

MSH-a new Process Promotor for improved quality of Mechanical Pulp

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Differentiation*



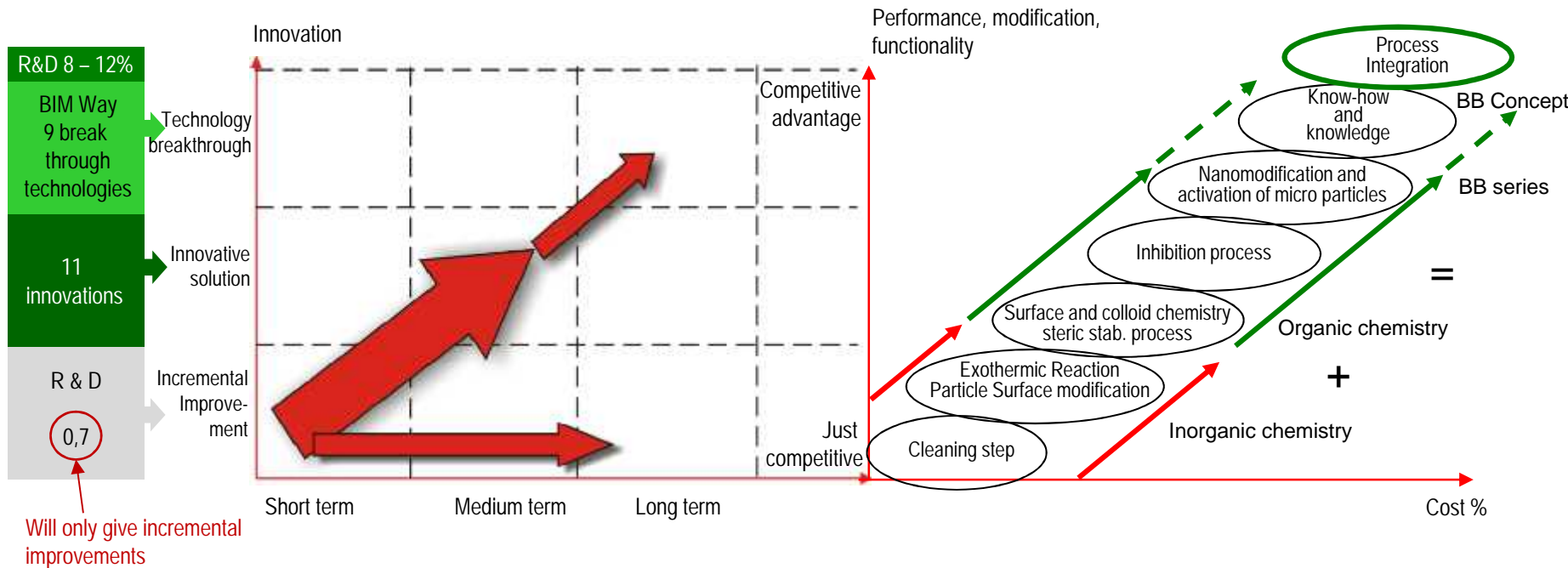
MSH-Magnesium Silicate Hydroxylate controlled release of hydroxyl ions

Real case:

Increased Yield
Lower COD-Pollution
Energy reduction

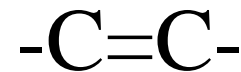
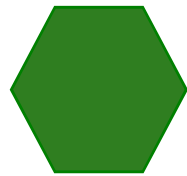
Inorganic and organic chemistry work in synergy
Hardware
 $1 + 1 = 3$

+ Know-how knowledge and process integration
Software
BIM Way = 4



Critical issues for bleaching

- Wood quality (age and type)
- What is causing "colour"?

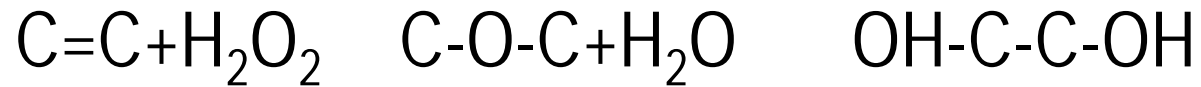


- Optimisation of peroxide activity

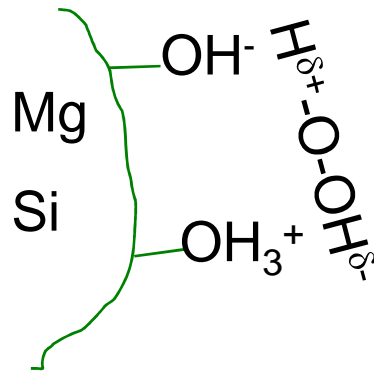
Balance between H_2O_2 and OOH^-

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Reaction of organic matter with peroxide aided by MSH process promoters



- First step critical, second rapid under alkaline and acid conditions
- For the first step, there are two pathways: indirect and direct.



Electrostatic surface-stabilisation of reactive hydrogen peroxide additional mechanism for MSH-based technology

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The Destruction of Value when Upgrading Quality on Mechanical Pulping – Now History!

MSH Process Promotors – Quality, Fibre, Energy and Pollution Program

	Conventional method (caustic/silicates)		New MSH Process Promotors	
	Destruction of value when trying to upgrade quality		Creating value	
Fibre costs	Up	↑	Down	↓
Energy costs	Up	↑	Down	↓
Pollution control costs	Up	↑	Down	↓
Emission of green house gases	Up	↑	Down	↓
Safety of chemical products and their application	Negative		Positive	
Scale (CaOxalate)	Up	↑	(None)	↓
Anionic trash	Up	↑	Down	↓

The use of specialty chemicals have a relatively SMALL IMPACT when we consider pulp and paper production cost structure. However, they have an IMPORTANT part to play in the overall process from furnish to finished products in terms of contribution.

