



High Temperature Heat Pump for increased sustainability papermachines

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What is Smurfit Kappa



- ▶ We make packaging, systems, corrugated boxes etc...



- ▶ From recycled paper and wood

- ▶ In large paper machines
5 - 8 m wide, 100 m long
1100 m/min, 35 ton/h

using a lot of energy
50 ton steam/h =
4000 m³/h natural gas
+ 8,5 MWe
jumbo reel : 15-20 ton paper

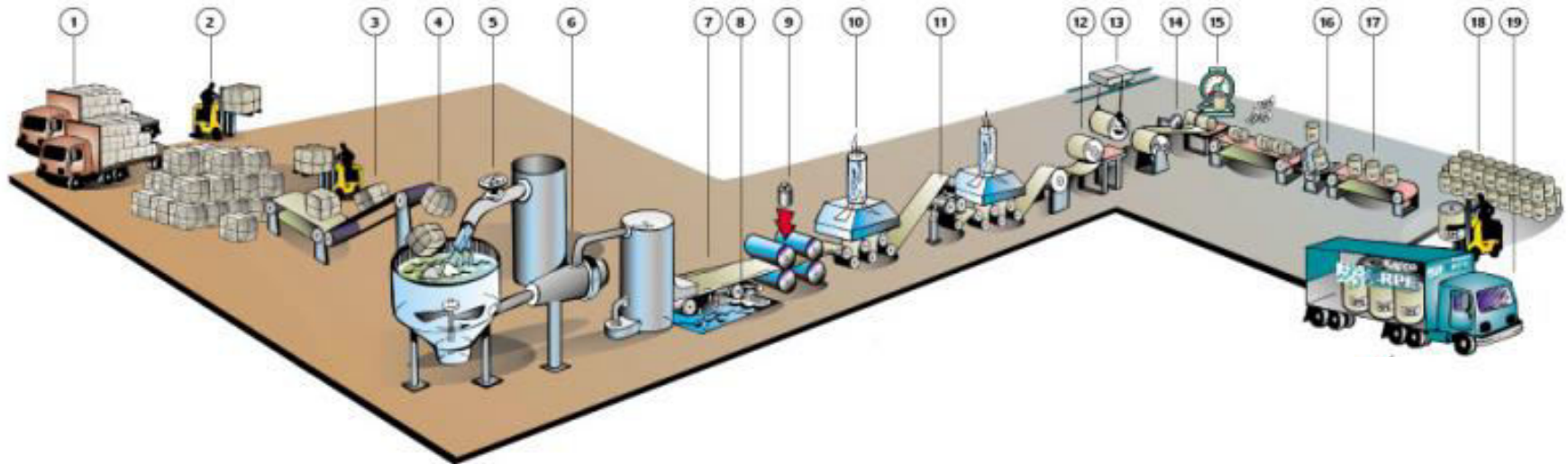
- ▶ 35 % of variable costs is energy : E-power + steam



