

Automation – taking customers' performance forward

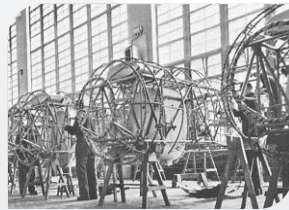
Tampere site visit
November 26, 2015

Sakari Ruotsalainen,
Business Line President, Automation

History of Automation in Tampere

1920's An aircraft repair Workshop founded in Helsinki to repair aircraft instrumentation

1936 **Division** is opened in Tampere

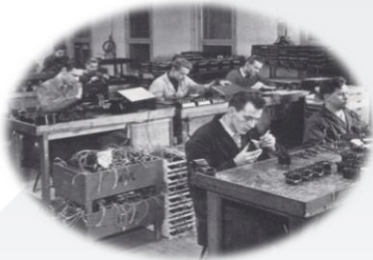


1944 **Measurement and control** instruments for the process industry begin to develop

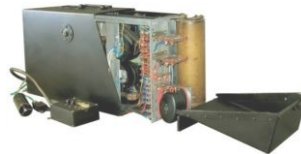


1968 **Valmet Oy Instrument Works** established in Rantaperkiö

VALMET
KÄTTEMME TÖITÄ



1940's **The first black box "Mata Hari"** invented and produced in the State aircraft factory in Tampere



1953 **Precision mechanics division established**, introduction of pneumatic measurement and control system



History of Automation in Tampere

1960

The Airmatic, a pneumatic measurement and control system



1980's

Damatic, the first Distributed Control System (DCS)

Acquisition of **Sentrol Systems (QCS)**

Damatic XD, modular second generation DCS



2000's

IQInsight
IQProfilers (IQSteam Pro)
IQCaliper-L
PaperIQ Plus
Multivariable Model Predictive Controls (MPC)
metsoDNA CR
24/7 ProCenter for DCS
24/7 ProCenter for QCS
PaperIQ Select
IQCaliper-L
IQFiber



2015

Metso Process Automation Systems to **Valmet**

Valmet DNA



2015

Valmet IQ

1990's

PaperIQ, QualityControl System (QCS)

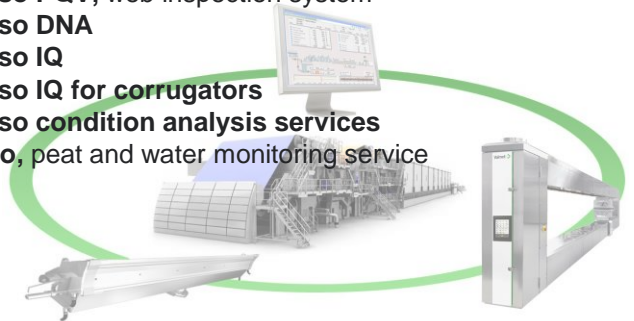
Metso Incorporated (the merger of Valmet Automation Inc. and Neles Controls)

metsoDNA, Dynamic Network of Applications



2010's

Metso PQV, web inspection system
Metso DNA
Metso IQ
Metso IQ for corrugators
Metso condition analysis services
Vapo, peat and water monitoring service



1970

Elmatic-100 system, electronic instrumentation

Valmet today at Lentokentänkatu

Automation

- R&D
- Project operations
- Sales and Services
- Management and support functions

>480
employees



Pulp & Energy

- Product and technology
- Delivery operations
- Management and support functions

>540
employees



Automation business line

Contents


1 Automation is a strong business with great positions

2 Automation market drivers

3 We take our Customers' performance forward

4 Strategy implementation through Must-Wins

5 Summary



Automation is a strong
business with great
positions

Automation business line overview

Extensive range of process automation and information management solutions to take our customers' business performance forward

Global network of expertise close to our Customers

Strong R&D investments across the automation offering

Global market leader with #1 market position in pulp and paper

Industry-leading product portfolio
Comprehensive services

Niche leader in Bio and Waste-to-Energy power plant automation

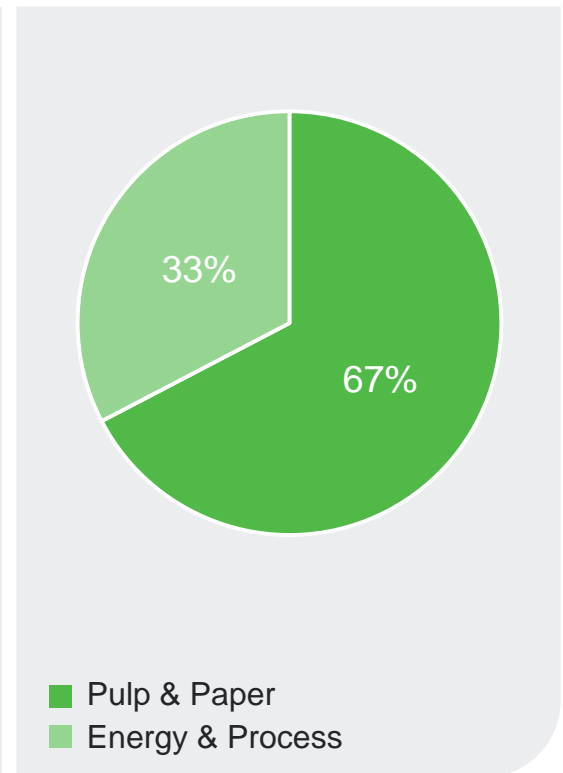
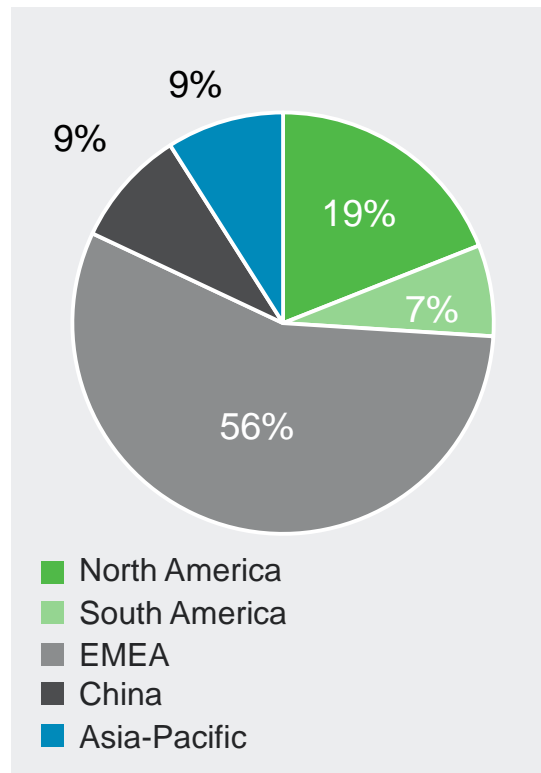
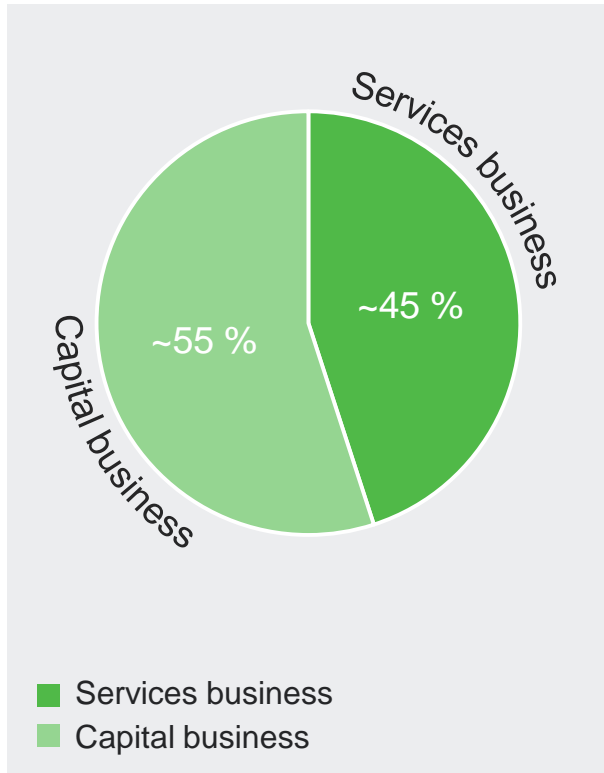
2014 figures

Net sales	EUR 297 million
Orders received	EUR 336 million
Employees	1,600



Automation business line overview

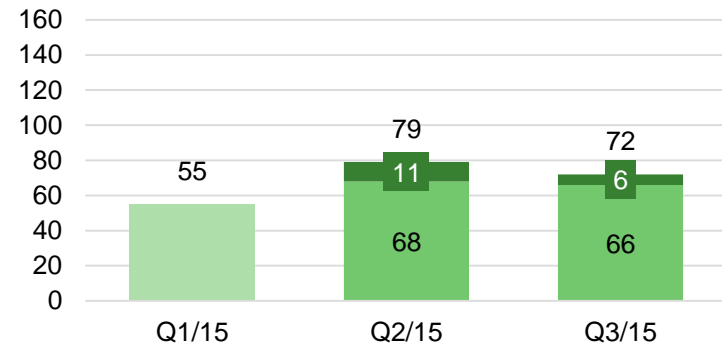
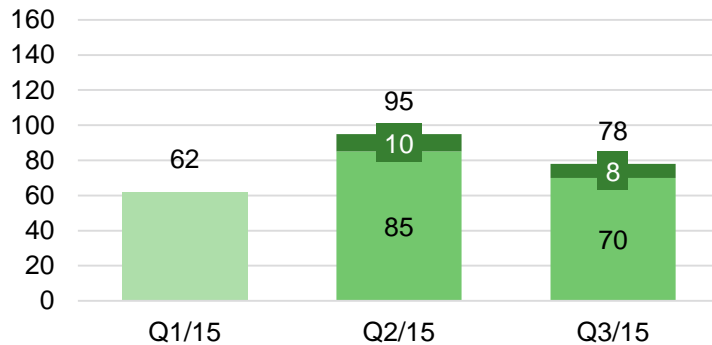
Net sales (2014)



Orders received in Automation totaled EUR 78 million in Q3/2015

Orders received¹ (EUR million)

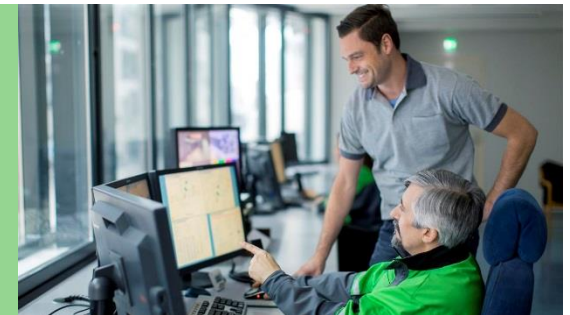
Net sales (EUR million)



- Orders received, internal (from other business lines)
- Orders received, reported
- Orders received, total (including internal)

- Net sales, internal (from other business lines)
- Net sales, reported
- Net sales, total (including internal)

- Orders received EUR 78 million in Q3/2015
 - Internal orders received amounted to EUR 8 million
 - EMEA accounted for ~50% and North America for ~30% of orders received
 - Pulp and Paper accounted for ~70% and Energy and Process for ~30% of orders received
- Net sales EUR 72 million in Q3/2015
 - Internal net sales amounted to EUR 6 million



1) Q1/2015 orders received is calculated from Metso's reported figures and pro forma figures excluding Process Automation Systems and are therefore indicative only. Q2/2015 and Q3/2015 figures are Automation business line figures.