Mikael Rasmusson

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Case 1-Multivariate data analysis

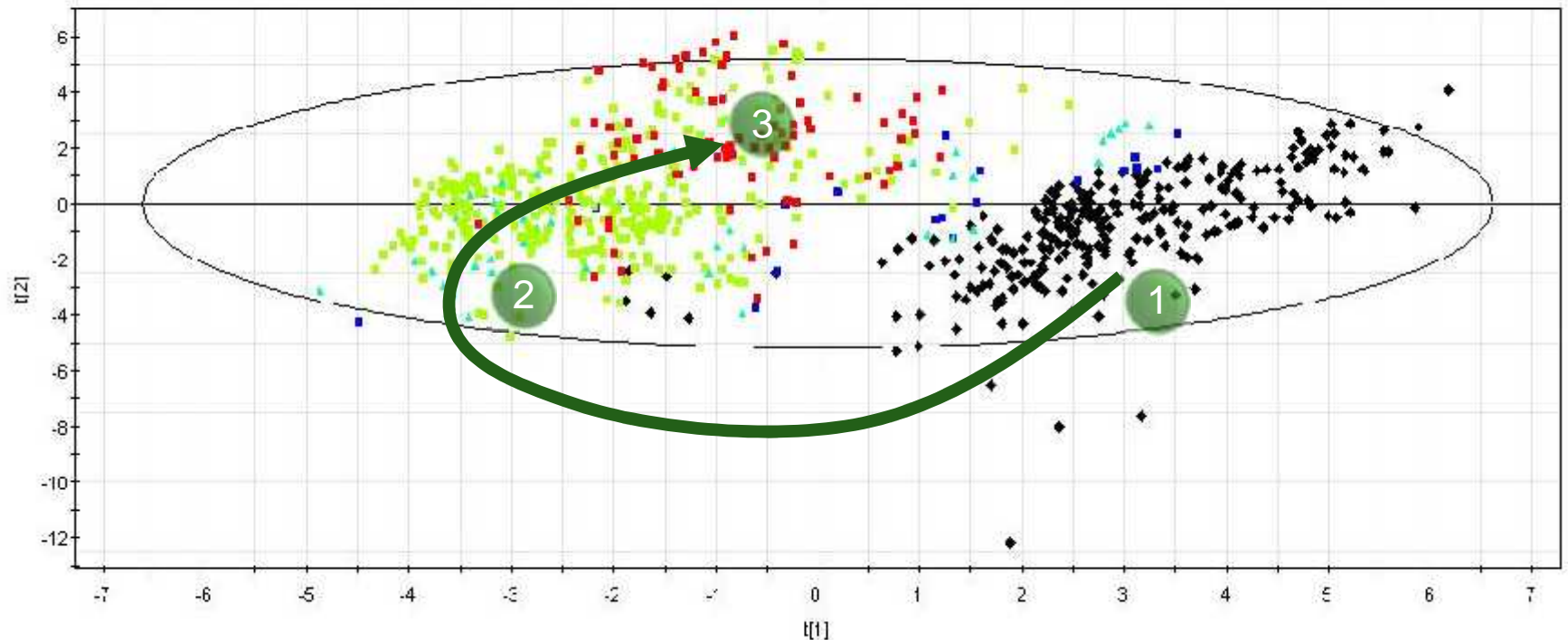
"Fingerprint in time" BoTeVa TMP with/without MSH

Two different technologies.
New possibilities.

TMPSC BIM eng.M1 (PCA-X)
t[Comp. 1]/t[Comp. 2]
Colored according to value in variable TMPSC BIM(Bimbright (kg/ton))

Series (Variable Bimbright (kg/ton))

- ◆ 0,00735651 - 2,34219
- 2,34219 - 4,67651
- ◆ 4,67651 - 7,01084
- 7,01084 - 9,34517
- 9,34517 - 11,6795



F2X[1] = 0,259231 F2X[2] = 0,159942
Ellipse: Hotelling T2 (0,95)

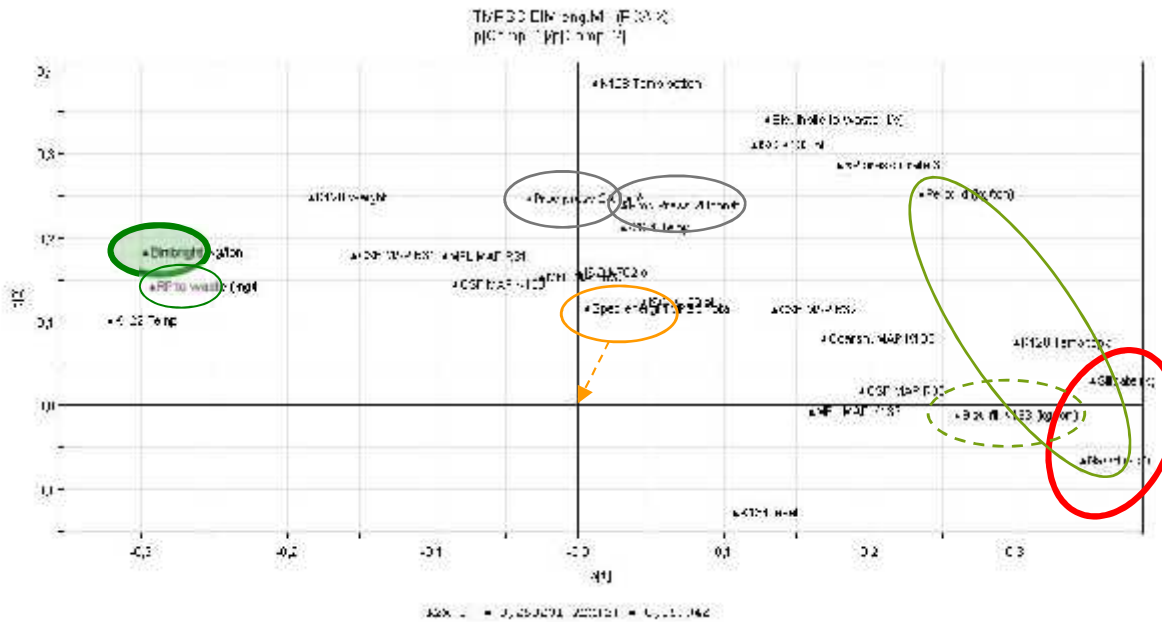
TMP – one year follow-up

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The X-axis shows the major trends (by definition)

