



7th ANQUE's International Congress Integral Water Cycle: Present and Future „A Shared Commitment“

AquaFit4USe Mid-Term Conference

Successful water circuit optimisation at Sappi Maastricht and
Hamburger Rieger

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sappi



Sappi Limburg Maastricht Mill – Facts & Figures



Sappi Limburg Maastricht Mill



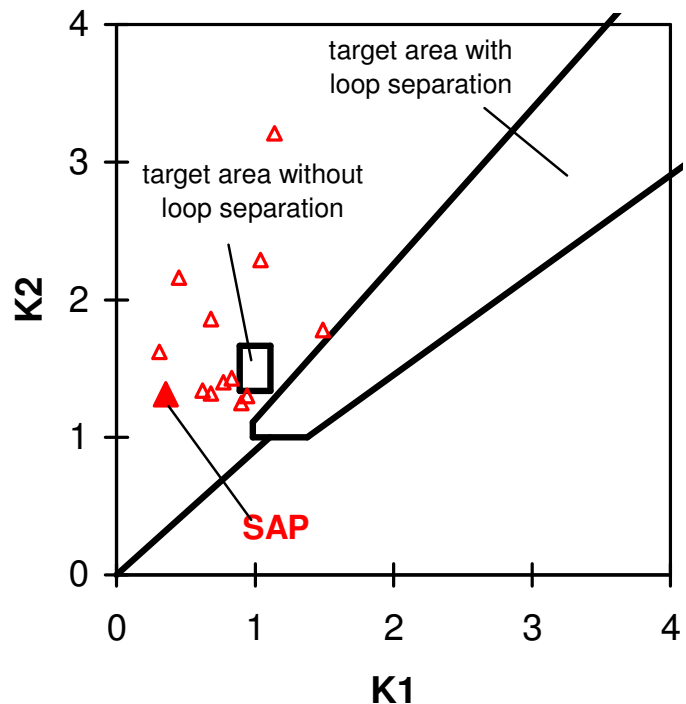
PM6 – Facts and Figures

Year of start-up:	1962
Offcoater:	1989
Last rebuild:	2005
Products:	graphic board
Grammages:	240 – 400 gsm
Width on reel:	4,250 mm
Machine speed:	850 m/min
Capacity:	300,000 tons

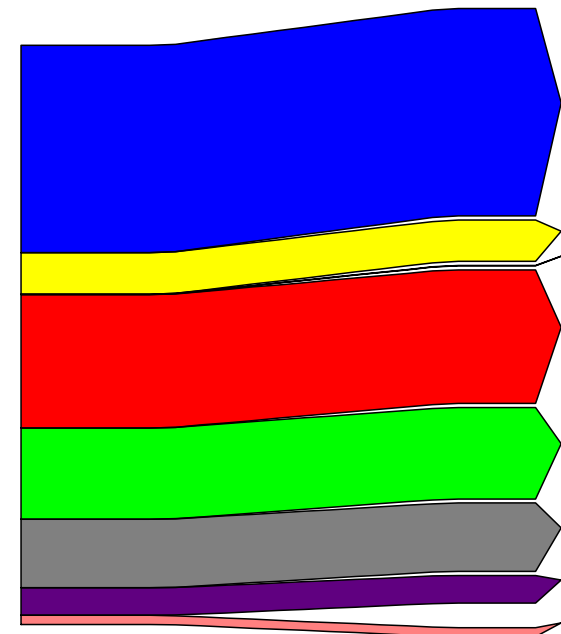
Water use - Current situation

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- Specific effluent volume (14 l/kg base paper) quite high compared to other mills producing coated woodfree paper.
- $K1 \ll 1$ indicates fresh water which is discharged directly to the effluent treatment plant without relieving the paper machine loop
- No loop separation and counter current arrangement



Showers	36 %
Chemicals	7 %
Cleaning, others	23 %
Vacuum system	16 %
Sealing waters	12 %
Fresh water losses	5 %
Cooling water losses	2 %

