CII National Award for Excellence in Energy Management 2021
(General Sector)

JK Tyre & Industries Ltd, Kankroli, Rajasthan

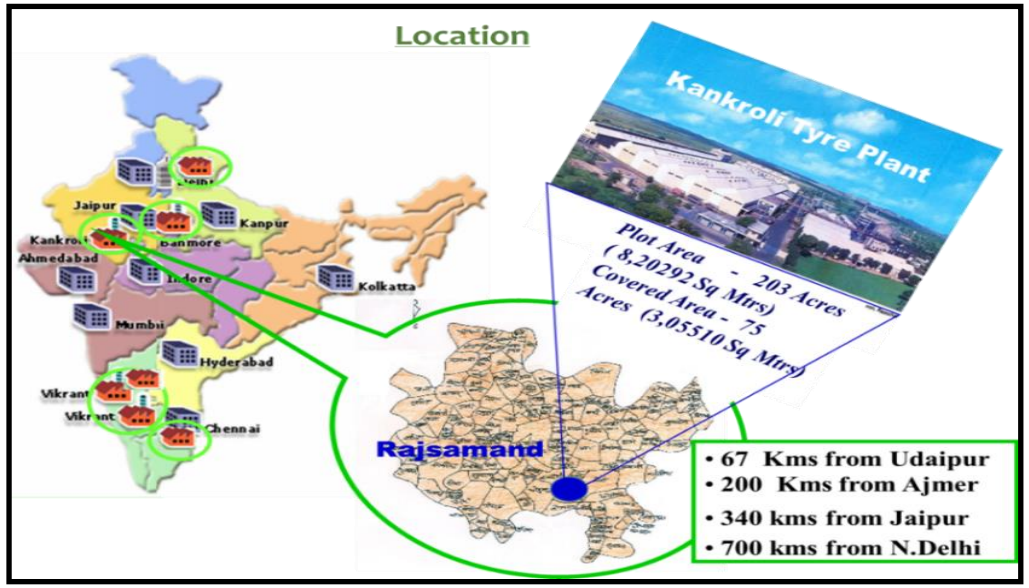
Presented By :-

- *DS Seervi – GM (Engineering) <dsseervi@jkmail.com>*
- *RK Yadav – Chief Manager (Utility) <rkyadav@jkmail.com>*
- *Abhishek Gaggar- Sr. Manager(Energy & EEI) <agaggar@jkmail.com>*

Company Profile

Confederation of Indian Industry

- 1st Plant at Kankroli – 1976
- Initial capacity – 55 MT/ Day,
- Present Capacity 230 MT/Day
- Pioneered Radial Tyre revolution in India
- 9 Plants in India - Capacity 1569 MT/Day
- 3 Plants in Mexico - Capacity 290 MT/Day



Our Product Range

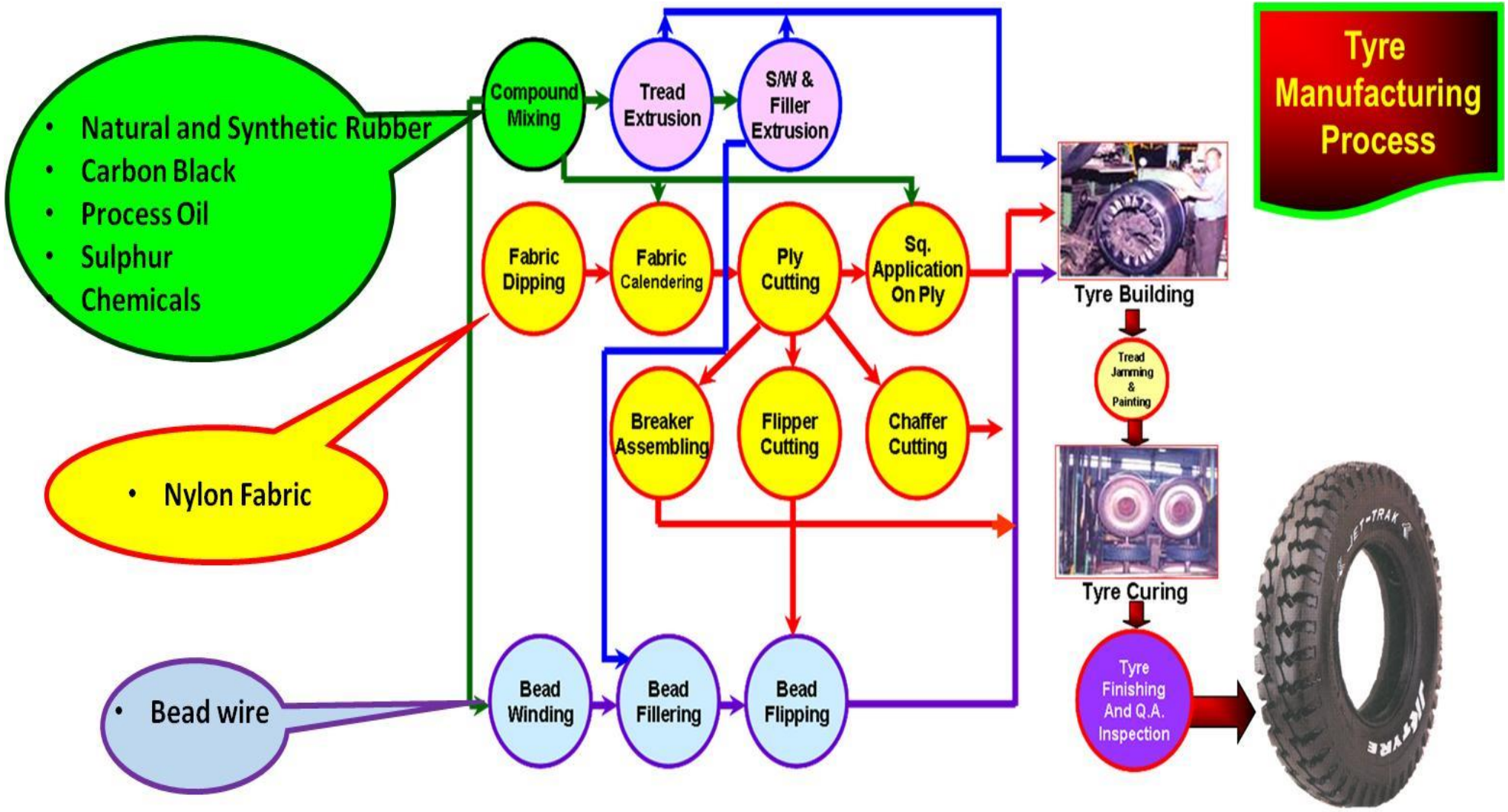
PRODUCT RANGE		
Sl. No.	CATEGORY	No. of SKU's
1	TRUCK	85
2	LIGHT TRUCK	64
3	SMALL COMMERCIAL VEHICLE	15
4	TRACTOR REAR	10
5	TRACTOR FRONT	5
6	ADV	2
7	OTR	4
8	INDUSTRIAL	1
	TOTAL	186





