Kuantum Papers

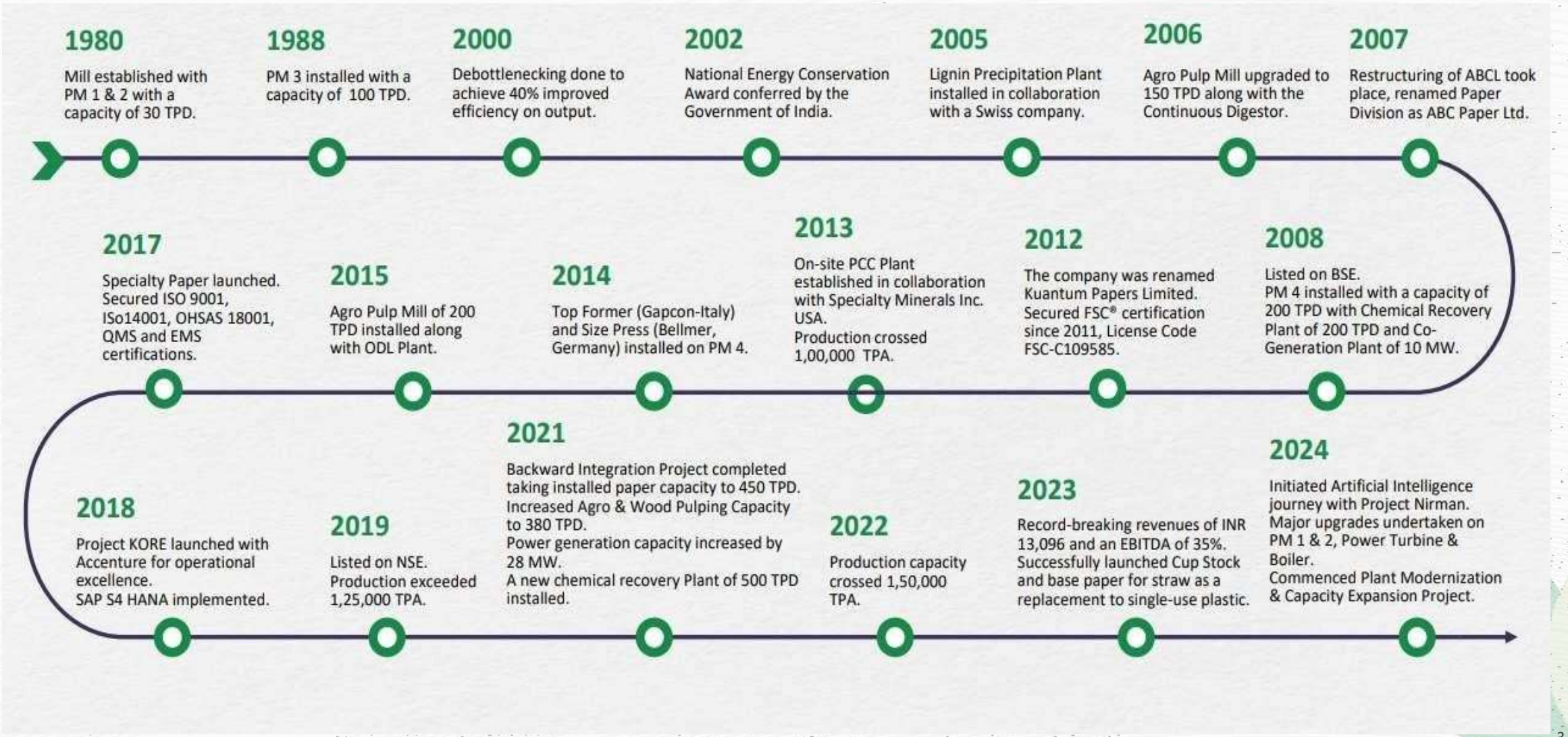
TRANSFORMING PAPER MILL WASTE INTO GREEN BOILER FUEL: ADVANCING CIRCULAR ECONOMY AND DE-CARBONIZATION IN PAPERMAKING

10th &11th July'2026 Marriot Hotel - Jaipur

HISTORY OF KUANTUM PAPERS

- Kuantum Papers, a leading Agro and Wood-based paper manufacturer started its commercial operations in 1980 in an economically underdeveloped village of Hoshiarpur, Punjab
- The company started its production with 30 TPD; through continuous upgrades and backward integration, it's now operating at 450 TPD, with expansion underway to reach 550 TPD.
- Located in the foothills of the Shivalik range, Kuantum Papers has leveraged agro residues—such as Wheat Straw, Sarkanda, Bagasse - along with wood chips, veneer waste, and bamboo to produce high-quality paper. Currently, production relies solely on wheat straw due to limited availability of other raw materials and a focus on quality
- A fully integrated 250-acre manufacturing facility gives the company a competitive edge through superior operational efficiency and a broader product portfolio.
- Its extensive portfolio of writing and printing paper finds application in books, notebooks, annual reports, directories, account books, envelopes, dairies, calendars, computer & office stationery.

OUR JOURNEY


1980
Mill established with PM 1 & 2 with a capacity of 30 TPD.
1988
PM 3 installed with a capacity of 100 TPD.
2000
Debottlenecking done to achieve 40% improved efficiency on output.
2002
National Energy Conservation Award conferred by the Government of India.
2005
Lignin Precipitation Plant installed in collaboration with a Swiss company.
2006
Agro Pulp Mill upgraded to 150 TPD along with the Continuous Digestor.
2007
Restructuring of ABCL took place, renamed Paper Division as ABC Paper Ltd.
2008
Listed on BSE.
PM 4 installed with a capacity of 200 TPD with Chemical Recovery Plant of 200 TPD and Co-Generation Plant of 10 MW.
2012
The company was renamed Kuantum Papers Limited.
Secured FSC® certification since 2011, License Code FSC-C109585.
2013
On-site PCC Plant established in collaboration with Specialty Minerals Inc. USA.
Production crossed 1,00,000 TPA.
2014
Top Former (Gapcon-Italy) and Size Press (Bellmer, Germany) installed on PM 4.
2015
Agro Pulp Mill of 200 TPD installed along with ODL Plant.
2017
Specialty Paper launched.
Secured ISO 9001, ISo14001, OHSAS 18001, QMS and EMS certifications.
2018
Project KORE launched with Accenture for operational excellence.
SAP S4 HANA implemented.
2019
Listed on NSE.
Production exceeded 1,25,000 TPA.
2021
Backward Integration Project completed taking installed paper capacity to 450 TPD.
Increased Agro & Wood Pulping Capacity to 380 TPD.
Power generation capacity increased by 28 MW.
A new chemical recovery Plant of 500 TPD installed.
2022
Production capacity crossed 1,50,000 TPA.
2023
Record-breaking revenues of INR 13,096 and an EBITDA of 35%.
Successfully launched Cup Stock and base paper for straw as a replacement to single-use plastic.
2024
Initiated Artificial Intelligence journey with Project Nirman.
Major upgrades undertaken on PM 1 & 2, Power Turbine & Boiler.
Commenced Plant Modernization & Capacity Expansion Project.

