Sripathi Paper and Boards Private Limited

Sivakasi

Presented By:

B Maniraj – DGM Production

P Vignesh Kannan – GM Power Plant

C Soundara Rajan – Energy Manger

About Sripathi

‘SRIPATHI’ Paper and Boards (P) Ltd (SPBPL), Owns and successfully operates a paper mill at Sivakasi & Sathyamangalam, Tamil Nadu, India, Capable of producing 2,00,000 tons per annum of Packaging and W&P paper grades.

Specific Energy Consumption

Description	Paper Machine 1			Paper Machine 2		
	2020-21	2021-22	2022-23	2020-21	2021-22	2022-23
Installed Capacity - Pulp (Tons)	50,000	50,000	50,000	120,000	120,000	120,000
Pulp (Tons)	29,873	30,463	16,026	72,440	80,920	63,013
Installed Capacity - Paper (Tons)	42,000	42,000	42,000	100,000	100,000	100,000
Production (Tons)	29,873	30,463	16,026	77,892	87,011	67,756
Steam (Tons)	62,838	66,679	36,449	155,247	173,161	143,046
Power Consumption (kWh)	10,423,006	10,725,903	5,560,798	36,642,078	38,833,113	31,455,719
SEC Power (kWh/Ton)	348.9	352.1	347.0	470.4	446.3	464.2
SEC Thermal (T/T)	2.1	2.2	2.3	2.0	2.0	2.1
Description	**Paper Machine 3**			**Paper machine 4**		
	2020-21	**2021-22**	**2022-23**	**2020-21**	**2021-22**	**2022-23**
Installed Capacity - Pulp (Tons)	18,000	18,000	18,000	50,000	50,000	50,000
Pulp (Tons)	8,610	9,300	9,787	24,653	25,179	24,263
Installed Capacity - Paper (Tons)	15,000	15,000	15,000	45,000	45,000	45,000
Production (Tons)	8,610	9,300	9,787	26,227	26,786	25,812
Steam (Tons)	21,608	21,752	23,913	57,343	53,019	50,217
Power Consumption (kWh)	4,597,541	4,844,330	5,518,766	10,774,367	10,970,186	10,482,183
SEC Power (kWh/Ton)	534.0	520.9	563.9	410.8	409.5	406.1
SEC Thermal (T/T)	2.5	2.3	2.4	2.2	2.0	1.9

Reasons for Variations

- SEC raised due to low production rate
- More start-stop plant operation, Hence the start/stop losses is higher