Customer base



90% of business directly with Customers

Automation has a history of modest growth but high and resilient profitability

Modest growth in net sales



High and resilient profitability

- Relative stable margins during the last 10 years, EBITA margin 10–12%
- Strong service business, based on large installed base and captive business model
- High-level technology and know-how business with high barriers to entry

Since 2006, Automation's EBITA margin has exceeded 10% every year but two

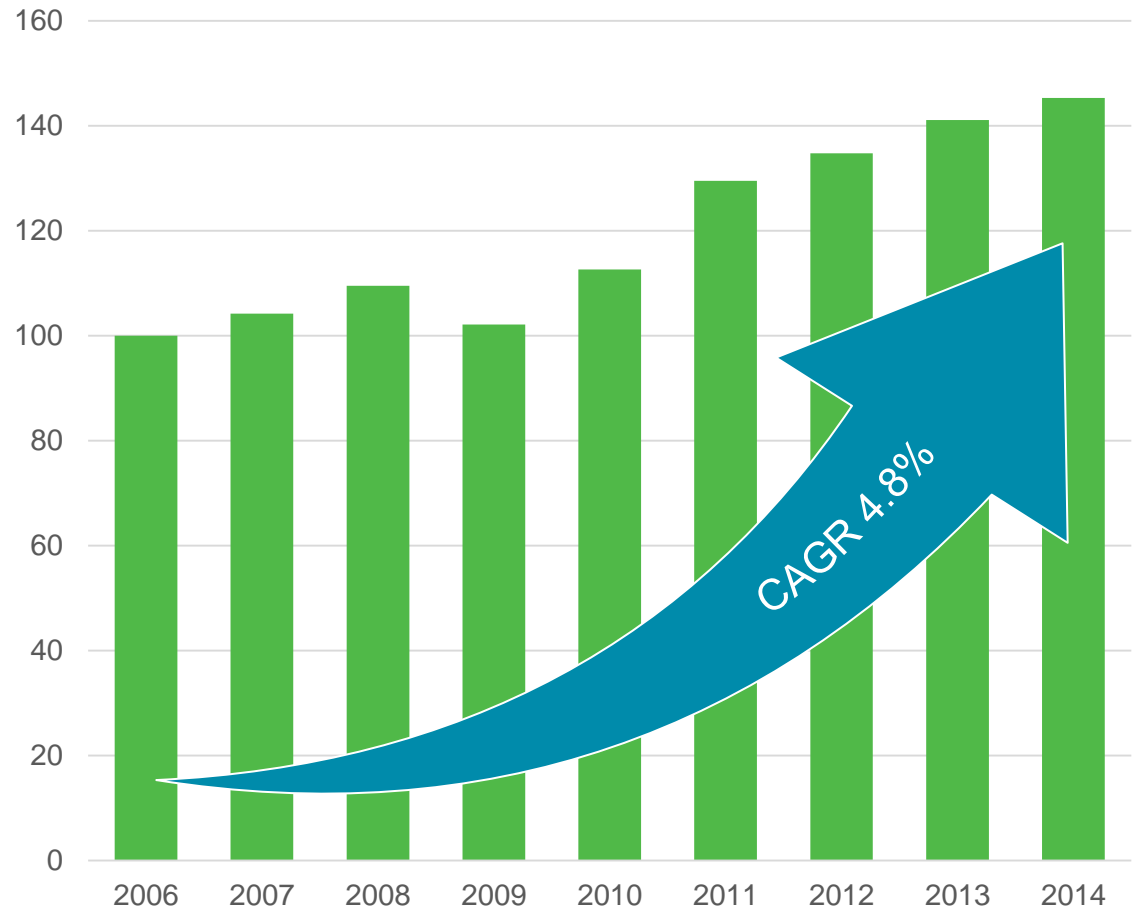
Automation's service business has grown steadily

Valmet's installed base grows constantly

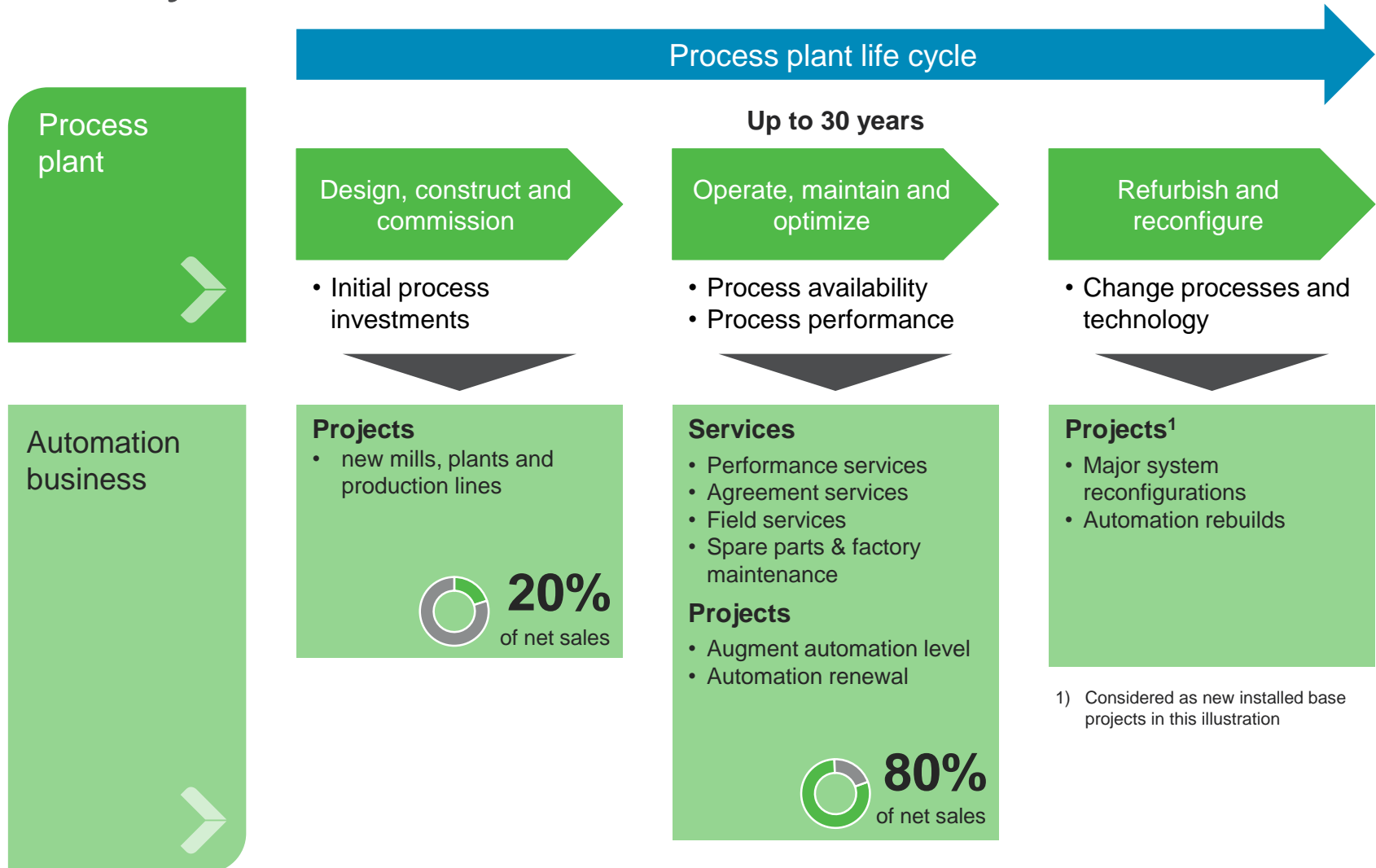
Customers have less own maintenance resources

Customers need to take process quality and performance forward

Indexed:
(2006 = 100)



Automation serves it's customers across plant life cycle



Our automation offering



Advanced automation and process monitoring solutions and services:

- Distributed Control System (DCS) – Valmet DNA
- Performance solutions
- Quality Control System (QCS)
- Profilers
- Analyzers and measurements
- Industrial internet solutions
- Automation services
- Process simulators
- Safety systems and solutions

Industry's widest offering in pulp & paper
Valmet DNA DCS delivered to other industries as well

Proven performance

Valmet has delivered more than

4,500 automation systems

40,000 analyzers and measurements

Over **1,000** power plants worldwide utilize Valmet's process automation

Valmet is

#1 in QCS, analyzers and measurements

#1 in pulp performance optimization using advanced controls.

