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Tools and Visions in Process Applications

Presented by Peter Bräuer
General Manager Products and Technology
Andritz AG, Graz, A

Tools & Visions

Process Applications

- **Both, wood species and wood quality have a big influence on process and machine design, with regard to**
  - **Specific energy consumption → operating costs**
  - **Capacity of a production unit / line → Investment costs**
  - **Screening system (baskets and apertures)**
  - **Dewatering, bleaching is hardly affected**
- **Correlations and trends based on wood density and fiber length can be used in advanced process control packages to achieve constant pulp quality.**

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Process Applications

- Mature long fibers (slabwood) need 10 – 15% lower specific energy
  - Smaller refiner motors required
  - Sometimes even smaller refiners (single line vs. Two lines)
  - Higher throughput possible at same motor size / refiner size
- High-intensity refining (RTS) resulted in similar pulp strength and higher brightness at lower energy consumption.
  - Typical energy savings (spruce) are 300 – 400 kWh/t
- If both advantages could be superimposed, savings in S.E.C. were in the range of 500 – 600 kWh/t.
- Future aspect: energy consumption has a direct effect on greenhouse gases („Kyoto-Protocol“)

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Process Applications

- **High-intensity refining is known to give better surface properties than conventional TMP (PPS, Light scattering, brightness)**
  - **If high amounts of juvenile wood are used, high-intensity refining will improve surface smoothness and decrease energy consumption even further.**

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Process Applications

- **Screening: Mature wood fibers fractionate more because of longer fibers and higher fiber thickness and fiber wall thickness**
  - **This will affect screen basket apertures (slot width)**
  - **May affect required screen sizes**

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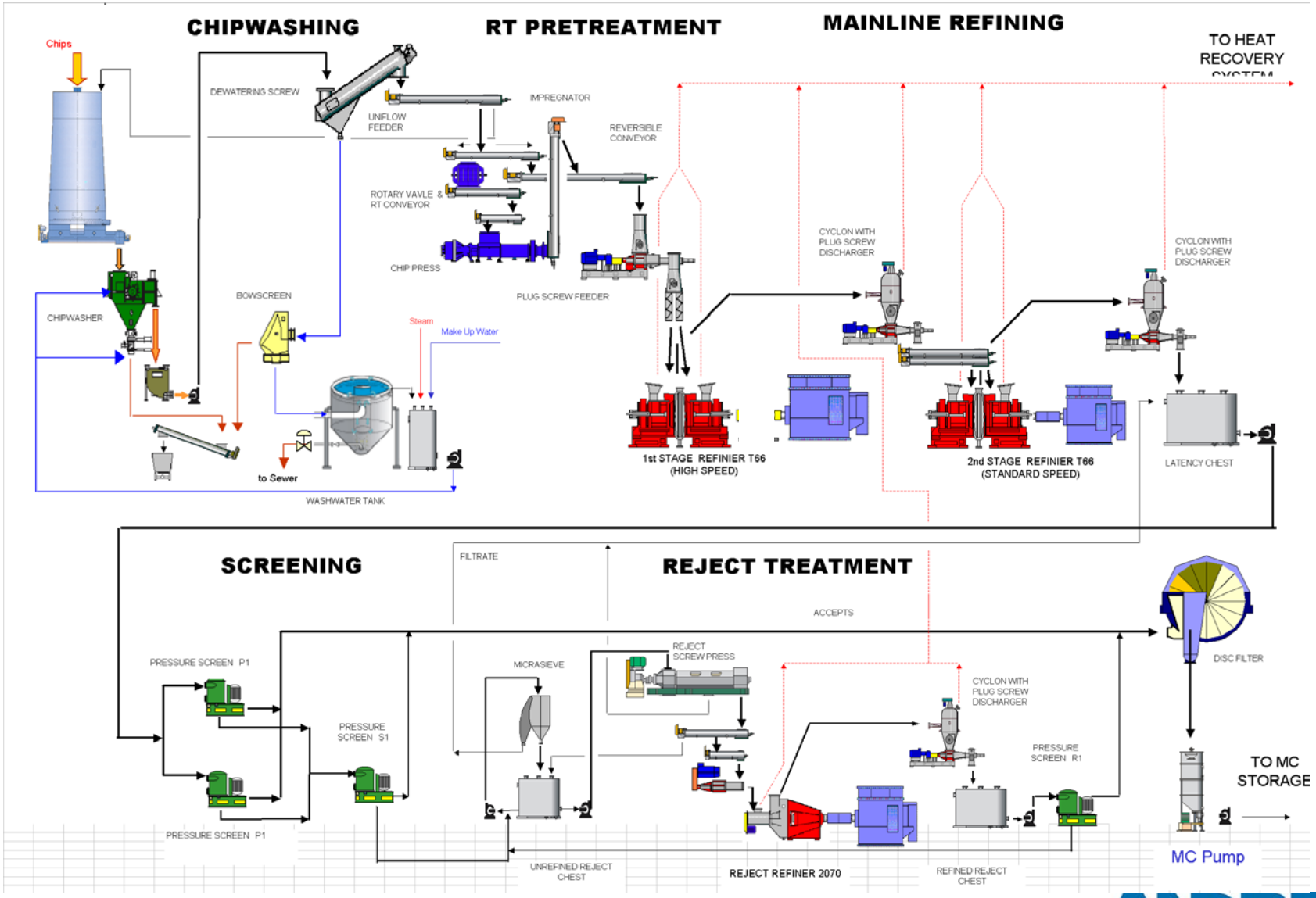
Process Applications – Case Study

	Case 1	Case 2
Production, admt/d	500	
Freeness, ml CSF	130	
Wood	100% Thinnings & top logs	100% mature wood (slabwood)
S.E.C., kWh/t	2300	1800
Required energy, MW	47.9	37.5
Installed energy, MW 1st stage 2nd stage rejects	62 26 26 10	52 22 22 8
Refiners used	2 x Twin TC 66	2 x S 3068 Single disc, high-speed refiner
Investment cost	-	15% lower

Case Study – TMP system for 500 admt/d



Energy Savings

- 175.000 ADMT/year saving 500 kWh/ADMT results in a saving of 87.500 MWh/year
- 87.5000 MWh/year of electric energy at a price of 30 EUR/MWh equals to EUR 2.625.000,- per year
  - Or EUR 15,0 per ADMT of pulp
- 87.500 MWh electric energy causes a CO2 emission of
  - min. 60.637 tons of CO2 in case of an oil fired power plant
- 87.500 MWh electric energy causes a consumption of
  - min. 21.525 tons of oil in case of a oil fired power plant