

# Best practices in the field of Manufacturing – SPB, Erode unit



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**Abstract:** This paper deals with the best practices adopted by SPB in the areas of energy, water conservation, renewable energy, innovations, green manufacturing, GHG mitigation, circular economy etc. and the benefits achieved. All these practices can be horizontally applied in across other mills. Some are unique in nature with a quantum shift in terms of financial performance in this competitive market.

**Our aim is to make qualitative products at competitive cost and team work in a sustainable manner taking care of People, Planet and the bottom line. To be in competition, we restructured, reengineered and adopted some unique models of sustainability. In this paper, we are also sharing how these concepts are practised with some examples.**

**The special features of this paper are the sustainability models with the best available technology. Extended 3R principles to 6R, and working on energy front based on pinch technology, international bench marking, future energy scenarios are also included in this paper.**

**Key Words:** Sustainability, 6R, pinch technology, Bio fuels, net zero emissions.

## Best practices – what, why & how?

A Best practice is a method or technique that has been generally accepted as superior to any alternatives. It produces results that are superior to those achieved by other means and regardless of the complexity of best practices, our aim is to make whatever we are doing work out better, faster and more efficiently with less problems and mistakes. We believe “Best practices is the framework for success and the minimization of failure”

## Approaches towards strategic growth

To improve the operational efficiency, following the lean manufacturing principles, we could observe incremental growth with the investments and post 2018, we could see the leap in our process efficiency by adoption of process innovation, change in strategy and deliberate improvement and in the coming decade to be globally competitive, our focus is on development of people and leadership skills along with the investments in IOT. And we continue our healthy performance based on conservation and sustainability principles.

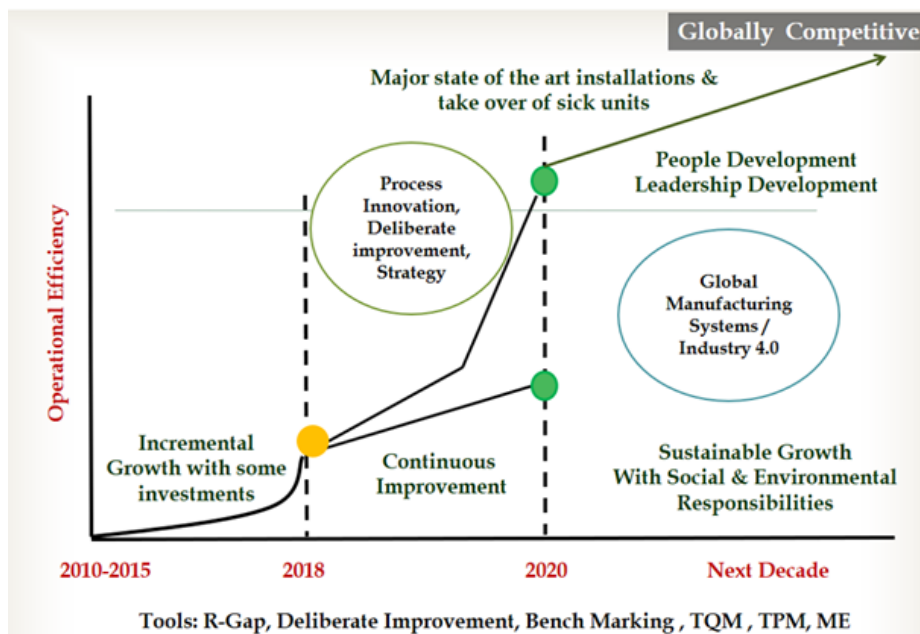


Figure – 1: Approaches towards strategic growth

## Sustainable manufacturing – concepts & models

Sustainability Should aim at meeting today’s needs without abridging the rights of tomorrow’s generation to meet their needs and our development strategy that should be Socially desirable, Economically Viable & Ecologically sustainable, in short, “People + Planet = Social + Environmental Responsibility”.

When it comes to sustainability people think, it is to nominate a sustainability manager, grow trees and spend on CSR’s. But the actual is sustainability is on a holistic approach starts from driving

Organisational change, working on policy, commitment and governance addressing climate change impact by reducing scope 1,2,3 emissions, taking care of People, EHS and CSR activities, reducing the specific consumptions, and work with supply chain partners to reduce the impact and empowers employees to contribute to sustainability.

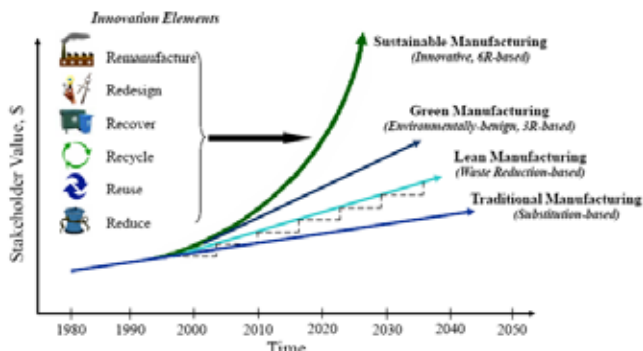


Figure – 2: Sustainable manufacturing

Sustainability is the driver for Innovation, and Innovation promotes accelerated growth in Manufacturing. Manufacturing is the engine for Wealth generation and societal well being. Societal wellbeing and Economic growth heavily depend on the level and quality of education and training.

