

## Clear vision: the architectural glass market takes the path to sustainability

SPOT ON | GLASS PROCESSING & FINISHING | JUNE 2023

### FLAT GLASS MARKET OUTLOOK

Since 2020, the glass industry has encountered significant challenges: the global COVID-19 pandemic, followed by the Russian invasion of Ukraine and the subsequent rise in inflation. The geopolitical tussle created turbulence in the global economy's recovery from the pandemic and gave rise to economic sanctions, triggered a rise in commodity prices, and brought about disruptions in supply chains. This situation, in turn, catalyzed inflationary trends across a plethora of markets worldwide. However, the early months of 2023 have brought signs of market stabilization and a return to normalcy.

In 2022, the glass industry faced a major setback as Russian gas supplies were cut by over 80%. This had significant repercussions for the industry as the wholesale price of natural gas in Europe soared 25-fold compared to early 2020. Additionally, the cost of soda ash, a vital component in glass manufacturing, doubled in late 2021 in comparison to its price at the beginning of 2020.

However, natural gas prices have now begun a downward trajectory, dropping below pre-war levels. Factors such as warmer weather and alternative gas sources are the primary drivers of this fall. Concurrently, soda ash prices have decreased by over 30% from their peak, allowing European float glass manufacturers to reduce their prices. Despite this, we anticipate a rise in natural gas prices with the approach of winter, which is not expected to be as warm in 2023 compared to last year. While this will certainly put pressure on glass manufacturers to increase their prices, we expect the effect to be less pronounced than in the second half of 2022.

The prices of glass in the USA and Europe generally follow a similar trend; however, the extent of price increases has been notably lower in the USA. This can be attributed to the direct correlation between the extent of natural gas price increases and corresponding glass price increases.

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“The next few years will be pivotal as the glass industry navigates through this transitional phase, taking full advantage of technological breakthroughs, collaborations and the dedication to sustainability demonstrated by key players. As such, the future of flat glass manufacturing seems increasingly inclined towards achieving both environmental responsibility and operational efficiency.”

**VALĒRIJA LIEĢE**

GLASS PROCESSING & FINISHING  
SPECIALIST, OAKLINS



While the trends in natural gas prices show similar timing in both Europe and the USA, the degree of these fluctuations is significantly more pronounced in Europe, resulting in more noticeable fluctuations in glass prices compared to the relatively more stable pricing observed in the USA. In contrast, the price of glass in China has followed a different trend: a relatively steeper increase during the COVID-19 pandemic, followed by a decline after the Russian invasion of Ukraine. This price reduction can be attributed to China's significantly lower energy costs compared to Europe and the USA.

Oaklins partner Valērija Lieģe expects the situation in the global glass market to stabilize in the coming months, a sentiment shared by Oaklins' glass clients. Although the short-term outlook for the global construction industry is shrouded in uncertainty and fears of an economic downturn due to soaring energy prices and high interest rates, there are strong positive indicators signaling steady growth in the demand for flat glass in both 2023 and 2024. This market recovery is also expected to reignite activity in the M&A markets, which have seen a slowdown since the fourth quarter of 2022.

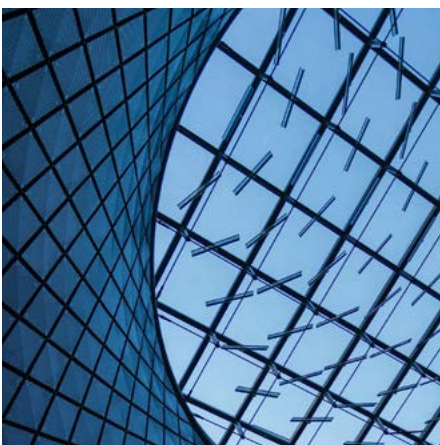
**The rising urban population around the world is set to drive demand for new residential and commercial buildings.**

The most recent UN World Urbanization Prospects report predicts that by 2050 about 68% of the global population will reside in cities<sup>1</sup>. This urbanization trend presents significant opportunities, particularly in Asian nations like Indonesia, Vietnam and the Philippines. The World Bank estimates that South Asia's urban population will increase by 250 million by 2030<sup>2</sup>. This swift urban growth is also expected to bolster the demand for infrastructure, thereby stimulating the non-residential construction market in the forecast period.

