

November 2022



In this issue ...

Chemical industry performance per market				
Introduction	Global chemicals – performance at a glance	4		
China	Lockdowns and lower economic growth weigh on the industry	5		
France	Most businesses are able to cope with the difficult market conditions	6		
Germany	Still resilient, but profitability is under threat	7		
Italy	More resilient to market shocks than other industries	8		
Japan	Pressure on profitability to remain limited	9		
The Netherlands	Increasing pressure from overseas competitors	0		
Spain	Concerns about liquidity strain have increased	1		
United Kingdom	Subdued demand, but deterioration of profitability should remain limited1	2		
United States	A sharper focus on de-carbonisation strategies	3		

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On the following pages we indicate the general outlook for each sector featured using these symbols:



Excellent

The credit risk situation in the sector is strong $\/$ business performance in the sector is strong compared to its long-term trend



Poor

The credit risk in the sector is relatively high / business performance in the sector is below its long-term trend



Good

The credit risk situation in the sector is benign / business performance in the sector is above its long-term trend



Bleak

The credit risk in the sector is poor / business performance in the sector is weak compared to its long-term trend



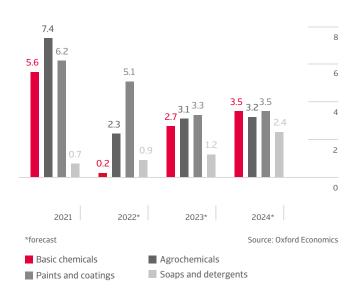
Fair

The credit risk situation in the sector is average \slash business performance in the sector is stable

Global chemicals - performance at a glance

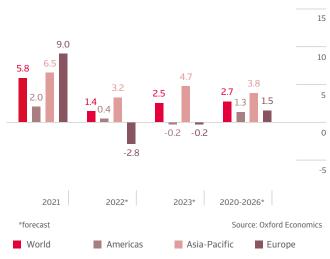
Global chemicals output

y-on-y, % change



Chemicals output per region

y-on-y, % change



Global chemicals

Short-term challenges

- Shortage of gas/gas rationing: The chemical industry is very energy intensive and requires high levels of natural gas as feedstock. There is looming uncertainty about the war in Ukraine and its destabilising effect on energy supply, for Europe in particular. Major gas shortage or gas rationing measures would severely affect European chemical producers.
- Economic downturn in advanced economies:

 Persistent and broadening inflation pressures, and aggressive tightening from central banks in response, are increasingly weighing on the outlook for advanced economies. A persistent recession and ongoing high inflation could lead to sharply deteriorating chemicals demand from both consumers and key buyer industries such as automotive and construction.

Mid-and long-term outlook: opportunities and challenges

- **Regional cost competiveness:** The US shale gas boom has restructured the landscape of the global chemical industry, particularly for basic chemicals. The US chemical industry has a feedstock cost advantage due to low and more stable gas prices, attracting larger investments. Other regions, in particular Europe, are facing a long-term competitive disadvantage.
- Rising middle class in emerging markets: Rapid urbanization and increasing household purchasing power of the middle class in emerging markets should boost demand for soaps and detergents products.
- Energy transition and sustainability concerns: This will create challenges and opportunities for chemical business as companies face tighter regulatory directives and changing customer preferences. There is growing demand for 'green' and ethical products. This includes consumers asking where ingredients come from and assessing environmental impacts. Companies are facing major investments in decarbonisation and optimisation of their carbon footprint. Pressure from various stakeholder groups is increasing, and ESG performance is expected to be benchmarked as highly as cost and other productivity metrics.

China

Lockdowns and lower economic growth weigh on the industry



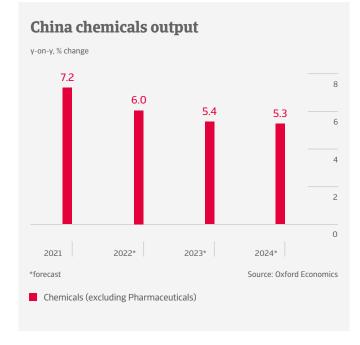
Chinese chemicals output decreased in Q2 of 2022, due to lockdowns in Shanghai and several other cities/regions which are major hubs for chemicals production. Many producers had to temporarily cease operations and faced supply chain disruptions. The lockdowns also negatively affected chemicals demand from households and key buyer industries like automotive.