Manufacturing Process

Confederation of Indian Industry



Bias Tyre Manufacturing Unit

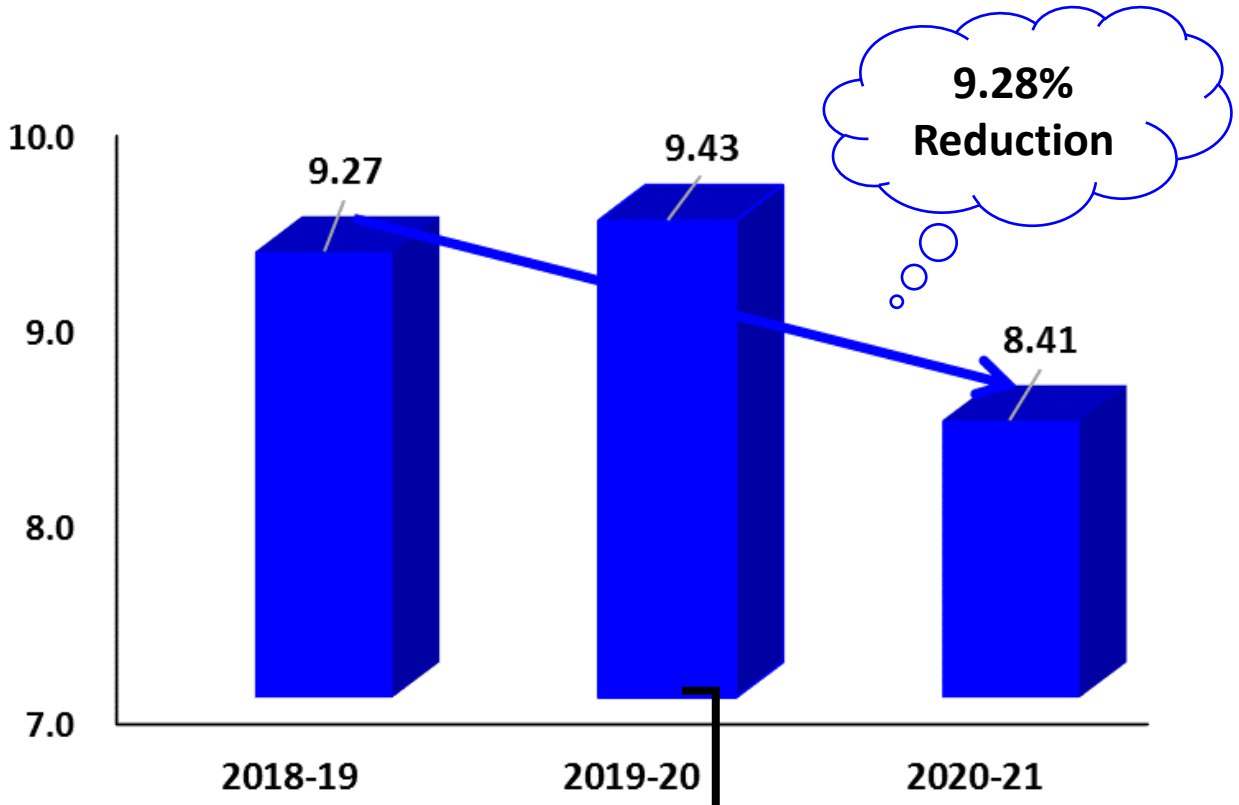
Impact of Covid-19

- From Apr'20 to Mid of May'20 Plant was completely shut down and than gradually ramp up of production, following market demand. Stoppage of plant & Partial running – Specific Energy Parameters Impacted. .
- The Planned Energy Efficiency Improvement projects are delayed for implementation.
    - The Original Plan for N2 Curing Project Commissioning in Jun'20. – Due to Lockdown it has been delayed by 4 Months.
- During Covid-19 Second Wave :-
    - There is Raw Material Shortage (Nylon Fabric during Apr'21. Resulted in partial running of plant and Impacted Specific Energy Consumption.
    - We faced shortage of Nitrogen Required for our Curing Process. & The Process was revert back to hot water curing- Impacted Energy efficiency in the month of May'21.

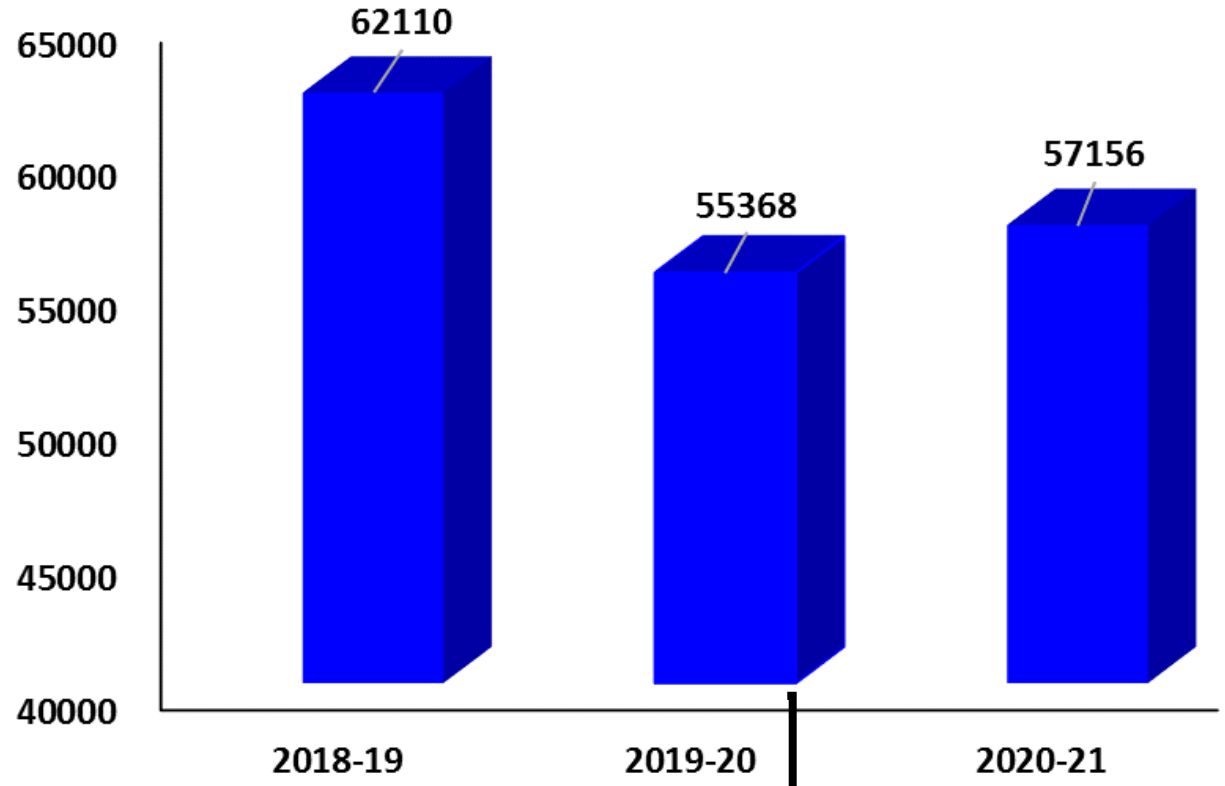
Sp. Energy Consumption in last 3 Years (FY2018-21)

Confederation of Indian Industry

Specific Energy Consumption (GJ / Ton)



Production Details (MT/ Year)