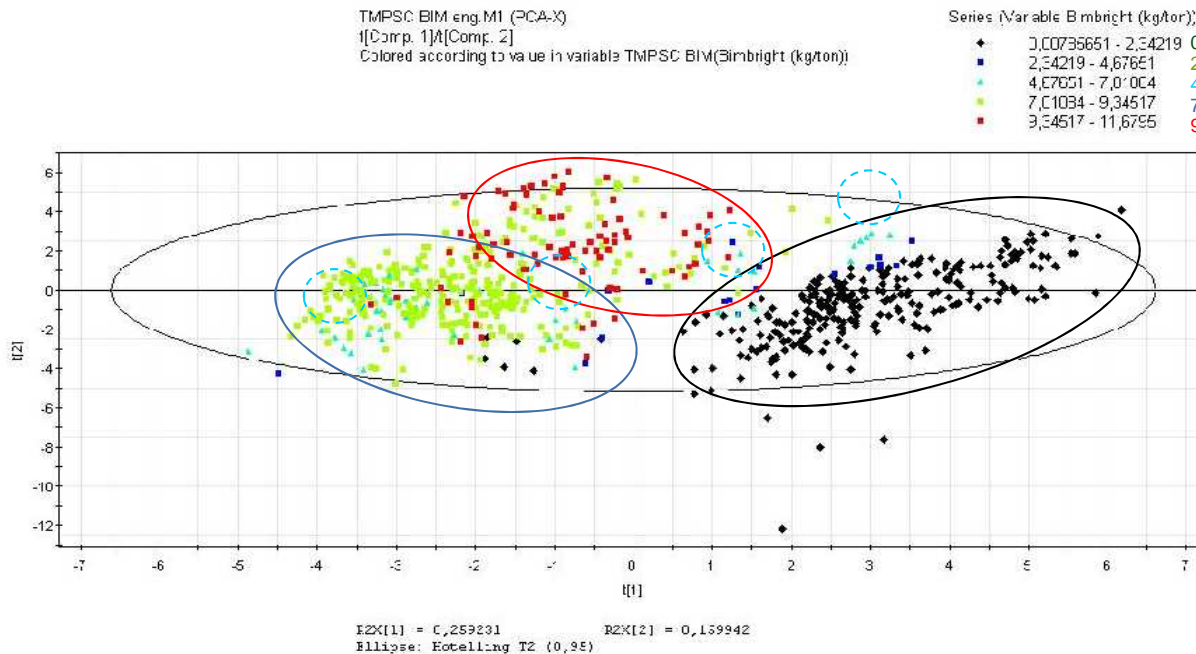
Fingerprint of TMP Process with/without MSH



Process Parameters
TMP – SC – Boteva
analysis.
BIM

1 year test data, 3 times/day

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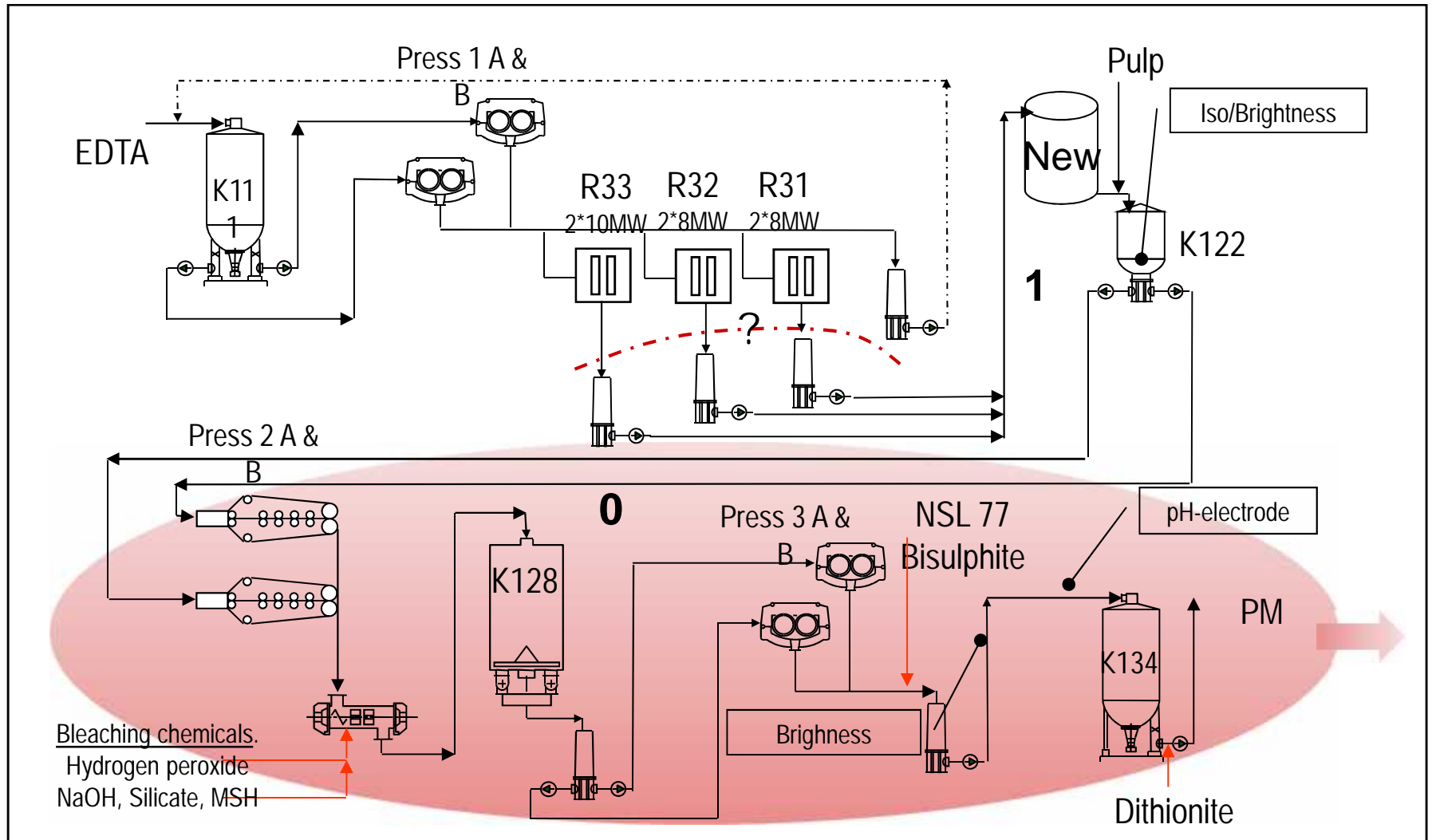


