

APRIL 2022

CIA Fourth Quarter Economic Report 2021

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RESPONSIBLE CARE

Current shape of the industry

CIA

CHEMICAL
INDUSTRIES
ASSOCIATION

UK CHEMICAL INDUSTRY

IN NUMBERS



4,535 businesses providing over 500k jobs (141,000 direct, support a total of 500,000 direct and indirect)



Salary over 34.3% higher than manufacturing and 48.3% higher than the economic average



Highly productive sector with £220k GVA* per employee
266% higher than Econ average
177% higher than manufacturing



Over 21% of UK R&D spend



UK's largest exporter of manufactured goods with annual exports of over £54bn

* Gross Value Added

Figures correct at 4 March 2022

Executive summary

I am pleased to present our latest Economic Report, which has been written by Tom Warren, our Head of Economics.

This report has two sections. The first is a CIA analysis of Government data via the Office for National Statistics (ONS) and other countries' statistical agencies, that assesses the UK chemical industry's performance in 2021 against that of the wider economy followed by a look at what challenges lie ahead. The second section presents the results and further analysis of our own Q4 2021 Business Survey. Unless otherwise specified figures are for the chemical industry excluding pharmaceuticals.

As has been the case in recent times, major economic events have been plentiful since our last update:

- In October the Chancellor presented his first multi-year Spending Review and Budget.
- The Bank of England's Monetary Policy Committee (MPC) increased interest rates in back-to-back meetings for the first time since 2004 from the historic lows of 0.1% to 0.25% then the to the current rate of 0.5%.
- The ONS published annual GDP, production, trade, prices and labour market data for 2021.
- The International Monetary Fund (IMF) and Organisation for Economic Cooperation and Development (OECD) published their global outlooks.
- The Government published multiple whitepapers including the long-awaited levelling up white paper.

Geopolitics aside, rising inflation, which is being felt acutely by both businesses and consumers through their energy bills, remains the topic of the moment. The Bank of England has changed its transitory rhetoric admitting high inflation is likely to be persistent over the coming years with a peak of 7.25% expected in April 2022.

Price rises are even more stark when focusing on the chemical industry, in the 12 months to January chemical inputs (including fuels) rose 23.8% whilst chemical output rose a less but still sizable 20.7%. Input price rises outpacing output has been a constant of 2021, exerting sustained downward pressure on chemical producers' margins.

Out of the 23 manufacturing industries in the UK, the chemical industry was one of two to increase production by more than 0.6% in 2020, rising output 6.9%. The other industry was pharmaceuticals which increased production by 13.9%. This resilience continued through 2021 as chemical and pharmaceutical products remained in high demand to tackle the pandemic with output from the industries increasing by 2.1% and 3.7% respectively.

Turning our attention to data collected in the CIA's Q4 Business Survey, respondents reported their sixth successive quarter of growth however, in the face of soaring input costs, the rate of growth was significantly slower than that experienced in the third quarter and below expectation.

Survey respondents reported that rising energy prices continue to be the largest current challenge faced by the industry. Raw material shortages and price increases were the second and third biggest challenges with all issues worsening through the final quarter of 2021.

Despite the acute challenges faced by the industry and coming from a high base of two years of strong production growth, CIA members remain positive entering 2022.



Steve Elliott
Chief Executive
Chemical Industries Association

The survey data presented in this report was collected from CIA members in January 2022. The macroeconomic data, predominantly sourced from the Office for National Statistics, was gathered up to mid-February. It is therefore important to note that economic analysis took place before the onset of the Ukraine crisis. The data is still relevant and provides a clear picture of the chemical industry's economic progression through the pandemic and what is expected for the future.

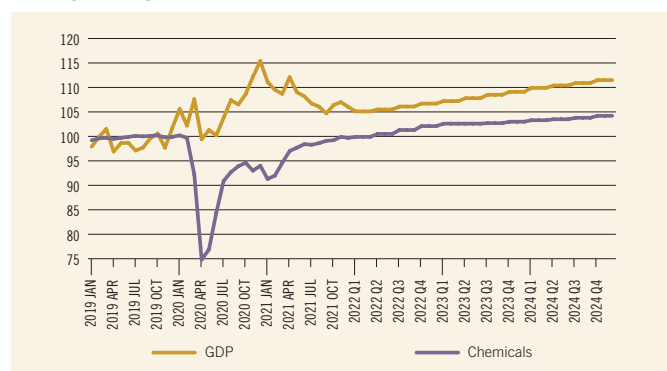
A look back at 2021 with an eye on 2022

In February 2022 the Office for National Statistics (ONS) published GDP, production, trade, price and labour market data for December 2021 providing us with the first official estimates for annual economic performance in the second calendar year of the pandemic, 2021.