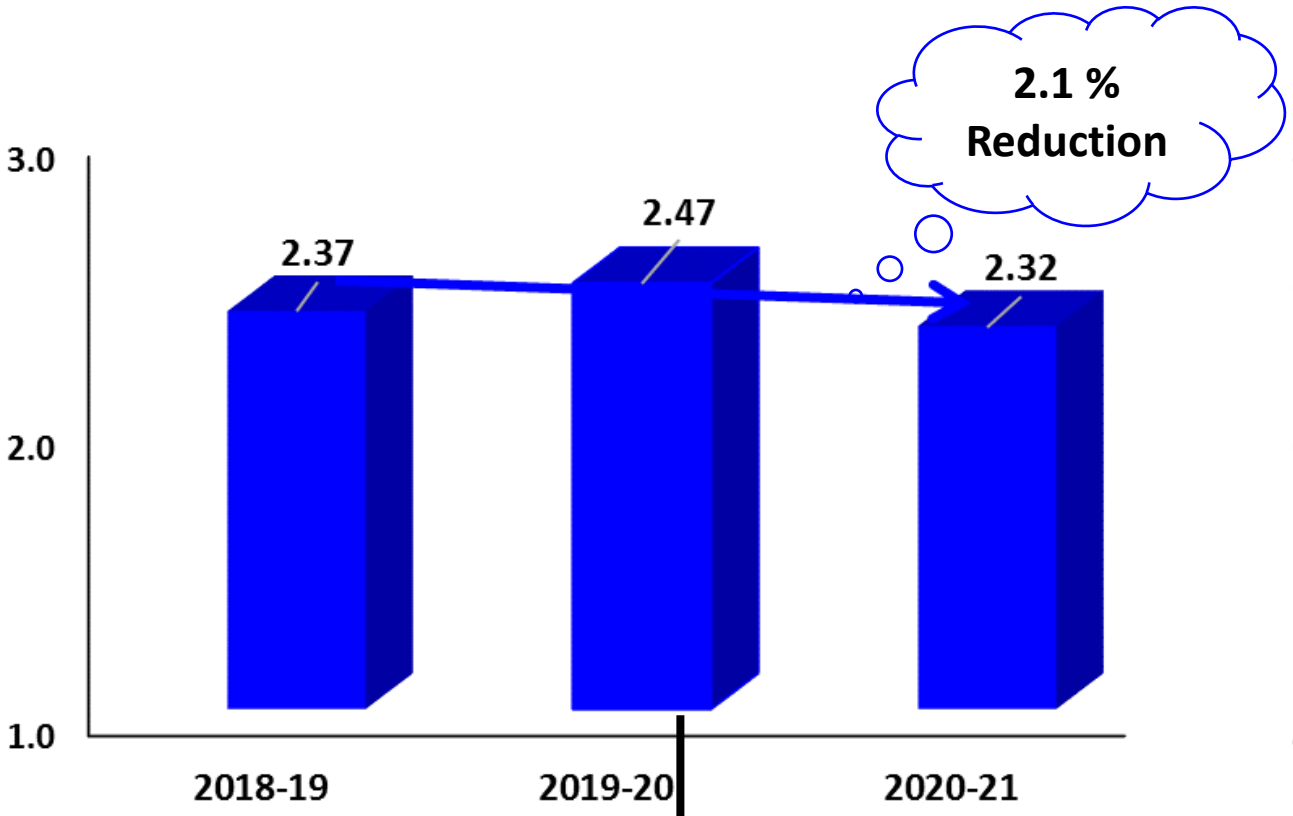


- Plant Run Partially
- Low Market Demand

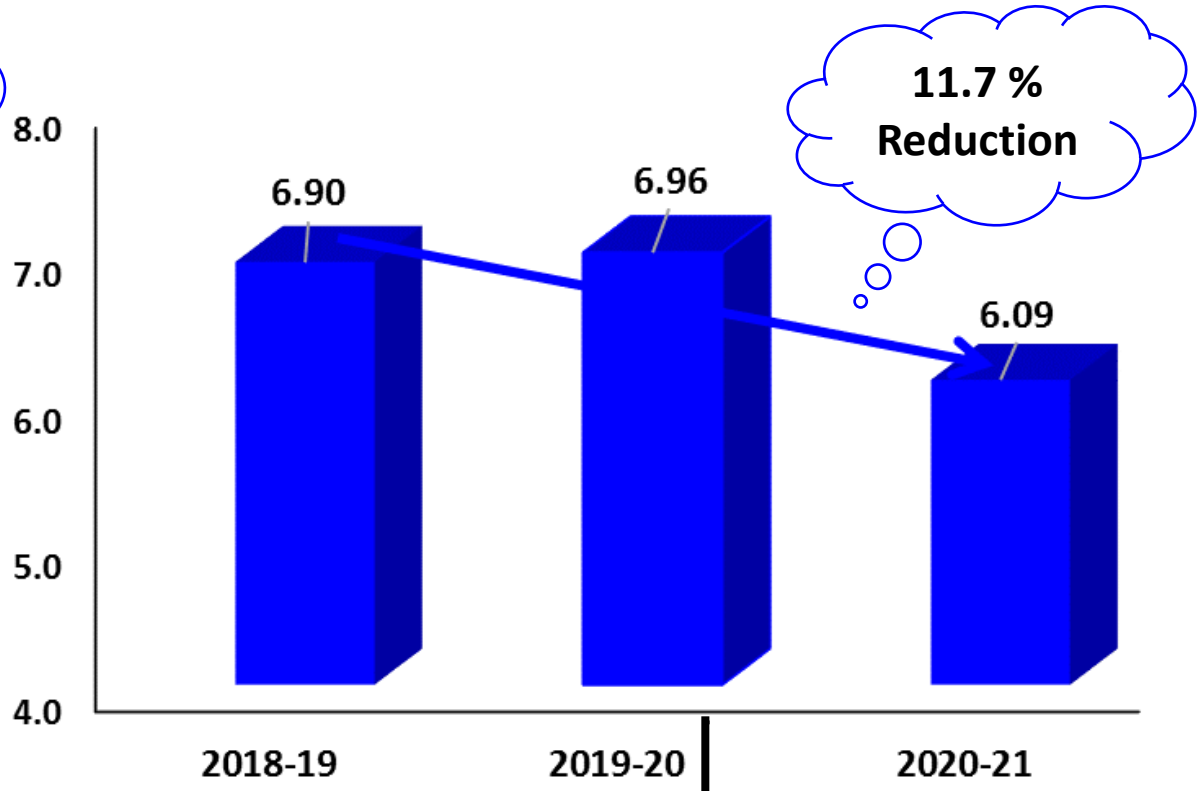
Sp. Energy Consumption in last 3 Years (FY2018-21)

Confederation of Indian Industry

Specific Electrical Consumption (GJ/Ton)



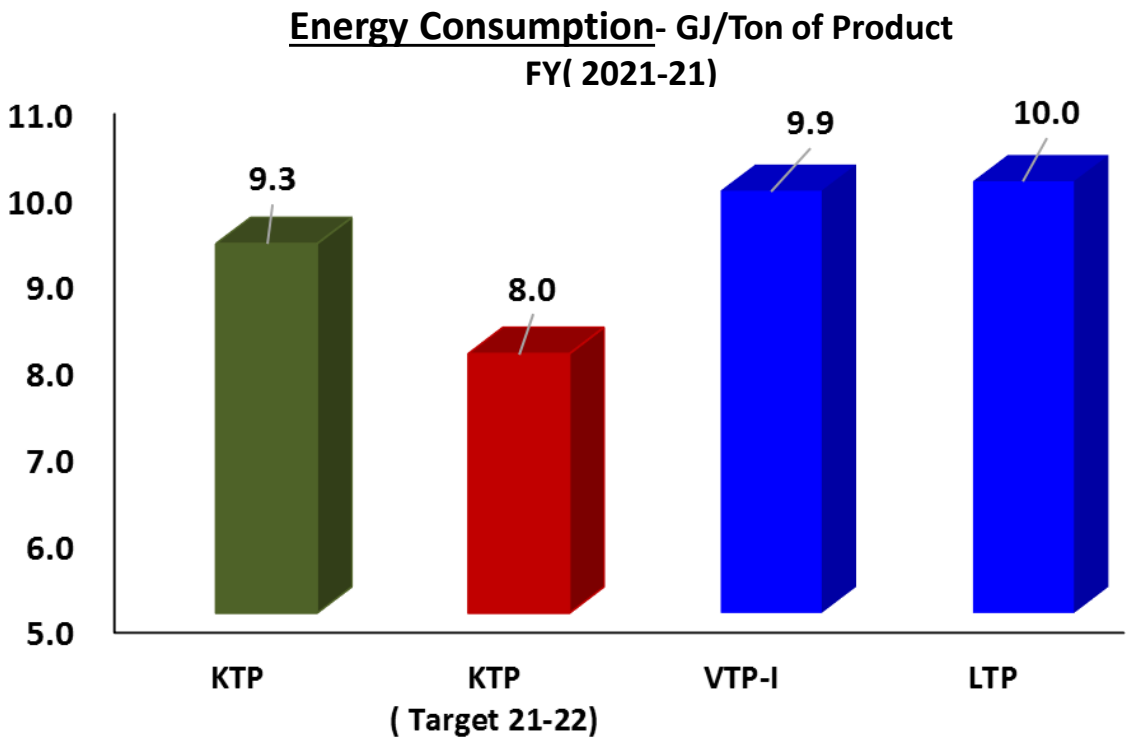
Specific Thermal Consumption (GJ/Ton)



