Värmlands Ingenjörsförening

Valmet Karlstad

2016-10-27

Hans Olsson

Stefan Antonsson

Program

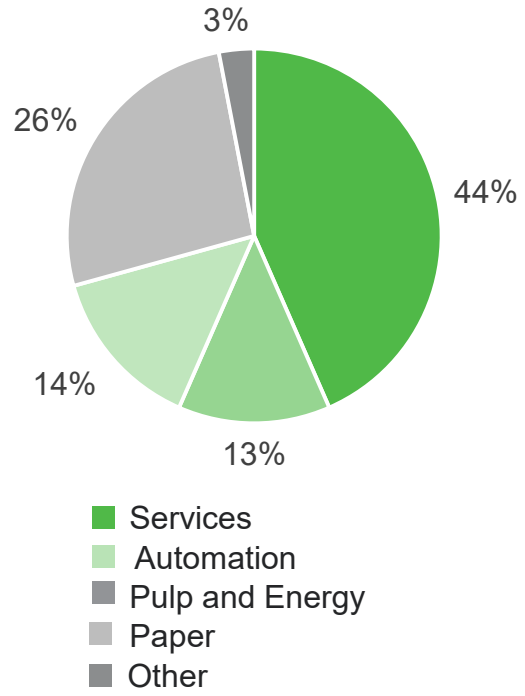
- Valmet
- Valmet i Karlstad
- Trender i branchen
- Exempel på projekt
- Rundvandring i Valmets laboratorium

12,000 professionals serving customers globally

Systematic development with global training portfolio:

- Champions in Services
- Networking in Procurement
- Leading through Lean
- Agility through Sales
- Excellence in Project Management
- Fast Forward
- Forward Strategy

Personnel by business line:



Valmet's Technology and Services Offering

Converting renewable resources into sustainable results to create the future

End-products

Biogas | Biofuels | Biochemicals | Biomaterials | New paper grades

Heat | Electricity | Diss pulp | Chem pulp | Mech pulp | Paper | Board | Tissue

Valmet technologies and solutions

Raw materials

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Pulp and Energy's global presence

1700 professionals at our customers' service

*) approximate number, in the end of February 2014

Valmet i Karlstad

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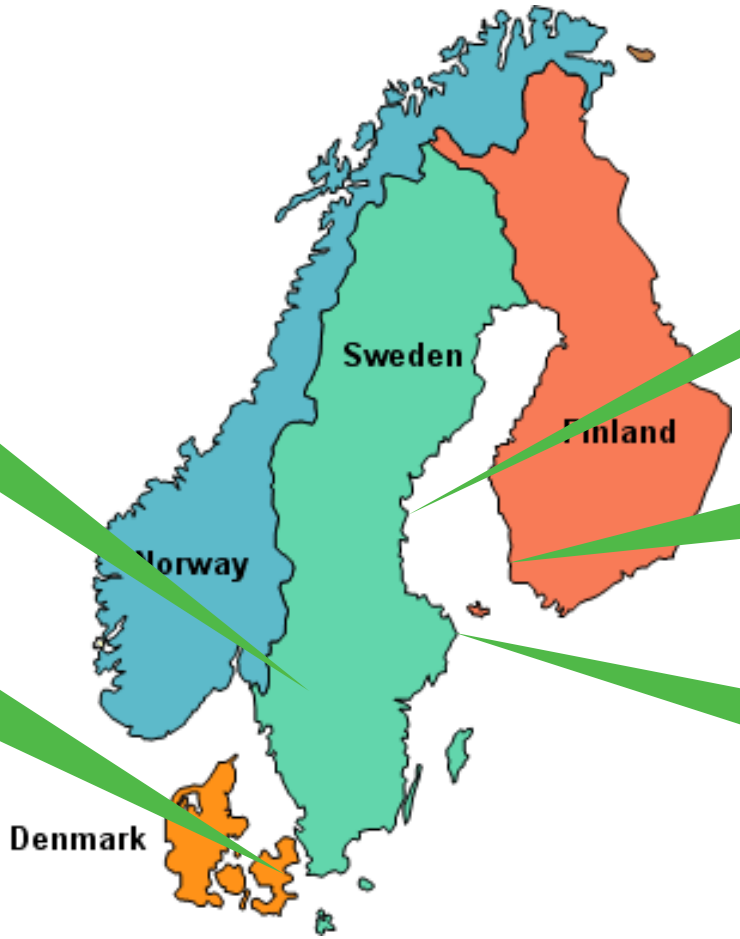
FPU operations in Sweden, Finland and Denmark



Karlstad
Continuous cooking & Recausticizing

Sundsvall
Fiberline, Fiberboard & Mechanical pulp

Ulvila (Pori)
Batch cooking

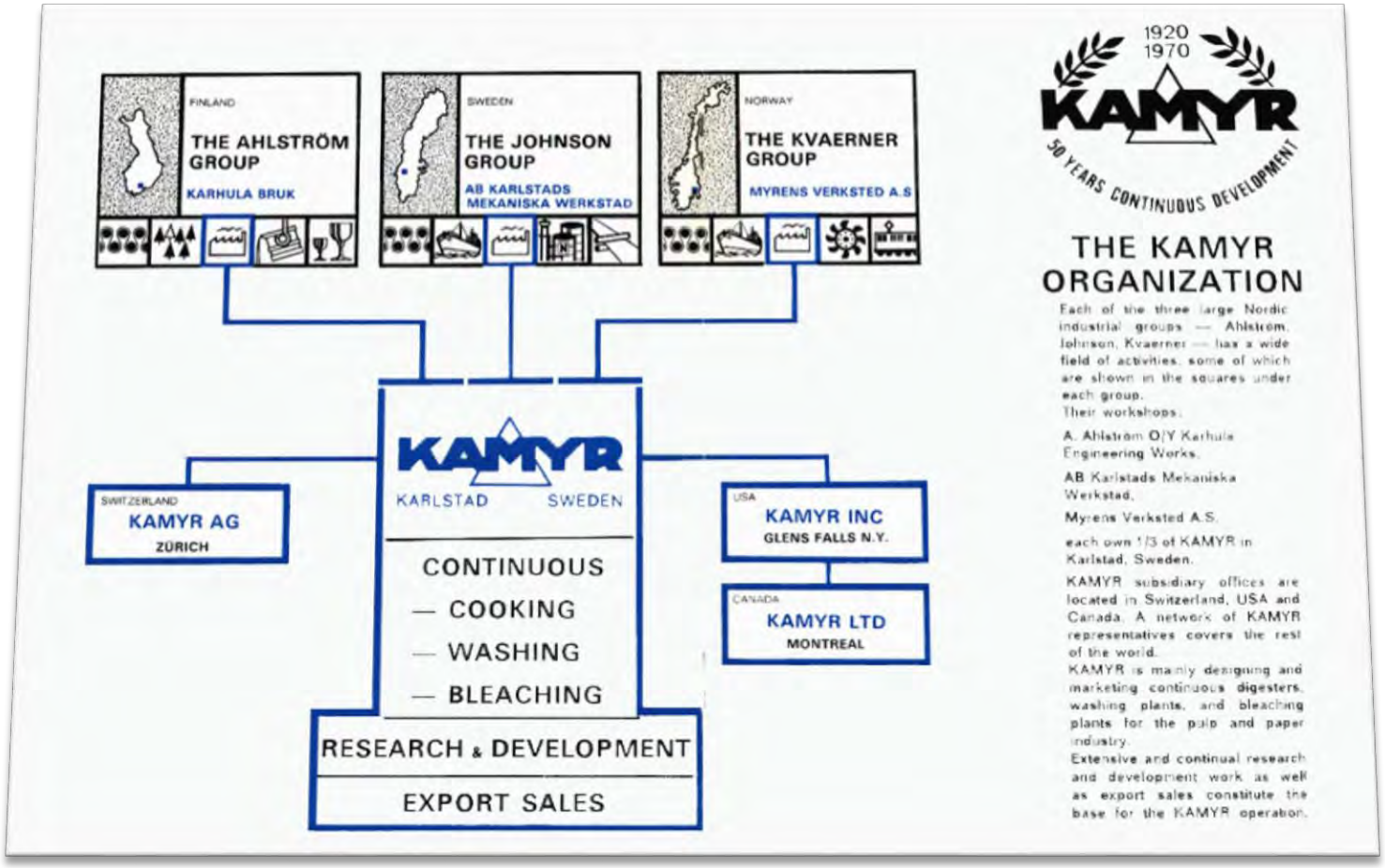
Copenhagen
Lime kiln

Solna (Stockholm)
Mechanical pulp & Pulp mill

Välkommen till Sommarro – en del av Valmets Fiber Processing Business unit

- Process design
- Plant engineering
- Machine design
- Sales/Technical Sales
- Cost estimation
- Project management
- Supply management
- Laboratory
- SER (MIL and Spares)