In addition, the ongoing development of smart cities and the support of favorable government initiatives will help boost demand for construction glass. This surge can be attributed to the rising number of buildings being constructed that adhere to energy-efficiency and sustainability standards, creating a need for construction materials that meet these requirements.

In particular, the demand for low-emissivity (low-e) glass and electrochromic glass is witnessing a notable increase, as these innovative glass types contribute significantly to energy-efficient buildings and the incorporation of smart technologies. In light of these trends, the global construction glass market is projected to experience a steady compound annual growth rate (CAGR) of 7.0% between 2023 and 2033<sup>3</sup>.

The increasing demand for consumer electronics is also projected to contribute to the glass sector's expansion, albeit not as significantly as the construction industry. The ongoing digital revolution coupled with the expanding global middle class, rising disposable incomes and declining prices for electronics collectively contribute to the growth prospects of the flat glass market. Additionally, the surging number of solar energy installations further fuels the demand for flat glass. According to Bloomberg Intelligence, global solar energy demand is anticipated to witness a 20–30% increase in 2023, following a substantial 40% surge in 2022<sup>4</sup>. While not the sector's primary driving force for growth, these combined factors still highlight the promising potential for the flat glass market.



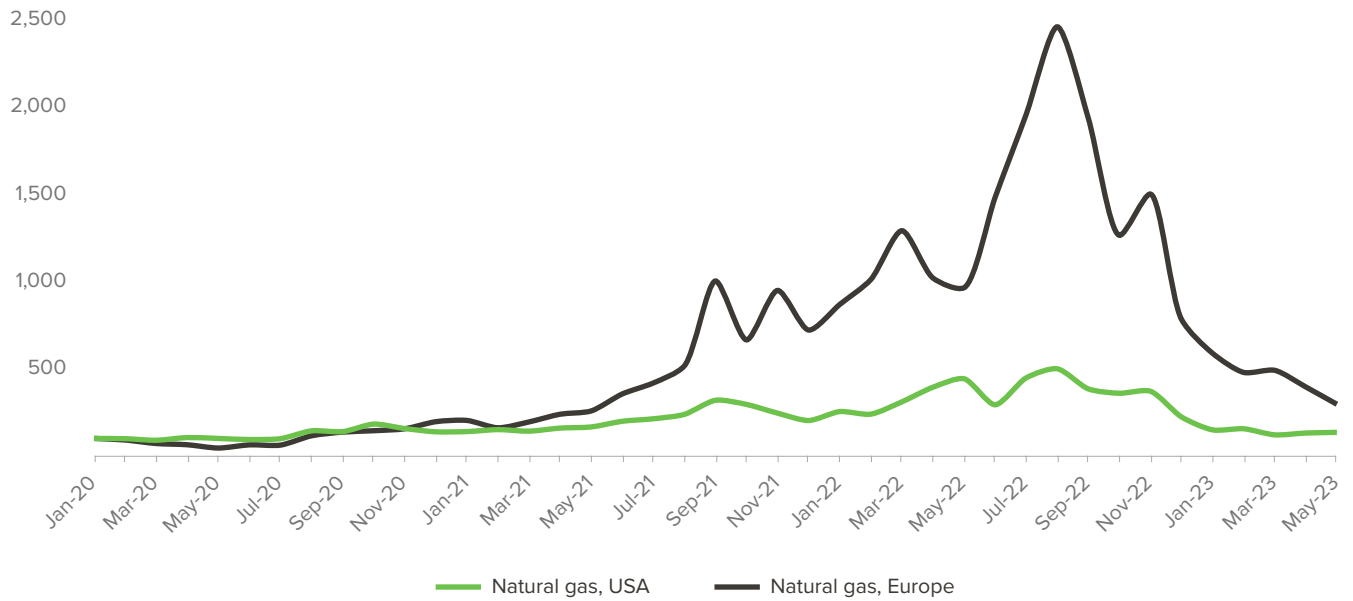
<sup>1</sup> <https://population.un.org/wup/Publications/Files/WUP2018-Highlights.pdf>

<sup>2</sup> Ellis, Peter; Roberts, Mark. 2016. Leveraging Urbanization in South Asia: Managing Spatial Transformation for Prosperity and Livability. © Washington, DC: World Bank. <http://hdl.handle.net/10986/22549> License: CC BY 3.0 IGO.