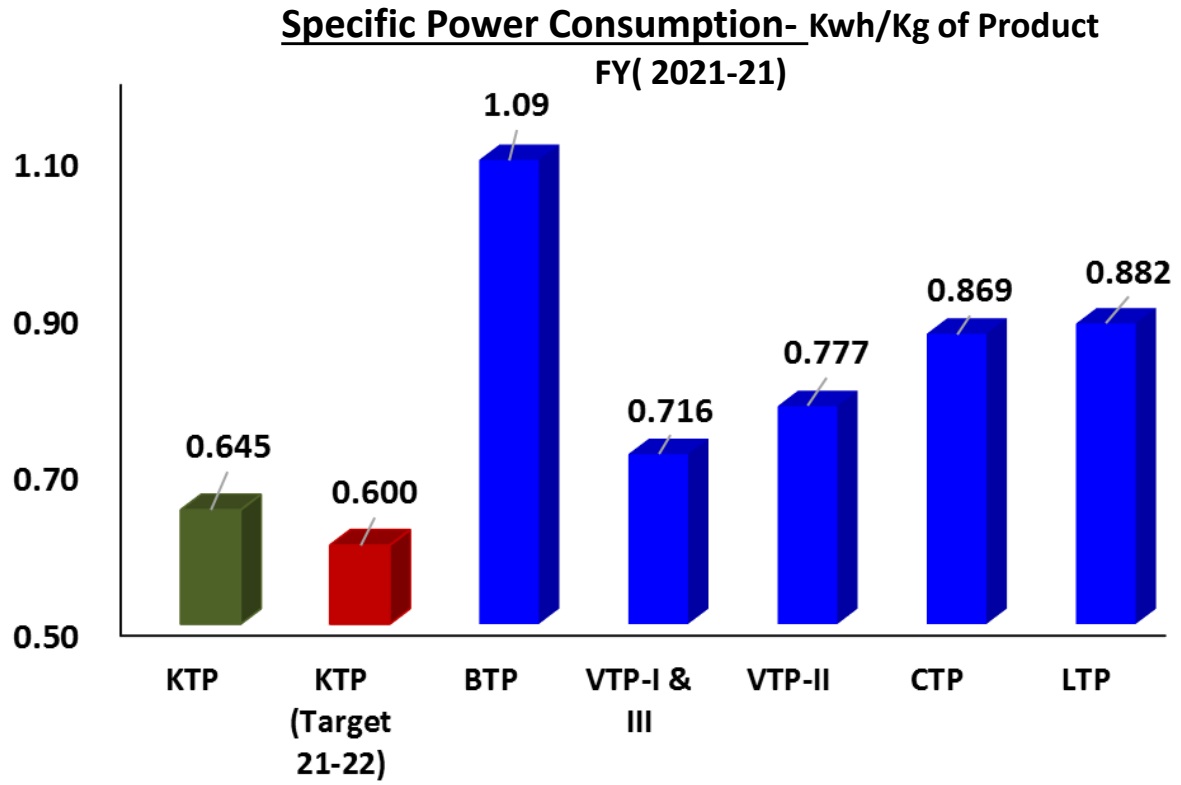
- Plant Run Partially
- Low Market Demand

Information on Competitors, National & Global Benchmark

Internal Benchmarking- Bias Tyre Manufacturing (JKTIL Plants)



Internal Benchmarking- All JKTIL Plants (Bias + Radial)



Kankroli Tyre Plant:

- ✓ Lowest Among All JK Tyre Plant for Specific Power Consumption.
- ✓ Lowest Among Bias Tyre Manufacturing Plant for Specific Energy Consumption.

Information on Competitors, National & Global Benchmark

Global Benchmarking Energy-GJ/Ton of Product	
Apollo Tyre	8.2
Goodyear	14.72
Pireli	15.22
Michelin	12.36
Nokian Tyres	10.46
JK Tyre (Total)	9.73
Bridgestone	12.66
Source: Sustainability Report-2019	

Kankroli Tyre Plant- Achievement Energy- GJ/Ton of Product

FY	GJ/Ton
2018-19	9.3
2019-20	9.4
2020-21	8.4

Kankroli Tyre Plant- Road Map Energy- GJ/Ton of Product (At Base Line Annual Production 62110 MT/ Year

FY	GJ/Ton
2021-22	7.4
2022-23	7.0
2025-26	6.0

Action Plan to Achieve Global Benchmark

- ✓ Provision of VFD on Mixer#3 Motor by 21-22.
- ✓ Conversion of all Conventional AHU's with Energy Efficient AHU's by 2021-22.
- ✓ Conversion of Mixer Ram from Pneumatic to Hydraulic by 22-23.
- ✓ Provision of VFD's on All Mill Motors by 22-23.
- ✓ Conversion of Conventional Heating system to Gas Heating by 2022.
- ✓ Increase Condensate Recovery by 50 % from existing by 2022-23
- ✓ Contribution of Renewable Energy to increase up to 25% by 2023.
- ✓ Increase Biomass Consumption to 40 % of Boiler Fuel by Year 2023.
- ✓ *Digitalization and Real Time Monitoring of Process Parameters*

Energy Saving projects implemented in last three years

Year	No of Energy Saving Projects	Investment (INR Million)	Electrical Saving (Million kWh)	Thermal Savings (Million K Cal)	Savings (INR Million)	Impact on SEC GJ/Ton
FY 2018-19	9	25.3	0.80	3710	20.4	0.30
FY 2019-20	4	4.5	0.12	1820	3.0	0.15
FY 2020-21	7	27.0	2.3	17912	16.5	1.45

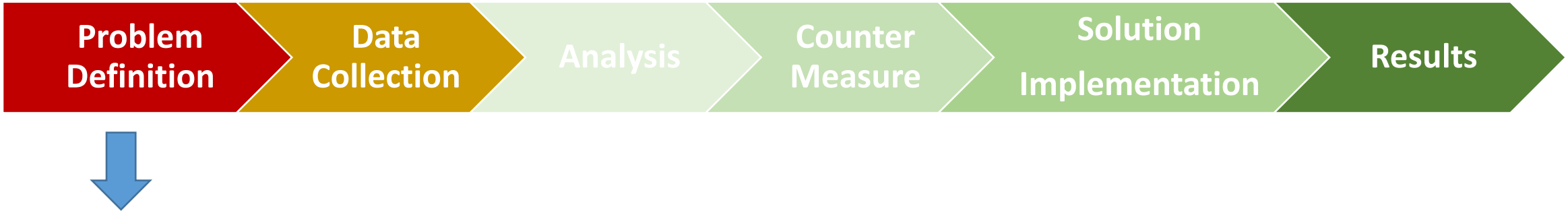
Identification of Energy Projects based on:

- ✓ Technological Up gradation
- ✓ Plant Internal Findings
- ✓ Horizontal Deployment from other JK Tyre plants
- ✓ External Audit Finding

Innovative Projects Implemented

Project:

Reduction of Energy Consumption in Utility for Tyre Curing



Kankroli Tyre Plant having old equipment and Tyre Curing (Vulcanizing) is being done using Conventional Method of Steam & Hot Water Curing Cycle, Which is old technology and Need to upgrade for Improvement of Energy Efficiency.

