



Valmet Pulp & Energy Investor Day

November 19, 2020

Agenda

2:00 pm

Valmet`s Pulp and Energy business today

Bertel Karlstedt, Business Line President, Pulp and Energy

2:05 pm

Valmet`s Energy business - Long-term demand driven by the move to a carbon neutral world

Presentation followed by Q&A

Kai Janhunen, VP, Energy Business Unit

2:30 pm

Future growth in pulp driven by favorable megatrends

Presentation followed by Q&A

Jussi Mäntyniemi, VP, Recovery Business Unit

2:55 pm

The new normal - opportunities through digitalization and Valmet`s industrial internet

Tuomas Petänen, Head of Industrial Internet, Energy segment

3:10 pm

Summary of key messages

Presentation followed by Q&A

Bertel Karlstedt, Business Line President, Pulp and Energy

3:30 pm

Ending of the event


Presentation slides can be found at
[https://www.valmet.com/investors/
reports-and-presentations/
other-presentations/](https://www.valmet.com/investors/reports-and-presentations/other-presentations/)

Q&A

Please participate by asking questions!

- You can submit questions throughout the event using the question form
- Three Q&A sessions
 - After the Energy presentation
 - After the Pulp presentation
 - In the end of the event
- Questions are visible only to the moderator, who will address them to the presenter





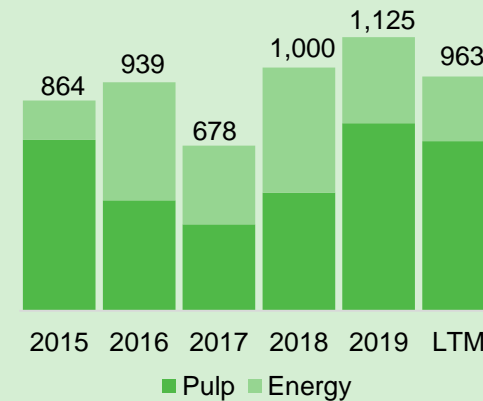
Valmet's Pulp and Energy business today

Bertel Karlstedt,
Business Line President

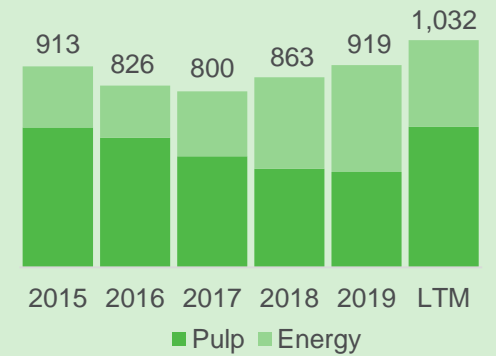
Pulp and Energy at a glance

- World-class pulp mill offering and complete delivery capability
- Global technology and know-how leader in biomass and multifuel based energy production
- A natural growth platform for environmental systems and biomass conversion technologies
- Over 1,500 pulp and energy experts serving our customers globally
 - Finland 840 people
 - Sweden 450 people
 - India 160 people
 - China 40 people
 - Denmark 30 people
- Close cooperation with Automation and Services business lines in all projects. Including industrial internet offering and digitalization.

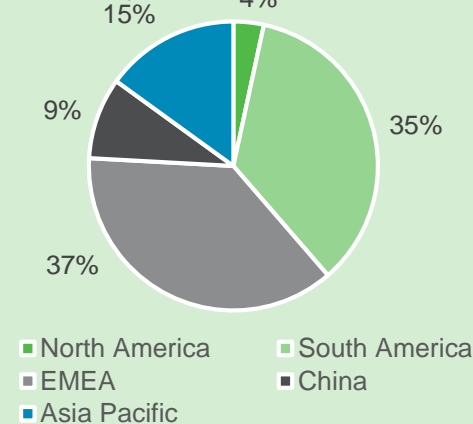
Orders received
(EUR million)



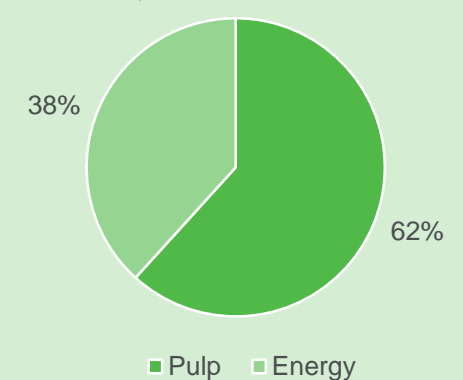
Net sales
(EUR million)



Net sales by area
(last 12 months)



Net sales by business
(last 12 months)



We are committed to moving our customers' performance forward



Pulp

- Chemical Pulp Mills
- Dissolving Pulp Mills
- Mechanical Pulp Mills
- Fiberboard plants



Energy

- Municipalities
- Utilities
- Independent power producers
- Pulp mills
- Process industries



Bio and environmental technologies

- Marine
- Ethanol industry
- Chemical industry
- Pellet producers
- Pulp and paper industry
- Utilities



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VOIMALAITOS

Valmet's energy business: Long-term demand driven by the move to a carbon neutral world