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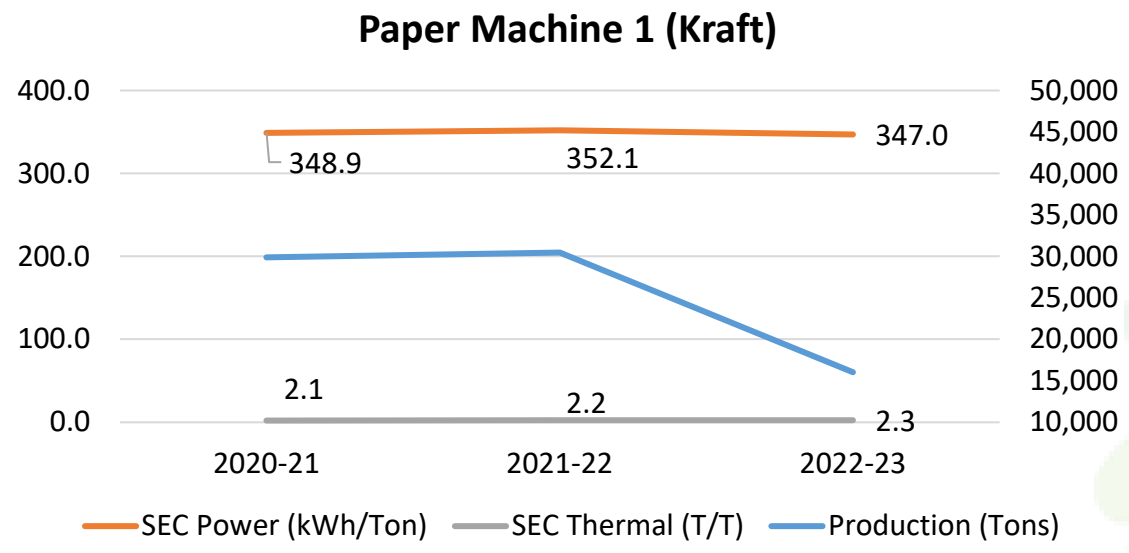