Since Q3 of 2022 chemical production and sales have rebounded, as lockdowns have been eased and the economy recovered. However, demand remains subdued due to the looming downside risk of renewed Covid-related restrictions.

Overall margins of chemical businesses decreased in Q1-Q3 of 2022, due to increased energy and raw material costs. We expect no substantial improvement of profit margins in 2023. The lockdowns and supply chain disruptions in H1 of 2022 triggered liquidity issues for many businesses, and we observed an increase in payment delays and non-payments. We expect non-payment and insolvencies will increase by 5%-10% in the coming 12 months. This is because economic growth is forecast to slow from 8.1% in 2021 to 3.2% in 2022 and 4.9% in 2023 while the global demand for chemicals remains subdued. Covid-related restrictions continue to affect economic activity, although authorities have fine-tuned the zero-Covid policy in order to reduce supply-side disruptions.

Among subsectors, the credit risk is highest for paints and coatings. Businesses in this segment have suffered losses due to high commodity prices and deteriorating demand from the ailing property market. That said, the agrochemical subsector is expanding, with China being a global key producer and export center for agrochemicals. Basic chemicals have shown an upward trend of sales this year but could face weaker demand and oil price volatility in the coming months.

Tighter environmental rules have been introduced since 2015, aimed at upgrading green technology innovation. High emitters have been gradually phased out, and such closures will continue. Given higher environmental standards and related cost increases, small and medium-sized chemical businesses could face problems in the short-term.



Performance forecast along subsectors Basic chemicals Agrochemicals Paints and coatings Coatings Source: Atradius

Fair China chemicals - credit risk assessment **Business conditions** Financing conditions Default assessment Demand situation Non-payments over the Overall indebtedness of low last 12 months (sales) the sector Profit margins: trend Dependence on bank Non-payments over the low over the next 12 months next 12 months finance Insolvencies over the Willingness of banks average to provide credit last 12 months Insolvencies over the next 12 months big increase stable big decrease Source: Atradius

France

15

10

5

0

1.9

2024*

Source: Oxford Economics

-0.3

2023*

Most businesses are able to cope with the difficult market conditions

In 2021, French chemicals production grew by more than 5%. However, since Q2 of 2022 output and sales are facing decreasing demand from key buyer industries, and sharply increased input prices for commodities and energy. Additionally, high freight costs weigh on businesses' financials.

All this puts high pressure on margins and cash flow of businesses. The paints and coating segment suffers from a combination of high energy prices and less demand from automotive, aeronautics and construction. In the agrochemical subsector the significant cost increase of energy and raw materials has resulted in sharply reduced production by some companies. That said, the basic chemicals subsector mainly consists of larger companies with good upstream/downstream integration and remains resilient in the current situation. Many producers active in the soap and detergent segment are able to pass on increased raw material prices to their customers.

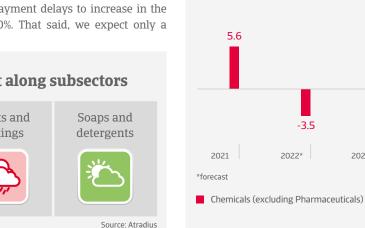
Payments in the industry take about 60 days on average domestically, while payment duration could be longer in export markets. Payment behavior has been good during the past two years, with a historically low number of payment delays. However, as very high energy costs negatively affect businesses' margins and cash situation, we expect payment delays to increase in the coming 12 months by about 30%. That said, we expect only a

slight increase in insolvencies of about 1%. Many companies in the chemicals sector are larger financially strong players, able cope with the difficult market environment. Therefore, we still assess the credit risk situation of the French chemicals sector as "Fair". Additionally, the French government continues to support companies affected by high energy prices. Currently a proposal to double aid for energy-intensive businesses is under discussion. The government could also act as a guarantor for energy contracts.

