Applied Value
Pulp & Paper Report

Quarterly Analysis Q4, 2022

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Applied Value Pulp & Paper Report

Applied Value's quarterly Pulp & Paper Report is focused on financial benchmarking and market trends impacting the industry

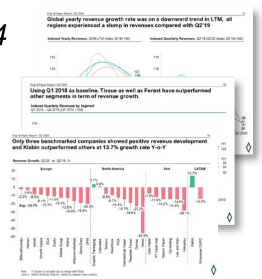
In this Pulp & Paper Report, Applied Value provides essential financial benchmarking focused on the latest quarter and 12-month period while also offering a brief update on the latest market trends.

The report provides a clear, understandable, and useful analysis of the relative performance of a selection of global Pulp & Paper companies. It also provides an overview of the industry and relevant market trends that occurred during the quarter.

Growth

Industry growth latest 4 quarters and LTM

Growth in the latest quarter per company segment, and region



EBITDA Margins

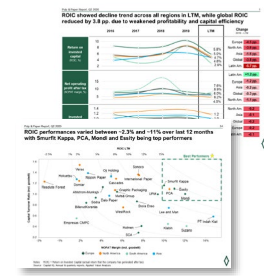
Average Industry EBITDA margin latest 4 quarters and LTM

EBITDA margin for the latest quarter per company, segment and region

ROIC

ROIC per region for the last 5 years

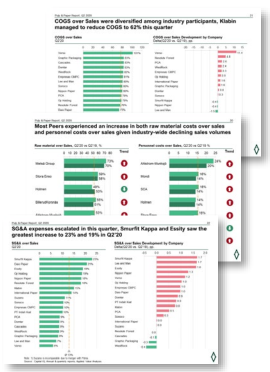
ROIC per company for LTM



Operational Costs Breakdown

Operational costs breakdown per company last quarter

Operational costs development YoY per company



Market Trends

Pulp & Papers market price movements

Commodity prices and currency movements

Note: Included companies might differ from previous quarters

The report is based on the financial performance of 27 leading Pulp & Paper companies in Europe, North America, Latin America & Asia

Companies included in Financial Benchmarking in the Q4 2022 report

Market	Company	Revenue 2022 (BEUR)	Country	Board	Paper	Tissue	Wood Products	Pulp	Other
Europe	Essity	14.0				✓			✓
Europe	Smurfit Kappa	12.8		✓	✓				
Europe	UPM	11.7			✓		✓	✓	✓
Europe	Stora Enso	11.7		✓	✓		✓	✓	✓
Europe	Mondi	8.9		✓	✓				✓
Europe	Metsä Group	7.0		✓	✓	✓	✓	✓	✓
Europe	Billerud	3.9		✓	✓			✓	✓
Europe	Södra	3.0					✓	✓	✓
Europe	Holmen	2.2		✓	✓		✓		✓
Europe	SCA	1.9		✓			✓	✓	✓
North America	WestRock	19.9		✓	✓				✓
North America	International Paper	19.8		✓	✓		✓	✓	✓
North America	Graphic Packaging	8.8		✓	✓				✓
North America	PCA	7.9		✓	✓				✓
North America	Sonoco	6.8		✓	✓				✓
North America	Resolute Forest	3.6			✓	✓	✓	✓	✓
North America	Cascades	3.0		✓	✓	✓			✓
LAT AM	Suzano	8.4			✓			✓	✓
LAT AM	Empresas CMPC	7.3		✓	✓		✓	✓	✓
LAT AM	Klabin	3.5		✓	✓		✓	✓	✓
Asia	Oji Holding	11.9		✓	✓		✓		✓
Asia	Nippon Paper	8.0		✓	✓		✓		✓
Asia	Shanying	5.4		✓	✓		✓	✓	✓
Asia	Shandong Sunpaper	4.9		✓	✓			✓	✓
Asia	Daio Paper	4.6		✓	✓				✓
Asia	PT Indah Kiat	4.1		✓	✓				✓
Asia	Hokuetsu	1.9		✓	✓			✓	✓

Note: For the companies whose Q4'22 financials have not been disclosed, Q3'22 financials are used instead in the analysis; Source: Capital IQ, Quarterly Reports

Revenue peaked in Q4’22 compared with last quarter due to softening demand amid weakening macroeconomics conditions

Financial Benchmarking: Highlights in Q4 2022

Key takeaways

Revenue Growth	› Revenues in all regions dropped or flattened out in Q4’22, after two years of spectacular growth in the industry. The global average revenue decreased by 6%, driven by a rising inflation and weakening macroeconomic conditions. Largest decline seen in North America and Latin America, with a drop of 14% and 9% respectively compared to Q3’22. › In terms of revenues by segment, pulp, tissue and board products stabilized at similar levels in Q4’22 compared to the previous quarter, with little growth observed; whereas revenues in paper products dropped by 16% in Q4’22 due to weaker demand and price adjustments › Billerud, Holmen and Essity were top industry performers in this quarter with reported Y-o-Y revenue growth of +79%, +31%, +28%. Billerud’s growth was largely attributed to its acquisition of Verso, which ignited its growth of the North American market
Profitability & Costs	› EBITDA margins of all segments showed downward trajectories. Board, paper, wood products, pulp were down by 4 pp., 6 pp., 4 pp., and 5 pp. respectively. Tissue recorded a flattened low level of EBITDA margin of ~2% due to overall heightened energy costs › EBITDA margins decreased by 1-3 pp. across all regions, except for NA, which saw a Y-o-Y increase of 1 pp. in Q4’ 22. UPM recorded the strongest growth at 5.9%, whereas Asian companies, especially the ones from Japan suffered a profitability decrease Y-o-Y due to high production cost. SCA saw a decrease of ~18% in EBITDA margin due to an unplanned production stop at Östrand, Sweden and lower selling prices › Most European companies experienced improvements in both raw materials and personnel costs over sales in Q4’22, albeit to a limited degree. › Many players experienced COGS ratio decreases due to higher sales compared with Q4’21 with the average level being 75% in Q4’22
Return On Invested Capital (ROIC)	› In accordance with yearly revenue growth, the global average ROIC ended at 9.3%, an increase of 0.7 pp. Y-o-Y. Only Asia saw a decrease of 2.9 pp. in ROIC. Europe, NA and LATAM’s ROIC grew by 2.6 pp.,1.9 pp. and 1.0 pp., arriving at 11.7%, 10.6% and 10.9% respectively › Södra and Resolute Forest were the top industry performers in LTM with ROIC >20% achieved

Top performers

BILLERUD

HOLMEN

essity

UPM

suzano we plant the future

indah kiat pulp and paper products

SÖDRA

resolute Forest Products

Source: RISI, S&P Capital IQ, Interim & Annual Reports.

Weak demand and inflationary pressure amid widespread pessimistic outlooks are expected to challenge the coming 2023

Market Trends: Highlights in Q4 2022

Key takeaways

Industry News	› 2022 has been characterized by the energy crisis in Europe and the war in Ukraine, while the world's central banks struggled with high inflation driven by shortages of raw materials. This has resulted in a tumultuous and uncertain market, with fluctuations in both pricing and supply. While some improvement is anticipated with the stabilizing of resource availability, improvement in logistics in both Europe and NA as well as the lifting of the COVID-zero policy in China, weaker demand and inflationary pressure amid widespread pessimism about the macroeconomic outlooks are expected to further challenge the industry in the coming 2023 › Pulp capacity is expected to grow in 2023 after limited gains in 2019-2021. It is expected that capacity will expand by 415 thousand metric tons in 2023, with most of the new capacity expected to be in LATAM › As the war in Ukraine grinds on, energy crisis is lingering on with European tissue producers suffering from the turmoiled natural gas supply and pricing. It is estimated that up to 30% of natural gas previously imported from Russia could not be replaced in 2023
Pulp Prices	› Apart from Asia, pulp prices in US and Europe have recorded increases of 22% and 14% Y-o-Y. However, on a Q-o-Q basis, Europe and US pulp prices have showed downward momentum in Q4'22, recording a drop of 8% and 5% respectively › The cooling of pulp prices in Q4'22 was attributed to weak demand and low spot market offerings, coupled with a challenging macroeconomic environment
Graphic Paper & Packaging	› Prices for all grades of graphic paper peaked up and stabilized at elevated levels. Meanwhile, prices for packaging paper began to decline. Corrugating medium, exported linerboard, and containerboard saw decreases of 7%, 6%, and 6%, respectively, Q-o-Q › The decrease in demand, attributed to seasonality and the alleviation of supply chain constraints, played a role in the stabilization and even decline of prices, further leading to a 'wait-and see' sentiment in the spot market
Commodities & Currencies	› Oil prices marked a continuous drop of 9% in Q4'22, landing at ~76 USD/barrel, a decrease of 33% from its peak in Q2'22 › Electricity prices remained stable in US and Germany in Q4'22. However, in Northern Europe, a surge in electricity prices was observed due to elevated natural gas prices and disruptions in nuclear and hydroelectric generation, resulting in a heightened reliance on costly coal and gas-fired power plants › EUR, GBP, SEK and CNY have demonstrated appreciation against the USD in light of the moderated interest rate hike US in Q4'22. Despite this, their values remain below their pre-interest hike levels established at the beginning of the year

Source: RISI, Interim & Annual Reports.