Kai Janhunen
Vice President, Energy business unit

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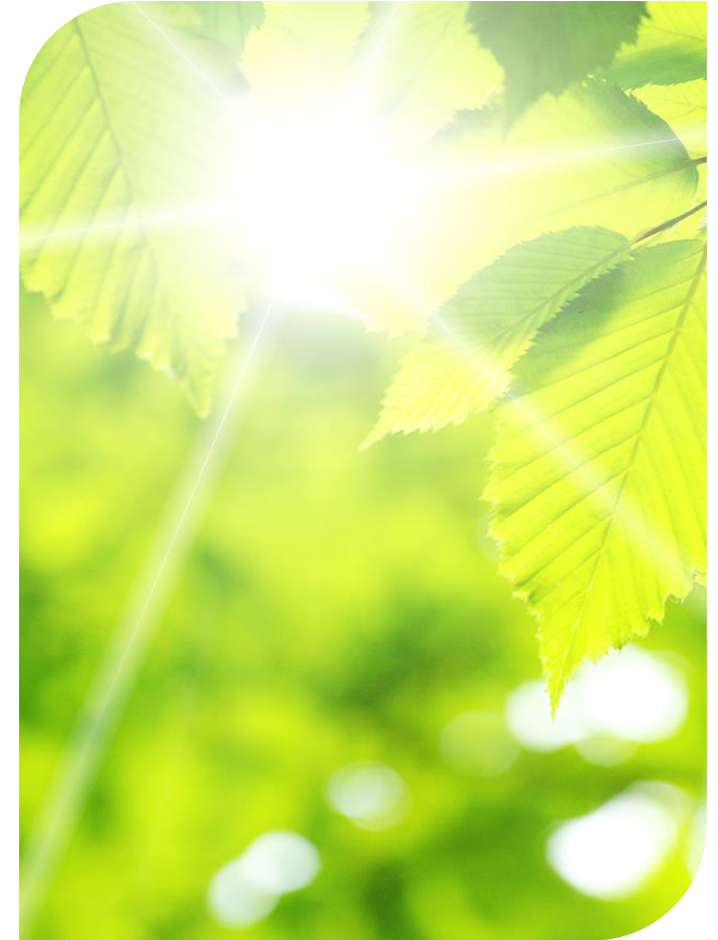
1 Energy business unit

2 Global market drivers

3 Order backlog

4 Key references

5 Summary

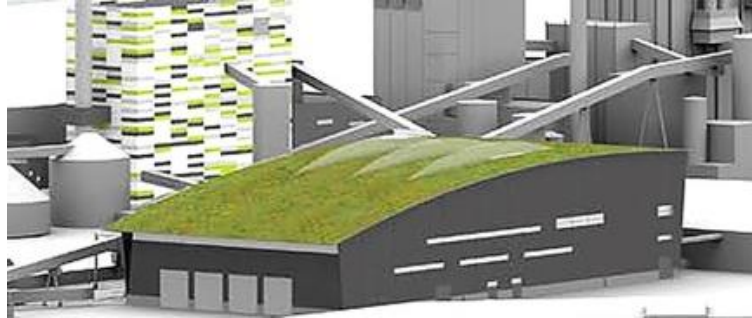


Energy business unit



Energy business unit

- Orders received (period 2017-2019)
 - 32%-52% of P&E OR
 - Average ~400 MEUR, ~40% of P&E OR
- Personnel (Oct 30, 2020): 620
 - White / blue collars: 481 / 139
- Main locations are in Finland:
 - Offices in Tampere, Vantaa, Raisio
 - Production facilities in Tampere, Lapua
 - R&D Center in Tampere
 - Valmet Performance Center in Tampere



Solution offering

- Biomass to Energy plants
- Industrial residues and Waste to Energy (RDF) plants
- Air Emission Control technologies
- Automation
- Life-cycle services
 - Reliability services
 - Performance services
 - Performance centers
- Industrial Internet solutions



Customer segments

- Industrial
- Power generation
- Waste management
- Marine

Global market drivers – Climate actions

Resource efficiency

- Waste widely recognised as valuable resource
 - Increased recovery and recycling
 - Residual waste > Energy recovery
- Higher efficiencies

Environmental awareness

- Carbon neutral power supply by 2050 (Power generation, Industrial)
 - Coal phaseout
 - From fossil to renewables
- Tightening emissions legislation and stricter directives & norms

EU



EU Commission President
Ursula von der Leyen:
*European Green Deal;
No net emissions of
greenhouse gases by 2050*

Japan



Japan's PM Yoshihide Suga:
*Climate change policy of
carbon neutrality by 2050*

China



President Xi Jinping:
*China will be carbon neutral
by 2060*

Ongoing energy projects / Order backlog

EMEA

- Kilpilahti Power Plant, Finland
145 MW_{th} asphaltene fired CFB+AEC
Start-up 2019
- Borås Energi och Miljö, Sweden
120 MW_{th} biomass BFB+AEC
Start-up 2019
- HOFOR, Denmark
459 MW_{th} biomass CFB
Start-up 2019
- Mondi Syktyvkar, Russia
184 MW_{th} biomass BFB, ESP
Start-up 2019
- Maren Maras, Turkey
185 MW_{th} multifuel CFB+AEC
Start-up 2020
- Greenalia, Spain
130 MW_e biomass BFB
Start-up 2020
- Loimua, Finland
35 MW_e BFB, Flue gas condenser, ESP
Start-up 2020
- Oulun Energia
194 MW_{th} biomass CFB+AEC
Start-up 2020
- Weig, Germany
49 MW_{th} BFB+AEC
Start-up 2020
- Kokkola Energia, Finland
FGC
Start-up 2020
- Double A Alizay, France
Conversion from RB to BFB
163 MW_{th} biomass
start-up 2020
- JSC Ilim , Ust-Ilimsk, Russia
2x72 MW_{th} biomass BFB
Start-up 2021
- Zespol Elektrowni Patnow-Adamow-Konin, Poland
Conversion to biomass fired BFB+AEC
Start-up 2021
- Göteborg Energi, Sweden
130 MW_{th} hot water plant+AEC, wood pellet
Start-up 2021
- Stora Enso, Finland
Flue gas scrubber
Start-up 2021
- Norske Skog Bruck, Austria
50 MW_{th} RDF fired BFB+AEC
Start-up 2022
- BS Energy, Braunschweig, Germany
78 MW_{th} CFB+AEC, waste wood,
Start-up 2022
- Tampereen Sähkölaitos, Finland
191 MW_{th} biomass CFB+AEC
Start-up 2022
- Helen, Vuosaari, Finland
Flue gas condensing plant
Start-up 2022
- Confidential customers: several marine scrubber projects