Our Manufacturing Focuses on Minimizing Environmental impact and Global Warming, Elimination of Wastes, Maximizing Green Resources in our Business, work based on Sustainable Development and Improvement in performance efficiency and profitability

**Energy Scenario in Pulp & Paper Industry**

Based on sustainability goals of 2030, the current decade of “Ecosystem restoration” and our Government vision to have Net zero by 2070, in Energy front sector is shifting from fossil to Bio energy. As earmarked earlier we Benchmark our performance with peers and aim to be the best in the industry.

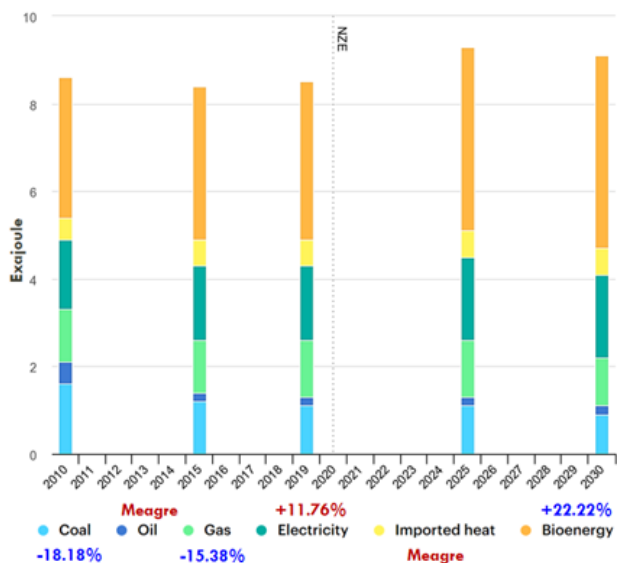


Figure – 3: Energy Scenario in Pulp & Paper Industry

To highlight are, **Buy star** labelled equipments and motors above IE2 standards, conversion of vacuum pumps to Turbo blowers, and with the increase in Pulp production, the increase in renewable energy from 49 to

60 %, and additional 2% by increase in usage of Biofuels in our captive power plants and efficient use of heat by adopting “Pinch Technology”. Some of the innovative ideas shared in other forums are our

1. WHR from compressors – CPP plant.
2. Bio-methanation gas from Bagasse + Foul condensate
3. Modification of digester by in house team

**In Water conservation, many projects were undertaken** inside the fence, Rain water harvesting in roof and non-roof areas (Capturing potential of rain water harvesting is 84.64%) and the substitution of fresh water with rain water is 1.2%, De-silting of village tanks completed by us.

**Utilization of renewable energy sources**

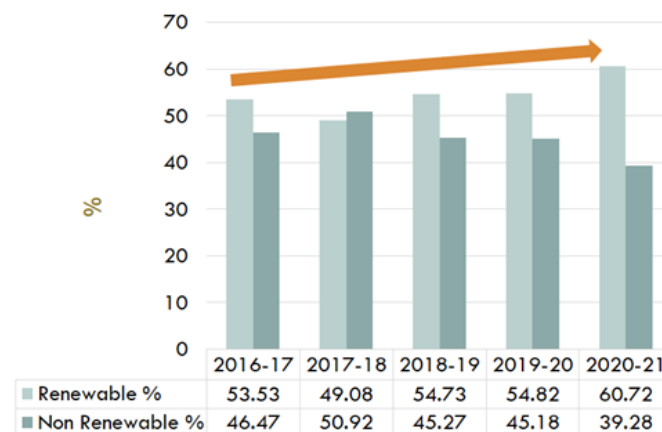


Figure – 4: Utilization of renewable energy sources

We could enhance our Green Energy by Process re-engineering in Evaporation plant – 5% increase in RE share, modification of digester to enhance pulp production and Green Energy – 32 TPD pulp production increased & 4% increase in RE share and by usage of Bio fuel to reduce fossil fuel consumption in CPP – 40 TPD coal reductions .

**GHG Inventorization**

We follow the principles of GPC while calculating the GHG emissions, some of the measures taken to mitigate GHG emissions are Increase in usage of Bio fuels – 3% (40 TPD fossil fuel reduction), usage of Bio-methanation gas to replace furnace oil – 3.5 KL FO consumption reduction, Procurement of wood above 80% within 200 KM radius, usage of indigenous materials for machine clothing, usage of native starch and Substitute Imported pulp with our indigenous pulp.

Source	Utilization	GreenCo Impact
MF 3 Starch	Rich in COD diverted to anaerobic lagoon	GHG Mitigation
Lime Mud	100% second stage mug recycled	GHG Mitigation
Odor issue from Pulp Mill	Alkaline Scrubber installed	Odor Mitigation
Food waste	Converted in to Bio Fuel and fired in our canteen	GHG Mitigation

Table – 1: GHG Mitigations

**Initiatives taken to minimize GHG impacts in Supply Chain**

**1. Bulk Transportation of Goods**

Our stores department increased the no of higher capacity trucks for collection of materials in close vicinity (Erode & Coimbatore)

**2. Higher Capacity Utilization of Trucks in Wood Procurement**

Capacity improvement of vehicle trucks in wood procurement 16 MT & more.

