Central co-ordinators	Mr Sudhir Bhale Mr Anil Dethe Mr Vivek Deshpande Ms Komal Battula Mr Pranav Katkamwar

11. Team Work, Employee Involvement & Monitoring

ENERGY CONSERVATION WEEK CELEBRATION

- 14Th DEC To 20Th DEC 2020

Energy Oath glimpse.

11. Team Work, Employee Involvement & Monitoring

ENERGY CONSERVATION WEEK CELEBRATION

- 14Th DEC To 20Th DEC 2020

SUGGESTION SCHEME - CVBU PUNE

Energy Conservation Campaign !!!

USS – 156 Launched !

PNCV_USS@156_19-20_16	December 17, 2019
Subject	USS (Unique Suggestion Scheme) on Energy Conservation
Scope	Pune CVBU Plant (including ERC, TTL & Maval)
Applicable to	Permanent / Probationers / Fix Term / Temp / Trainee Employees on TML Pay Roll
Period of USS	December 17, 2019 to January 25, 2020
USS Focus Areas	Topics on which the fresh suggestions can be submitted : • Reduction in energy consumption by change in process, • Arresting Energy Wastage in Machine Operation Cycles • Capacity Downsizing of Energy Pumps /Motors • Optimization of Air conditioning plant • Optimization of Compressed Air Consumption • Ways to optimise Water Usage & Fuel • Office Lighting and Air Conditioning

USS 156 – PARTICIPATION AWARD FOR EXCELLENCE IN ENRGY EFFICIENCY SUGGESTION SCHEME

AWARD FOR MAXIMUM NUMBER OF ENRGY EFFICIENCY UNIQUE SUGGESTIONS

Name of the Factory	
1	Chinchwad Foundry
2	GEAR Factory
3	Axle Factory

USS 156 – BEST SUGGESTION AWARD FOR EXCELLENCE IN ENRGY EFFICIENCY SUGGESTION SCHEME.

Best Suggestion in Tata Motors CVBU Pune-Waste Heat recovery Test Engine Test Bed.
Name of the Factory
Engine Factory

11. Team Work, Employee Involvement & Monitoring - IDEA GENERATION WORKSHOPS

Sr No.	Factory	No. of Ideas Generated	Potential KWH Saving /day
1	Engine Factory	74	2000
2	E Block Factory	106	1200
3	Gear Factory	61	1000
4	Paint Shop	49	1200
5	Foundry	107	1200
6	Xenon	42	150
7	LCV	67	178
8	Fdy CLT Idea Workshop	155	1000
9	ERC CLT Idea Workshop	70	1300
	Total	731	6228

ERC CLT Idea generation workshop

Foundry CLT Idea generation workshop

J 11 Paint Factory Work shop

Gear Factory Work shop

Factory Level Workshop

11. Team Work, Employee Involvement & Monitoring

ENERGY CONSERVATION TRAINING PROGRAMS

Advanced Training Programme on Energy Efficiency on 27 & 28 February 2020,Pune

Sr.No.	CVBU Pune	Nominations
		Name
1	Gear	Sanjay Dhake
2	Engine	Mahesh Mathkar
3	Press Shop	Suraj Kumar Sahu
4	Paint Shop	Sunil Lokhande
5	ERC	Mahesh Chougule

Sr.No.	Nominations
	Name
1	Komal Battula
2	Pranav Katkamwar

Online Sessions arranged in Lockdown

Sr No.	Sessions	Date	Arranged by
1	Technical Session on VFD	14th Apr 2020	Schneider Electric
2	PLC & Drive Basics	17th Apr 2020	Schneider Electric
3	KVAH Billing, Harmonics and Power Quality Solutions	18th Apr 2020	Schneider Electric
4	Selection of LV Switchgear	28th Apr 2020	L & T
5	Energy Savings with VFD & Automation in Automobile Industry	25th July 2020	L & T

11. CII 21st National Award for Excellence in Energy Management 2020

Excellence in Energy Efficiency unit Award

TATA MOTORS CVBU Pune Won " **CII National Award for Excellence in Energy Efficiency Unit 2020**" and Prestigious **" CII National Energy Leader award 2020**"

CII National Energy Leader award

CII 21st National Award for Excellence in Energy Management 2020

12. Any Other Relevant Information

Recognition / Awards

2018

"CII - National Award for Excellence in Energy Management Award -2018"

TATA Motors Ltd., CVBU Pune Won the "CII-National Energy Leader Award -2018"

2019

"CII - National Award for Excellence in Energy Management Award -2019"

TATA Motors Ltd., CVBU Pune Won the "CII-National Energy Leader Award -

2017

TATA Motors Ltd., CVBU Pune Won the "CII-National Award for Excellence in Energy Management -2017" and declared as "Excellent Energy Efficient Unit"

"CII – Green Co Gold Rating Award -2017"

TATA Motors Ltd., CVBU Pune Won the **"CII- Green Co Gold Rating Award-2017"** at Green Co Summit organized by Confederation of Indian Industries at Pune.