<sup>3</sup> <https://www.factmr.com/report/construction-glass-market>

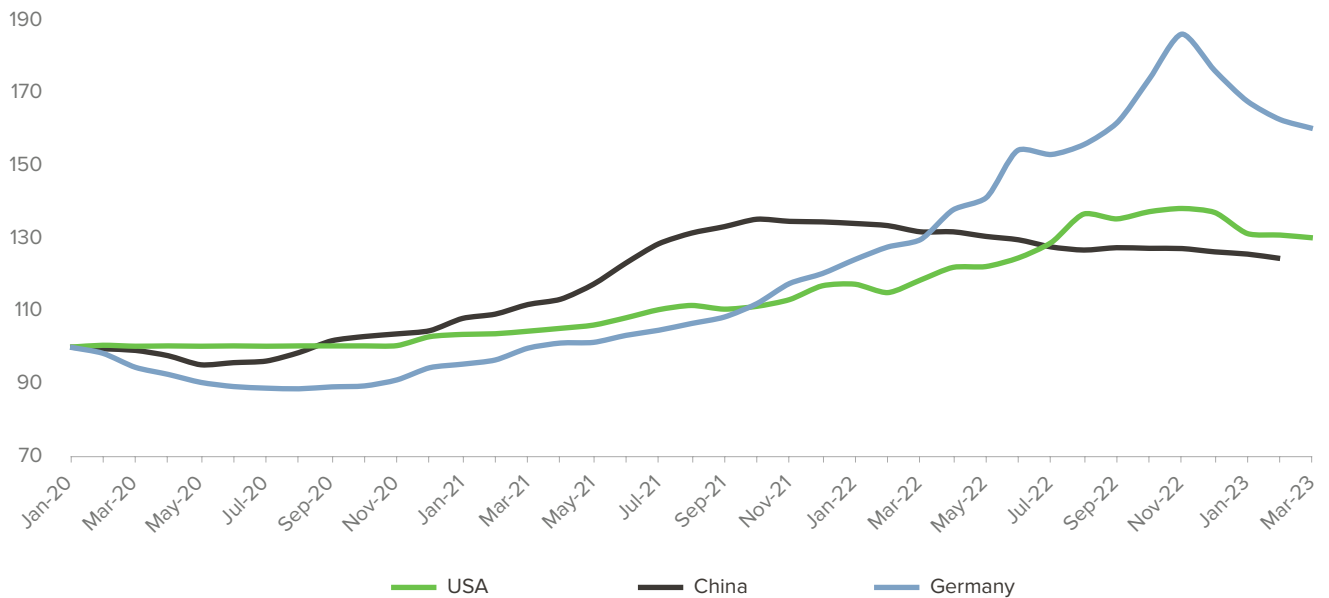
<sup>4</sup> <https://www.bloomberg.com/professional/blog/webinar/2023-outlook-global-solar-energy/>

Natural gas prices in USA & Europe from January 2020 to May 2023 (Indexed)



Source: Trading Economics. Data as of May 2023

Prices of flat glass in USA, China & Germany from January 2020 to March 2023 (Indexed)



Sources: Trading Economics, US Bureau of Labor Statistics, CEIC Data. Data as of March 2023



## DECARBONIZATION OF GLASS INDUSTRY

Driven by a pressing need to prioritize sustainability while simultaneously mitigating their reliance on natural gas, flat glass manufacturers are exploring various ways to significantly reduce their CO<sub>2</sub> emissions. Burning fossil fuels to heat furnaces accounts for 75–80% of CO<sub>2</sub> emissions in the sector<sup>5</sup>, so a transition to a carbon neutral energy source would represent a significant reduction, but it faces challenges in making this move.

