



ODOR-FREE PAPER MAKING BY ANAEROBIC TREATMENT IN ETP

Presentation by
Madhure Desarda
Director - Operations,

&

Raj Kumar
Vice President – Projects,
Parason Machinery India Pvt. Ltd.

Trash to Treasure™ Parason ETP System

Our solutions are designed not just to reduce environmental footprints but also to maximize returns on your capital.

CHALLENGES IN THE PAPER INDUSTRY

- Highlight the growing issue of odor in the Kraft paper industry Suffering to cut down the production/plant closures and reduced paper quality.
- Mill owner can't export their paper because of Foul smell.
- Leading to financial losses and environmental concerns.



THE SOLUTION - ETP WITH ANAEROBIC DIGESTER

- Mitigating Odor Issues in Kraft Paper Industry through ETP with Anaerobic Digesters and Bio-CNG.
- Transforming ETP into valuable asset.
- Trusted source of Treasure – ROI with in 3 years



CHARACTERISTICS OF INFFLUENT

SR.NO	PARTICULARS	UNIT	VALUE
1.	pH	-	6.5 – 7.5
2.	BOD	mg/l	2000
3.	COD	mg/l	5000
4.	TSS	mg/l	3000

Table -1 (Inlet Parameter)

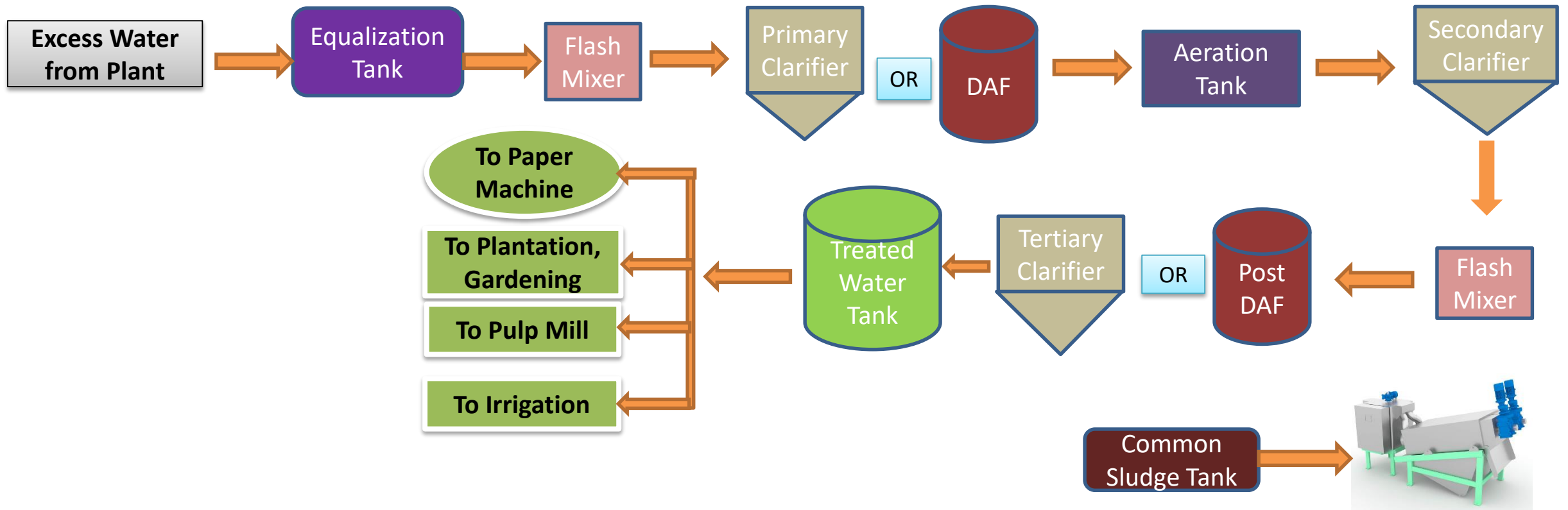
SR.NO	PARTICULARS	UNIT	VALUE
1.	pH	-	6.5 – 8
2.	BOD	mg/l	<20
3.	COD	mg/l	<200
4.	TSS	mg/l	<30

Table -2 (Outlet Parameter)