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Revenue peaked in Q4'22 compared with last quarter due to softening demand amid weakening macroeconomics conditions

Financial Benchmarking: Highlights in Q4 2022

Key takeaways

Revenue Growth

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- In terms of revenues by segment, pulp, tissue and board products stabilized at similar levels in Q4'22 as in the previous quarter with little growth observed; whereas revenues in paper products dropped by 16% in Q4'22 due to weaker demand and price adjustments
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Profitability & Costs

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- Most European companies experienced improvements in both raw materials and personnel costs over sales in Q4'22, albeit to a limited degree.
- Many players experienced COGS ratio decreases due to higher sales compared with Q4'21 with the average level being 75% in Q4'22

Return On Invested Capital (ROIC)

- In accordance with yearly revenue growth, the global average ROIC ended at 9.3%, an increase of 0.7 pp. Y-o-Y. Only Asia saw a decrease of 2.9 pp. in ROIC. Europe, NA and LATAM's ROIC grew by 2.6 pp.,1.9 pp. and 1.0 pp., arriving at 11.7%, 10.6% and 10.9% respectively
- Södra and Resolute Forest were the top industry performers in LTM with ROIC >20% achieved

Top performers

BILLERUD

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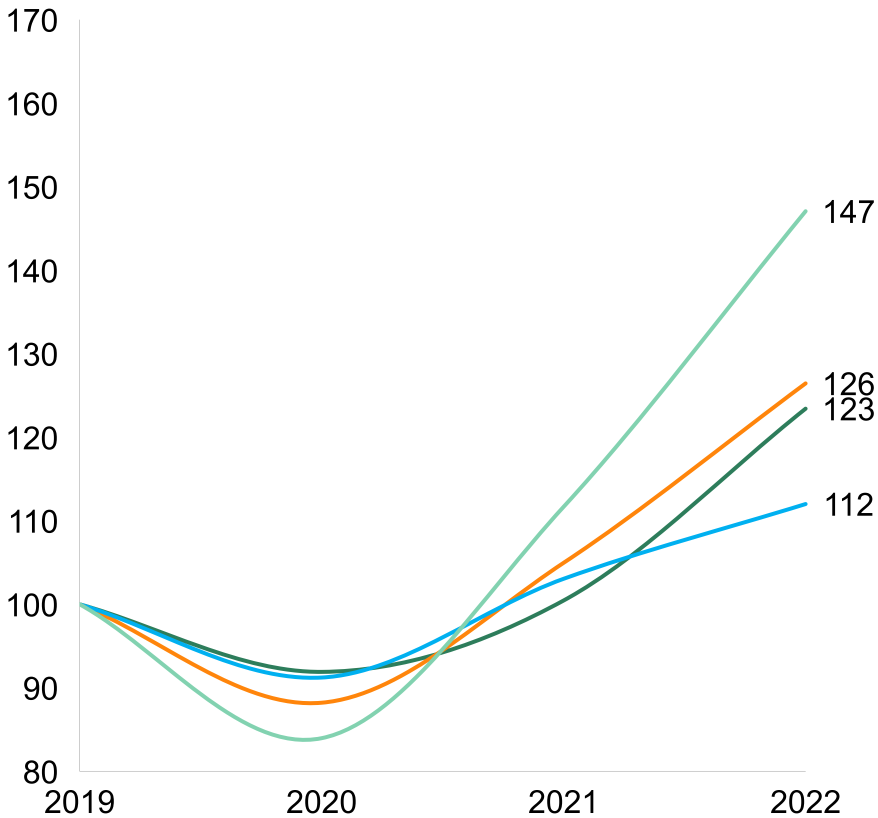
resolute
Forest Products

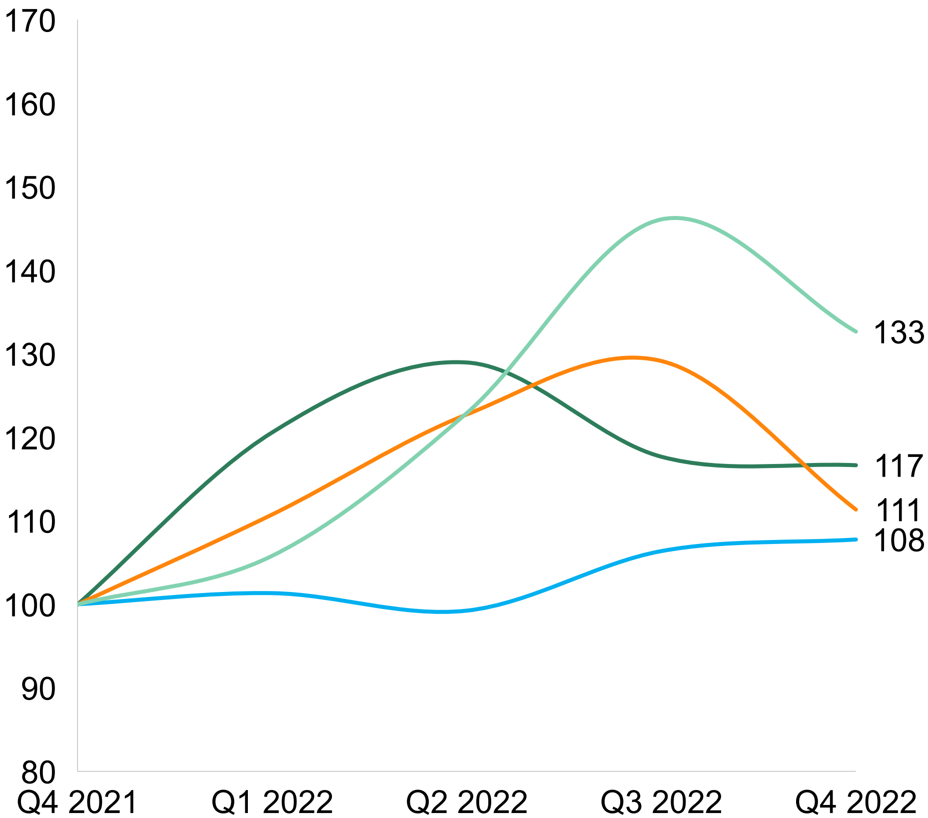
Source: RISI, S&P Capital IQ, Interim & Annual Reports.

Revenues in all regions dropped or flattened out in the second half of 2022, after two years of spectacular growth in the industry

Indexed Yearly Revenues, 2019-2022 (index 2019=100)



Indexed Quarterly Revenues, Q4'21-Q4'22 (index Q4'21=100)

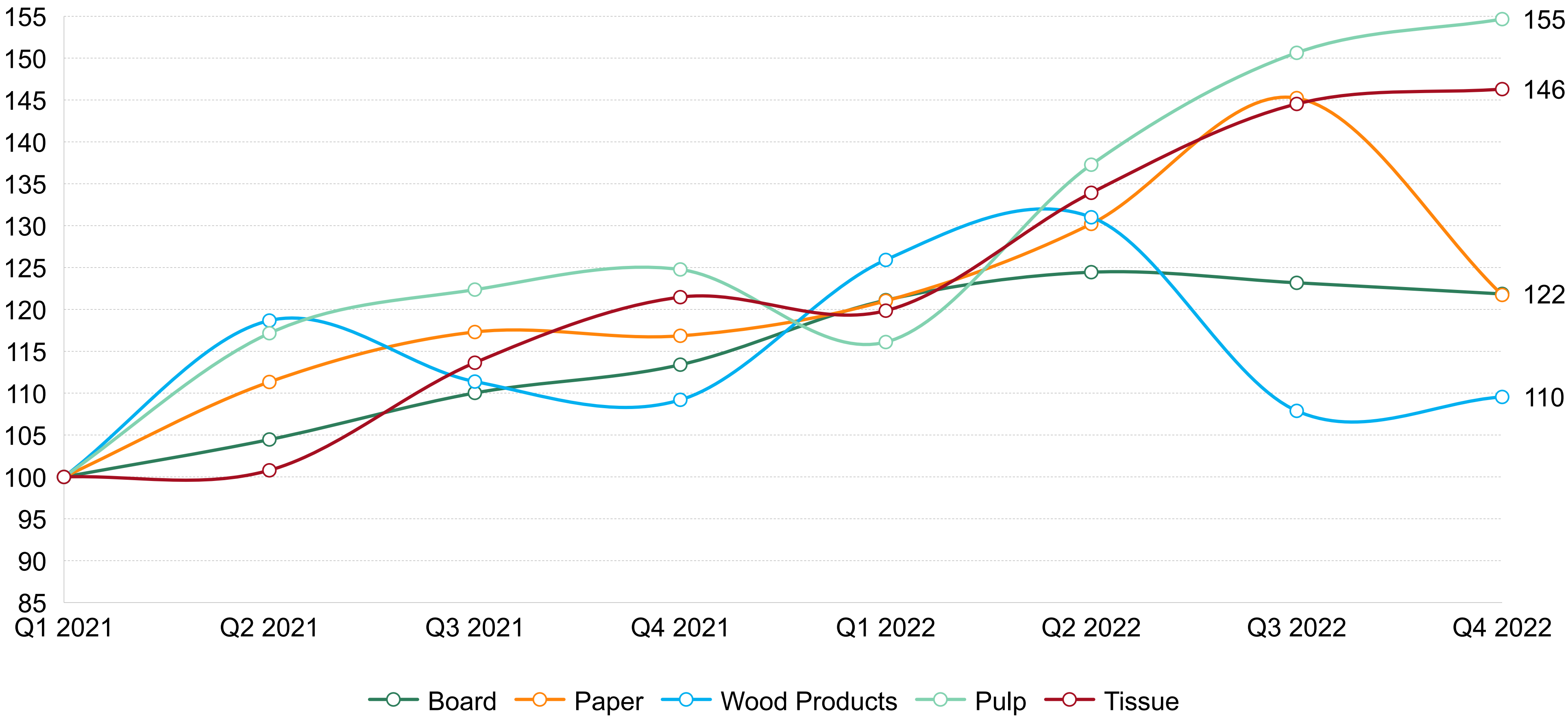


Europe North America Asia Latin America

Note: For the companies whose Q4'22 financials have not been disclosed, Q3'22 financials are used instead in the analysis
Source: S&P Capital IQ, Interim & Annual Reports, Applied Value Analysis.