SUSTAINABLE DEVELOPMENTS IN KUANTUM PAPERS

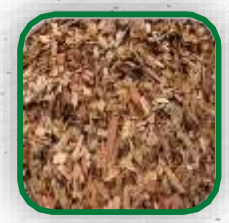
- In line with sustainability values, commissioned the Backward Integration Project which included expanding Agro and Wood Pulping Capacity from 365 TPD to 438TPD and addition of new Chemical Recovery Plant, taking the total recovery capacity to 700 TPD for ensuring efficient resource utilization. We are entirely self-sufficient in meeting power requirements, with a sustainable power generation capacity of 40MW, primarily using biomass. The establishment of a Chlorine Dioxide (ClO_2) plant ensures that our paper meets the ECF (Elemental Chlorine Free) norms
- In recent years, Kuantum expanded global footprint and are proud to serve customers in over 30 countries, making us a trusted name in the international markets. Our distinguished clientele include renowned names such as Walmart, McGraw Hill, Kokuyo, Thomson, Lotus Global, Pearson, Oxford University Press, Macmillan and many more
- Our core commitment is driving continuous innovation, operational excellence, and the pursuit of a sustainable future. As a responsible ecological entity, we strive to minimize environmental footprint while delivering an exceptional experience to valued customers, esteemed suppliers, dedicated employees, and the community at large

MAJOR RAW MATERIALS USED

Wheat Straw

Cut Chips

Hardwood (Eucalyptus, Subabaul, Casurina & Popular etc.) & Bamboo



Veneer Waste Chips

Major biomass resources relevant to paper mills include:

Biomass Type	Estimated Availability
Bagasse (sugar industry)	100 million tonnes/year (wet basis)
Rice straw	44 million tonnes surplus/year
Wheat straw	25 million tonnes surplus/year
Rice husk	Large quantities from rice milling

SOCIAL/ FARM /AGRO FORESTRY PROGRAMME

Sapling capacity will be doubled from **4.5 Millions** to **10 Million** by **2027-28**

- Total Plantation covered 16000+ acres
- Expanding the approach working area spreading from **100Kms** radius to **200Kms** radius to promote afforestation for wood sustainability

PAPER INDUSTRY ENERGY USE : GLOBAL VS INDIA

Indicator	Global Paper Industry	Indian Paper Industry
Share of global industrial energy use	~6% of industrial energy consumption (≈6.7 EJ in one assessment)	One of India's most energy-intensive industries; primary energy consumption estimated at ~15-18 Mtoe in 2024 – 2025
Fossil fuel share in energy mix	The Fossil fuel usage is reduced from 33% to 20-22% from 2010 to 20205.	Much higher dependence on coal and other fossil fuels, especially for steam generation and paper drying
Biomass/renewable use	Biomass (black liquor, wood residues, bark) is the dominant fuel globally in many mills	Biomass is used, but many mills particularly smaller and recycled-fiber mills still rely heavily on coal-fired boilers
Decarbonization trend	Increasing electrification and replacement of fossil fuels with biomass and renewables	Gradual shift toward biomass, solar thermal systems, and energy efficiency, but coal remains important due to cost and availability

FUEL MIX COMPARISON INDIA VS GLOBAL

Fuel Type	India (%)	Global (%)	Notes
Coal	55–60	25–30	India is far more coal-dependent than the global average.
Biomass (agro residues, black liquor)	25–30	40–45	Globally dominant, especially in North America & Scandinavia; India lags due to limited recovery boiler adoption.
Natural Gas	5–7	15–20	Cleaner fuel widely used in Europe/North America; India's usage is constrained by infrastructure and cost.
Oil	3–5	5–7	Similar share, used mainly as backup.
Renewables	<2	<3	Still marginal everywhere, though growing slowly.