Glass for Europe, the EU's flat glass sector trade association, evaluated the feasibility of three renewable power options in a recent report — biogas, hydrogen and electric melting. Biogas, although technically possible, was deemed infeasible due to its limited availability. Hydrogen supply through a modified gas grid was deemed to require further research, particularly given the low level of radiation heat transfer from hydrogen flames. Electric melting, although currently viable for small furnaces, has yet to be established as effective in large furnaces for float glass production.

Despite these hurdles, manufacturers continue to achieve technical milestones in reducing the CO<sub>2</sub> footprint of flat glass production.

A trial conducted by NSG Group demonstrated a seamless transition from natural gas, its current main fuel, to hydrogen, resulting in substantial carbon emission reductions. “The trial proved that hydrogen was as capable as natural gas in achieving excellent melting performance, and that it could be possible to operate the furnace with vastly reduced carbon emissions. It is a key step in the group’s plans to decarbonize,” the company reported. For the longer term, a stable supply of hydrogen made possible through a network of pipelines to key industrial sites could enable a full transition to hydrogen-fueled glassmaking, according to NSG.

Similarly, Saint-Gobain, during R&D trials at its Herzogenrath site in Germany, has proven the technical feasibility of manufacturing flat glass with a significant proportion of hydrogen, which can complement other decarbonized energy sources and reduce the site's direct CO<sub>2</sub> emissions (scope 1) by up to 70%.

In 2023, AGC announced a collaboration with Saint-Gobain to design a pioneering flat glass production line that is expected to drastically reduce direct CO<sub>2</sub> emissions<sup>6</sup>. As part of this R&D project, AGC's patterned glass production line in Brevka, Czechia will be completely transformed into a high-performing, state-of-the-art line, with the aim being to achieve 50% electrification and 50% of operations done using a blend of oxygen and gas. This collaboration marks a significant technical advance from the current technology used in natural gas-fired flat glass furnaces. Davide Cappellino, president of AGC Architectural Glass Europe & Americas, commented: “To contribute to a sustainable world, AGC is committed to developing products that promote sustainable development, and to reducing the environmental impact of its production processes.”

<sup>5</sup> <https://ww3.rics.org/uk/en/modus/natural-environment/renewables/the-75-percent-problem--making-greener-glass.html>

<sup>6</sup> <https://www.agc-glass.eu/en/news/press-release/agc-and-saint-gobain-partner-decarbonization-flat-glass-manufacturing>

## COMMITTING TO SUSTAINABILITY

Saint-Gobain has signed a 10-year renewable electricity supply agreement with TotalEnergies for the purchase of solar power for its 145 industrial sites in North America<sup>7</sup>. Commenting on this agreement, Mark Rayfield, CEO of Saint-Gobain North America, said: “With this agreement, Saint-Gobain North America will dramatically reduce its CO<sub>2</sub> emissions while sending a strong signal to the market that the manufacturing industry is ready to commit to green electricity.” This 200-MW Power Purchase Agreement (PPA) is expected to offset Saint-Gobain’s North American CO<sub>2</sub> emissions from electricity (scope 2) by 210,000 metric tonnes per year, a reduction of around 33%. The agreement is expected to come into force at the end of 2024. This is the second PPA signed in North America by Saint-Gobain; the first one was for

a wind project in Blooming Grove, Illinois. Combined, the two projects are expected to represent a 62% reduction in Saint-Gobain North America’s scope 2 emissions.

Sisecam has recently installed a 6.2-MW solar plant on the roof of its Mersin flat glass factory<sup>8</sup>, making it, at the time of installation, the second largest solar rooftop in both Turkey and Europe. Spanning over 79,300 square meters and featuring panels manufactured in-house, this solar facility has a substantial environmental impact, offsetting approximately 5,600 tonnes of CO<sub>2</sub> emissions each year. As part of their sustainability initiatives, Sisecam plans to invest US\$9.7 million over the next five years, starting with an 87-kWh solar power plant project on the roof of their Science and Technology Center. The project has been submitted to the Turkish Electricity Distribution

Corporation for approval and, once it has the go-ahead, this system will also contribute to domestic energy consumption, showcasing Sisecam’s commitment to a greener and more sustainable future.