Steep revenue growth since Q1’21 slowed down in most segments in Q4’22, largest drop seen in the paper segment which experienced a decline of 16%

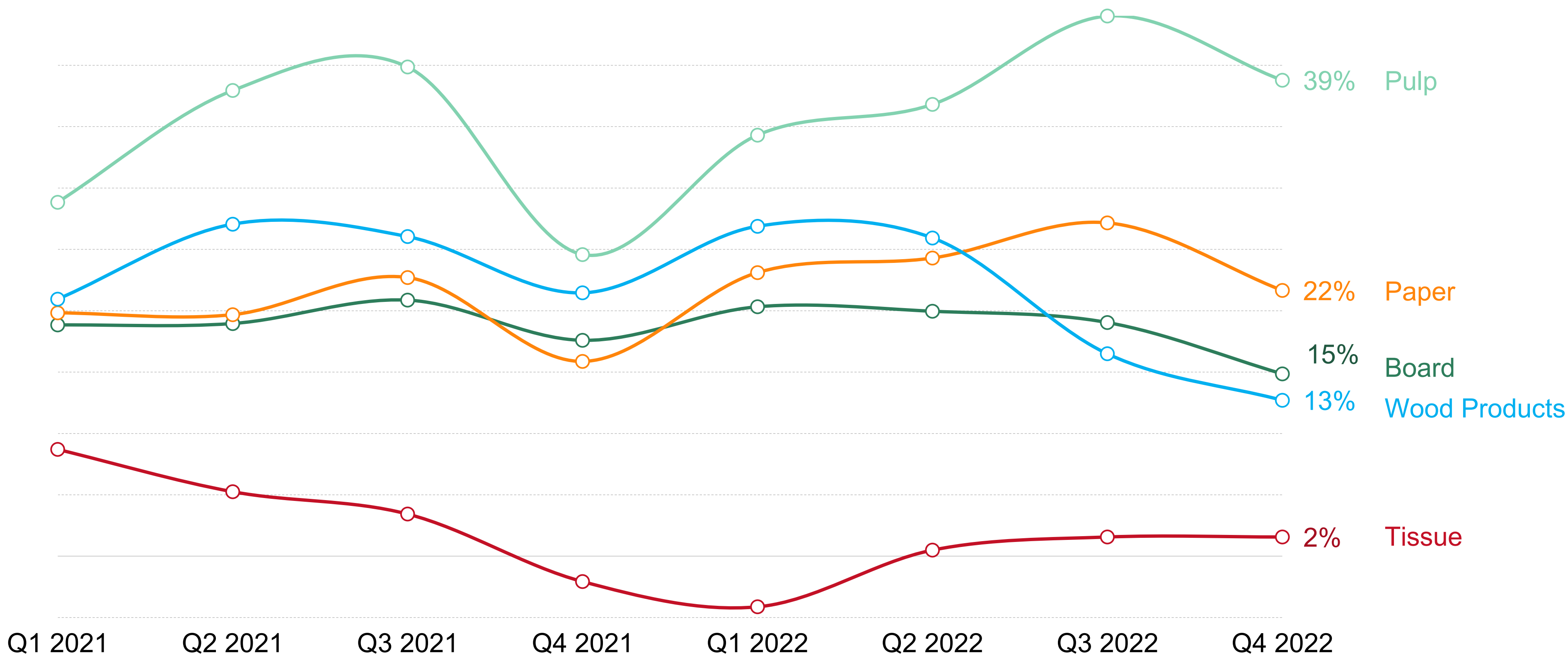
Indexed Quarterly Revenues by Segment, Q1’21 – Q4’22 (Q1’21 =100)



Note: For companies whose Q4’22 financials have not been disclosed, Q3’22 financials are used instead in the analysis
Source: S&P Capital IQ, Applied Value Analysis.

Segment profitability shows downward trajectory in Q4’22, with EBITDA margins of pulp, board, paper, and wood dropping by ~5 pp. compared to Q3

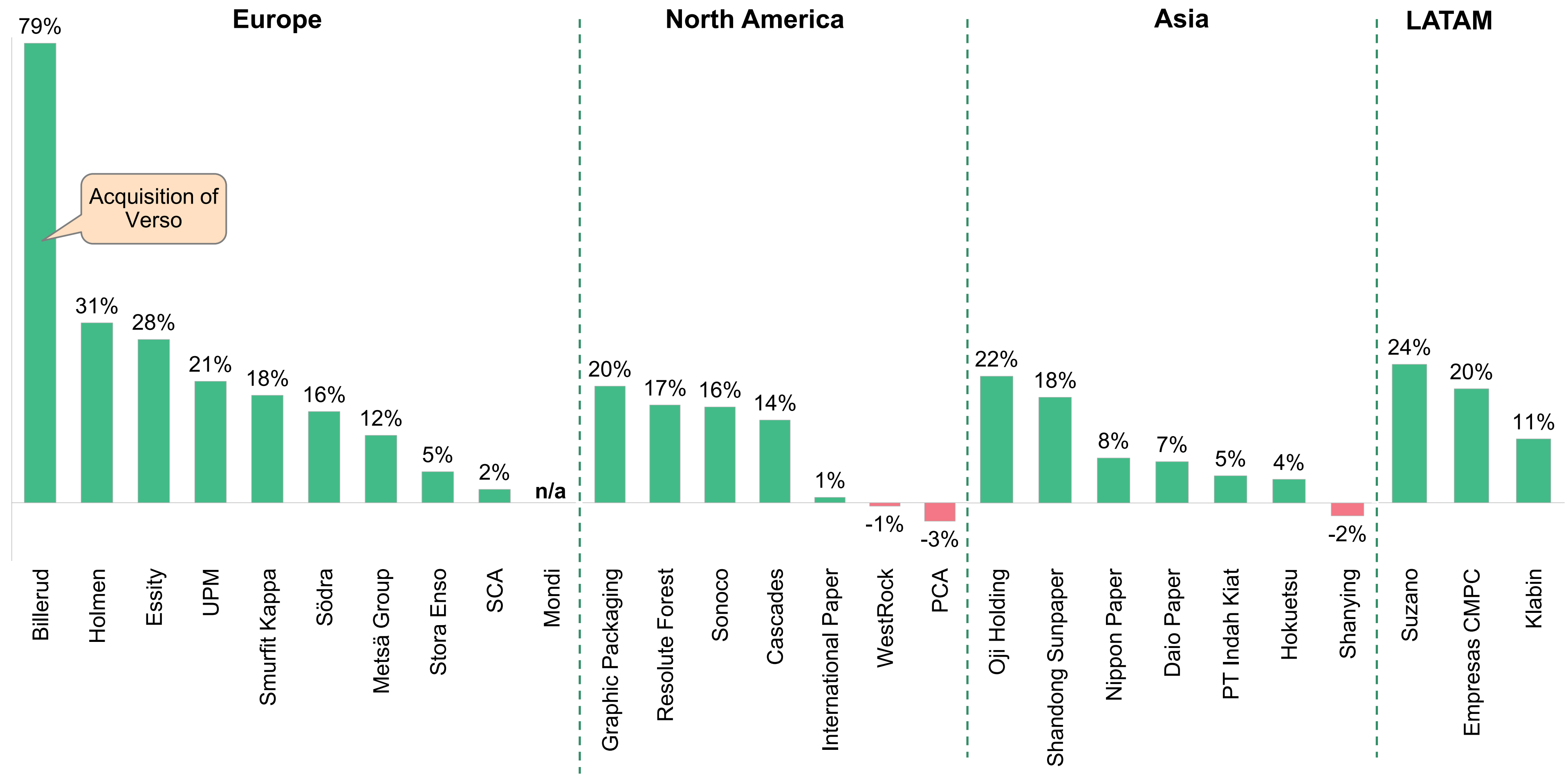
Quarterly EBITDA Margin by segment, Q1’21 – Q4’22, %



Note: For companies whose Q4’22 financials have not been disclosed, Q3’22 financials are used instead in the analysis
Source: S&P Capital IQ, Applied Value Analysis.

Strong revenue growth seen for most players across all regions Q4’22 compared to Q4’21

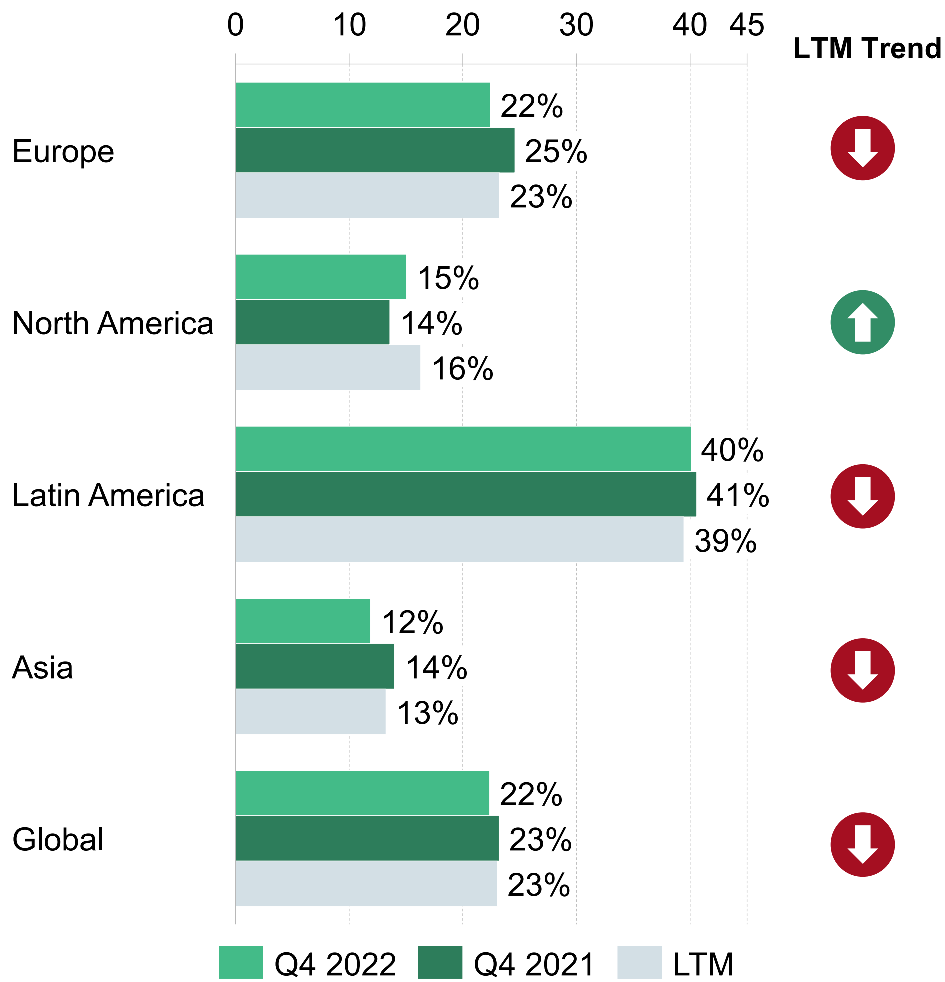
Revenue Growth, Q4’22 vs. Q4’21, %



Note: For companies whose Q4’22 financials have not been disclosed, Q3’22 financials are used instead in the analysis
Source: Interim & Annual Reports, S&P Capital IQ, Applied Value analysis.