China

- Beijing Environment Sanitation Engineering Group
123 MW_{th}, 2xCFB, WtoE
Start-up 2020
- Shanying Zhejiang
107 MW_{th} CFB, sludge, reject
Start-up 2020
- Shanying Anhui
92 MW_{th} CFB, reject
Start-up 2021
- Confidential customer
100 MW_{th} sludge, reject
Start-up 2020
- Aituo Eco-Energy Co., Ltd, Zhejiang China, 142 MW_{th} CFB, reject
Start-up 2020
- Asia Symbol (Shandong) Pulp & Paper, Rizhao
DeNOx scrubber
Start-up 2020
- Confidential customers, Marine scrubber projects

South America

- Arauco MAPA, Chile
160 MW_{th} biomass fired BFB
Start-up 2021
- Star Bracell,
2 x biomass gasifier
Start-up 2021

Asia-Pacific

- JFEE, Kushiro Japan
112 MW_e multifuel CFB+AEC
Start-up 2019
- JFEE, Onahama Japan
75 MW_e multifuel CFB+AEC
Start-up 2019
- PT Cikarang Listrindo, Indonesia
Biomass fuel feeding system
Start-up 2020

Key references 2020



TKS Naistenlahti 3, Tampere, Finland

Energy turnaround towards renewables

Valmet scope:

- Valmet CFB boiler plant: extends from the boiler silos to the existing Valmet Flue Gas Heat Recovery System
- Valmet Bag House Filter
- Value: EUR ~70 million



Norske Skog, Bruck, Austria

Coal phaseout, reduce carbon footprint as part of green diversification initiative

Valmet scope:

- Valmet BFB boiler plant
- Valmet Flue Gas Cleaning
- Valmet DNA Automation System
- Valmet Industrial Internet
- Value: EUR ~40 million



Zespól Elektrowni, Konin, Poland

Coal phaseout, the first Polish city that is heated with energy originating exclusively from renewable sources

Valmet scope:

- Conversion of a lignite-fired boiler into a biomass-fired Valmet BFB Boiler
- Valmet Selective Non-catalytic Reduction Solution (SNCR)
- Value: EUR ~20 million



Helen, Vuosaari plant, Finland

Reduce carbon footprint

Valmet scope:

- Valmet Flue Gas Condensing Plant: increases district heat production by an additional 69 MW
- Value: The value of these types of orders is EUR ~20–30 million

Summary

Valmet in Energy - Reliable technology partner in changing energy markets

- Resource efficient, flexible and clean solutions for energy and industrial customers
- Global trends and changing energy markets drive renewal and adaptation
- Our project portfolio shows global market coverage and strong offering (technology, automation, services)
- Innovative solutions created in collaboration with our customers
- Our solutions enable our customers' initiatives for energy turnaround







Q&A Energy

Submit questions using the question form

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Future growth in pulp - driven by favorable megatrends

Jussi Mäntyniemi
Vice President, Recovery business unit

Contents

- 1 Our offering for pulp production
- 2 Project execution in a pulp mill project
- 3 Megatrends and pulp market
- 4 Future possibilities
- 5 Summary



Valmet has leading technology for all pulp mill islands and processes



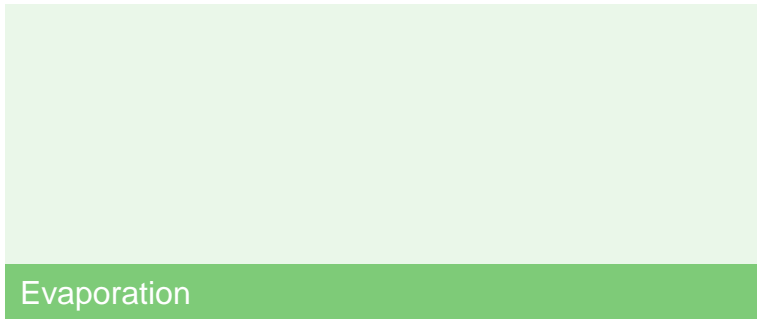
Woodhandling



Cooking and fiberline



Pulp drying



Evaporation



Recovery boiler



White liquor plant



Heat and power production



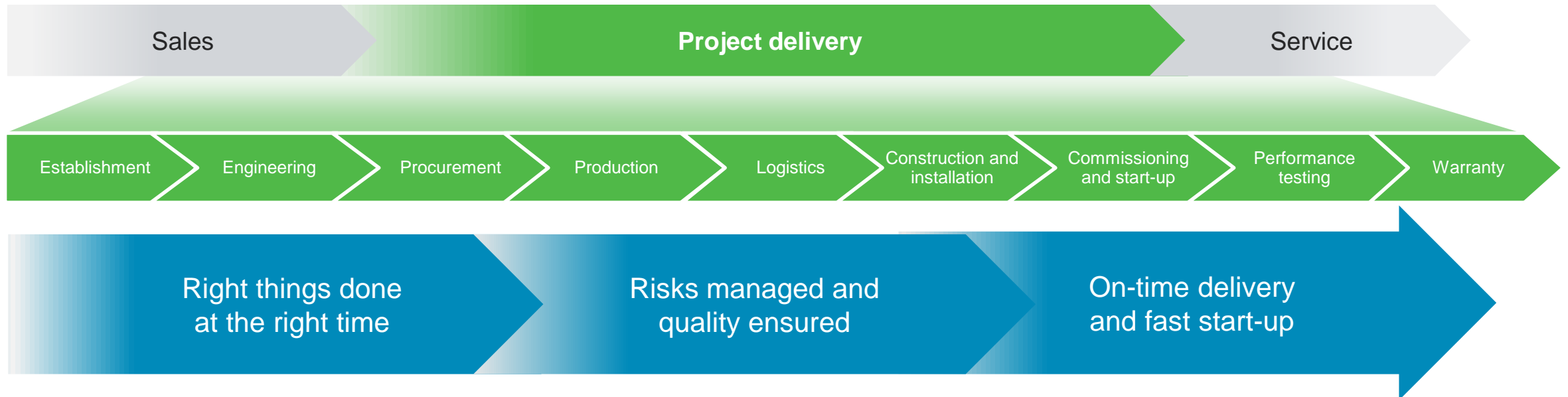
Air emission control



Process controls and simulators

Our unified project execution model ensures successful project delivery

Project length depends on the scope and size of the project, typically 1-3 years



The left side of the slide features a series of overlapping geometric shapes, including triangles and polygons, in various shades of gray and white, creating a modern, abstract background.