#2 in pulp & paper control systems

Niche leader in Bio and Waste-to-Energy power plant automation



Customer results in pulp and paper markets 2010–2014

More than **60** new tissue and board lines automated

More than **600** new QCS and Profiler system deliveries

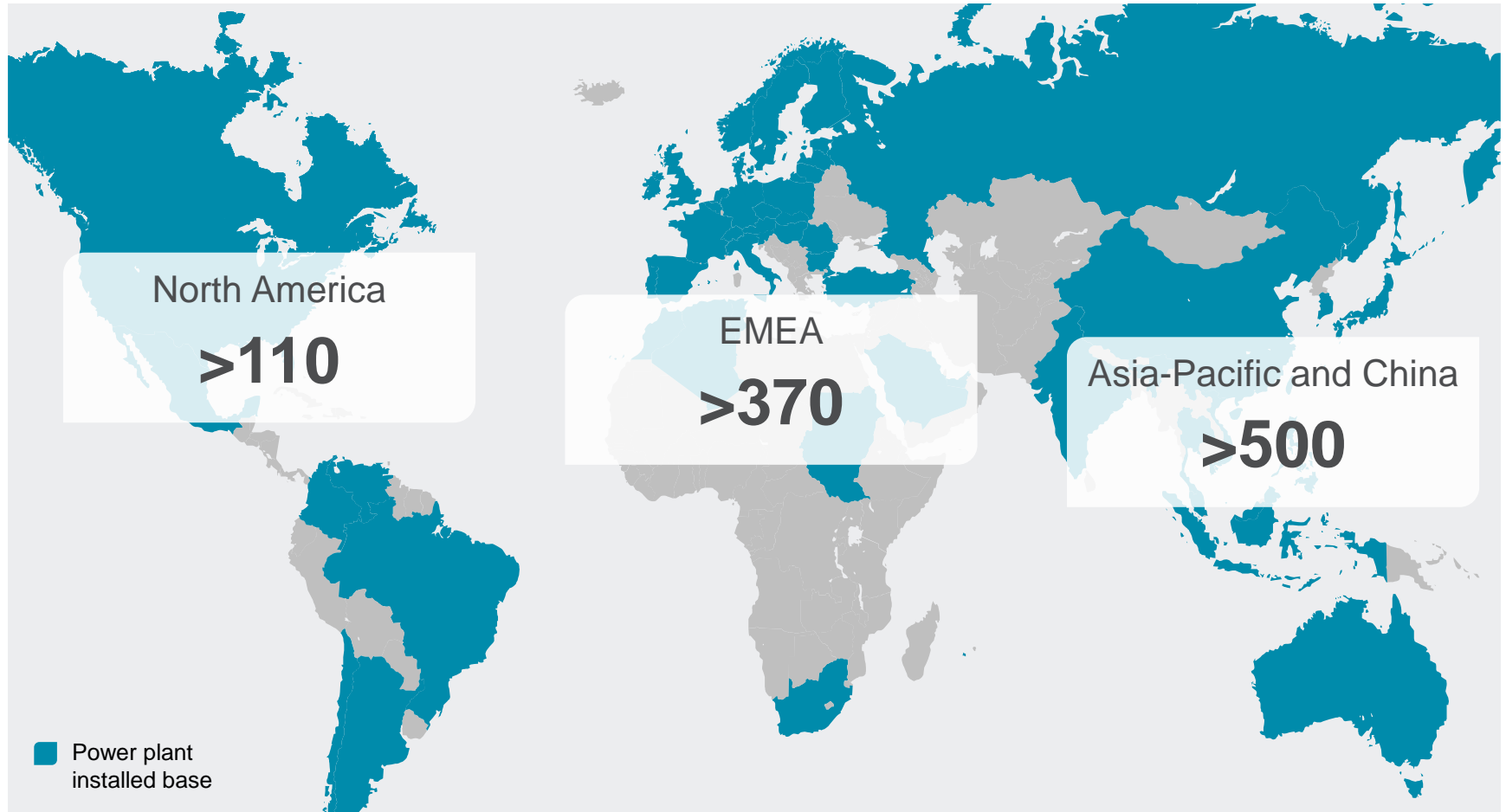
More than **200** QCS and Profilers competitor system replacements

More than **100** competitor DCS/PLC replacements

Market leader in analyzers



1,000 power plants worldwide utilize Valmet's process automation



Includes Valmet's systems delivered by partners



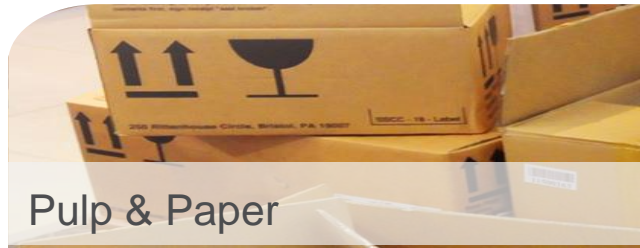
Automation market drivers

Market drivers and opportunities

■ Anticipated long-term market growth

■ Estimated market size for the current offering (EUR)

■ Valmet's market share



Pulp & Paper



Energy, Process and Marine

~1%
p.a.

1.0
bn

~20%

~2%
p.a.

1.0
bn

~10%

Market drivers

- World trade, e-commerce and emerging markets growth
- Rise in purchasing power and living standards
- Ageing production assets

- Urbanization and growing middle class especially in emerging markets
- Growing share of renewable energy generation in the energy mix

Competitors


- ABB, Honeywell, BTG

- ABB, Emerson, Siemens, Yokogawa

Automation's short-term opportunities

- Short term opportunities
 - Very large ageing competitor installed base of systems
 - Valmet synergies in new mills and lines as well as rebuilds
 - Healthy services demand

- Softness in short term opportunities, especially in new power generation projects
 - Power plant retrofit market active
- Marine: cruise market active
- Healthy services demand



We take our Customers'
performance forward

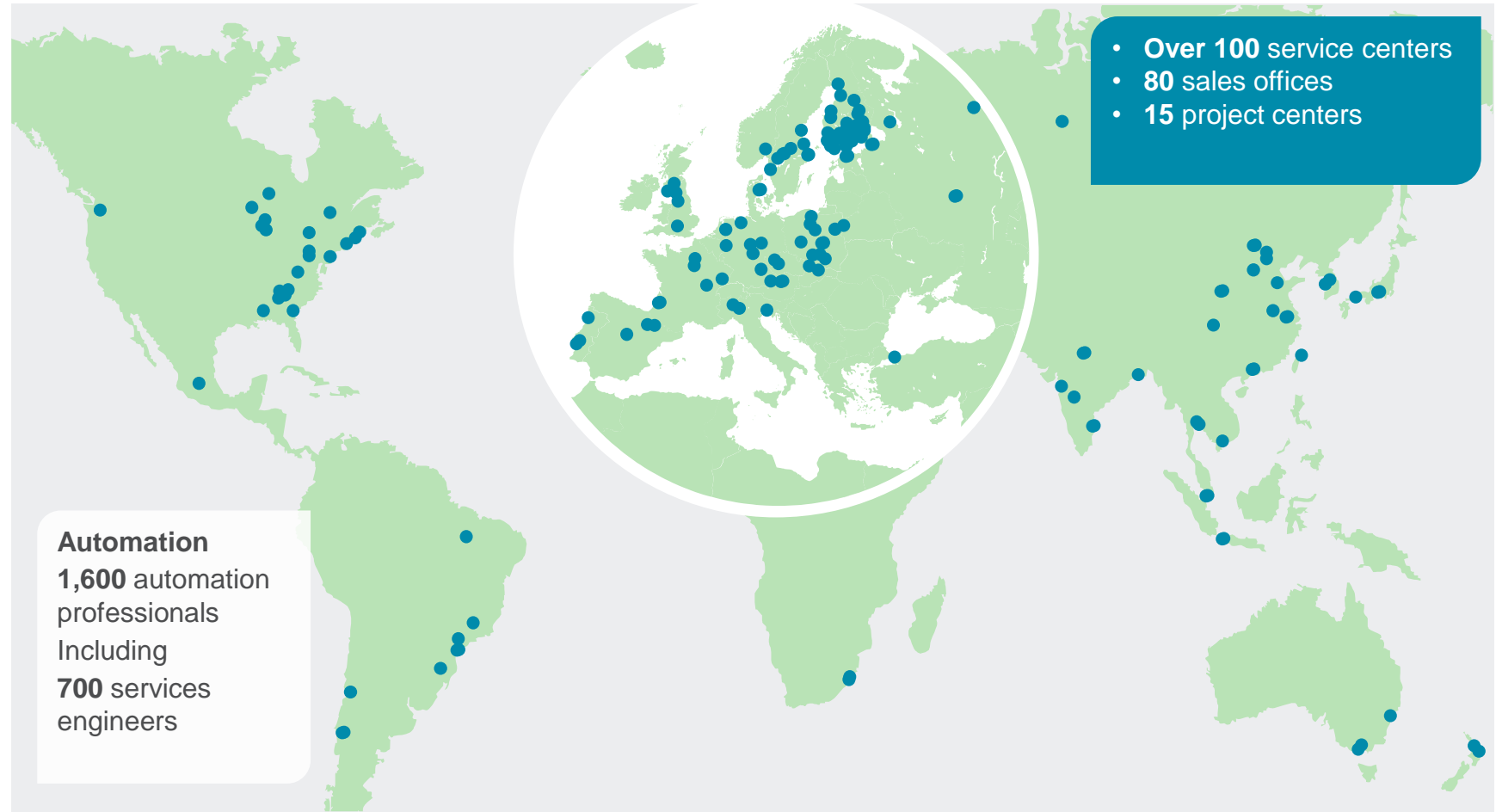
We take our Customers' performance forward

- 1 Expertise close to our Customers
- 2 Business model with flexibility and intimacy
- 3 Continuous innovation & renewal
- 4 Combining process technology, automation and services
- 5 Industrial internet delivered – every day



Strong global presence close to our customers

Over 100 locations in 33 countries



Our business model is based on high customer intimacy with a flexible delivery system

Flexible
Project execution
Product supply

Customer intimate
Sales & Service

Engineering

- 60%** Project management and lead engineering in-house
- 40%** Project engineering by external partners and service providers

Supply chain

- 20%** In-house assembly and final testing
- 80%** Outsourced & externally purchased components, sub-assemblies

- >90%** Direct sales and service network
- <10%** Growing strategic partnerships
Several partner business models applied

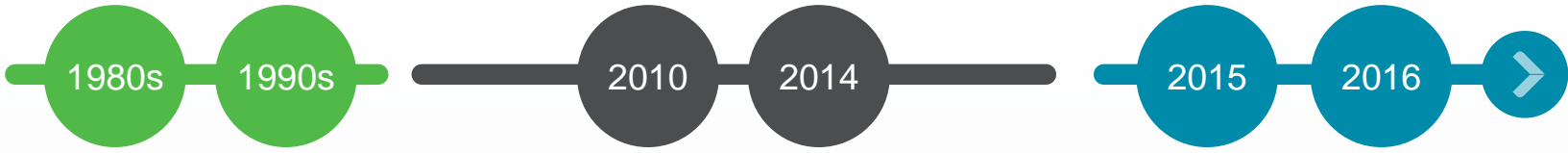
High degree of outsourced engineering and supply chain

Net working capital (NWC)
8% of net sales

'Two-fold market model' through direct sales and partnerships



Continuous technology innovation & renewal to move our customers' performance forward



Automation foundation

- Damatic "Classic"
- Damatic XD
- Damatic Xdi
- PaperIQ
- Kajaani analyzers

Industry leading offering

- Metso DNA (now Valmet DNA)
- Integrated condition monitoring
- Turbomachinery controls
- Virtualization
- Compact controllers
- High-density I/O's
- Metso IQ (now Valmet IQ)
- IQ Fiber
- Image-based sensors
- New MD & CD Controls
- New IQ Profiler actuators
- IQ Induction Profiler
- Next gen Web Inspection systems
- Rotary
- OC, LC
- LS, Alkali R
- MR Moisture, FS5
- KappaQC
- Corroded
- Alkali C