KUANTUM USING BIOMASS FUELS FOR BOILER

VENEER CHIPS DRY DUST
DAILY EXTACTION: 20 TPD

VENEER CHIPS WET DUST
DAILY EXTACTION: 15 TPD

WOOD CHIPS DRY DUST
DAILY EXTACTION: 30 TPD

WHEAT STRAW DRY DUST
DAILY EXTACTION: 16

WHEAT STRAW WET DUST
DAILY EXTACTION: 12

WHITE BOARD
DAILY EXTACTION: 12

STORING & FEEDING OF DIFFERENT BIOMASS FUEL

AGRO DUST

BARK & BOARD

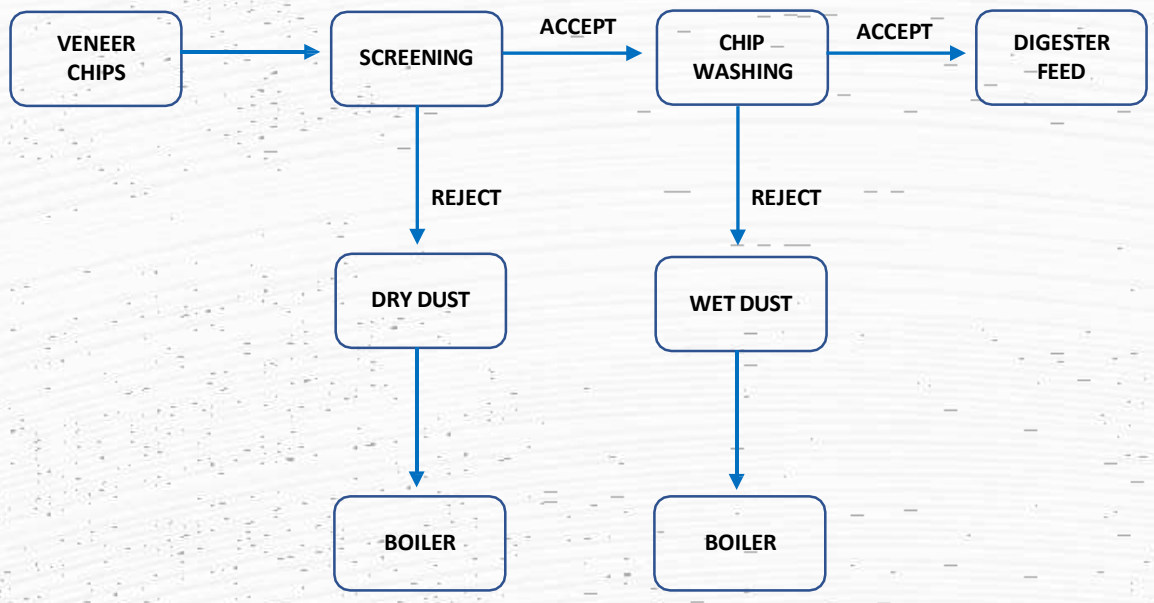
WOOD DUST

WET WASHING

COAL

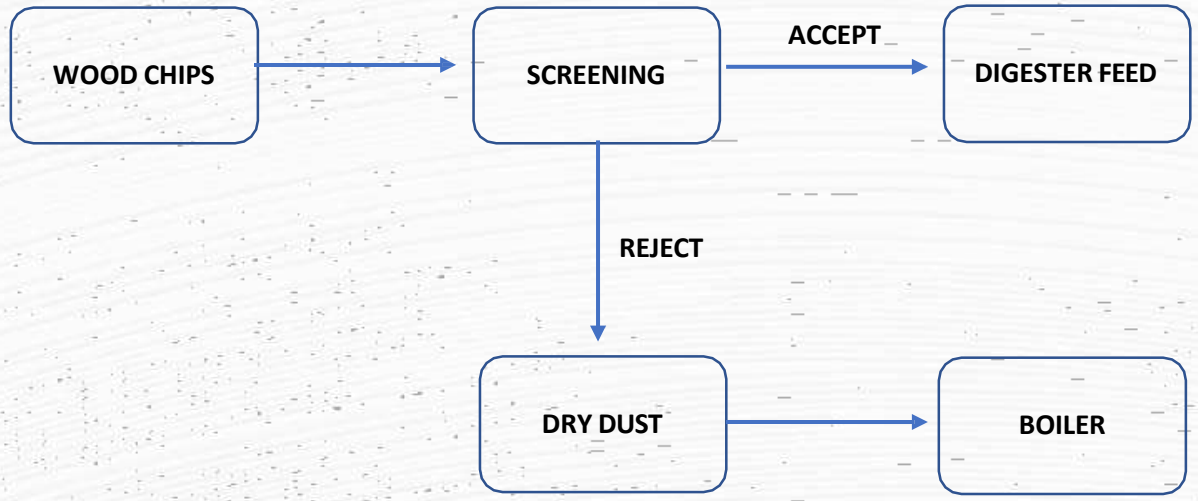
BARK

VENEER CHIPS



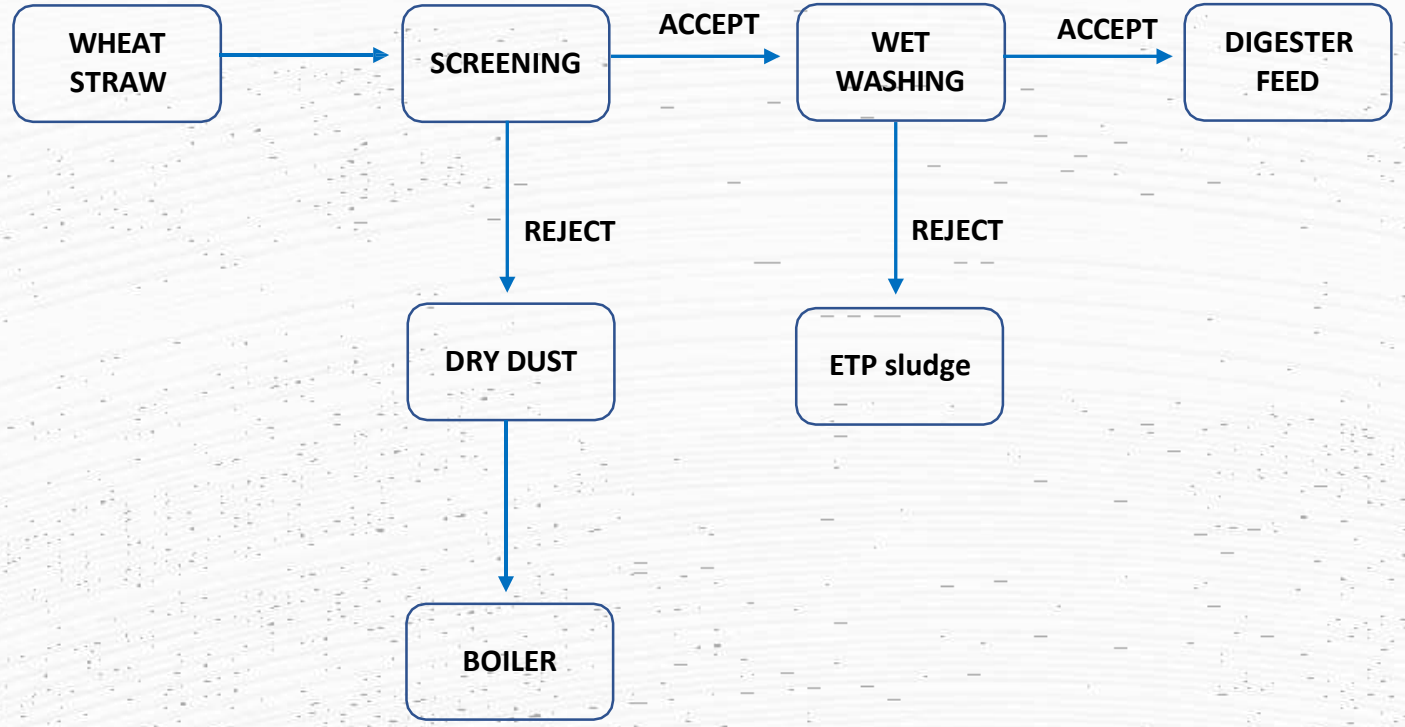
Veneer chips are screened using an octagonal screen where fines are removed as dry dust (sent to boiler) and accept chips go for washing. The washed chips are further cleaned in a screw screen, separating wet dust for boiler while clean chips are sent to the digester feed.

WOOD CHIPS



Wood chips are screened in a Bezner screen, where fines and dust are separated as dry dust and sent to the boiler. The accepted chips are discharged and transferred to the next stage for further processing.