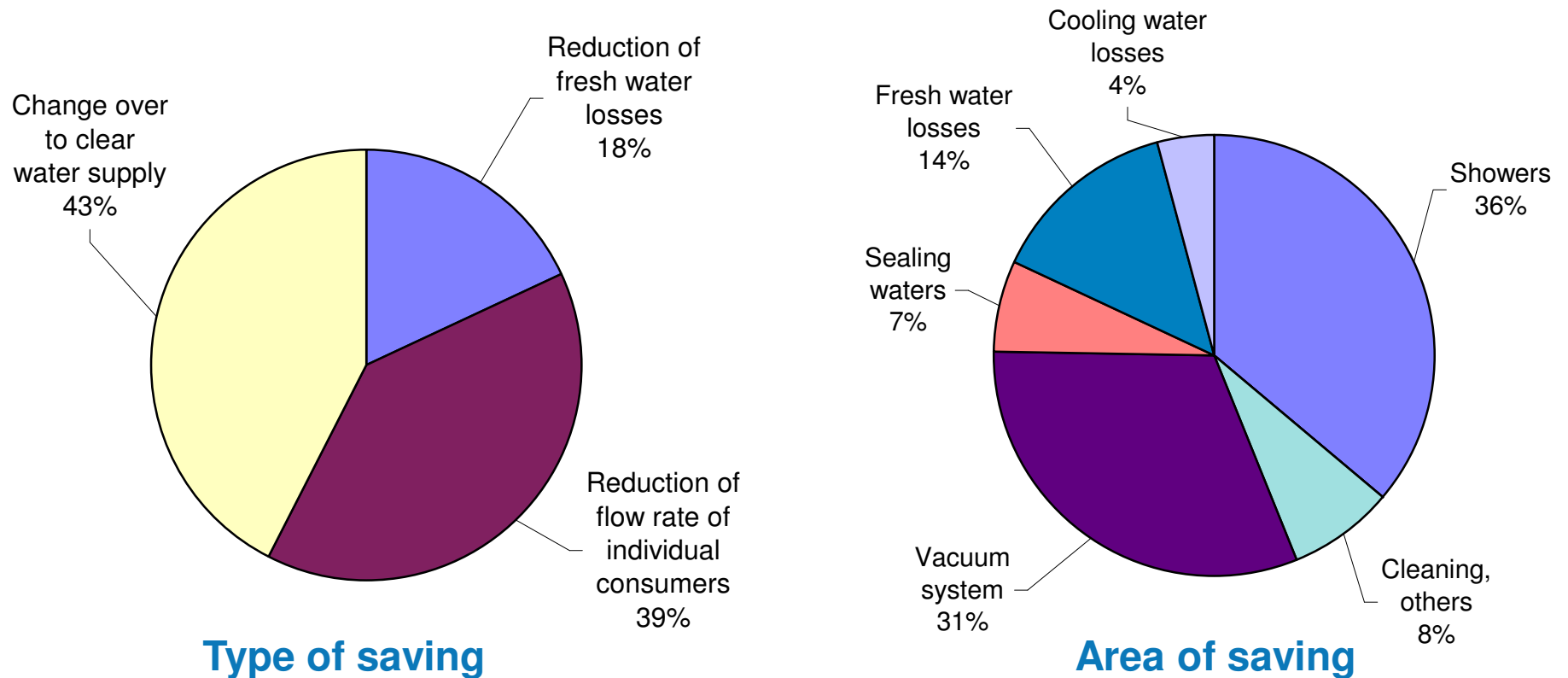




Identified fresh water saving potential

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An action plan with single measures, partly including several alternatives, for a reduction of the specific fresh water consumption was elaborated. The entire saving potential amounts to 33 % of the current fresh water consumption.





Individual measures – Example

Cooling water tank:

- Overflow (20 m³/h) into sewer and at the same time addition with cold fresh water to warm water tank

Water balance cooling water tank		m ³ /h
Input		
	Cold water from main pipe	0,0
	Cooling water from calander	21,6
	Cooling water from condensor	9,4
	Sum Input	31,0
Output		
	Overflow into sewer	20,0
	to warm water tank	11,5
	Sum Output	31,5
	Deviation	-1,7%

Measure Optimisation of warm water management and reuse entire amount of cooling water

Savings: 20 m³/h

Effort: Connection of further fresh water to consumers to warm water supply

Status: Already implemented



Implementation

- Sappi already implemented some of the proposed measures regarding a reduction of fresh water losses.
- Further measures are selected for implementation in the business year 2010: Reduction of flow rate for sealing waters and reduction of fresh water consumption for spray nozzles at the fourdrinier wire.
- After implementation of all selected measures, the effluent volume will decrease by more than **300,000 m³/a** with very low investment costs.