Example: Mondi Steti

New recovery boiler to an existing mill

14-month site works in 14 seconds

Global megatrends impact also pulp production



Resource efficient and clean world

Climate change, environmental awareness and resource scarcity drive the need to improve resource efficiency and reduce emissions.

Implications to pulp production

- Need for best available technologies and advanced air emission control



Digitalization and new technologies

Digitalization, automatization and new high impact technologies drive efficiency and new business models.

Implications to pulp production

- Asset optimization and drive for autonomous mills



Urban, responsible and global consumers

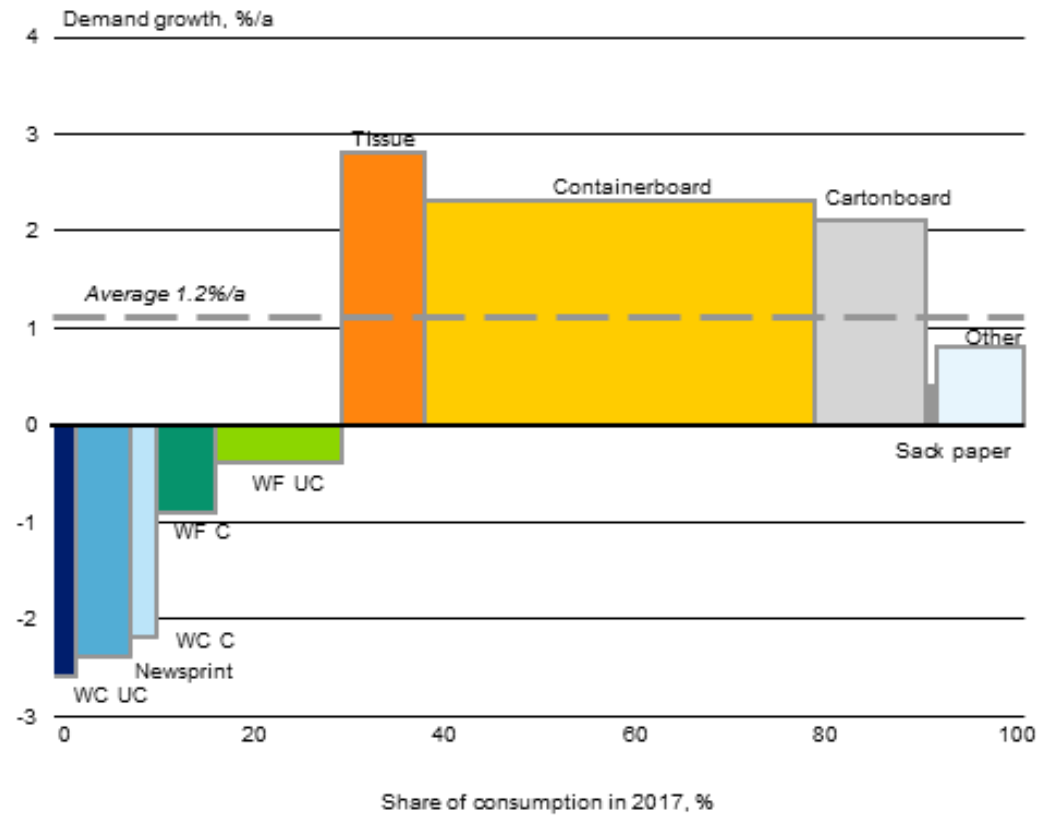
Urbanization, increasing living standards, changing demographics, and globalization drive changes in consumer behavior.

Implications to pulp production

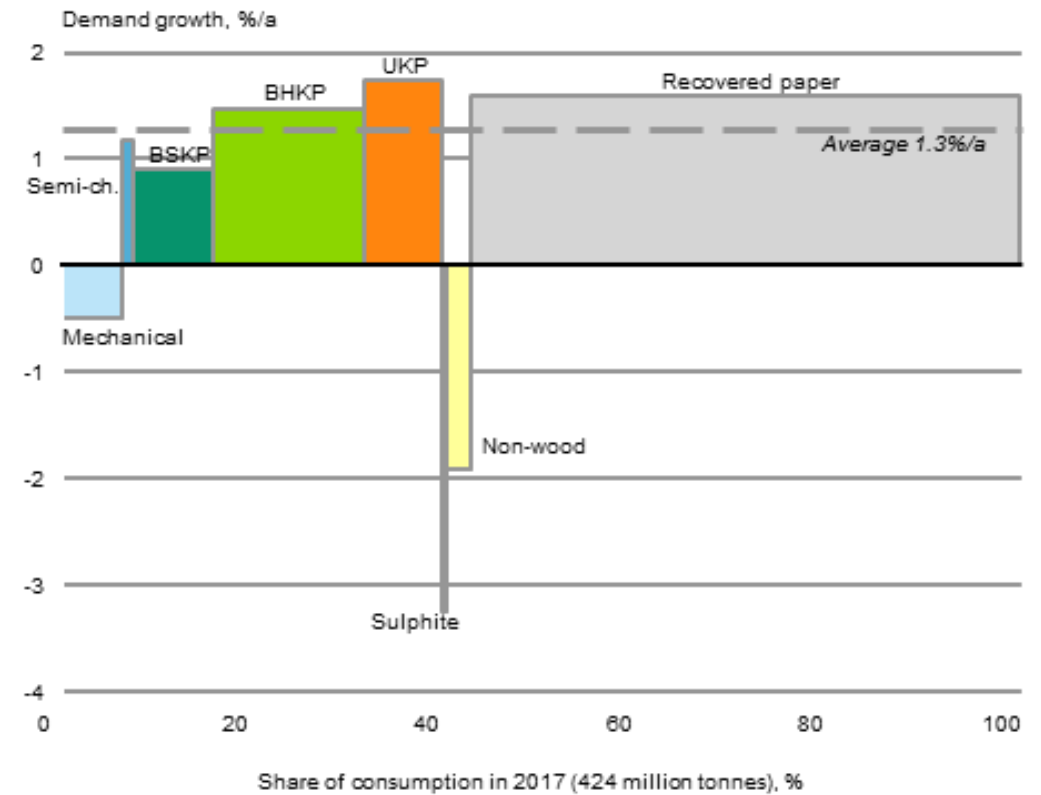
- Increasing demand for fiber-based products e.g. tissue and packaging