ETP PROCESS

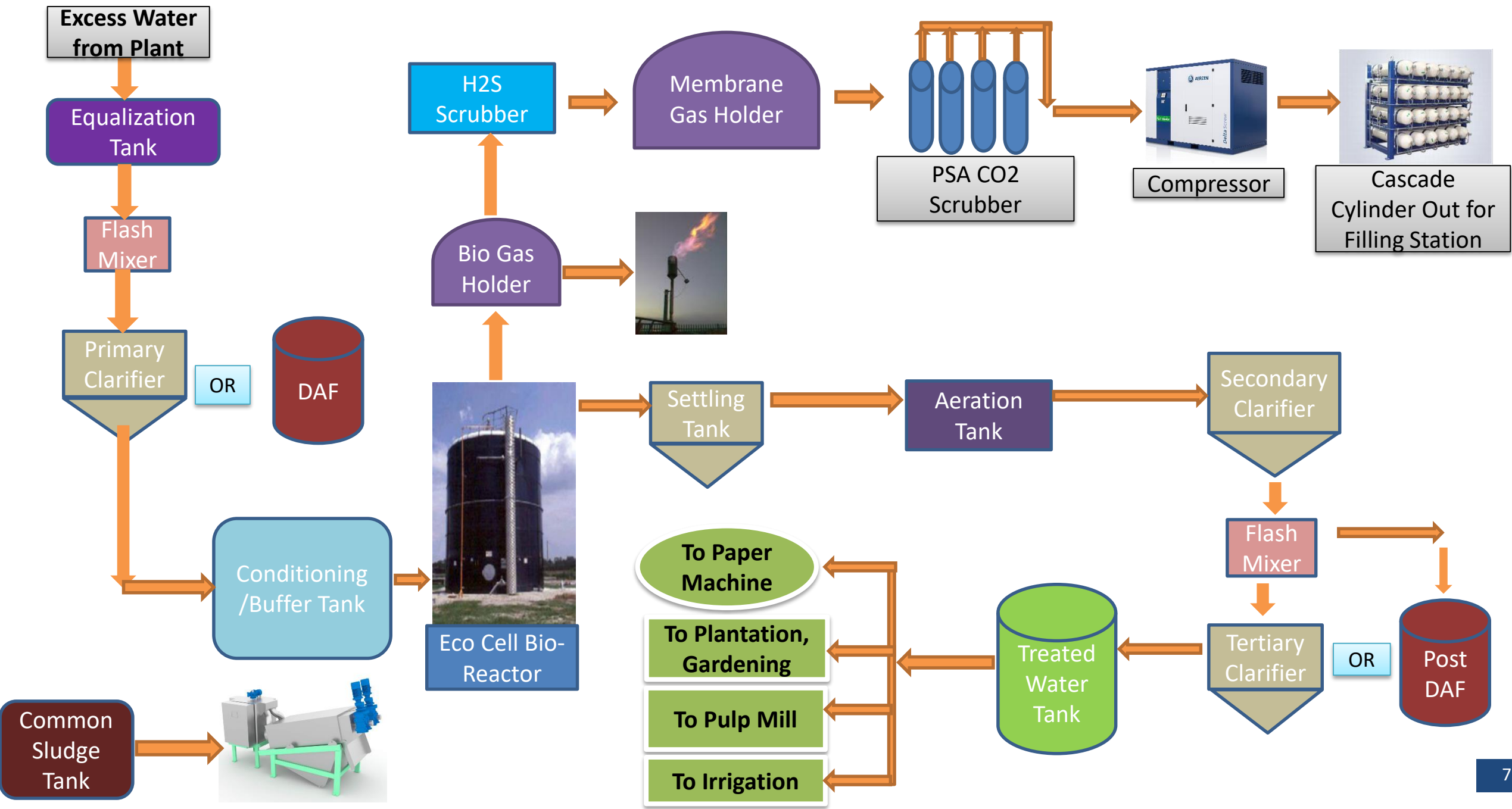
- Primary Treatment – Physio-chemical Treatment
- Anaerobic process
- Bio gas production
- Bio-CNG production
- Aerobic process
- Secondary Treatment – Biological Treatment
- Tertiary Treatment- water polishing
- Sludge Handling