Year	Higher Capacity Trucks	No. of Trucks	% Increase
2018-19	20087	31654	63.46
2019-20	21074	29181	72.22
2020-21	20065	25196	79.64

Table – 2: Wood Procurement

**Utilization of waste:**

There is no material called waste and it is not used at its right place. So, Key initiatives taken for enhancing waste utilization were extending its life by working on cross sector economy.

Waste Component	Quantity in Tons	Industry
Filter Cake	28071	Board Manufacturing
Wet Pith	2455	
Lime Sludge	19319	Cement Manufacturing
Lime Grits	3987	
Fly Ash	8584	
Sodium Sulphate	1566	Soap Manufacturing

Table – 3: Utilization of waste

**Material Conservation & Recycling**

100% sustainable sourcing of bagasse through 'Waste-to-Wealth' initiative - "Chief Crop" – Sugarcane - Being a C+ plant, sugarcane has a very low CO<sub>2</sub> compensation point, 83% replacement of limestone by efficient lime-mud recycle, 11% weighted reduction in the packaging material used, namely, HDPE fabric, ESKP wrappers for ream and reel packaging, etc. and New Product developed – reduction of ClO<sub>2</sub>, increase usage of Natural shade products, less OBA consumption.

**Approach model – transformation in business**

We work on the sustainability principles and we have seen the how the concept is applied in the practical manner and when we think of the approach model the answer is the "Triple Helix



Figure – 5: Triple Helix Model

model". It is the multiple reciprocal relationships among the Academics, governments and the Industry - Institutional Sectors. Thus Sustainability can be illustrated as the place where the 3 dimensions overlap.

**3R to 6R concept**

The Green Manufacturing journey, by design itself is Circular. It moves beyond 3R approach of

"Reduce, Reuse, Recycle" towards 6R approach of "Repair, Reuse, Refurbish, Re-manufacture, Recycle and Redesign" thereby driving an optimized usage of the resources.

**Our future plan to be in the competition**

We work on minimising our dependency on Imported pulp and maximise our production of pulp production, Increase the usage of biofuel, and renewable Energy share to 70%. Further work on Bleach filtrate – Treatment at source to reduce 30% load in ETP in terms of TOC, colour, COD and recycle water and Compliance to Extended Producers Responsibility guidelines & Preparing ourselves for proposed Ecosystem restoration guidelines.

**Conclusion**

The industry is demanding for the survival of fittest and fastest. It is the need of the hour to prove ourselves that we are not disturbed by any means. This is quite possible if we adopt the best practices in every activity of our business.

SPB's manufacturing excellence, with sustainability as the founding principle, has created an enviable financial record. SPB takes pride in achieving consistent and stable financial performance over the years due to adaptation of best practices and green practices.

**References:**

1. IPPTA, Journal, volume 32, No.2 ,2020
2. <https://www.iea.org/reports/pulp-and-paper>, Nov-21.

6 R	Example
Reduce	<ol style="list-style-type: none"> <li>1. Reduction in water consumption by modification of nozzles in Paper Machines – <b>Savings – 3000 M3 / day</b></li> <li>2. Frequency reduction from 50 HZ to 49 HZ - <b>Savings – 19200 Units / day</b></li> </ol>
Reuse	<ol style="list-style-type: none"> <li>1. Usage of secondary condensate as sealing water for the vacuum pumps and compressors – <b>Savings – 1200 M3 / day</b></li> <li>2. Usage of Paper Machine back water as PER water for bagasse slushing, wood log washing - <b>Savings – 4000 M3 / day</b></li> </ol>
Recycle	<ol style="list-style-type: none"> <li>1. To ensure <b>disposal of waste in a responsible manner</b> and to work on the concept of WOW – Usage of used cartridges as floor mats promoting livelihood for Tribes</li> <li>2. Usage of by products as raw materials for other sector</li> </ol>
Recover	<ol style="list-style-type: none"> <li>1. Introduction of disc save all in place of conventional to recover fiber</li> <li>2. Installation of Spiral Heat Exchanger to recover heat based on application of Pinch technology- <b>Savings – 60 TPD steam</b></li> </ol>
Remanufacture	<ol style="list-style-type: none"> <li>1. Modification of our smelt dissolving tank agitator by the usage of old SAPPI agitator.</li> <li>2. Conversion of the SAPPI condenser as standby for the spout cooling system in Recovery Boiler</li> </ol>
Redesign	<ol style="list-style-type: none"> <li>1. Reengineering of evaporation plant at each stage which includes vacuum system, recirculation pumps, ash addition point and condensers</li> <li>2. Modification of digester to enhance pulp production from 378 TPD to 440 TPD</li> </ol>

Table – 4: 6R with Examples