How do we do that



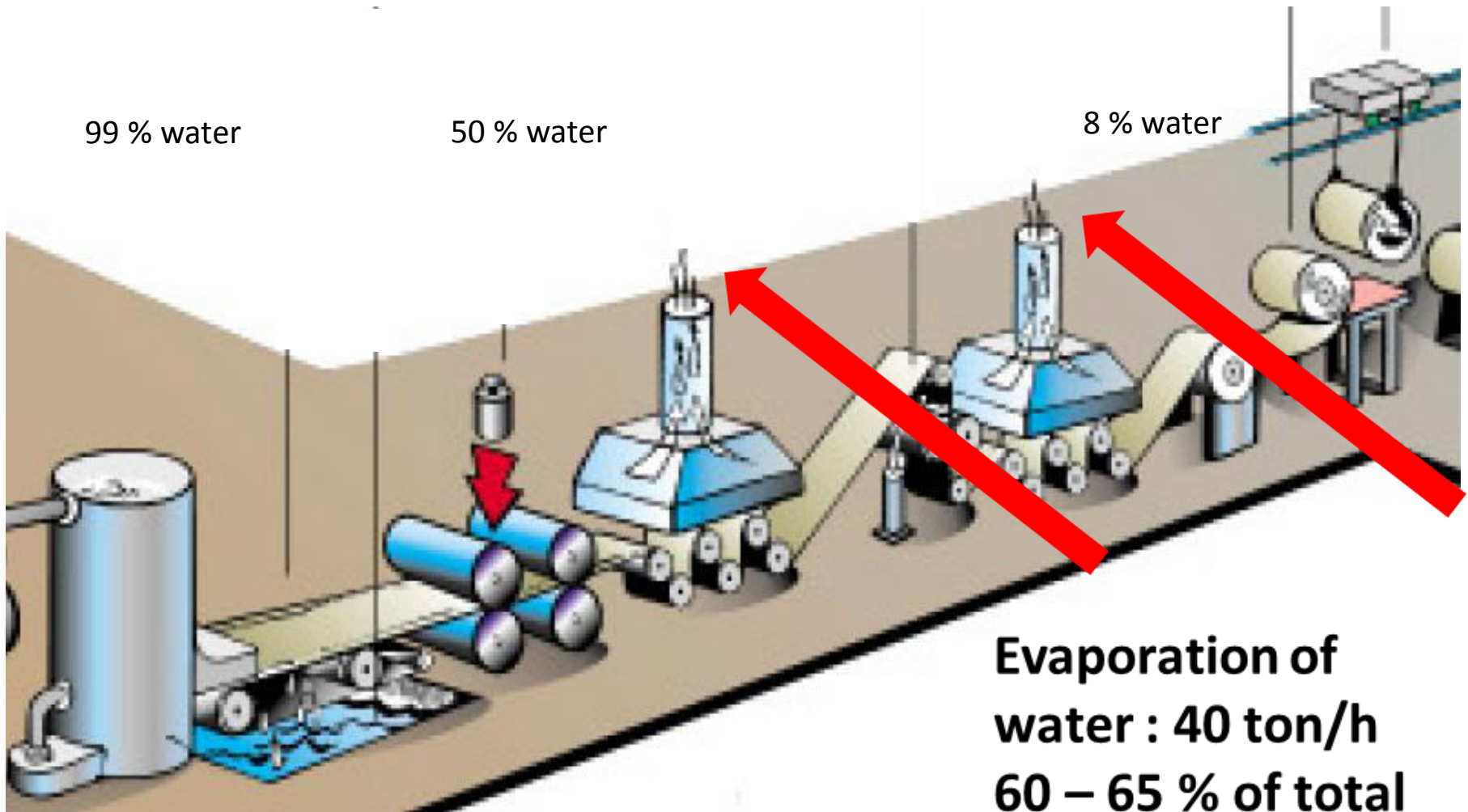
► Recycled Paper machine



- Extensive anaerobic water treatment plant with biogas production.
- Re-use of non paper-fiber materials.
- Integrated CHP ($\eta = \text{ca } 87 \%$).
- Strong focus on energy efficiency/reduction.
- Energy recovery.

Increase
sustainability !!!!!

