

GREEN MANUFACTURING IN BAGASSE PULPING IN PAPER PLANTS



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IPPTA Annual Conference

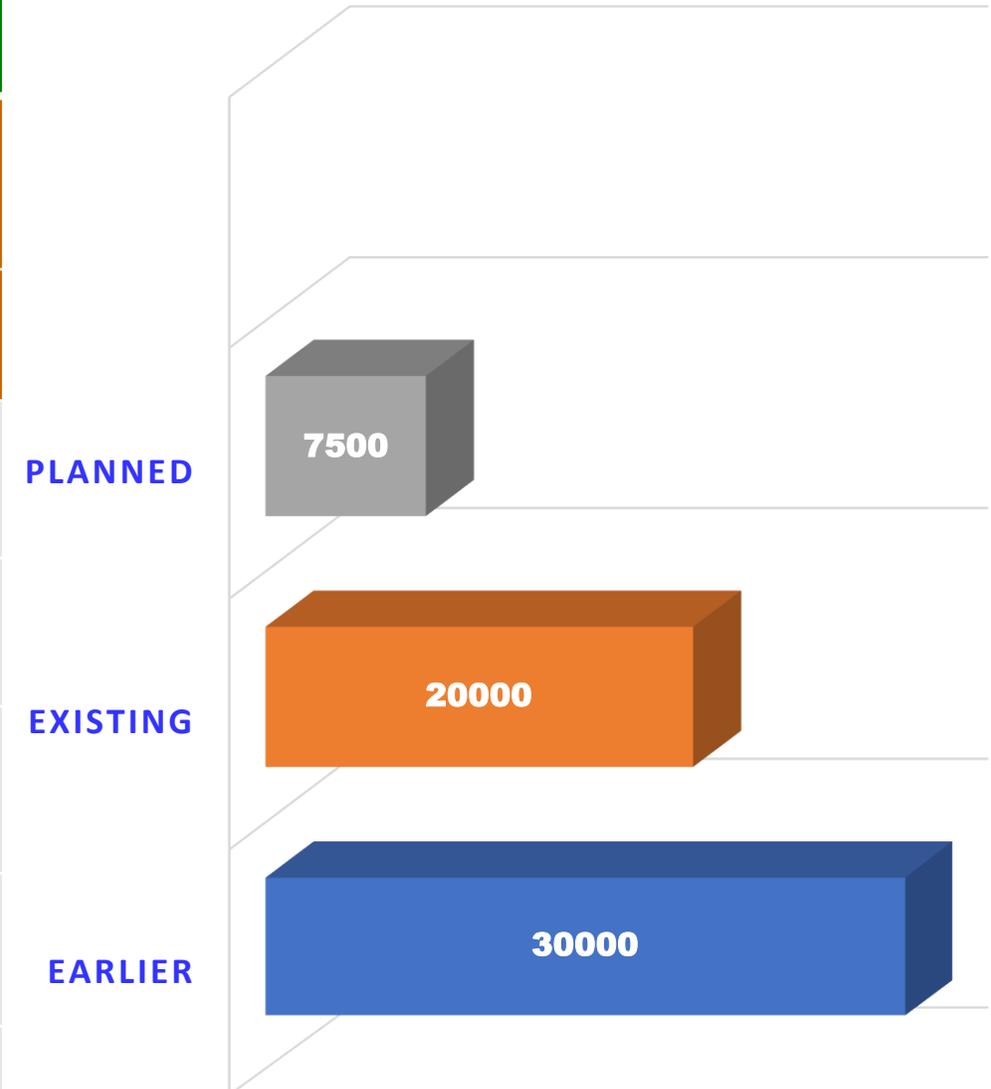
Hyderabad

17th -18th March 2023

EMISSION REDUCTION PROJECTION by 2030 [Pulp & Paper sector] -INDIA -PWC Report 2022

PAT –QUAL. LIMITS:
ENERGY CONSUMPTION [MTOE /YR]

