



Welcome to Valmet
in Sundsvall

Program

Meeting with investors in Sundsvall, September 10, 2015

09:35 am	Coffee and welcome
09:50 am	Presentation and discussion Stefan Mattsson VP, Fiber Business Lars Eklund VP, Service Business Rickard Andersson VP, Biotech & ES Business
12:00 pm	Lunch
12:40 pm	Pulse & Innovation
01:10 pm	Site Tour
03:05 pm	Coffee and wrap-up
03:20 pm	Transportation to SDL Airport
04:20 pm	Departure to Stockholm



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Safety first



Main office



Service



Workshop



Fiber Technology Center





Safety glasses



High-viz vest

You will be given visitor's personal protective equipment. These are mandatory in our laboratory and production facilities.



Smoking is not allowed in our premises.

The use of cameras or
video equipment is
prohibited.
(Special permission
can be given)





Evacuation point

- A Production Workshop
- B Main Office
- C Technology Center
- D Service Center



If the emergency alarm rings or you are ordered to evacuate the building, stay with your host and follow his/her instructions:

- Follow the exit signs and take the shortest route outside
- Do not use elevator and walk orderly in the stairs
- Your host will guide you to evacuation point. Your host will inform when it is permitted to leave the evacuation point and give then any further instructions

Valmet Sundsvall

Located in Sundsbruk

- 410 employees
- Technical experts in Pulping & BIO
- Office
- Fiber Technology Center
 - Pilot facility
 - Laboratory, Bleaching & Analysis
- Service Center
- 24–7 Services



The workshop



- Specialized in high alloy materials, complex welding and machining
- Highly skilled own manning, totally 92 persons
- Large network of external resources for maximized flexibility (+150)
- Integrated development with product design and project departments

The Fiber Technology Center (FTC)



- The cornerstone in our ambition of continuous product development
- Close co-operation with universities in Sweden
 - Chalmers
 - Kungliga Tekniska Högskolan (KTH)
 - Mid Sweden University

Contents

Pulp session, Sept 10, 2015

1 Pulp & Energy business line in brief

2 Global pulp market

3 Pulping in a nutshell

4 Process solutions

5 Summary



Valmet Pulp & Energy business line in brief

Pulp and Energy business line in brief

World-class pulp mill offering and complete delivery capability.

Global technology and know-how leader in bioenergy and multifuels.

A natural growth platform for environmental systems and biomass conversion technologies.

2014 figures

Orders received EUR 1,344 M

Net sales EUR 956 M

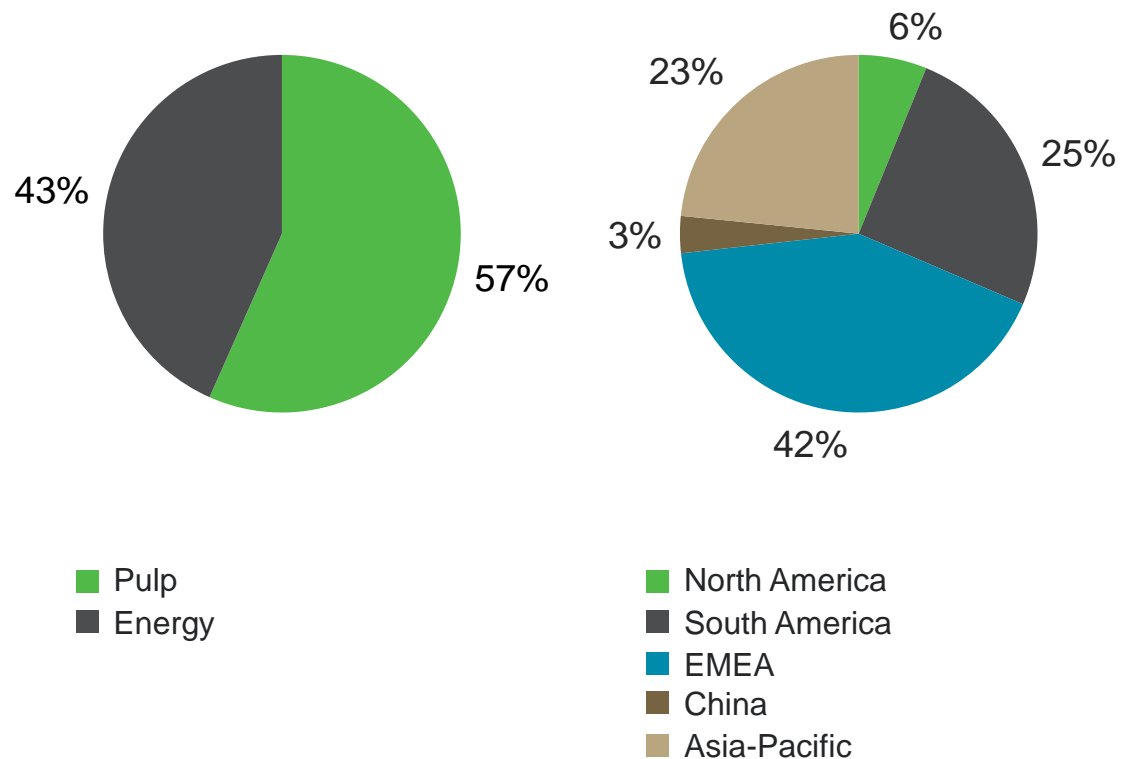
Employees 1,737

Position

#1-2 Pulp

#1-3 Energy

Net sales (2014)



Pulp and Energy offering

A range of solutions and technologies fulfilling our customers' needs



Suzano Mucuri pulp mill in Brazil



Valmet's CYMIC boiler at Stora Enso Langerbrugge



First demonstration scale integrated pyrolysis unit, Fortum

Pulp

- Wood and pulp handling
 - Wood handling, fuel handling, pulp drying
- Fiber processing
 - Cooking systems, mechanical pulping, complete fiber lines
- Recovery
 - Recovery boilers, evaporation systems, recovery islands

Energy

- Heat and power generation
 - Fluidized bed boilers, bio-grate boilers, biomass and waste gasification
 - Boiler islands and small power plants

Biotechnologies and Environmental Systems

- Biotechnologies
 - Lignin recovery, pre-hydrolysis, pyrolysis, bio-coal
- Air pollution control
 - Flue gas cleaning and heat recovery for boilers
 - Odor and pulp mill balance control
 - Environmental systems for biotechnologies





Pulp Business

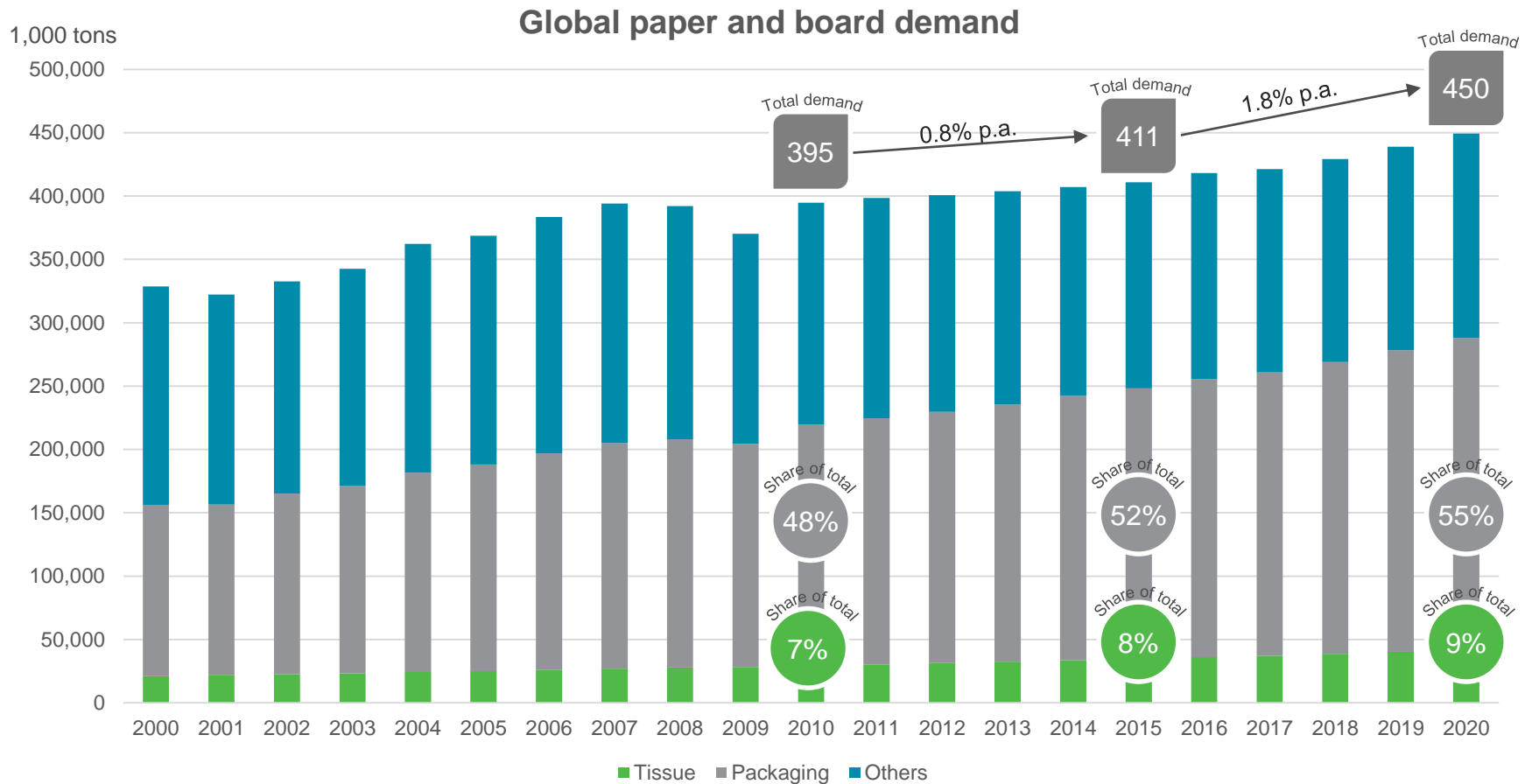
Stefan Mattsson,
VP Fiber Processing Business unit

Site visit to Sundsvall
September 10, 2015



Global pulp market

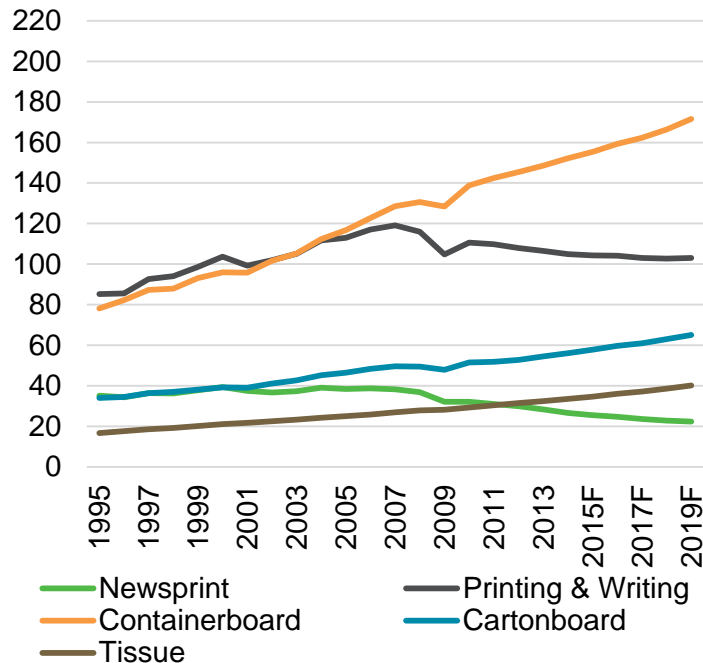
Packaging and tissue are driving the total paper and board demand growth



Packaging: containerboard, cartonboard and other paperboard

Growth in packaging and tissue demand is expected to continue while printing & writing and newsprint are declining

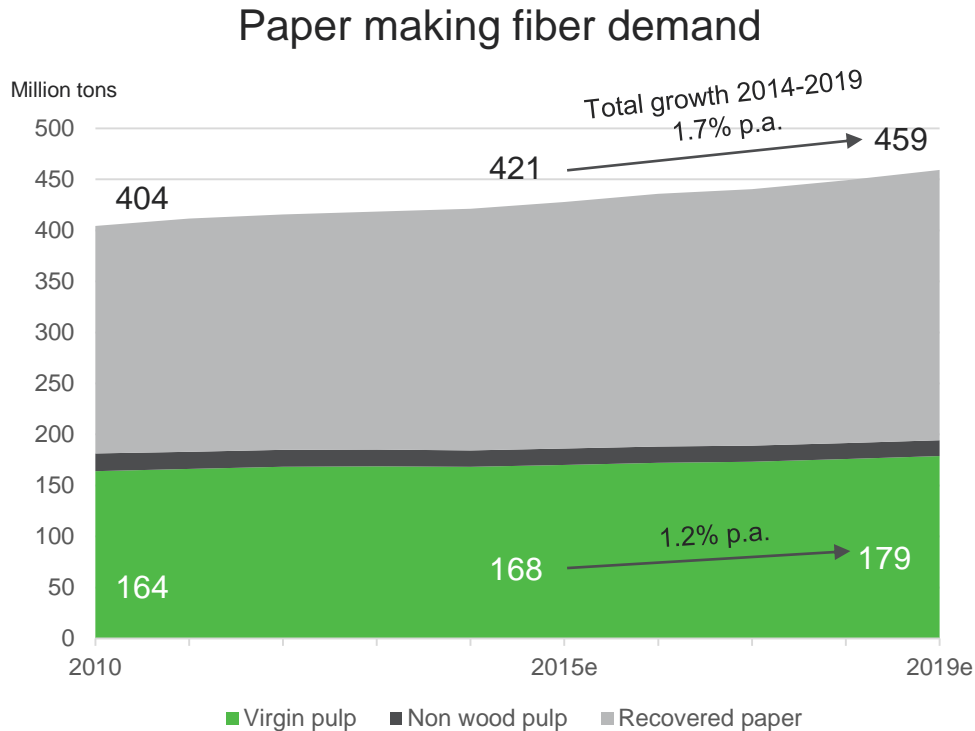
Paper consumption (Million tons)