1 year test data, 3 times/day



TMP/SC

MSH Step One

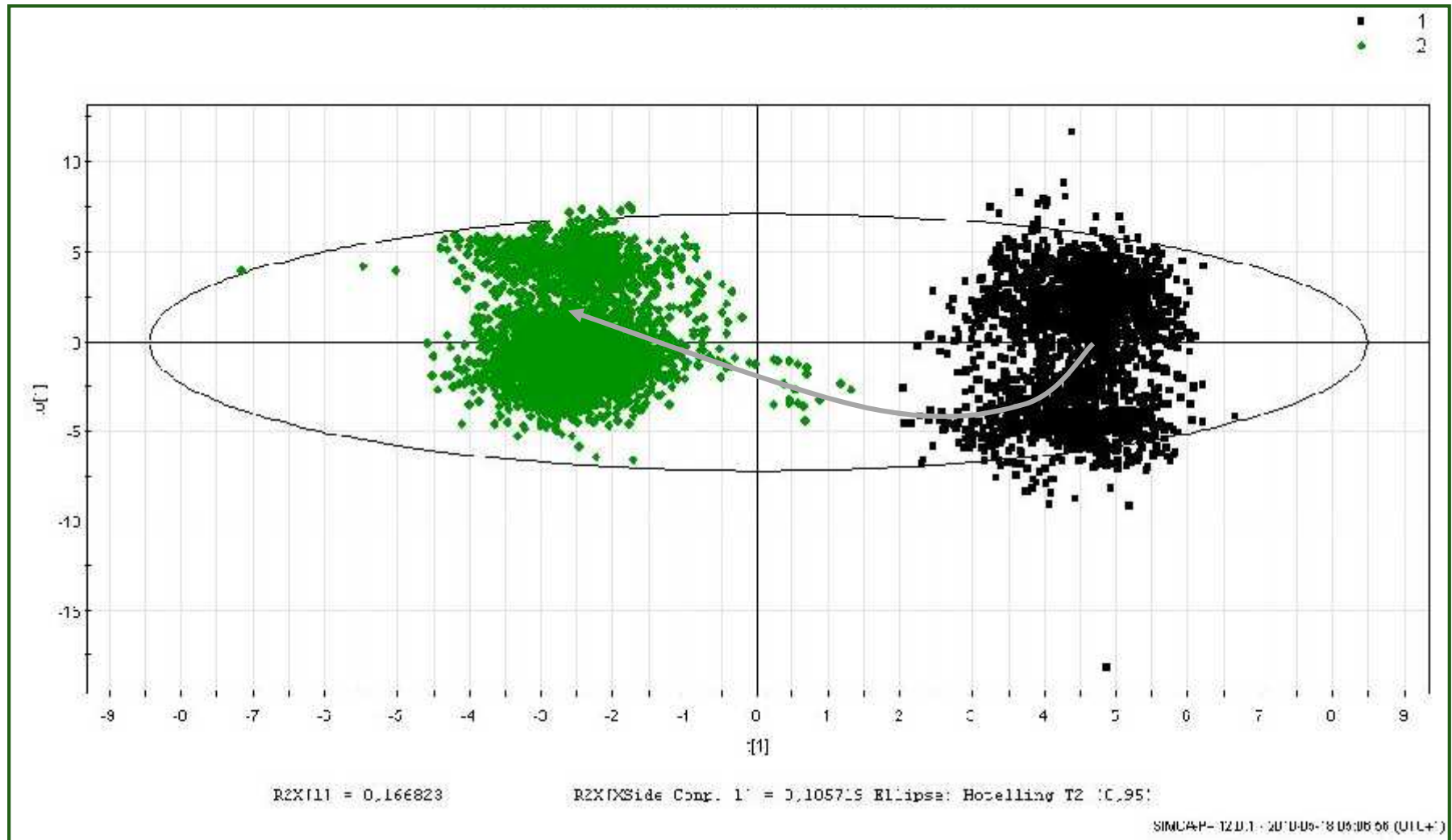


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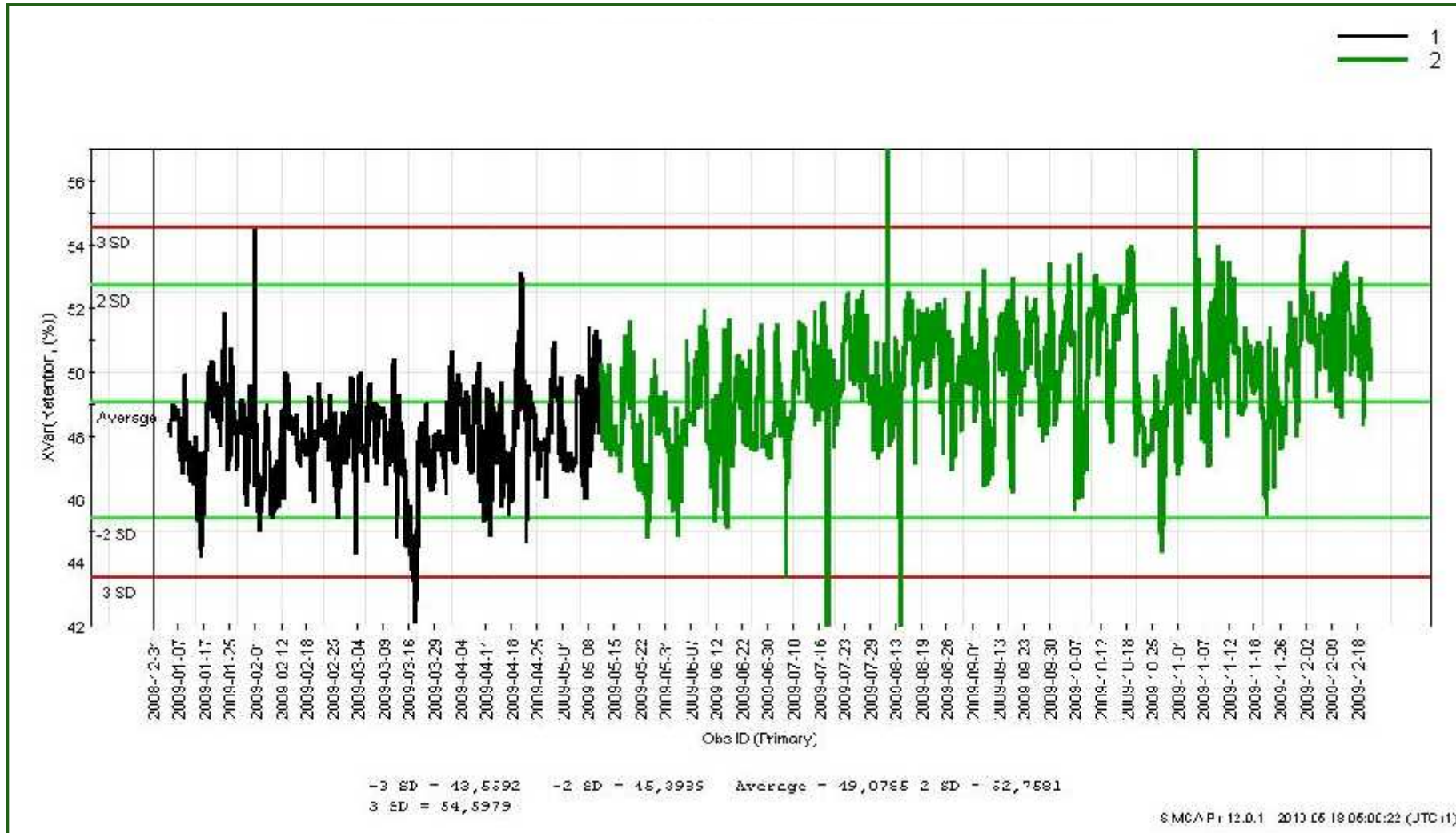
Fingerprint with/without MSH, PM