	2019-20		2030-31 [Projection]		CO ₂ e Savings/yr
	Emission Intensity	Production Annual	Emission Intensity	Production Annual	
	Kg CO ₂ e/t	Mil tonnes	kgCO ₂ e/t	Mil. tonnes	Mil.tonnes
Value	2170		1010		
<u>Projection</u>		18 .0		34.22	39.7
Production Increase			<u>90%</u>		
Emission Reduction/yr			39.7 Mil.tonnes		
Energy Intensity Reduction			<u>54 %</u>		



SUGAR CANE – BAGASSE – PULPING

Sugar Cane



Sugar Mill



Juice
73%

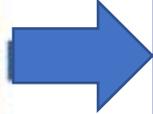
Sugar



Bagasse 27%

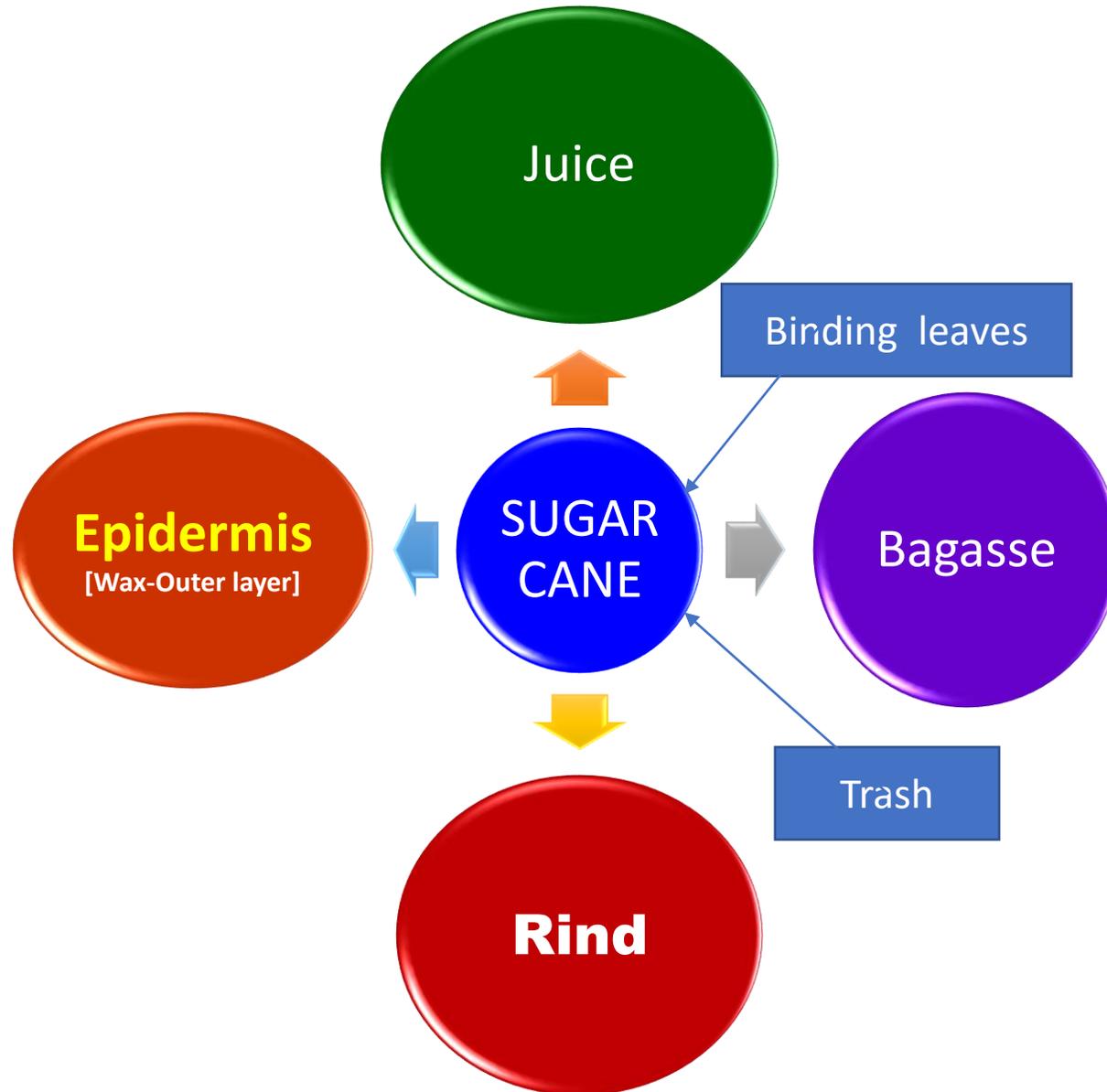


Bagasse Storage



BAGASSE PULPING

PAPER
MANUFACTURING



Energy Conservation with Productivity

SUGAR-
CANE
HARVESTIN
G & MILLING

Source

BAGASSE
PULPING

Process

INCREASED
PRODUCTIVITY
OF QUALITY
WITH 3 E's

Product



DPB with High & Low Fibre Cases

Feed Source	From Ponni Sugar Mill	External Bagasse
Fibre	62-63 %	54 %
Pith & Fibre-Fines	27-28 %	35 %
Solubles	9-10 %	11 %

Productivity with Quality related to Bagasse Pulping - Advisory

- Cane quality control in harvesting in place.
- Minimization of cane trash, cane tops and binding material alongwith cane prior to milling.
- Minimal generation of fibre fines during cane preparation & milling operation.
- Solubles in bagasse to be minimal through hot water imbibition.
- Maximizing fibre with minimum fibre fines, pith and solubles in finished bagasse to be made available for Wet depithing [with efficient dewatering in Screw feeder] and subsequent Bagasse pulping.