Project Start Date : Apr-2019

Project Completion Date : Oct-2020

Innovative Projects Implemented

Problem Definition → Data Collection → Analysis → Counter Measure → Solution Implementation → Results

Energy Used For Hot Water Curing System (FY 2019-20)

S No	Particulars	UOM	Quantity
1	Hot Water Supply Pump	Kwh/ Year	466032
2	Pumping of HW Recovery	Kwh/ Year	72656
3	Pumping of PCW Supply	Kwh/ Year	693302
4	Pumping of HBD +CBD (One Pump)	Kwh/ Year	162336
5	HW Booster Power	Kwh/ Year	514174
6	Power Consumption on Start Up	Kwh/ Year	26000
7	Power Consumption for water Cooling (ACFC)	Kwh/ Year	164160
	Total Power Consumption for HW	**Kwh/ Year**	**2098660**
8	Steam to HWG	Tons/ Year	15200
9	Steam to HWG on Start Up	Tons/ Year	520
	Total Steam Consumption for HW	**Tons/ Year**	**15720**

Data Collection Tools:-

1. Energy Meters 2. Steam Flow Meters

Analysis - Using Why- Why and Brain Storming

S. No.	Problem Statement	Root Cause
1.	**Higher Fuel Consumption for Hot Water Generation**	**Low Efficiency of Heat Transfer** to Product & Losses Due to Residual Heat Removal by Cold Water Circulation.
2.	**Higher Power Consumption for Hot Water & Cold Water Circulation**	**Required to Meet High Pressure** Tyre Curing Specification
3.	**Oxidation in Curing Bladder**	**Repetitive Circulation** and Cooling of Water in Cooling Tower – Oxygen Carryover

Innovative Projects Implemented

Problem Definition → Data Collection → Analysis → Counter Measure → Solution Implementation → Results

Countermeasure Identified

- To Use Nitrogen Gas instead of Hot Water for Retaining the Heat Input Given by Steam and Use Desired Pressure as Per Specification for Process.
- Make Storage Facility for Nitrogen at Plant.
- Modify Press Piping & Control to Use Nitrogen in place of Hot Water & Cold Water. And Revise Cure Cycle to Replace Hot Water Curing to Nitrogen Curing.

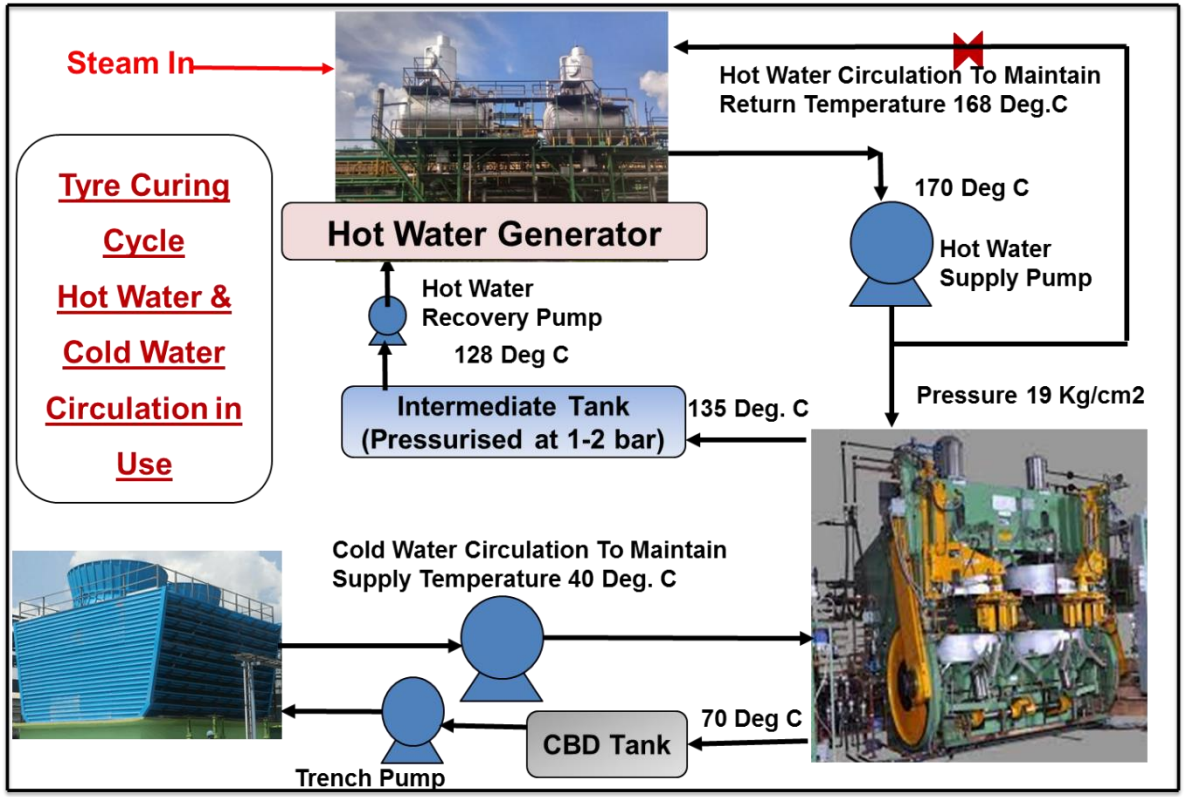
Validation

- A Pilot Project – Using Nitrogen Cylinder Banks and Modification of Presses Completed with Curing of 2000 Tyres. And Energy Consumption data Validated.

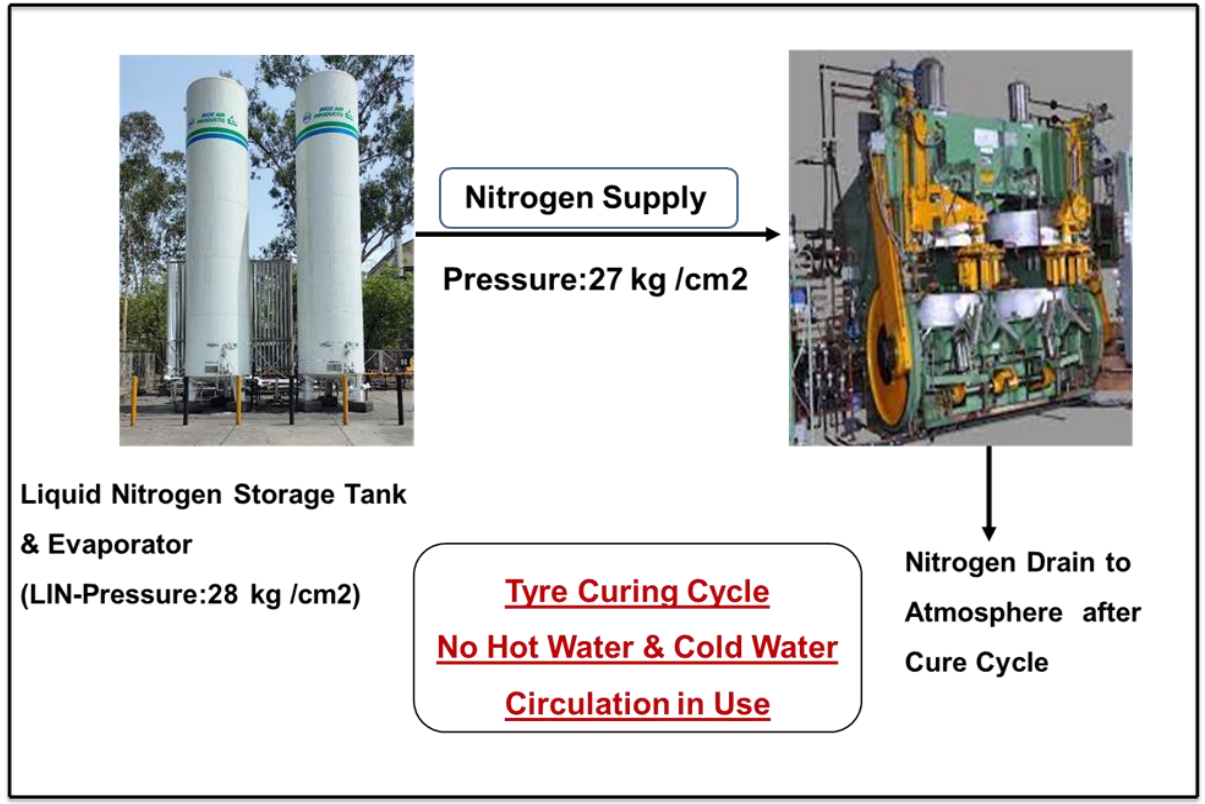
Innovative Projects Implemented

Problem Definition → Data Collection → Analysis → Counter Measure → Solution Implementation → Results

Before Situation



After Situation



Innovative Projects Implemented

Problem Definition → Data Collection → Analysis → Counter Measure → Solution Implementation → Results

- Saving in Coal For Hot Water = 12 MT / Day
- Saving in Utility Power = 6200 Kwh/ Day
- Reduction in Specific Energy Consumption = 254 Kcal/ Kg of Product.