Two completely different backwater systems with impacts on both the tensile of the paper machine and paper quality



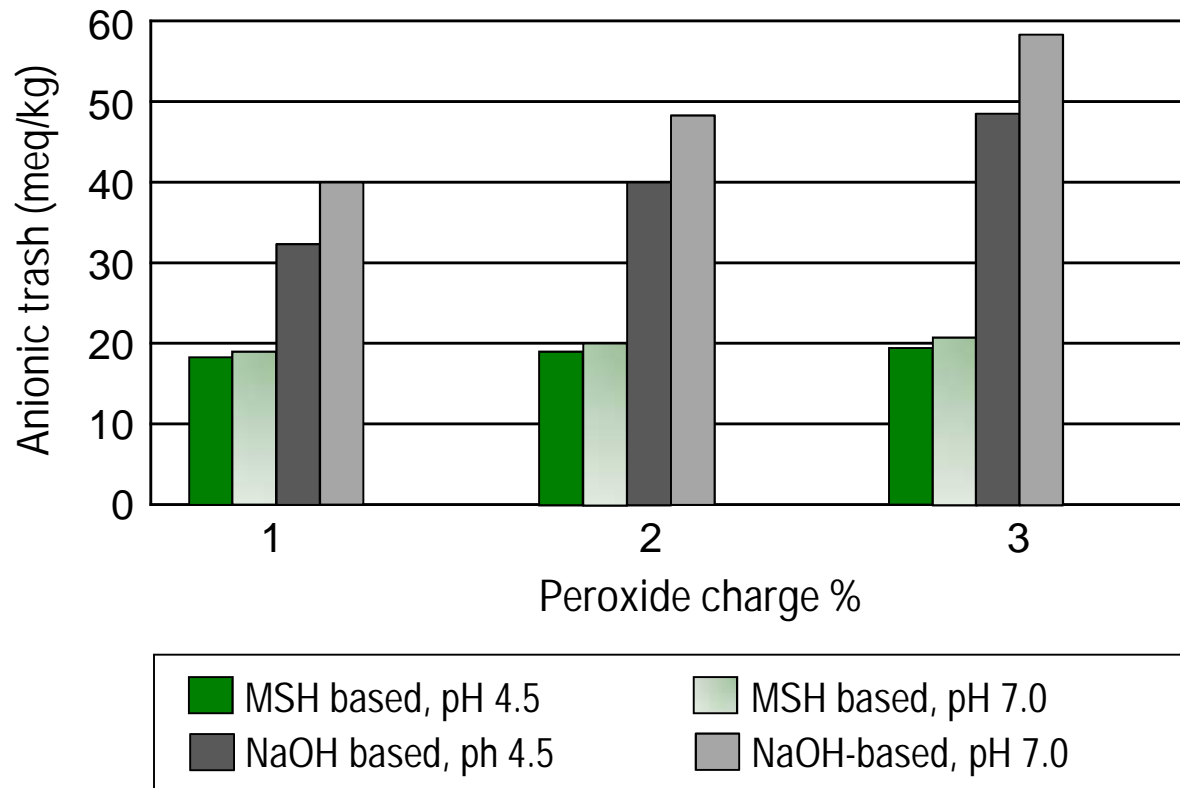
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Total Retention PM (Improved)