Similarly, energy company E.ON and AGC have solidified their partnership by jointly undertaking a waste heat recovery and green power production project at AGC’s float glass plant in Seingbouse, France<sup>9</sup>. The collaborative project includes the installation of an innovative Organic Rankine Cycle (ORC) plant, being able to generate CO<sub>2</sub>-neutral electricity from the recovered waste heat, and a 2.7-MW photovoltaic power plant. This combination will supply AGC with approximately 10 GWh of decarbonized electricity annually from 2023 onwards, offsetting around 595 tonnes of CO<sub>2</sub> each year.




























<sup>7</sup> [https://www.saint-gobain.com/sites/saint-gobain.com/files/media/document/2022\\_10\\_25\\_PPA\\_NorthAm\\_VA.pdf](https://www.saint-gobain.com/sites/saint-gobain.com/files/media/document/2022_10_25_PPA_NorthAm_VA.pdf)

<sup>8</sup> <https://www.dailysabah.com/business/2017/12/26/turkish-glass-producer-sisecam-founds-europes-second-largest-roof-top-solar-power-plant>

<sup>9</sup> <https://www.agc-glass.eu/en/news/press-release/agc-and-eon-deepen-their-partnership-improve-energy-efficiency>

# M&A activity














A selection of recent private transactions in the sector from October 2022 through March 2023

Date	Target	Rationale	Bidder	Type	Country
Mar-23		vandaglas, backed by AEQUITA, a Germany-based investment company, acquired Glassolutions Switzerland from Saint-Gobain. This marks AEQUITA's fourth acquisition from Saint-Gobain and the fourth add-on acquisition to vandaglas since 2019.	 <b>AEQUITA</b>	PE Buy & Build	
Mar-23		The managing director of Keller Glass, Mr. Vogt, completed a management buy-out of Keller Glass via his holding company Lina Romeo Holding.	Lina Romeo Holding (Mr. Vogt)	MBO	
Feb-23		Modular Group Investments (MGI) acquired Oakland Glass, adding significant capacity and capability in insulated double and triple glazed unit production, and providing established routes to market for Oakland Glass through MGI's existing sales channels.		PE	
Jan-23		RIOU Glass, a France-based company engaged in the transformation of flat glass, has acquired Diffuser, a flat glass transformer specialized in technical insulating glazing dedicated to facades. This is the second acquisition by RIOU Glass in two months.		PE Buy & Build	
Jan-23	Vortex Glass	Guardian Glass has acquired Vortex Glass, a Florida-based laminated and insulated glass fabrication business. Vortex products meet the stringent Florida Building Code for hurricane impacts and supplies Florida and Caribbean customers with complete tempered glass packages for residential and commercial construction.		Strategic	
Dec-22		Bergen Bygginredning, a manufacturer offering glass walls, screen walls and system walls in a variety of designs, was acquired by Inredo via its financial sponsor, Credo Partners.	 <b>CREDO PARTNERS</b>	PE Buy & Build	
Dec-22		AGC has decided to transfer its ownership stake in AGC Flat Glass (Dalian), which manufactures and sells glass for architectural, automotive and industrial use, to SYP Group, which has strong sales capabilities and a solid business base in China.		Strategic	
Dec-22		RIOU Glass has acquired, together with the management team, Euroglas-De Landsheer from Dovesco, a Belgium-based, family-owned investment company. RIOU Glass aims to achieve industrial and commercial synergies by marketing its products in the Benelux, the Euroglas range of tempered glass and fittings in France.		PE Buy & Build	
Oct-22		Truelink Capital has acquired Trulite Glass, one of North America's largest architectural glass and aluminum fabricators. Trulite fabricates and distributes a full suite of customized tempered, laminated, insulated and decorative glass as well as architectural aluminum.		PE	