Hamburger Rieger Trostberg – Facts & Figures



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PM2

- 4-ply-fourdrinier machine
- Size press
- 3 inline-coating units (roll coater, blade)

KM1

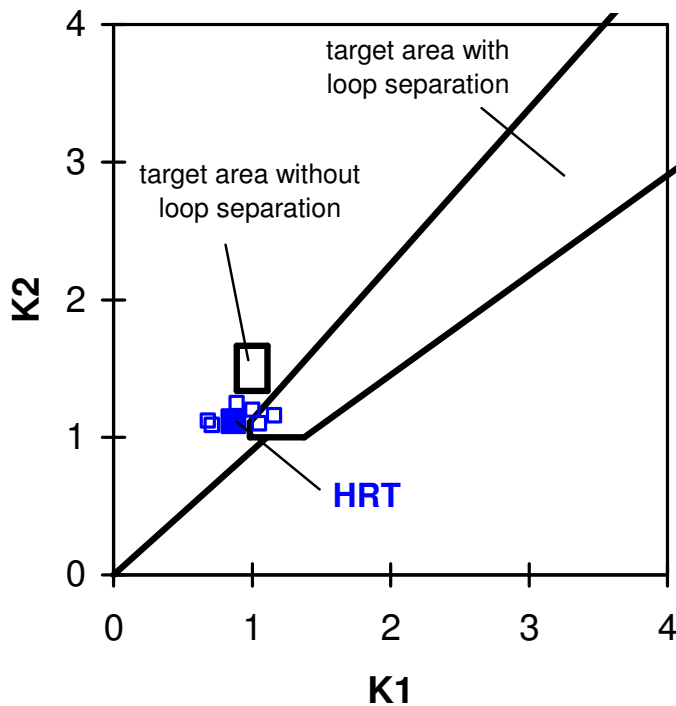
- 9-ply-vat machine
- Inline coater (roll doctor)



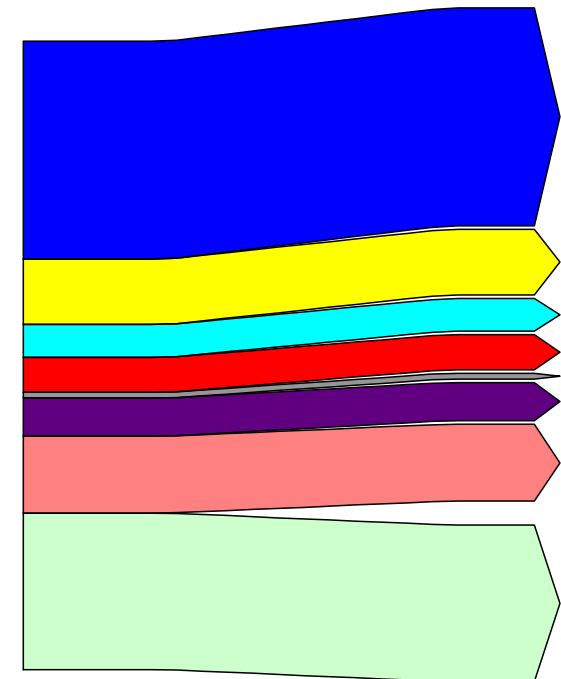
	PM2	KM1
Production rate	133200 t/a	27000 t/a
Operation width	2510 mm	2280 mm
Max. production speed	> 950 m/min	80 m/min

Water use - Current situation

- Specific effluent volume (5,5 l/kg base paper) within the typical range for mills producing packaging papers with white top layer.
- K1 is approximately 1. This indicates a good fresh water use.
- No loop separation and counter current arrangement

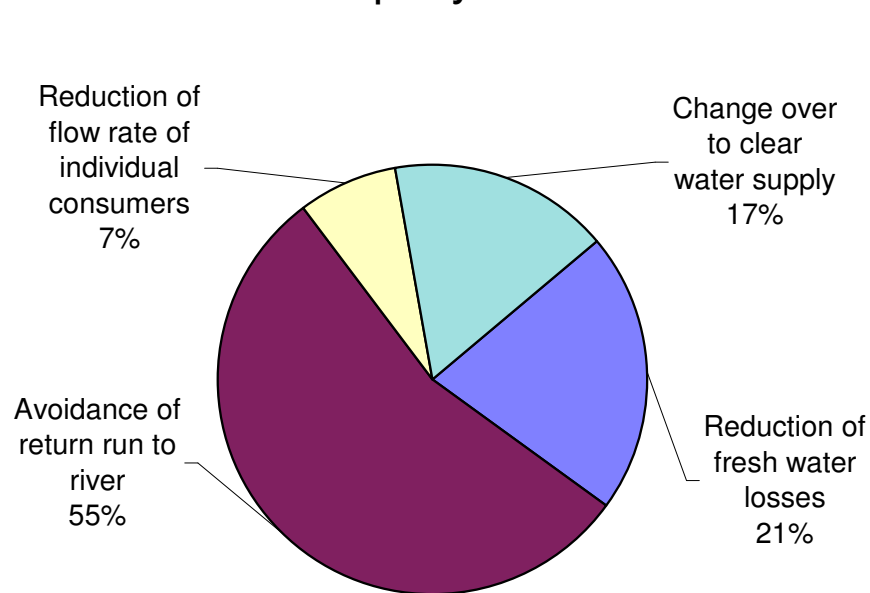


Showers	35 %
Chemicals	10 %
Pulp dilution	5 %
Cleaning, others	6 %
Sealing waters	1 %
Fresh water losses	6 %
Cooling water losses	12 %
To receiving waters	25 %