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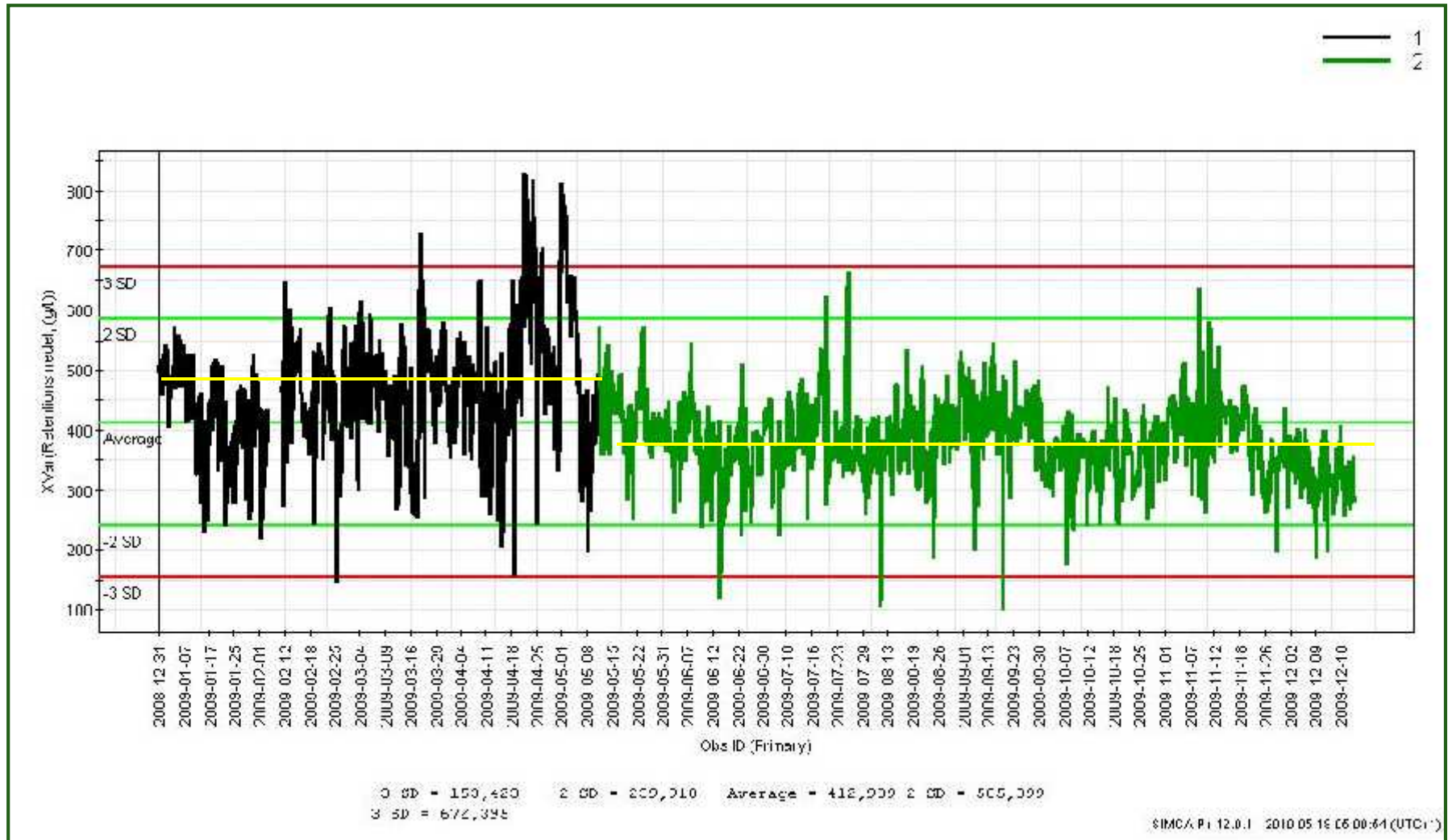
Formation of Anionic Trash



“50 to 60% less anionic trash generated from MSH based process”

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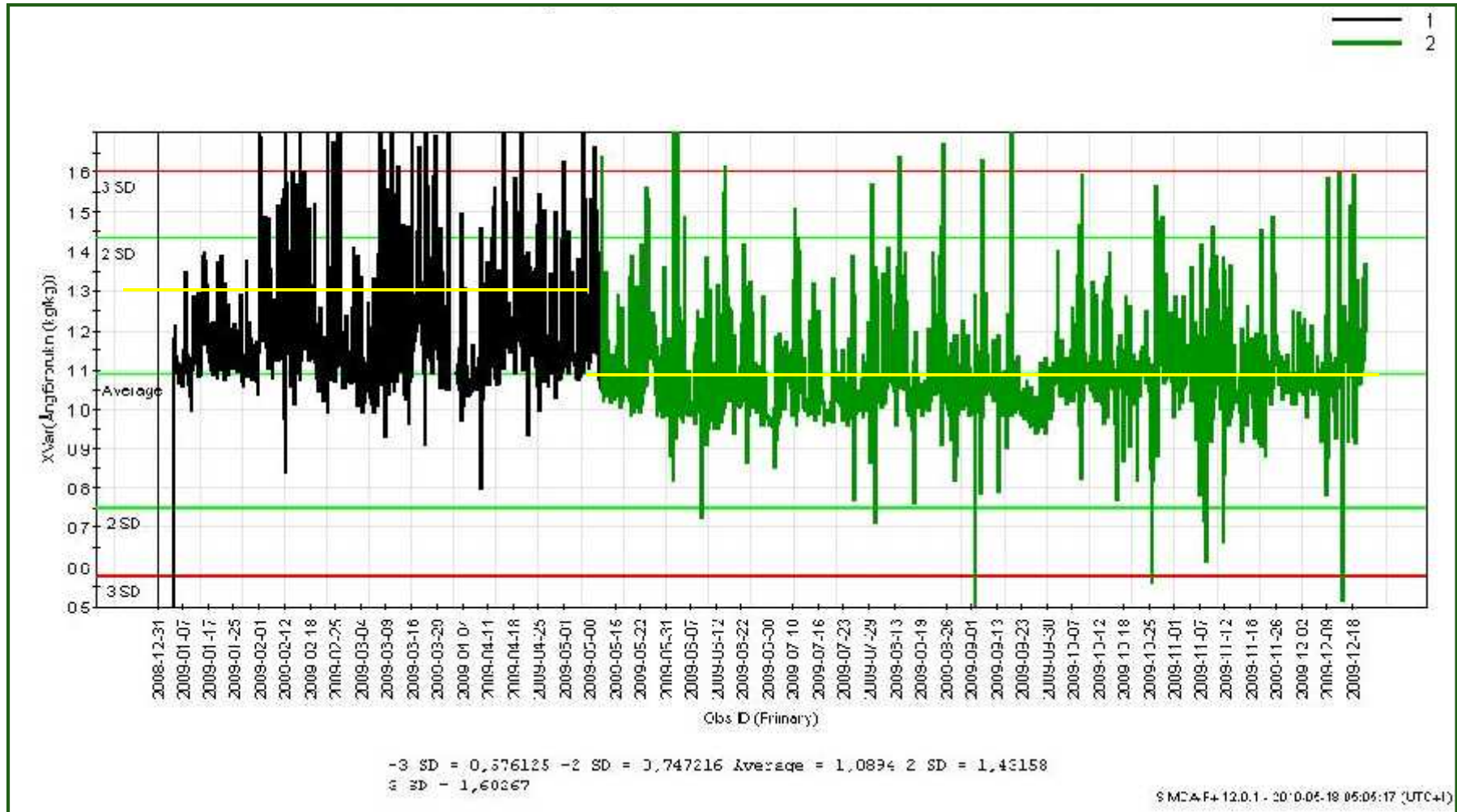
Consumption of Retention Agent – g/ton (Lower - 20%)