Valmet continuous cooking system origins from Kamyr technology



History - Valmet Fiber in Karlstad

1920 Kamyr AB established

1933 A Ahlström Oy acquires part of Kamyr

1986 Kamyr acquires the cellulose division of KMW and names it Kamfab AB

1997 Caustec/Hedemora part of Kvaerner

1994 Kamyr AB becomes Kvaerner Pulping AB

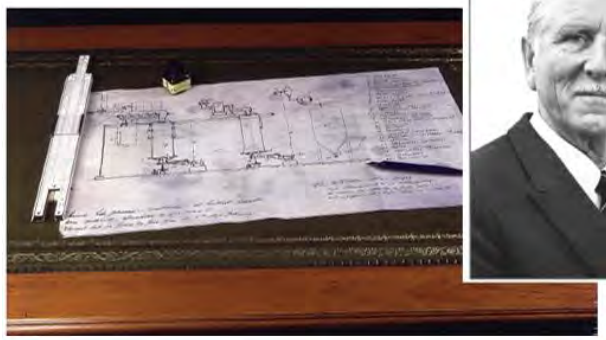
2007 Metso acquires Kvaerner Pulping and Metso Fiber Karlstad is created. “WOB” sold to GLV

2011 Metso Fiber Karlstad AB merged with Metso Paper Sundsvall AB

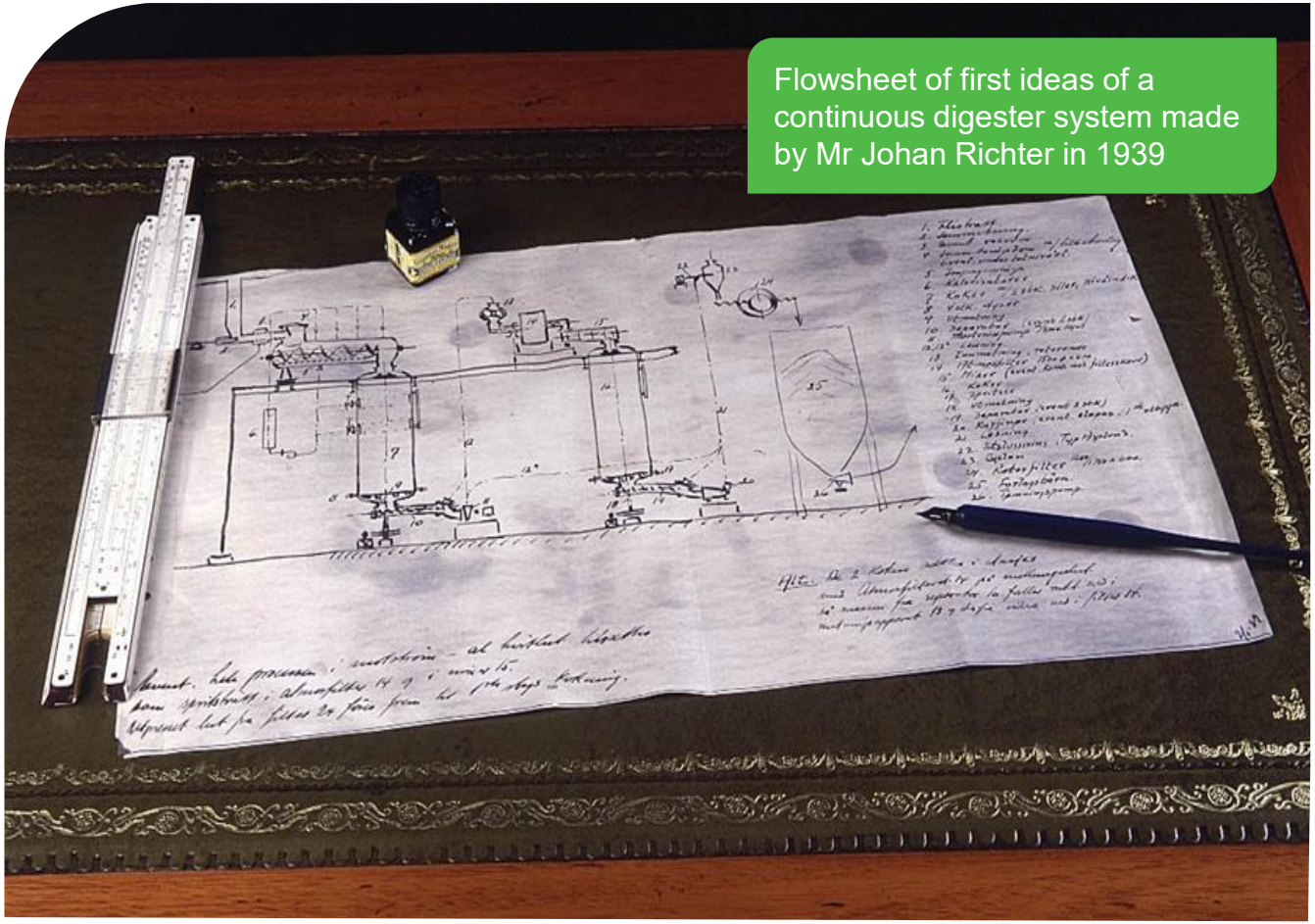
2013 Metso Paper Karlstad AB is merged into Metso Paper Sweden AB. FLS pulp- and paper business acquired.

2014 Metso Paper Sweden AB is renamed Valmet AB

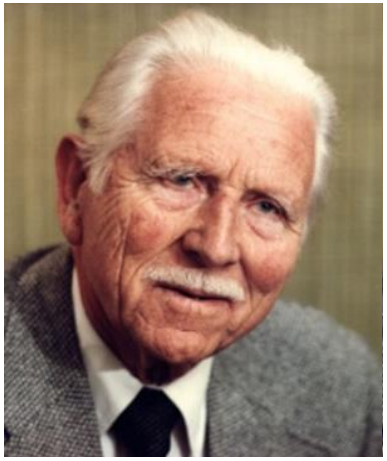
Flowsheet of first ideas of a continouos digester system by Johan Richter in 1939

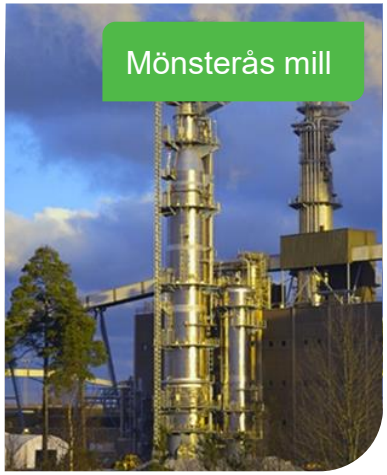


Valmet and its predecessors have a long history of developing continuous cooking systems



Flowsheet of first ideas of a continuous digester system made by Mr Johan Richter in 1939