WHEAT STRAW DUST

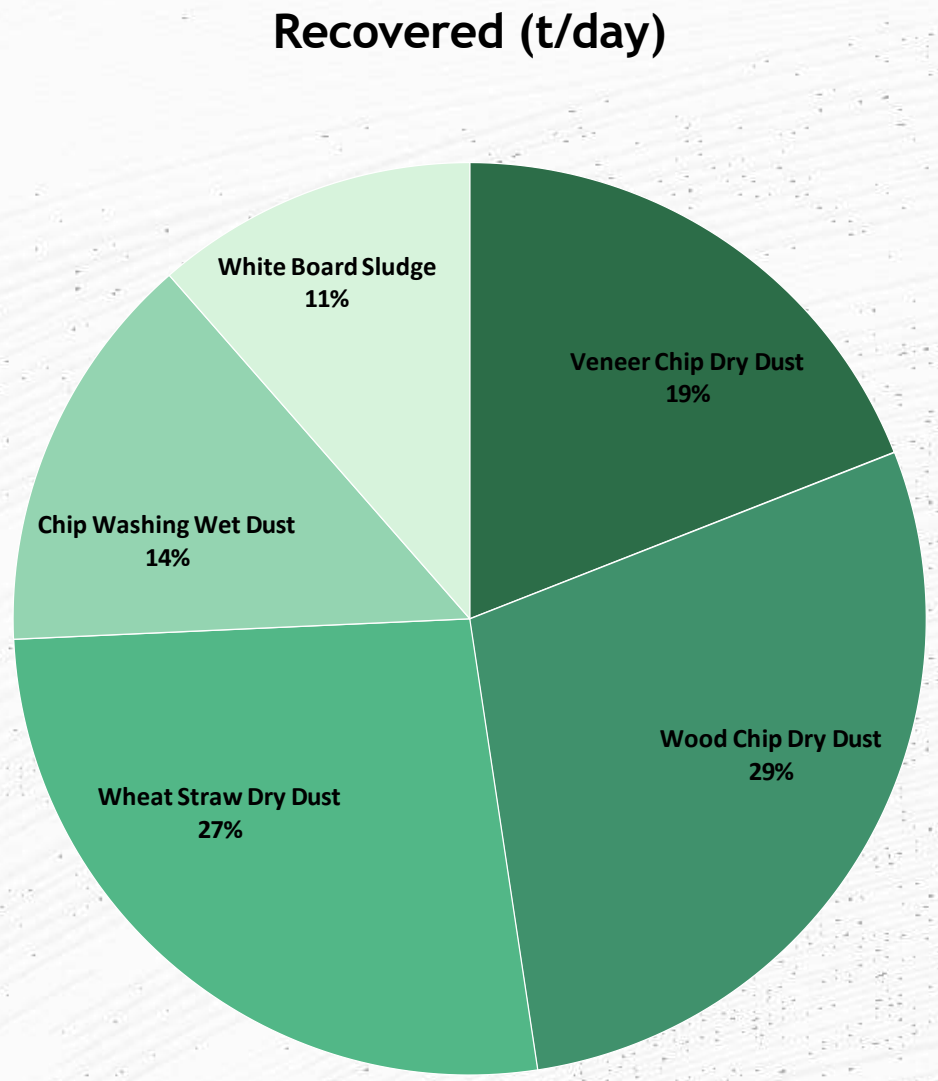


Wheat straw is passed through sequential screening stages, where each screen separates undesired fines, dust, and oversized particles. The rejects (dust/fines) are removed at each stage, while the accepted chips move forward for further processing.

WHITE BOARD

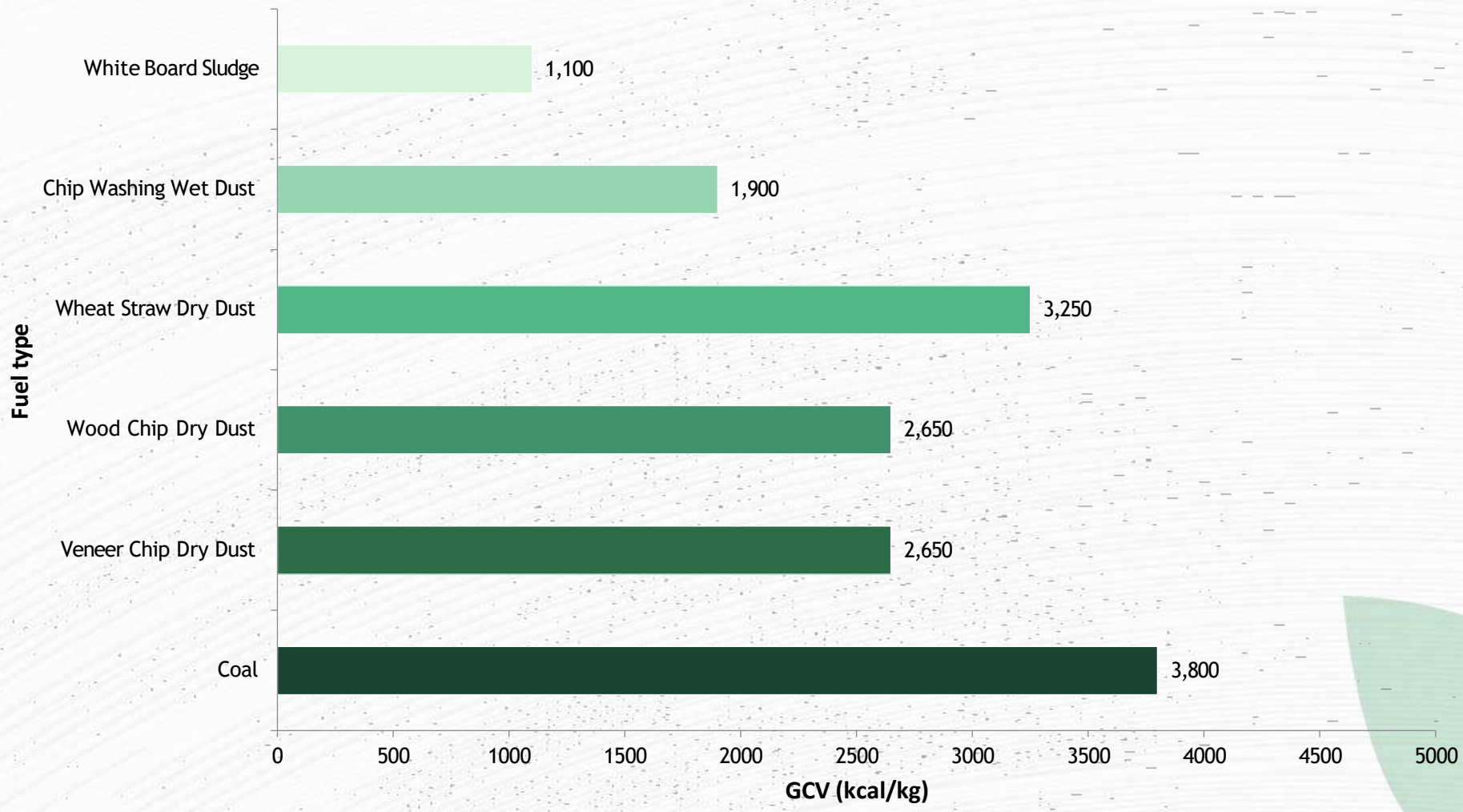
The save-all system recovers fibers and fines from white water and sends the clarified water back to the white board for reuse. The collected sludge (fiber fines) is routed to the boiler as fuel for energy recovery.