Chemical Production

GDP vs Chemical production

Graph 1: Monthly index of UK GDP and chemical production with quarterly forecasts from Q1 2020 to Q4 2024, Q4 2019 = 100



Source: CIA Analysis of ONS data, IHS Markit forecasts

After the largest annual economic contraction in almost 100 years of 9.4% in 2020, the UK economy partially rebounded 7.5% in 2021 and at the end of December was estimated to be 0.3% smaller than the pre-pandemic level of the final quarter of 2019. The economic recovery has been felt unevenly across the economy. At the end of 2021 the services sector, which accounts for around 80% of UK GDP, was the only major sector of the economy to have output above its pre-pandemic level, services output was 0.3% higher than pre-pandemic. The production, construction and agriculture sectors, which account for the remaining 20% of GDP, all had output at the end of 2021 below pre-pandemic levels by 3.2%, 0.1% and 15.5% respectively.

Due to elevated demand from the pharmaceutical industry, stockpiling ahead of the end of the transition period and a beneficial substructure to combat the pandemic, chemical production rose 6.9% in 2020. The high demand for chemicals continued through 2021 with further output growth of 2.1%. Graph 1 displays a monthly index of UK GDP and chemical production for 2020/21 and forecasts out to the end of 2024 where the pre-pandemic level of the final quarter of 2019 is equal to 100. The graph highlights the disparity between GDP and chemical recoveries as at the end of 2021 chemical production remained 6.0% above its pre-pandemic level. GDP growth outpaced chemical production growth in 2021, a phenomenon that is expected to continue in 2022 and 2023 however not at a rate sufficient to recover the lost ground in 2020 as chemical production is expected to remain elevated compared to UK GDP when using the pre-pandemic level of the final quarter of 2019 as a base.

Chemical production vs M5

The 'M5' industries, comprised of chemicals, pharmaceuticals, automotive, aerospace and food, drink and tobacco, account for 40.4% of the manufacturing sectors value added.

Table 1: Annual production growth of M5 and forecasts

Industry	2020	2021	2022	2023	2024
Food, Drink and Tobacco	-5.3%	4.2%	0.7%	2.1%	1.9%
Chemicals	6.9%	2.1%	1.0%	2.2%	2.3%
Pharmaceuticals	13.9%	3.7%	0.8%	1.9%	3.3%
Automotive	-24.8%	3.1%	7.0%	9.0%	3.8%
Aerospace	-25.3%	-9.6%	3.4%	2.1%	6.4%

Source: CIA Analysis of ONS data, IHS Markit forecasts

Table 1 displays the annual production growth rate for these industries over the last two years. Understandably the pharmaceutical industry, which creates products vital to tackling the pandemic, was the best performing manufacturing industry. The food, drink and tobacco industry, which produces a mix of essential and luxury goods, experienced a relatively small contracting in 2020 when comparing to the economy as a whole and by the end of 2021 had output 0.2% below pre-pandemic levels. The automotive industry has had a challenging two-year period with a sharp fall off of production in mid-2020 which was initially followed by a strong rebound in production however output has been stifled in 2021 by supply chain issues and raw material shortages focused around microchips. Global travel restriction spearheaded the troubling two-year period for the aerospace industry with output at the end of 2021 38.5% below pre-pandemic levels.

UK Chemical production vs International

Moving away from UK comparisons, Table 1 in the appendix displays chemical production growth in 2020 and 2021 for 21 countries / regions of the world as well as forecasts out to 2024. As previously mentioned, UK chemical production expanded 6.9% in 2020 followed by growth of 2.1% in 2021, comparing globally, global chemical production contracted 0.2% in 2020 followed by a rebound of 6.7%. The three major chemical producing regions: China, the EU27 and the US, which account for over 71% of global chemical sales, experienced chemical production growth of 2.9%, -2.3% and -3.5% in 2020 followed by rebounds of 8.4%, 5.9% and 1.9% in 2021 respectively.

Summarising the chemical production data, it is clear the UK chemical industry has displayed resilience in the face of numerous challenges over the last two years. Both domestically and internationally, the industry has been among the top performers. The resilience reflects the adaptability and hard work of business within the sector paired five key drivers:

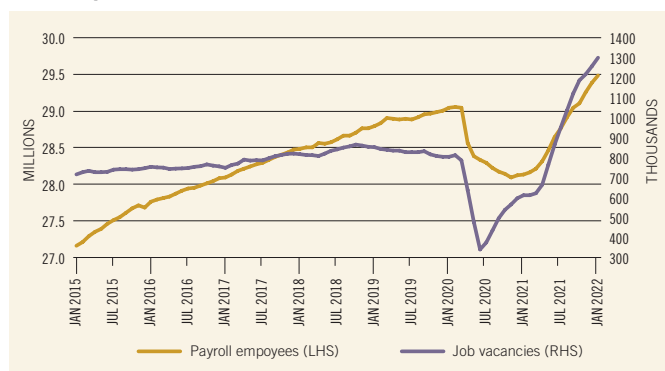
- 1 **UK's chemical substructure:** The largest chemical subsector in the UK, accounting for over a third of chemical production, is the manufacture of 'Soap and detergents, cleaning and polishing, perfumes and toilet prep'. This subsector not only created products vital to tackling the pandemic but is also the only chemical subsector the sells directly to households.