Tangible Benefits :-

- Saving of Rs. 109 Lacs / Year
- (Simple Payback on Investment =1.5 Years)

Intangible Benefits :-

- Consistent Higher Pressure Leads to Better Product.
- Lower Maintenance Cost.

Uniqueness of the Project :-

- Nitrogen Curing First In Bias Tyre Technology in India
- Implementation at 40 years old presses with in- house modifications
- Successful Implementation in Record time of 3 Months for 121 Tyre Curing Presses.

CO_2

6900 Ton / Year

Utilisation of Renewable Energy Source

Year	Technology (Electrical)	Type of Energy	Onsite/Offsite	Installed Capacity (MW)	Generation Million kWh	% of Overall Electrical Energy
FY 2018-19	Solar PV	Electrical	Onsite	3.020	0.36	0.78
FY 2019-20					0.425	11.35
FY 2020-21					0.397	10.77

- Onsite Generation FY (2018-21) – 1.182 Million kWh ; Investment Made- NIL (Opex Model)
- KTP Contributes 16% of Total Group Capacity

Year	Technology (Thermal)	Type of Energy	Installed Capacity (Million K Cal)	Usages Million K Cal	% of Overall Thermal Energy
FY 2018-19	Biomass As Boiler Fuel	Thermal	N.A.	4713	4.6 %
FY 2019-20				21363	23.2 %
FY 2020-21				18628	22.3%

Utilisation of Renewable Energy Source

- **RPO Obligation**

S No	Details	UOM	2018-19	2019-20	2020-21
1	Total Power Consumed	kWh	46204600	41409457	36552600
2	DISCOM Power Utilised	kWh	40858928	25028247	16159492
3	Open Access Power from IEX	kWh	5345672	14516880	20393108
	Total kWh to Comply RPO	**kWh**	**5345672**	**14516880**	**20393108**
	RPO Compliance				
4	Solar	**% age**	4.75	6.0	7.25
5	Non Solar		8.6	9.0	9.40
	Total RPO		**13.35**	**15.0**	**16.65**
	Total RPO	**kWh**	**713647**	**2177532**	**3395452**

Waste Utilisation and Management

S No	FY	Type of Waste	Quantity (MT/Year)	GCV (K Cal/Kg)	Waste as percentage of Total Fuel
1	2018-19	Coal Fine Dust & Horticulture Waste from Premises	36	3877	0.1
2	2019-20		599	3717	2.42
3	2020-21		402	3688	1.78

All horticulture waste :-

Tree Leaves / Twigs/ Trimming etc. are Collected & Being Used as Boiler Fuel.

Canteen Food Waste :-

Being Used to Generate Bio Gas &

Being Utilize for Cooking in Canteen.

Waste Qty. = 55 Kg/Day

LPG Saved = 4 Kg/ Day

Implementation = Apr'21 Onwards

Waste Utilisation and Management

Conversion of Inhouse Horticulture waste into powder form and use it in to Boiler

Collection of Horticulture Waste → Grinding it in to Powdered form by Third Party Vendor → Collection by Purchase Deptt with weighment → Blending it with Existing Coal → Feeding it into Boiler

Horticulture Waste Crushing Machine

Capacity :- 170 Kg/ Hour

Pallet Making Machine

Pallet of 25 mm size

Palletization from Dust & Use in Boiler

Collecting Coal Dust → Blending it with Cow Dung & Making Pallets → Feeding to Boiler

Process Waste Management

S No	FY	Type of Waste Generated	Quantity of Waste Generated (MT/Year)	Disposal Method
1	2018-19	PVC Barrels , Electrical Scrape, Wooden Material, Metallic Scrape	884	Scrape Sell to Authorised Vendor to Use as input material for further use. **(Zero Waste to Landfill)**
		Process Waste (Compound ,Cures Tyre , Fabric, Insulated Bead etc.…)	125	
2	2019-20	PVC Barrels , Electrical Scrape, Wooden Material, Metallic Scrape	705	
		Process Waste (Compound ,Cures Tyre , Fabric, Insulated Bead etc.…)	112	
3	2020-21	PVC Barrels , Electrical Scrape, Wooden Material, Metallic Scrape	662	
		Process Waste (Compound ,Cures Tyre , Fabric, Insulated Bead etc.…)	123	

GHG Inventorisation

GHG Inventorisation Base Year :2013-14

Public Disclosure: Sustainability Report

Inclusive of :

Scope 1 – Monitoring & Reporting

Scope 2- Monitoring & Reporting

Scope 3 – Data Collected and under verification Process

GHG Emission	UOM	2018-19	2019-20	2020-21
Scope 1	CO2 Eq Ton	41235	29141	26377
Scope 2	CO2 Eq Ton	37324	29366	28372
Scope 3	CO2 Eq Ton	-	-	6594
Total Emission	CO2 Eq Ton	78559	58507	61343
Emission Intensity	CO2 Eq Ton / Ton of Tyre	1.16	0.98	0.90

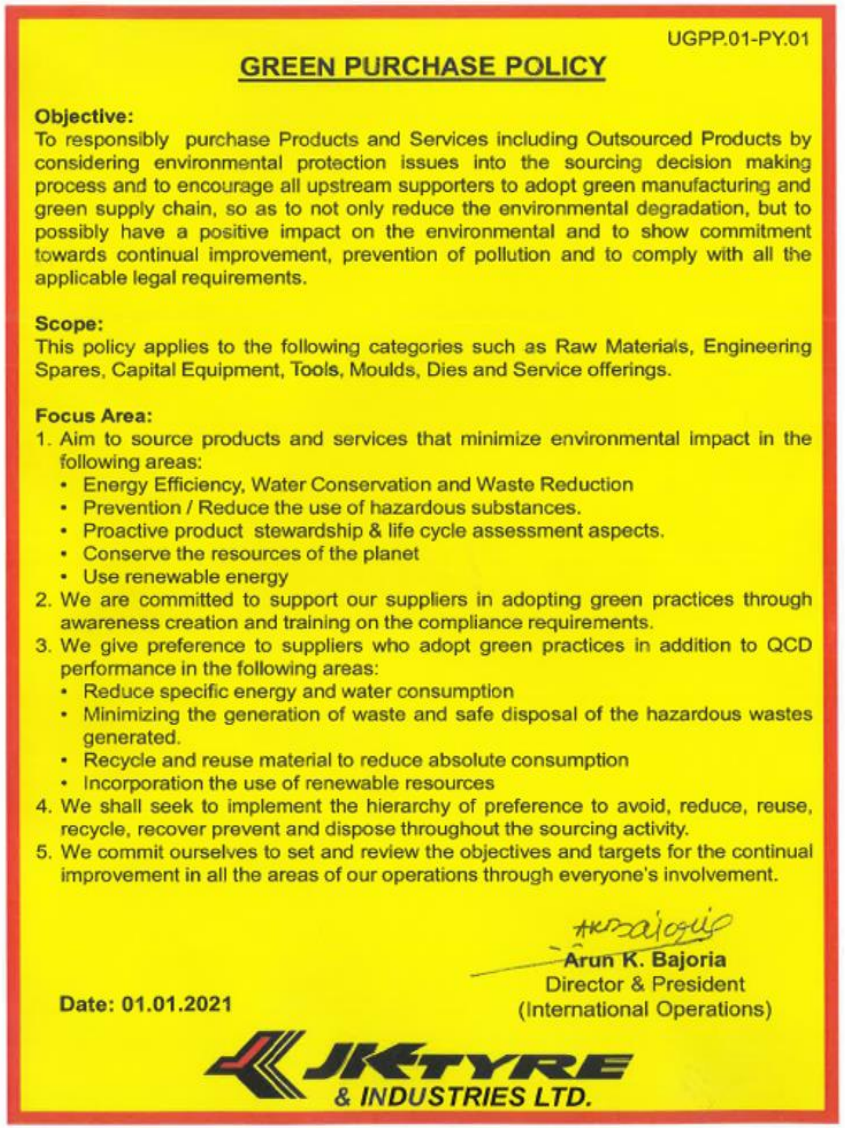
Target- Short term & Long Term	
FY 2020-21	0.90
FY 2021-22	0.86
FY 2021-22	0.80
FY 2022-23	0.75
FY 2023-24	0.70