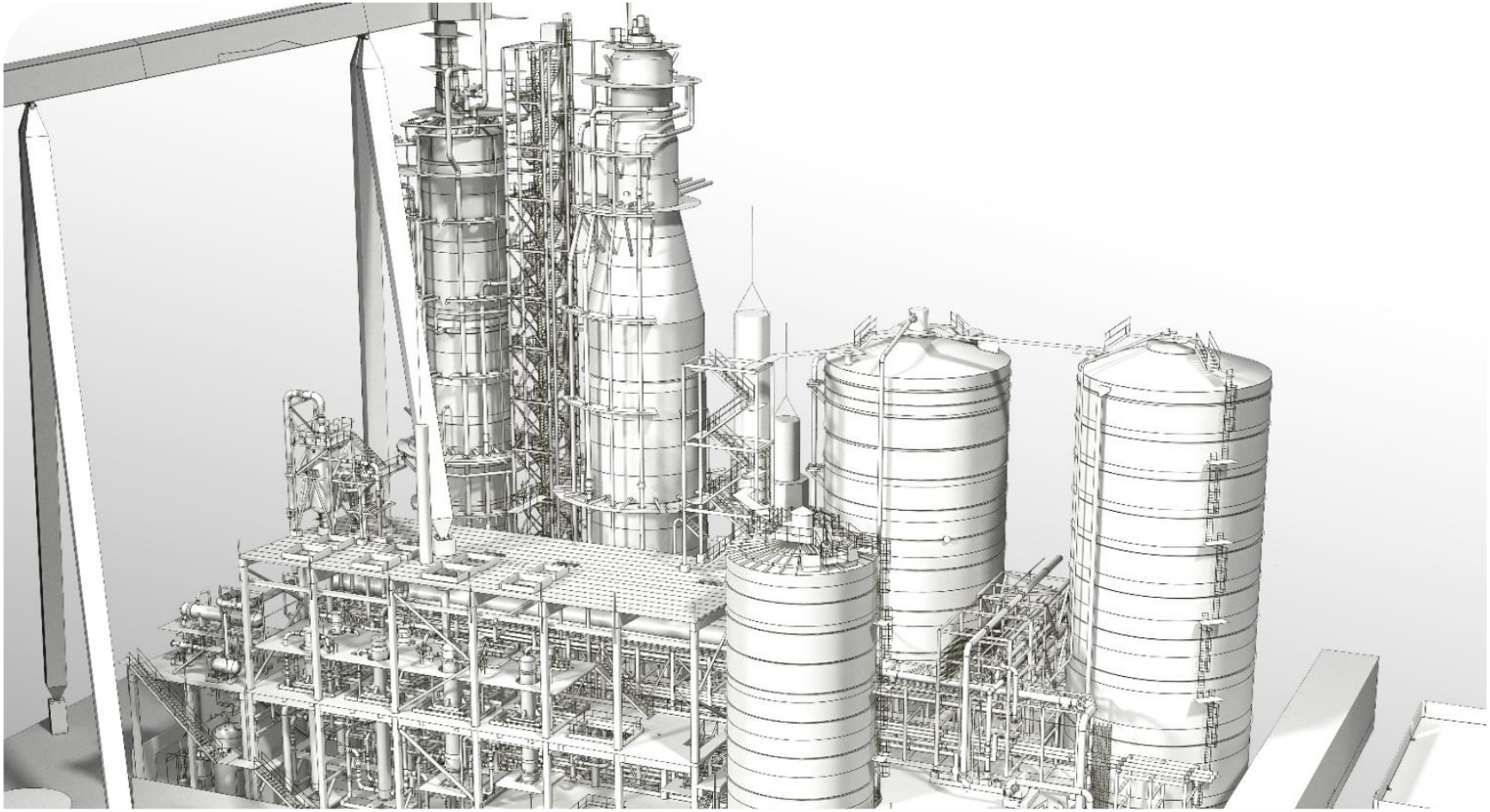
Mönsterås mill

Valmet

The pilot plant in Karlsborg and the first commercial continuous cooking plant in Fengerfors

CompactCooking™

Typical layout



CompactCooking™

Installation view

Valmet Sundsvall

Located in Sundsbruk

- 410 employees
- Technical experts in Pulping & BIO
- Fiber Technology Center
  - Pilot, Bleaching & Analysis Laboratory
- Manufacturing workshop
- Service hub and workshop
- 24-7 Services from the Service Center

The workshop

- Specialized in high alloy materials, complex welding and machining
- Highly skilled own manning, totally 92 persons
- Large network of external resources ensures flexibility (+150)
- Close co-operation with design and project departments

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Trender

2016-10-27

Hans Olsson

Stefan Antonsson

Skog – en av våra mest betydelsfulla naturtillgångar

Massa & Pappersindustrin
- en del av kretsloppet

Wood

Annual plants

Saw mill chips

Closed chemical cycle

Generation of green energy

Biomass power plant

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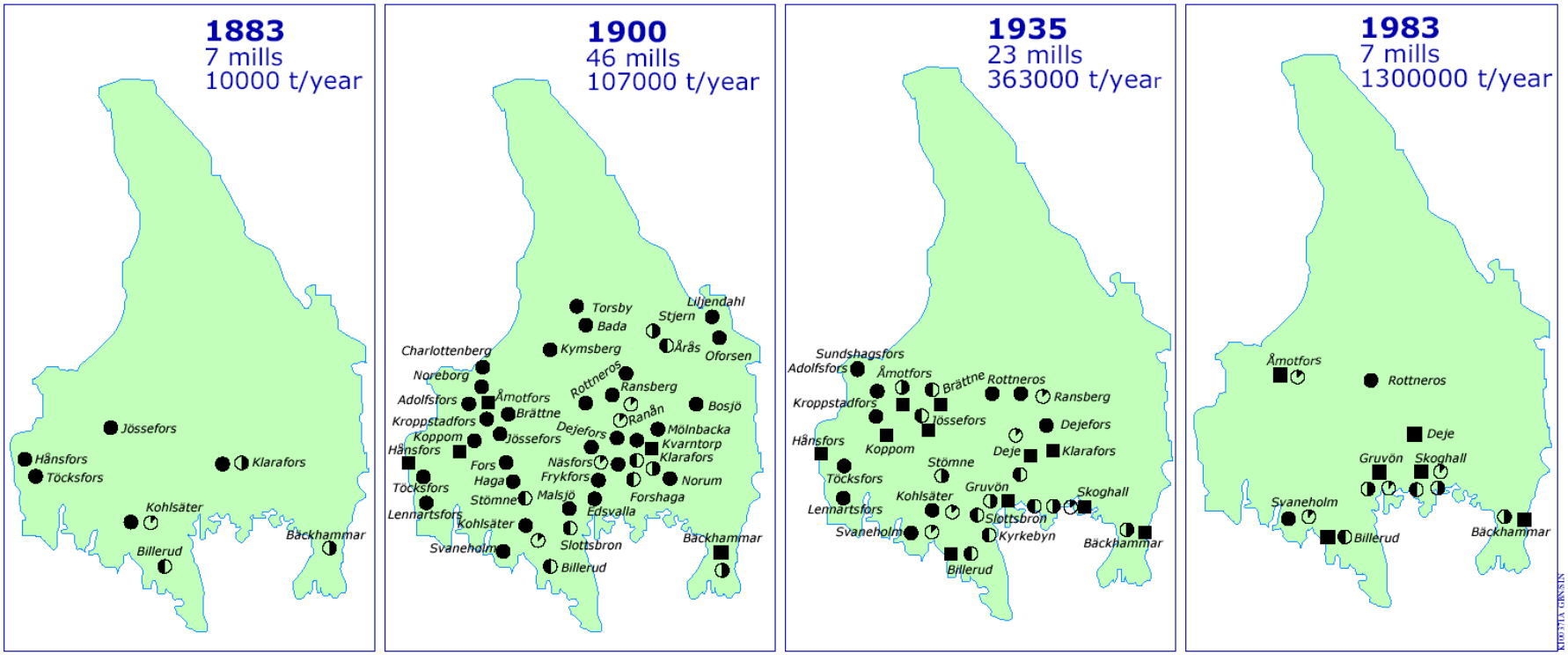
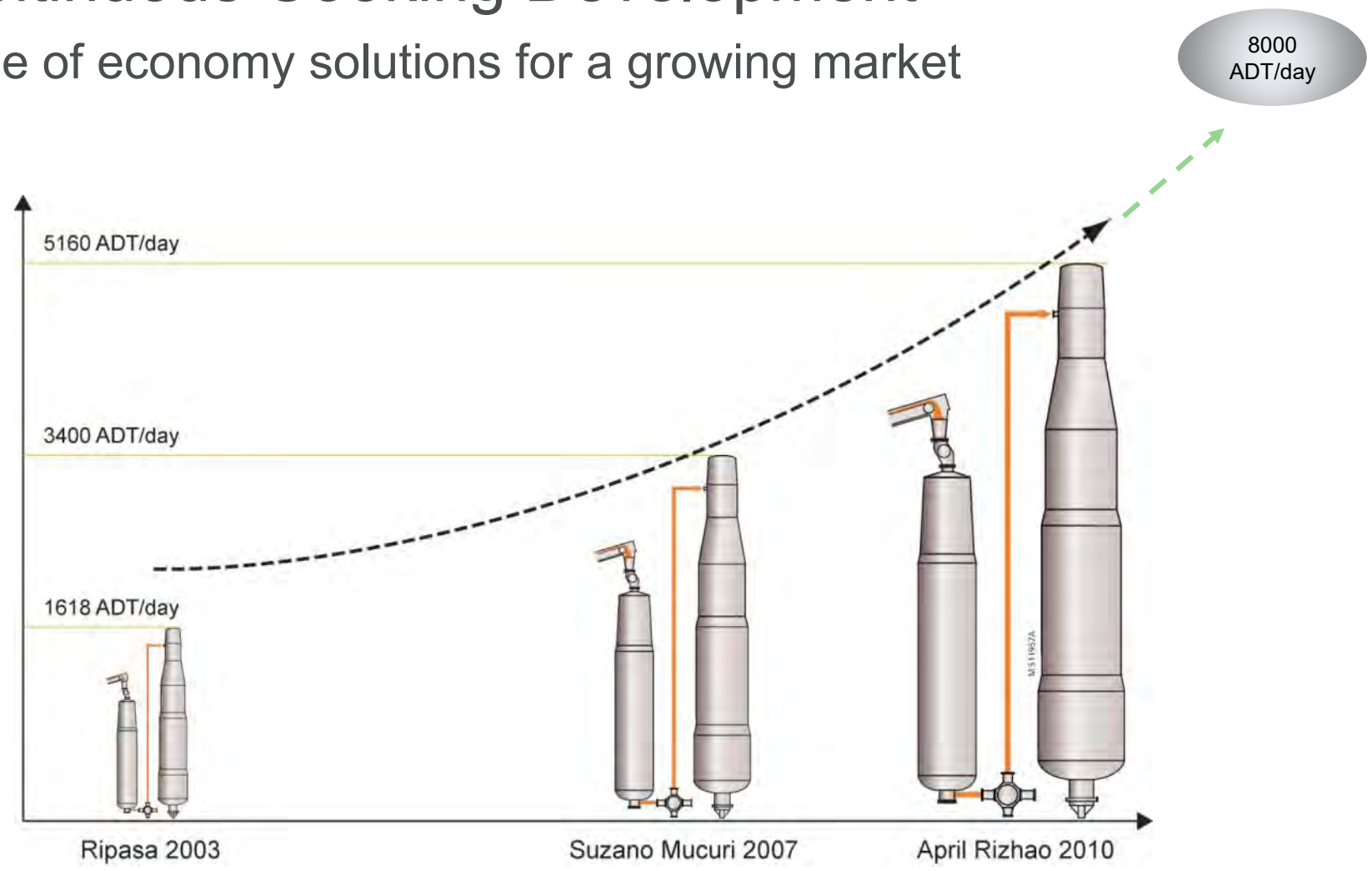
Utvecklingen av massa och pappersbruk Värmland