CAGR	1999–2014	2014–2019F
Containerboard	+3.3%	+2.4%
Printing & Writing	+0.4%	-0.3%
Cartonboard	+2.6%	+3.0%
Tissue	+3.5%	+3.7%
Newsprint	-2.3%	-3.5%

World pulp demand

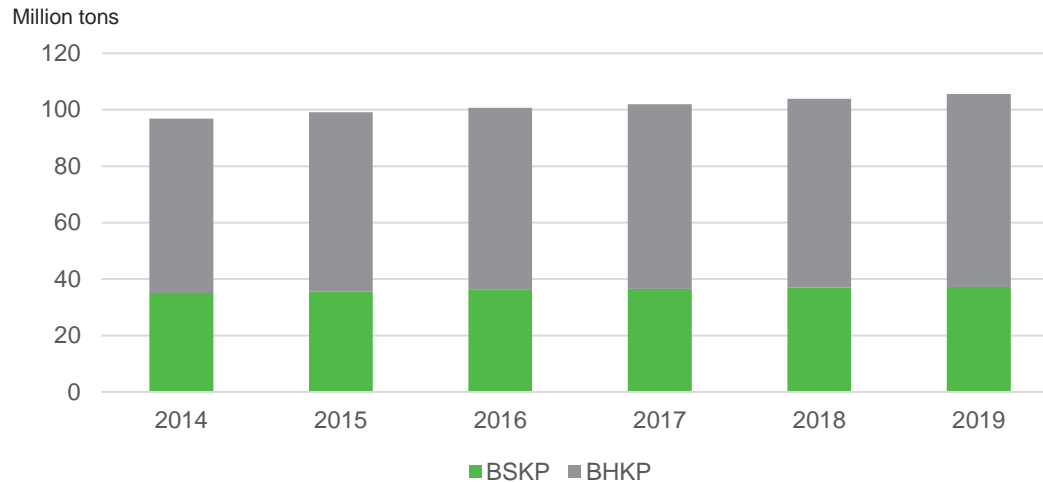
Fiber substitution by high quality virgin fiber wood pulp continues to grow



- World paper-making fiber demand is growing
- Virgin fiber demand is increasing
- The share of market wood pulp is increasing
- Industry offers different types of investment opportunities in different markets
- New bio-pulp mill concept offers opportunities especially in Europe and North America, and also in Latin America

Virgin fiber demand is concentrating on BHK, fluff and dissolving

Integrated and market BSK and BHK demand



Growth estimates

BHK

2.0%/a or 1.3 million t/a

BSK incl. fluff

1.2%/a or 425,000 t/a

Fluff

3.8%/a or 225,000 t/a

BHK drivers

- Growth of tissue paper and high-quality boxboard
- Growing market share of woodfree papers relative to mechanical papers in P&W segment
- Advances in paper machine design, and more extensive use of BEK in woodfree papers

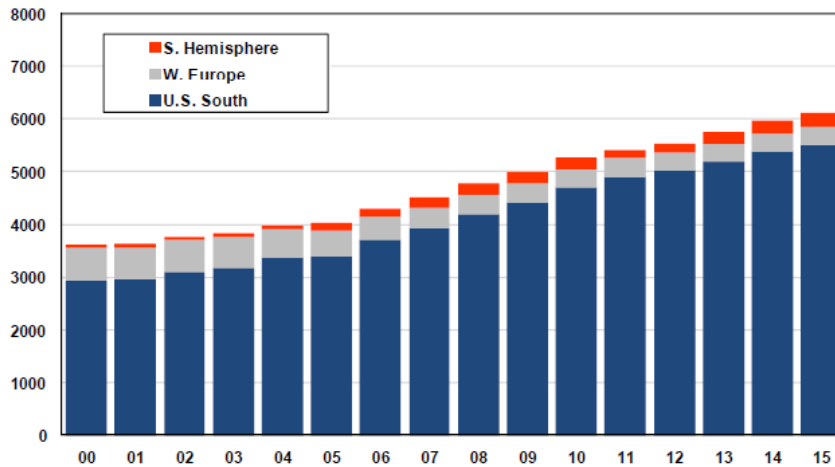
BSK drivers

- Growth of tissue paper throughout the world
- Steady rise in fluff pulp demand

Fluff pulp market

Almost all BSK fluff pulp is sold on the market to consumer product companies for conversion to absorbent products

Fluff pulp capacity by region



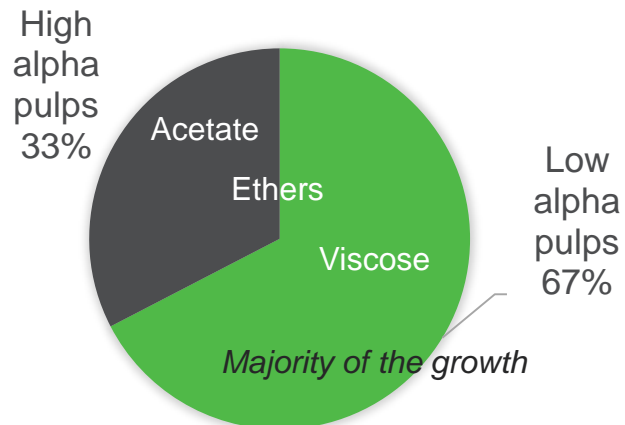
- World fluff pulp demand is approx. 5.6 million tons, growing steadily by about 3.8%/a or about 225,000 t/a up to 2019
- Capacity expansion outside USA is underway

Industry trends

- Growth in disposable diapers in the developing world and increasing usage of incontinence products in the developed world as population ages
- Swing capacity between fluff and BSK pulp production
- Brazilian BEK producers exploring options for using BEK in absorbent products

Dissolving pulp market

End uses of dissolving pulps

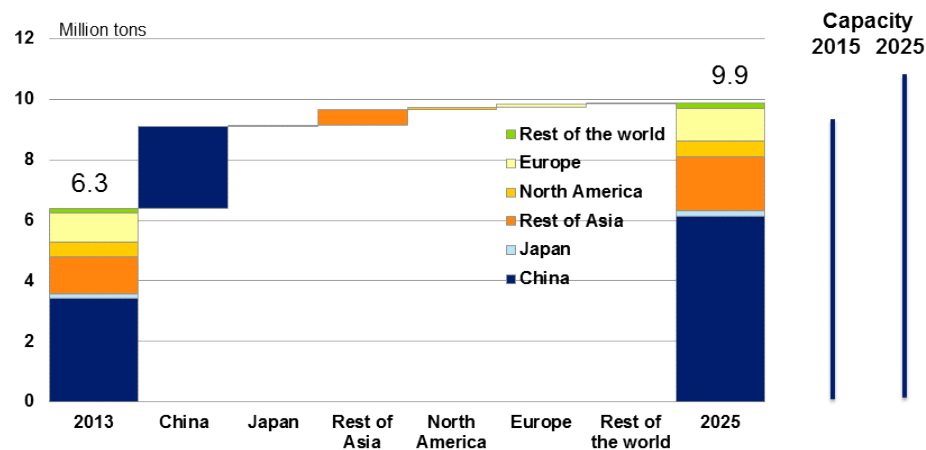


Purity is an important characteristic of dissolving pulp

	Common end uses
Viscose	Textile industry, non-wovens, cord and industrial yarn, cellophane, sausage skin, sponges
Acetate	Cigarette filter tows, LCD films, high quality plastics, acetate yarn, fibers
Ethers/others	Food industry, pharmaceutical, cosmetics, special paints, binders and glues, artificial leather, explosives

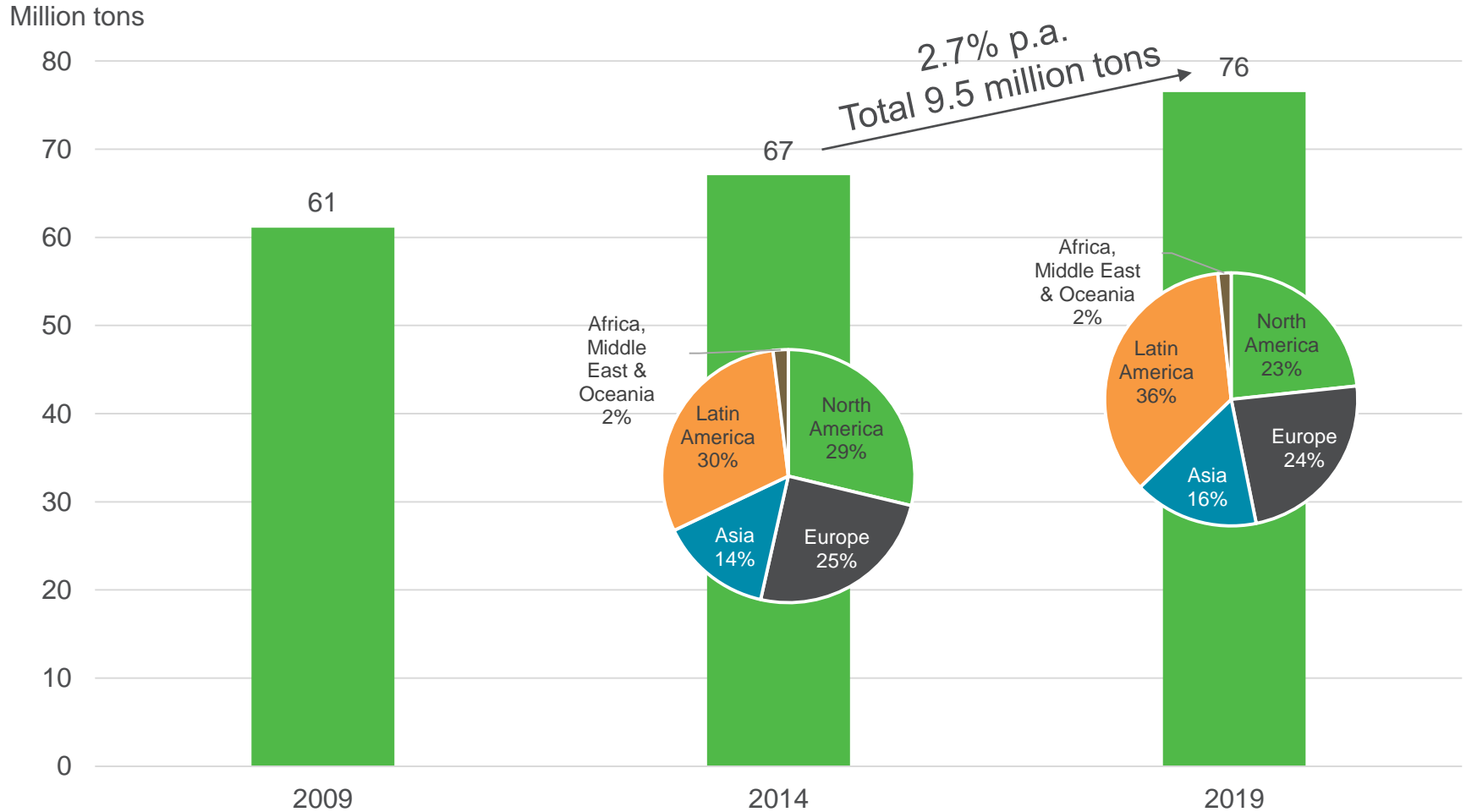
- In 2015, demand estimate is 6.9 million tons.
- Present capacity is estimated to about 9.0 million tons.
- Estimated demand of 9.9 million tons in 2025, with 3.7%/a growth in 2013–2025 requires about 11 million tons of capacity, i.e. +2Mt, mainly through conversions.