Paper demand and fiber consumption by grade 2017-2030

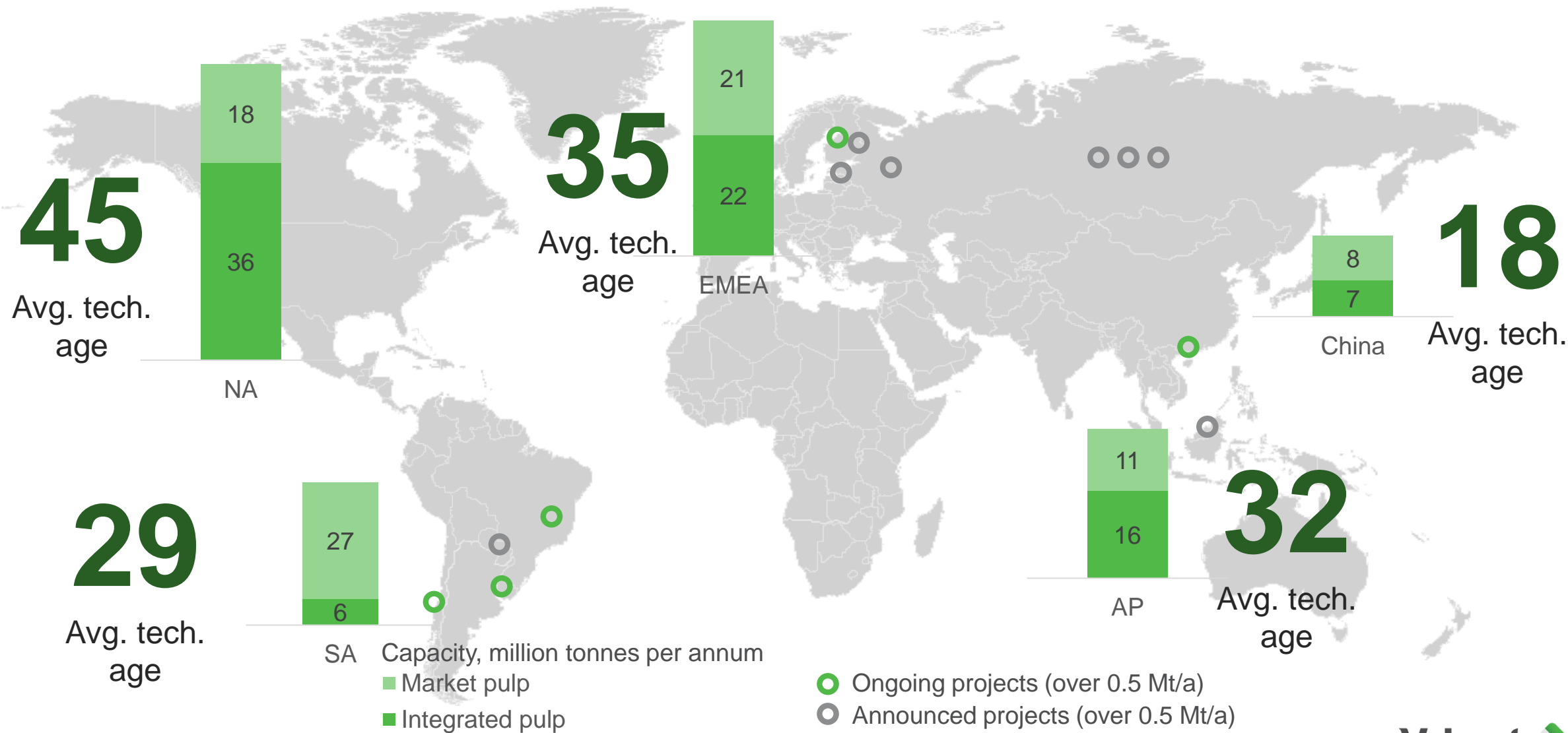
Long-term Paper Demand Growth by Product Area 2017-2030



Papermaking Fibre Consumption by Grade 2017-2030



Chemical pulp capacity by area and announced large projects



Drivers and future possibilities



Cost and production efficiency



Improved safety and environmental performance



Product differentiation

New value-adding products and platforms for growth

New value adding processes – integrated to pulp mills

Sulfuric acid plant

- Integrated sulfuric acid production of mill's NCG (odorous gases)

Biomass gasifier

- Bark, sawdust and forest residue gasified to produce biogas for e.g. lime-kiln

LignoBoost

- Lignin extraction from black liquor to produce biobased chemicals and materials

Sugar extraction

- Extraction of hemicellulose sugars to produce biobased chemicals



Unrivalled combination of technology, services and automation for pulp customers







Q&A Pulp

Submit questions using the question form

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who will address them to the presenter



The new normal - opportunities through digitalization and Valmet's industrial internet

Tuomas Petänen
Head of Energy Segment, Industrial Internet

Profitability can be improved with real-time data and analytics

Energy

- Is your plant running in optimal capacity right now?
- What are the upcoming risks for production downtime?
- Is the fuel economy on an optimal level?
- Own electricity consumption?
- Consumption of additives?