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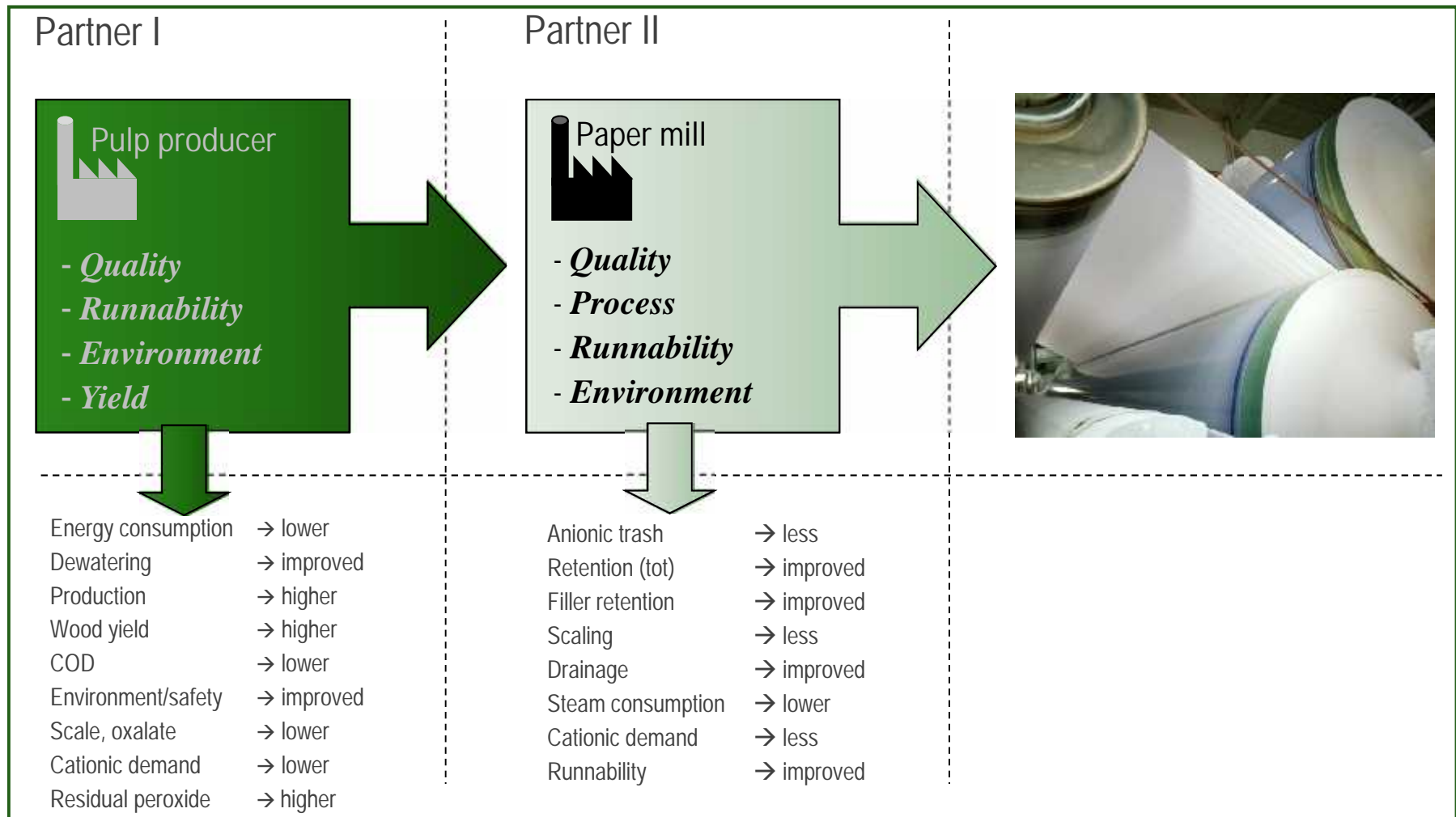


Steam Consumption (Lower -15%)



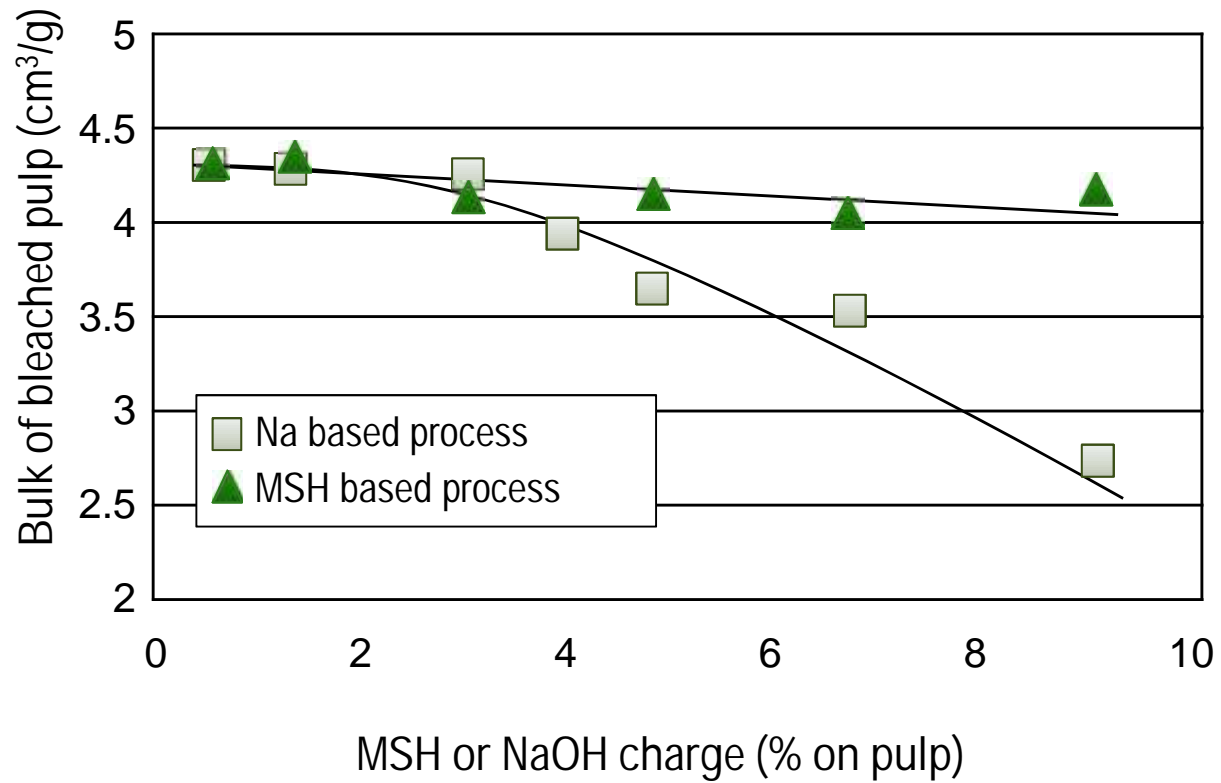
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BIM MSH Process Promoters Impact on the Value-chain