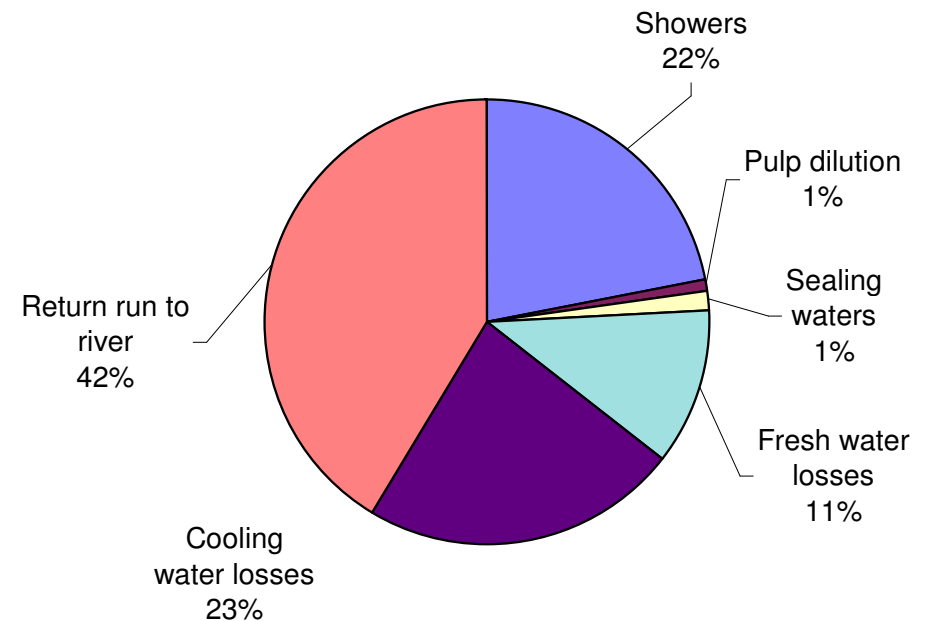


Identified fresh water saving potential

- 14 measures for a reduction of the fresh water consumption
- Saving potential amounts to 55 % of the fresh water intake (including return run to river)
- Limiting effect for implementation: Colour of white water → negative impact on whiteness in top layer