GREEN MAUFACTURING SEQUENCE

CANE

Quality @ Source

BAGASSE

Green Steam & Power

DEPITHING

Green Aux. Power

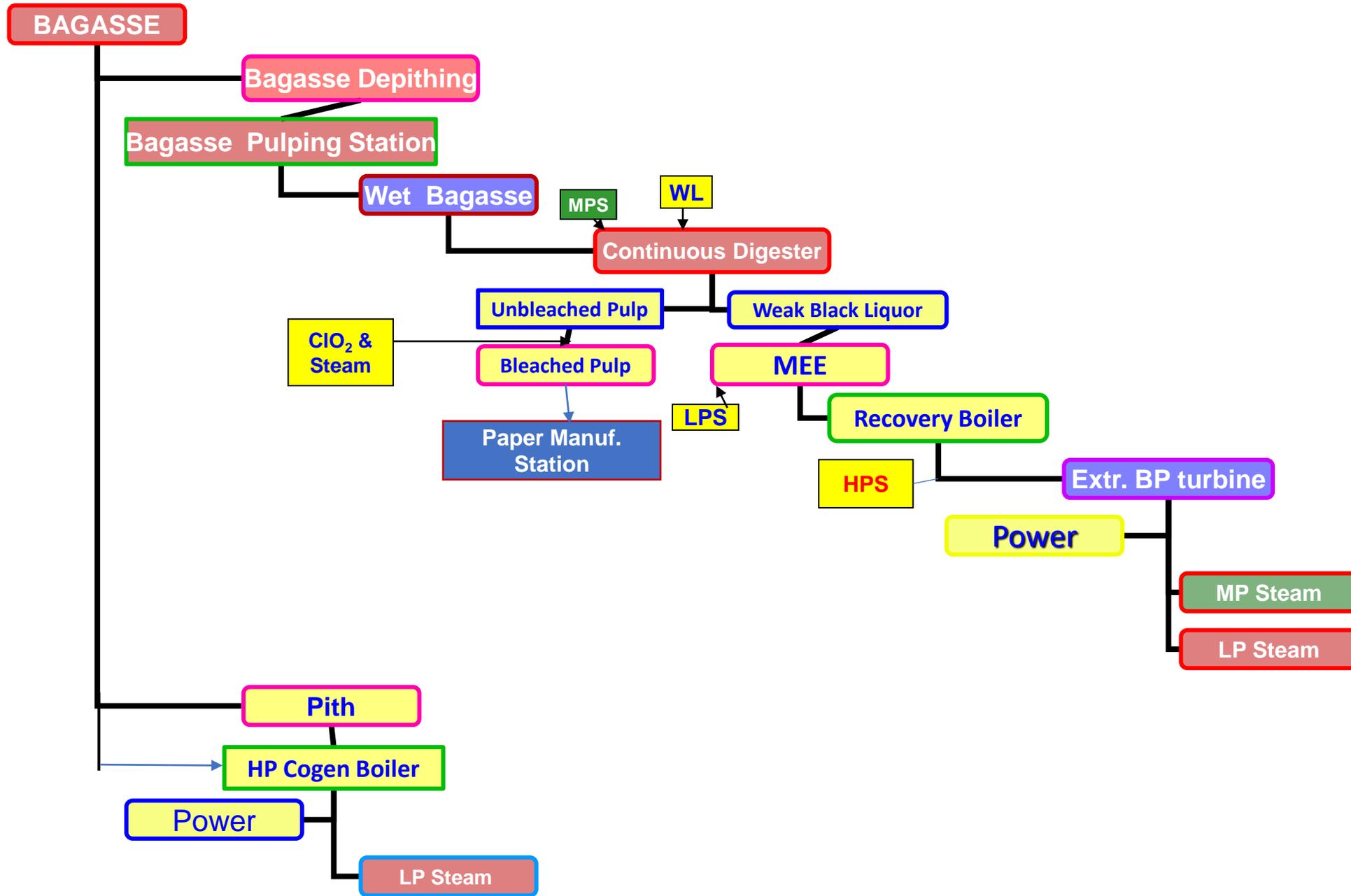
PULPING

Green Steam & Power
& C-offset

PAPER



FLOW CHART : BAGASSE TO PULP & POWER



