Straw
and other lignified agricultural residues

I

Brown fibers
for corrugated board & packaging

White fibers
for graphic papers

Steam processes
(steam explosion/refining)

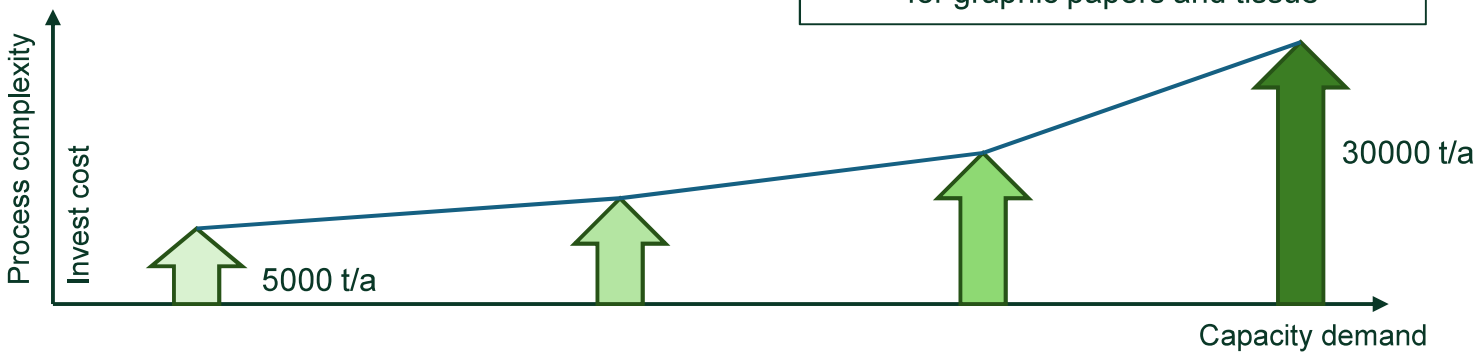
Horizontal tube digester

No chemicals	Na_2CO_3	Na_2CO_3 & O_2	NaOH
(3)	(2, 3)	(2)	(1)

Brown grades
for board and packaging (e.g. corrugated board)

Bleaching
(e.g. **O**: O_2 & NaOH → **A**: acid wash (H_2SO_4) → **P**: hydrogen peroxide & NaOH)

White grades
for graphic papers and tissue



1) Salehi, K.; Kordsachia, O.; Patt, R. (2014) Comparison of MEA/AQ, soda and soda/AQ pulping of wheat and rye straw. **Industrial Crops and Products**, *52, 603–610*. DOI: 10.1016/j.indcrop.2013.11.014

2) Steffen, F.; Kordsachia, T.; Heizmann, T.; Eckardt, M. P.; Chen, Y. (2024) Sodium Carbonate Pulping of Wheat Straw—An Alternative Fiber Source for Various Paper Applications. **Agronomy**, 14, 162. DOI: 10.3390/agronomy14010162

3) Hagel, S.; Schütt, F. (2024) Reinforcement Fiber Production from Wheat Straw for Wastepaper-Based Packaging Using Steam Refining with Sodium Carbonate. **Clean Technol.** 2024, 6, 322–338. DOI: 10.3390/cleantechnol6010016