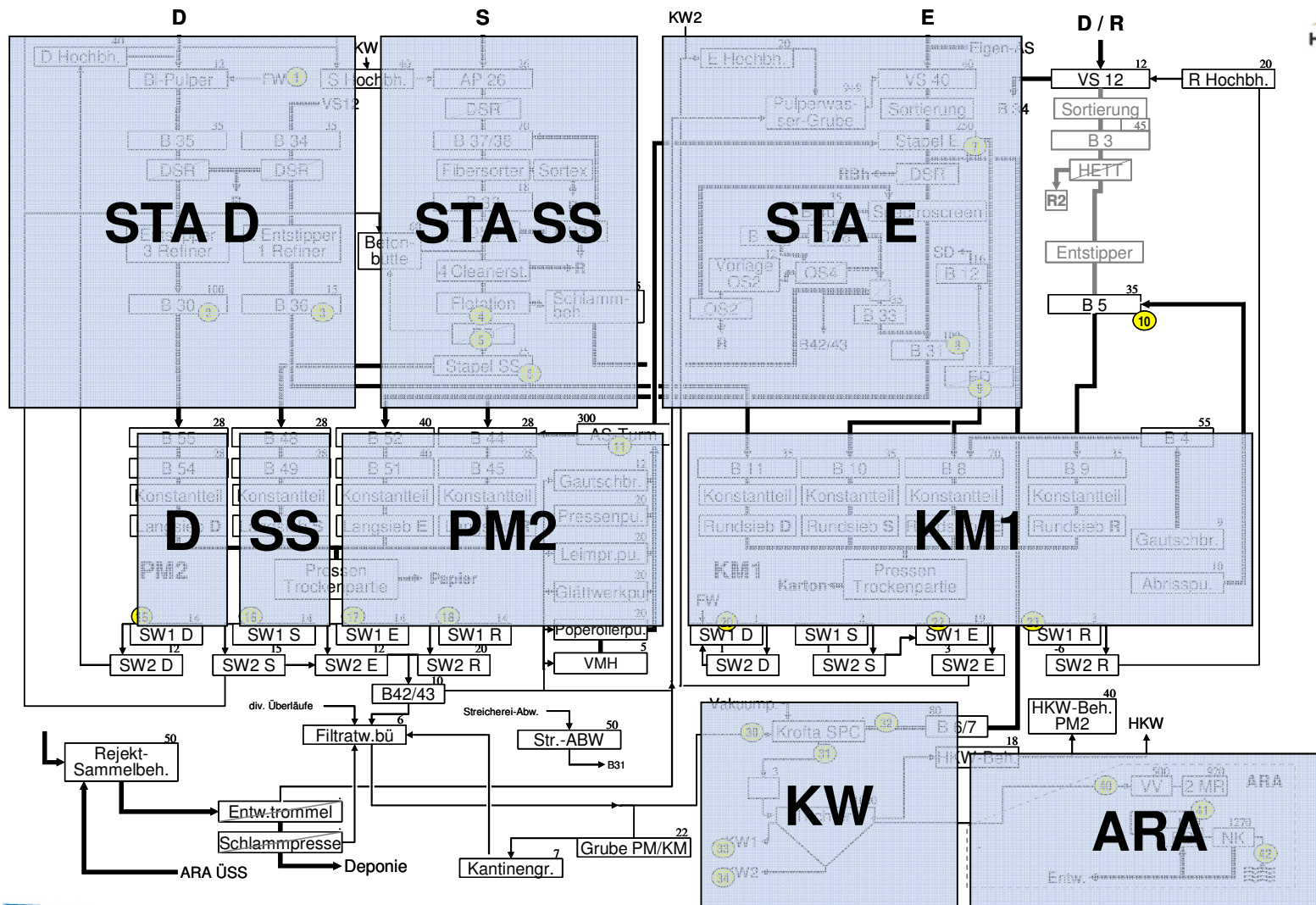


Type of saving

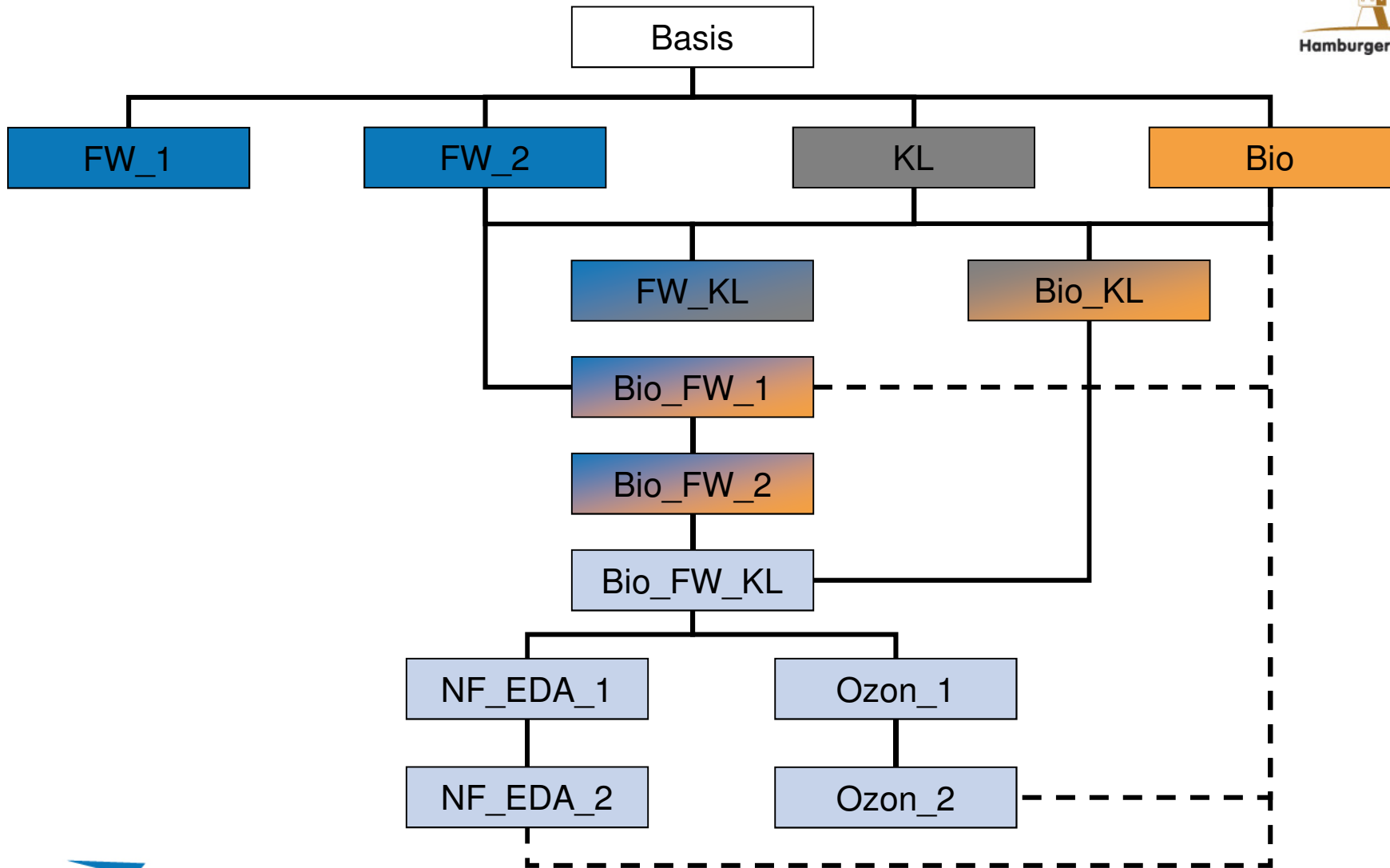