Negative profitability trend in all regions but North America in Q4'22 and Mondi and Stora Enso acquire or convert board capacity in Europe

EBITDA margin by region, Y-o-Y

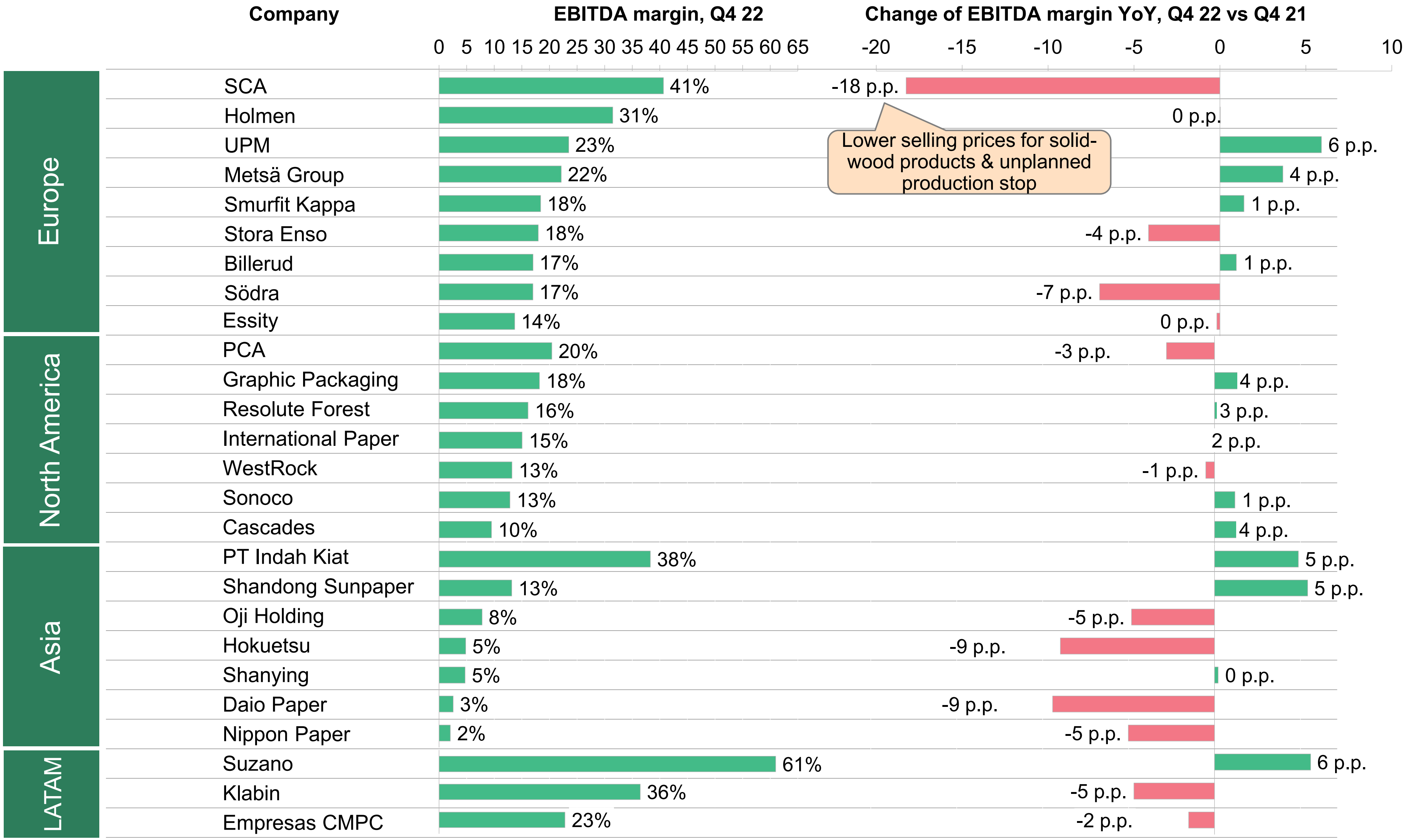


Recent Industry News

- **Sonoco** announced the acquisition of Skjern Paper for **USD 88 million**, a paperboard manufacturer based in Denmark, to expand its production capacity and convert operations in Europe. Skjern is a high-grade paperboard with an annual production capacity of 75,000 metric tons per year
- **Stora Enso** has completed the divestment of its Nymölla paper production site in Sweden to Sylvamo, a US-based global producer of uncoated paper for **EUR 150 million**
- **Mondi** announced the completion of the acquisition of the Duino paper mill near Trieste (Italy) from the Burgo Group for **EUR 40 million**. It plans to invest **EUR 200 million** to convert the mill's paper machine from the production of lightweight coated mechanical paper to recycled containerboard (420,000 tons per year)
- **Stora Enso** completes the acquisition of the Netherland-based company De Jong Packaging Group for **EUR 1,020 million**. With the acquisition, Stora Enso will increase its corrugated packaging capacity by approximately 1,200 million m² to more than 2,000 million m²

Note: For companies whose Q4'22 financials have not been disclosed, Q3'22 financials are used instead in the analysis
Source: S&P Capital IQ, RISI, Interim & Annual Reports, Applied Value Analysis.

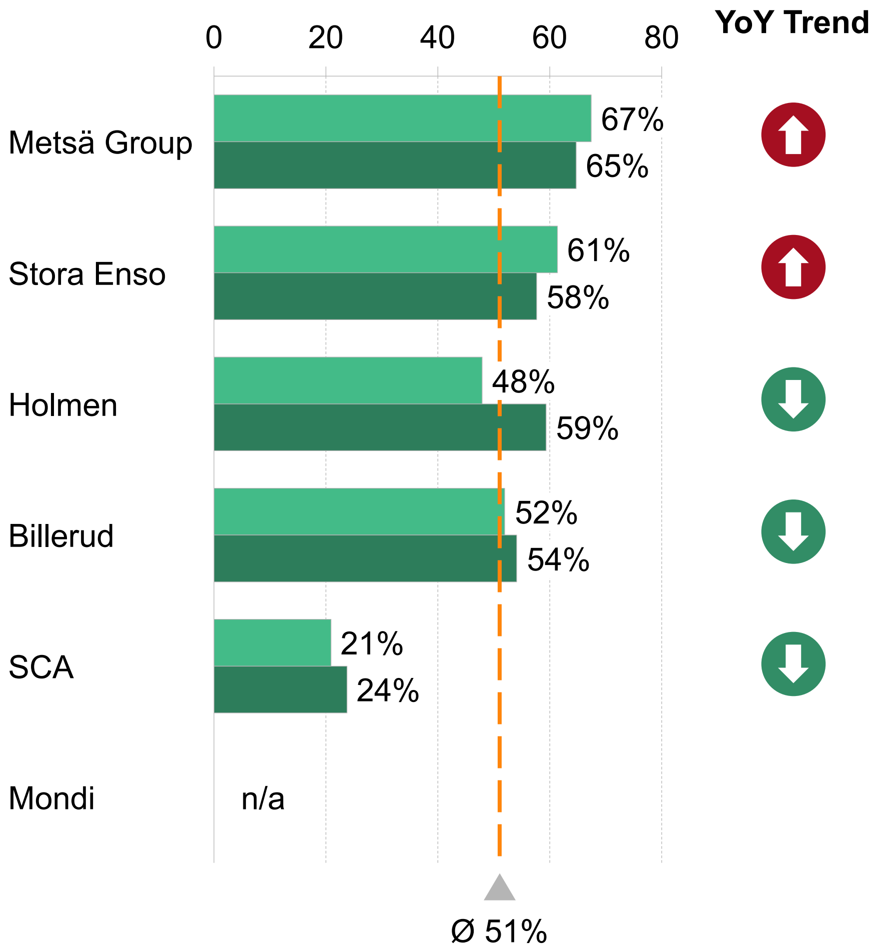
North American companies showed the most stable margin growth in Q4’22, compared to the same period previous year



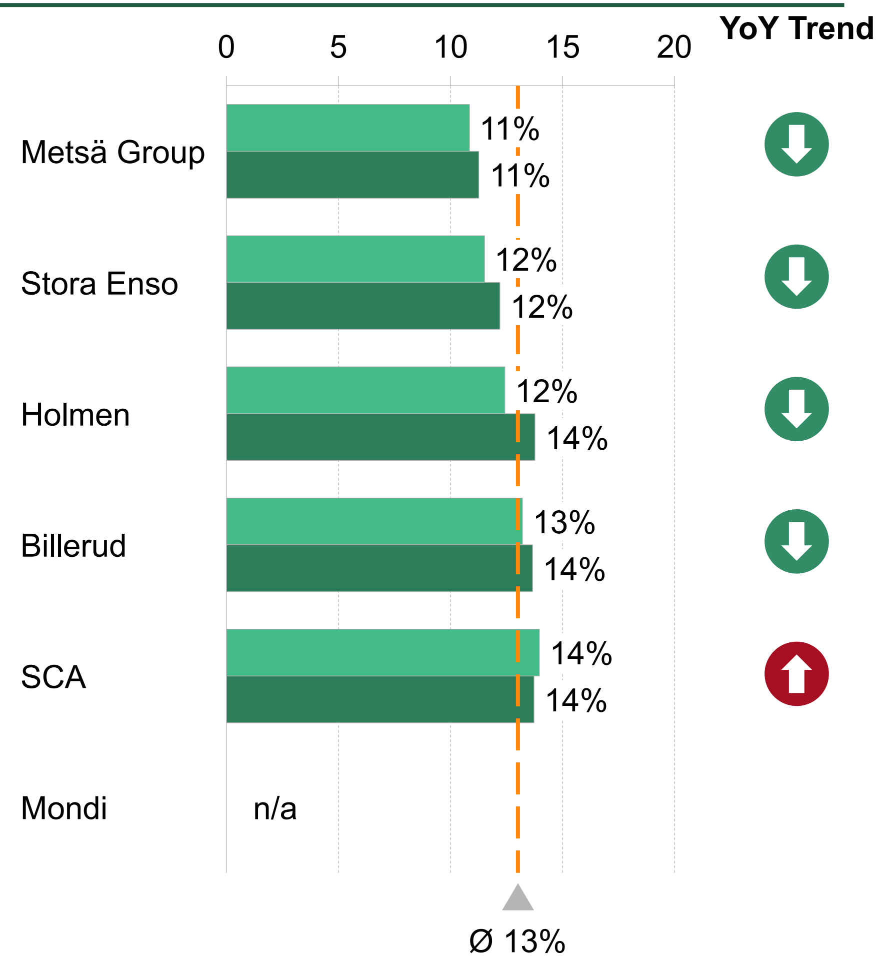
Note: For companies whose Q4’22 financials have not been disclosed, Q3’22 financials are used instead in the analysis
Source: Interim & Annual Reports, S&P Capital IQ, Applied Value analysis.