Sources: Mergermarket, Pitchbook

# Selected listed players

## Selected flat and specialty glass industry players

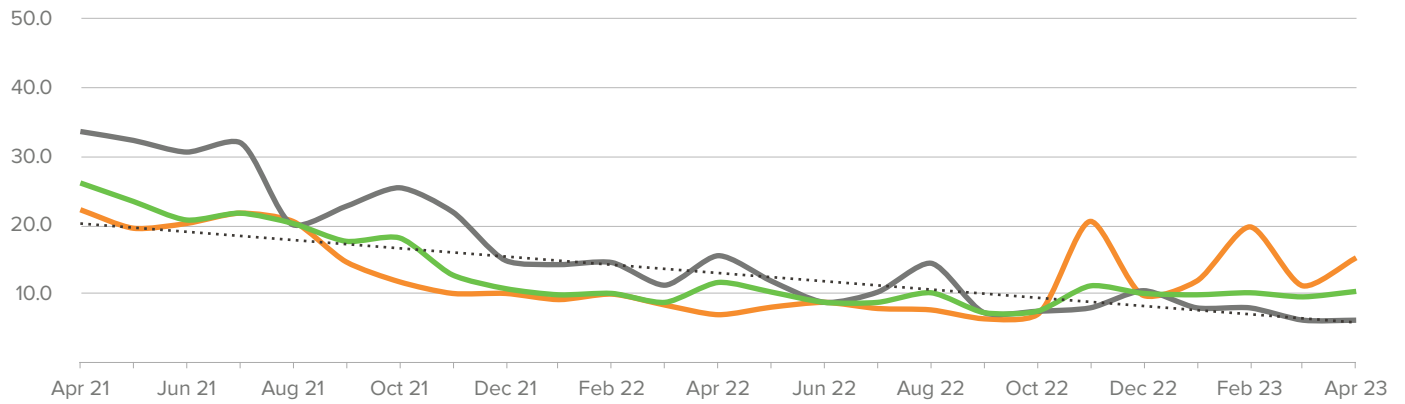
Company	Country	Market cap (US\$m)	Enterprise value (US\$m)	Revenue	EBTIDA	EBITDA margin	EV/Revenue	EV/EBITDA
 SAINT-GOBAIN		27,496	36,171	51,197	6,805	13%	0.82x	6.06x
 福耀集团 FUYAO GROUP		10,864	10,439	3,713	915	25%	3.66x	14.08x
 FCG FLAT GROUP		9,178	10,287	2,067	502	24%	11.50x	36.00x
 AGC		7,637	12,165	14,496	2,568	18%	0.87x	4.94x
 XUYI		5,736	7,107	3,079	905	29%	2.32x	7.90x
 旗滨集团 KIBING		2,950	3,402	1,802	357	20%	1.92x	9.70x
 SG		2,007	2,555	2,005	457	23%	1.29x	5.65x
 TAIWANGGLASS 台玻集團		1,634	2,297	1,339	186	14%	1.73x	12.49x
 金晶集团 G-CRYSTAL JINJING GROUP		1,546	1,810	1,010	135	13%	1.82x	13.61x
 CENTRAL GLASS		839	1,275	663 <sup>£</sup>	170 <sup>£</sup>	26%	0.91x	9.18x
 apogee enterprises, inc.		793	965	1,362	158	12%	0.72x	6.19x
 NSG GROUP		371	3,566	4,597 <sup>£</sup>	422 <sup>£</sup>	9%	0.80x	6.75x
<b>Average</b>						<b>18.80%</b>	<b>2.36x</b>	<b>11.05x</b>
<b>Median</b>						<b>18.76%</b>	<b>1.51x</b>	<b>8.54x</b>