Global demand of dissolving pulp



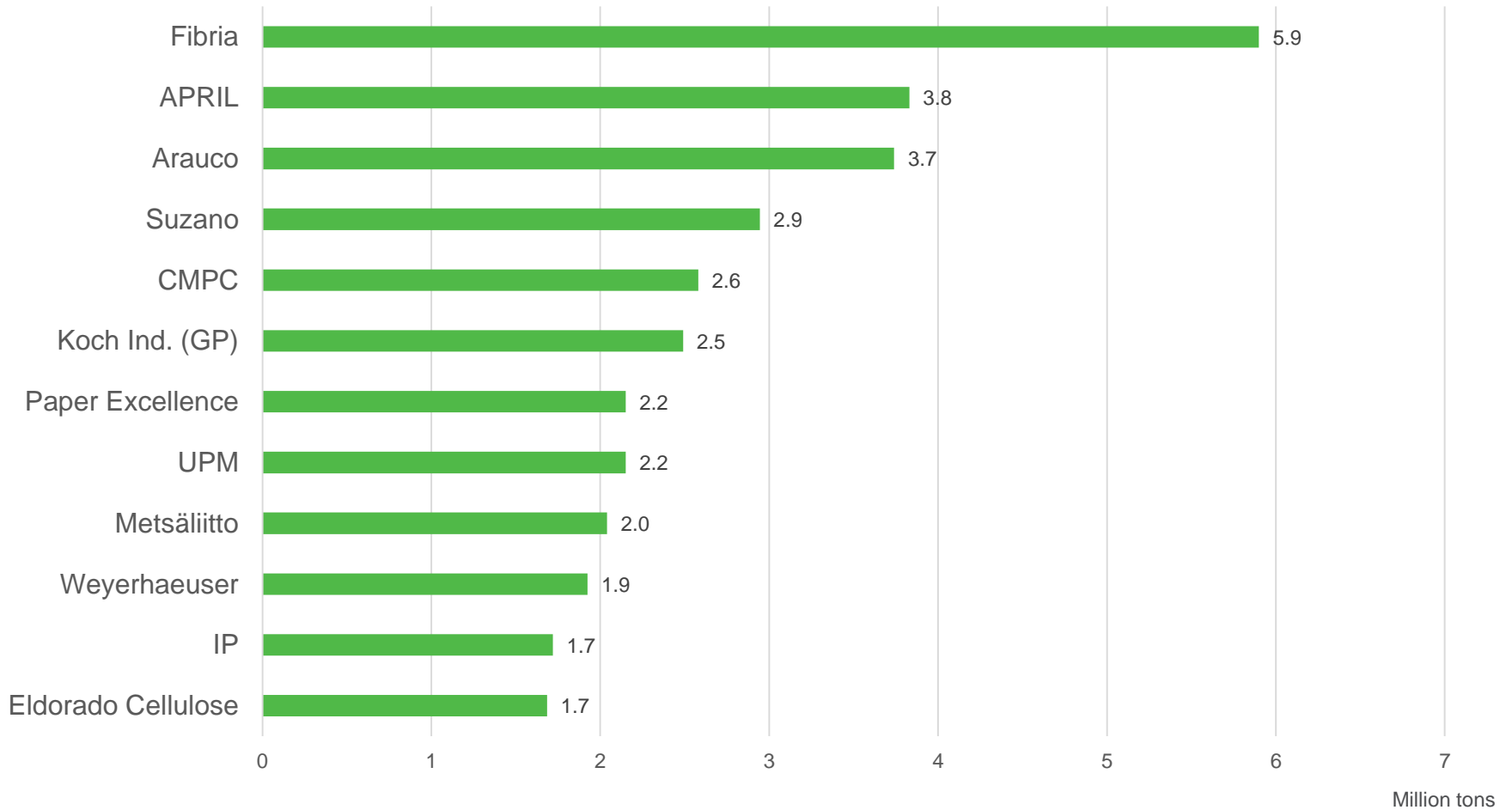
World market pulp capacity

Majority of the investments occur at market pulp mills



Top market pulp producers

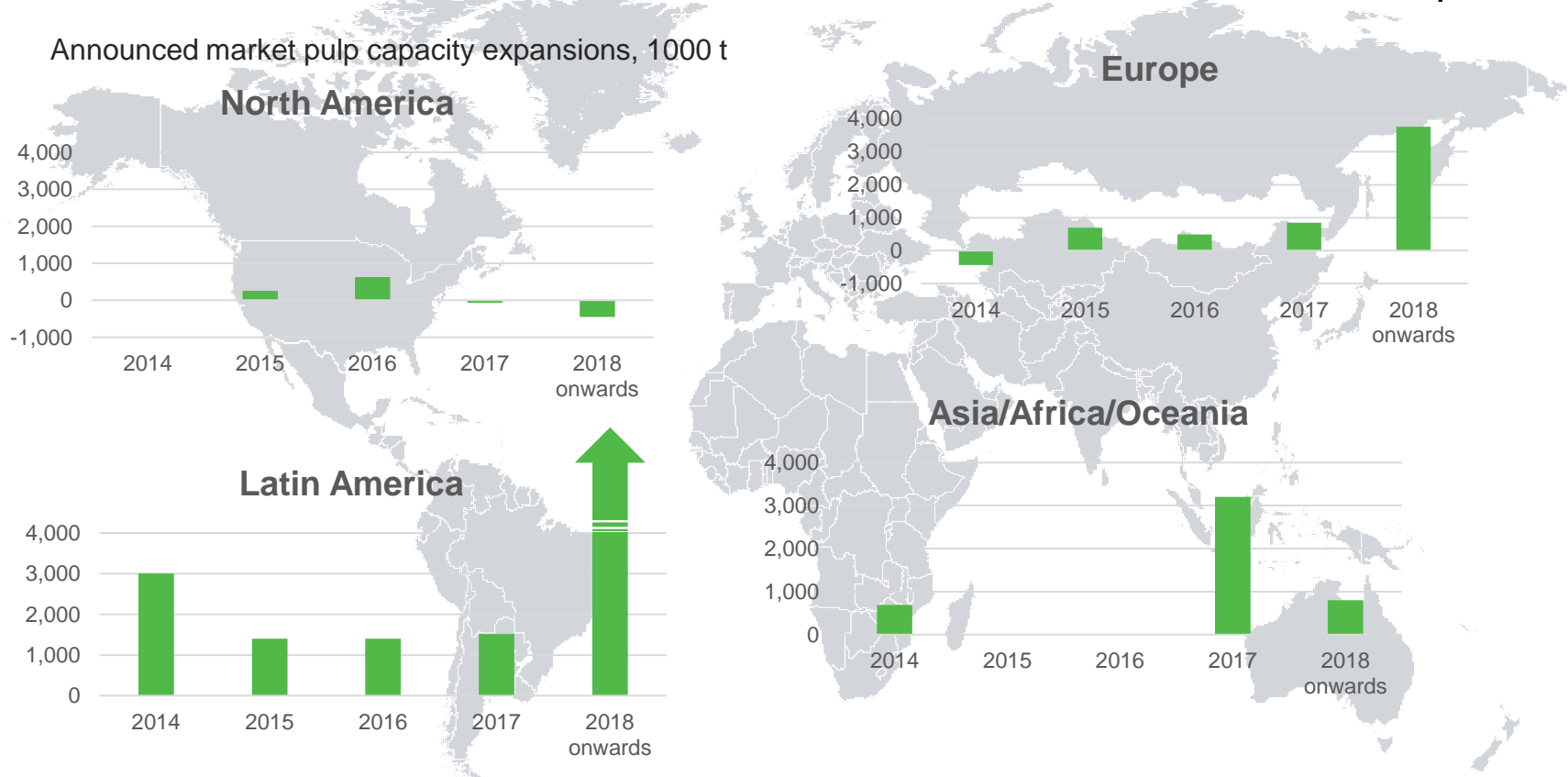
Top 5: 27% market share; Top 10: 43% market share



Future pulp capacity changes offer good project opportunities

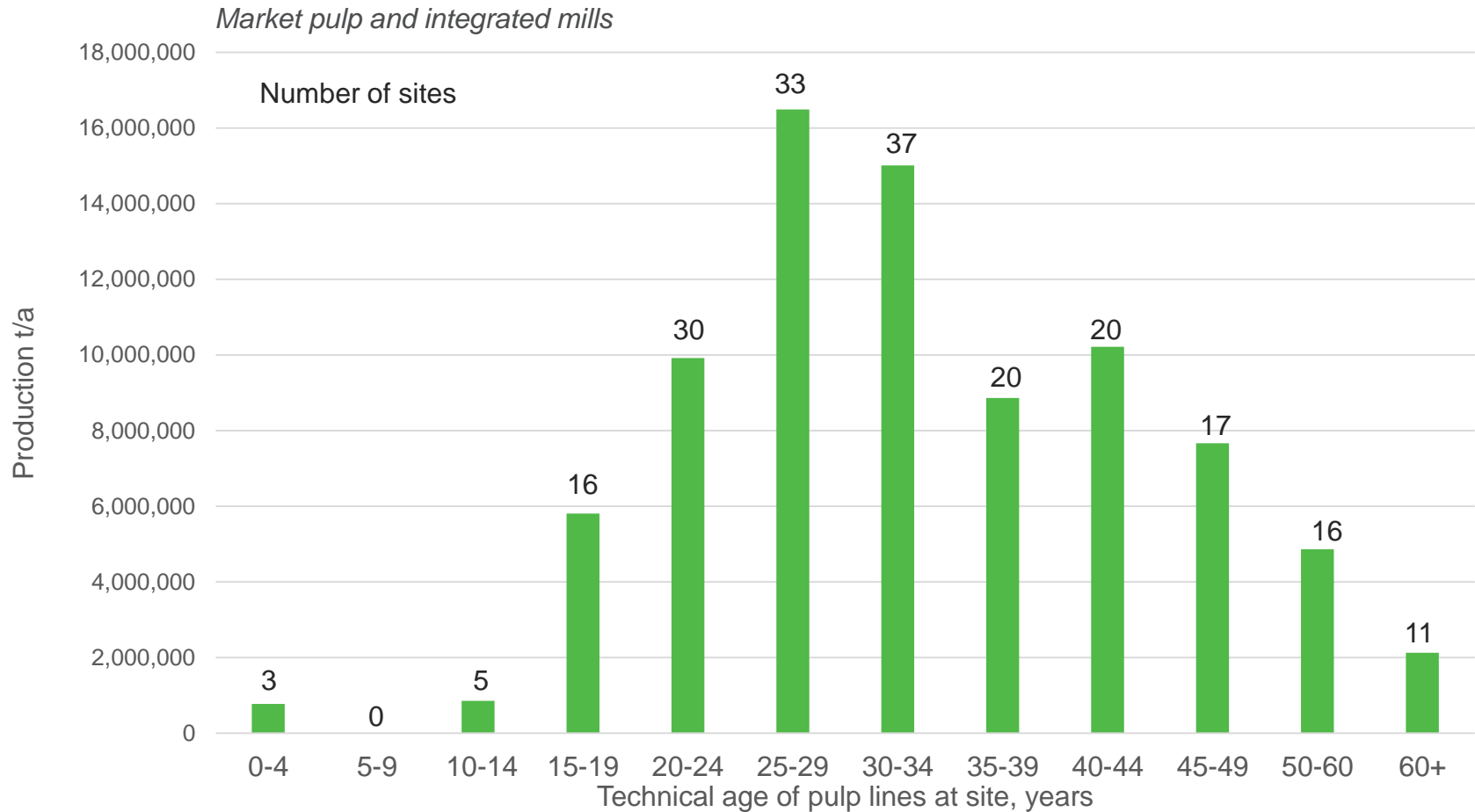
New mills will be constructed in Latin America, Asia and Finland. New mid-sized installations are in demand in Asia-Pacific. Upgrades, rebuilds and conversions are done in the mature markets of North America and Europe.

Announced market pulp capacity expansions, 1000 t



North American fiber production

88% of the sites in the North America have over 30 years old pulp line(s)



Conditions for pulp investments

Projects have realized in locations where implementation and operating risks are acceptable. In addition, investors benefit from a sustainable competitive advantage

- **General cost levels**

- Strong USD relative to most currencies has reshaped the cost structure of pulp industry, with South America and Indonesia pulp mill projects becoming more interesting investments
 - High quality pulp – low total production costs
 - A lot of land can be planted in Indonesia
- Restrict project implementation in highly developed economies

- **Good business environment**

- Needed for capital intensive investments
- Country risks, credit availability
- China's economy will remain one of the key global drivers

- **Infrastructure & Logistics**

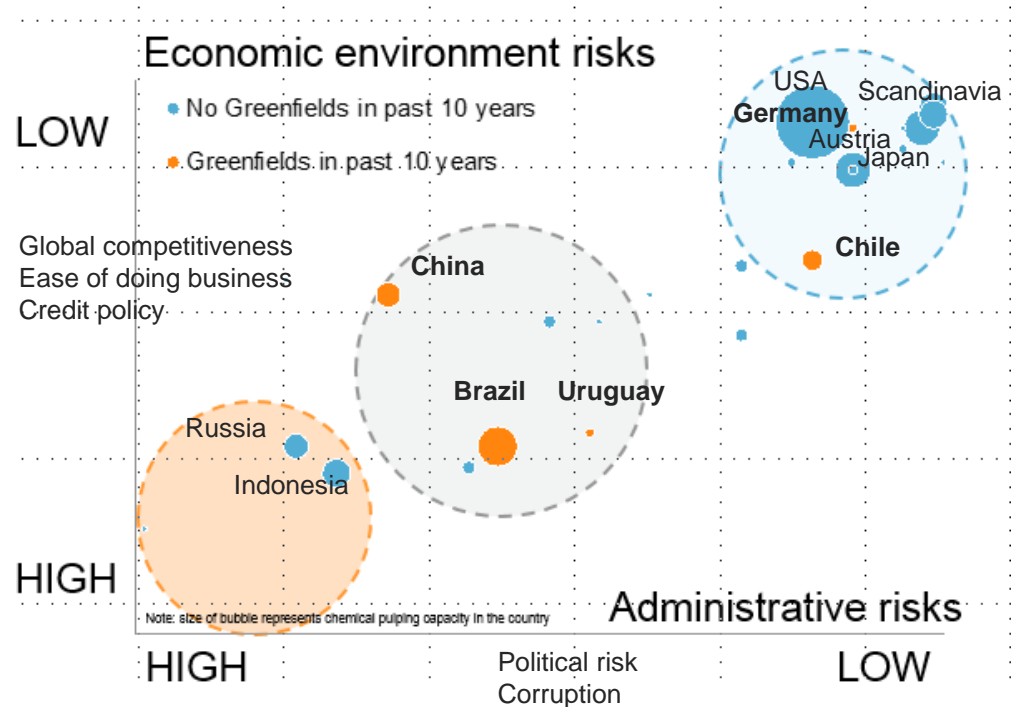
- Distance to raw material and to the markets