ETP PROCESS FLOW DIAGRAM WITHOUT CBG PLANT

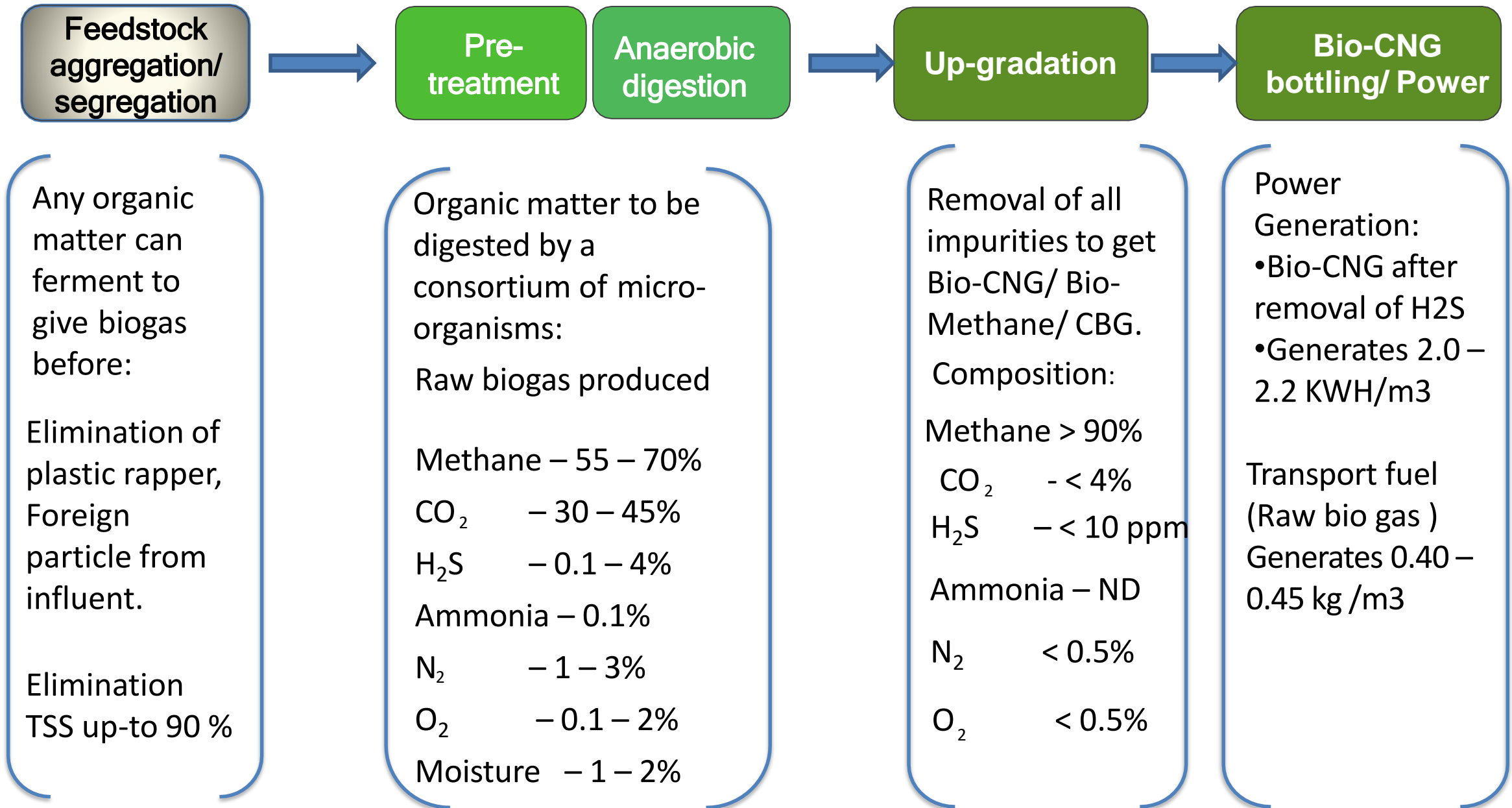


- We have to treat this Effluent as per government norms and to achieve those legal compliances we require lot of investment.
- Now implanting Bio gas Unit we can counter this capital cost and get positive ROI.
- It will additionally provide reduction of load to Aeration, Secondary & tertiary treatment, as example without CBG plant we have to need reduction of COD from 5000 to 250 where as with CBG 1500 to 250 additional benefit of less power & chemical consumption also.
- **Smell free paper.**

DIAGRAM WITH CBG PLANT



BIO-CNG PRODUCTION STEPS AND SPECIFICATIONS



ANAEROBIC TREATMENT

- From Paper mill Effluent as trash to treasure
- A high-efficiency, new-generation anaerobic reactor is designed with advanced solid separation technology, incorporating two separators that optimize the process.