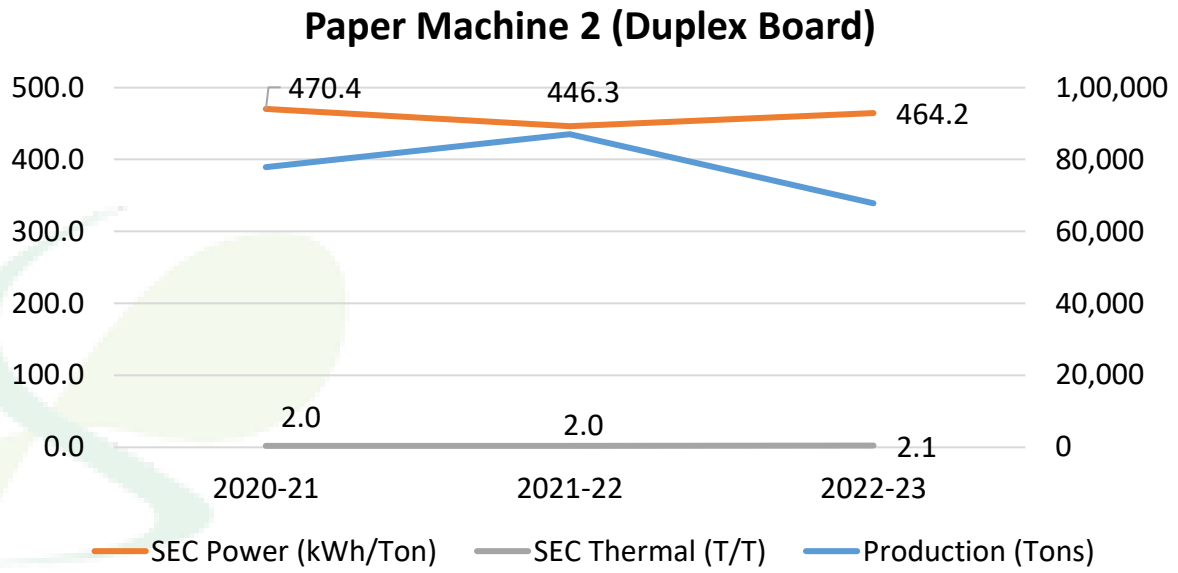
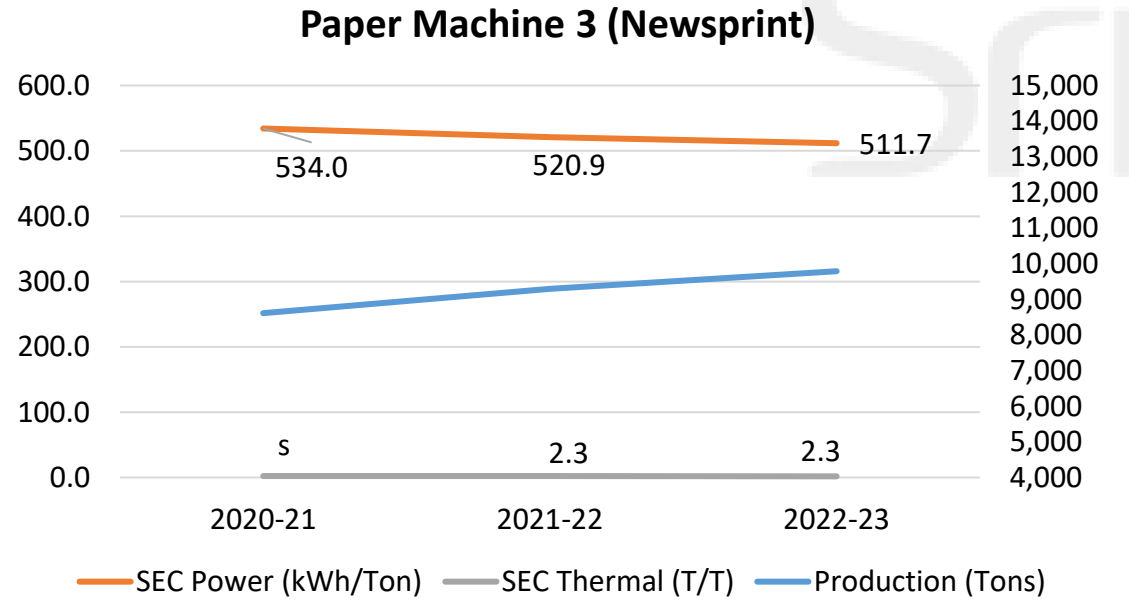
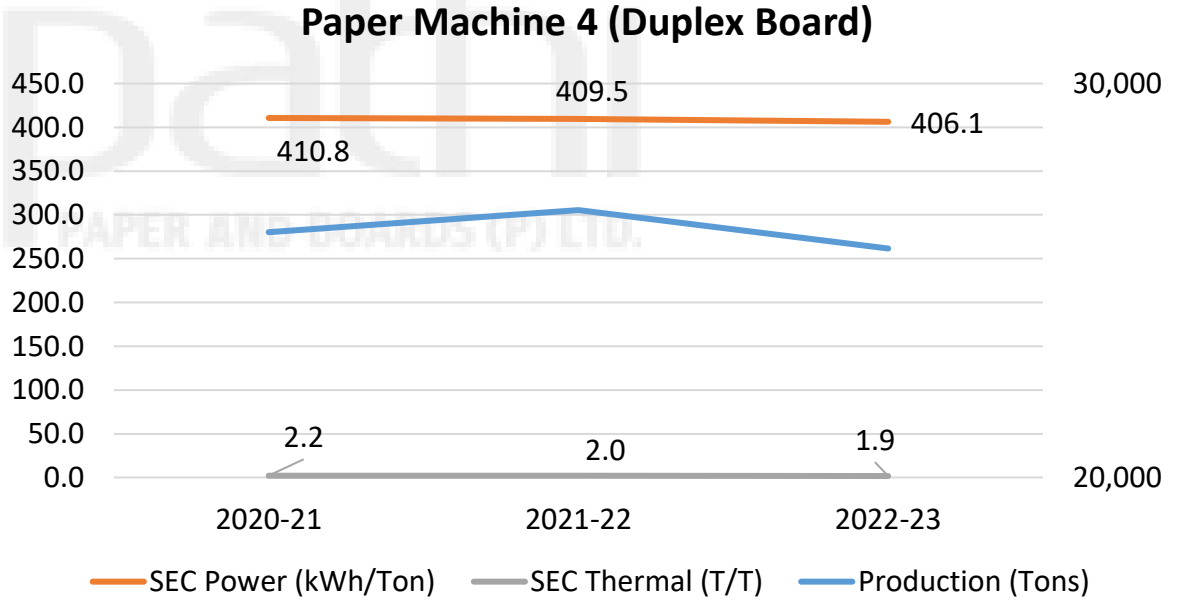
SEC Trend