- Change of consumer spending habits:** Lockdown restrictions and large fiscal stimulus led to households saving tens of billions of pounds. Accompanying this, lockdown restrictions reduced consumers' ability to spend on services boosting demand for goods, over 95% of which contain chemicals.
- Stockpiling:** Stockpiling of goods on both sides of the Channel ahead of the end of the transition period between the UK and EU on 1 January 2021 led to elevated UK chemical production in the latter half of 2020.
- UK pharmaceutical industry:** The UK boasts a large pharmaceutical industry that rose to the challenge of the pandemic, in doing so boosting demand for chemicals as a key end market for our products.
- Rebounds of customer markets:** After sharp falloffs in production in the second quarter of 2020, key end markets for the chemical industry such as construction, automotive and rubber and plastics rebounded 41.4%, 171.4% and 33.9% respectively in the third quarter, boosting the demand for chemicals.

The Labour Market

As has been the case for the second half of 2021, the labour market remains tight. The Chancellor's furlough scheme successfully averted a wave of unemployment which peaked in at 5.2% in the three months to December 2020, far below the over 10% forecasts made by multiple organisations in April 2020. The number of people on payroll fell 951,000 between March 2020 and November 2020 before rebounding 1.4 million to January 2022. The number of job vacancies in the UK economy reached a record high of 950,000 in the three months to July 2021, a record that has been broken in every subsequent three-month rolling period, with the number of job vacancies reaching just under 1.3 million in the three months to January 2022. Alongside record vacancies, the redundancy rate in the three months to December 2021 was at record lows, 35% below the pre-pandemic level.

Graph 2: Payroll employees and job vacancies in the UK economy from Jan 2015-Jan 2022



Source: CIA analysis of ONS data

Job vacancy data isn't published in enough granularity by the ONS to ascertain how many jobs are yet to be filled in the chemical industry specifically however, there is data for the manufacturing sector as a whole. There were 97,000 job vacancies in the manufacturing sector in the three months to December 2021, a record level that is 83% higher than pre-pandemic. This figure equates to 4.0 jobs in every

100 in the manufacturing sector being empty, compared to 2.1 pre-pandemic and a pre-pandemic peak of 2.6 in the three months to October 2018.

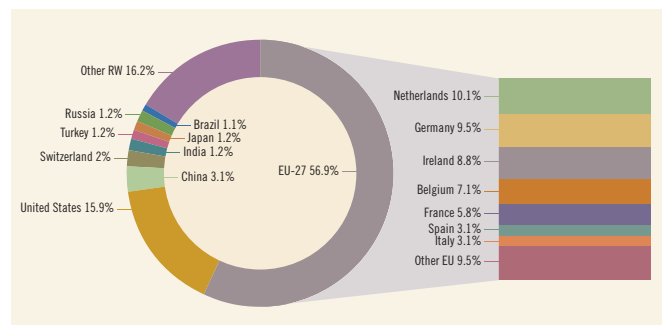
Somewhat surprisingly due to the increased production through 2020, chemical employment fell, mirroring the pattern displayed by payroll employees. Falls in chemical employment were driven by lockdown restrictions reducing the number of contractors on manufacturing sites, as lockdowns eased employment rose and in the three months to September was 2.1% above pre-pandemic levels.

Trade

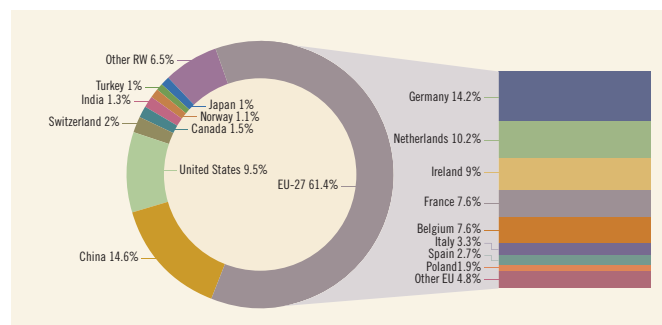
The UK's trade deficit of goods in 2021 increased 20.4% compared to 2020 and 12.8% compared to 2019 to £155.8 billion. The trade deficit the UK runs with the EU-27 reduced from £99.1 billion in 2019 to £86.1 billion in 2020 and 70.2 billion in 2021. The opposite can be said for the UK's trade deficit with the rest of the world which has over doubled in the two-year period from 39.2 billion in 2019 to 43.4 billion in 2020 and finally 85.7 billion in 2021.