Introducing the next level in automation


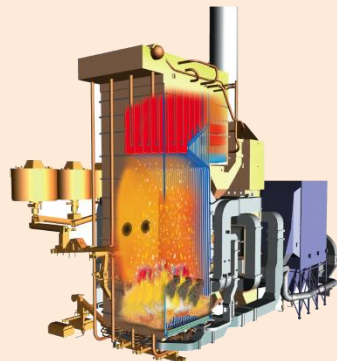
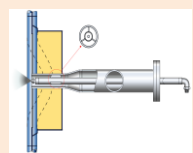




- Valmet IQ 2015 family launched
- Valmet DNA growth story continues
- Analyzer and measurement portfolio grows even stronger

... and in addition significant cost-out element in all new products launched

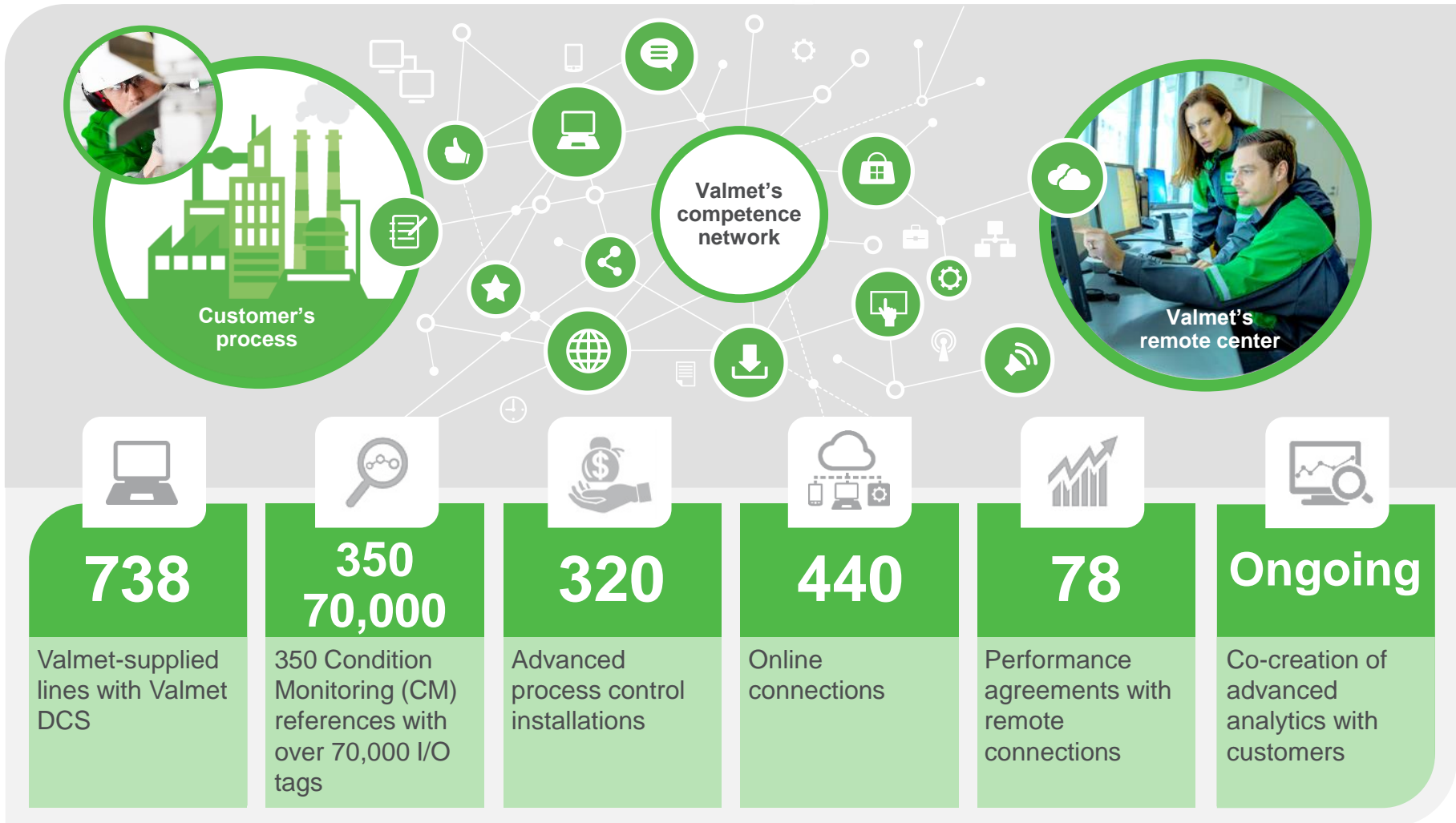
Valmet's unique offering combines process technology, automation and services



Valmet's key capabilities combined to take customers' performance forward

Challenging fuels in use or plan to change fuel diet	Boiler type: CFB, BFB & grate boiler	Additives in use or plan to use	Occuring super heater corrosion
	 <p>Process conditions with challenging fuels: Steam temp > 420C Material temp -> 450 C</p>	<p>Liquid sulphate</p>  <p>Solid sulphur</p> 	
<div style="display: flex; align-items: center;">   <div style="margin-left: 20px;"> <h3>Valmet's Solution</h3> <ul style="list-style-type: none"> • Process, materials & fuel knowhow • CorroRed analyzer + process sampler • Additives injection • Control system </div> </div>			<div style="background-color: #333; color: white; border-radius: 50%; padding: 20px; text-align: center;"> <p>Increased Superheater lifetime 3-10 yrs Payback in 4-6 months</p> </div>

Valmet has a solid foundation for Industrial Internet



Our unique offering can be fully integrated into Industrial Internet

Remote Services

- Advanced Analytics
- Performance optimization
- Remote Support
- Maintenance planning
- Remote condition monitoring

On-site visualization and analytics

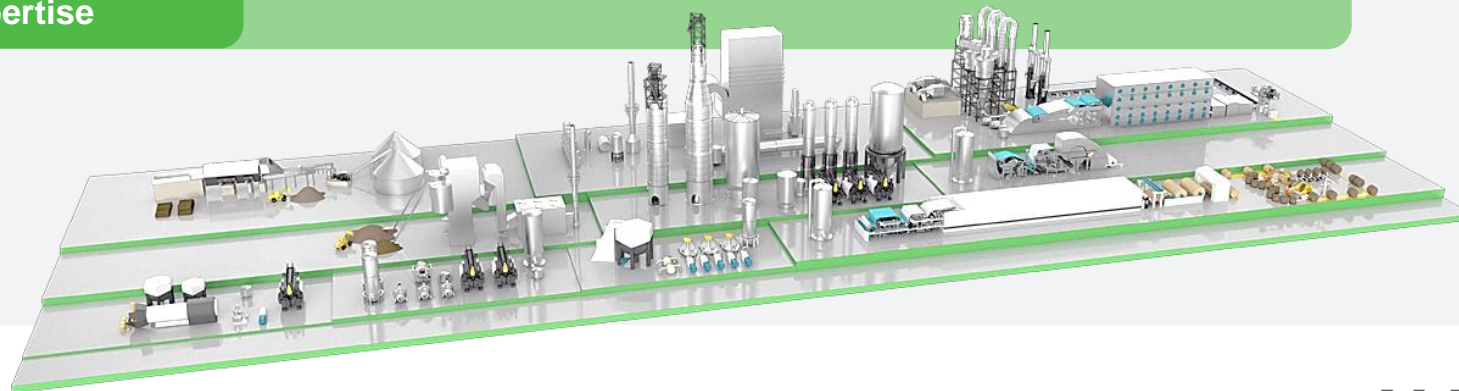
- Process visualization
- Information and historian platform
- Energy management
- Control performance

Control and instrumentation

- Distributed control systems
- Advanced process control solutions
- Quality control solutions
- Data communication
- Vision systems, instrumentation and analyzers

Process technology and expertise

- Pulping and Recovery
- Heat and Power generation
- Board and Paper making
- Tissue making



Centralized control room

Undisclosed energy customer



Background and Customer's target

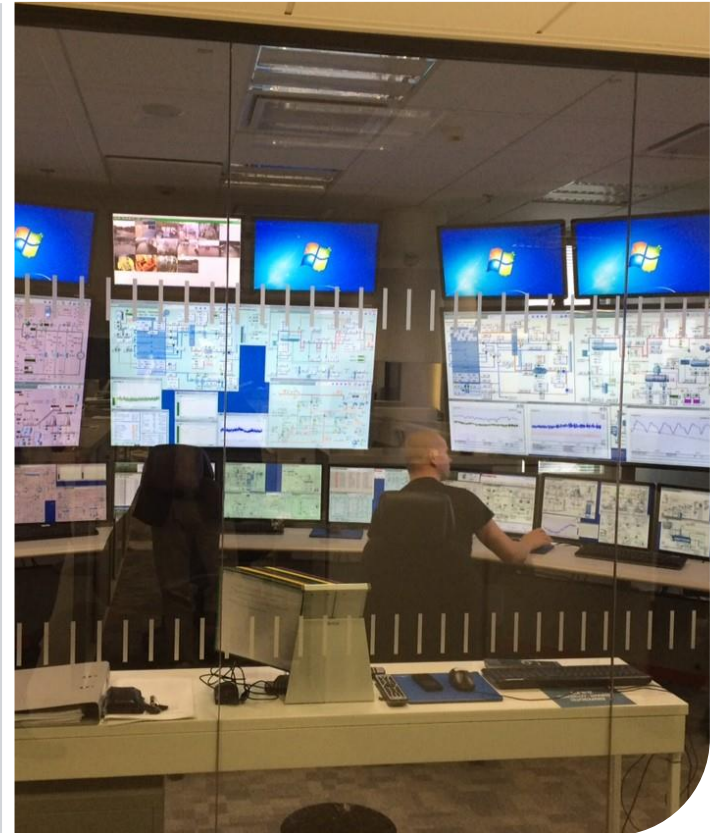
- Energy customer with 26 plants
- Target to centralize operation control to one location to achieve cost savings in the plants and securing best operating competence to all plants

Our Solution

- Centralized Valmet DNA control room in one physical location – 11 plants now operational

Benefits

- Cost savings in the plants
- Accumulating the best operating competence
- Identifying best control strategies via benchmarking plant performance to central control room to boost plant performance



