



MANUFACTURERS ASSOCIATION
OF SOUTH AFRICA (PAMSA)



Water Efficiency Solutions For The Pulp and Paper Industry

AGBIZ – 25 March 2019

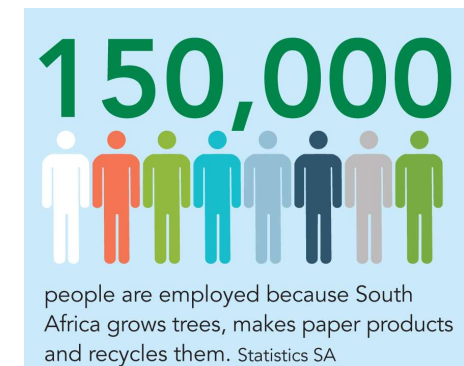
Mike Nash - PAMSA

PAMSA – who we are

- Represents more than 90% of paper, packaging and tissue manufacturers in South Africa.
- Actively advancing the ‘story of paper’ since its foundation in 1992.
- As an industry we focus on conscientious environmental stewardship, resource efficiency and innovation.
- We promote active research into process innovation and the beneficiation of our bio resources and waste streams

PULP & PAPER INDUSTRY – contribution to SA

Sector contribution to SA GDP	2015	2016	2017
Forestry contribution to SA GDP	0.49%	0.44%	0.48%
Forestry contribution to manufacturing GDP	4.21%	3.64%	4.06%
Forestry contribution to agricultural GDP	23.3%	20.1%	21.0%



- Contribution of **pulp and paper industry** to **South Africa's national GHG emissions = 0.8%**.
- Average of **211,000** trees planted every day.

CARBON NEUTRAL PRODUCTS



Dissolving Pulp

- Clothing
- Binders
- Nano fibers



Paper products

- Printing & writing
- Packaging
- Tissue



Bio-Streams

- Bio-fuels and chemicals

PAPER

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FRESH WATER DEVELOPMENTS

its affect on usage and environmental impact

Water Related Issues

Forestry



- Regulatory requirements

- Water licenses – the industry relies on a number of small private and rural farmers to supply a significant proportion of its timber- each plantation needs to apply for a separate license – as there are hundreds of these entities for which the administration load is huge and costly and also tedious to obtain.

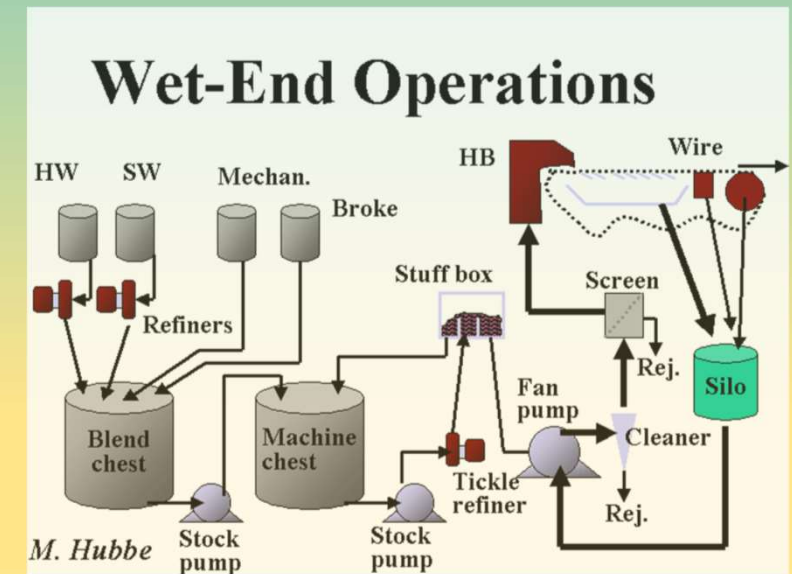
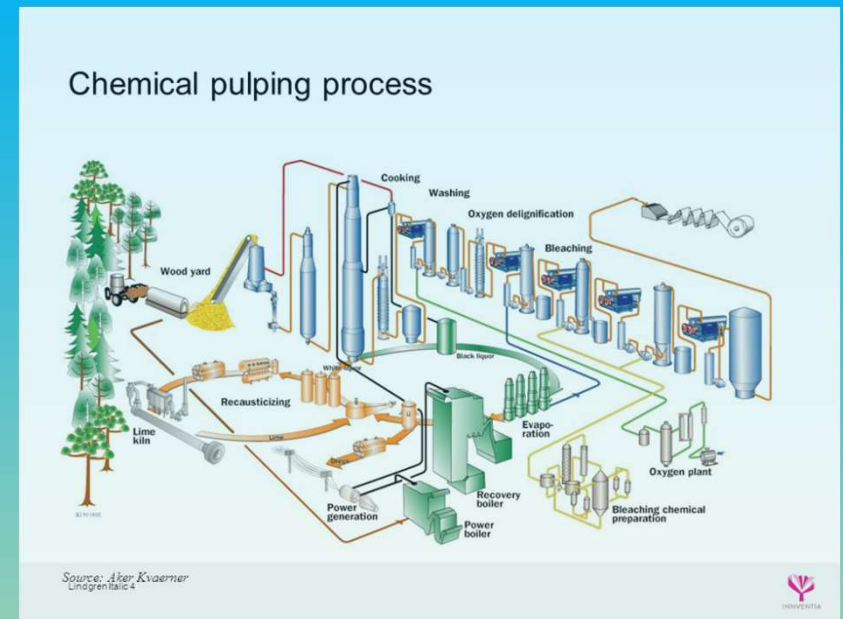
- Taxes