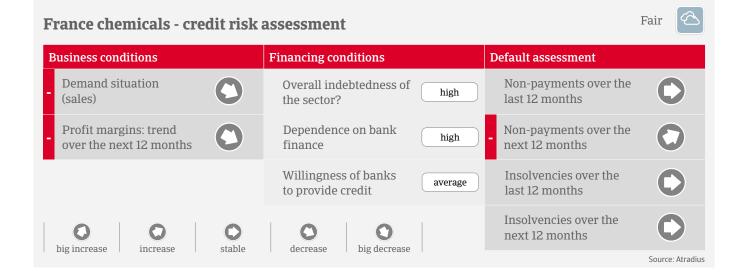
However, state measures will also pose challenges in the coming years, as the French government plans to reduce emissions caused by the chemical industry - by 26% in 2030 compared to 2015. In order to reach this target a high level of capital expenditure is required. In particular, the plastics segment is facing the need for a speedy transformation due to environmental regulations, for example the EU ban on single-use plastics.

France chemicals output

y-on-y, % change



Performance forecast along subsectors Basic chemicals Paints and coatings



Germany

Still resilient, but profitability is under threat



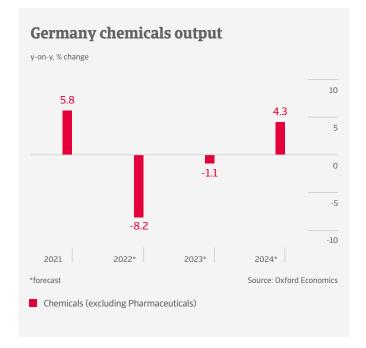
Production volumes in the German chemicals industry are currently shrinking, but due to higher sales prices, sales volumes are still slightly growing. With sharply increased energy and raw material prices, 10% of companies have recorded strong production declines, while 40% report sales growth. Energy and commodity prices have increased between 35%-50% for producers, which, in most cases, they can only partly pass on to end-customers. Consequently, about 70% of chemical businesses report decreasing profits.

Large fiscal support should provide some relief for chemicals and other energy-intensive industries. The German parliament recently passed an energy-relief package worth EUR 200 billion to support businesses and households alike, and the government plans to introduce price caps on electricity and gas early next year. However, stubbornly high inflation, higher interest rates and lower economic growth will negatively affect demand for chemicals in the coming months.

Generally, German chemicals businesses have robust equity, solvency and liquidity, which provides resilience in the current situation. A strong capitalization across the sector facilitates access to external financing, with an acceptable indebtedness structure and a well-balanced debt maturity profile. However, rising interest rates will increase financing costs for necessary investments (production facilities, tighter environmental requirements), which could lead to lower profitability.

Payments in the chemicals industry take about 30-60 days on average, and payment behavior has been very good during the past two years. Currently we expect no substantial increase in payment delays and insolvencies in 2023. However, despite strong fiscal support, there is still the downside risk of persisting high gas prices next year and/or a shortage of gas, which could trigger higher default rates and insolvencies.

We currently assess the credit risk situation of the chemicals sector as "Fair", due to its financial resilience and still low default rate. Along subsectors, we see higher risks for the agrochemicals segment, which in the past received most raw materials from Ukraine and Russia, while high prices will curb sales. The soaps and detergent segment are extraordinarily affected by high raw material prices and face lower household consumption due to high inflation.



Performance forecast along subsectors Basic chemicals Paints and coatings Soaps and detergents Source: Atradius

Fair Germany chemicals - credit risk assessment **Business conditions** Default assessment Financing conditions Demand situation Non-payments over the Overall indebtedness of average (sales) the sector? last 12 months Profit margins: trend Dependence on bank Non-payments over the average over the next 12 months next 12 months finance Willingness of banks Insolvencies over the high to provide credit last 12 months Insolvencies over the next 12 months big increase stable big decrease Source: Atradius

Italy

More resilient to market shocks than other industries



After a robust rebound in 2021, chemicals output and sales have slowed sharply since H1 of 2022. Exports as a main driver of growth have plummeted, as demand from main European markets (France, Germany) has decreased. Domestic demand from automotive and textiles remains modest. Sales to construction are also slowing down, affecting the paints and coating segment. High inflationary pressures impact household consumption of soaps and detergents.