Paper Machine 1 (Kraft)
400.0
300.0
200.0
100.0
0.0
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
348.9
352.1
347.0
2.1
2.2
2.3
2020-21
2021-22
2022-23
SEC Power (kWh/Ton)
SEC Thermal (T/T)
Production (Tons)


Paper Machine 2 (Duplex Board)
500.0
400.0
300.0
200.0
100.0
0.0
1,00,000
80,000
60,000
40,000
20,000
0
470.4
446.3
464.2
2.0
2.0
2.1
2020-21
2021-22
2022-23
SEC Power (kWh/Ton)
SEC Thermal (T/T)
Production (Tons)


Paper Machine 3 (Newsprint)
600.0
500.0
400.0
300.0
200.0
100.0
0.0
15,000
14,000
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
534.0
520.9
511.7
s
2.3
2.3
2020-21
2021-22
2022-23
SEC Power (kWh/Ton)
SEC Thermal (T/T)
Production (Tons)


Paper Machine 4 (Duplex Board)
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
30,000
20,000
409.5
406.1
410.8
2.2
2.0
1.9
2020-21
2021-22
2022-23
SEC Power (kWh/Ton)
SEC Thermal (T/T)
Production (Tons)

Internal Benchmarking

Description	Paper Machine 1 (Kraft)	Paper Machine 2 (Duplex Board)	Paper Machine 3 (Newsprint)	Paper machine 4 (Duplex Board)
SEC Power (kWh/Ton)	<300	< 460	<530	< 380
SEC Thermal (T/T)	<2.0	< 2.0	<2.1	< 1.9

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Energy Saving projects implemented in 2020-21

Description of ECMs	Energy Savings	Units
Operate turbine with rated extraction flow to reduce the power consumption of condenser fans	33,093	kWh
Improve the performance of the power plant auxiliary equipment and reduce auxiliary energy consumption	628,640	kWh
Interlink both Instrument and Service air-compressors and operate only one service air compressor for overall compressed air demand to reduce the unload energy consumption	238,990	kWh
Installation of Strong Acid Cation and Solid Base Anion in DM plant to save 75KL per day and pumping energy savings	51,000	kWh
Rectify piping and pneumatic system leakages to eliminate avoidable compressed air losses	339,478	kWh
Replaced conventional boiler with new FBC boiler for process steam requirement	2,379	Tons
Optimized PM4 steam pipe size and reduced pressure drop across steam line to reduce coal consumption	352	Tons
Replacing conventional lights with LED lighting in entire plant	551,372	kWh
Replacing conventional ACs with Energy Efficient VRF ACs at various locations	118,325	kWh
Installed VFD for various process application to optimized energy consumption based on production requirement	1,724,000	kWh
Reduced compressed air set point from 6-7 Bar to 5-6 Bar in Kraft & Newsprint unit compressor to reduce compressed air energy consumption	95,506	kWh
Improved condensate recovery from process various location	272	Tons fuel
Fuel saving by Improving thermal insulation of steam system, provision of removable insulation for steam piping mountings & accessories.	278	Tons fuel

Energy Saving projects implemented in 2021-22 & 2022-23

Description of ECMs Implemented on Year 2021-22	Energy Savings	Units
Energy savings achieved by installing Energy Efficient Fan for Medium Vacuum Blower	78,195	kWh
Energy Savings achieved by operating 37 & 30 kW air compressor during 1 paper machine operation	140,202	kWh
Installing VFD for CEP pump to optimize the re-circulation flow and reduce energy consumption	122,273	kWh
Modified APH design in FD circuit and air ingress to ID circuit to improve boiler performance and to reduce fans power consumption	308,880	kWh
Replacing pending conventional lights with LED lighting at various locations	17,870	kWh
Arresting steam leaks by replacing appropriate steam gaskets, steam traps and defective steam equipment's at various locations	124	Ton
Revamping of existing air compressor to reduce the specific energy consumption	198,000	kWh

Description of ECMs Implemented on Year 2022-23	Energy Savings	Units
Recovering Power boiler CBD condensate and utilized in process boiler and reduced fuel consumption	946	Ton
Replacing Conventional ACs with energy efficient Inverter ACs at Pulp mill DCS rooms	33,715	kWh
Replacing conventional lights with LED lighting at mill locations	48,049	kWh