- The owners of plantations are required to pay for the rain falling on their plantations (DWAF 2003) – R2-R6/Ha/annum
- Water resource management charges for plantations

Water related Issues

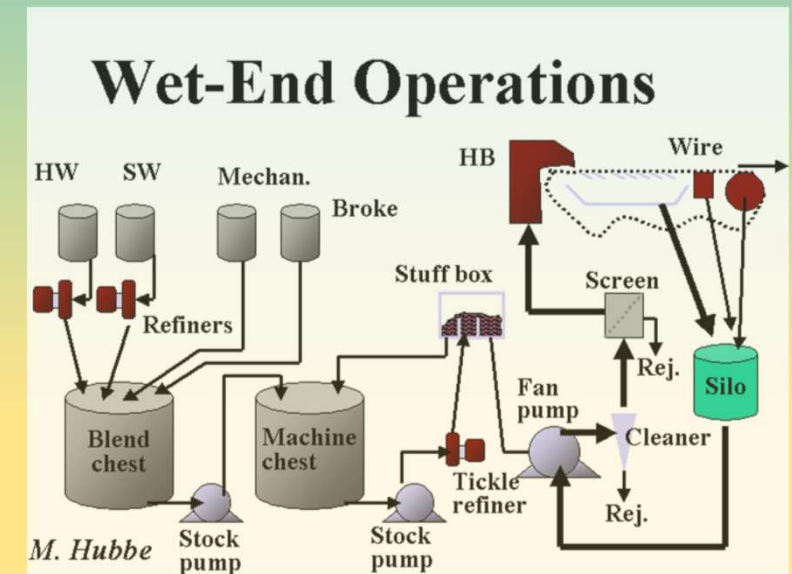
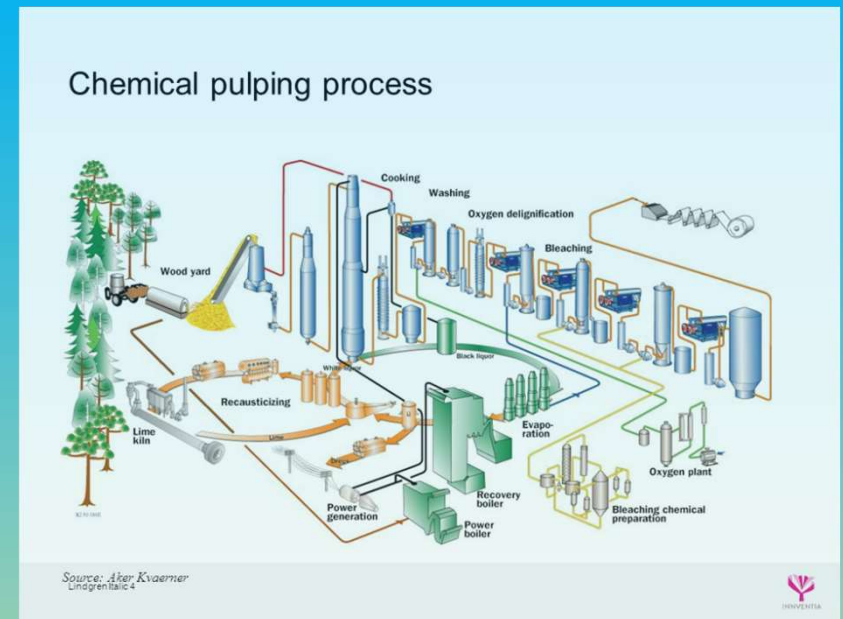
Production plants

- Both the pulping and paper making operations require significant amount of water which in integrated mills situated in rural areas is either abstracted from rivers and in urban areas from municipal supply.
- Rural supply is becoming increasingly more challenging as the affects of climate change becomes more pronounced, whilst urban supply is subject to increasing cost and restrictions on supply.
- Water is required in the manufacturing process generally as a final stage in washing and make-up processes
- Potable water is used for the generation of steam to produce power and then as a heating medium – co-generation



Water Use Mitigation integrated water circuits

- The pulping circuit is designed to minimize the use of fresh water by integrating a number of closed loops into the circuits which only requires the making up of losses associated with those from equipment or production rate changes.
- Steam condensates from steam generation is returned to the boiler after demineralization processes.
- Evaporator condensates are returned to the final washing stages for re-use in the closed washing circuit.
- In integrated mills final treated effluent is used as an irrigation medium for pasture land and cattle farming or for plantations.
- Paper circuits are optimized through advanced mathematical techniques, (pinch analysis), where intermediate streams are matched wrt. temperature and concentration to substitute fresh water usage.