DAILY WASTE RECOVERY DISTRIBUTION (115 T/DAY)

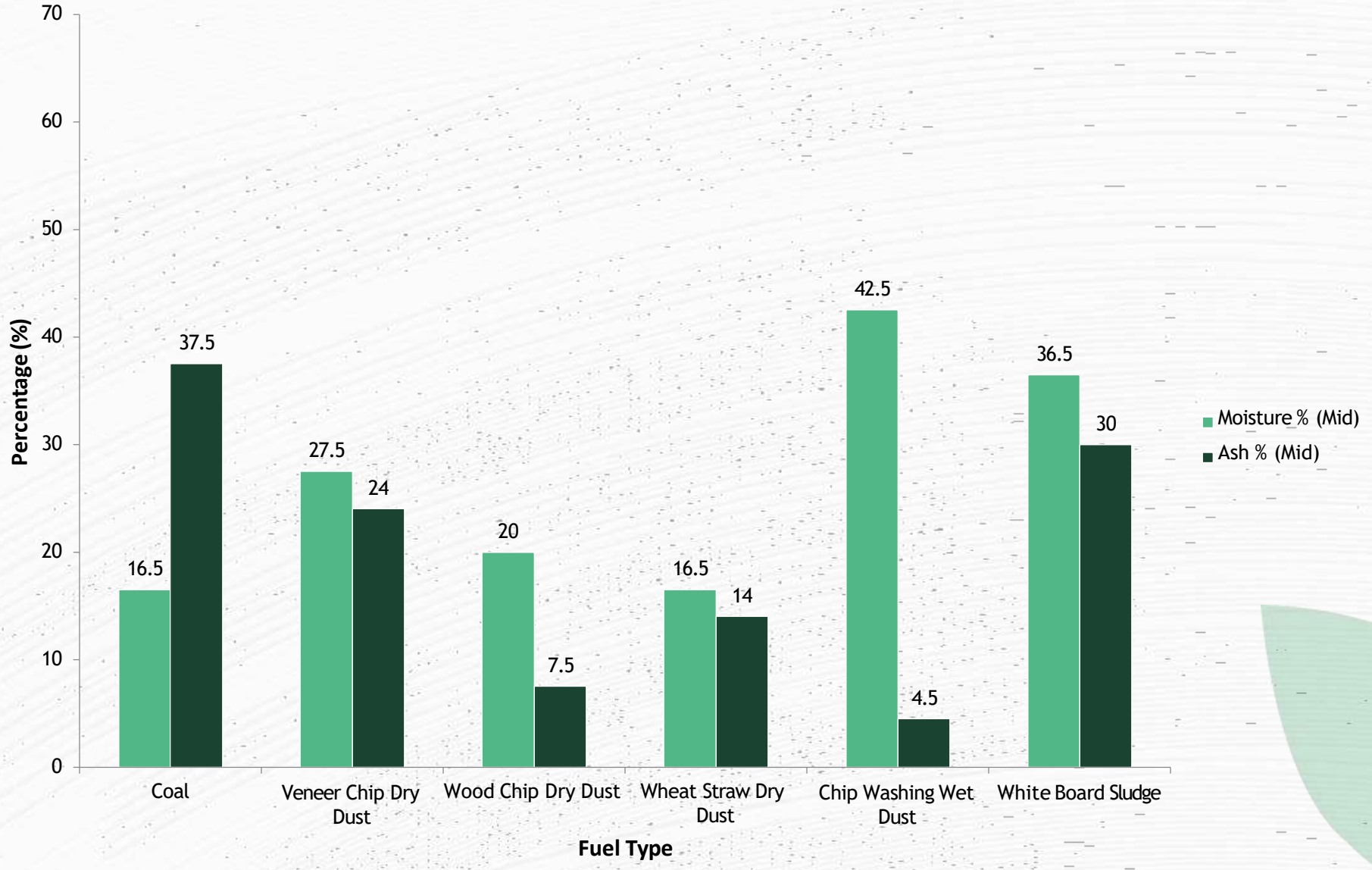


Waste Stream	Recovered (t/day)
Veneer Chip Dry Dust	20
Wood Chip Dry Dust	30
Wheat Straw Dry Dust	28
Chip Washing Wet Dust	15
White Board Sludge	12
Total	**115**