Favorable cost to sales ratios for most European companies, mainly driven by higher revenues in Q4'22 compared to previous year

Raw material over Sales
Q4'22 vs Q4'21, %



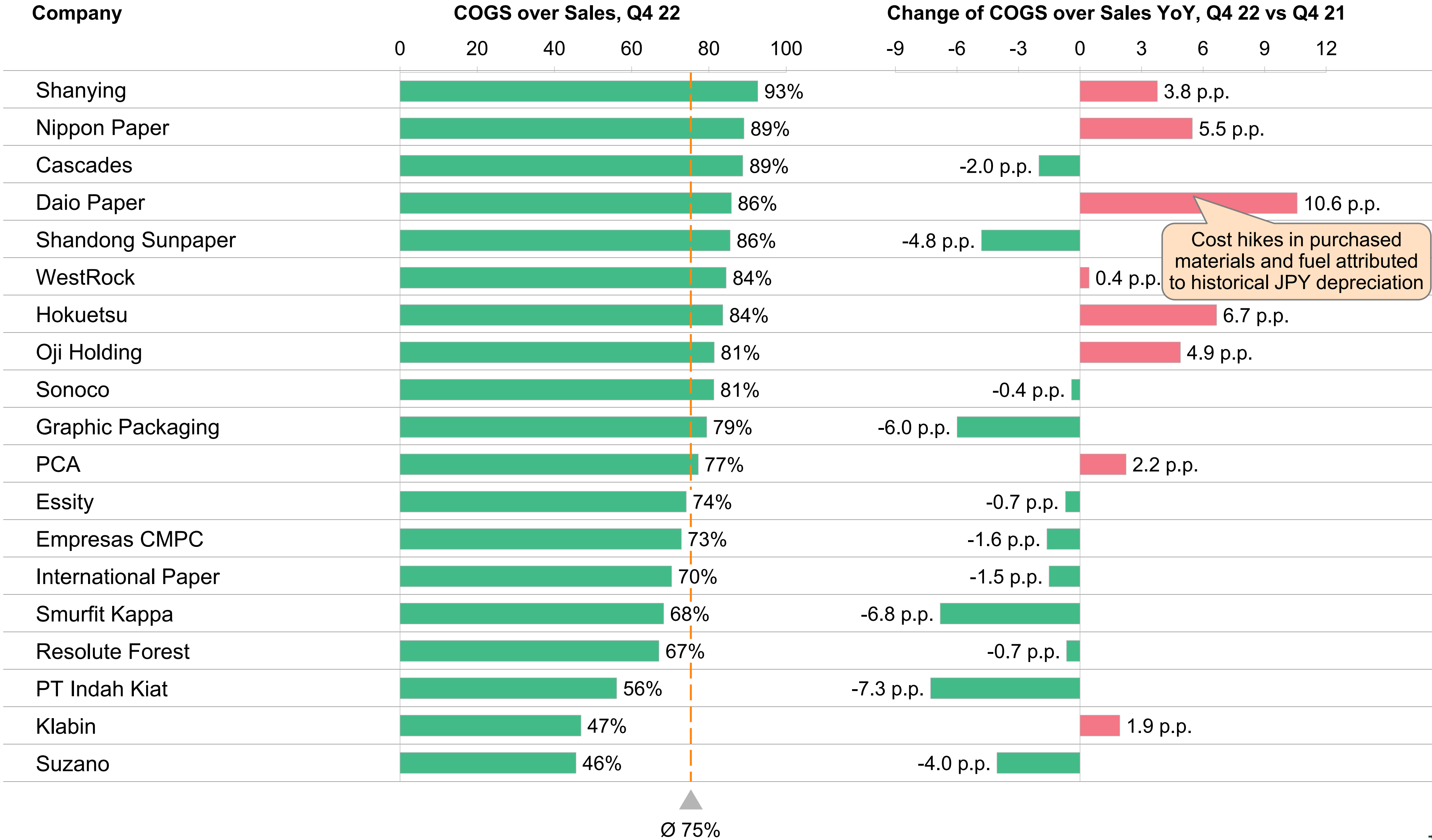
Personnel costs over Sales
Q4'22 vs Q4'21 %



Q4 2022 Q4 2021

Note: For companies whose Q4'22 financials have not been disclosed, Q3'22 financials are used instead in the analysis
Source: S&P Capital IQ, Interim & Annual Reports, Applied Value Analysis.

Cost headwinds continue to uplift COGS over sales, most companies primarily operating in paper products segment are negatively impacted



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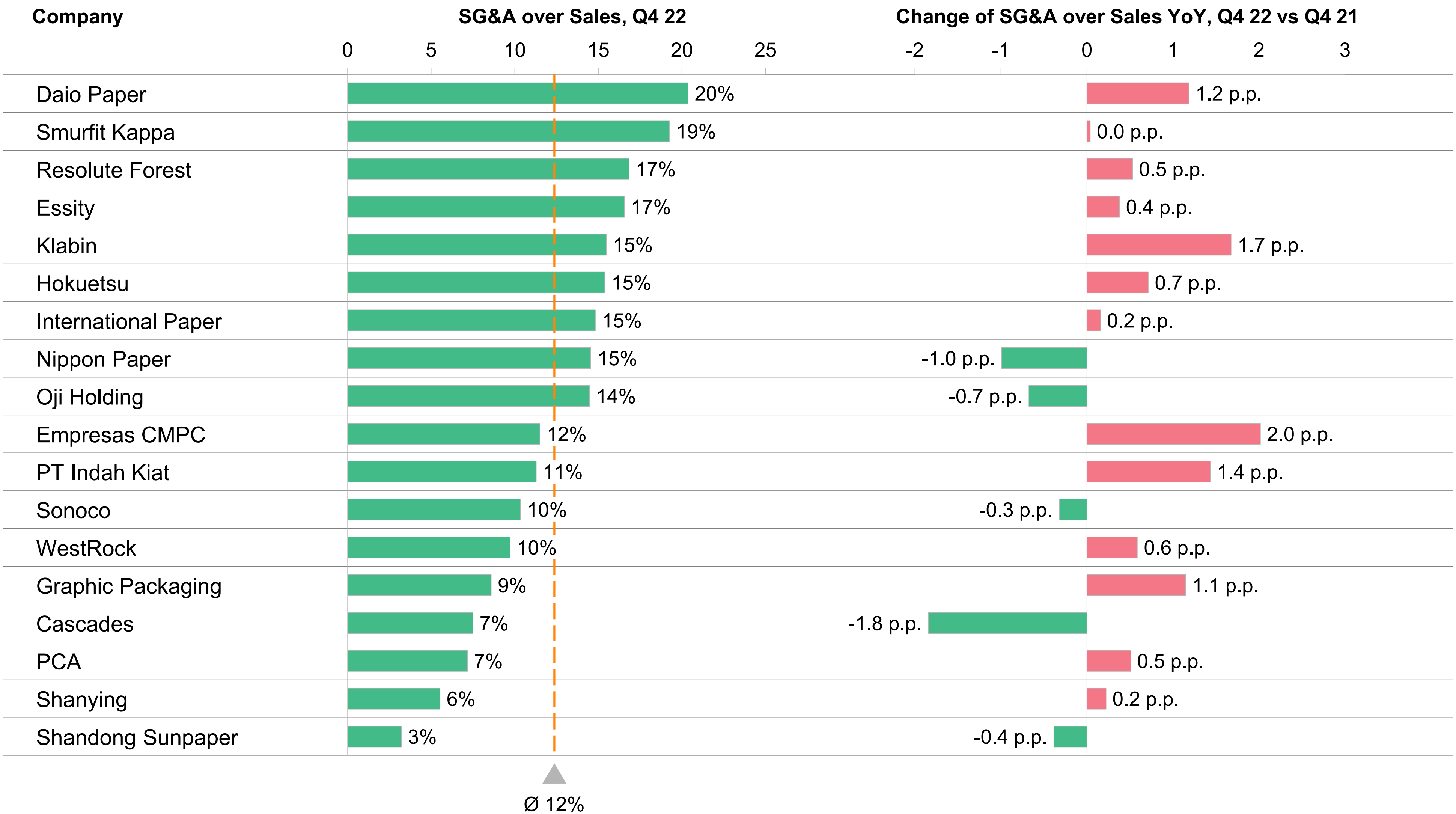
Most companies saw a negative SG&A over sales ratio in Q4’22