- **Technology**

- Relative few suppliers offering full technology packages
- Bio-concepts

- **Ready installed base**

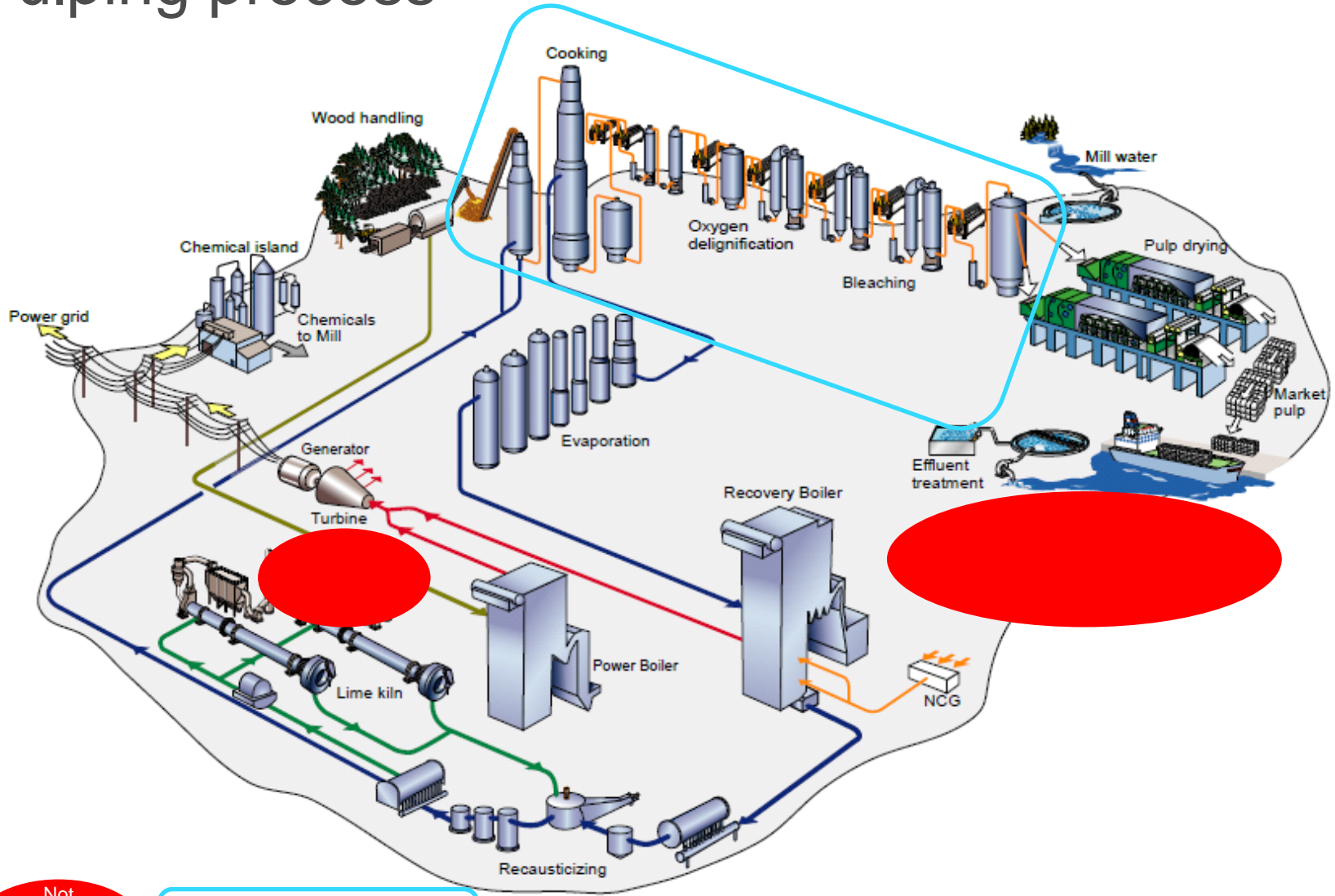
- North America offers strong rebuild market





Pulping process in a nutshell

Pulping process



Not included in Valmet Scope

FiberLine Today's Focus



Valmet Process solutions

Chemical pulp - BSK / BHK / BEK/ Dissolving

Valmet FiberLine

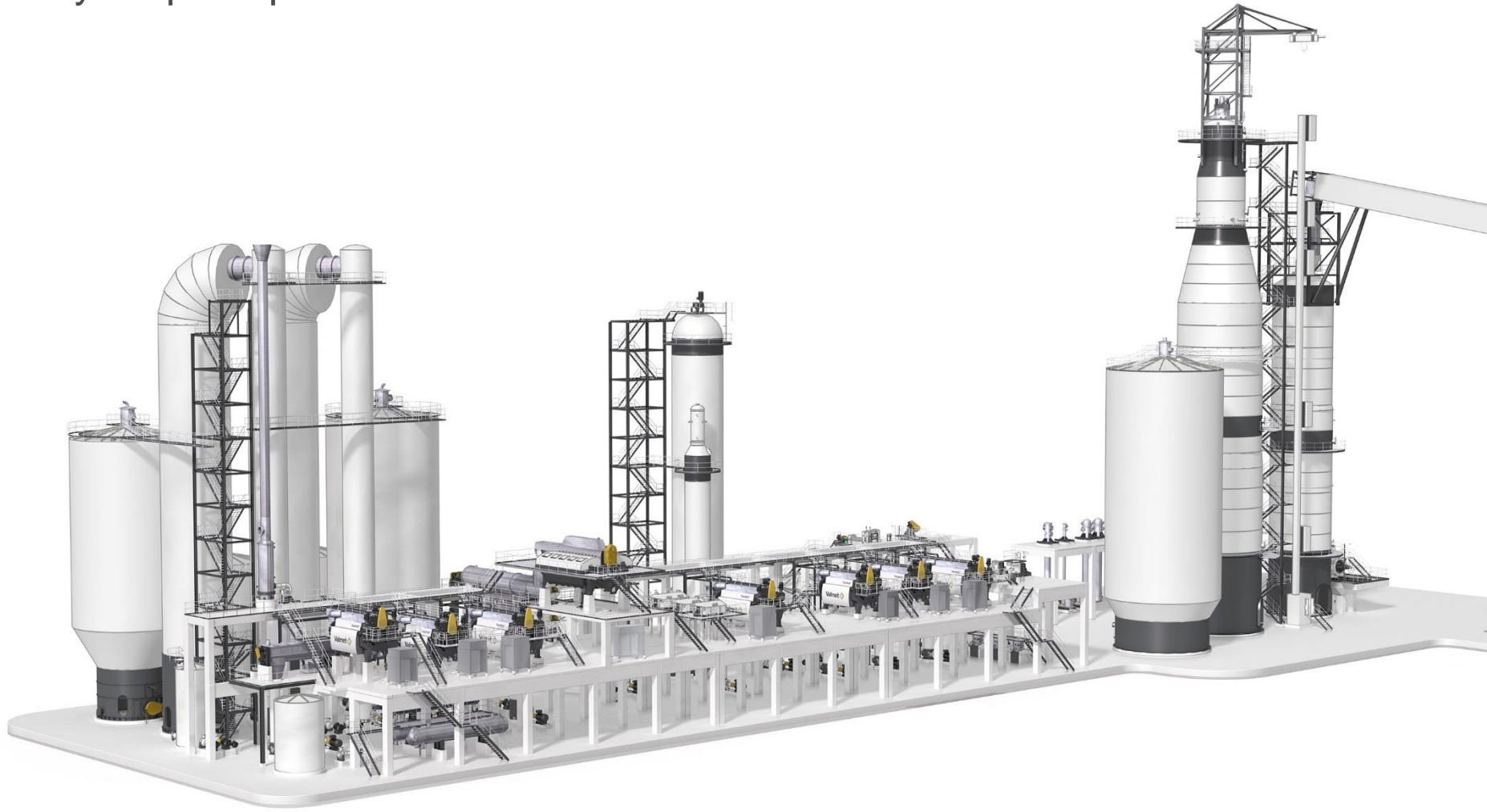
Proven large scale efficient and reliable

- High yield >54.5% with Compact Cooking
- Maximized power to the grid
 - +9.6 MWh = 4.4 Million USD/a @ 1.75MT/a
- Benchmark in water consumption and effluent volumes with TwinRoll press
 - Saving 10 million m³/a @ 1.75MT/a
- Low maintenance cost with TwinRoll press
 - USD 8.5 million savings/10 years @ 1.75MT/a
- Good platform for Service growth and profit !



The modern Valmet kraft fiberline

Layout principle



Pulp washing

TwinRoll™ Evolution - probably the best pulp washer in the market

Will be looked at
during the Site
tour

- Easy to install
- High capacity
- Reliable and flexible
- Optimized operation
- Low pressure demand
- Suitable for gravity feed
- Minimized operational and maintenance cost

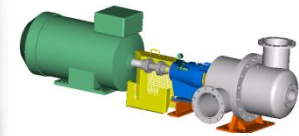
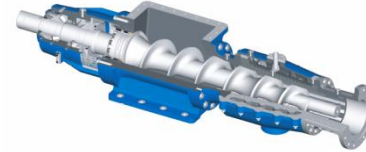


~1,300 sold to date

Fiberline machine products

More than 100 various machine products

- Digesters
- Refiners
- Washers
- Screens
- Filters
- Mixers
- Tower equipment
 - Scrapers
 - Agitators
- Feeders
- Ozone reactors
- MC Pumps (Sulzer)
- Reactors
- Kilns



Machines are good for service business !



Summary

Pulp summary

- Good Market opportunities
 - New Mills
 - Rebuilds
 - Upgrades
- Well received products
 - CapEx
 - OpEx
 - Sustainability



Pulp initiatives going forward

Customer excellence

Capitalize on Northern hemisphere softwood opportunities

Leader in technology and innovation

Significant R&D investments focused in increasing cost competitiveness

Further commercialization of new offering of Pulp and Energy business line targeting in >20% of orders received from new offerings

Excellence in processes

Savings through efforts in the field of procurement, and through further development in the utilization of cost competitive countries opportunities

Continued focus on lowered cost of product quality

Innovation and renewal

Lean Operations in all we do

Winning team

Unified local presence close to customers, suppliers and partners

Focus on global processes and competence development

Being a good place to work at





Services

Lars Eklund,
VP Performance Parts

Site visit to Sundsvall
September 10, 2015

Contents

Services session, Sept 10, 2015

1 Services

2 Service for Fiber customers

3 Performance parts



Services

Services business line in brief

Empowered to serve the pulp, paper, and energy industries

Sustainable services for energy production, fiber processing, paper, board and tissue production lines

Committed to sustainability, customers' profitability, optimized production and maintenance, long-term partnership

2014 figures

Orders received EUR 1,055 M

Net sales EUR 989 M

Employees 5,230

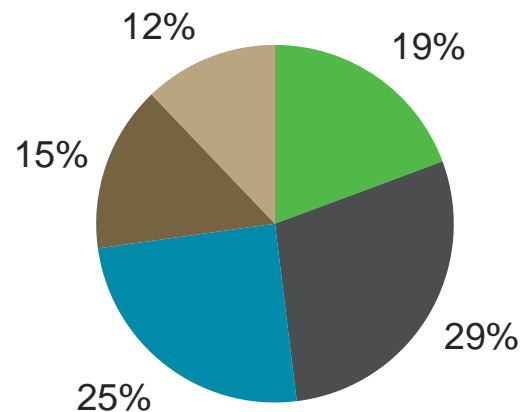
Market position

#1-2 Services

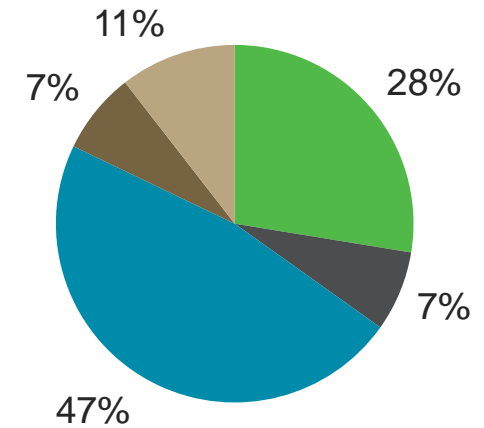
3,800 pulp and paper mills worldwide, of which over 50% purchase services from Valmet

400 customers outside the paper industry

Net sales (2014)



- Rolls and Workshop Services
- Mill Improvements
- Performance Parts
- Fabrics
- Energy and Environmental