Compared to 2020, total annual UK imports of goods increased by £38.0 billion, or 8.7%, to £476.3 billion in 2021 but were £33.9 billion, or 6.6%, lower than 2019 levels. EU imports fell to £222.5 billion in 2021 from £232.8 billion in 2020 and £269.8 billion in 2019. Imports from the rest of the world rose to £253.9 billion in 2021 from £205.5 billion in 2020 and £240.4 billion in 2021. Turning to exports, compared to 2020 total annual UK exports of goods increased by £11.6 billion, or 3.8%, to 320.5 billion but were £51.5 billion, or 13.8%, lower than 2019 levels. EU exports were valued at 152.3 billion in 2021 compared to £146.7 billion in 2020 and £170.7 billion in 2019. Rest of the world exports followed a similar pattern with a value of £168.2 billion in 2021 following 162.2 billion in 2020 and £201.2 billion in 2019.

Graph 3: UK Chemical Exports broken down by destination (Jan-Nov 2021)



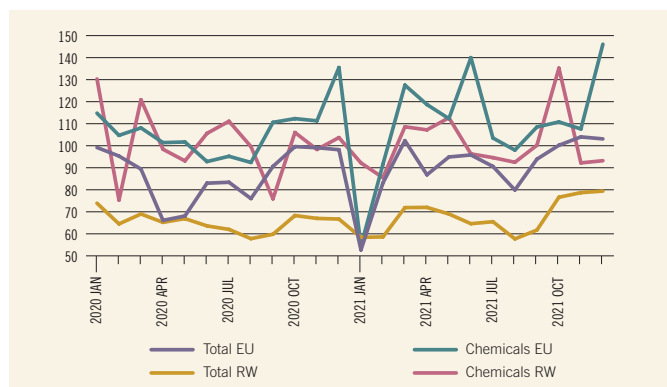
Graph 4: UK Chemical Imports broken down by destination (Jan-Nov 2021)



The graphs above breakdown UK chemical imports and exports in 2021 (Jan-Nov) by region. The EU remains the single largest market for trade however the single largest country to export to is the US. In a standard year either Germany or the Netherlands would be the largest single country that the UK imports chemicals from however due to an over doubling of the value of the imports of chemicals from China in 2021, they've taken the top spot.

Using standard international trade classifications (SITC) the UK's trade deficit in chemicals rose to £6.6 billion in 2021 compared to £0.3 billion in 2020 and £3.0 billion in 2019. The value of chemical imports rose £39.6 billion in 2021 from £32.9 billion in 2020 and £34.7 billion in 2019. Increases in the value of chemical imports from the rest of the world, from £9.7 billion in 2019 and £9.9 billion in 2020 to £15.3 billion in 2021 was the main driver of this rise. Chemical imports from the EU27 rose to £24.4 billion in 2021 compared to £22.9 billion in 2020 but were below 2019's £25.0 billion. Chemical exports to both the EU27 and rest of the world have been relatively constant throughout the pandemic. Total UK chemical exports rose to £33.0 billion in 2021 from £32.5 billion in 2020 and £31.7 billion in 2019. EU exports rose to £18.9 billion from £18.3 billion and £17.9 billion in 2020 and 2019 respectively while exports to the rest of the world experienced a modest fall from £14.2 billion in 2020 to £14.1 billion in 2021 however is above 2019's £13.8 billion.

Graph 5: Monthly index of total UK and chemical exports to the EU and rest of the world from January 2020 to December 2021, Q4 2019 = 100



Source: CIA analysis of ONS data

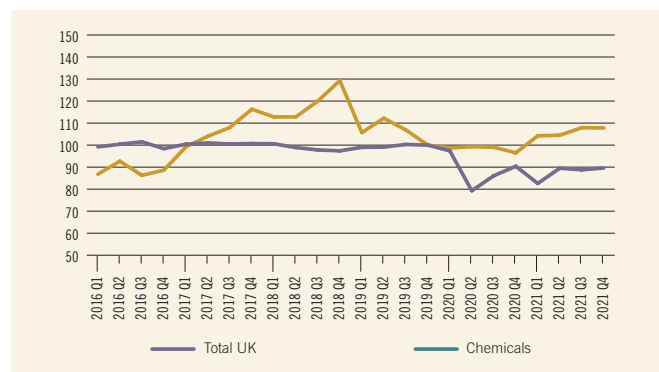
Untangling the impacts of Brexit and the pandemic on UK trade flows over the last couple of years remains a challenge which is open to a high level of subjectivity and interpretation. How a country's trade is impacted by and responds to a crisis is dictated by a number of factors. These factors include the basket of goods domestically produced, the fiscal support offered to consumers, the changes in currency value, inflationary pressure, geopolitical relations and many others.