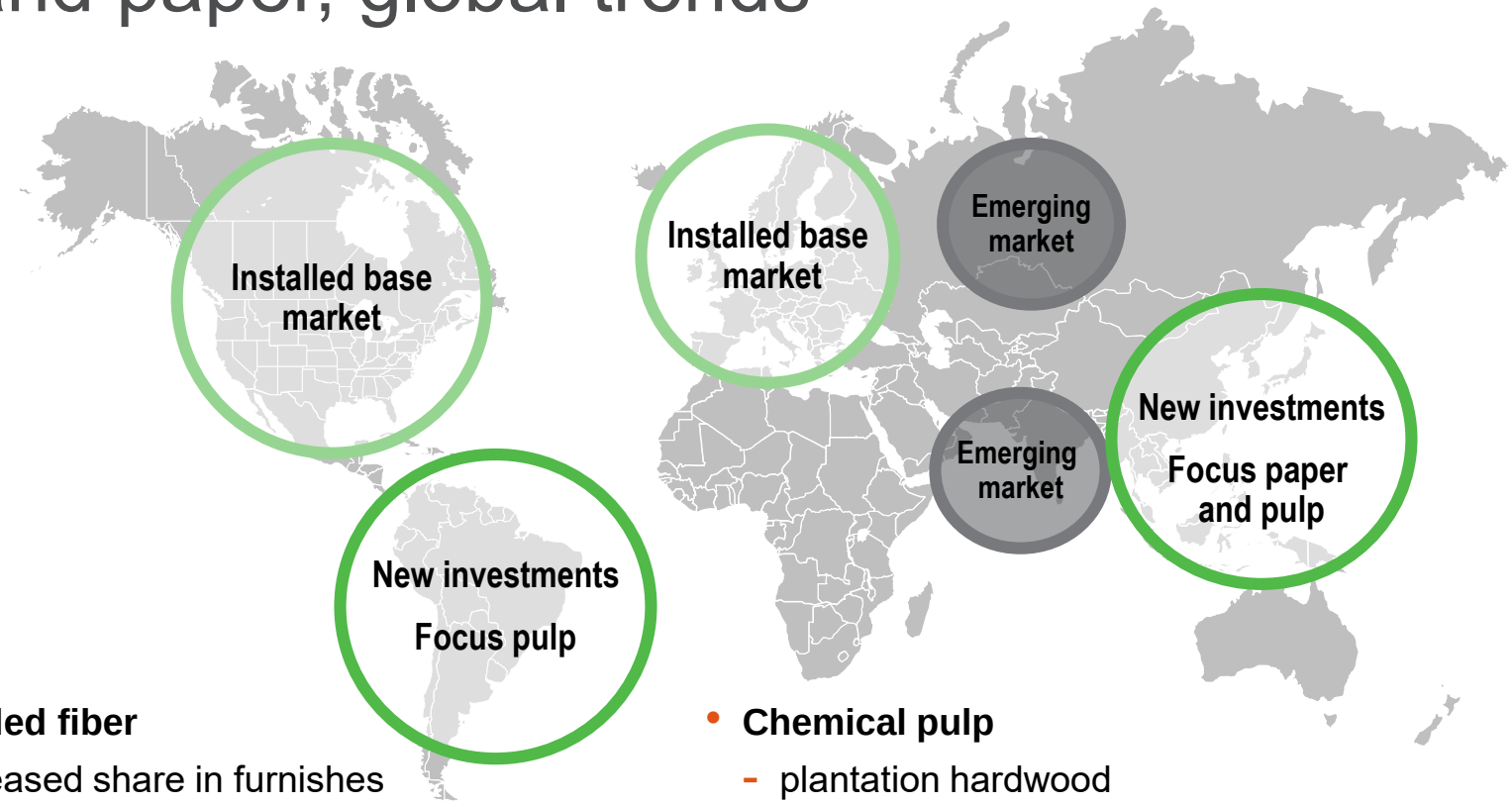


Continuous Cooking Development

Scale of economy solutions for a growing market



Pulp and paper, global trends



- **Recycled fiber**
  - increased share in furnishes
  - increasing quality (brightness)
- **Papermaking**
  - large production lines for bulk grades
  - smaller lines for emerging markets
  - lower energy consumption
  - less effluent
- **Chemical pulp**
  - plantation hardwood
  - large single lines, 5,000 – 6,000 ton/d
- **Mechanical pulp**
  - possibility to replace kraft pulp content in some grades
  - hardwood as raw material

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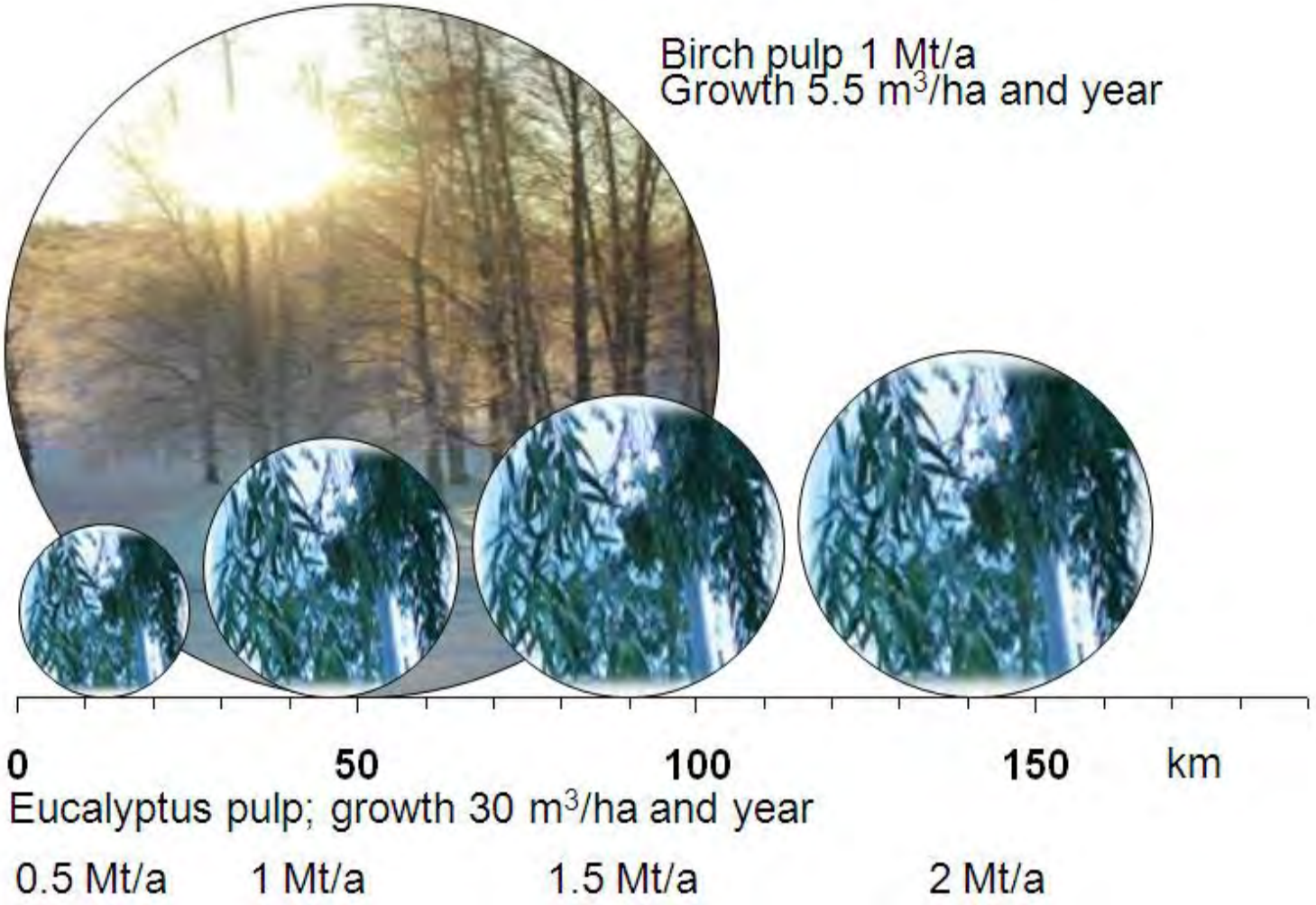
Land areas required for hardwood plantations in Brazil and the Nordic countries