Green Supply Chain Management

Best Practices: Vendor/Supplier/Contractor

- ✓ Energy Efficiency Parameter is part of technical specification before procurement
- ✓ Classification of Material based on Energy Efficiency parameter.
- ✓ After received of material all the energy efficiency parameter verified by vendor and it is linked with payment terms and condition .

Product LCA Study and Improvement Initiative planned.



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GREEN PURCHASE POLICY

Objective:
To responsibly purchase Products and Services including Outsourced Products by considering environmental protection issues into the sourcing decision making process and to encourage all upstream supporters to adopt green manufacturing and green supply chain, so as to not only reduce the environmental degradation, but to possibly have a positive impact on the environmental and to show commitment towards continual improvement, prevention of pollution and to comply with all the applicable legal requirements.

Scope:
This policy applies to the following categories such as Raw Materials, Engineering Spares, Capital Equipment, Tools, Moulds, Dies and Service offerings.

Focus Area:
1. Aim to source products and services that minimize environmental impact in the following areas:
   - Energy Efficiency, Water Conservation and Waste Reduction
   - Prevention / Reduce the use of hazardous substances.
   - Proactive product stewardship & life cycle assessment aspects.
   - Conserve the resources of the planet
   - Use renewable energy
2. We are committed to support our suppliers in adopting green practices through awareness creation and training on the compliance requirements.
3. We give preference to suppliers who adopt green practices in addition to QCD performance in the following areas:
   - Reduce specific energy and water consumption
   - Minimizing the generation of waste and safe disposal of the hazardous wastes generated.
   - Recycle and reuse material to reduce absolute consumption
   - Incorporation the use of renewable resources
4. We shall seek to implement the hierarchy of preference to avoid, reduce, reuse, recycle, recover prevent and dispose throughout the sourcing activity.
5. We commit ourselves to set and review the objectives and targets for the continual improvement in all the areas of our operations through everyone's involvement.

Arun K. Bajoria
Director & President
(International Operations)

Date: 01.01.2021

JK TYRE & INDUSTRIES LTD.

Team Work Employee Involvement & Monitoring

Daily Energy Monitoring :

- Real Time Monitoring of Power of Individual Equipment 334 Meters – Daily Review of Specific Power Consumption of Equipment / Process.
- Real Time Flow & Temperature Monitoring on 43 Locations – Daily Monitoring of Specific Steam & Fuel Consumption for Process..

Phase wise Allocation of Energy Project Budget

Status of Energy Projects

KTP

ENERGY PHASE- IX YEAR (2020-21)

S No	Energy Project	Investment Rs. Lacs	Savings Rs Lacs p.a.	Payback Years	Status
1	Power Saving by installation of VFD on Mixer#5 TCU Pumps	4.5	2.4	1.9	Completed
2	Power Saving by GAS Heating on Dryer Zone HOT canes ipo Electrical Heating at 4 Roll Calendar	16	11.6	1.4	Material received, Installation Job under Process. TCD- Aug 2021
3	Power Saving by provision of Existing VFD along with IE-3 Motor on DUAL Extruder 8.5' FD Mill and 10" FD Mill	26	14.2	1.8	Completed
	Total	46.5	28.2	1.6	

ENERGY PHASE- X YEAR (2021-22)

S No	Energy Project	Investment Rs. Lacs	Savings Rs Lacs p.a.	Payback Years	Status
1	Power Saving by provision of VFD on Extruder & Calendar Roof ventilation Fan and Control Speed as per Seasonal Variation.	5.0	3.2	1.5	PR under Process
2	Power Saving by provision of VFD on Mixer Roof ventilation Fan and Control Speed as per Seasonal Variation.	3.0	1.7	1.8	PR under Process
3	Power Saving by provision of VFD on Tyre Building Roof ventilation Fan and Control Speed as per Seasonal Variation.	3.5	2.0	1.8	PR under Process
4	Power Saving by Upgradation of Energy Efficient AHU in place of old and inefficient AHU's (Plant-III AHU # 4)	15.0	8.4	1.8	PR under Process
	Total	26.5	15.3	1.7	

Slide -69

Employee Involvement

- All Process Owners – KPI are Linked to Respective Energy Parameter
- Plant Level Suggestion Scheme & Reward

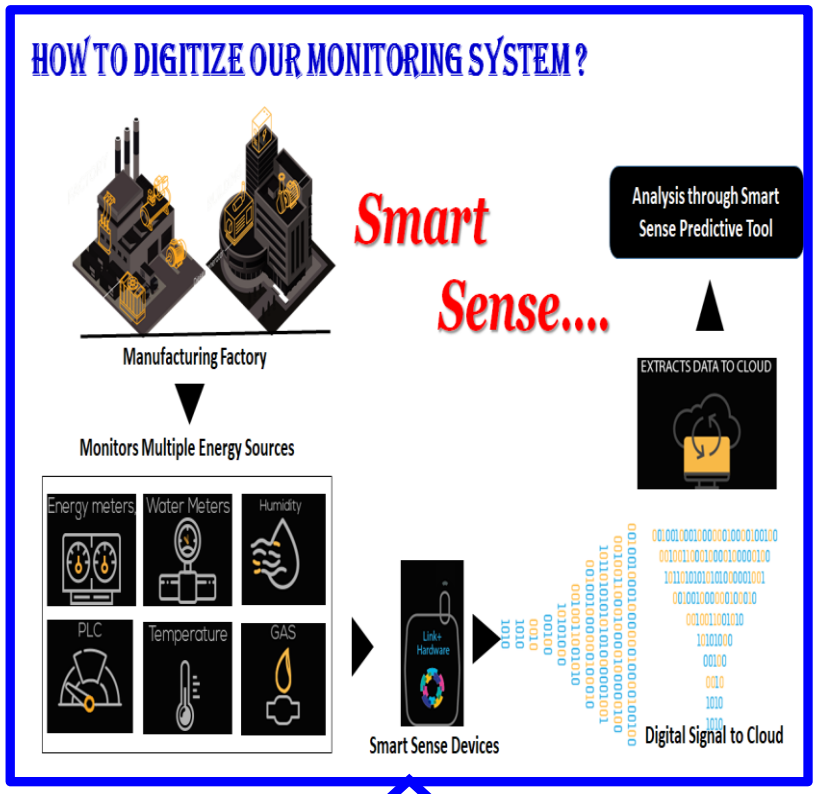
Energy Awareness Training Programme:-

- Internal & External Faculty.
- Online Training By Vendors on Energy efficient Products.
- Training on Energy Management System – by BSI