Area of saving

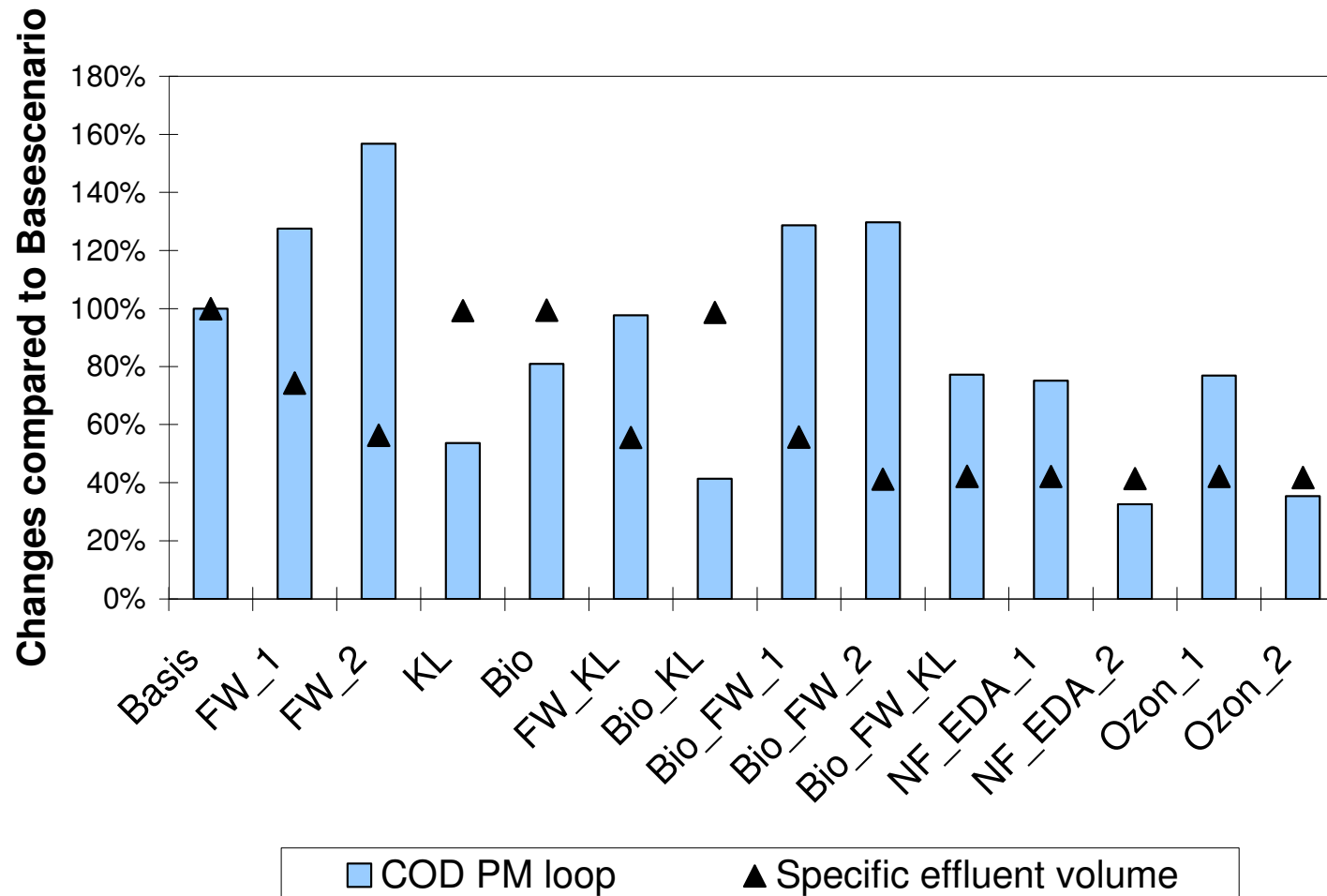
Simulation model