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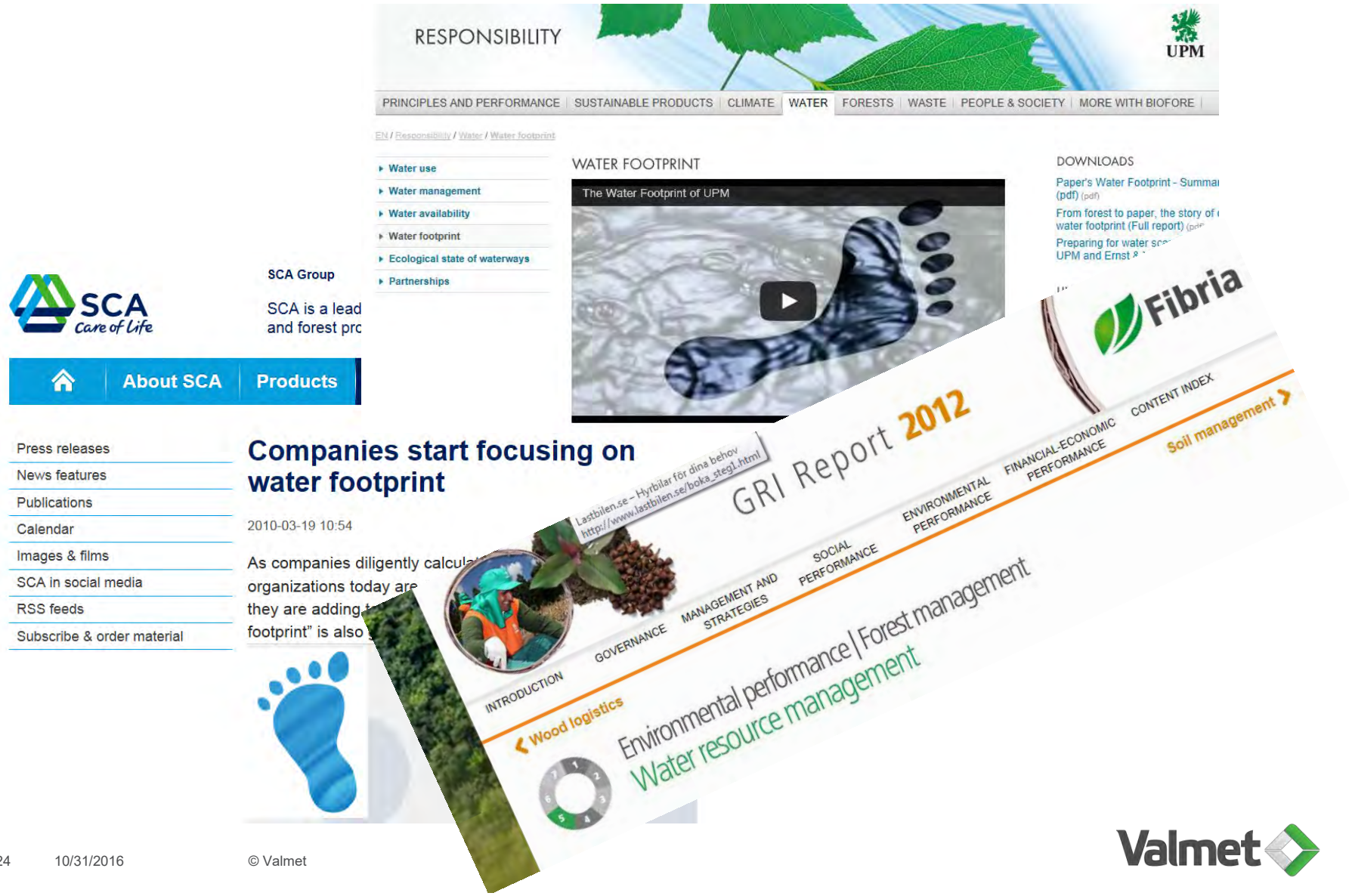
Water footprint already starts to be established



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En produktportfölj för framtida utmaningar

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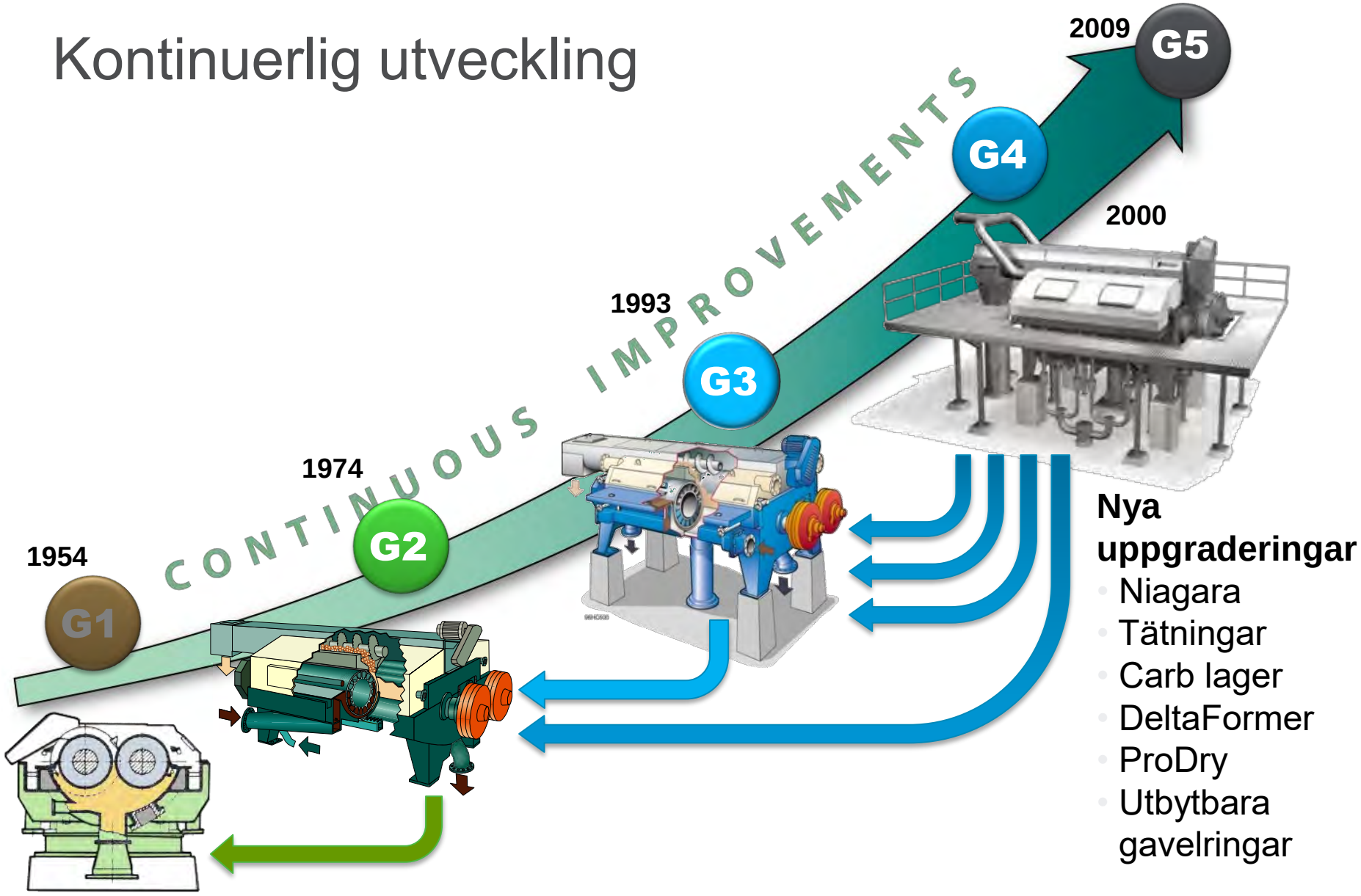
Kontinuerlig utveckling



Nya uppgraderingar

- Niagara
- Tätningar
- Carb lager
- DeltaFormer
- ProDry
- Utbytbara gavelringar

Valmet

Olika förutsättningar olika teknologier

Miljöpåverkan bromsar bomullsproduktion
Ny era för dissolving

Abhishek Indien

Världen största fiberlinje baserad på årsväxter

Nya marknader 1(4)

Nya marknader 2(4)

Nya marknader 3(4)

Nya marknader 4(4)

Nanping PM5

Newsprint Machine
Nanping PM 5

Wire width	6100mm
Design speed	1600m/min
Grade	newsprint

Valmet

Pulp mill as a core of a bio product mill

Äänekoski, Finland– Biorefinery mill. Release may 2014.