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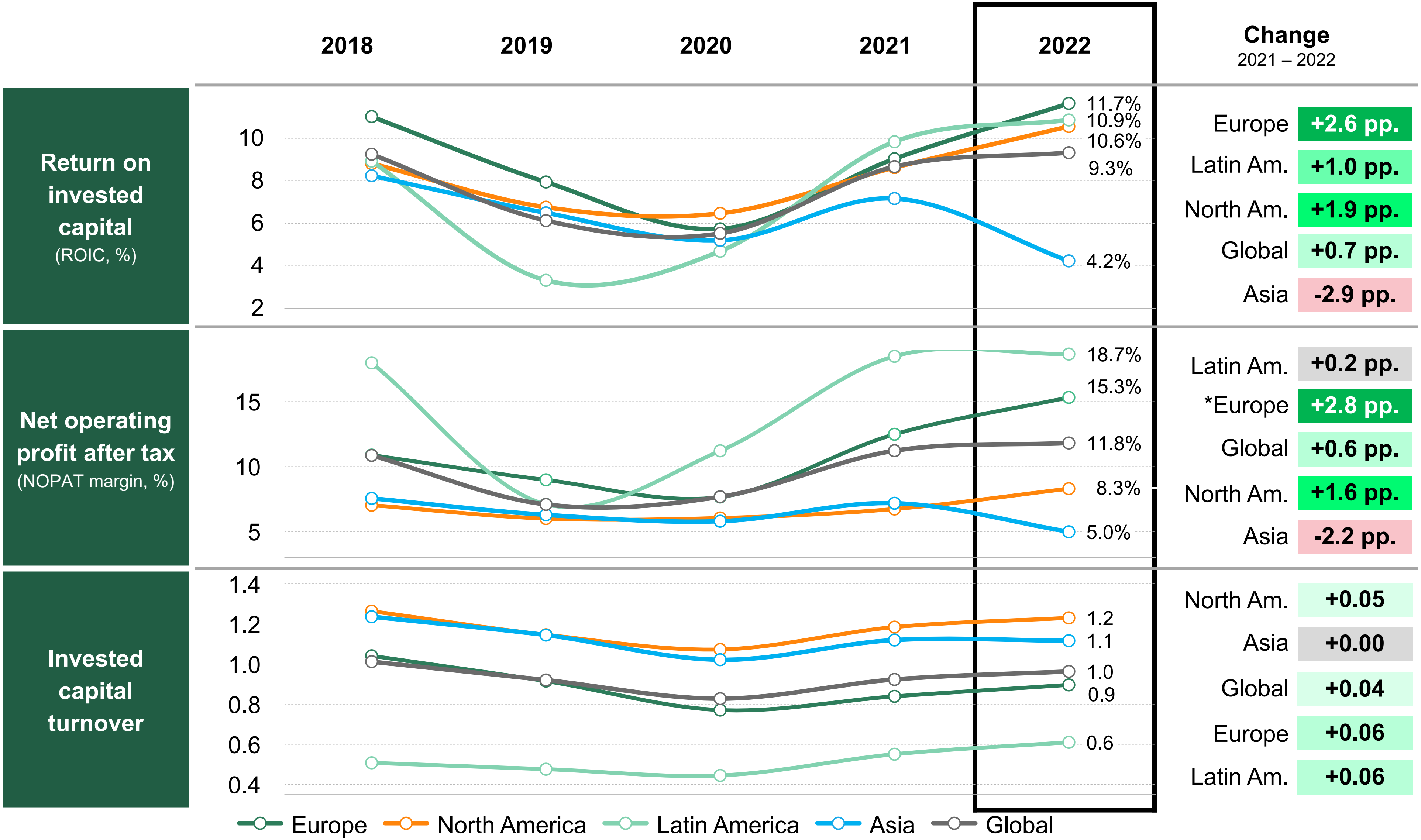
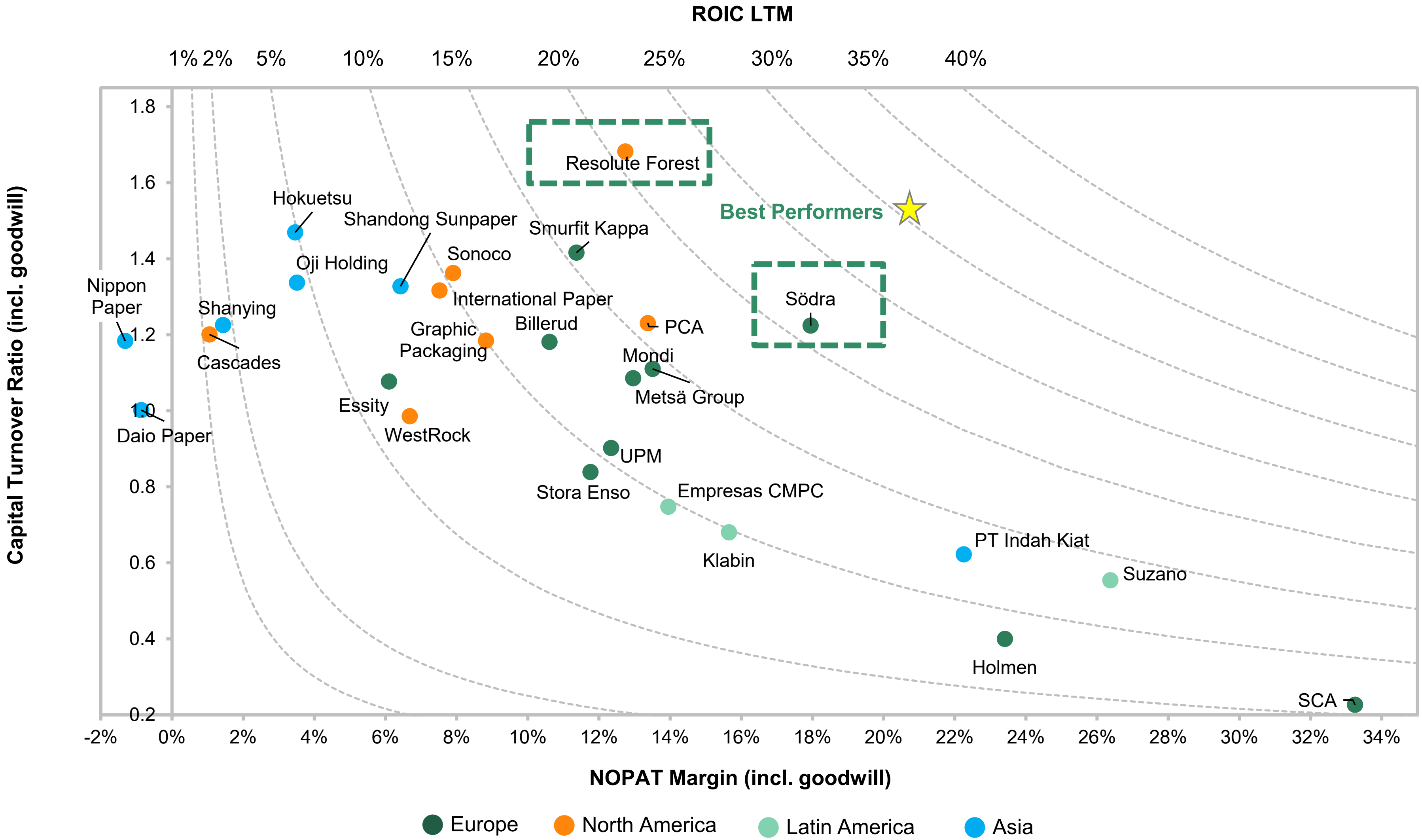
All regions but Asia have experienced a Y-o-Y ROIC improvement, with European companies seeing the largest increase of 2.6 p.p.



Note: Benchmarked European companies enhanced NOPAT margin on full year operating results with inferior performance in Q4'22
Source: S&P Capital IQ, Interim & Annual Reports, Applied Value Analysis.

ROIC performances varied between -1.5% and 21.1% over the last 12 months with Södra and Resolute Forest being the best performers



Notes: ROIC = Return on Invested Capital (actual return that the company has generated after tax).
Source: S&P Capital IQ, Interim & Annual Reports, Applied Value Analysis.

Applied Value Pulp & Paper Report

Weak demand and inflationary pressure amid widespread pessimistic outlooks are expected to challenge the coming 2023

Market Trends: Highlights in Q4 2022

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Industry News	› 2022 has been characterized by the energy crisis in Europe and the war in Ukraine, while the world's central banks struggled with high inflation driven by shortages of raw materials. This has resulted in a tumultuous and uncertain market, with fluctuations in both pricing and supply. While some improvement is anticipated with the stabilizing of resource availability, improvement in logistics in both Europe and NA as well as the lifting of the COVID-zero policy in China, weaker demand and inflationary pressure amid widespread pessimism about the macroeconomic outlooks are expected to further challenge the industry in the coming 2023 › Pulp capacity is expected to grow in 2023 after limited gains in 2019-2021. It is expected that capacity will expand by 415 thousand metric tons in 2023, with most of the new capacity expected to be in LATAM › As the war in Ukraine grinds on, energy crisis is lingering on with European tissue producers suffering from the turmoiled natural gas supply and pricing. It is estimated that up to 30% of natural gas previously imported from Russia could not be replaced in 2023
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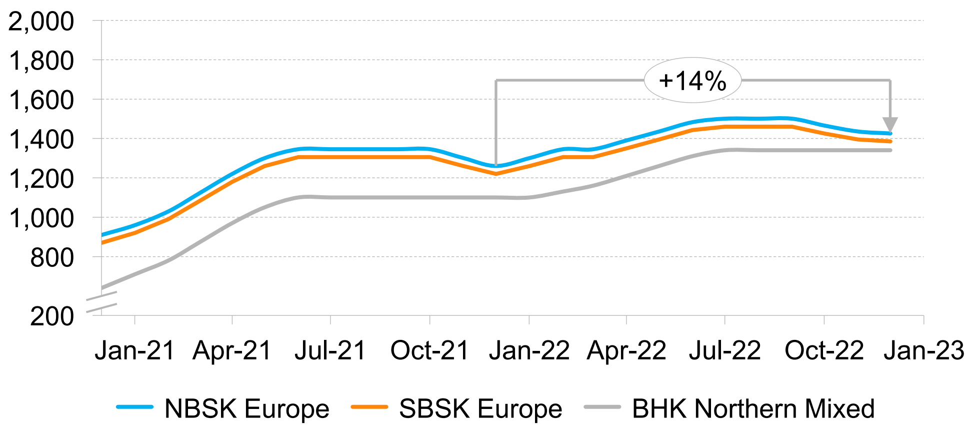
Source: RISI, Interim & Annual Reports.