Due to the currently very high energy and feedstock prices, Italian chemicals manufacturers face competitive headwind from overseas peers, while at the same time demand from main-end markets is decreasing. Additionally, there are supply chain issues with virgin naphtha, one of the main raw materials needed by the Italian chemicals industry. Rising prices for commodities and gas have caused some chemicals manufacturers to stop production and to apply for furlough schemes. The scope and scale of public support to shield businesses from high energy prices remain to be seen.

Despite deteriorating margins, Italian chemical manufacturers remain well capitalized and not overly dependent on external financing. This makes the industry more resilient to market shocks compared to other sectors.

Due to very high energy costs, we expect payment delays to increase in the coming 12 months. According to the latest Atradius Payment

Performance forecast along subsectors

Basic chemicals

Agrochemicals

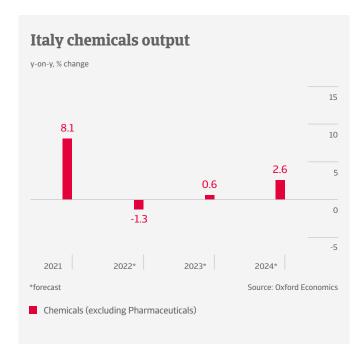
Paints and coatings

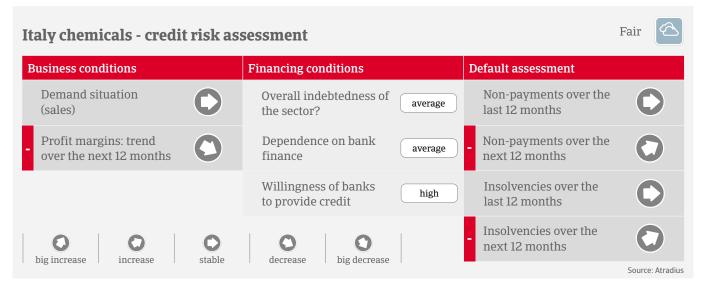
Coatings

Source: Atradius

Practices Barometer, Days Sales Outstanding (DSO) average more than 100 days, and there is concern among businesses about deteriorating DSO in the coming months. We also expect more insolvencies in this period, although from a very low level. In case of a serious shortage of gas over a longer period, or gas rationing, the insolvency risk would sharply increase, particularly for smaller chemical producers and traders.

Despite the current major challenges, we assess the credit risk situation of the Italian chemicals sector still as "Fair", due to its financial resilience and low default rate. The basic and specialties segments continue to perform well, while we perceive higher credit risk in the agrochemicals segment. This subsector suffers severely from a shortage of raw materials, which previously mainly came from Ukraine and Russia, while payment collection time is historically long.





Japan

Pressure on profitability to remain limited



After a decrease across all subsectors in Q2 of 2022, Japanese chemicals production has rebounded again in Q3. The short-term outlook remains positive, with modest but steady growth rates. Domestic household chemicals consumption continues to recover, due to pent-up demand for soaps and detergents (up 3.7% in 2022). At the same time, demand from automotive as a key customer sector is increasing, in line with an easing of the global chip shortage.

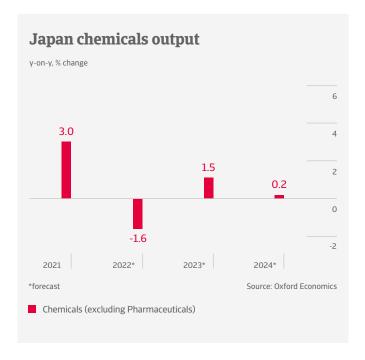
Overseas markets account for about 50% of chemicals sales, and external demand has increased again in Q3. However, weaker economic growth in advanced economies and in China could dampen exports in the coming months.

Higher energy prices remain a concern, although the industry does not overly depend on oil and gas supplies from Russia. While the weakness of the yen supports exports, it leads to higher costs for energy and commodity imports. Fully passing on higher input prices for energy and raw materials to end-customers remains difficult. Therefore, we expect margins of chemicals businesses to shrink in the Financial Year (FY) 2022 (April 1, 2022 to March 31, 2023). However, most companies recorded growing profitability in the FY 2021 due to favourable market conditions.