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Bulk – New possibilities



“Where Na-based process loses bulk, using MSH not”

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Summary (after 2 years of collaboration)

Peroxide

- *25% reduction*

Sodium Silicate

- *60% reduction*

Sodium Hydroxide

- *80% reduction*

Dewatering

- *Production 2nd press increased capacity*

Acidification

- *Less demand*

COD

- *30% reduction*

Higher yield

Anionic trash

- *50% reduction*

Less need for fixative

Filler retention

- *50% increase*

Less loss of brightness

- *Decreased by 2 ISO-units*

Dithionite

- *Not used anymore*

Quality improvement PM

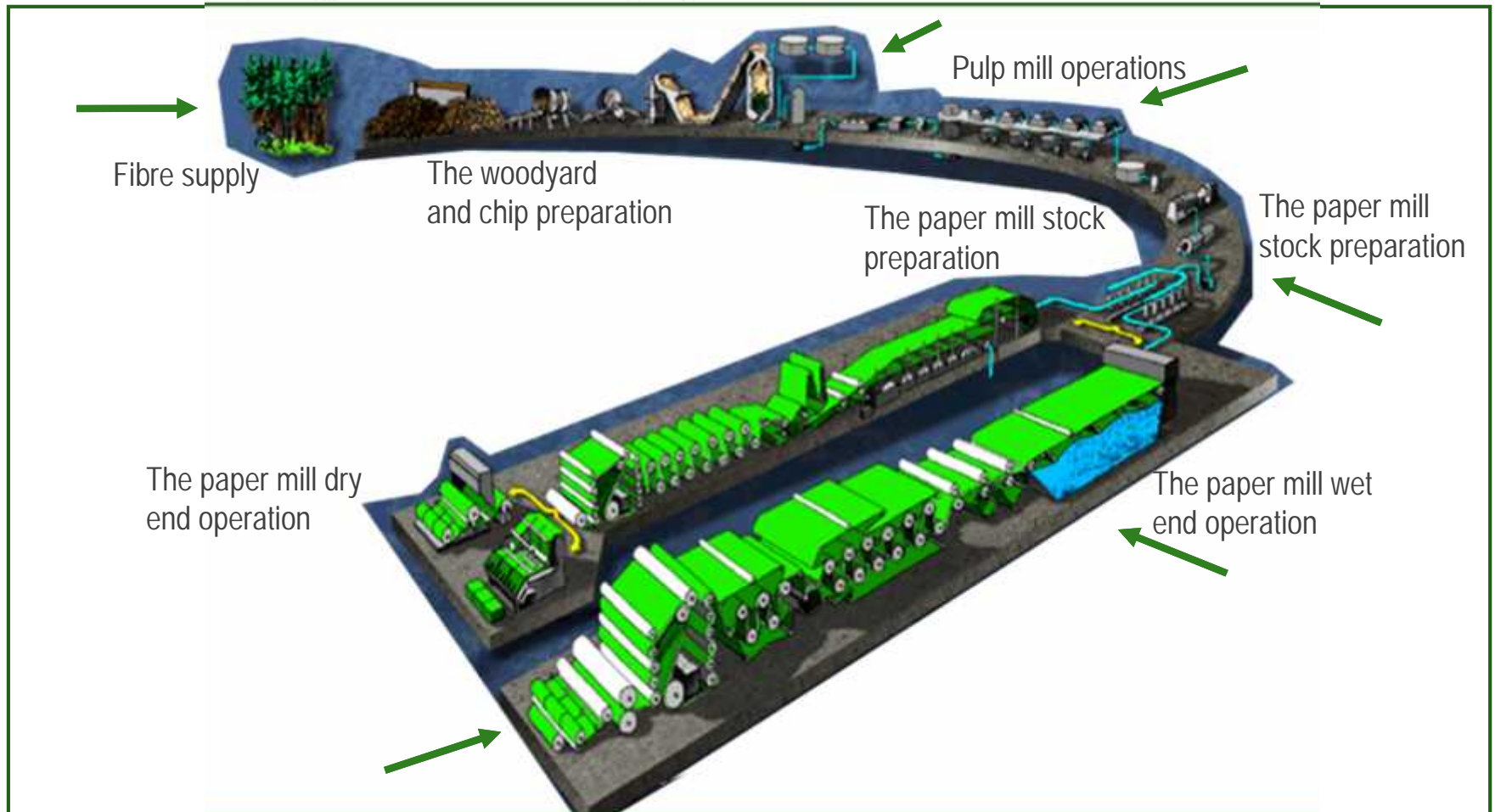
Brightener PM

- *Less demand*

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BIM's MSH Process Promoters have an impact on both Runnability and Quality...

...from the pulp mills to the paper machines



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