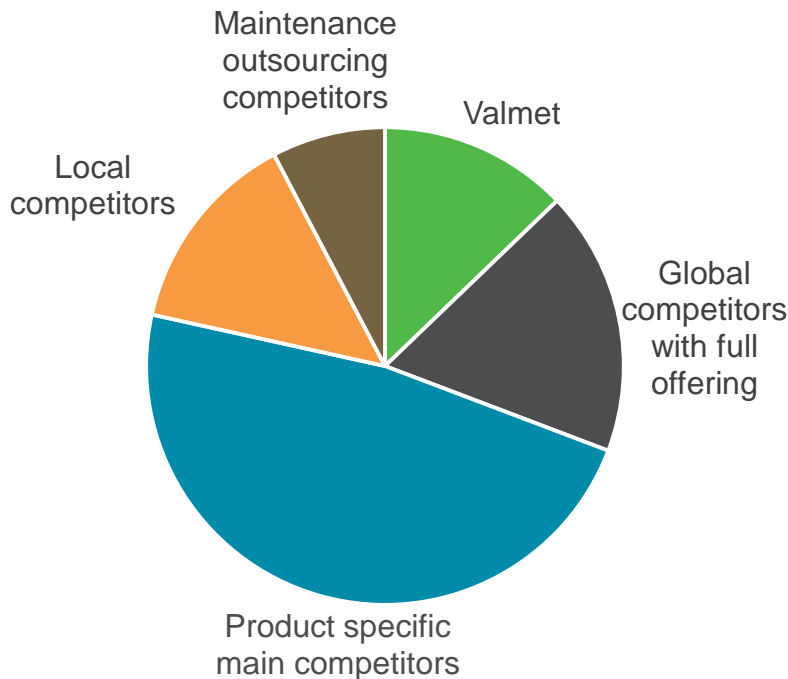


- North America
- South America
- EMEA
- China
- Asia-Pacific

Services competitors and market position

Room for growth

Valmet's market share is ~13%



Competitor type	
Global competitors with full offering	
Product specific competitors	
Local competitors	
Maintenance outsourcing competitors	

Valmet Services

Leading technologies and expertise close to customers

Increased
reliability

Improved
performance

Reduced
costs

Global presence with
comprehensive offering

Local service shops and service experts

Permanent presence at customer sites

Long-term partnership with focus on quality and safety improvements

Products and
components


Maintenance
and repair
programs

Process
consumable
programs

Maintenance
outsourcing

Production
improvement
projects

Analysis &
consulting,
remote data
management

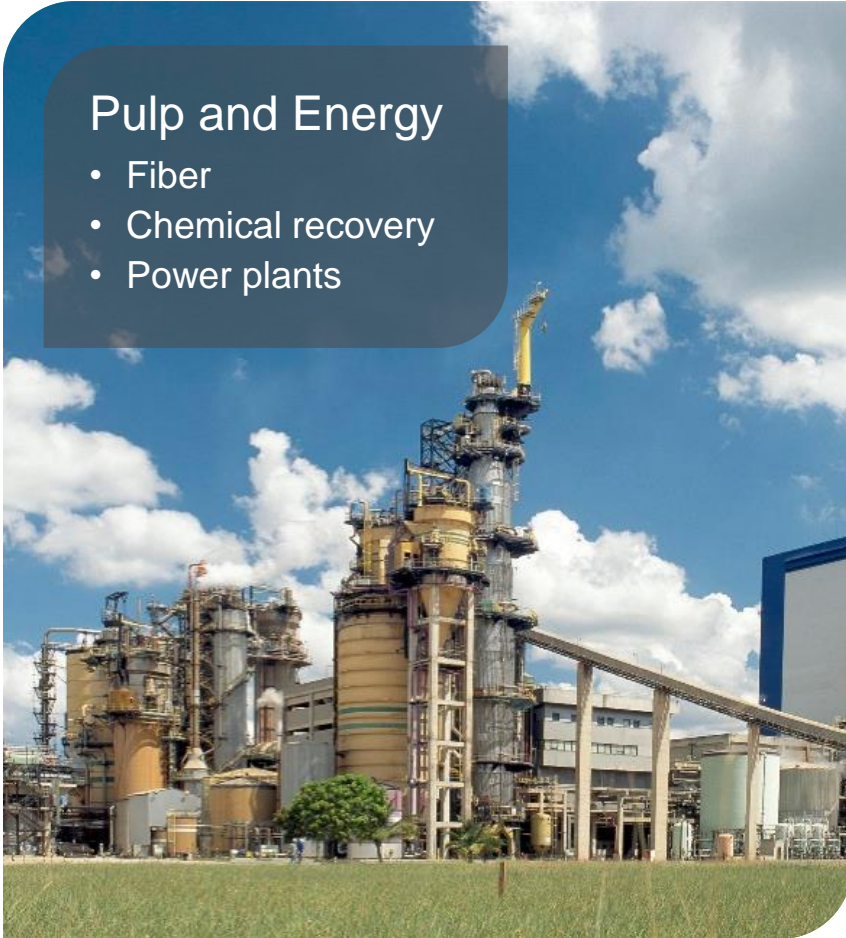


Service for Fiber customers

Services growing the fastest in Pulp and Energy

Pulp and Energy

- Fiber
- Chemical recovery
- Power plants



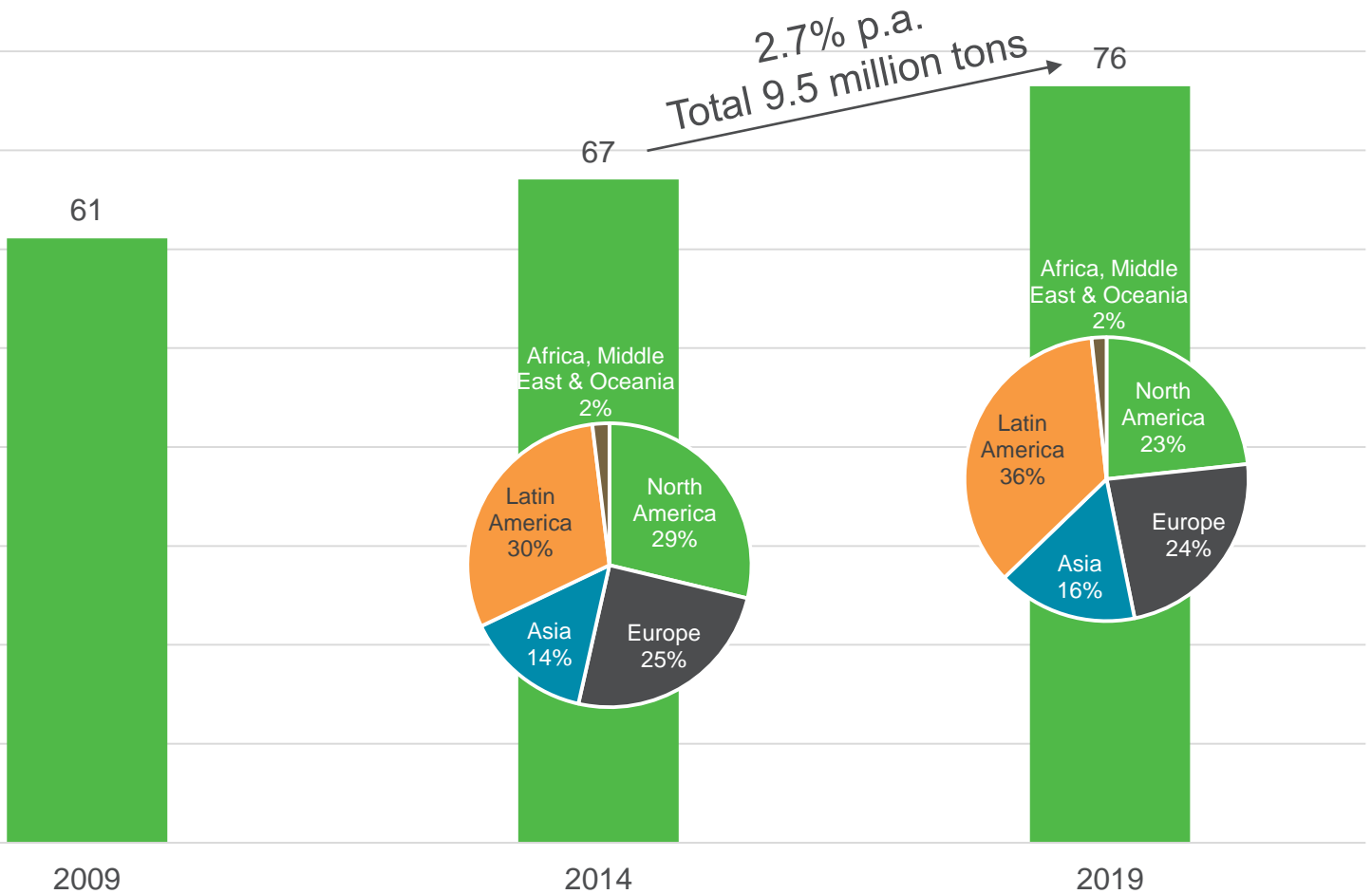
40%

of the world's pulp
is made with Valmet machines

New capacity has higher service potential

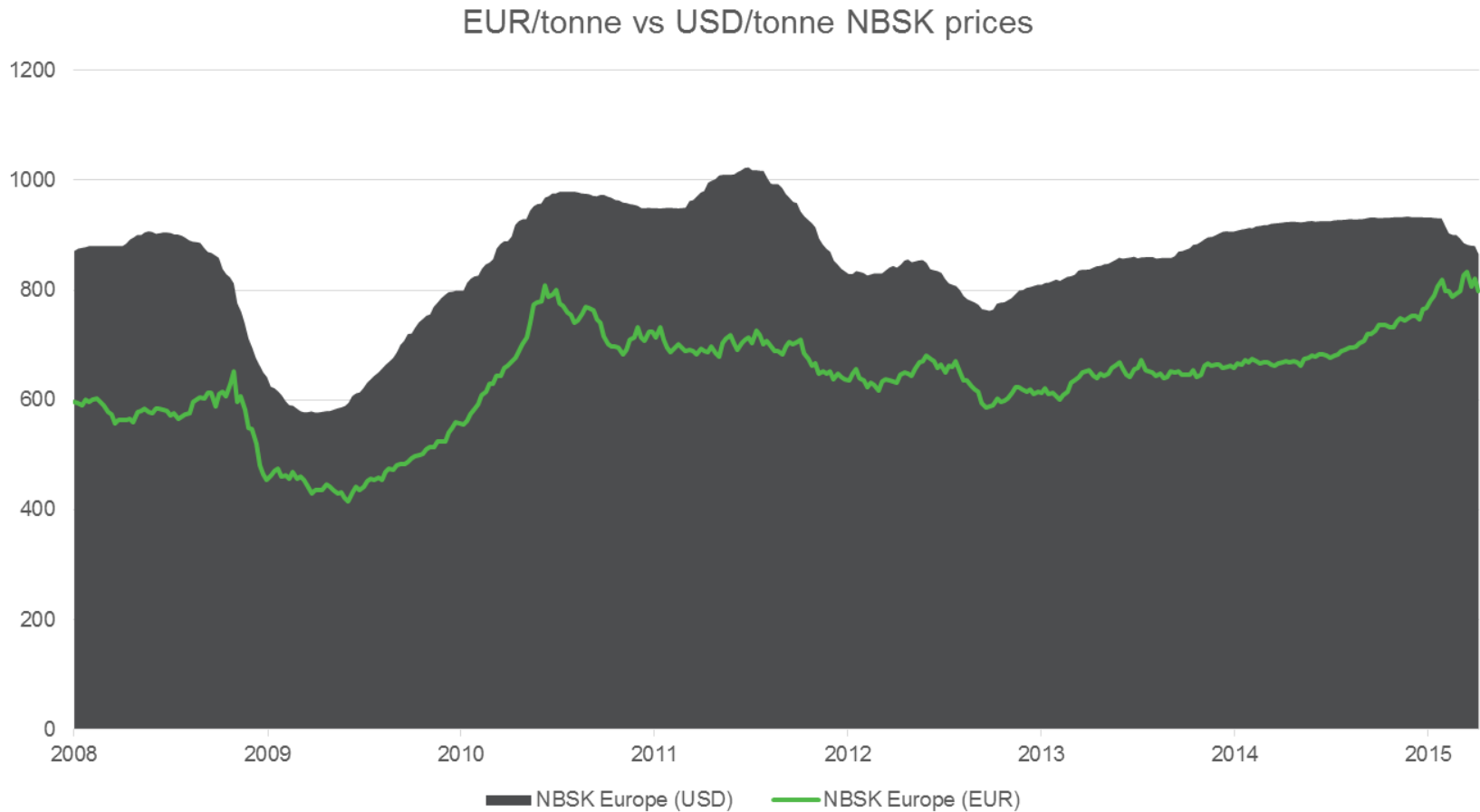
Million tons

80
70
60
50
40
30
20
10
0



Source: RISI 5 year forecast July 2015

Pulp price has an impact on Services



Expansion of service capacity in growth areas



New Service centers and expansions of existing

- Araucaria, Brazil
 - Full scope service center for Fiber
 - Open 2012
 - Logistic center 2016
- Jakarta, Indonesia
 - Full scope service center for Fiber
 - Open 2016 (12)
- Expansion in Wuxi, Zibo and Shanghai, China,
 - New resources in existing centers
 - Expansion of logistic centers
 - Screen basket expansion 2014