INNOVATIVE ENERGY CONSERVATION SCHEME



- **BAGASSE DEPITHING**

Warm water [70°C] depithing of Bagasse

- **EE Screw Press- Dewatering**

- **PANDYA DIGESTER [with total Nano-insulation]**

Followed by switch from MP to LP steam to the extent practicable,

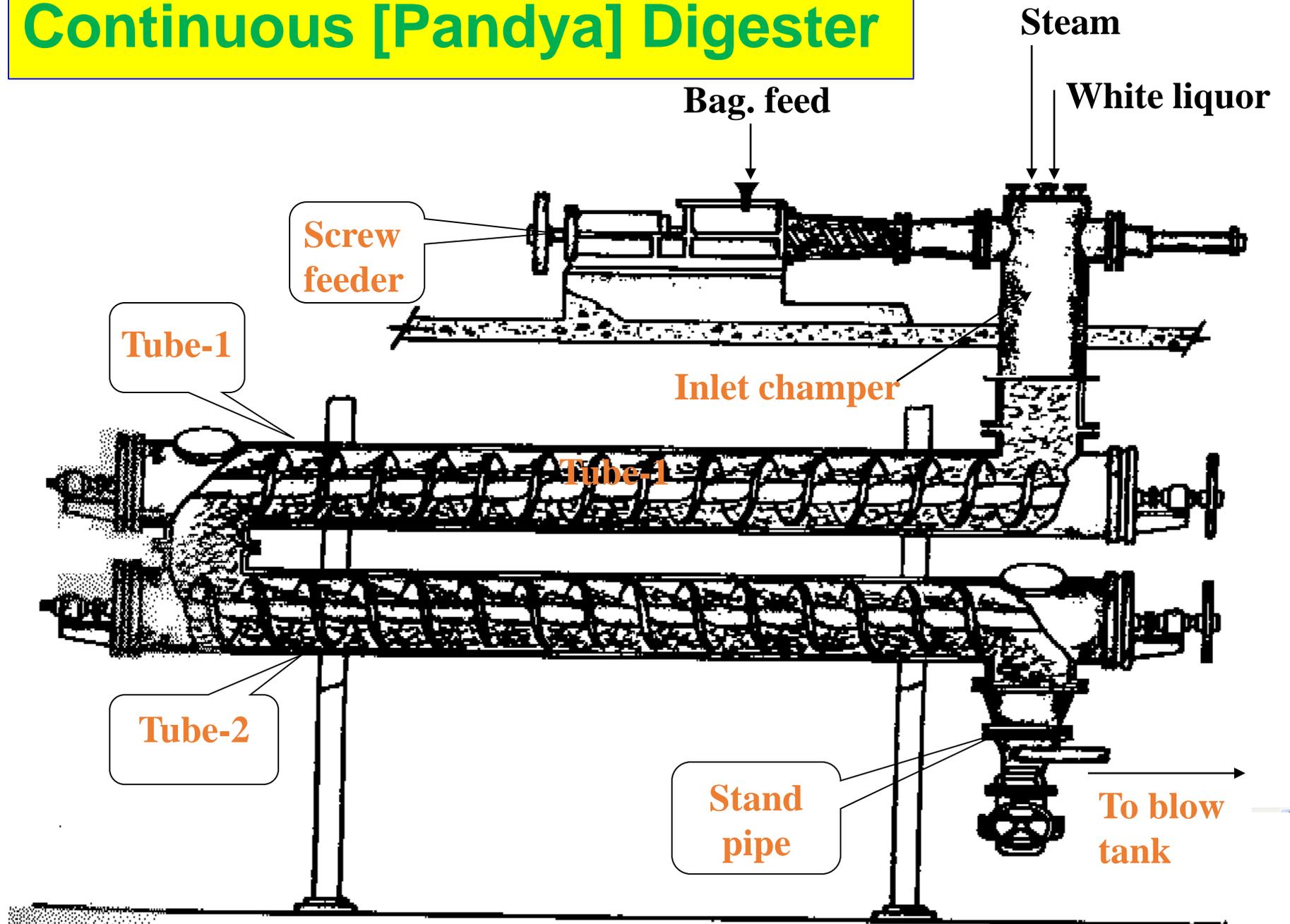
Balance MP Steam as necessary -

**Would result in increased Green Power generation from associated EBP
STG**

with corresponding reduction in Absolute Stack Pollutants discharge &