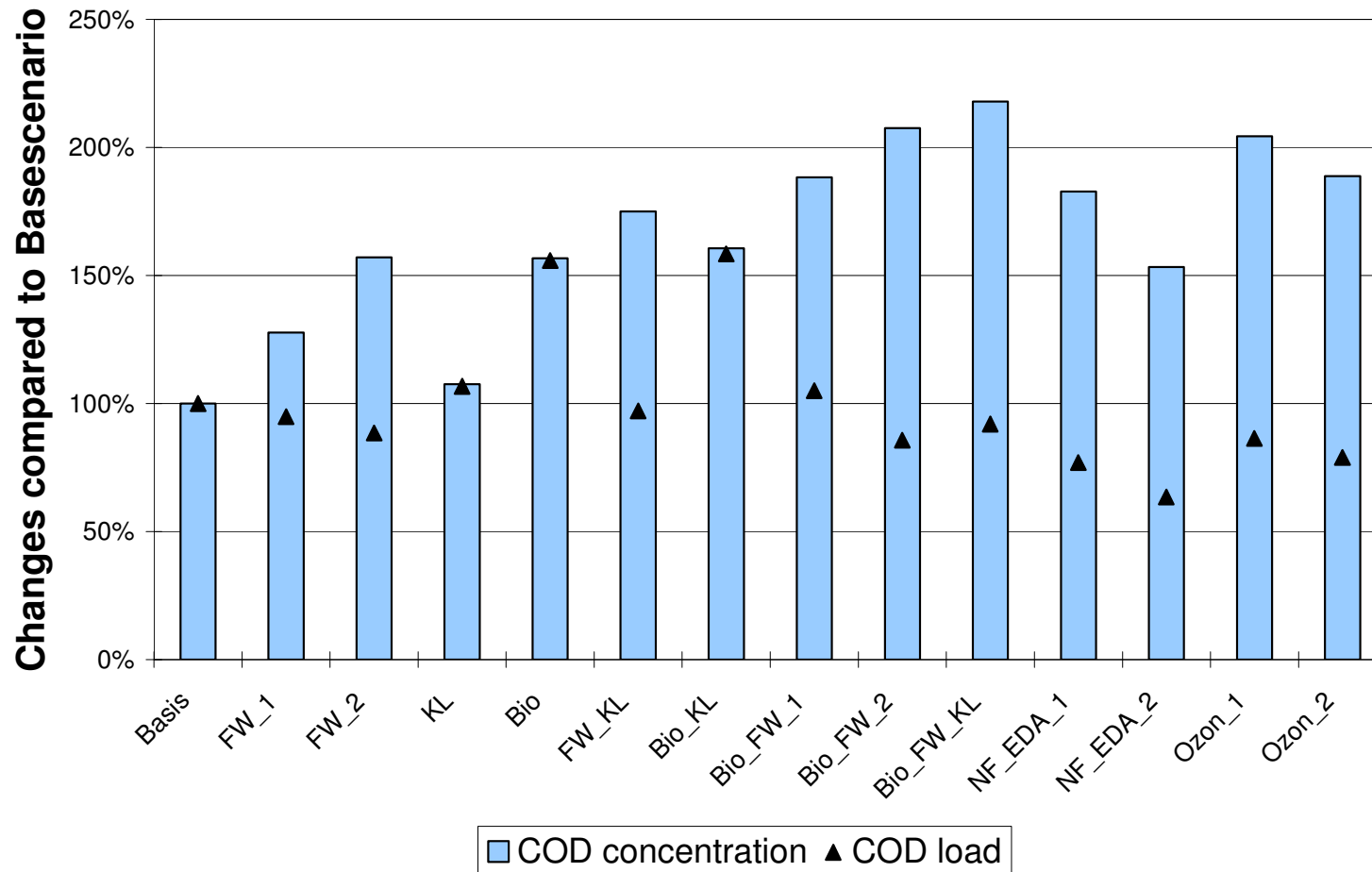
Simulated scenarios



Simulation results (1)