Business investment and R&D

Total UK business investment stagnated in 2016 after the EU referendum before falling 18.6% in the second quarter of 2020 as business looked to preserve cash in the face of an uncertain economic and health outlook. In the final quarter of 2021 total UK business investment remained 10.4% below pre-pandemic levels with total business investment in 2021 of £198.8 billion compared to 2019's and 2016's £225.8 billion and £226.5 billion respectively. The UK government is keen to unlock the billions of pounds on companies' balance sheets that have been saved through the pandemic to trigger an investment led recovery. Industry bodies

such as the Confederation of British Industry support this optimistic outlook however despite policies such as the super deduction, it is clear from the data presented above, this rebound of business investment is yet to feed through into official data.

Graph 6: Quarterly index of total UK and chemical (Incl pharma) business investment from Q1 2016 to Q4 2021, Q4 2019 = 100

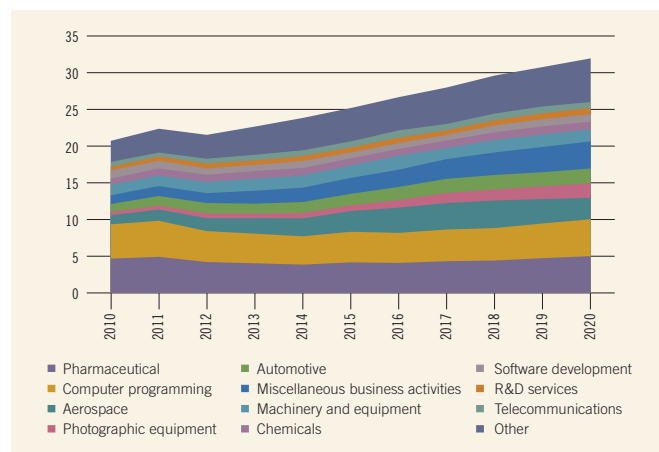


Source: CIA analysis of ONS data

Graph 6 displays the quarterly index of UK business investment between the first quarter of 2016 and final quarter of 2021 with the pre-pandemic level of Q4 2019 equal to 100. Chemical and pharmaceutical business investment defied the UK's stagnation through 2016/19 and despite falling in 2020, at the end of 2021 was 7.8% above pre-pandemic levels. IHS Markit forecasts the chemical business investment (excluding pharmaceuticals) will increase by 10.3% in 2022. Using CIA survey and macroeconomic data the CIA is too optimistic for business investment levels in the chemical industry moving forward, however, we feel an over 10% rise may be slightly too ambitious.

Turning our attention to research and development (R&D) expenditure, the scientific sister of business investment, the ONS publishes annual business R&D expenditure each November with the most recent data for 2020. Total business spend on R&D in 2020 rose 3.5% compared to 2019 to £26.9 billion. Chemical and pharmaceutical R&D accounted for 21.6% of total UK business spend, equivalent to £5.8 billion or 0.3% of GDP. As a clear big supporter of the Government's goal of becoming a scientific superpower, this R&D spend was split £5 billion on pharmaceuticals and £800 million on chemicals.

Graph 7: Total annual UK business expenditure on R&D broken down by subject from 2010-2020



Source: Office for National Statistics

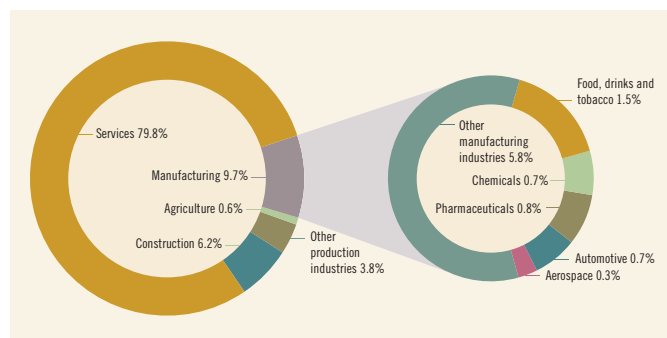
Gross Value Added

At a national level, gross value added (GVA) is the monetary value of the goods and services that have been produced in a country, minus the cost of all inputs that are directly attributable to that production. GVA can therefore be used to work out GDP by adding the value of taxes less subsidies on production, i.e. $GVA + (\text{taxes} - \text{subsidies}) = \text{GDP}$. GVA can be worked out at an industry or even company level, it is simply the value that is being added by an entity in the production process.

UK GVA in 2021 was just under £2.1 trillion. Breaking this figure into the major sections of the economy, the services sector contributed 79.8%, production 13.4%, construction 6.2% and agriculture 0.6%. The largest component of the production sector is the manufacturing sector which accounts for 9.7% of UK GVA or £202.2 billion.