Metsä

Metsä Group plans to build a next-generation bio-product mill in Finland

Metsä Group Stock Exchange Release 23 April 2014, at 9.50 am EET

Metsä Fibre, part of Metsa Group, is planning to build a bio-product mill in the existing mill area in Äänekoski, Finland. When materialized, the approximately EUR 1.1 billion investment would be the largest ever investment in the forest industry in Finland. The new mill with an annual pulp production capacity of 1.3 million tonnes is planned to be operational in 2017.

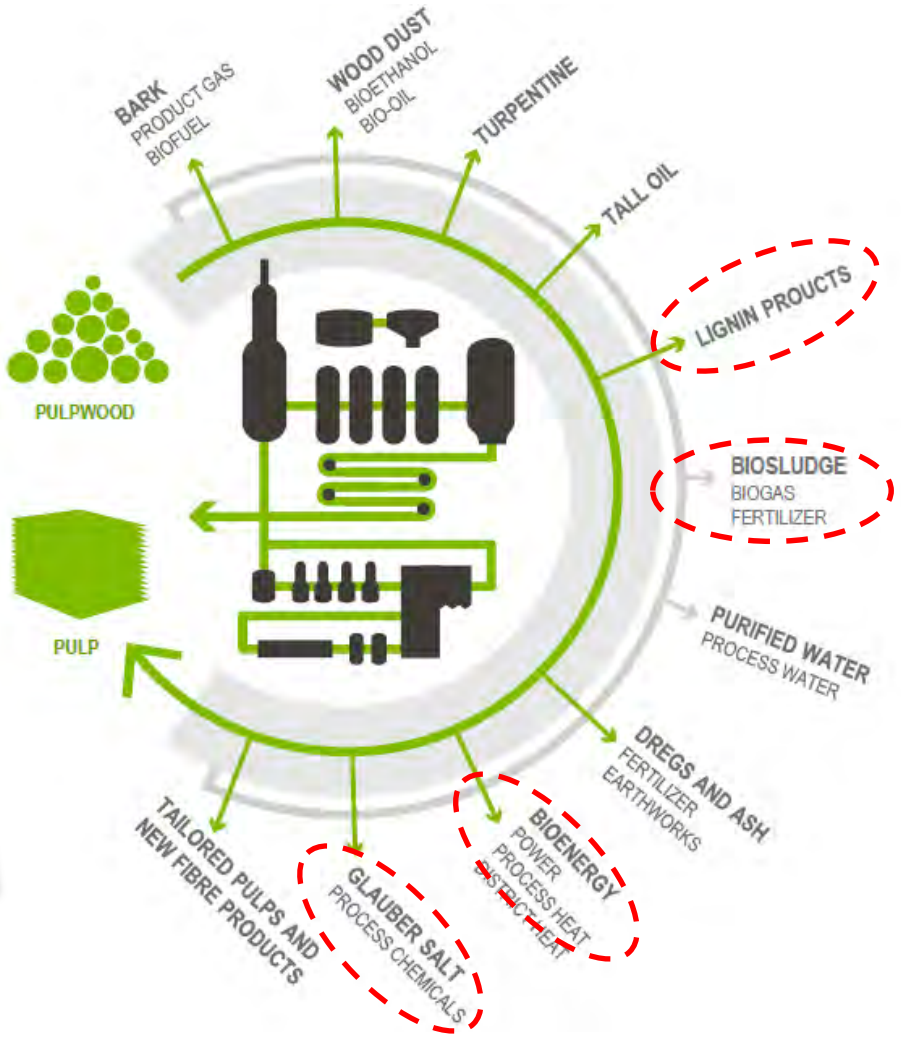
The new mill will be the world's first next-generation bio-product mill that can convert wood raw material into a diverse range of products. In addition to high-quality pulp, the mill will produce bio-energy and various bio-materials in a resource-efficient way. A unique bio-economy ecosystem of companies will be built around pulp production.

The annual impact of this investment on the Finnish economy will be over EUR 0.6 billion and it will provide 2,500 jobs in the forest industry value chain. The annual increase in the value of exports is estimated to be EUR 0.5 billion.

"Our new mill will be the most efficient and modern bio-product mill in the world. The global increase in the demand for high-quality softwood pulp is the most important driver for the investment, and our aim is to strengthen our leading position in this market. The investment will support Metsä Fibre's growth and improve profitability in the long term," says **Kari Jordan**, President and CEO of Metsä Group. "In addition to the Environmental Impact Assessment (EIA) and environmental permit processes, the development of the world economy and especially the economic development in Asia, market outlook and decisions related to for example wood supply, permits and logistics, will affect the final decision."

The bio-product mill will contribute to achieving renewable energy targets in Finland through increasing the share of renewable energy by approximately two percentage points.

20 % of future mill revenue will come from new products



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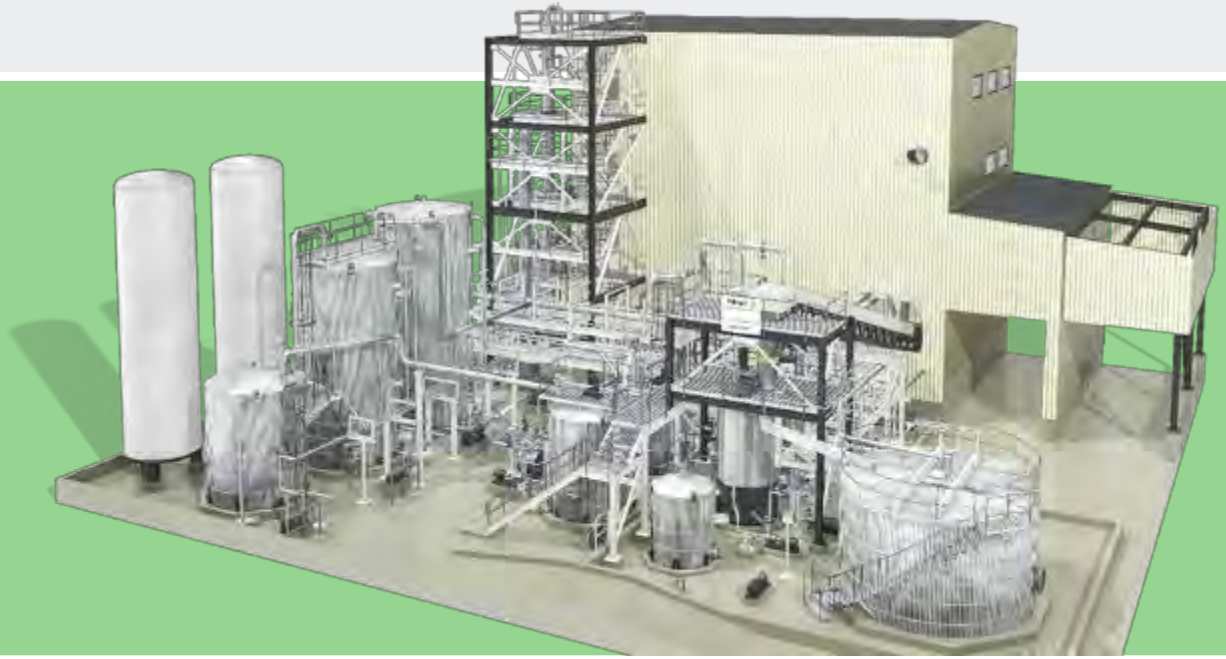
LignoBoost lignin separation technology for pulp mills