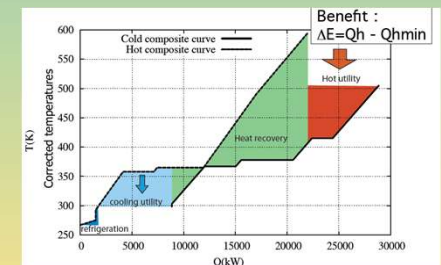
Water Use Mitigation

research and development

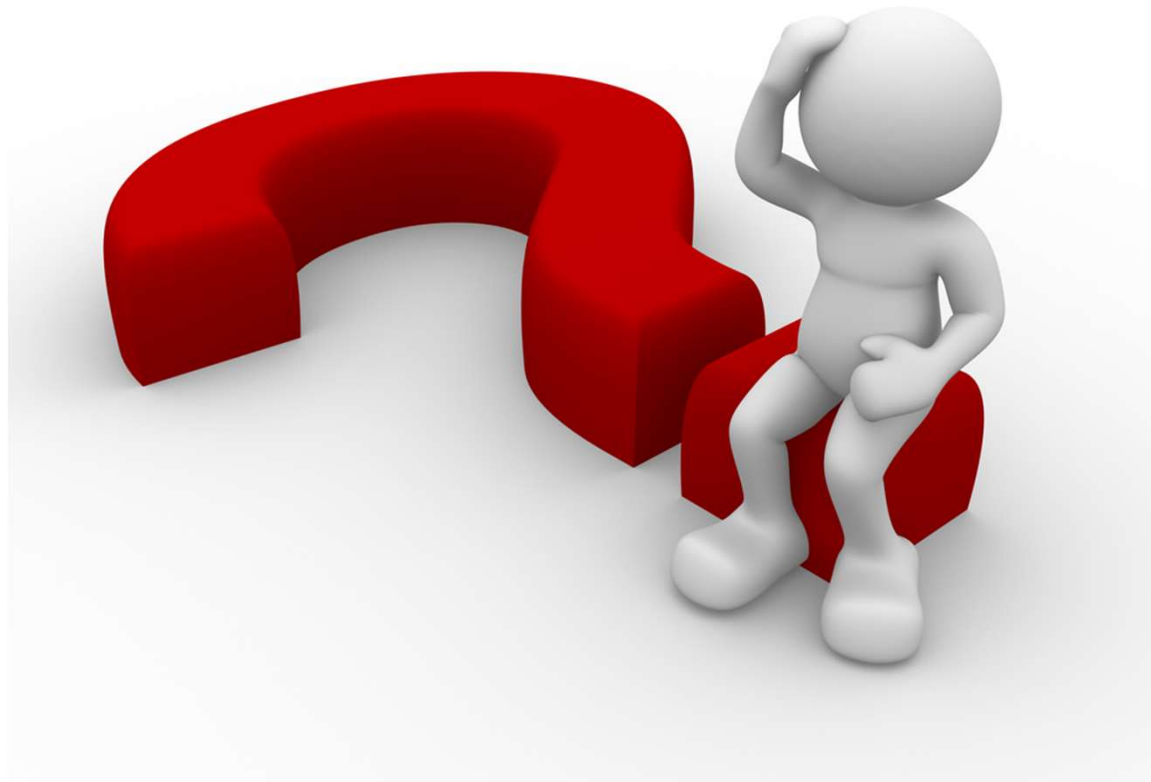
PAMSA through its Process Research Unit is involved with a number local higher learning institutions to expand the industries knowledge of the latest mathematical techniques and worldwide process developments whilst also carrying out fundamental research at the masters and doctoral level.

In particular:

- The development of mathematical algorithms applicable to particular mills to analyze complex water circuits for both thermal and chemical content through “stream matching” to optimize the use of exiting streams and reduce the need for fresh water addition to the circuit.
- The treatment of water rich paper sludge effluent streams by enzymatic action to produce bio-ethanol, reducing the solid load to waste fill and enabling the recycle of the water for further use in the plant.
- The development of separation techniques, (both bio and membrane based), to extract valuable chemicals and render the liquid stream available for further treatment and possible recycling.



PAMSA – questions?





THANK YOU

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