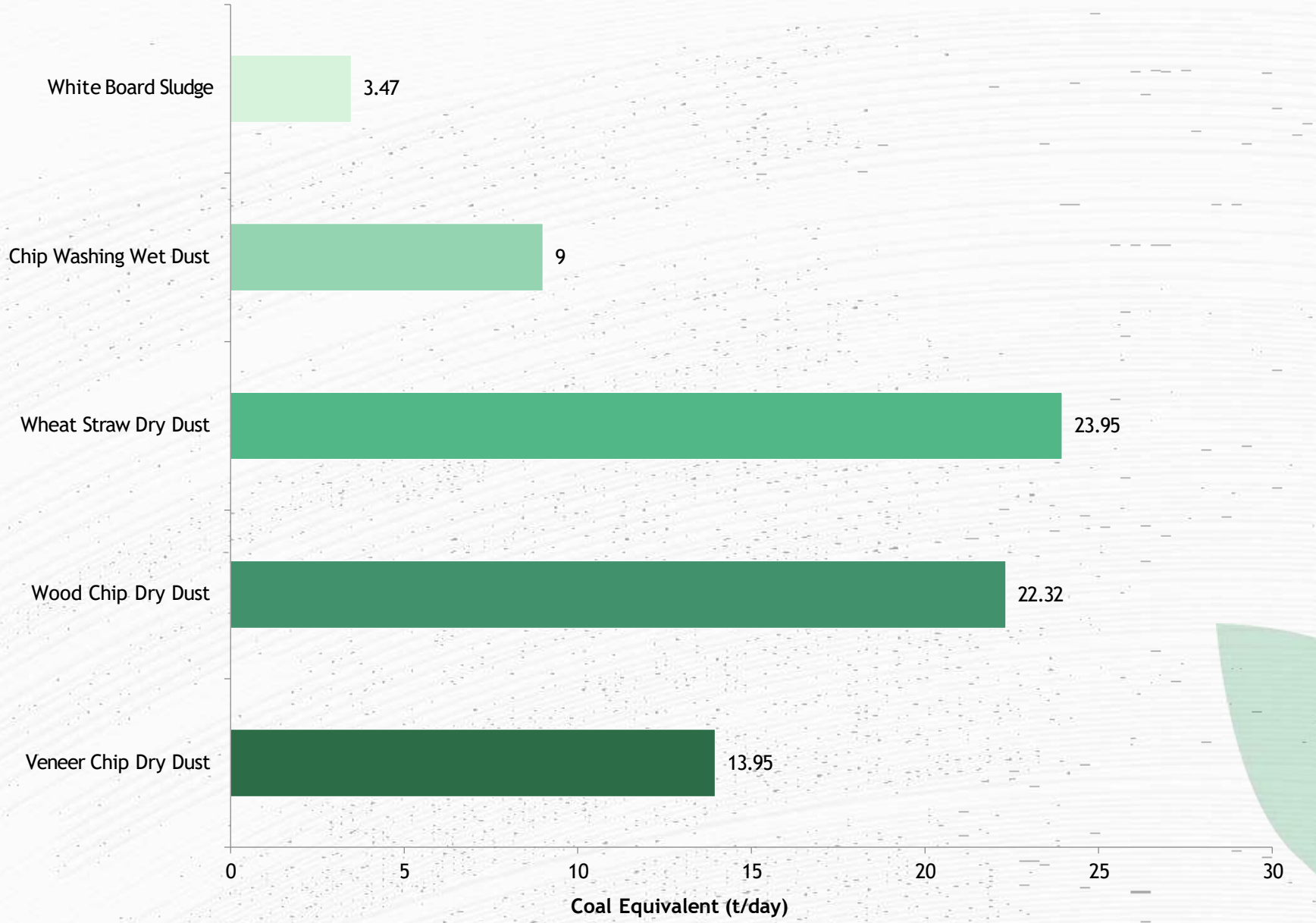
GCV COMPARISON ACROSS FUEL TYPES



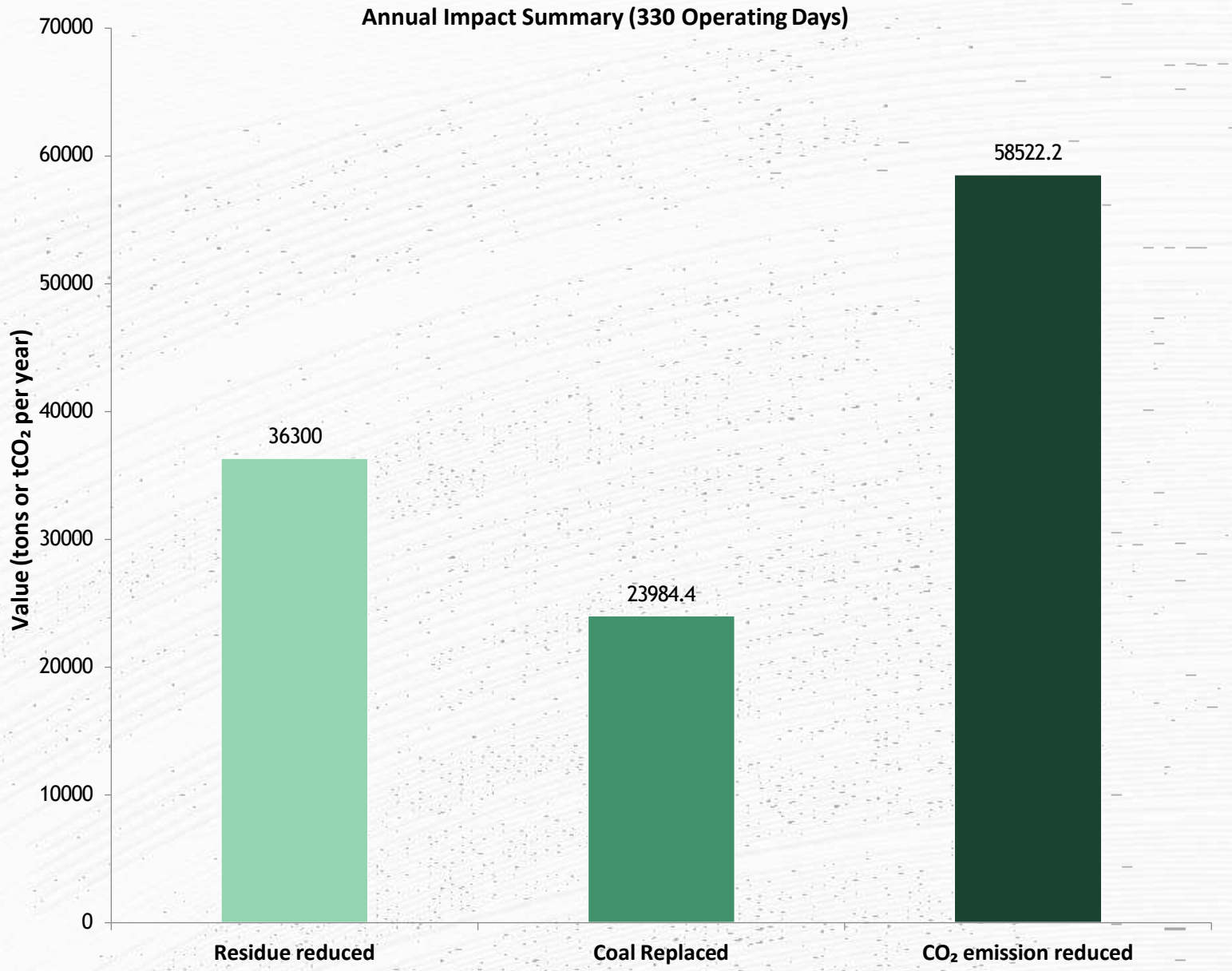
MOISTURE AND ASH CONTENT COMPARISON



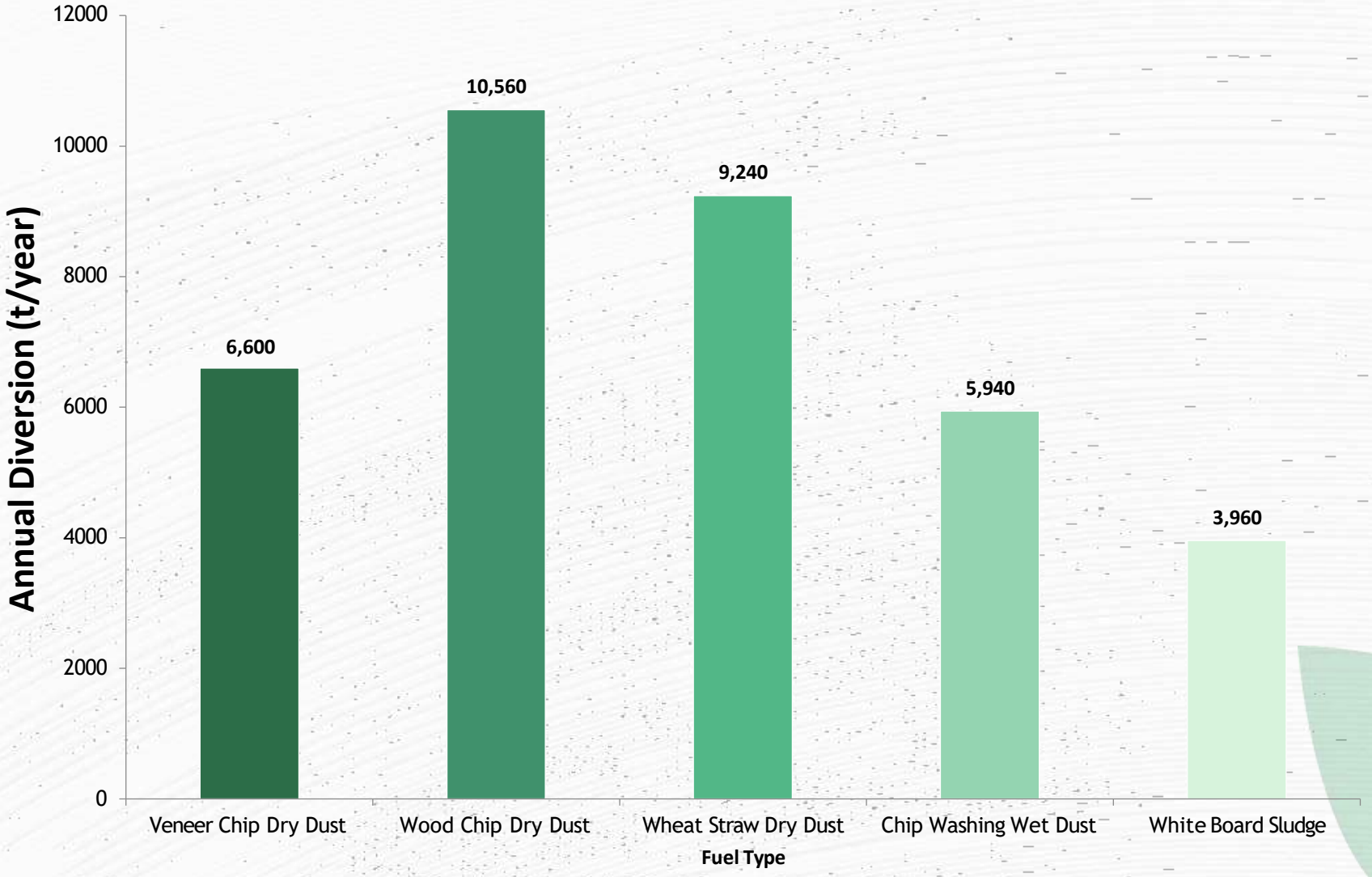
FOSSIL FUEL REPLACEMENT BY DIFFERENT RESIDUES



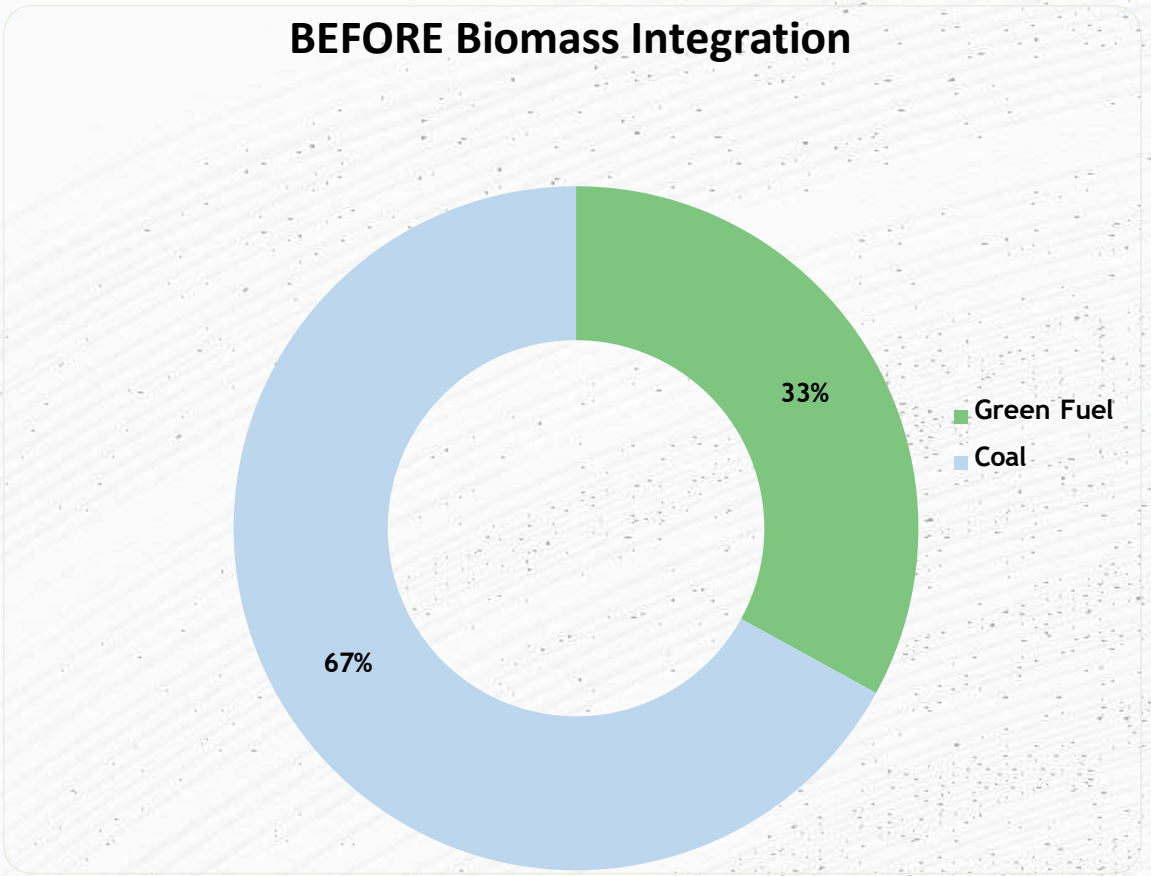
CARBON FOOTPRINT

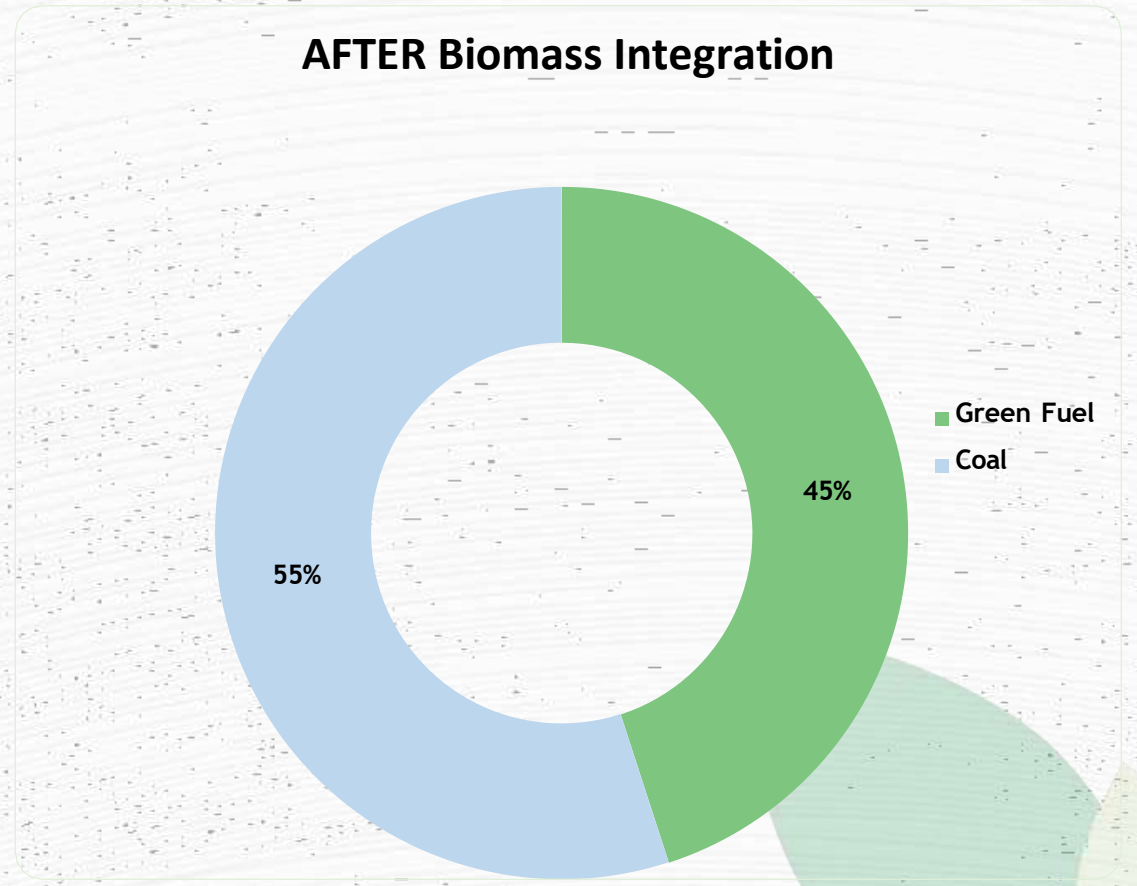


ANNUAL WASTE MITIGATION BY STREAM (T/YEAR)



GREEN FUEL SHARE — BEFORE VS AFTER BIOMASS INTEGRATION





BOILER OPERATIONS RISK AND CONTROL STRATEGY

The major operational risks associated with paper mill residue utilization includes

- ✓ High moisture,
- ✓ Low GCV,
- ✓ Ash loading,
- ✓ Slagging,
- ✓ Fouling,
- ✓ Corrosion,
- ✓ Feeding instability, and emission variation.