Predictive component lifetime modelling

Undisclosed paper mill



Background

- Paper Mill with Valmet Paper Machine

Challenge

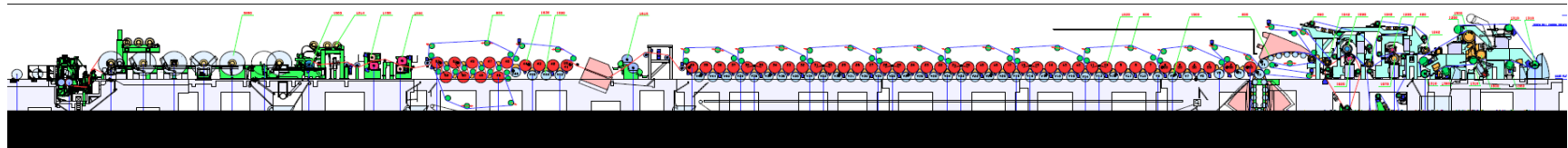
- To reduce total cost of ownership (TCO) for several significant components

Our Solution

- Mill connected to Valmet Advanced Analytics research environment
- Advanced Analytics performed on Mill data to investigate potential for TCO optimization
- Analytics allows TCO optimization through
 - Lifetime prediction
 - Model parameters
 - Model status
 - Expert recommendations

Results:

- Accurate lifetime predictions to Mill
- Enables fast learning of new component behavior
- Improved component lifetime





Strategy implementation through Must-Wins

Strategy implementation via Must-Win initiatives

Must-Wins

Must-Win initiatives for Automation business line

Customer excellence

- Further strengthen our capabilities close to customers
- Win market share through competitor replacements
- Grow partner business
- Provide customer benefits by combining process technology, automation and services
- Drive services growth

Leader in technology and innovation

- Continue to renew and expand offering

Excellence in processes

- Implement Lean to improve end-to-end performance
- Save 10% in procurement
- Improve health and safety

Winning team

- Nurture shared values
- Drive high performance
- Continue globalization of our capabilities



Summary

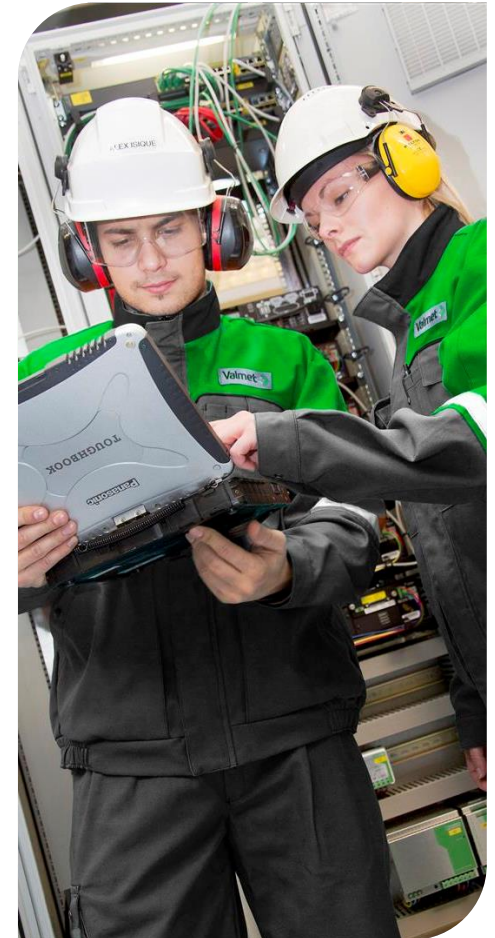
Summary

We have


- Delivered strong and stable business performance
- Great market positions
- Strong footprint of experts close to our Customers
- Market leading technology solutions
- Strategy to continue winning market share

We are

- Committed to taking our Customers' performance forward







Energy and process automation – well positioned for long term growth

Tampere site visit
November 26, 2015

Jukka T. Pulkkinen,
VP, Energy & Process Systems

Energy and process automation

Contents

- 1 Our market focus and our position
- 2 Technology and services offering
- 3 Well positioned for long term growth
- 4 Valmet takes Customers' performance forward in energy
- 5 Summary



Our market focus and our position

Valmet has a good position in energy and process industries, including marine

Energy and process industries

- We have consistently developed the energy automation system business for over 20 years
- Strong market position in bio and waste-to-energy
- Blue-chip partnerships based on our technology
- Long-term business cooperation with process industry customers

Marine industry

- We have a strong position with leading European shipyards as well as world's leading cruise line companies and other ship owners

Solid energy and process industry business with good long-term growth opportunities



Addressable market:

~EUR 1 billion

Market growth rate:

~2%

Valmet's market position:

Established niche position

Main competitors:

ABB, Siemens, Emerson, Yokogawa



Technology and services offering

Automation offering for energy and other process industries

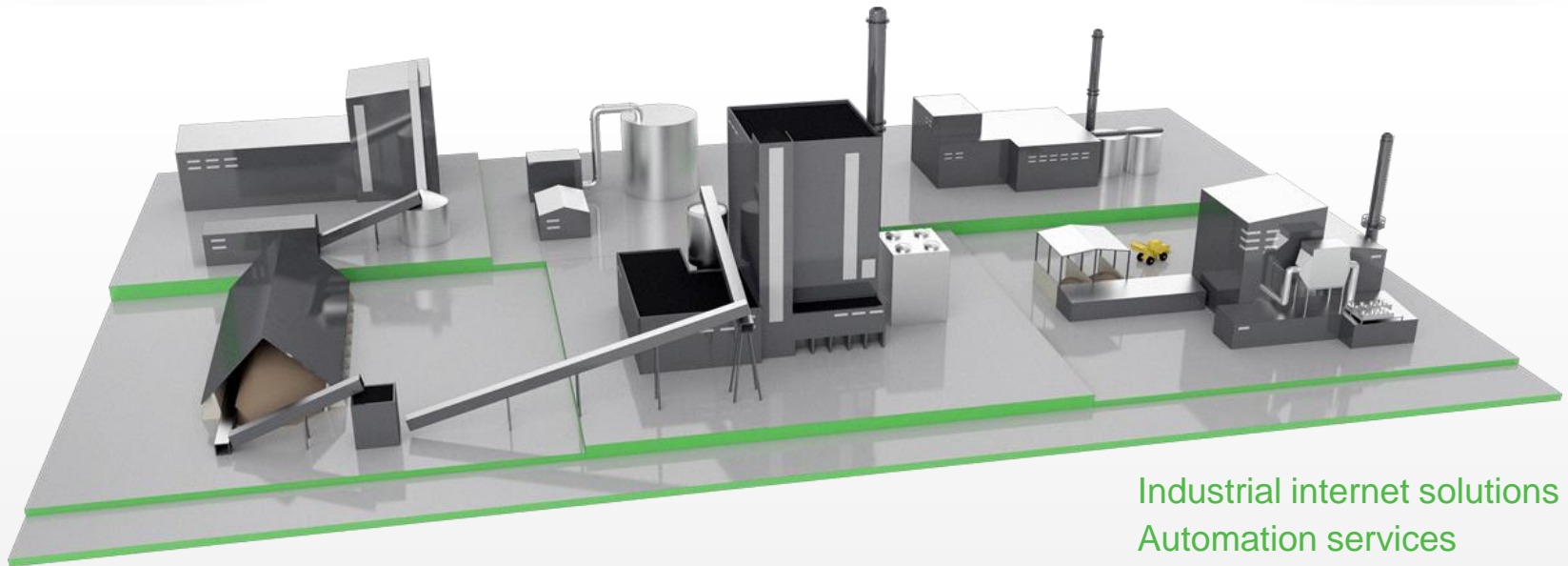
Distributed Control System (DCS)

- Process controls
- Information management

Analyzers and measurements

Performance solutions

- Advanced process controls
- Plant management applications
- Energy management solutions
- Condition monitoring
- Process simulators
- Safety systems and solutions





Well positioned for long
term growth

Well positioned for long-term growth

Target market

Biomass and multifuel power plants
Waste-to-energy plants

New power generation capacity in
China and India

New power generation capacity in other
Asia-Pacific

Marine

Solid process industry business in
selected countries

Growing installed base of our own
technology

Automation's proven opportunity

Valmet is a market leader in solutions for biomass industry. Use of biomass for power generation has its place in the global energy mix.
Valmet is a market leader in European waste-to-energy. Recovery of energy from waste by incineration is part of any modern waste management system.

Rapid power generation new capacity growth.
Market commanded by state owned or controlled entities.
Automation's approach with strategic partnerships.

Several Asia-Pacific countries such as Indonesia, Thailand and Vietnam adding power generation capacity.
Automation works with key EPC's and other partners in the region.

Valmet in a leading position in cruise vessel automation.
Overall, >160 vessels of an average 2500-berth capacity estimated to be needed up to 2025 from nearly 70% global cruise passenger growth

Valmet has established long term business co-operation in process industry automation in CIS (oil and gas) and Finland.

Installed base with Valmet's automation's technology has grown steadily over the years.
Growing installed base converted into service agreements.

Market leader in European waste-to-energy automation

UK

- Ineos Runcorn, Manchester phase 1
- Ineos Runcorn, Manchester phase 2
- MES Environmental, Dudley
- MES Environmental, Wolverhampton
- Waste Recycling Group, Lincolnshire
- Veolia Environmental Services, Staffordshire
- SITA Suffolk
- Viridor Oxfordshire Ardley
- Viridor Cardiff
- Cory Environmental, Riverside London
- Veolia Environmental Services, Newhaven
- Sita, Cleveland 4 & 5
- SSE Ferrybridge Multifuel project
- Buckinghamshire
- Dundee Energy Recycling, Dundee
- RWE Markinch, Glenrothers
- London Waste, London

Over 60% market share in UK

- Valmet
- Hitachi Zosen Inova (former Von Roll Inova)
- Keppel Seghers
- CNIM
- Martin GmbH
- Posco E&C
- Other Technology or Automation Replacement

Norway

- BIR Avallsenergi, Bergen

Finland

- Westenergy Oy Ab, Vaasa

Estonia

- Eesti Energi AS, Tallinn

Sweden

- Åmotfors Energi Ab

Poland

- Bialystok
- Krakow

Austria

- A.S.A., Zistersdorf
- AVE Wels II
- AVE Wels I
- AVE Lenzing

France

- Veolia, Prociner
- Veolia, SIAP

Italy

- Trattamento Rifiuti Metropolitan, Turin
- Veolia, Piacenza
- Veolia, Energonut

We have automated world's largest multifuel FBB plants



Alholmens 240MW –
World's largest multifuel boiler



Neyveli Lignite 250MW – India's
largest FBB



Nacogdoches 100MW – Largest biomass boiler in US



Sha Lang Tan 300MW –
China's largest FBB



Lagisza 460MW – World's largest
FBB – OT CFB

India's leading power plant EPC trusts Valmet's automation technology

India's leading power plant EPC and equipment manufacturer BHEL trusts Valmet automation technology (>360 deliveries)