LignoBoost separates lignin from kraft black liquor in pulp making

- Reducing the amount of lignin increases pulp production capacity
- Fossil fuels can be replaced with lignin to produce energy
- Lignin can become a new source of income for the pulp mill



High value products from lignin

Some examples

- Dispersants
  - Concrete, Textile dyes

- Resins & Binders
  - Board
  - Wood pellets
  - Dust control

- Release control
  - Pesticides, fertilizers

- Transportation fuel
- Phenolic feedstock for chemical industry

- Bioplastics

- Activated carbon
- Carbon black
- Low cost carbon fibers

Steam exploded pellets from forest industries

New opportunity for supply of sustainable fuel for heat and power generation

Steam exploded black pellets can be produced from for example forest residues and bark, but potentially from bagasse and EFB as well. They can be used as a renewable fuel in many types of boilers

- The production process is continuous and based on existing technology
- They can be produced from many types of pulp mill residues
- Significant carbon emissions reductions over fossil fuels

Exempel på projekt

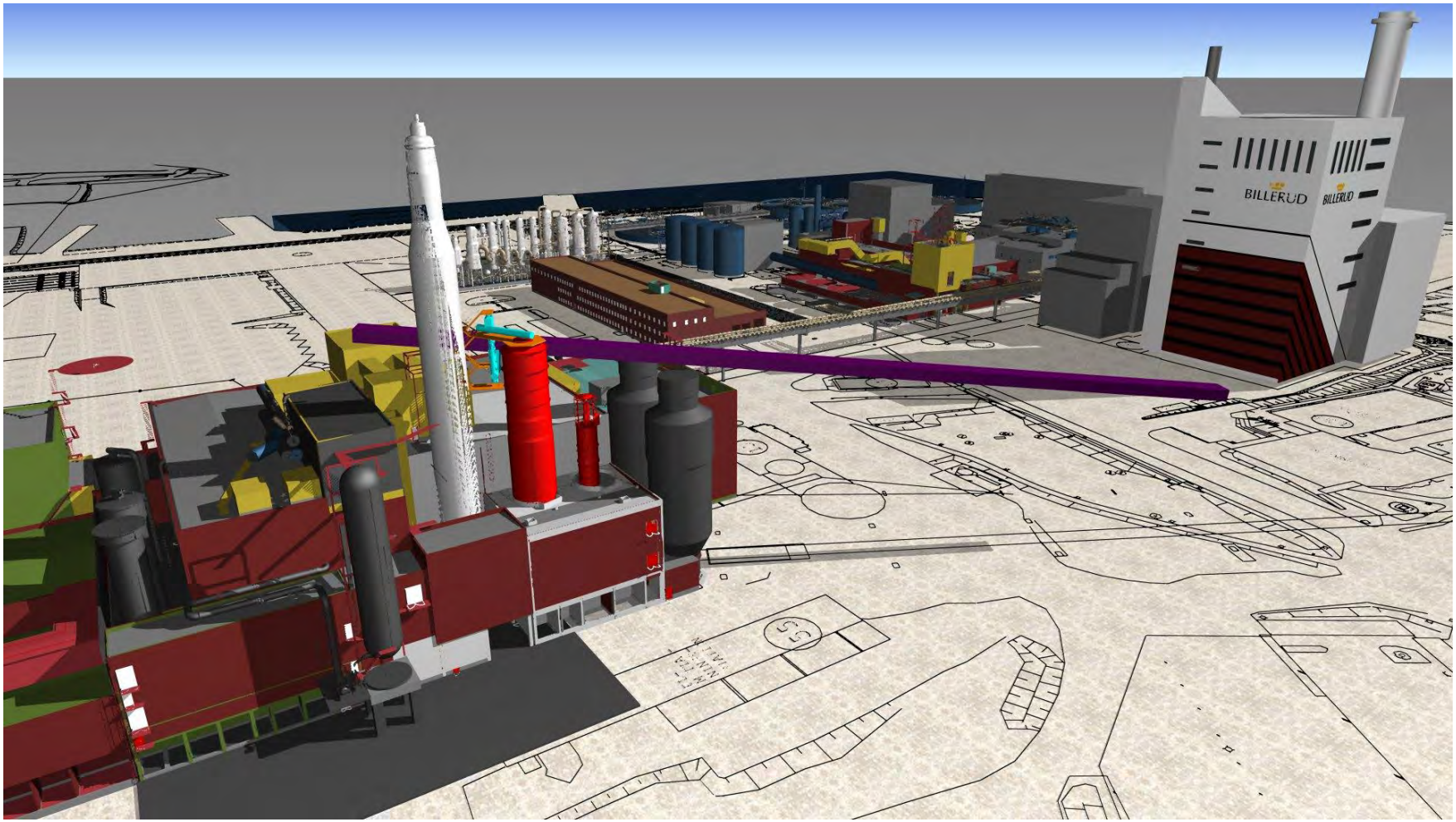
2016-10-27

Hans Olsson

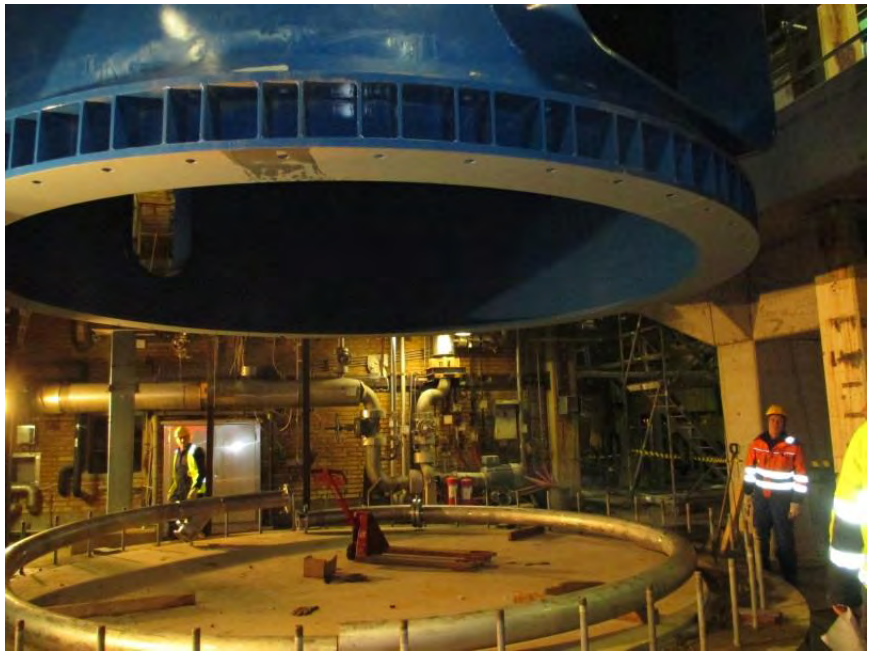
Stefan Antonsson

BillerudKorsnäs Gruvön

Project “Pulp 2015” started



Construction phase



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Construction phase

Expected results, follow up

Start-up May 19, 2014

Improvement	Status	Improvement	Status
Improved Safety		Reduced usage of deformer	
Increased Yield		Reduced chemical consumption	
Lower reject content		Increased availability	
Reduced power consumption		Reduced cost for high pressure cleaning	
Improved washing		Reduced cost for descaling	
Reduced COD to bleaching		Easy to operate	