Revenue:

- Electricity
- Heat

Maximize
revenue

Costs:

- Fuels
- Emissions
- Additives
- Maintenance

Minimize
costs

Profit



**Every minute counts
in plant profitability**



Profitability can be improved with real-time data and analytics

Pulp

- Does your mill have capacity limitations right now?
- What are the upcoming risks for production downtime?
- Is performance for each process area optimized?
- Own electricity consumption?
- Consumption of steam and chemicals?

Revenue:

- Pulp production
- Other streams

Maximize
revenue

Costs:

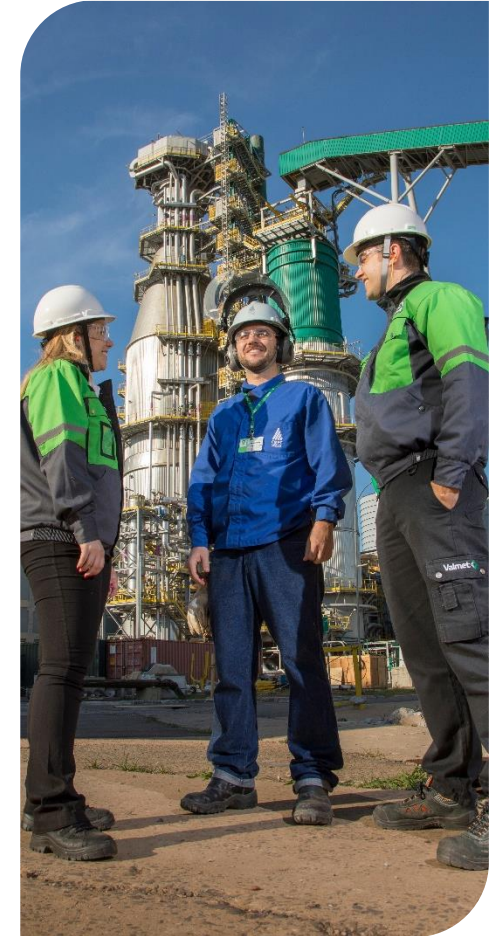
- Raw material
- Chemicals
- Electricity
- Maintenance

Minimize
costs

Profit



**Every minute counts
in mill profitability**



Why is Valmet investing in Industrial Internet?

- Move our customers' performance forward
 - Improved operation and maintenance
- New insight with real-time process data
 - Deep insight on performance of our deliveries
- Digitalization improves our competitiveness
 - Performance optimization
 - Asset reliability
- Improved efficiency of our services
 - Remote start-up support



A series of overlapping, semi-transparent geometric shapes in shades of gray and white, forming a stylized arrow-like pattern pointing towards the right.

Demo

Valmet Industrial Internet

LEARNING

Actions concerning you

PM4 SAFETY INSTRUCTIONS

13.00 Request for proposal of spare parts

14.15 Request for proposal of spare parts

15.30 Request for proposal of spare parts

16.15 Request for proposal of spare parts

17/28

START

START

START

START

Latest business benefits

Better maintenance structure: more planned and predictive maintenance.

RATING ★★★★★

Significantly reduced unplanned shut-downs

OPPO

Nov

Oct

Sep

Aug

Jul

Jun

May

Apr

Mar

Feb

Jan

Q4

Q3

Q2

Q1

REVENUE

EXPENSE

Net efficiency

97.2 %

(95. %)

Benchmark

in the line

Production

15.7 %

(11 %)

Benchmark

Average

Chat with Jose

Welcome to Valmet Customer Portal

tuomas.petanen@valmet.com

.....

Forgot your password?

Log in

Valmet Internal

+358 5467899

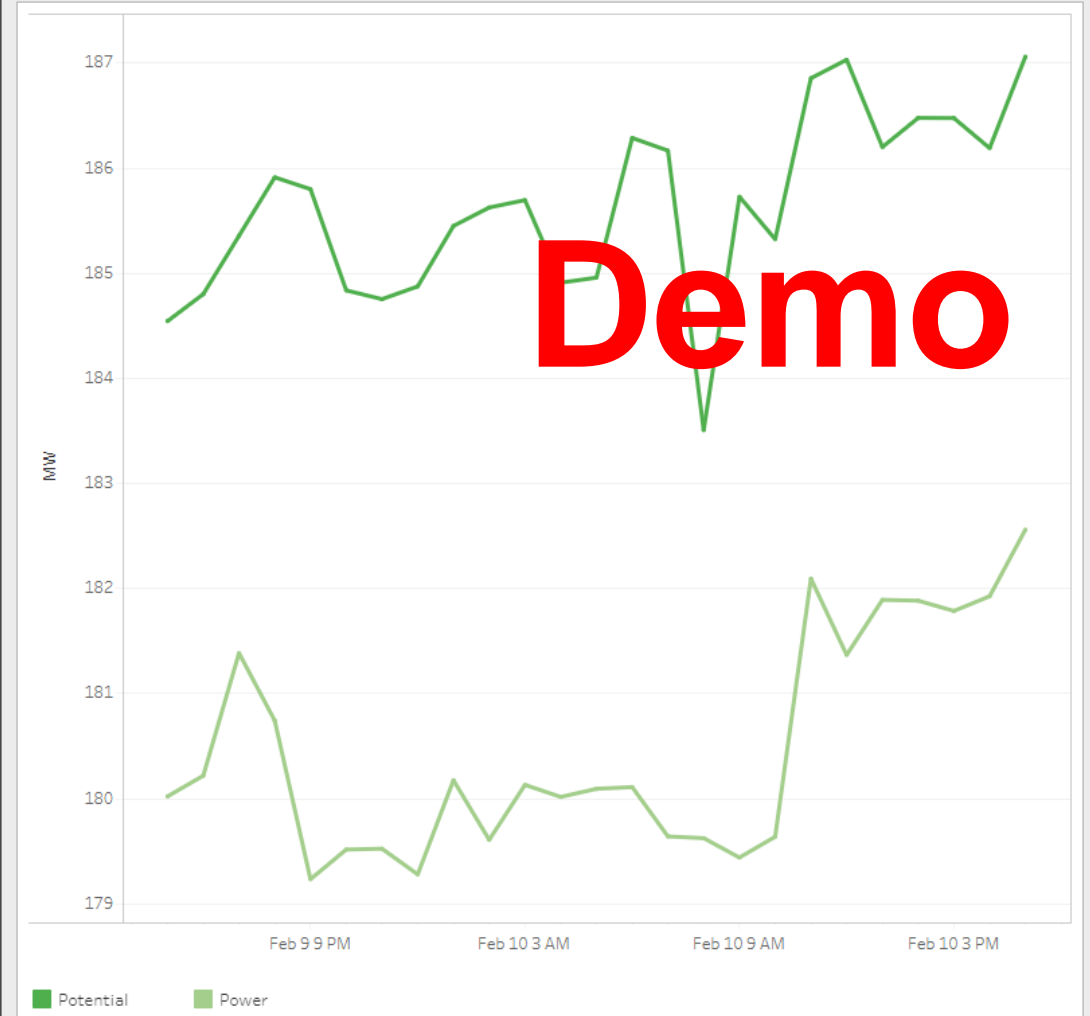
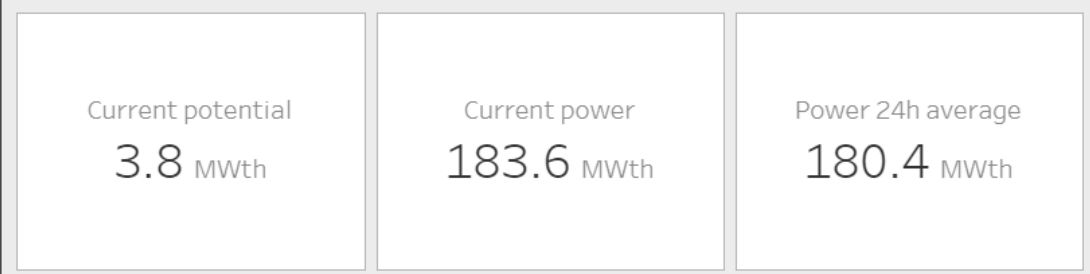
jose.sants@valmet.com