- State-owned and largest power plant equipment manufacturer in the closed Indian power market operating as an engineering and manufacturing company
- BHEL has over 70% market share in India
- Several technology licensing agreements with major western technology providers including Valmet for process automation
- TCA (Technology Collaboration Agreement) with us since year 2000



JV with SAC Guodian Nanjing Automation to address Chinese thermal power market

China Huadian Corp, China's second biggest power producing company with 130GW installed base trusts Valmet's technology



- JV between Valmet and SAC Guodian Nanjing Automation Co. Ltd
- SAC Guodian Nanjing Automation Co. Ltd is a power automation company majority-owned by China Huadian Corp.
- Provides DCS technology to complement digital power plant offering in turn-key deliveries for Huadian Corp's thermal power plant projects




Valmet DNA automation system on board flagship cruise liners

Valmet DNA systems sold to 31 vessels including flagship cruise liners since 2011

- >600 ships sailing with Valmet's technology on board
- Automation system for a cruise liner is the same size as for a big pulp mill





Valmet takes Customers'
performance forward in
energy

Minimizing safely our customer's fuel costs with Valmet combined capabilities for biomass use

Kuopion Energia Oy, Finland



Background

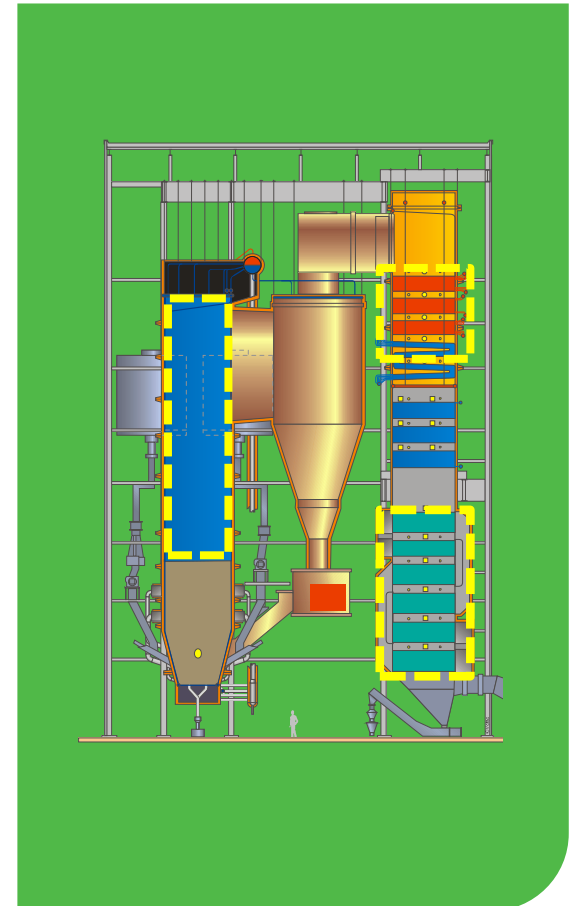
- Kuopion Energia Oy produces electricity and district heat for the residents of the city of Kuopio, thus production reliability is in high priority
- Long term partnership with Valmet

Challenge

- Main fuels are peat, woody biomass and other bio based fuels
- During summer bio based fuels are up to 100 % and all year around 50% of the fuel consumption
- Heading for more cost efficient fuel mix will add risks of corrosion of the super heater

Solution

- Software for reporting, controlling and predicting high-temperature corrosion & optimizing the fuel diet
- Corrosion Reduction Analyzer – online measurement unit analyzing the corrosiveness of flue gases





Summary

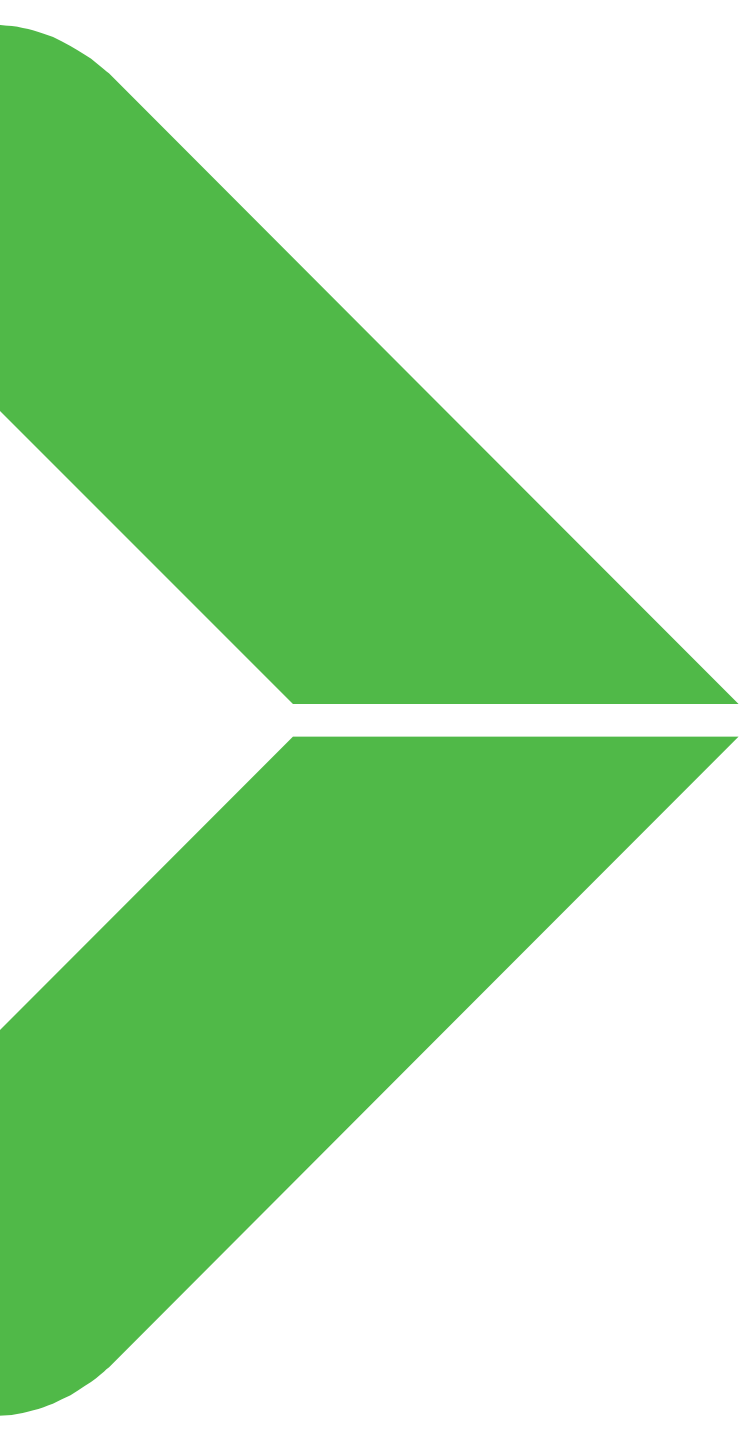
Summary

Solid energy, process industry and marine business with good long-term growth opportunities

- Market leader position in biomass & multifuel market – can strengthen further in Valmet
- Leverage strong position in Waste-to-Energy market in Europe to new geographic areas
- Marine cruise market is active and we have strong position in Europe, new geographies such as China will grow in the near future
- We have strong position in India and China with our partners and continue to penetrate to other Asian markets with EPC contractors







Valmet – world leader in pulp and paper automation

Tampere site visit
November 26, 2015

Juha Koistinen,
VP, Control & Measurement Systems

Pulp and paper automation

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- 1 Strong market position
- 2 Technology and services offering
- 3 Pulp and paper market is a growth market
- 4 We take our pulp and paper customers' performance forward
- 5 Summary



Strong market position

Automation has a strong position in pulp and paper

- Pulp and paper is globally a niche segment, where Valmet is the #1 player
- Very high entry barriers limits number of potential new entrants
- Competitors have been losing focus
- Very strong offering due to continued R&D investments
- Global customer reach
- Captive service business model

Valmet is the only supplier in market with process technology, services and automation



Addressable market:

~EUR 1 billion

Market growth rate:

~1%

Valmet's market position:

#1-2

Main competitors:

ABB, Honeywell, BTG



Technology and services offering

Unique and market leading automation offering

	Scope/product		Market position in pulp and paper	Main competitors
Distributed Control Systems (DCS)	<ul style="list-style-type: none"> DCS for process and machines controls Condition monitoring Information management APC (Advanced Process Controls) 		#2	<ul style="list-style-type: none"> ABB Honeywell Emerson Siemens Yokogawa
Quality Management Systems	<ul style="list-style-type: none"> QCS (Quality Control Systems) Profilers Web inspection and web break analysis systems 		#1-2	<ul style="list-style-type: none"> ABB Honeywell Yokogawa Voith Paperchine Procemex Cognex Isra
Analyzers and measurements	<ul style="list-style-type: none"> Paper analyzers Pulp analyzers Pulp consistency measurements Conductivity measurements Power analyzers 		#1	<ul style="list-style-type: none"> ABB BTG PulpEye

Source: Management estimates

Completely renewed market leading Quality Management System product family launched