12. Any Other Relevant Information

Recognition / Awards

"RE Excellence End User Award 2018"

TATA Motors Ltd., CVBU Pune Won the "**RE Excellence award – End User Category"** at REI summit organized by UBM group at Greater Noida.

"BEE - National Energy Conservation Award -2017"

TATA Motors CVBU Pune has been awarded the "Certificate of Merit" of National Energy Conservation Award 2017, in Automobile Manufacturing category by Bureau of Energy Efficiency (BEE), Ministry of Power, Government of India.

"Golden Peacock Award for Energy Efficiency -2017"

TATA MOTORS CVBU PUNE Won the "Golden Peacock Award for Energy Efficiency" in"19th World Congress on ENVIRONMENT MANAGEMENT"**,** On 7th July, 2017 in Hyderabad.

13. Long Term Vision on EE

Design

LONG TERM SUSTANABILITY

(3 ACTION PILLARS)

Technology

Operation & Maintenance

13. Long Term Vision on EE

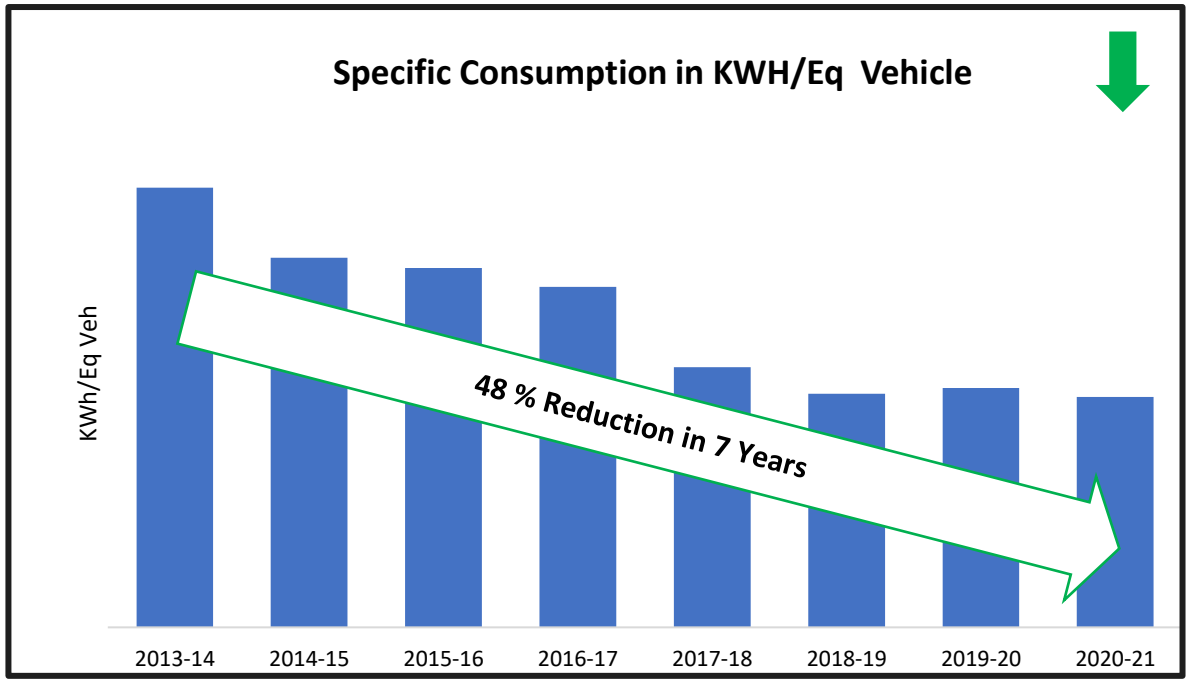
Long Term Vision on EE - Energy Efficiency:-

TATA Motors CVBU Pune Plant follows the ISO:50001 Energy Management System and will continue to refine all process to improve the Energy Efficiency.

We are following robust process of assessment of performance vis-à-vis comparative information / benchmark from different organisation and standards for.

- ❑ Optimise Resources
- ❑ Adapt Latest Technology
- ❑ Innovations
- ❑ Maximise Renewable Energy
- ❑ Science Base Target to Reduce Carbon Footprint

.....And Journey Continues



THANK YOU