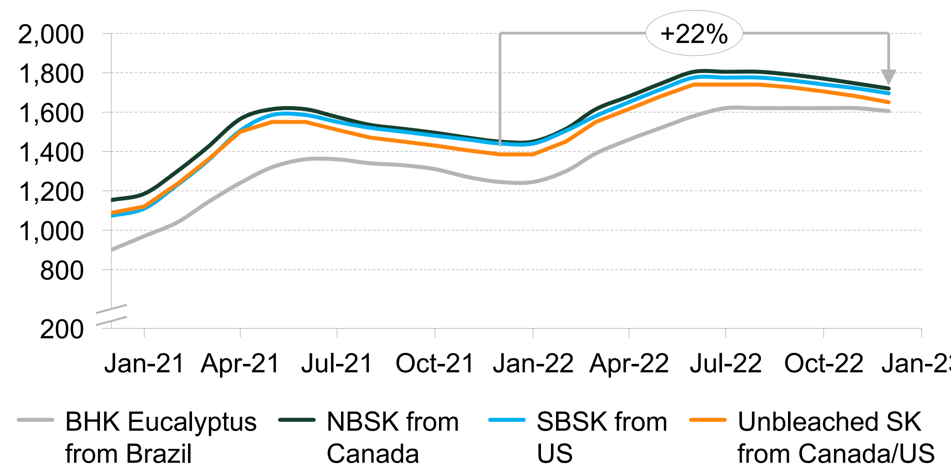
Pulp prices have increased in Europe and US with Y-o-Y growth rates of 14% and 22%, albeit downward trend was observed in Q4 due to soft demand

Global Pulp Price Development, Last 24 Months

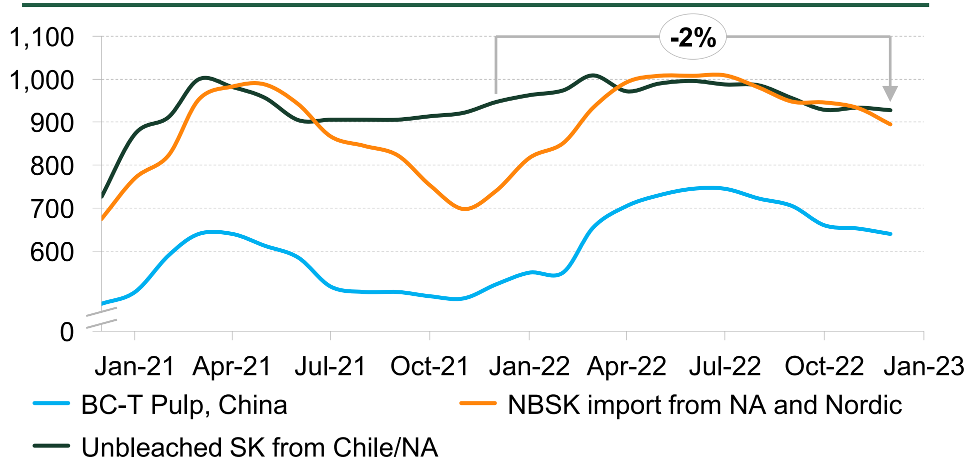
Northern Europe, USD/Tonne



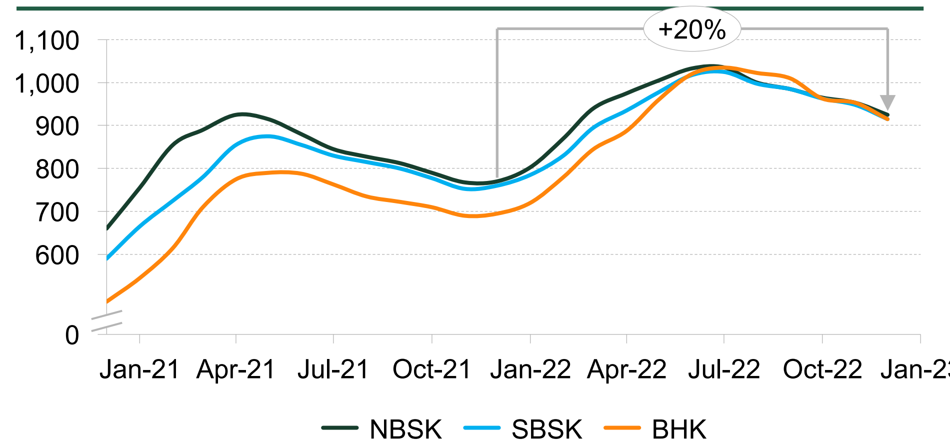
US East, USD/Tonne



Asia, USD/Tonne



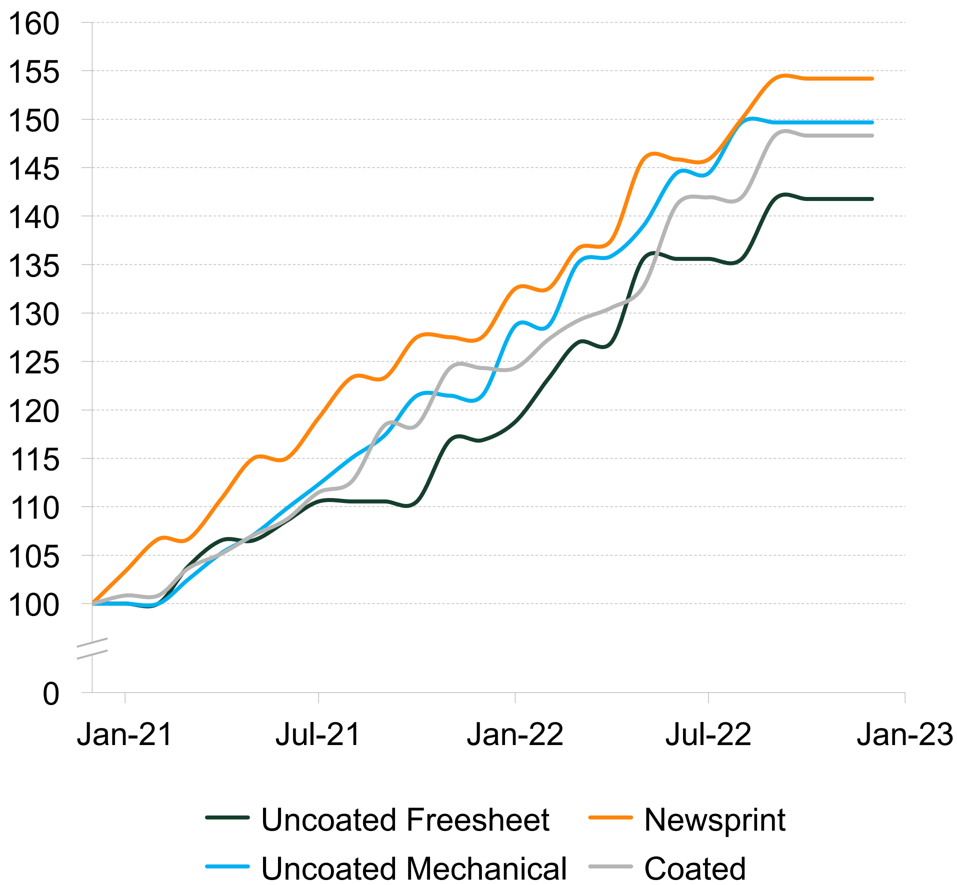
US East spot prices, USD/Tonne



Note: Midpoint price levels.
Source: RISI PPI Pulp & Paper Week.

Packaging paper prices dropped in Q4'22 from high levels, while graphic paper prices reached a plateau after significant increase since Q1'21

Graphic paper prices
Avg. indexed price per product segment, (index Dec'21 =100)



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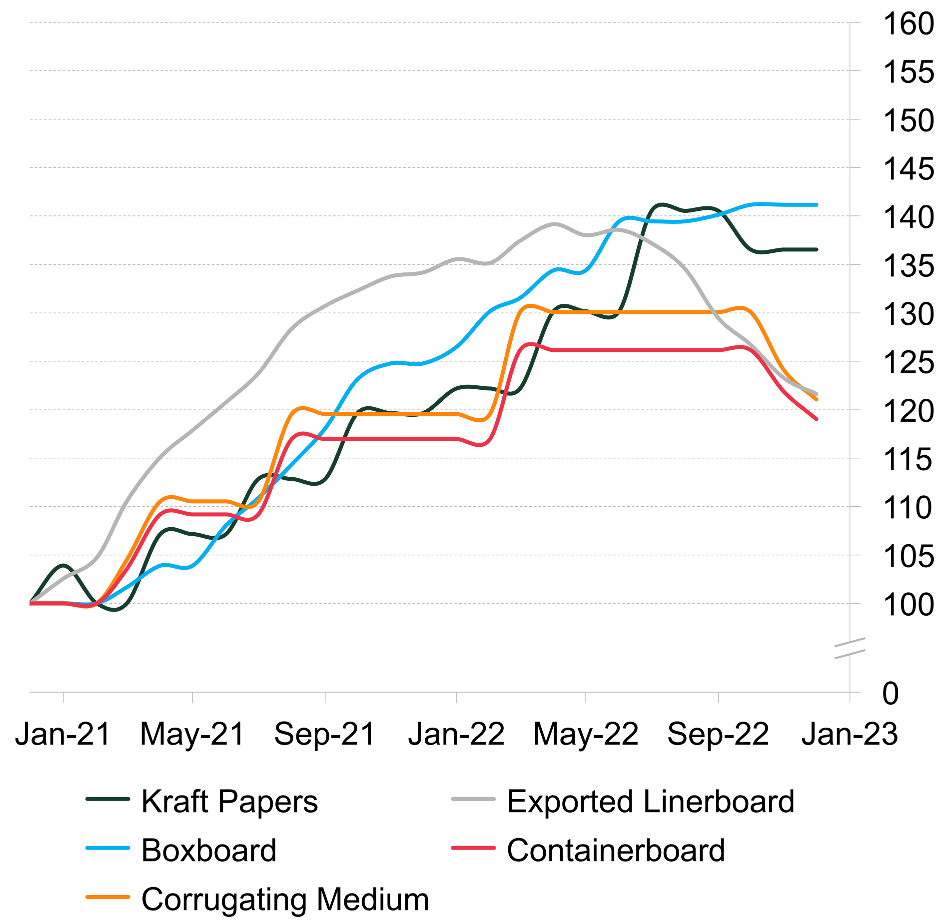
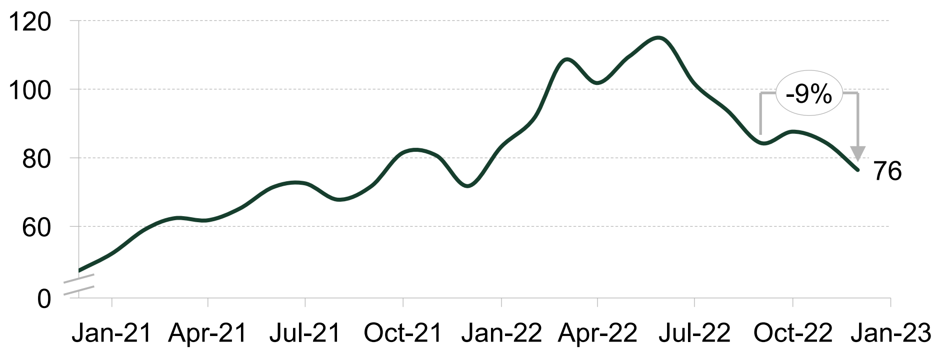


Note: Midpoint price levels.
Source: RISI PPI Pulp & Paper Week.