The value added to the UK economy by the chemical and pharmaceutical industry rose £2.4 billion in 2021 to £30.4 billion and is now £4.6 billion higher than 2019. This breaks down to £14.7 billion from chemicals and £15.7 billion from pharmaceuticals. Using standard industrial classifications (SIC), of the 23 defined manufacturing industries, the M5, whose constituents are food and drink, chemicals, pharmaceuticals, automotive and aerospace contributed 40.4% of the GVA in 2021. Food and drink, which technically are two separate manufacturing industries, had a combined GVA of £31.1 billion in 2021. The automotive and aerospace industries have experienced a challenging couple of years through the pandemic with GVAs of £13.7 billion and £6.5 billion in 2021 respectively.

Graph 8: Structure of the UK economy in 2021



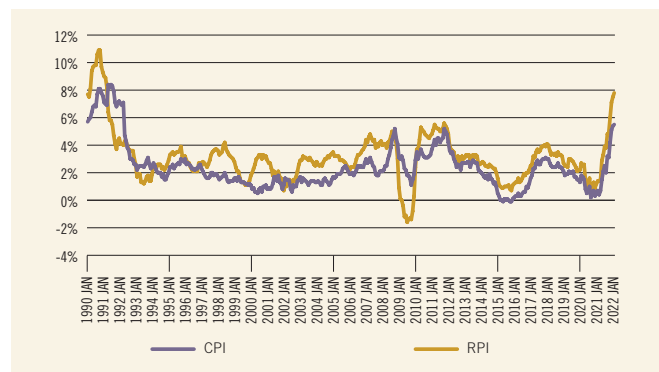
GVA per employee is a productivity measure as it displays the value of output produced by a single employee. The chemical industry has a GVA per employee of over £151,000 which is 90.0% higher than the average manufacturing worker and 151.6% higher than the average worker in the economy. Therefore, not only does the UK chemical industry contribute billions of pounds to the economy but it also helps tackle the productivity puzzle that the UK economy has been facing since the global financial crisis.

Prices

Despite the comparative resilience the chemical industry has displayed through the pandemic when comparing both domestically and internationally, it is crucial to not understate the challenges that are being faced. In the mid-to-long term the most prominent challenges surround the transition to net zero, the future trading relationship with the EU and regulatory issues such as UK / EU REACH. However, currently the issues being felt most acutely surrounds the prices of inputs such as gas and raw materials as

well as the added complexity and timeline in sourcing goods. It is easy to get complacent in a time of growth however it is vital that government and other stakeholders do not underestimate these challenges as they dampen production outlooks, restrict businesses' ability and appetite to invest and have the potential to reverse all the beneficial work the chemical industry has done to support the UK economy and government's strategic goals through the pandemic.

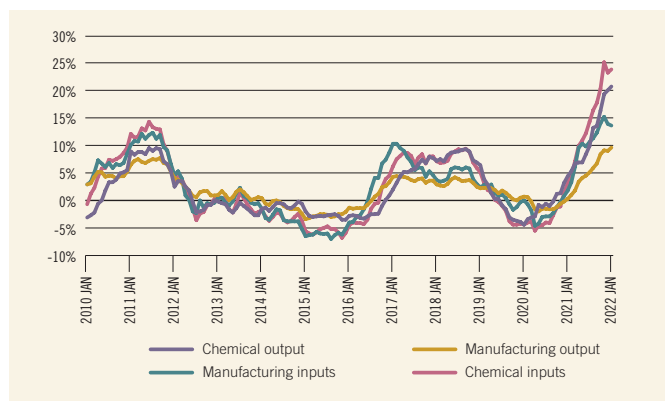
Graph 9: 12 months growth rates in CPI and RPI inflation from January 1990-January 2022



The UK's headline rate of inflation, CPI, which the Bank of England targets to keep at 2.0%, is a broad measure of the cost of living increases for households and doesn't provide detail on impacts on the business world, specifically producers. To analyse the change in manufacture's input and output prices producer price inflation (PPI) data is used. The latest official data provided by the ONS shows that in the 12 months to January 2022 CPI inflation rose 5.5%, its highest level since the 7.1% recorded in March 1992. CPI inflation is expected to peak at between 7.0% and 8.0% in April 2022 when the energy cap, national insurance and minimum wages all rise. After April 2022 the Bank of England expects inflation will begin to fall back however this fall off will be slow with inflation only reaching the 2% target in second quarter of 2024. Forecasts from the International Monetary Fund (IMF) show that CPI is expected to average 6.3% in 2022 followed by 3.1% in 2023 which depicts a sustained rise in the cost of living in the UK. The lesser used RPI inflation, which again aims to track the changes in living costs and tends to track a percentage point or two above CPI due to its dependence on housing costs, rose 7.8% in the 12 months to January, its highest level since March 1991.