- ✓ Wet dust and sludge reduce net heat release because part of the combustion energy is consumed in evaporating moisture

TECHNICAL RISK-CONTROL MATRIX

Risk	Most affected stream	Control measure
High moisture	Wet dust, white board sludge	Dewatering, solar/waste-heat drying, blending with dry wood dust
Low GCV	White board sludge	Limit sludge fraction; co-feed with high-GCV wood/veneer dust
Slagging/fouling	Wheat straw dust	Monitor ash fusion temperature, K, Na, Si, Cl; maintain controlled blend ratio
Feeding instability	Dust and sludge	Use screw feeders, rotary feeders, controlled dosing, and bulk density monitoring
High ash loading	Sludge and wheat straw	Track bottom ash, fly ash, LOI, and clinker formation
Corrosion	Wheat straw	Monitor chlorine and alkali content; inspect super-heater and economizer zones
Emission variation	Mixed fuel	Monitor O_2, CO, NOx, SOx, PM, and unburnt carbon

CONCLUSION

Challenge

- Generation of combustible residues during raw material preparation
- Disposal leads to environmental impact, land use & cost burden

Solution

- Developed integrated waste-to-fuel system
- Converts residues into alternative boiler fuel

Value Created

♻ 110–120 TPD residue recovered

Replaces 72.68 TPD fossil fuel

Reduce CO_2 emission by 177.35 TPD

SAVINGS : 107,929,800 INR/Year

Plant Overview

- Production: 540 TPD
- Bleached Pulp: 450 TPD
- Raw Material:
  - 1.6 Lakh TPA Wheat Straw
  - 1.65 Lakh TPA Wood

Impact

- Reduced fossil fuel dependency
- Lower operational & disposal costs
- Enhanced sustainability footprint

THANK YOU