Energy Saving projects under implemented in 2023-24

- Upgradation in Condensate Recovery Systems
- Efficient Traps for process Steam & condensate system
- Waste fuel based boiler with Turbine
- Energy Efficient VRF Air Conditioners in place of Energy Intensive Acs
- Implementation of Energy Monitoring System

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Innovative Projects implemented – Turbo Blower

Energy Efficient Turbo Blower for Vacuum application

Energy Savings		
Before Energy consumption for Liquid Ring Vacuum pump	kW /t of paper	48.5
After Energy consumption for Turbo Blower	kW /t of paper	40.9
Savings in power	kW /t of paper	7.6
Annual Energy Units	kWh	514,945

Steam Savings		
Specific Steam Consumption for Liquid Ring Vacuum Pump	t/t of paper	2.10
Specific Steam Consumption for Turbo Blower	t/t of paper	2.00
Reduction in SEC by improving vacuum efficiency	t/t of paper	0.10
Annual Steam Savings	Tons	6,750

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Innovative Projects implemented – Turbo Blower

Energy Efficient Turbo Blower for Vacuum application

- Existing is Liquid Ring Vacuum pumps which are highly energy intensive compared to Turbo Blower.
- Turbo Blower is the centrifugal blower which has energy saving of 40% compared to Liquid ring Vacuum pumps.
- Liquid ring requires sealing water to generate vacuum, whereas turbo is nil water requirement.
- Maintenance of the turbo is very less compared to Liquid Ring Vacuum Pump.

Utilisation of Renewable Energy sources

Description	Unit	2020-21	2021-22	2022-23
Self Generation from Captive Power Plant	kWh	36,642,078	37,692,141	26,471,991
	% Utilization	59%	52%	45%
Power Consumption from State Grid	kWh	24,538,414	30,660,129	23,398,900
	% Utilization	39%	43%	40%
Renewable Energy (Offsite) - Solar	kWh	0	1,950,465	7,936,256
	% Utilization	0%	3%	13%
Renewable Energy (Offsite) - Wind	kWh	1,256,500	1,496,508	1,037,172
	% Utilization	2%	2%	2%

Offsite Generation Capacities

Offsite Solar Capacity: 5 MWp

Offsite Wind mill 1 Capacity: 850 kW

Offsite Wind mill 2 Capacity: 250 kW

Emission Intensity

Power boiler air quality:

- Power plant Stack temperature: 126°C
- Particulate Matter: 26.6 mg/Nm^3
- Sulphur Oxide: 24.5 mg/Nm^3
- Nitrogen Oxide: 53.9 mg/Nm^3

Ambient Air Quality:

- Suspended particulate mater in air: 30.1 mg/Nm^3
- Sulphur Oxide: 13.02 mg/Nm^3
- Nitrogen Oxide: 16.31 mg/Nm^3

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Waste utilization and management

- ETP sludge is given to local hard board manufacturers
- ETP sludge also planned to utilize in Waste fuel based boiler

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EMS and other requirements

- Dedicated Energy meters are installed for major loads like, Turbo blower, Vacuum pumps, Refiners, pulpers etc,. and note down in log book.
- MCC wise energy meter installed and taken shift wise readings in log book.
- Proposed Energy monitoring system to implement in 2023-24
- Yearly Energy Audit is conducted from Accredited firm(Empaneled by BEE) and implementing various measures

Net Zero Commitment.

- In PAT Cycle 2 we have achieved the target SEC and earned ESCerts for the achievements.
- Working towards net zero commitment by implementing various measures.

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Thank You

Presented By:

B Maniraj – DGM Production, dgmproduction@sripathi.net, 97500 17009

P Vignesh Kannan – GM Power Plant, gmpower@sripathi.net, 95009 11221

C Soundara Rajan – Energy Manger, energymanager@sripathi.net, 86104 40554