



Pulp and Energy: Strengthening the position in growing biomass conversion market

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1

ATTRACTIVE MARKET

Global megatrends strongly support use of bio-based products and energy

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STRONG MARKET POSITION

Strong position with competitive technology –potential to grow in Pulp

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COMPETITIVE OFFERING

Full offering for pulp and bioenergy customers

4

ATTRACTIVE BUSINESS MODEL

Flexible cost base, projects financed by advance payments, balanced risk portfolio

5

NEW TECHNOLOGIES FOR FUTURE GROWTH

Solid track record of scale-up and commercialization of new technologies

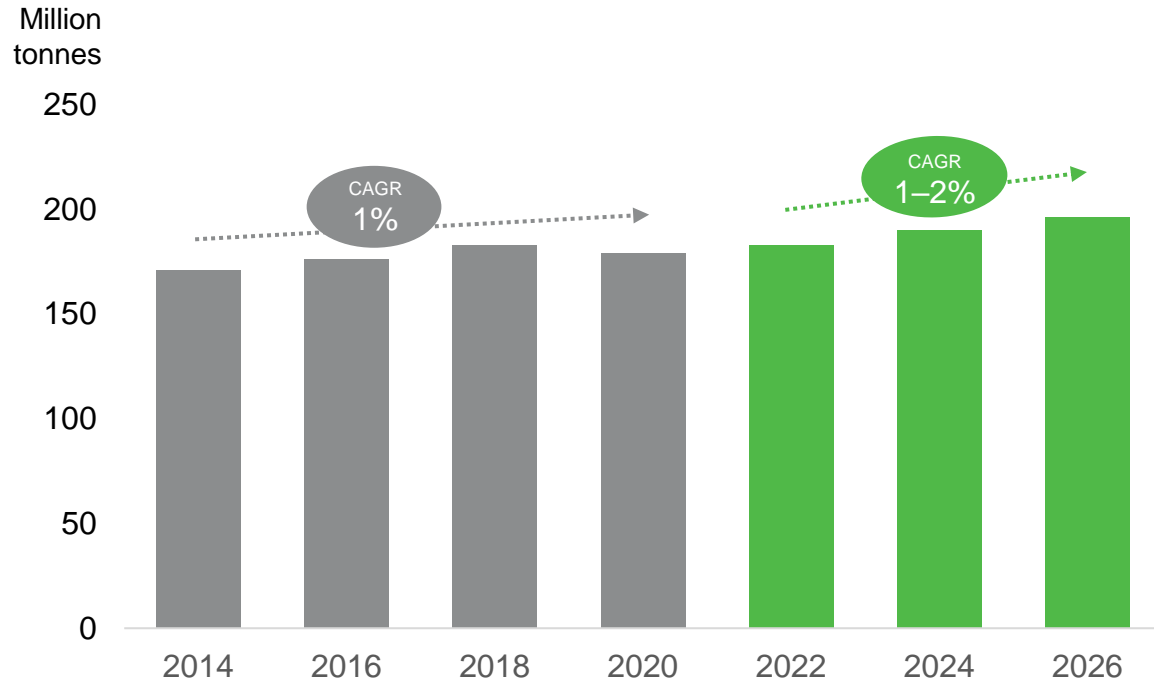
FINANCIAL TARGET

Net sales to exceed market growth



Pulp market is growing

Global pulp demand



- Steadily growing market
- Potential to grow market share
- Rebuilds and efficiency improvements supporting growth beyond market growth