Paper machine



99 % water

50 % water

8 % water

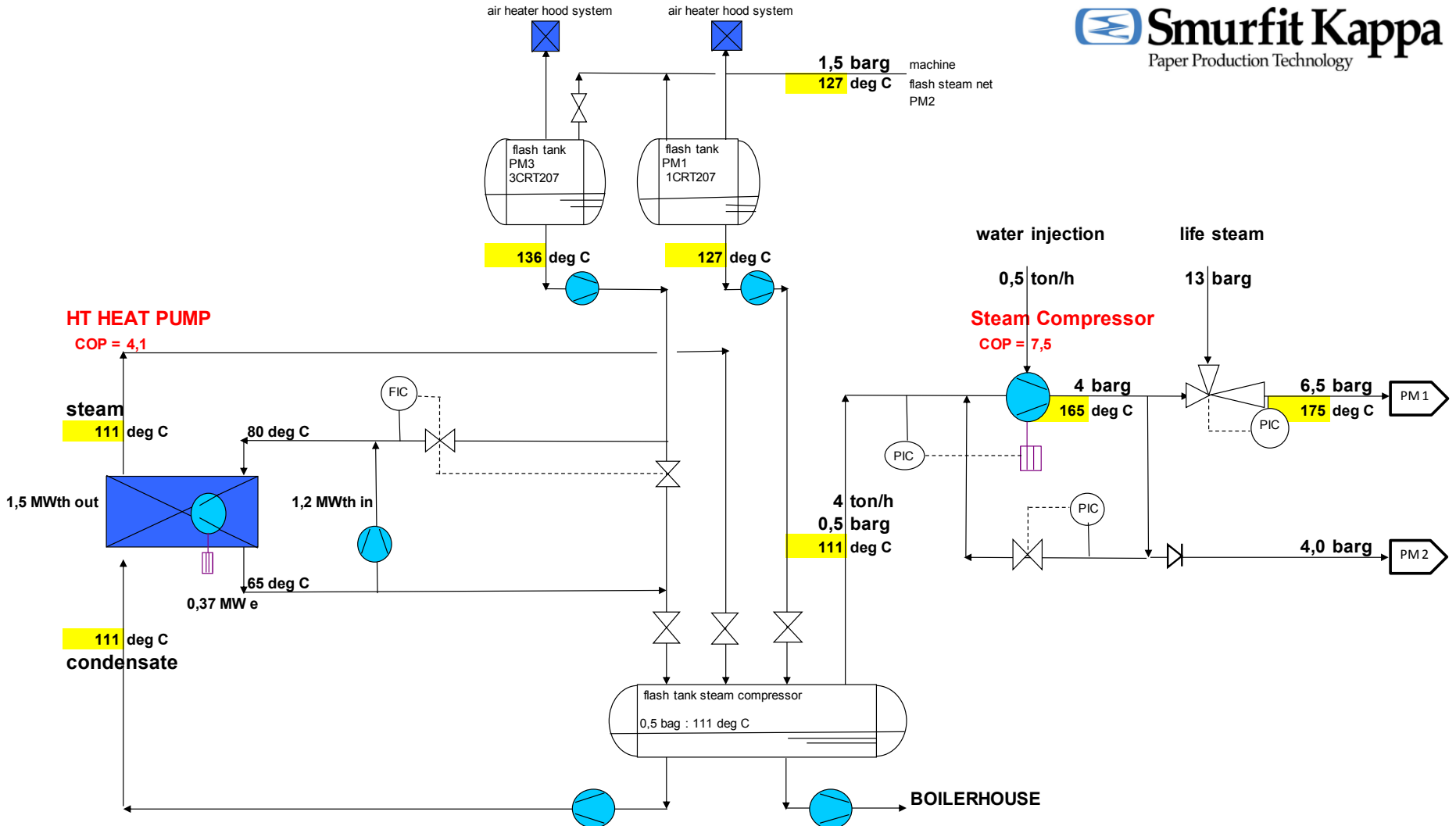
**Evaporation of
water : 40 ton/h
60 – 65 % of total
energy use**

Planned Project

3,5 MWth Demonstration unit 2018/2019 (HT Heat Pump + MVR)



Smurfit Kappa
Paper Production Technology





- ▶ **Low investment cost** (< € 100 /kWth uit)
Attention for integration costs
- ▶ **Higher values of COP** (Carnot > 75 %)
- ▶ **Low ratio :** price power / price gas
- ▶ **Refrigerant :** low GWP (< 5)

- ▶ **FINAL TARGET : ROI < 3 year**

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Thank you for your attention !