2015 Valmet IQ 2015

2015 New IQ Quality Vision

2012 Metso WMS and WIS

2012 Metso IQ system

2008 PaperIQ Select – intelligent scanning

2004 One Source IQ Profilers

2004 PaperIQ Plus – fast scanners, MPC controls

2001 IQInsight – non-scanning measurement

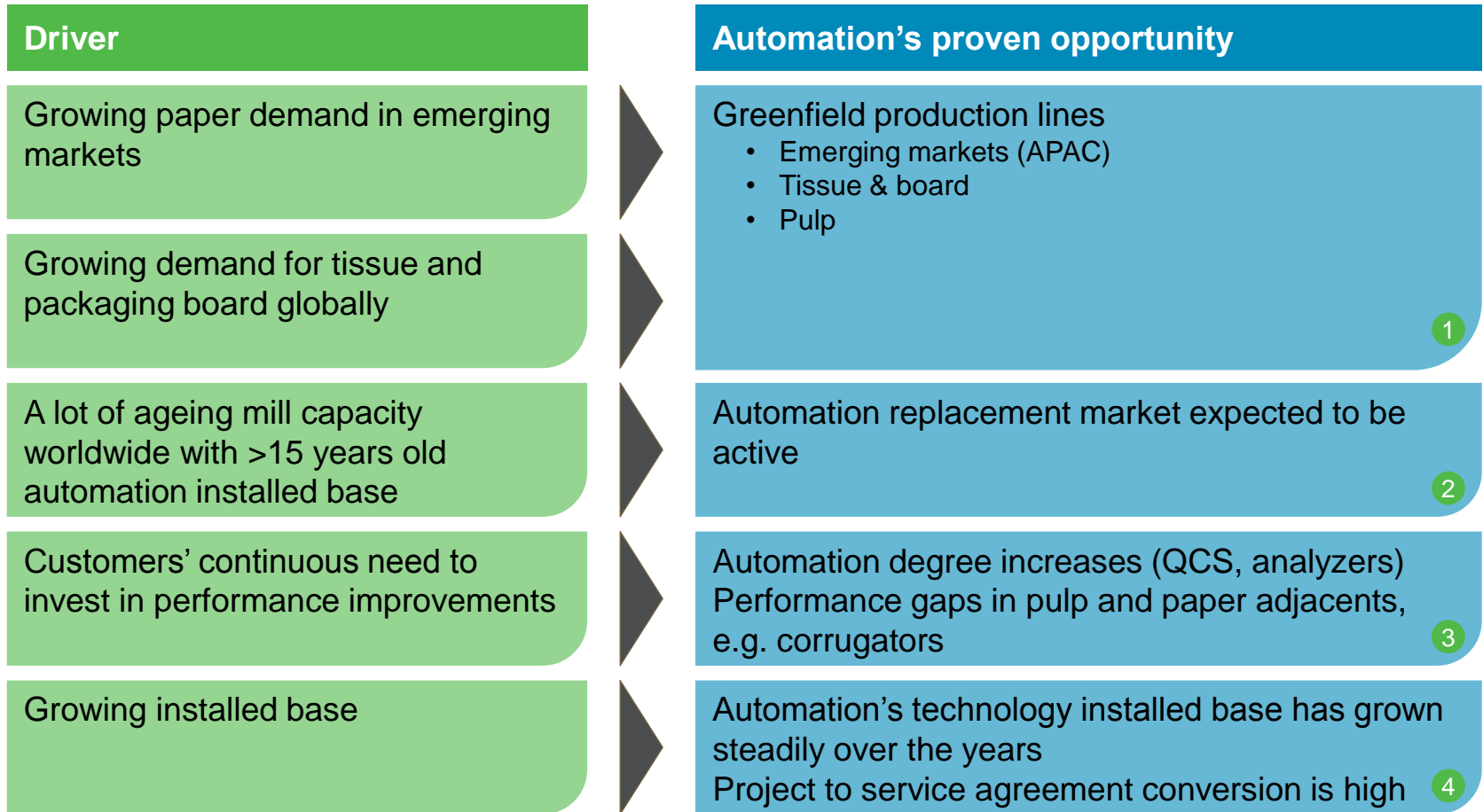
1995 PaperIQ – modular, intelligent sensors

1990 First fully integrated QCS and DCS system



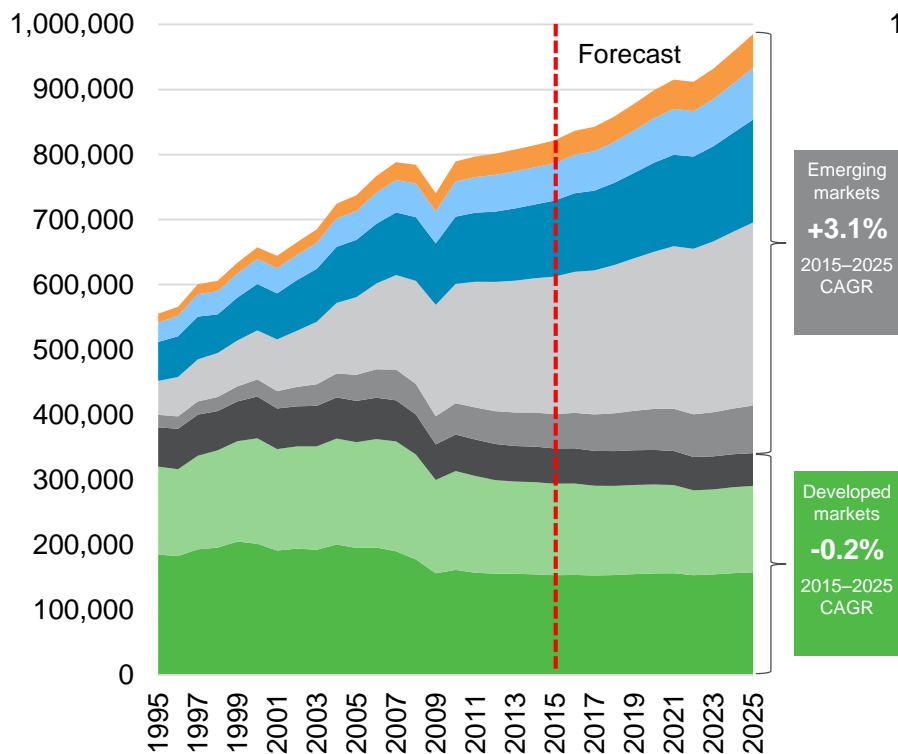
Pulp and paper market
is a growth market

Pulp and paper is a growth market for Automation

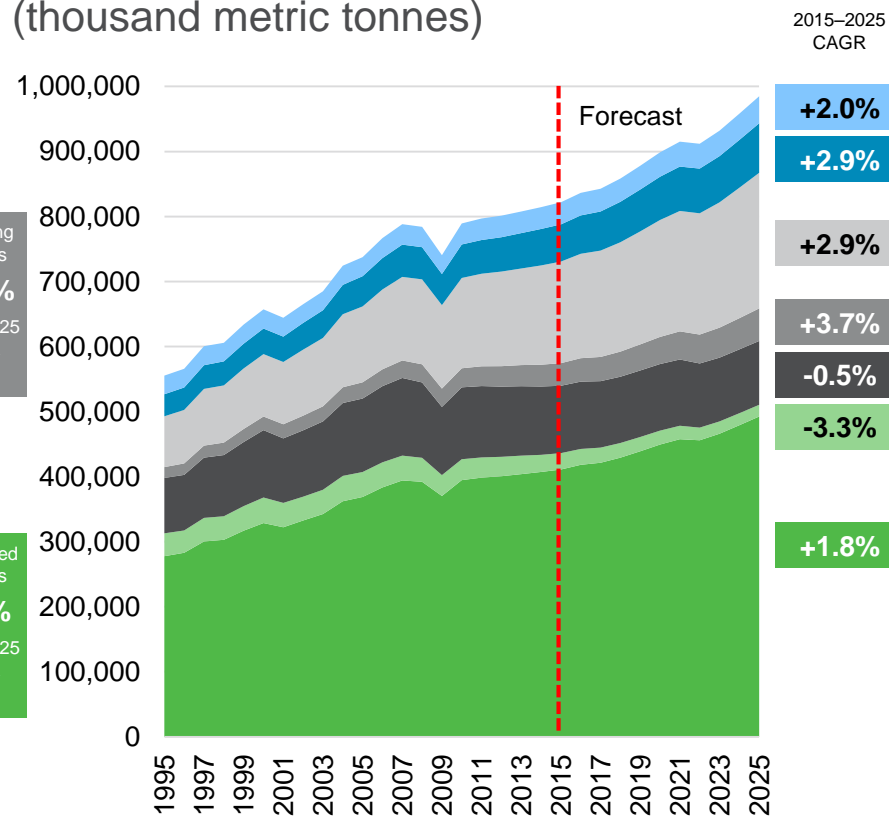


Global paper demand expected to grow

Paper consumption by area (thousand metric tonnes)



Paper consumption by paper grade (thousand metric tonnes)

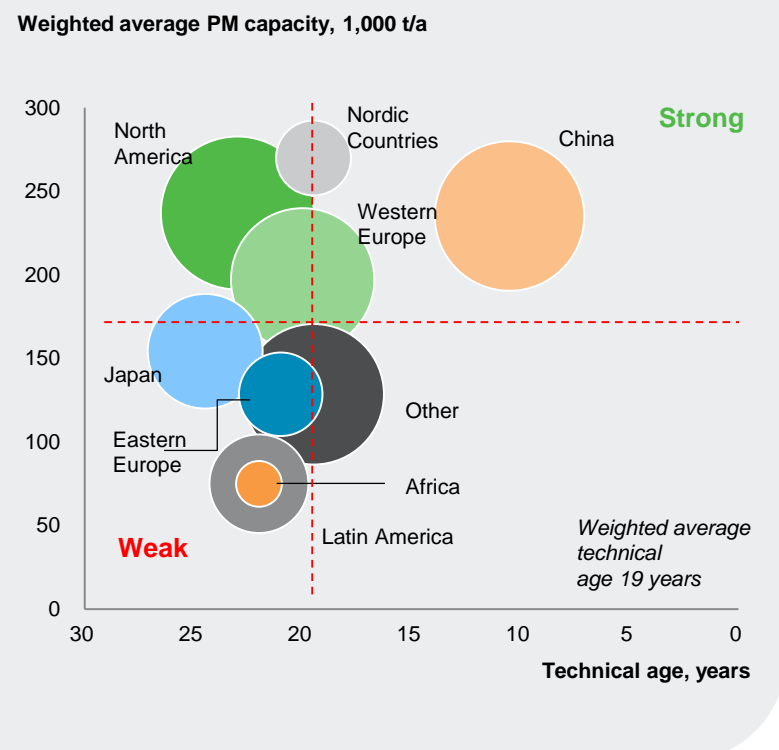


- North America
- Western Europe
- Japan
- Eastern Europe
- China
- Rest of Asia
- Latin America
- Other

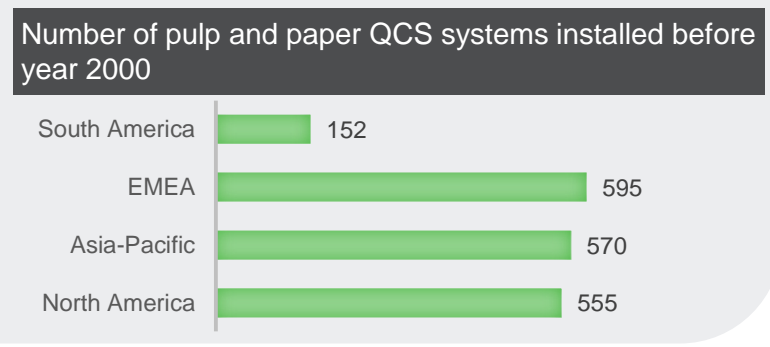
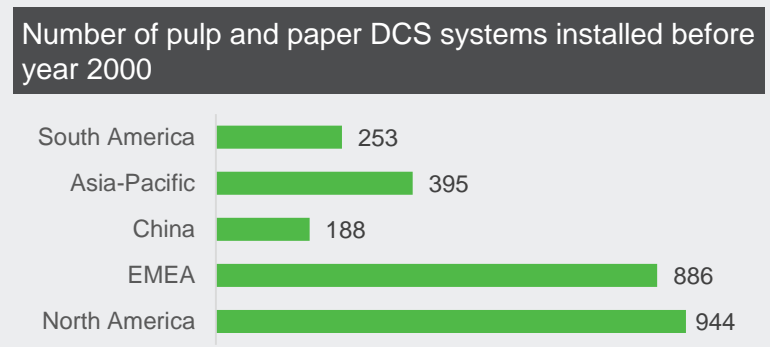
- Board and Paper
- Newsprint
- Printing & Writing
- Tissue
- Containerboard
- Other