Key Process Overview

- **Conversion of Organic Matter:** Organic matter in the wastewater (both liquid and solid) is broken down through microbial action in an oxygen-free environment.
- **Bio-Methane Production:** Microorganisms convert the organic load into bio-methane, a renewable energy source.
- **Solid Separation:** The dual-separator design enhances the efficiency of solid-liquid separation, maximizing biogas production and reducing sludge.
- **Reduction In COD:** 70 % Reduction In COD.



BIOGAS HOLDER & FLARE SYSTEM

- There is circular tank for Biogas holding.
- The generated biogas from the anaerobic reactor being stored to safeguard the reactor & being purified in CBG plant and in case of any shut down in CBG plant the raw bio gas being flared for safety point of view.



Technologies are available for H₂S scrubbing

- Wet Scrubber - System used for less H₂S contents.
- Bio Chemical Scrubbing- Caustic will be used to prepare alkaline solution.
- Chelating Agent Scrubbing.



CO2 SCRUBBER

Technologies are available for CO2 scrubbing

- Pressure Swing Adsorption (PSA)
- Water Scrubber
- Membrane Separation
- Amine Scrubbers

But we are proposing PSA (4 tower) technology because it is user friendly.

- > 96% Methane Purity
- Ease of Operation



ODORIZATION SYSTEM

- Since both methane and Bio-CNG are odorless, detecting leaks without an odorant would be difficult, posing safety risks.
- Odorization serves as a vital safety measure to ensure any leaks are easily noticed by smell.
- **Mercaptans (e.g., Methyl Mercaptan, Ethyl Mercaptan):** These compounds are used for gas odorization, with a distinct sulphurous smell.



HIGH PRESSURE COMPRESSOR SYSTEM

- Here we compress the pure CBG from **0.3 kg/cm²** to **250 kg/cm²** and finally gas being filled in the Cascades.



CASCADE FILLING SYSTEM

- These cascades used to transport the CBG to Bio CNG pump station and there it is being dispensed to vehicles as fuel.



FILLING STATION

Cost-Effective: Bio-CNG offers a lower cost per kilometer compared to diesel and petrol, providing substantial savings.

Engine Compatibility: Suitable for CNG-compatible engines with minor modifications, making it easy to adopt in existing vehicles.

Environmental Impact: Transitioning to Bio-CNG supports national and global goals for carbon reduction and renewable energy adoption.

Bio-CNG filling stations are essential infrastructure for the clean energy transition. By replacing diesel and petrol with pure methane, Bio-CNG offers a practical, renewable, and eco-friendly fuel solution for today's transportation needs.



AEROBIC SYSTEM

- Biological Process
- Activated sludge
- Role of Urea
- Role of Phosphoric Acid
- Role of Diffusers



SECONDARY CLARIFIER

- Clarifier for Activated sludge settling which come from Aerobic system.
- Sludge recirculation.
- Sludge waste in sludge holding tank to reduce the load of MLSS (Mixed Liquor Suspended Solid).