Market driven both by new investments and refurbishment of existing mills

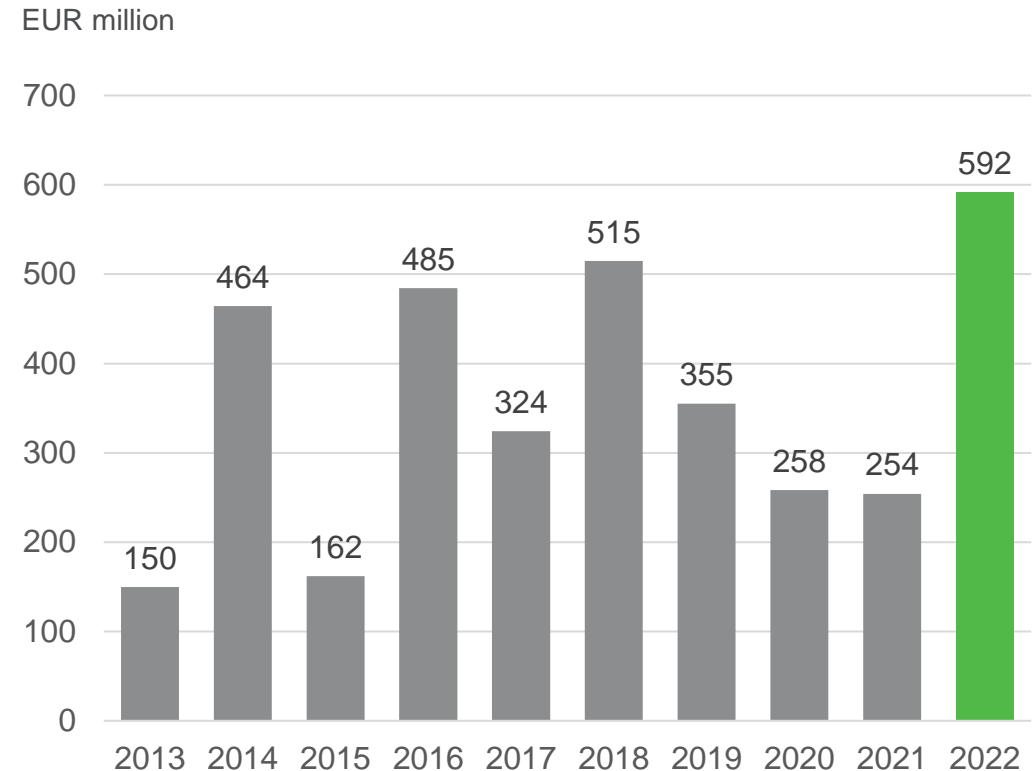
- Pulp demand growing due to demand for sustainable packaging, tissue, textiles and plastic replacement
- Demand for new pulp capacity is about 1–2 million tonnes per year
- Significant investments are made continuously to rebuild the existing production facilities
- Legislation and companies' own targets promote investment in environmental efficiency

Energy: Record demand in 2022 driven by fossil phaseout

Energy market drivers

- Decarbonization in energy production drives investments in renewables including biomass-based energy production
- Biomass and residual waste increasingly used in heat and steam production
- Local fuels like biomass favored when securing the energy supply
- Tightening air emissions legislation and stricter directives increasing demand for emission control technology
- Solid biomass use in energy production is estimated to grow most in Europe and China

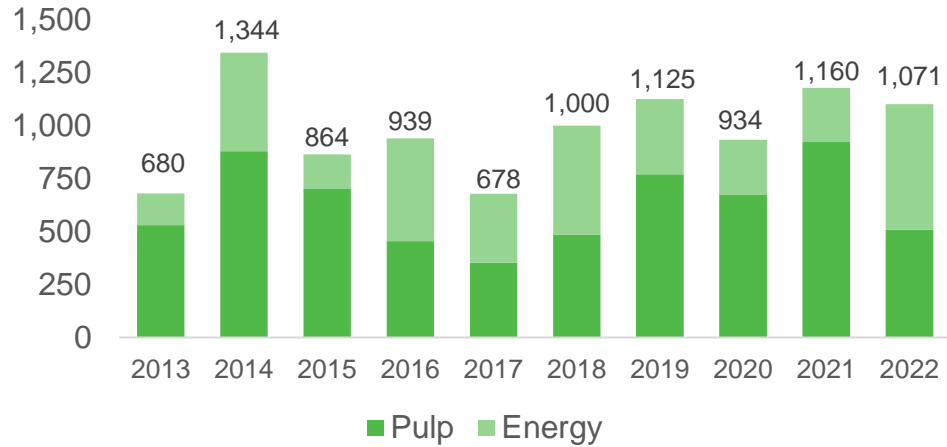
Valmet's energy business orders received