Source: InFront Analytics

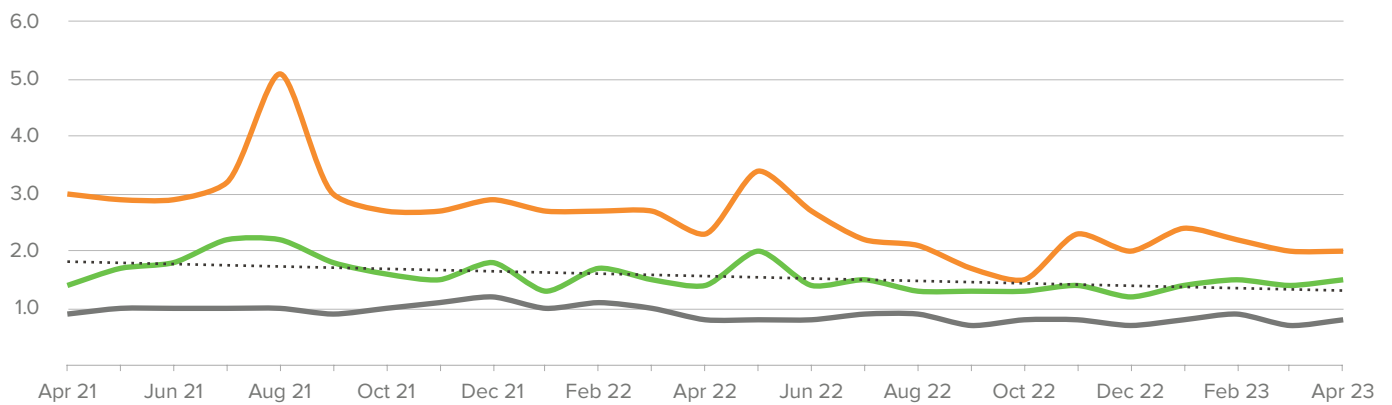
<sup>£</sup> Estimate

# Valuation trends

Price/Earnings (last 24 months)

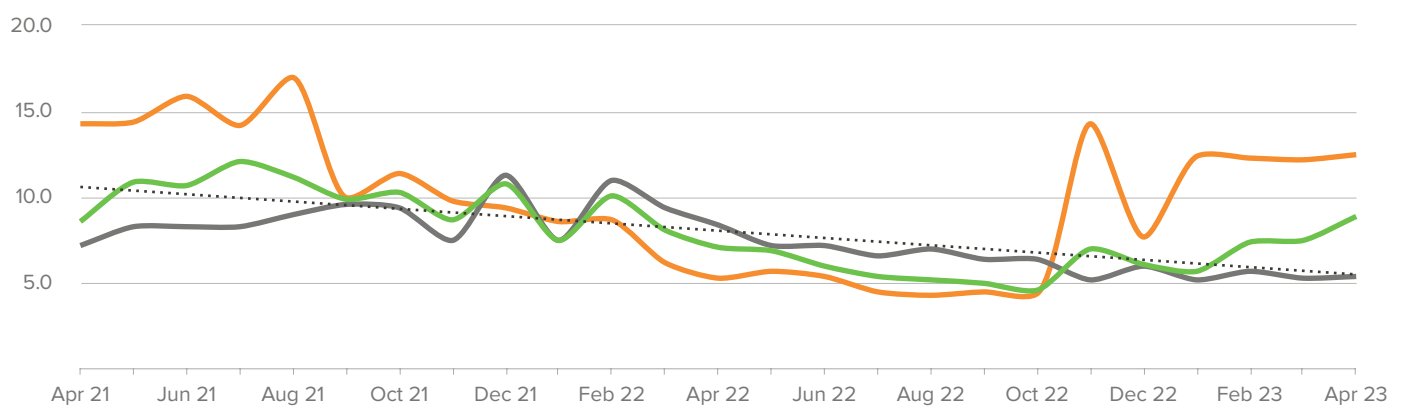


EV/Sales (last 24 months)



— Selected listed peers    
 — Selected listed peers based in China and Taiwan    
 — Selected listed peers outside of China and Taiwan

EV/EBITDA (last 24 months)



— Selected listed peers    
 — Selected listed peers based in China and Taiwan    
 — Selected listed peers outside of China and Taiwan

Source: InFront Analytics  
Valuation data is as of 1 April 2023



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- M&A advisory (buy- and sell-side)
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- Debt advisory
- Corporate finance services

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If mergers, acquisitions or divestitures of businesses or business units are part of your strategy, we would welcome the opportunity to exchange ideas with you.



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Valērija leads Oaklins' glass processing & finishing team, and is a partner at Oaklins Baltics in Riga. As part of her sector focus, Valērija continuously follows developments, attends the major events and maintains regular contact with the key players in the industry. Among other transactions, she recently advised former owner NCH Capital and the management team on a management buy-out of Groglass, the world's leading producer of anti-reflective glass using proprietary vacuum coating technology.

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