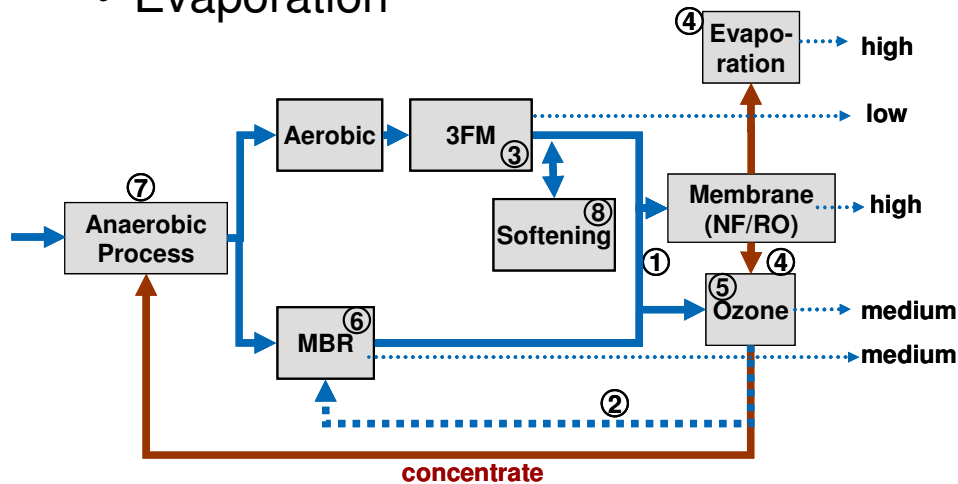
Simulation results (2)



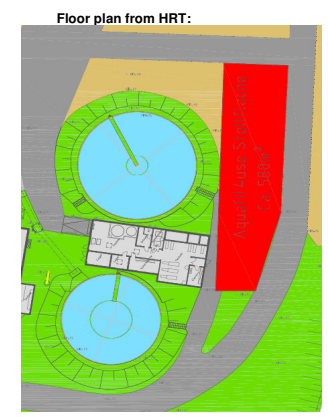
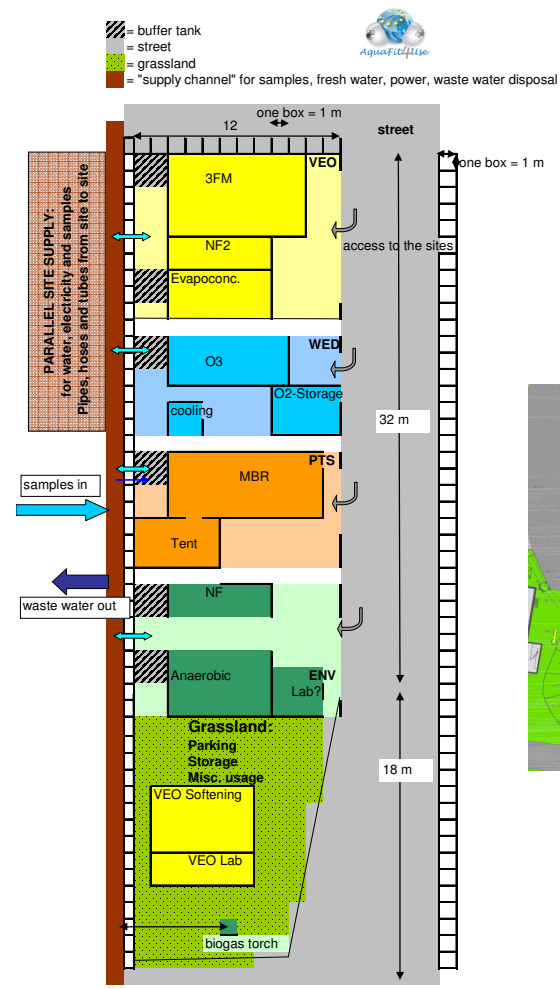
Future Prospects

Extensive pilot trials at Hamburger Rieger Trostberg scheduled for March – September 2011:

- MBR
- Anaerobic treatment
- Filtration
- Membrane treatment
- Ozone treatment
- Evaporation



Water quality for reuse



Logos for Hamburger Rieger, VEOLIA WATER, WEDECO, PTS THE PAPER TECHNOLOGY SPECIALISTS, and ENVIROCHEMIE Technology for Water.