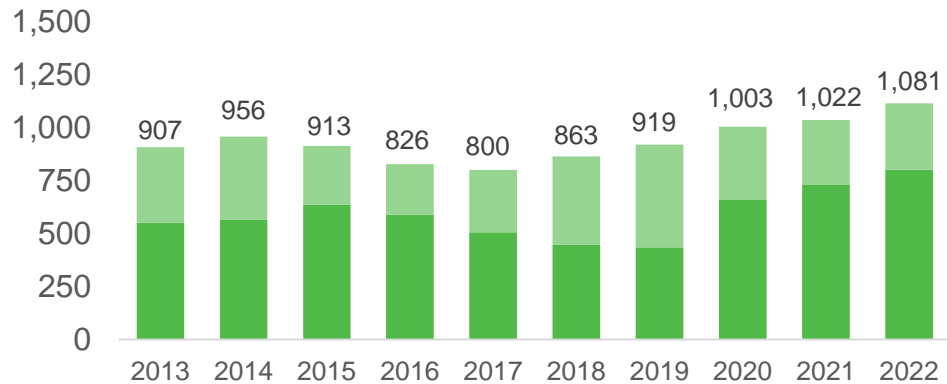
- Record orders in 2022 driven by fossil phaseout
- Supply security emerging as next driver

Pulp and Energy key figures

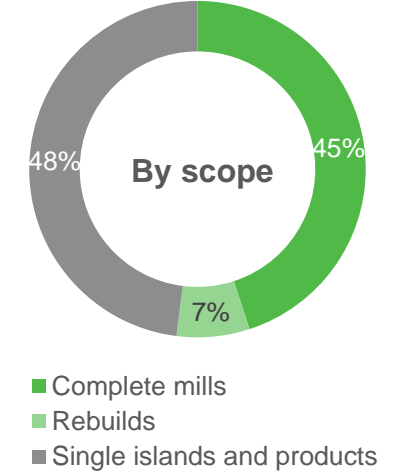
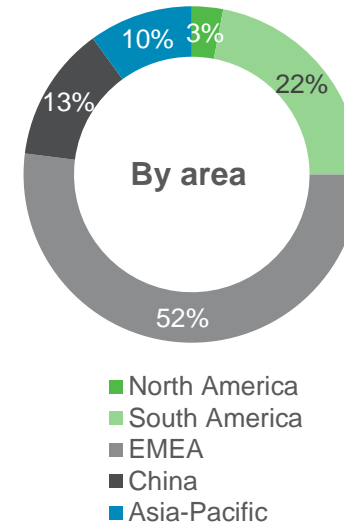
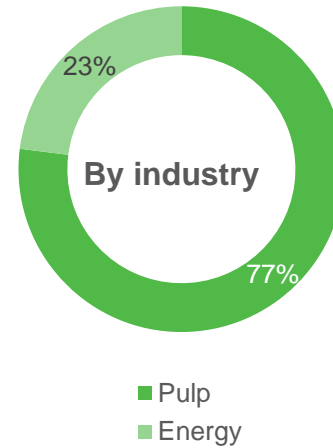
Orders received (EUR million)



Net sales (EUR million)