Performance parts

Services offering

Comprehensive life-cycle services offering



Rolls and Workshop Services

- Rolls
- Roll covers and maintenance
- Workshop services



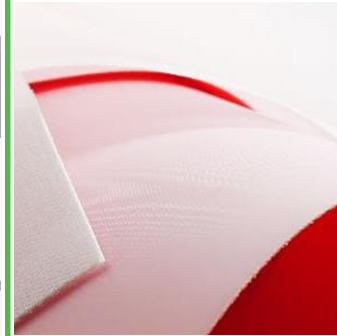
Mill Improvements

- Upgrades
- Components
- Expert services



Performance Parts

- Spare parts
- Processes Parts



Fabrics

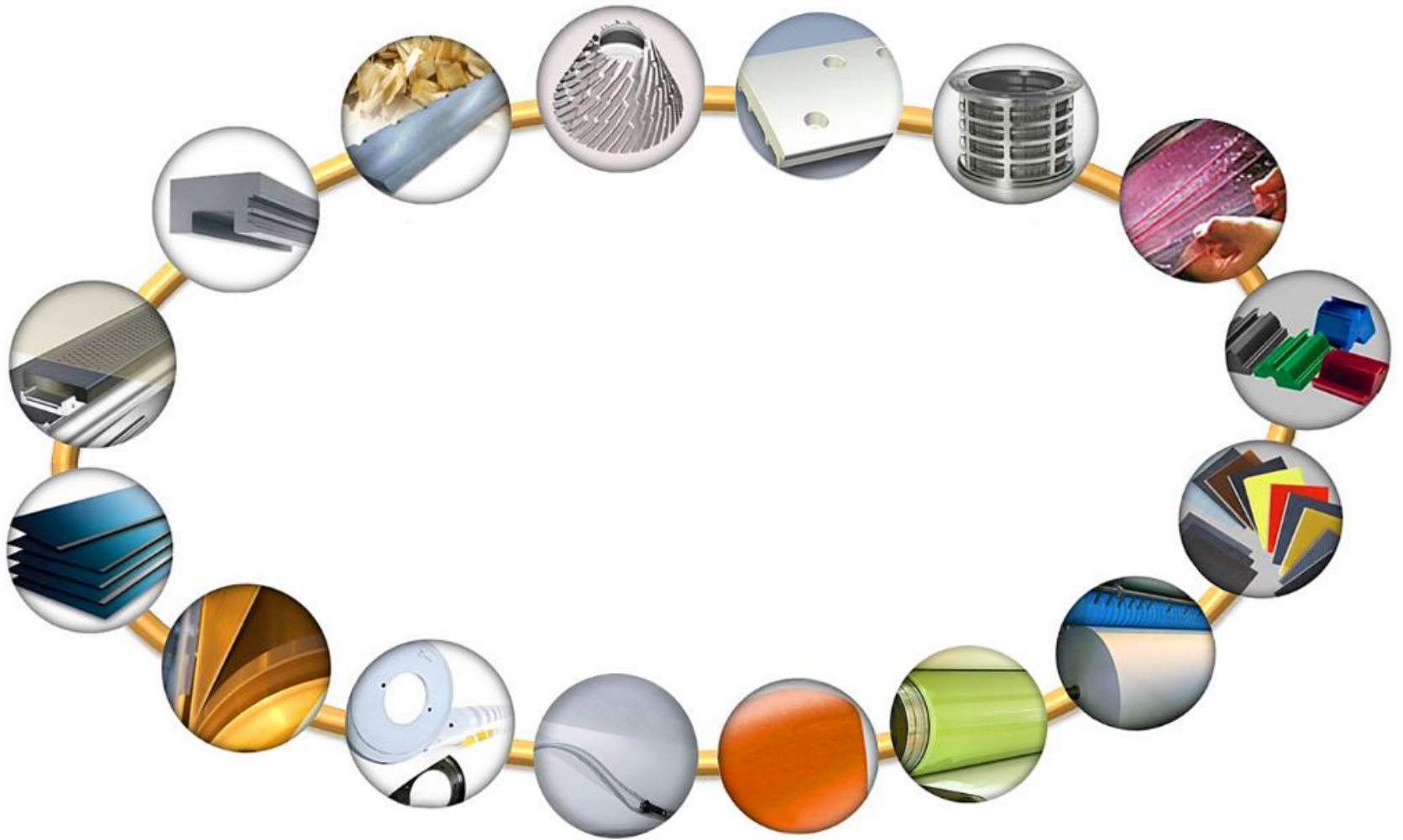
- Paper machine clothing
- Filter fabrics



Energy and Environmental

- Services for evaporation plants, power and recovery boilers and environmental equipment

A selection of parts



Parts

100,000
deliveries yearly

eServices

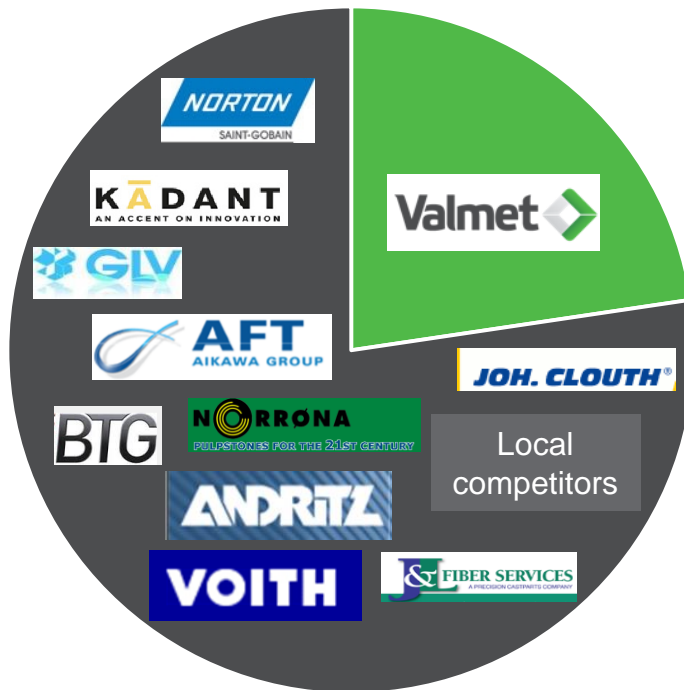
1.1
million parts


60,000
Orders per year

One order every
6 min

Parts market size is big and growing

Market and key competitors





Uniqueness of
parts business and
development areas

Different type of parts, different drivers

Increased
reliability

Reduced
costs

Improved
performance

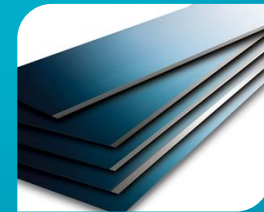
Convenience - speed

Spare parts



Performance - savings

Process parts



Spares are reliability (convenience) driven

Supported by 4 global logistic centers

Increased
reliability

Reduce
costs

Improved
performance

Convenience - speed

Spare parts



Performance - savings

Process parts



Speed is critical for spares growth



- Actions for speed

- Quotation and order handling in local service centers
- 4 global logistic centers with local sourcing and global supply
- Tailor-made customer Inventory solutions
- IT tools for customer easiness and internal efficiency

Speed

On time

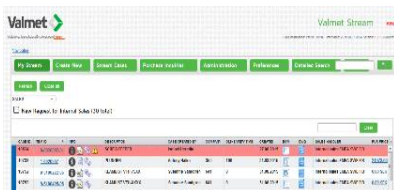
Easiness

New IT tools for enhanced customer experience

Tools launched and implemented in 2014 and 2015

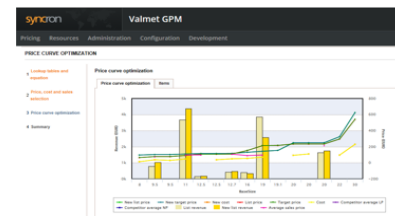
Internal efficiency – faster response

Stream



- Global search and communication tool
- Linking all Service Centers

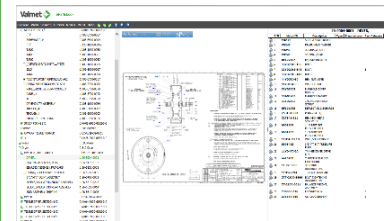
Value based pricing (VBP)



- Pricing based on value drivers like complexity, customer value & competition
- Improved price quality, efficiency and customer trust

Simplify life for customer

eParts book



- Electronic customer machine documentation
- Hot-links to eServices

eServices



- On-line access to parts information
 - Price & availability
 - Part details
- 1,100,000 articles

Process parts performance driven

Agreement based business

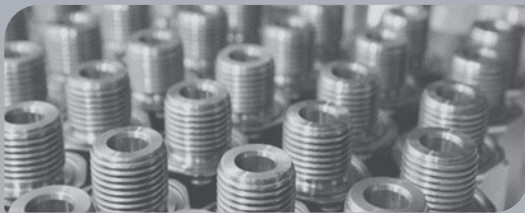
Increased
reliability

Reduce
costs

Improved
performance

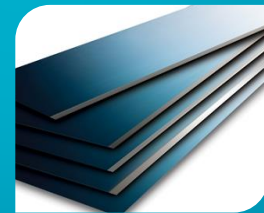
Convenience - speed

Spare parts



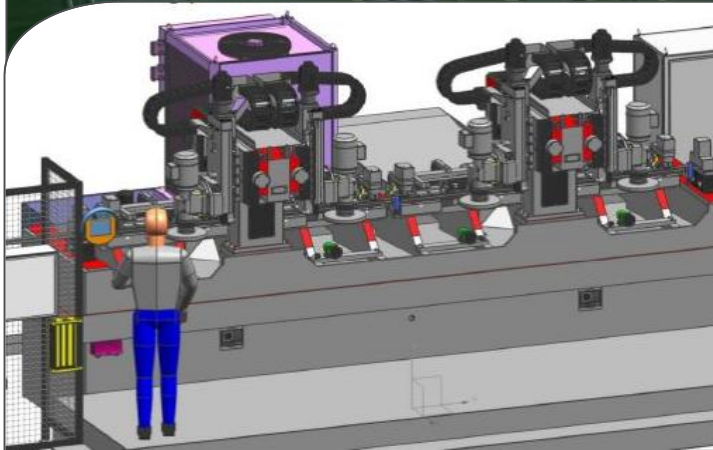
Performance - savings

Process parts



Process parts

Energy, capacity and production cost focus



- New production capacity
 - Parts center established in Shanghai, China, doctoring and screen baskets
 - New capacity in added in NA, coater blades
- R&D initiatives
 - Focus on product renewal
 - Additive manufacturing, 3D
- Local technology competence
 - Sales by technology focus
- Focus on agreements
 - Flexible offering model

Cost

Energy

Capacity

Creating customer value via flexibility

Make your own mix of technical scope, stocking, pricing and technical support

Technical scope	Inventory management	Pricing agreement	Valmet support
Process parts	Stock at customer site	Results based model	Expert services
Fabrics	Reserved stock at Valmet	Production based model	Process expert support
Roll covers	Deliveries based on prediction / demand	Flat rate TCO model	Shutdown / maintenance support
Spare parts		Invoicing per usage / transaction	Inventory management support
			eServices



Summary

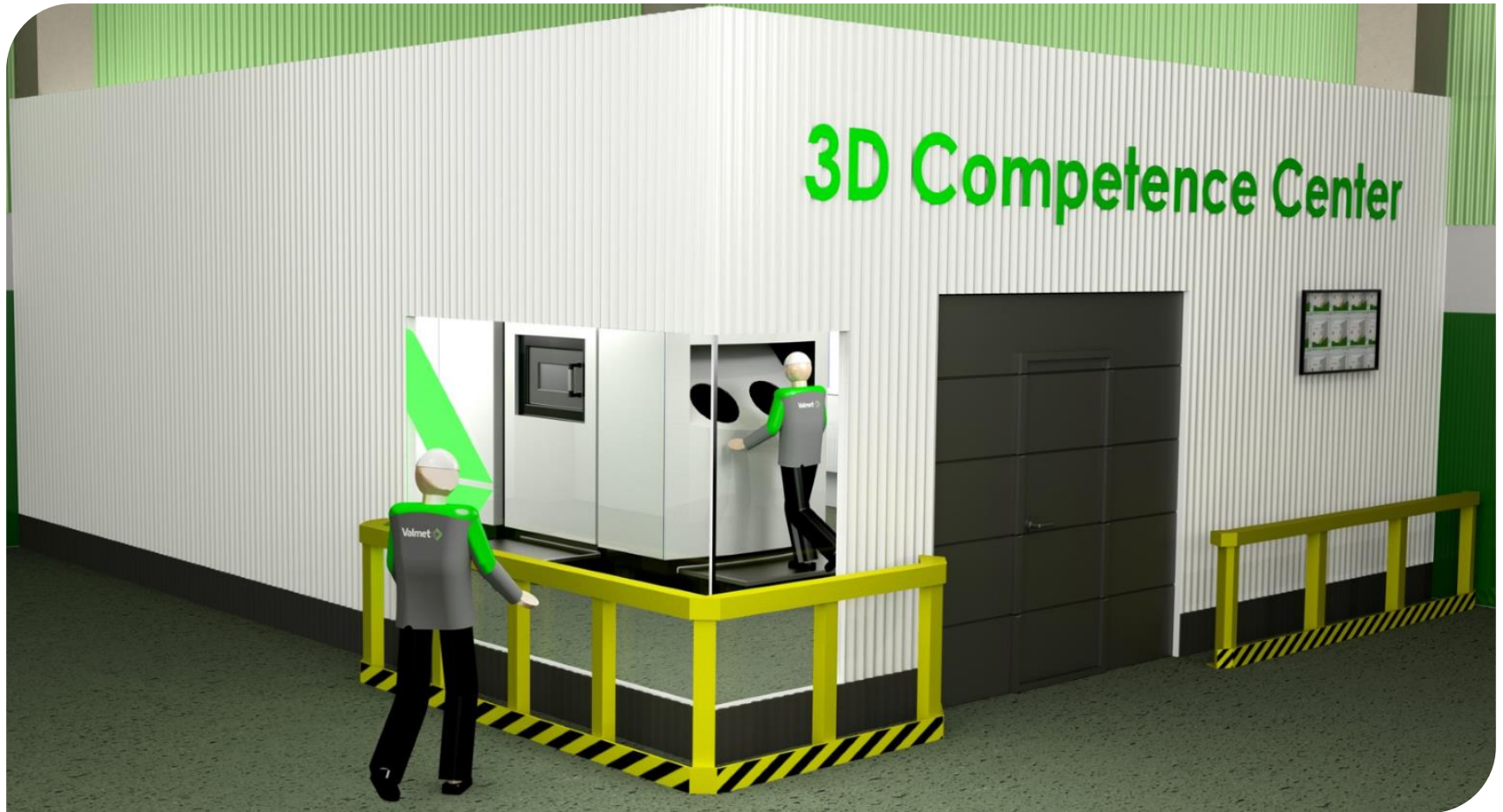
Performance parts summary

- Service and performance parts are growing
- New service capacity for Fiber customers in Brazil, China and Indonesia
- Investments and development in process parts supporting growth targets
- Speed and convenience are main drivers for spares growth
- 3D printer for metal can change the game