Energy Review :-

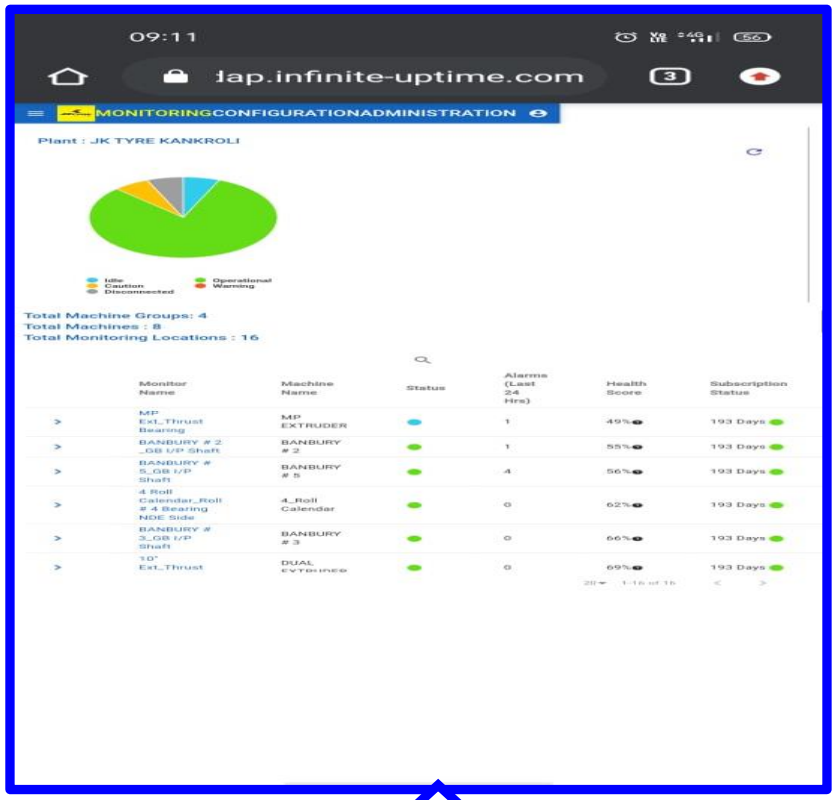
- Chaired By: Top Management (Director Manufacturing)
- Process Wise Comperasion with Base Line , Internal Benchmarking & Review of new Initiatives.

Team Work Employee Involvement & Monitoring - Digitalization



Real Time Energy Monitoring at 377 Numbers Energy Meters Using Smart Sense Software

Use of QR Code attached to equipment for easy tracing of Drawings & Manuals



Real Time Monitoring of Vibration , Temperature & Noise Level at Equipment (Pilot Project Implemented)

Implementation of ISO 50001/ Green Co / IGBC rating

ENERGY POLICY

We at JK Tyre are committed to design, manufacture and distribute our products & services in an energy efficient manner to meet our mission statement of becoming a green company. We will continually improve our energy performance for sustainable growth by:

- Complying with all applicable legal and other requirements related to our energy use, consumption and efficiency.
- Taking measure in Energy Management System by being proactive, innovative and cost effective including procurement of energy efficient product & services.
- Enhancing effectiveness of energy management system by ensuring the availability of information and necessary resources to achieve the objectives and targets.
- Integrating energy policy into our business planning, decision making and performance review at appropriate level.

We commit to communicate this policy to all our employees, persons working for and on our behalf and also will make it available to all interested parties on request.

Authorised and Approved by

Vivek Kamra
President (India)

JK TYRE & INDUSTRIES LTD.

bsi.

By Royal Charter

Certificate of Registration

ENERGY MANAGEMENT SYSTEM - ISO 50001:2018

This is to certify that:

JK Tyre & Industries Ltd.
P.O.: Tyre Factory, Jaykaygram
Kankroli
Dist. Rajsamand 313 342
Rajasthan
India

Holds Certificate No: **ENMS 589491**

and operates an Energy Management System which complies with the requirements of ISO 50001:2018 for the following scope:

The Manufacture of Conventional (Bias) Tyres, Pre Cured Tread Rubber including generation of steam through Boilers.

For and on behalf of BSI:

Chris Cheung, Head of Compliance & Risk - Asia Pacific

Original Registration Date: 2012-11-21
Latest Revision Date: 2018-10-19

Effective Date: 2018-11-21
Expiry Date: 2021-11-20

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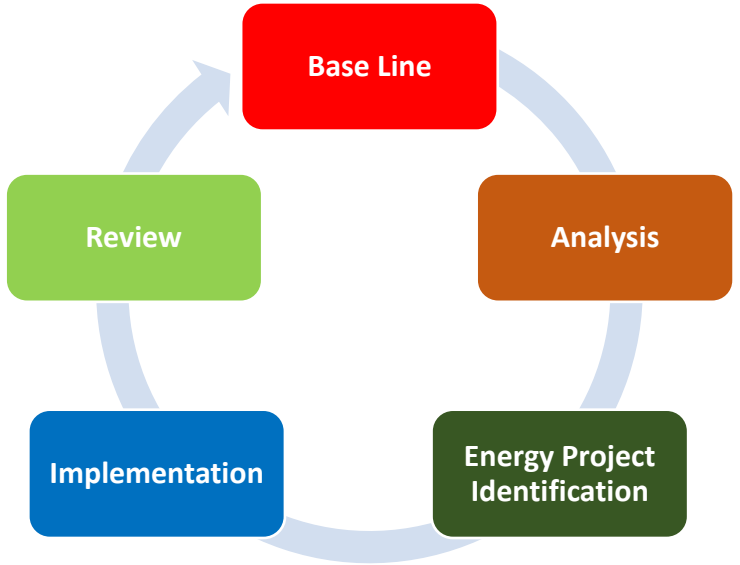
..making excellence a habit."

Kankroli Tyre Plant (KTP)
is
✓Asia's First Tyre Plant &
✓World's Second Tyre Plant
To Get
ISO 50001:2011 Certification



- **CII Green Co Bronze Rating – 2013,**
- **Initiated BSC- Globe of Honor – Final Audit Scheduled- Nov'21**
- **Percentage investment on Energy Saving Project is 0.1% of Turnover**

Learning from CII Energy Award 2020 or any other award program

1. **Replacement of Conventional Old & Inefficient Motors with Energy Efficient – IE3 Motors. (With help of International Copper Association of India) – Learning from CII- Energy Award -2015 Interaction.**

   JKTIL Kankroli Tyre Plant is the First in the Private sector to receive the honor from ICAI for their initiation of IE-3 Motors.

India Copper Forum-2016

2. **Replacement of Conventional Lumminaire with LED Luminaire – CII- Energy Award- 2015**

   Kankroli Tyre Plant has converted all of it conventional luminaire with LED Luminnaire.

3. **Real Time Monitoring of Energy Meters – CII – Energy Circle Competition - 2019**

   Kankroli Tyre Plant has implemented – Real Time Energy Monitoring & Condition Monitoring of All Electrical Installations.

4. **Energy Saving in Fans & Blowers - Input from CII Energy Circle Competition -2019**

   Blowers are Replaced with Energy Efficient Design & with Speed Control based on ambient temperature.

Any Other relevant information

Awards/Accolades

5th CII National Energy Efficiency Circle Competition'2020- Appreciation Category

National Water Awards for Excellence in Water Management 2020' by CII "Winner Category"

National Water Awards for Excellence in Water Management 2018' by CII on "Noteworthy Water Efficient Unit"

2nd CII National Energy Efficiency Circle Competition'2018

Golden Peacock Award For Energy Efficiency-2018

Rajasthan Energy Conservation Award-2019- Recognition Category

Thank you

Contact :-
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JK Tyre & Industries Ltd.
Kankroli Tyre Plant
At/ PO – Tyre Factory
Jay kay Gram , Kankroli
Dist:- Rajasamand – Rajasthan