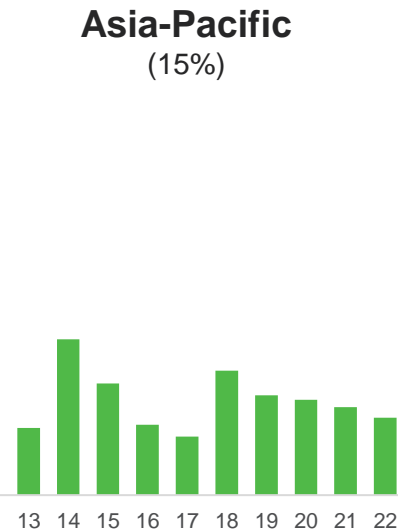
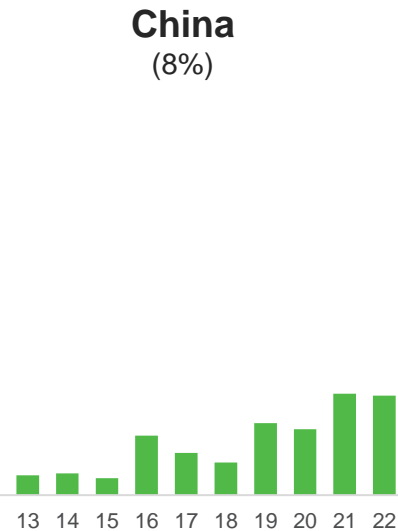
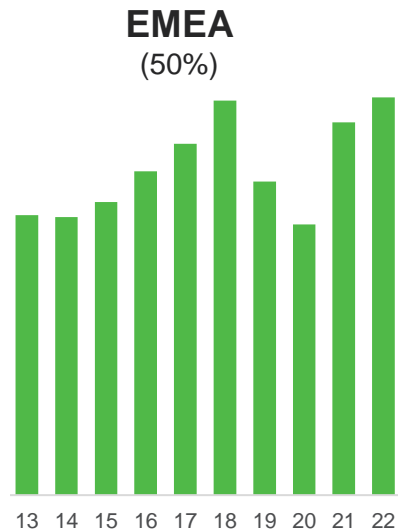
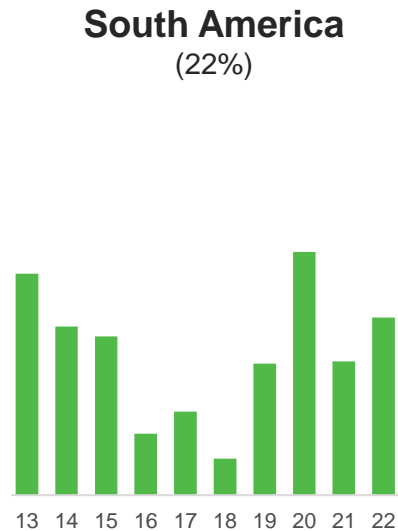
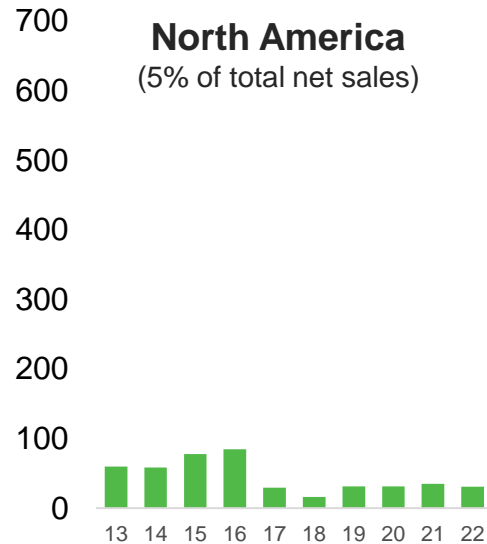
Net sales split 2022 (% of total)



	Market position	Market share	Estimated market size, EUR
Pulp	#2	30–35%	2–3 bn
Energy	#1–3	15–25%	1.5–2 bn

Growth potential in greenfield and rebuild market in all areas

Net sales
(EUR million)



Market characteristics

Pulp

- Large aging integrated pulp mill installed base

- New mega-scale pulp mills and pulp mill expansions

- Investments into pulp mill expansions and upgrades

- Recycled paper import restrictions drive investments in pulp production

- New pulp mills and pulp mill upgrades in South-East Asia and India

Energy

- Limited opportunities in bioenergy sector

- Energy opportunities linked to pulp mills

- Fossil phaseout driving energy investments
- Potential in new bioproducts

- Waste-to-energy opportunities

- Bioenergy and waste-to-energy opportunities in selected countries

Leading pulp and energy technology offering



Pulp

Complete mills and lines

- Complete chemical pulp mills from wood handling to bales
- Mechanical pulping lines (BCTMP, CTMP)
- Plant-wide project execution and management

Single islands and products

- Chemical pulp mill islands
- Defibrators for fiberboard production
- Prehydrolysis BioTrac systems
- LignoBoost plants
- Textile recycling technology

- Mill-wide offering with automation and services
- Optimized production, energy efficiency and environmental performance
- Local presence through Area organization

- Leading technology e.g. G3 Cooking with strong market success
- Leading mechanical pulping (CTMP) solutions
- Strong position in new products
- Excellent energy and environmental performance



Energy

Boilers and power plants

- Fluidized bed boilers – using biomass, waste and residues
- Biomass gasifiers
- Modular power plants
- Emission control systems (SOx, NOx and dust removal)

- Strong expertise in biomass-based power and heat
- Excellent fuel flexibility with fluidized bed technology
- Large reference base
- Local presence through Area organization and partners

Rebuilds and conversions

- Boiler fuel conversions from fossil to biomass
- Boiler production capacity upgrades
- Emission reduction projects

- Technical knowledge of the process including fuel handling, combustion and emission control
- Various complementing technologies
- Large reference base