Additive manufacturing – 3D printing of parts

Will change the game







Biotech & Environmental Systems

Rickard Andersson,
VP Biotech and ES

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Biotech & ES session, Sept 10, 2015

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- Summary



Global biotechnologies market

Biotechnology drivers create new demand

Drivers may differ somewhat depending on technology and market

In general

- Strong market demand on bio based products
- Ethanol and non-fossil based chemicals and materials market demand
- Making use of waste streams by adding value
- De-bottlenecking of existing plants
- New products and revenues from existing processes
- Incentives and political decisions



Our traditional business and customers form sound foundations for our biotechnologies

Pulp Mills

- Number one in chemical pulping
- Decades of experience and references in wood handling systems, cooking systems, complete fiber lines, evaporation systems and recovery islands as well as odor control

Heat and Power Generation

- Largest boiler and plant supplier in biomass and waste sector
- Extensive experience in fluidized bed boilers, bioGrate boilers and air pollution control systems

Proven Solutions for Industry

Biofuels

- Gaseous fuels
- Liquid fuels
- Solid fuels

Bio-based chemicals & materials

- Monomers and polymers
- Composites
- Fine and specialty chemicals



Bio-based products are any products – fuels, chemicals, materials – made from renewable resources

Plant material and municipal waste – biomass – are turned into electricity, fuels, intermediates for the chemical processes and materials

Biofuels

Bioethanol (1G and 2G)¹

Biodiesel (1G and 2G)²

- Replace fossil raw material based petroleum
- Decrease the greenhouse gases

Bio-based chemicals

- Replace chemicals derived from fossil petroleum
- Reduce pollution
- Increase efficiency
- Limit the hazardous materials in the manufacture and use of chemicals

Biomaterials

- Materials made from petrochemicals can be replaced with materials made from biomass
- Useful and biodegradable alternatives
- Reduction of fossil based products
- Utilization of byproducts and residues

Valmet serves the emerging biotechnologies markets

Our focus is on lignocellulosics and waste raw materials

1) First generation biofuels: produced directly from food crops such as corn or sugar cane.

2) Second generation biofuels: produced from non-food crops such as wood, organic waste, food crop waste, specific biomass crops

Examples of bio-based products and main players

Biofuels

Products

Bioethanol (2G)
Biodiesel (2G)

Commercial scale producers



Bio-based chemicals

Sugar platform / Commercial products (of fermentation process)

Products

Aspartic acid, Algal oils, Farnesene, Itaconic acid, Isobutanol, Lactic acid, N-butanol, Succinic acid, Polyhydroxyalkanoates, 1,3-Propanediol

Key players



Biomaterials

Products

Bio-based plastics, as a product example
Main material PET

Number of players such as



Biotechnologies market

Market drivers

- Emerging market for converting biomass into fuels, chemicals and materials
- Growth of energy, transportation, and chemical industry sectors
- De-bottlenecking and making value from waste and residues
- Volatile due to changes in regulations and oil price



Industry trends

- Partnerships, mergers and acquisitions proceed in search of synergistic know-how, value chains and value networks, business concept, process and equipment optimization
- Huge number of companies; some fail, others continue to move steadily towards commercialization
- Conversion of biomass to chemicals and materials instead of or in addition to fuels in search for economic viability
- Location at the source of feedstock to reduce transportation costs and other costs associated with feedstock aggregation
- Alternative feedstocks, e.g. waste or gas





Valmet's biotechnologies offering

Valmet's biomass conversion technologies

Penetrating the market in steps through references



- **LignoBoost** system for extracting lignin from kraft black liquor
- Solutions for **prehydrolysis** of biomass to sugars and lignin for further refining to fuels or chemicals
- Complete production lines for **steam exploded black pellets** and revamps of existing white pellet plants
- **Pyrolysis** solutions for bio-oil production
- **CFB gasification technologies** for biomass and waste gasification

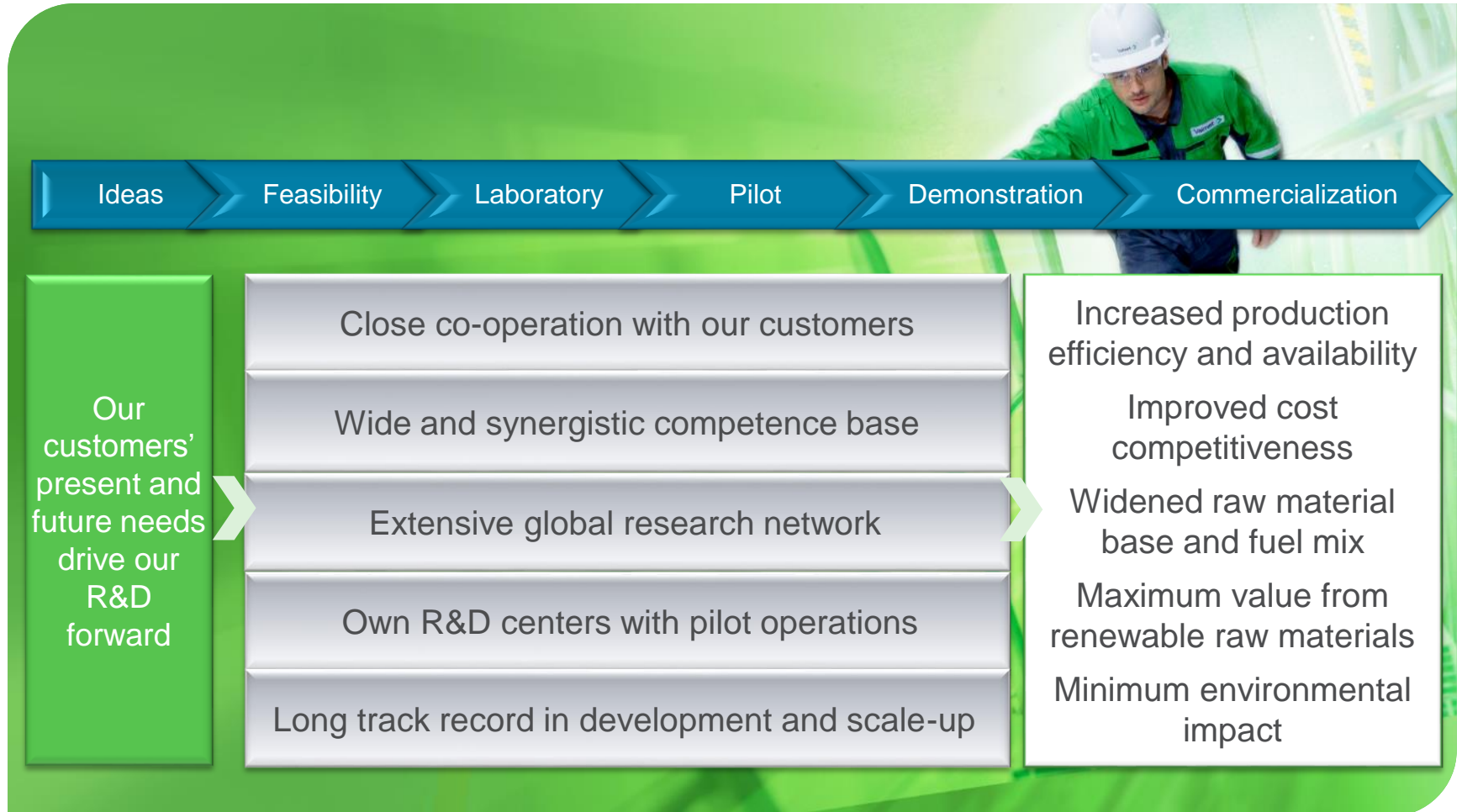
Facts

- Commercial scale lignin separation installations in operation since 2013
- Several prehydrolysis pilot scale deliveries. First demonstration scale plant in operation in 2012. Commercial scale being offered.
- Bio-oil pilot production since 2009, first demonstration scale plant in operation in 2013
- Commercial scale gasification of biomass and waste since 2011

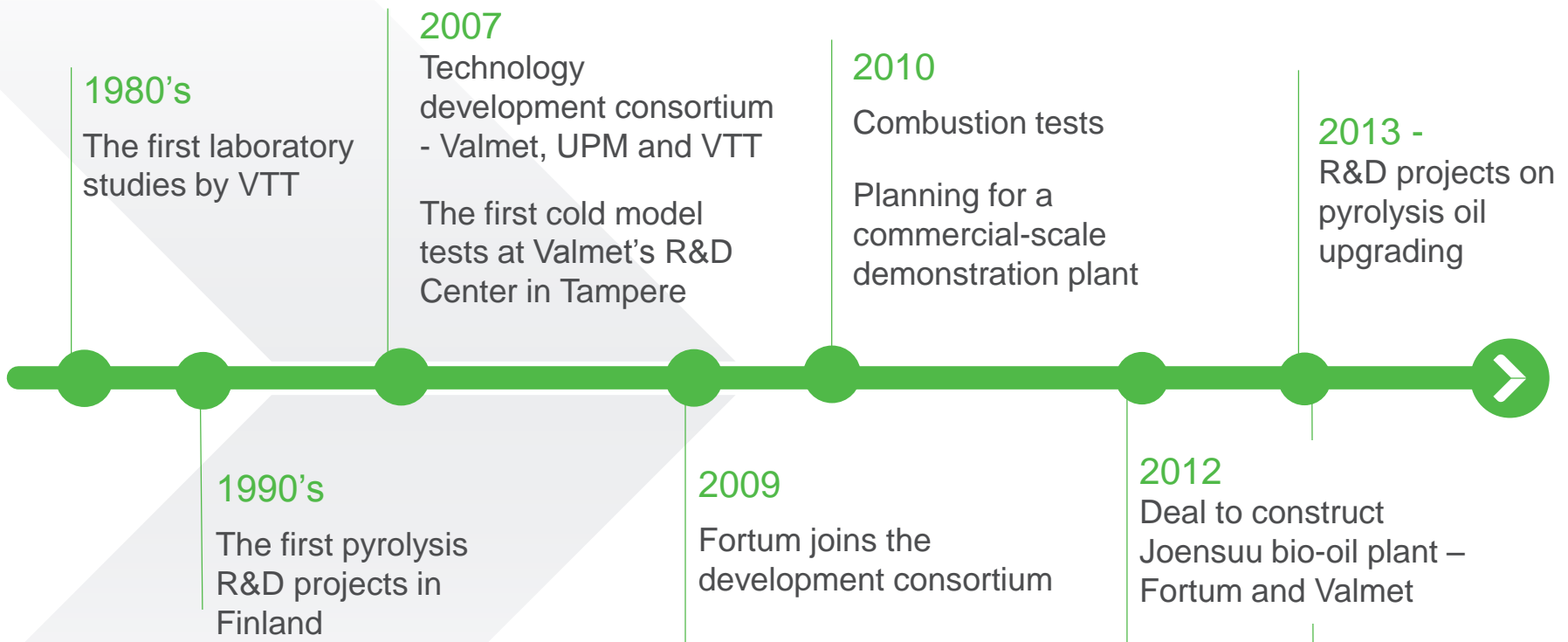
Results

- New revenue streams for pulp mills and biomass power plants
- Reduction of emissions
- From fossil fuels to utilization of sorted waste and biomass
- Alternative renewable fuels

Valmet is committed in R&D: We continue to move our customers' performance forward



Long-term R&D cooperation with partners produces results – pyrolysis as an example



Produced bio-oil = heating for 10,000 houses in cold Nordic climate





LignoBoost™
– Lignin

How can pulp production be increased when lignin is extracted from black liquor?