Pulp and paper automation replacement market expected to be active

Papermaking lines in developed markets are getting old



Large ageing competitor installed base is a major opportunity



Automation has replaced >300 competitor DCS, QCS and Profiler systems 2010-2014

We address pulp and paper makers' challenges

Energy

- High energy utilization per ton of production

Production

- Maximize tonnage by eliminating process downtime and increasing speed
- Brain-drain

Quality

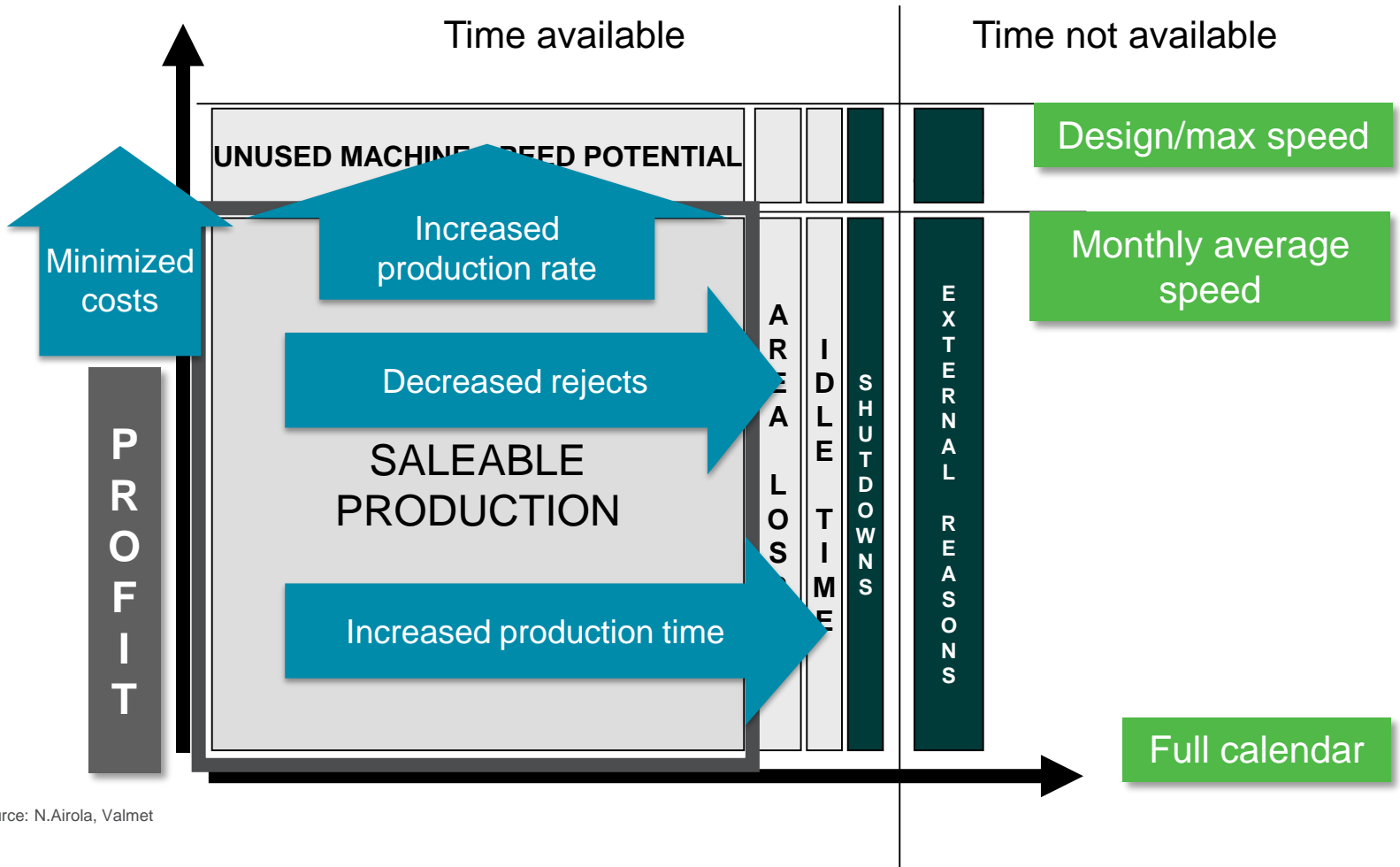
- Ever stricter end-customer requirements for product quality

Costs

- Commodity grades compete on price - costs are critical
- Minimize use of expensive fibers and other raw materials
- Less manpower related costs

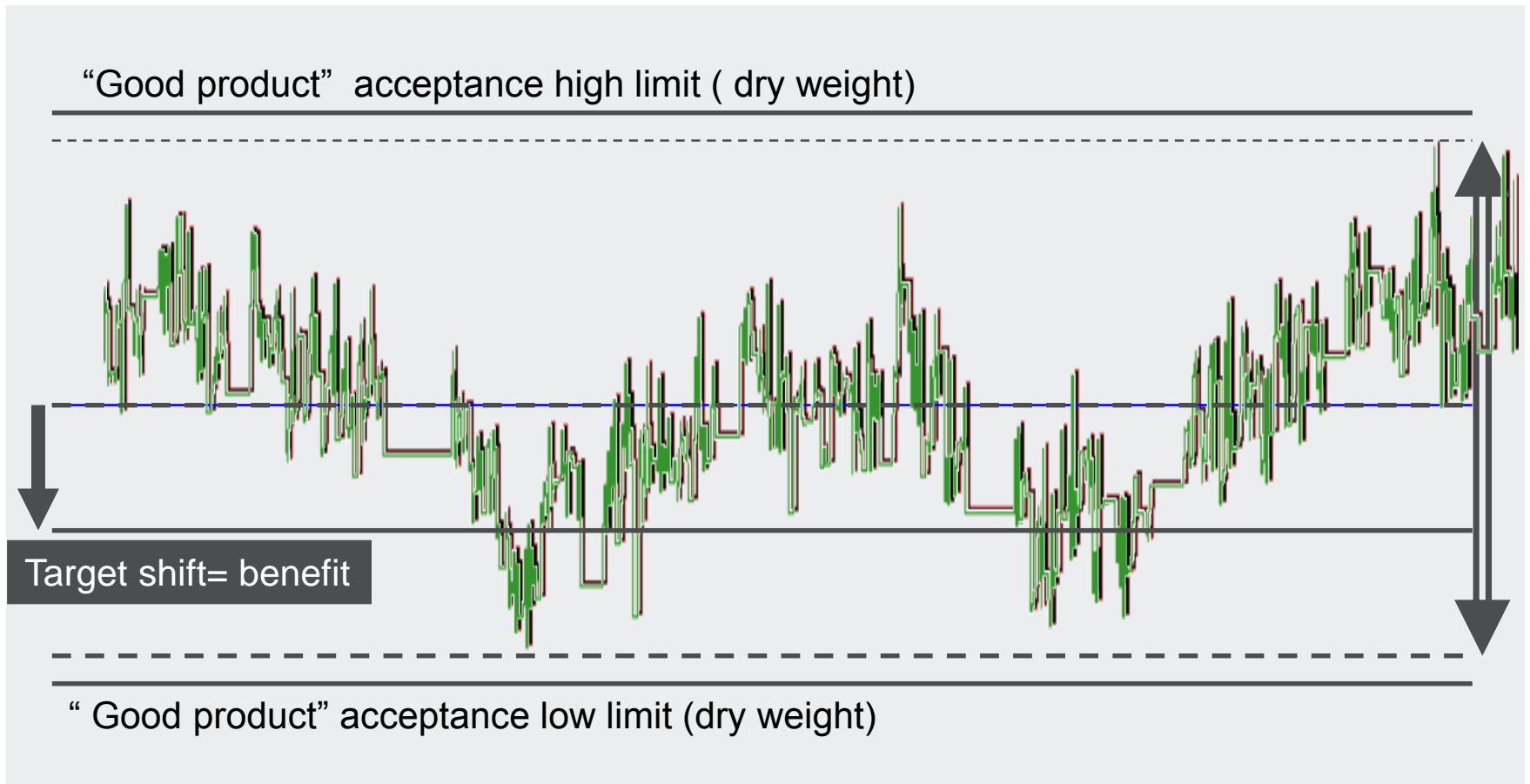
Technology and services offering addressing all major customer challenges

How can improvements in production efficiency and cost savings be achieved



Source: N.Airola, Valmet

Earning model: Fiber savings via improved stability - target level shift in MD or CD




Continuously growing installed base turns to service business

300 to 400
new systems installed
every year



>70%
project to service
agreement conversion





We take our pulp and
paper customers'
performance forward

Combining Valmet's strengths to take Customers performance forward



Background

- Stora Enso Heinola mill's target was to improve broke refining with a refiner rebuild
- Re-fitted refiner from Varkaus mill to Heinola

Path to the solution

- Customer's inquiry included refiner refit and automation elements
- Collaboration with Customer leads to turn-key Valmet solution including also process engineering, equipment and installations as well as project management

Valmet Solution

Turn-key delivery of broke refiner rebuild including e.g.

- Electrical, instrumentation and automation engineering and installation
- Process equipment, fittings and piping
- Valmet DNA system and applications
- Project management
- Process training

The Results

- Significant tensile stiffness increase immediately after start-up



“When Valmet offered to not only refurbish the refiner, but provide us with a turnkey delivery of the whole project it was an excellent option. It's easy to work when there is only one partner.”

“No need to run trials for the performance guarantee, we could see the results in normal operation”

Mr. Tero Karvinen

Production Superintendent, Stora Enso Heinola

Several follow-up performance improvements since this project



Summary

Summary

- Market leader in pulp and paper automation
- Pulp and paper is a growth market for us
- Committed to taking our customers' performance forward