Offering

Competitive advantages

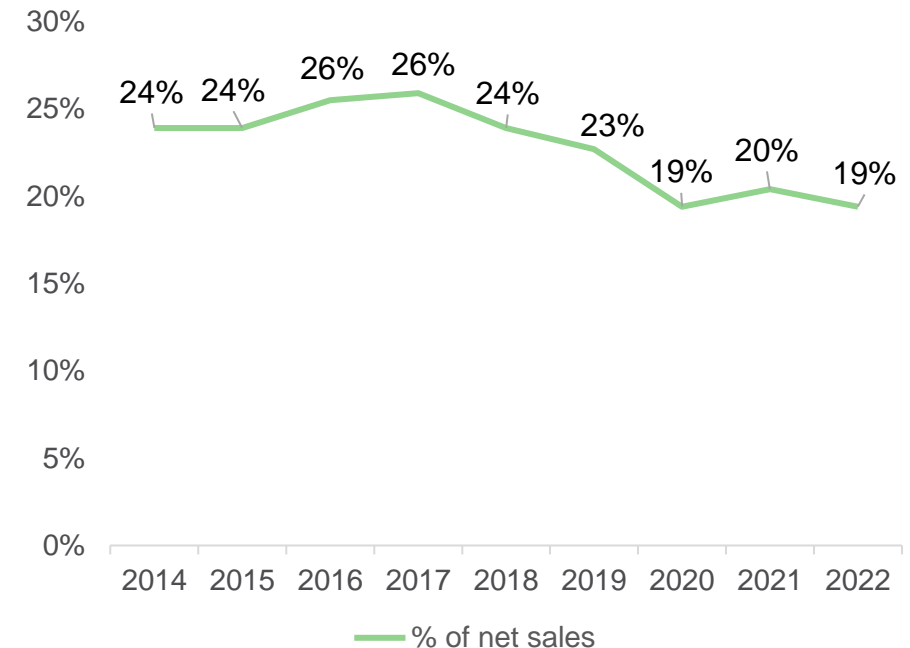
Efficient business model

Efficient operations

- Own manufacturing for core equipment
- Flexible operating model with outsourced engineering and manufacturing
- Capacity cost kept stable despite growing net sales and R&D investments
- Focus on successful project risk management
- Global footprint optimization, with own engineering and project execution hubs in India and China
- Upfront cash generation from projects due to pre- and milestone payments
- Market demand fluctuations offset by different investment cycles in energy and pulp
- Continuous R&D together with customers and growth opportunities outside the traditional pulp and energy

Capacity costs

(% of net sales)



Capacity costs have decreased
by 5 %-points since 2014

Growth outside traditional pulp and energy

– New bioproducts

Market drivers:

- Fossil replacement driving innovation and investments in biofuels, biochemicals and biomaterials
- Circular economy principles promoting high-value end uses for biomass, e.g., lignin usage to replace fossil-based carbon

Valmet's solutions:

- Prehydrolysis for 2nd generation bioethanol, biochemicals and steam treated pellets production
- Kraft lignin extraction
- Pyrolysis for biochemicals and biofuels production

Development

- Own pilot facilities
- Active joint development with key customers



Recent customer cases:

- Prehydrolysis BioTrac: Clariant, Praj, UPM, Orlen
- LignoBoost: Klabin, Mercer, Stora Enso
- Pyrolysis: Circa

Growth outside traditional pulp and paper technologies

– Recycled and Cellulose-based Textile Fibers

Market drivers:

- Global megatrends drive sustainable textile fiber production and textile recycling
- Several challenges with existing textile fibers (microplastics, cotton water and land usage, toxic chemicals in viscose production)
- Textile recycling boosted by EU legislation

Valmet's solutions:

- Utilizing and adapting existing pulping and stock preparation technology
- New offering, e.g., filament dryer and heat recovery with focus on modularity

Development

- Joint development with several pulp producers and new entrants
- Possibility to use existing Fiber Technology Centers for piloting



Recent customer cases:

- Renewcell textile recycling plant, Sundsvall, Sweden:
 - Key technology for stock preparation, bleaching and drying
- Woodspin (Spinnova & Suzano joint venture), Jyväskylä, Finland:
 - Filament drying and heat recovery

Strategic focus areas

Pulp and Energy

Key actions to grow

- Grow market share in Pulp through successful execution of projects
- Grow Energy business through energy transition in Europe and Asia
- Expand business through new technologies and industries

Key actions to improve profitability

- Improve cost competitiveness of technology and deliveries
- Develop engineering and supply chain efficiency
- Commercialize new value-adding technologies



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