Payments in the Japanese chemicals sector take 30-120 days on average, and payment behavior has been good during the past two years. The number of payment delays and insolvencies in the industry has been low during the past couple of years, and we expect no significant deterioration in 2023. We assess the credit risk situation of the Japanese chemicals sector as "Good" across all segments, because pressure on profitability will remain limited, banks are willing to provide loans, and the majority of businesses are not highly geared.

In the long-term, high domestic production costs and cheaper competition from China and the US is likely to have a negative effect on output capacities, particularly in the basic chemicals subsector. We expect that businesses in this segment will try to climb up the value chain towards low-carbon and specialized products made for key buyer sectors like automotive.

Performance forecast along subsectors Basic chemicals Paints and coatings Soaps and detergents Source: Atradius



Japan chemicals - credit risk assessment				
Business conditions	Financing conditions	Default assessment		
Demand situation (sales)	Overall indebtedness of the sector?	Non-payments over the last 12 months		
Profit margins: trend over the next 12 months	Dependence on bank finance average	Non-payments over the next 12 months		
	Willingness of banks to provide credit	Insolvencies over the last 12 months		
big increase increase stable	decrease big decrease	Insolvencies over the next 12 months		
nereuse i mereuse i stable	decrease sig decrease	Source: Atradius		

The Netherlands

Increasing pressure from overseas competitors



Dutch chemicals output should decrease by about 4% in 2022 as the industry suffers from high energy prices and supply bottlenecks of raw materials. In 2023, we expect output contraction to lower to about 1% because supply issues of commodities will ease.

Competitors from overseas (particularly in the US) currently face comparatively lower energy costs. This makes it difficult for Dutch and European chemical producers to pass on their sharply increased energy bills to end-customers. The number of Dutch chemicals companies which have reduced or temporarily stopped production has increased, because being fully operational is no longer profitable. Many intermediate products supplied by the chemical industry go to the rubber, plastics and furniture industries. Therefore, production bottlenecks have an adverse effect on the manufacturing capabilities of those sectors.

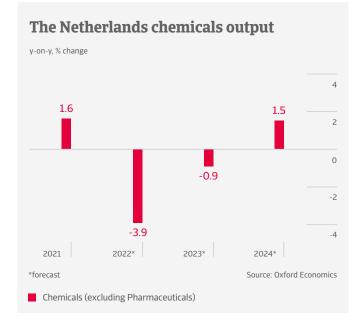
Profit margins increased in 2021 due to robust sales, but have started to decrease since Q2 of 2022 and will further deteriorate in the coming months. After very low numbers of payment delays and insolvencies seen in 2021 and in Q1-Q3 of 2022, there will be substantial increases in 2023. The main reason is the combination of high energy prices, lack of commodities, and fierce competition from abroad. Much will depend on the future development of gas prices. with the downside risk of gas rationing measures. Dutch small and medium-sized businesses whose energy costs amount to at least 7% of turnover can receive a compensation over the period 1 November

2022 up to and including December 2023 of a maximum of EUR

160,000 through the Energy Costs Allowance Scheme for Energyintensive SMEs (TEK).

We expect the 2023 insolvency surge of chemicals businesses to be much lower than the 77% increase we expect for all Dutch businesses. Coming from a very low level, the increase will be a return to (normal) pre-Covid levels.

We currently assess the credit risk situation of the Dutch chemicals industry as "Fair", given the strong financial position of many businesses, in particular multinational players. However, challenges are mounting. Should high gas prices in the Netherlands persist over a longer period, new investments in chemicals production sites could drift to markets where energy is less expensive. Additionally, higher investments in order to meet environmental standards will be a challenge, due to both tighter regulations and growing demand from consumers for 'greener' products.