Turning to PPI data, throughout 2021 the rate of growth in input prices has consistently outpaced growth in output prices. Although the most recent data reiterates this pattern, there are signals that it might be beginning to change. The most recent data displays that the rate of growth in input prices, despite still being above output prices, looks to have peaked however the same can't be said for output prices that are continuing to accelerate. In the 12 months to January 2022 manufacturing input prices rose 13.6%, fractionally down from the 13.9% in the 12 months to December and below the peak of 15.2% in the 12 months to November. Manufacturing output prices grew 9.9% in the 12 months to January its highest level since September 2008.

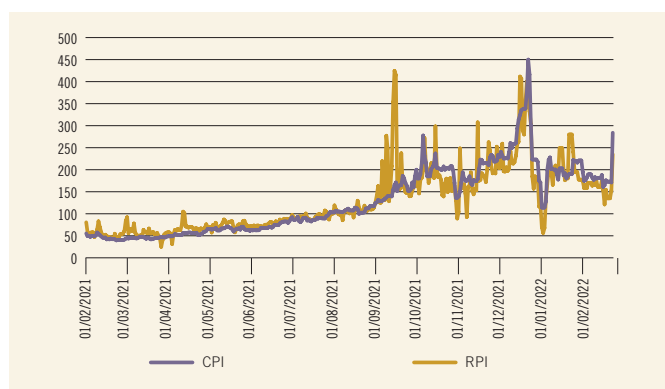
Graph 10: 12 month growth rates in manufacturing and chemical input and output prices from January 2010 to January 2022



Delving into the PPI data it is possible to assess the changes in input and output prices of chemicals. The figures are more extreme however follow the same pattern as displayed by the manufacturing sector as a whole. Chemical input prices rose 23.8% in the 12 months to January 2022, below the peak of 25.1% in November 2021 while chemical output prices rose 20.7% in the 12 months to January, up from 20.0% in December and its highest level on records dating back to 1997.

Energy prices have dominated the headlines in recent months as home and abroad, households and business bear the weight of soaring gas, electricity and oil prices. Despite the Ofgem energy cap receiving most media attention, the rises in gas prices are largest in intensive industries such as the chemical industry. The average daily day ahead price of gas, which removes the volatile intraday spikes, peaked at 450.10p a therm on the 22 December 2021. Despite the removal of intraday peaks this day ahead rate was 853.6% higher than a year prior. In recent months gas prices have tracked back down and begun to stabilise between 180p and 220p a therm however, compared to the historical norm this is significantly elevated as at the time of writing this report day ahead gas prices are 387% more expensive than one year prior. In light of recent geopolitical events gas prices have spiked back towards record levels. The longer this energy crisis persists the more hedged positions mature leaving chemical producers at the will of the spot rate.

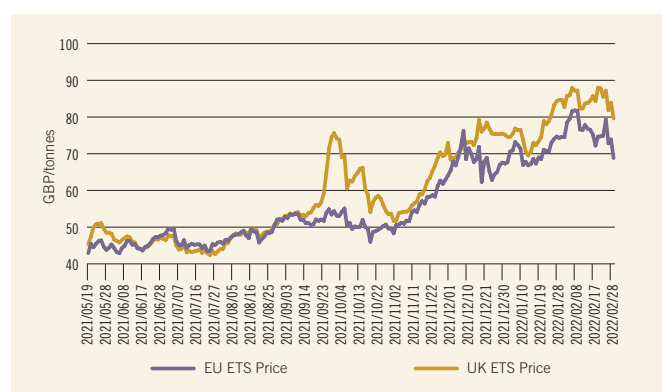
Graph 11: Daily day ahead cost of gas and electricity over the last year



Electricity prices are in large part dictated by gas prices as on an average day, depending on the weather, around 40% of the UK's energy supply is generated by burning gas. Electricity prices peaked at £424.61 a MWh on the 15 September 2021, 555% higher than they were a year prior. Despite falling back towards the £170 per MWh mark, at present electricity prices remain 258% higher than they were a year ago. In line with gas prices, electricity prices have returned toward record highs amid geopolitical struggles. Oil prices, which were first driven up by the global economic rebound but have since experienced upward pressure due to geopolitical tensions, recently crested the \$100 a barrel figure for the first time since September 2014.

Overshadowed by spiralling energy costs, a lesser reported, however still important, cost to energy intensive industries is the cost of carbon. The UK's emissions trading scheme (ETS) went live in May 2021 as the UK was no longer a member of the EU ETS post the UK's departure from the European Union. Since the commencement of the UK ETS in May 2021, the cost of carbon to UK emitters has risen 86%. Moreover, the cost of the UK ETS has consistently been above EU ETS, reducing the UK's competitiveness on an international stage, in recent months this gap has narrowed but carbon still remains 6.9% more expensive in the UK.