Decarbonization

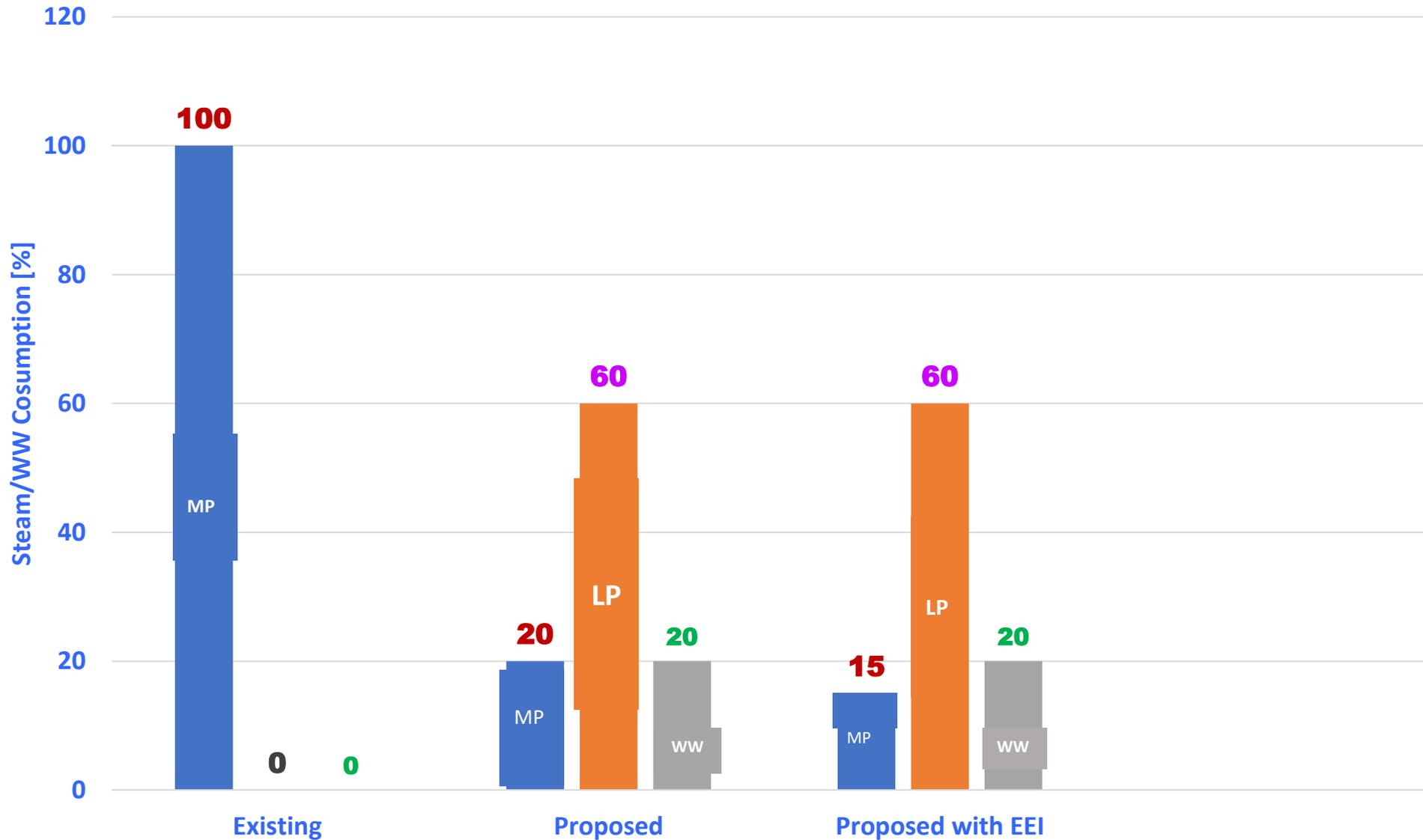
Continuous [Pandya] Digester



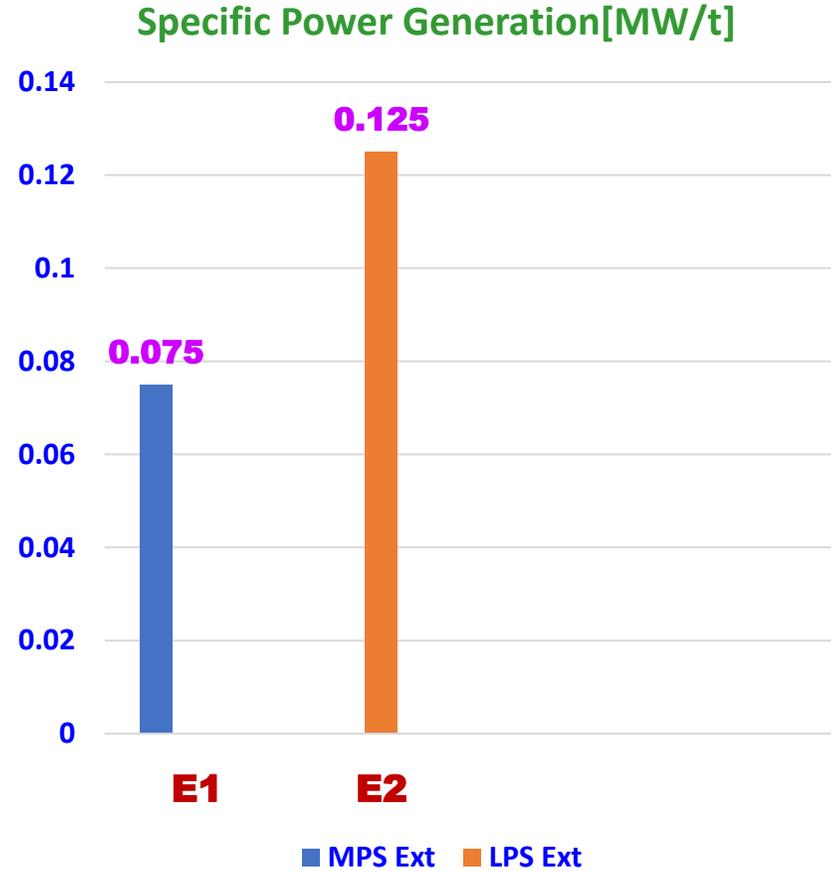
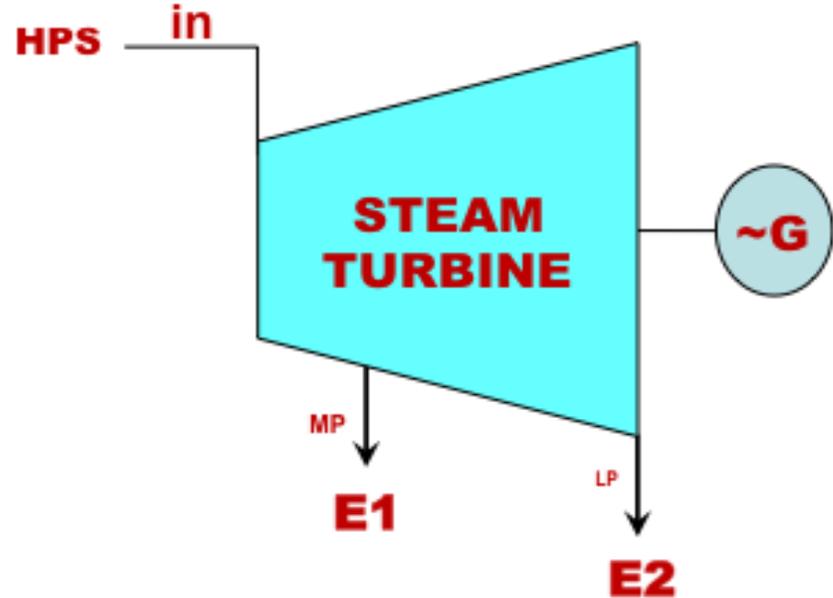
UGAM HRTI 200 Coating over the Cylindrical Vessel [Illustration]