Chat with Jose

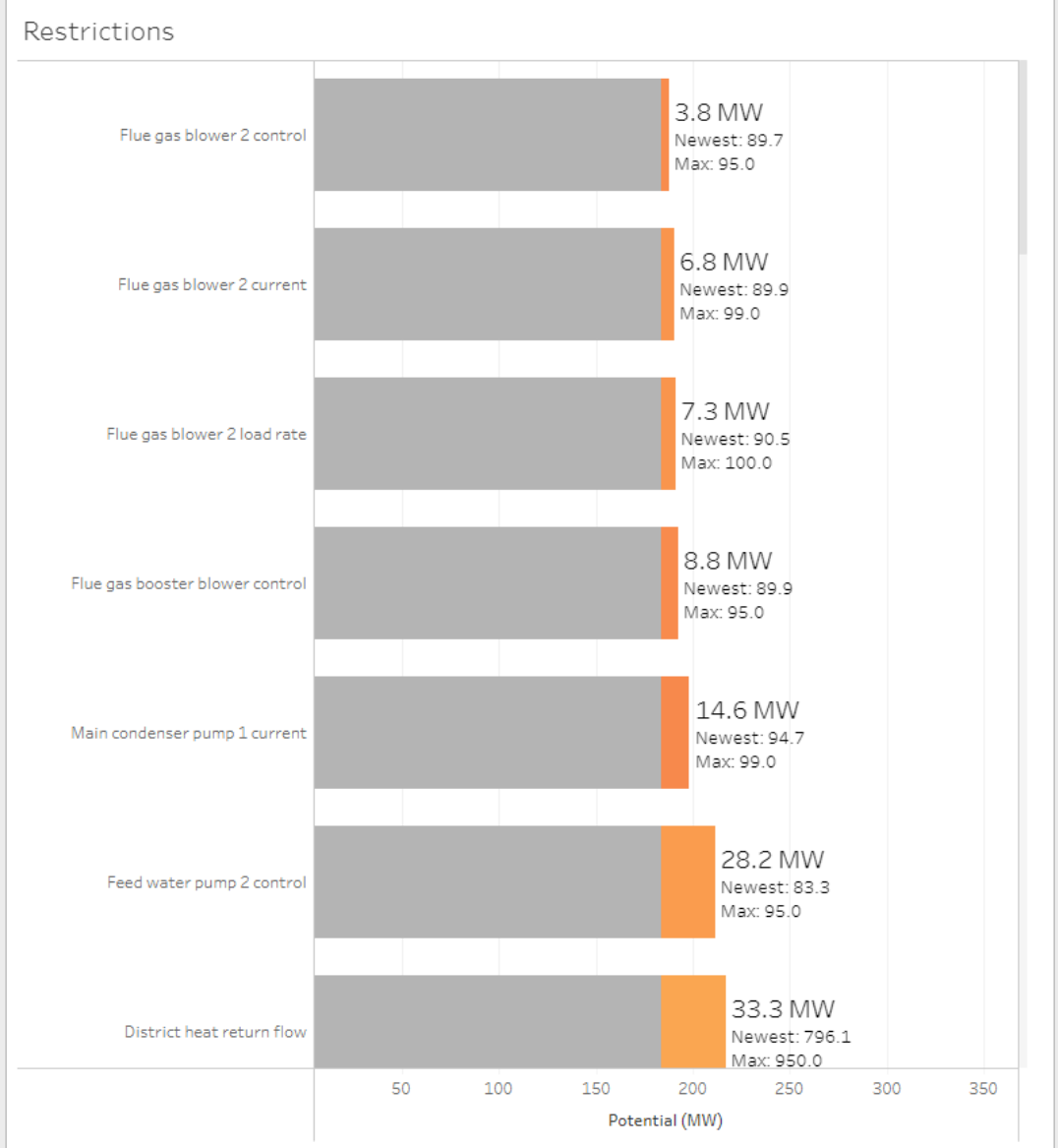
Demo

peril

valmet

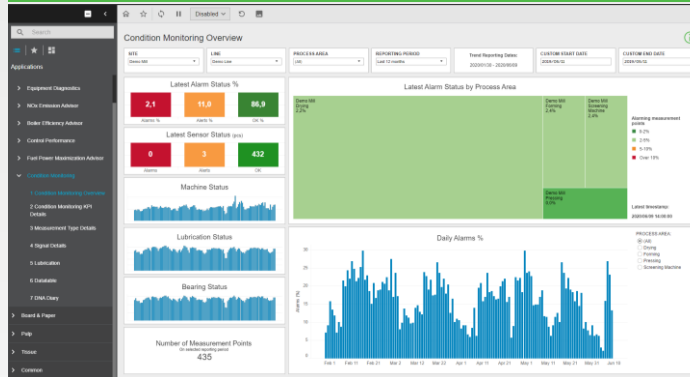


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Key elements of Valmet Industrial Internet - VII

Industrial Internet applications



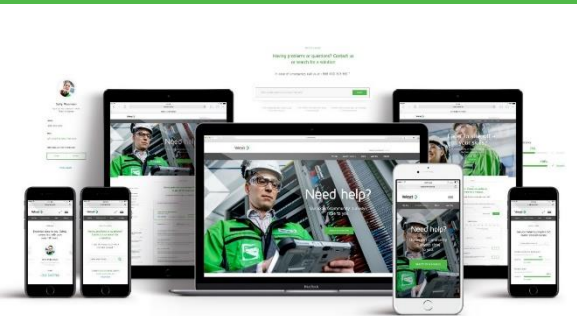
From analytical applications for reliability and performance to Advanced Process Controls, information management and process simulators

Valmet Performance Center



Provides remote support, monitoring and data analysis and access to Valmet's expert network

Valmet Customer Portal



Contact experts • Solve problems • Benchmark performance • Build capabilities • Innovate together

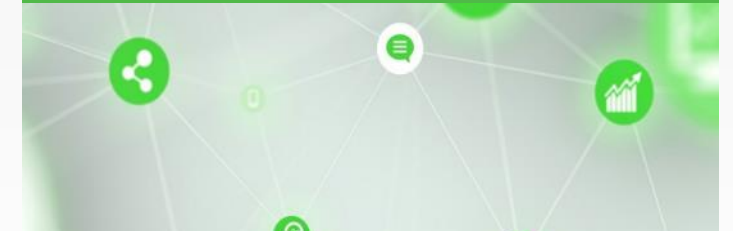
A digital, personalized collaboration space between you and Valmet

Intelligent machines and automation



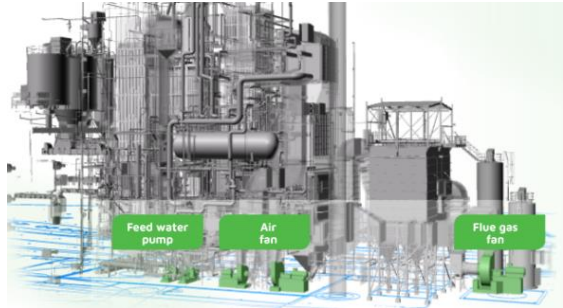
A solid data source for Industrial Internet solutions

Solution ecosystem



Brings leading industry players and innovative start-ups together to co-create new value-adding data driven services

Opportunities through digitalization and Valmet's Industrial Internet

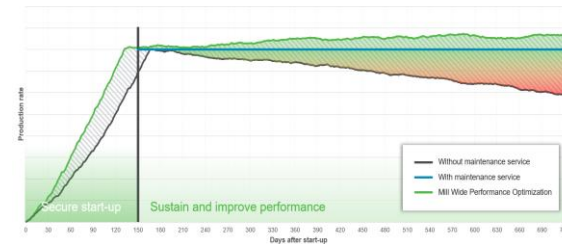


Predictive maintenance

Opportunity

Improve plant availability and manage production limitations by predicting upcoming failures

Secure start-up curve and improve performance
Efficiency optimization and continuous improvements

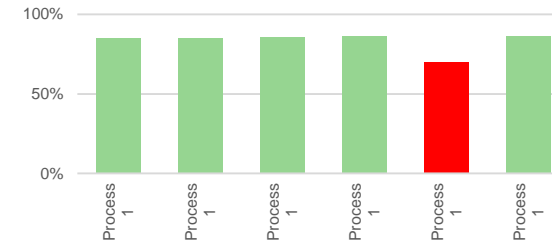


Autonomous mills

Opportunity

- Optimization of entire production processes
- Reduced manual work

Fleet performance



Fleet management

Opportunity

Continuous benchmarking of performance in similar processes enables

- Fast recognition of failures
- Insight to improvement opportunities

CO₂ Emissions

Year to date

8 900 tons/MWe



Corporation level transparency

Opportunity

Real time follow-up of critical performance parameters and targets on plant level and corporation level





Summary of key messages

Bertel Karlstedt,
Business Line President

Pulp and Energy key messages

Pulp and Energy in good position

- Good order backlog for the coming years
- Global technology and know-how leader
- A natural growth platform for environmental systems and biomass conversion technologies



Industrial Internet and digitalization

- Combination of technology, automation and services knowhow
- Solution offering meeting customer demands
- Sustainable way to operate, share knowledge and utilize our experts globally



Global opportunities in pulp business

- Global demand for tissue and packaging is supporting pulp production growth
- Performance and sustainability strong drivers in pulp production
- Valmet has the full scope offering



Sustainability driving energy business

- Emission reduction targets and EU Green Deal impact national policies
- Resource efficiency and clean solutions driving forces for customer investments
- Europe remains our main market with growth opportunities in Asia







Q&A

Submit questions using the question form

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Feedback survey

Please respond!

We greatly appreciate your feedback

Thank you!