 = Evaluation in progress

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A system for the future

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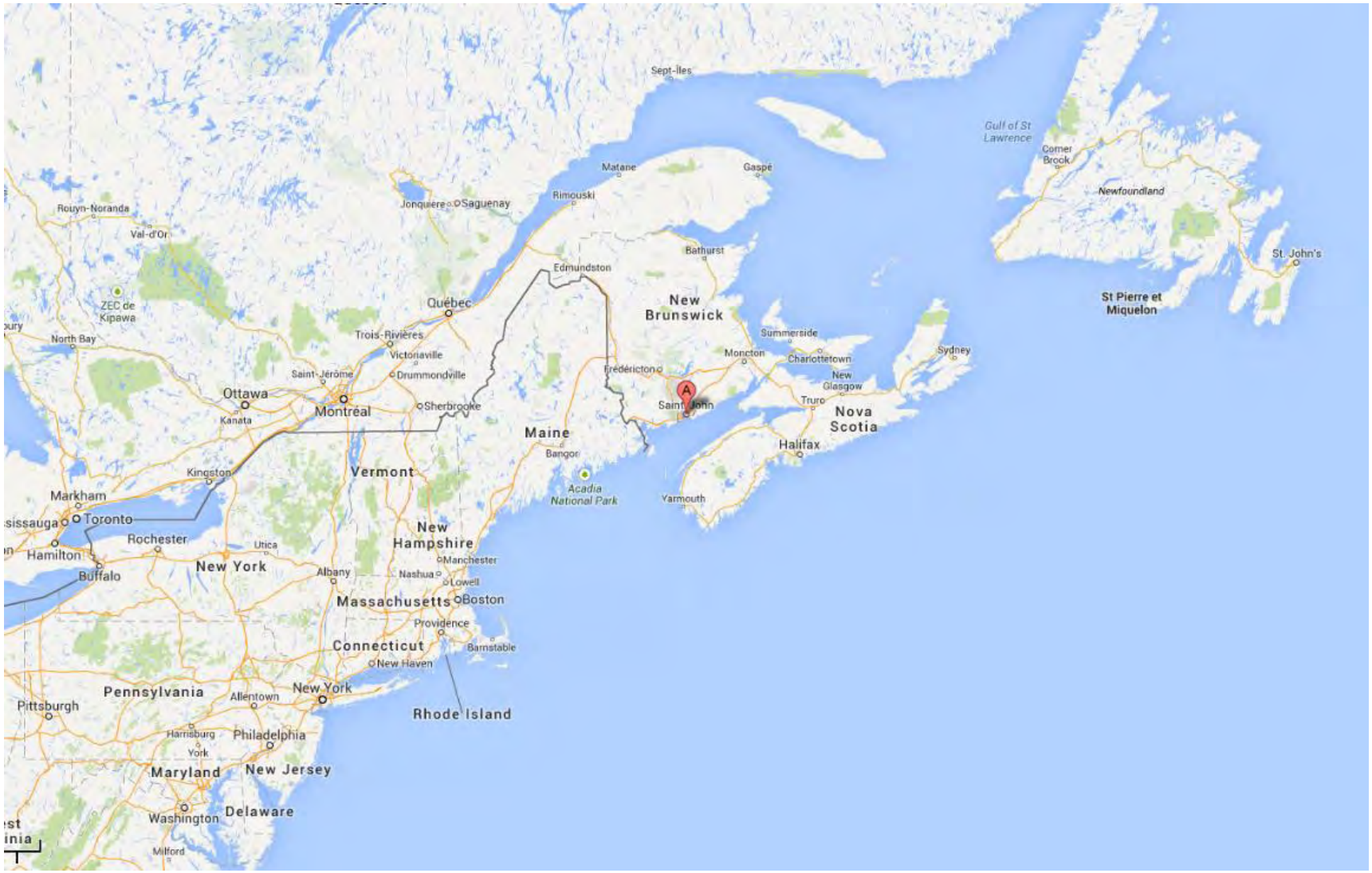
Saint John – New Brunswick, Canada



Valmet

Transportation, March 29 2015

Transportation, March 29 2015


IRVING

Suzano Maranhão – Valmet delivery

1.5 MADt/year

The Biggest Soft Wood Pulp Mill in the World

- A softwood pulp mill for fully bleached pulp
- The mill is based on a standard Elemental Chlorine-Free (ECF) process
- Based on Valmet TwinRoll press technology
- Low water, energy and chemicals consumption

Pulp Mill
OJSC ILIM Group, Bratsk, Russia

Case

Worlds biggest CompactCooking G2 digester, capacity 800,000 tons per year

Södra Cell – Värö Mill
Major mill upgrade, 425 000 to 700 000 t/y

Additional Woodroom

New Cooking Plant

Fiberline upgrade

Pulp Dryer Upgrade

Flash Dryer Upgrade

Baling Upgrade

Recovery Boiler rebuild

Evaporation upgrade

Recaust Upgrad

"This investment increases our pulp production, makes the mill more energy efficient and increases its bioenergy supply potential", says Gunilla Saltin, CEO, Södra Cell

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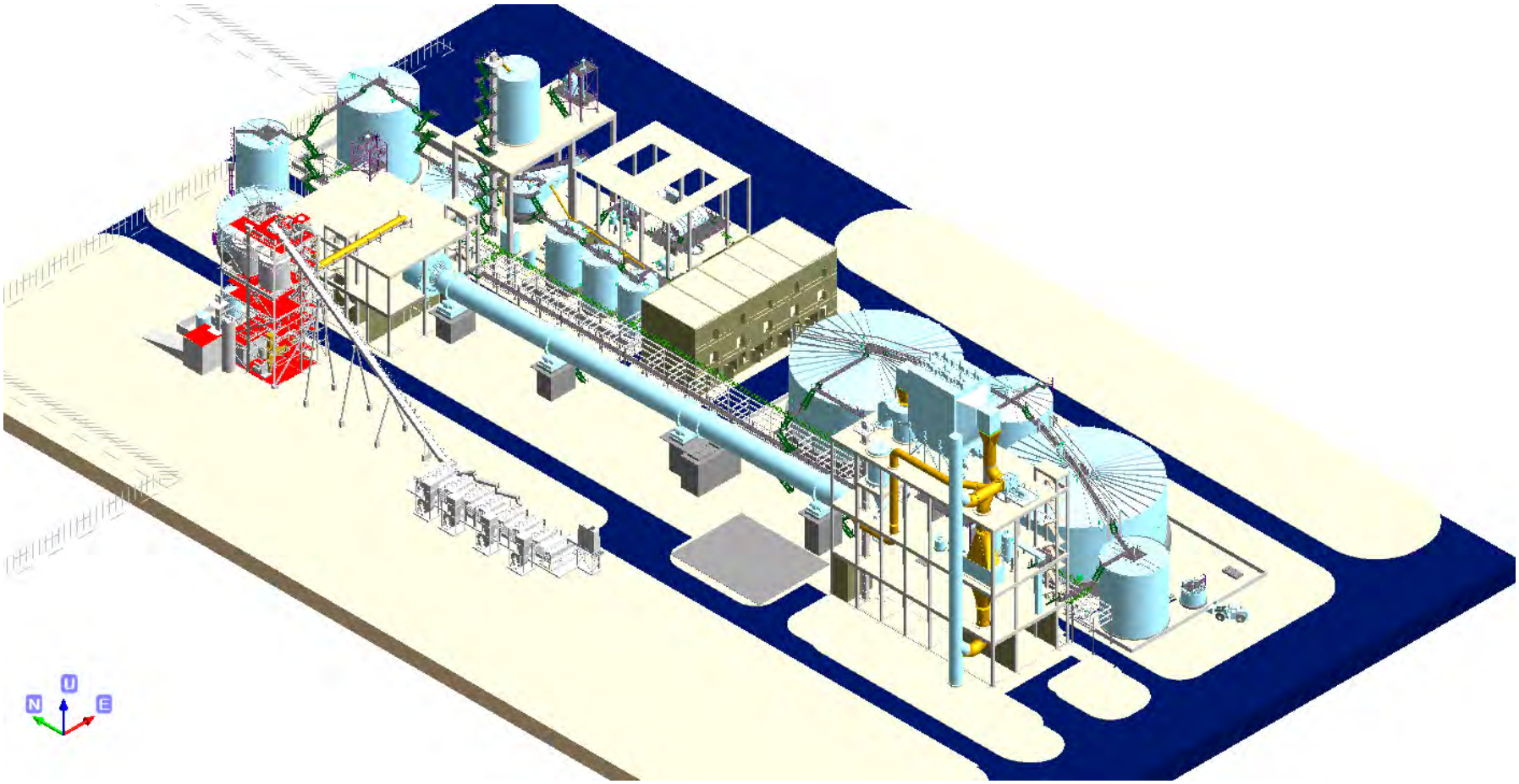
Valmet white liquor plant



Valmet has long history as recausticizing supplier

1935-79

Dorr-Oliver

Hedemora

1993

Caustec (Kvaerner/FLS)

1997

Kvaerner

2006

Metso

FLS/GL&V/ Elmco

2014

Valmet

Valmet Recausticizing Plant activities 2012-2016

- Oji Nantong, China
- Suzano Marañhao, Brazil
- MB Kemi, Finland
- Huatai Anqing, China
- Sappi Ngodwana, South Africa
- Hyogo, Japan
- IP Kwidzyn, Poland
- Sappi Cloquet, USA
- ITC Bhadralacham, India
- SCA Obbola, Sweden
- Södra Cell Värö, Sweden
- SCA Munksund, Sweden
- CMPC Guaiba, Brazil
- Smurfit Kappa Lövholmen, Sweden
- Stora Enso Skoghall, Sweden
- OKI Palembang, Indonesia
- Chenming Huanggang, China

White liquor plant at Suzano Mucuri, Brazil

SCA Östrand

Driving forces

Production cost in world class	World class environmental performance	Optimal Investment level	HSE in focus
Lean / Quality focus	Yield Energy Efficiency	AOX/COD NOX	Process Integration