STEAM CONSUMPTION OPTIMIZATION



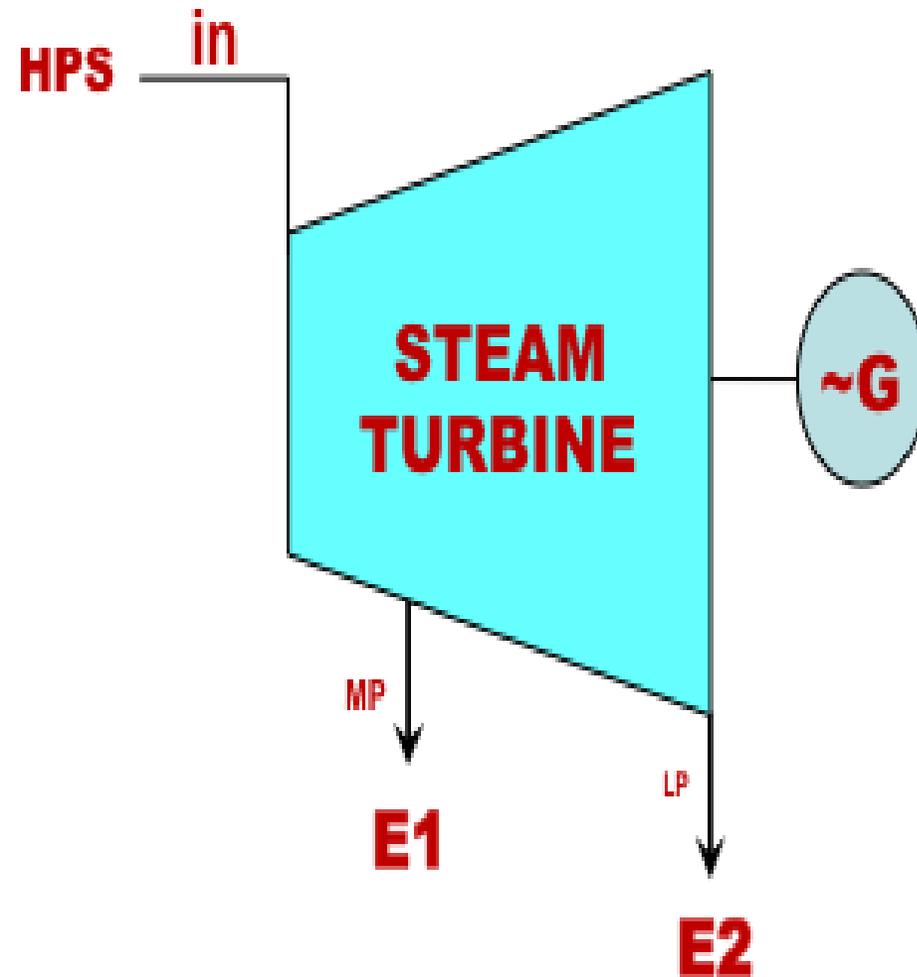
Power Generation Enhancement with MP to LP Steam Switch



**16 MW EBP STG : Energy Management
MPS to Warm Water & LPS +Min. MPS**

- Power gen. increase : 0.05 MW/t
- Addl. Green Power gen..... : 0.3 MW

- GHGE reduction [Carbon Off-set]
: 2500 tCO₂e/ annum



Overall Gains of Bagasse Pulping Innovative Schemes

Bagasse Pulping : ~ 70 TPD ; Operating hours : 12-14 hrs/day

Parameter	Hourly gain	Gains of 3 Es & P
Green Power increase	0.3 MW	4000 Units/day
Steam consumption reduction	0.5 -1 TPH	12 TPD
DM Water saving		12 m ³ /d
Absolute Stack Pollutants reduction		Marginal
Emission Reduction [C-Offset]		2500 tCO ₂ e/annum
Productivity Enh . of Quality		3 %

ENERGY EFFICIENT BAGASSE PULPING -GAINS



- ❖ Maximizing quality bagasse usage from adjoining sugar mill for efficient Depithing & Pulping ensures Increased fibre yield for paper manufacturing .
- Warm water [70°C] depithing of Bagasse +
- Efficient dewatering by Screw press +
- Totally nano-insulated CD & connected pipes & fittings +
- Switch from MP to LP Steam in CD to the extent practicable, would result in:
 - ❖ Green Power generation from EBP STG of Chemical Recovery Boiler +
 - ❖ Stack Pollutants discharge and
 - ❖ Decarbonization [Carbon Emission off-set].

ADVISORY FOR 3 E's

VISION OF EnERG TEkH

Strive for Excellence in :

Energy Conservation ,
Cleaner Environment &
Emission Reduction



.... Continuing on a Sustained Basis.

GOAL
: Net ZERO
Emission
by 2030

Make in India

Jai Hind

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