- Lignin has a high heating value (about 26 MJ/kg DS) and it creates ~35% of the dry solids content in the recovery boiler
- The recovery boiler is limited by the heat load and many mills run their boiler close to the maximum limit
- When lignin is removed prior to combustion, the dry solids content and the overall heating value of the black liquor is decreased
- The thermally off-loaded recovery boiler can then take a larger flow of black liquor



Lignin is a versatile product

Applicable as a fuel or intermediate for chemicals and materials

- Lignin is structurally and chemically very complex high molecular weight material containing different aromatic building block components
- The variability of structure will naturally lead to mixtures of products when converting lignin
- The exact details of biomass feed and lignin recovery process will result in lignins of differing properties in e.g. molecular weight distribution, solubility, number of free phenolic, hydroxyl and carboxyl groups etc.



Photos: Compliments to Innventia

Lignin separation as part of pulp mill process

LignoBoost lignin separation process connected to pulp mill chemical recovery

- Lignin can be utilized as renewable fuel replacing fossil fuels and as new bio-material for many industries

Domtar Plymouth, USA

- Annual yield of 25,000 tons lignin
 - Decreased use of fossil fuel
 - Increase of pulp production capacity by 5% and efficiency by off-loading the recovery boiler
 - Domtar sells recovered lignin as BioChoice™ product

Stora Enso Sunila mill in Finland

- LignoBoost plant produces 50,000 metric tons of dried lignin per year

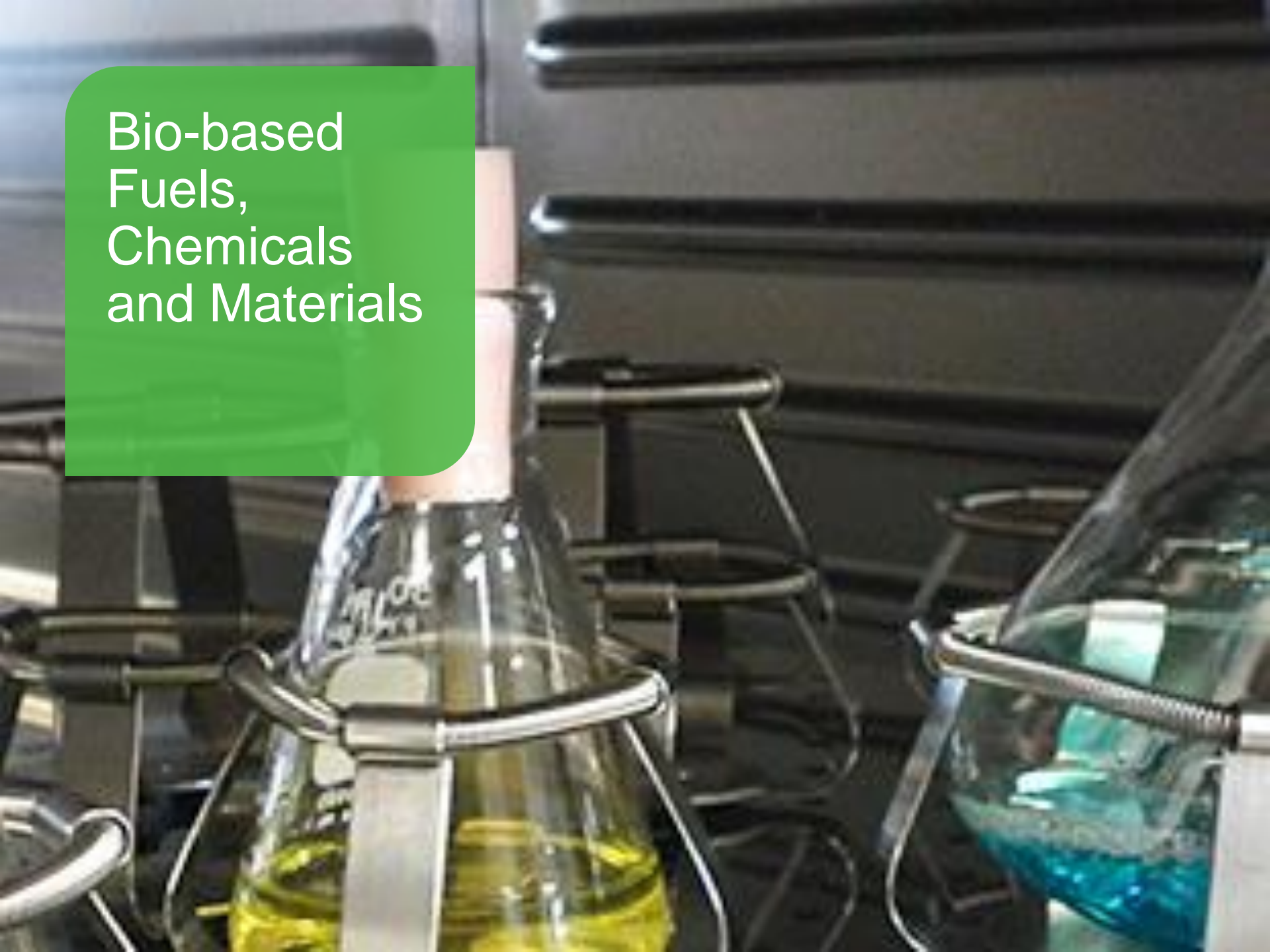
Domtar Plymouth,
North Carolina, USA



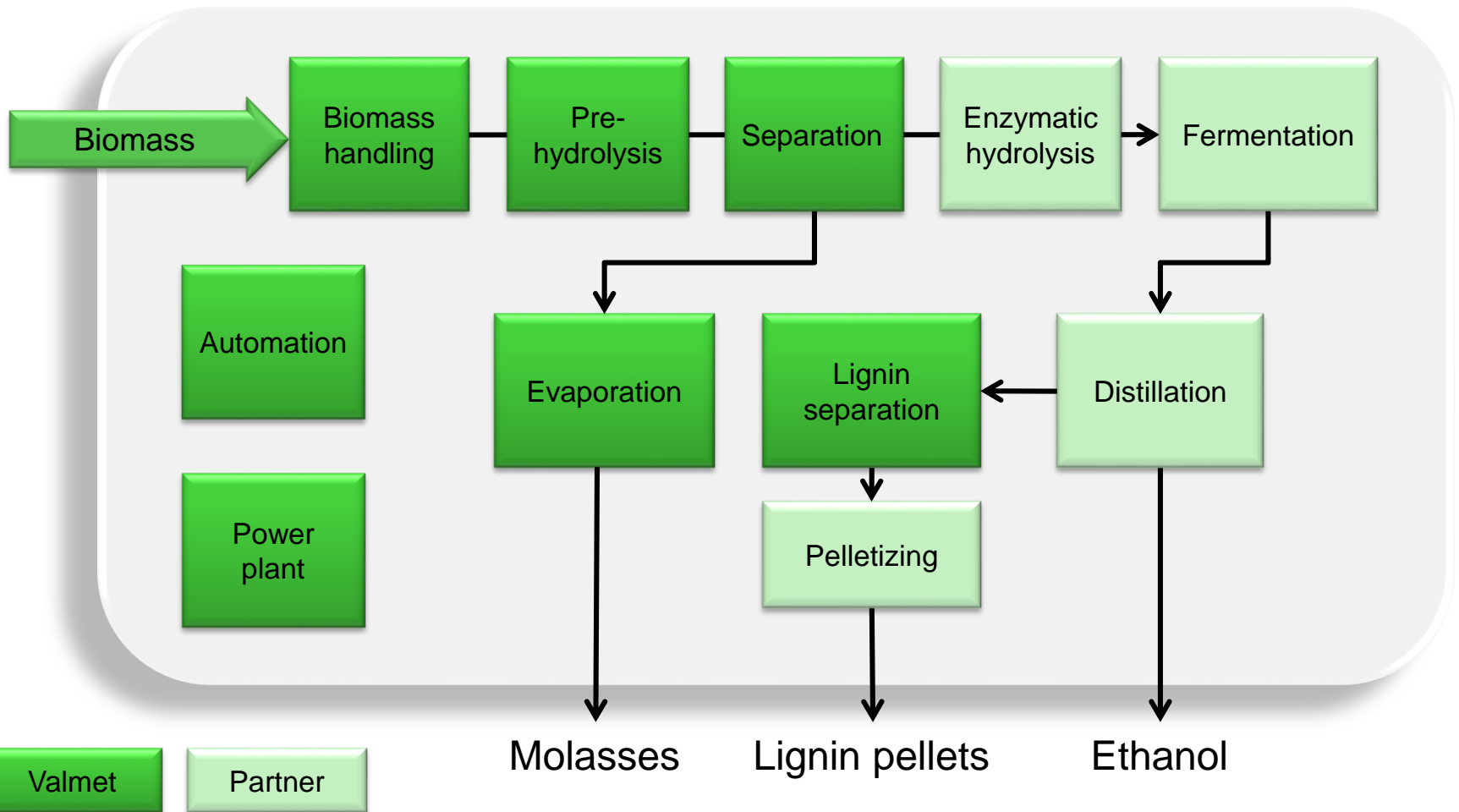
Stora Enso Sunila, Kotka,
Finland



Bio-based
Fuels,
Chemicals
and Materials



We contribute to bioethanol and bio-based chemicals with our proven solutions



Production of climate-friendly bioethanol from agricultural waste

Second generation bioethanol produced from agricultural waste

Up to 1,000 tons of cellulose ethanol from around 4,500 tons of wheat straw

Key results

- Biofuel cuts CO₂ emissions by about 95% compared to fossil-based

Germany's largest second generation bioethanol plant
Clariant, Germany

Case

Renewable fuel for over 1,000 cars running with 100% bioethanol





Steam
Explosion –
Bio coal

Steam explosion technology for bio coal

- Zilkha Biomass Energy LLC and Valmet have signed a collaboration agreement in the field of steam explosion. The parties will work together to develop a joint global offering.
- Steam exploded bio coal provide a number of benefits compared to traditional wood pellets
 - Improved durability, water-resistance, higher energy content, lower shipping costs, and reduced dust problems compared to other types of bio-based pellets.

Material handling



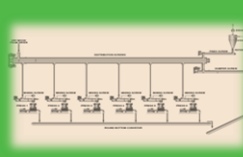
Steam Explosion



Drying



Densification



Bio coal is principally used for replacing fossil coal in heat and power generation

Integrated
Pyrolysis –
Bio-oil



Biotech and Environmental Systems case example: Additional revenue from bio-oil

Fast pyrolysis of biomass integrated to a fluidized bed boiler

Production of bio-oil by pyrolysis from forest residue and other biomass

Renewable bio-oil production of 50,000 t per annum

Key results

- Results in significant reductions in CO₂ emissions
- Bio-oil can replace heavy fuel oil in heat and power generation and might be further refined to transportation fuel
- Integration provides maximum energy efficiency

Pyrolysis plant

Fortum, Joensuu, Finland

Case

Produced bio-oil provides heating for 10,000 houses in cold Nordic climate





Global environmental systems market

Environmental systems are part of our traditional offering with 500 references

Pulp and energy industries

Air pollution control



Flue gas
cleaning and
heat recovery
for boilers

Odor and pulp
mill balance
control

Environmental
systems for
biotechnologies

- Valmet provides proven systems to pulp mills and energy sector
- Valmet has delivered 500 air pollution control systems

Environmental systems market

Market drivers

- Very large and growing global market in air pollution control
- Tightening emissions legislation and stricter directives globally
 - USA, Europe
 - China biggest market & increasing
- Aging power plants and pulp mills
- Increasing energy efficiency



Industry trends


Energy

- Industrial Emission Directive (IED) - EU
 - Large combustion plant
 - Medium combustion plant
 - Waste directive
- Aging power plants, in EU, 45% of power generation capacity is more than 30 years old – APC rebuilds
- Life span thinking of plants
- Energy efficiency – heat recovery especially in the Nordics

Pulp

- Odorless mill, environmental acceptance
- Capacity increases - debottlenecking
- Aging pulp mills - ESP rebuilds
- Chemical balance control - sulphuric acid production





Valmet's offering in environmental systems

Extensive offering of air pollution control systems



- Dry, semidry and wet flue gas cleaning processes for removal of particular and gaseous emissions
- Condensing scrubbers and heat exchangers for recovering heat from flue gas
- SNCR and SCR technology for NOx reduction
- Odorous gas treatment and chemical balance control systems for pulp mills processes

Facts

- Complete flue gas cleaning and heat recovery systems
- Odor and mill balance control for pulp mills
- 500 air pollution control references

Results

- Minimum emissions
- Reliable and proven technology solutions
- Increased plant efficiency
- Fuel savings

Meeting BAT emission levels with lowest life cycle cost

Valmet's scope of delivery

- Selective catalytic NO_x reduction (SCR) for each boiler
- Wet limestone flue gas desulfurization (FGD)
- Take over in 2016 to 2018

Key results

- Meeting BAT emission levels with lowest life cycle cost

Flue gas cleaning

CIECH Soda Polska

Case

Inowroclaw CHP plant

Four pulverized coal boilers, each 140 t/h, built in 1970's by Lentjes

Steam and electricity is used in production of soda

Investment in emissions to meet IE Directive requirements





Summary

Questions?