TERTIARY TREATMENT

- Pressure sand Filter
- Activated Carbon Filter

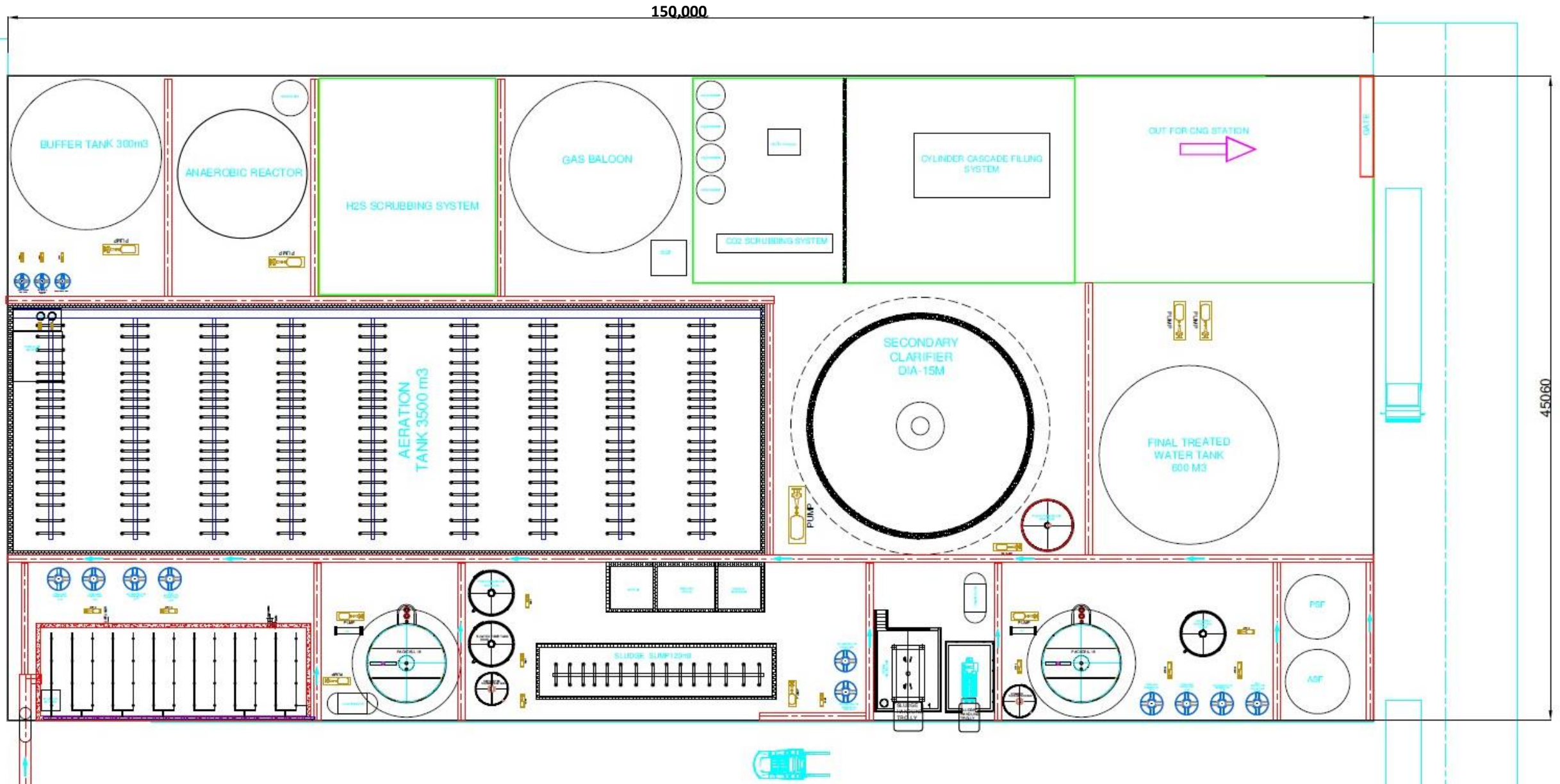


SLUDGE HANDLING -SCREW PRESS

- Sludge handling for Chemical and biological/Activated sludge
- Inlet CY – 2 to 3%
- Outlet CY – $25 \pm 2 \%$



LAYOUT



ENGINEERING SERVICES FOR PROJECTS



Equipment sizing



Layout drawing with optimum area



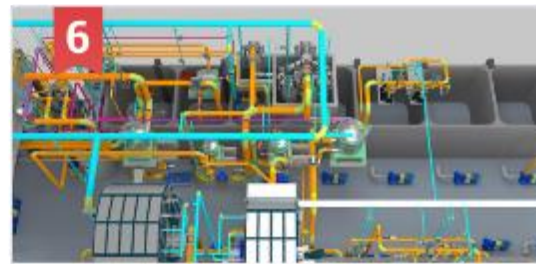
Pump sizing



Power requirement evaluation



Mass balancing



Piping layout



Instrumentation design



DCS Engineering

ETP: FROM OBLIGATION TO VALUABLE ASSET

- Eliminating Foul Smells,
- Enhancing Paper Quality,
- Ensuring Financial Viability with Bio-CBG Projects

The integration of anaerobic digesters in ETPs within Kraft paper mills is a transformative solution that addresses odour management, regulatory compliance, and financial sustainability.





Thank you!



Stock Preparation System



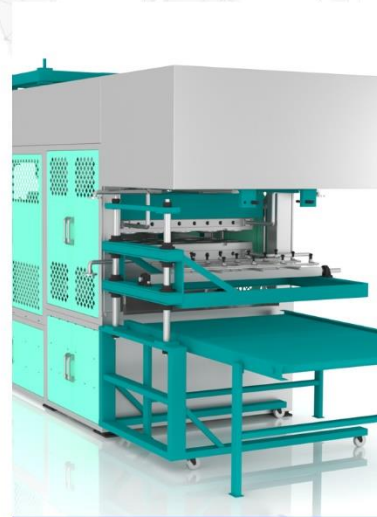
Paper Machines



Tissue Machines



Agro & Wood Pulping



Molded Fiber



Oil & Gas

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