Electricity prices in Northern Europe soared in Q4’ 22 and most currencies appreciated against the USD in Q4’22 after a period of depreciation

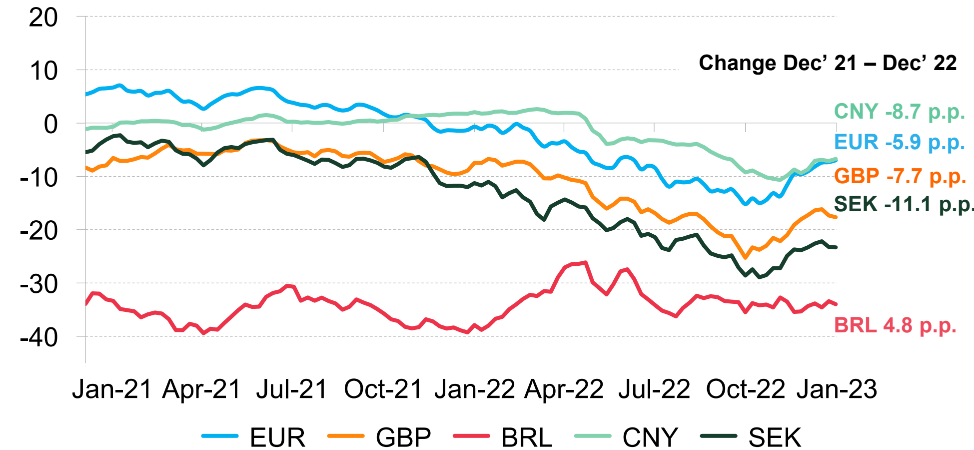
Commodity & Currency Price Development, Last 24 months

WTI Spot Crude Oil, USD/Barrel



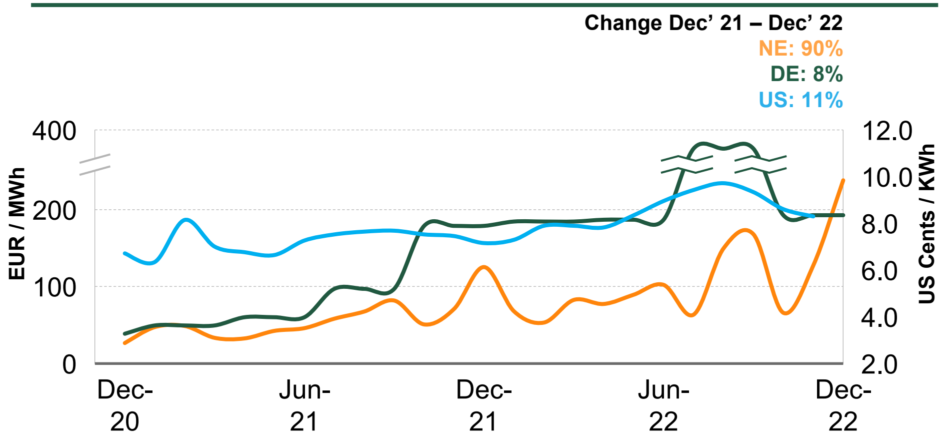
Source: US Energy Information Administration.

Currency appreciation against USD, %



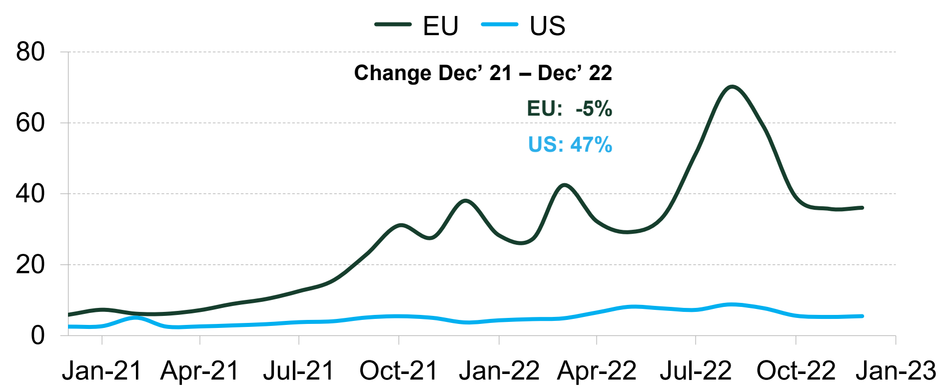
Source: S&P Capital IQ.

Electricity



Source: US Energy Information Administration (Industry retail price), Nordpool, EEX (EGIX Germany).

Natural Gas, USD/mmbtu



Source: NYMEX (Natural Gas spot price at the Henry Hub terminal in Louisiana), World Bank (EU average import border price).

Applied Value Pulp & Paper Report

Applied Value is a management consulting & investment firm founded on the principles of lean growth and entrepreneurship

1997 Background as an internal consultancy and change agent within the Swedish ***Stenbeck Group…***

KINNEVIK

Today …today, a hands-on consultancy supporting clients **across industries**

Industries of Expertise

- Chemicals and Process
- Industrial & Engineering
- Telecom and Media
- Consumer Goods
- Automotive

Applied Value Group

Investments

Management Consulting

Social Impact

Selected portfolio companies

HUMAN CARE
COSMOSID
Division 5 Inc STEEL FABRICATION
rivermeadow
Bake My Day
KAUNIS IRON
PNP STÅLHALLAR
SOURCING VALUE
SODERFORS STEEL

APPLIED VALUE

C10
HAND IN HAND
Straight Ahead MINISTRIES
World Vision
The Wenham House
OPPORTUNITY International
CODE FOR LIFE What's Your Code?
KRIS

ROI driven

Fact-based

Practical over theoretical

Hands-On

Global perspectives

Applied Value challenges and supports global clients across industries from six offices

Selected clients

GM, PEPSICO, ERICSSON
SCA, Facebook, Epiroc
Whirlpool, BILLERUD, VERSO
SONY, BMW, AHLSTROM MUNKSJÖ
telenor, B/S/H/, UPS
Vestas, FCA FIAT CHRYSLER AUTOMOBILES, WestRock

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Our Lean Growth framework is based on Focus, Simplicity, Speed – guiding principles to raise client performance

Lean Growth

Focus
- ✓ Define strategic focus
- ✓ Excel in key capabilities
- ✓ Use partners for non-core activities

Simplicity
- ✓ Reduce complexity
- ✓ Simplify and standardize processes, organization and supply chain

Speed
- ✓ Set targets
- ✓ Measure and improve
- ✓ Reduce Market-Customer-Cash Time

Example Offerings

- **Strategy & Organization -** Go-to-Market Strategy, G&A Productivity, Capital Management, Digitalization & IT
- **Commercial Excellence & Pricing -** True Profitability, Portfolio Optimization, Sales Efficiency, Pricing Model, Governance
- **Sourcing & Procurement -** Sourcing Strategy, Negotiations, Risk Management, SRM, Competence Development
- **Supply Chain & Operations -** Supply Chain Strategy, Inventory Management, Operational Excellence
- **Product & Innovation -** Portfolio Profitability, VA/VE, R&D Strategy & Efficiency, Product Lifecycle Management
- **Mergers & Acquisitions -** Commercial Due Diligence, Operational Due Diligence, Post-Merger Integration

Applied Value has extensive experience in the Pulp & Paper industry and has helped several businesses achieve tangible results

Example of client engagements

Area	Results
Turnaround	› EBIT improved from **4% to 20%** over a 4-year period for an Integrated Pulp & Paper company › Capital Turnover Ratio was improved from 0.55 to 0.9
Commercial Excellence	› **Market disruptive value prop**, charging for service and complexity, developed and implemented › Potential of **350 SEK/ton** identified (excluding organizational streamlining enabled by the concept)
Sales Efficiency & Effectiveness	› Potential **SG&A reduction of 15%** identified for a global Pulp & Paper company › Service level differentiation and customer categorization were enablers
True Profitability	› True profitability findings enabled **EBIT improvement of 5 ppt** for a leading Paper division › Actions included portfolio rationalization, new pricing model and customer segmentation
Pricing Excellence	› A **fact-based pricing tool** was developed for a leading Packaging company › True costs and customer value were considered in the market disruptive pricing concept
Production Efficiency	› **Sheeting capacity increased by 15%** over a 3-month period › Key actions were related to engagement and discipline, planning and material flows
Supply Chain Optimization	› Variable cost reduction of **500 SEK / ton** achieved by supply chain optimization › Addressing sub-optimizations and optimizing the production cycle were key initiatives
Working Capital Efficiency	› Potential **gross margin improvement of ~5%** for a Global Wood Supply company › Inventory reduction potential of 40% identified and concrete action plan handed over

Our Pulp & Paper practice has been serving world leading organizations since our founding

Overview of Applied Value's Pulp & Paper Experience

Applied Value has continuously advised global market leaders in the Pulp & Paper industry:

- Key advisor to top executives during several successful turnarounds using our lean growth framework
- Improving business performance of Pulp & Paper and Chemicals companies, as well as equipment & services providers

We have conducted 50+ engagements improving Cost & Capital efficiency and Revenue Growth for our Pulp & Paper clients:

- EBIT improvement program from 4% to 20% over a 4-year period for an Integrated Pulp & Paper Company
- Sourcing Improvement Program covering Services / Chemicals / Logistics / MRO for a Global Packaging Company
- External Distribution System Optimization for European Manufacturer of Liquid Paperboard and Sack Paper
- Product Strategy for an Integrated Pulp & Paper Company
- Operations Improvement Program to improve Unit Output and Labor Efficiency for an Integrated Pulp & Paper Company
- SG&A efficiency for an Integrated Pulp & Paper Company

We are known for **driving change** and **creating immediate impact** for our clients

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APPLIED VALUE GROUP