Performance forecast along subsectors



The Netherlands chemicals - credit risk assessment



Business conditions	Financing conditions	Default assessment
Demand situation (sales)	Overall indebtedness of the sector?	+ Non-payments over the last 12 months
Profit margins: trend over the next 12 months	Dependence on bank finance	Non-payments over the next 12 months
	Willingness of banks to provide credit	+ Insolvencies over the last 12 months
big increase increase stable	dormaco hig dormaco	Insolvencies over the next 12 months
big increase increase stable	decrease big decrease	Source: Atradius

Spain

Concerns about liquidity strain have increased



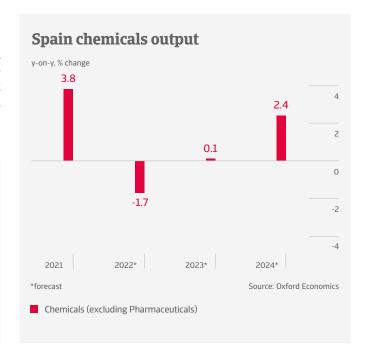
Demand from key buyer industries like automotive and construction has been stable so far in 2022. However, with persistently high inflation and a subdued 0.8% economic growth expectation in 2023, sales will most probably deteriorate in the coming months. After decreasing profits in Q2 of 2022 due to high energy (gas) and commodity costs, chemical producers have started to pass on price increases to end-customers since Q3. This resulted in a partial recovery of margins. Additionally, the Spanish government supports chemicals and other industries affected by high energy prices with state-guaranteed loans and a gas price cap.

Leverage of Spanish chemical businesses is generally not high, due to the sector being a good cash and EBITDA generator. Banks are mostly willing to provide loans, with bank finance usually required for acquisitions, important investments (in plants and equipment, for example) or working capital needs.

According to the latest Atradius Payment Practices Barometer, payment terms average 67 days from invoicing in the Spanish chemical industry, while Days Sales Outstanding (DSO) average more than 100 days. There is concern among businesses about deteriorating DSO in the coming months and a subsequent strain on liquidity. After low levels seen during the past twelve months,

we expect both payment delays and insolvencies to increase in 2023, as demand shrinks and input costs remain elevated. However, we do not expect a severe deterioration of the sector's performance.

We currently assess the credit risk situation of the Spanish chemicals sector as "Fair" across all segments. However, downside risks remain, as higher financing costs and deteriorating payment behavior increase the financial pressure on businesses, while at the same time demand from key buyer industries is about to decrease. At the same time, Spanish chemical companies could benefit from lower competition next year. This would be the case if their peers in central Europe are forced to cut production due to further rising gas prices or even gas rationing.



Performance forecast along subsectors Basic chemicals Paints and coatings Soaps and detergents Source: Atradius

Fair Spain chemicals - credit risk assessment **Business conditions** Default assessment Financing conditions Demand situation Non-payments over the Overall indebtedness of average (sales) the sector? last 12 months Profit margins: trend Dependence on bank Non-payments over the average over the next 12 months next 12 months finance Willingness of banks Insolvencies over the high to provide credit last 12 months Insolvencies over the next 12 months big increase stable big decrease Source: Atradius

United Kingdom



Subdued demand, but deterioration of profitability should remain limited

We forecast UK chemicals output to decrease by 8% in 2022 and about 2% in 2023, because high energy and input prices are weighing on the industry. High inflation and rising interest rates continues to erode household purchasing power, while GDP will contract in 2023. This all leads to lower demand for products such as soaps and detergents or cars, with automotive being a key buyer sector for chemicals. A slowdown in construction activity will additionally curb demand from the paints and coatings segment.

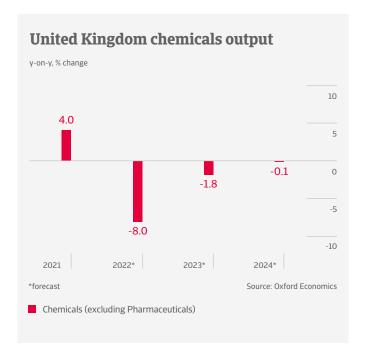
To cope with high energy prices, chemical manufacturers are sometimes required to renegotiate price contracts with their customers. This is to try to ensure they remain sustainable in the medium to long-term, but has led to several plant closures. While some businesses are able to pass on costs to their buyers, those with fixed contracts are susceptible to financial pressure. In order to support businesses, the British government announced an energy price cap for six months until April 2023.

In the chemicals sector, gearing mainly relates to working capital requirements driven by prices/seasonality. Businesses generally do not have to meet large interest and capital repayments. This provides some scope to manage the current deterioration in profitability. Banks are still willing to provide loans to the industry.

Payments in the British chemicals sector take 60-90 days on average, and the number of payment delays and insolvencies in the industry has been low during the past 18 months. As high energy and commodity costs continue to burden businesses, we expect insolvencies to increase by about 5% in 2023. We assess the credit risk situation of the UK chemicals sector as "Fair" across most segments, because the deterioration of profitability should remain limited, banks are still willing to provide loans, and the expected increase in business failures will not be overly high.

In the mid and long-term, the impact of Brexit could weigh on chemical industry prospects, causing a shortage of skilled workforce and an increased regulatory burden. While the United Kingdom has set up its own regulatory system for the chemicals sector (UK REACH) since January 2021, compliance costs for exports to the EU are expected to increase.

Performance forecast along subsectors Basic chemicals Agrochemicals Paints and coatings Coatings Source: Atradius



United Kingdom chemicals - credit risk assessment				
Business conditions	Financing conditions	Default assessment		
Demand situation (sales)	Overall indebtedness of the sector?	Non-payments over the last 12 months		
Profit margins: trend over the next 12 months	Dependence on bank finance	Non-payments over the next 12 months		
	Willingness of banks to provide credit high	Insolvencies over the last 12 months		
big increase increase stable	decrease big decrease	Insolvencies over the next 12 months		
. 23 mereuse . mereuse . stable	. Dig defeate	Source: Atradius		

United States

A sharper focus on de-carbonisation strategies



The US chemicals industry currently faces a more difficult domestic market environment, due to lower economic growth, continued high inflation and rising interest rates. Higher oil prices have put pressure on margins, in particular in the basic chemicals segment. However, many businesses could increase their sales prices in order to offset higher input costs. After the outbreak of the war in Ukraine, the US fertilizer segment has seen increased demand, leading to higher sales prices and margins.

The US chemicals sector currently outperforms most other regions. In particular European chemical businesses struggle with record high gas prices since Russia's invasion in Ukraine. In contrast, US producers can rely on relatively cheaper domestic shale gas. This competitive advantage supports exports, expected to grow by 7% in 2022, and has led to a rising trade surplus (forecast USD 26 billion in 2022).

Payment duration in the US chemicals sector is about 80 days on average. The amount of non-payments and insolvencies has been low in 2021 and 2022, and we expect no deterioration in 2023. Mergers and acquisitions across the industry have led to increased levels of debt, but in most cases with long maturity. The sector has good access to capital markets and bank loans in order to fund operations.

We currently assess the credit risk situation of the US chemicals

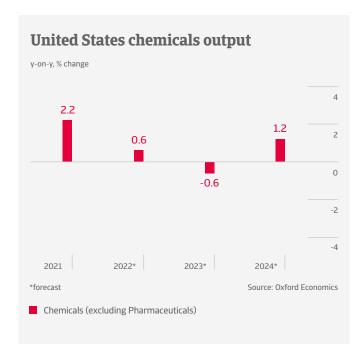
Performance forecast along subsectors

Basic chemicals
Paints and coatings
Soaps and detergents

Source: Atradius

industry as "Fair", given the satisfying profit margin situation, low number of business failures and good access to external financing. Future opportunities for the industry include increasing exports to emerging markets (Asia-Pacific, Africa, Middle East) and rising demand for alternative fuels. Challenges for chemicals businesses are the smooth integration of acquisitions in order to reach synergies, as well as the need to onboard new revenue sources.

Another major task ahead comes with the need to reduce greenhouse gas emissions in order to meet tighter environmental requirements. In 2023 and beyond the US chemicals industry is likely to have a sharper focus on de-carbonization strategies, in order to meet increasing demand from shareholders and comply with regulatory changes. At the same time, government schemes to boost emission reduction will increase demand for chemicals used in insulation materials, solar panels etc.



United States chemicals - credit risk assessment **Business conditions** Default assessment Financing conditions Demand situation Non-payments over the Overall indebtedness of average (sales) the sector? last 12 months Profit margins: trend Dependence on bank Non-payments over the high over the next 12 months next 12 months finance Willingness of banks Insolvencies over the high to provide credit last 12 months Insolvencies over the next 12 months big increase stable big decrease Source: Atradius

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