Graph 12: UK and EU costs of Carbon (GBP/ tonnes)



As explained earlier in this report, the labour market is very tight. Pair this with the rising cost of living which is not expected to abate in the near term and there is growing pressure on employers to increase salaries during pay negotiations. Average growth in regular pay, which excludes bonuses, rose 3.7% in the three months to December 2021 however due to the aforementioned high levels of inflation, in real terms this is a 0.8% pay cut.

To summarise the macroeconomic data set out so far in this report, it has been clear that through the pandemic the UK chemical industry has been resilient opposite domestic and international comparisons. Chemical production, investment, employment and value added are all above pre-pandemic levels however logistical issues on accessing goods and labour shortages persist. However, the strength displayed by the industry is threatened by persistent, significant rises in input costs which threaten UK chemical companies' ability and propensity to invest and produce in the UK.

Survey results

About the survey

At the close of each quarter, we survey member companies of the Association to get on-the-ground data about current trading conditions and views on what lies ahead. The information from this is incredibly useful in our work and we are grateful to all who respond.

Due to the Christmas break the CIA's Q4 2021 Business Survey was live between 10th and 21st of January and received responses from 50% of the CIA's membership. The survey was split into two sections: Industry Performance and Challenges and Opportunities. There were three questions in the Industry Performance section that asked respondents whether the 19 variables listed below had increased, decreased or stayed the same in the final quarter of 2021 compared to the third, and what member's expectations were for these variables in the first quarter of 2022 and 12 months' time.

Industry performance variables:

- 1 Total sales
- 2 Domestic sales
- 3 Exports
- 4 EU exports
- 5 Rest of the world exports
- 6 New orders
- 7 Production levels
- 8 Capacity utilisation
- 9 Employee numbers
- 10 R&D spend
- 11 Capital expenditure / Business investment
- 12 Your level of business optimism
- 13 Time to deliver
- 14 Raw material (input) prices
- 15 Cost of importing
- 16 Cost of exporting
- 17 Your energy costs
- 18 Finished goods (output) prices
- 19 Your company / site profit margins

When displaying the industry performance data diffusion indexes are used. These are an easy to interpret statistical tool that can be read in the same way as Purchasing Managers Indexes (PMIs), therefore any figure below 50 indicates a contraction, above 50 an expansion while 50 means it remained constant.

Industry performance

Performance in third quarter

Table 2 displays the diffusion indexes for the 19 variables mentioned in 'about the survey'. The first column is the diffusion index for the performance in the fourth quarter, the second column contains the diffusion index for what was expected for the fourth quarter when respondents were asked in the CIA's Q4 Business Survey, and the third column contains the diffusion index for third quarter performance.

Table 2

	Q4	Q3	Q4 Prediction
Total sales	51.1	61.3	53.8
Domestic sales	53.6	58.8	50.0
Exports	52.4	57.7	55.1
EU exports	51.2	55.3	51.3
Rest of the world exports	53.6	62.8	51.3
New orders	45.0	60.3	53.8
Production levels	51.2	59.0	56.4
Capacity utilisation	47.7	59.2	53.8
Employee numbers	53.4	53.8	56.6
R&D spend	50.0	53.8	48.7
Business investment	53.5	62.8	60.3
Your level of business optimism	47.7	46.3	47.4
Time to deliver	60.7	65.4	69.2
Raw material (input) prices	97.7	97.5	90.0
Cost of importing	87.2	92.5	78.8
Cost of exporting	83.7	95.0	82.5
Your energy costs	94.3	93.8	93.6
Finished goods (output) prices	90.7	87.5	87.5
Your company / site profit margins	35.7	38.5	38.5

There are two key takeaways from the data displayed in Table 2:

- 1 Respondents to the CIA's Q4 Business Survey reported their sixth successive quarter of sales and production growth in the final quarter of 2021 however alongside this came a broad-based rise in the cost of raw materials, energy, finished goods and trade, while time to deliver continued to increase.
- 2 Despite growth being reported in the final quarter, it was modest and far slower than what was expected from the data gathered in the CIA's prior Business Survey and was below the rate of growth experienced in the third quarter of 2021. At the same time the rate of growth of raw material and finished goods prices continued at astonishing pace, above what was expected, putting further pressure on margins.

Analysing the fourth quarter data in more detail, breaking down total sales, the domestic market slightly outperformed exports which aligns with what was experienced in the third quarter however goes against what was experienced previously in the pandemic. Focusing on exports in more detail, rest of the world exports continue to outperform EU exports with both regions reporting modest growth.

New orders, production levels and capacity utilisation, three metrics that tend to be correlated, were some of the worst performing with new orders and capacity utilisations experienced modest contractions. After six consecutive quarters of strong growth it is not felt that alarm bells should ring at this modest contraction however the CIA will monitor it closely moving forward as new orders especially is a good proxy for ongoing market conditions.

Two of the three 'slower' variables, employee numbers and business investment, which tend to have the lowest quarter on quarter volatility and react slower to economic shocks, were two of the best performing variables in final quarter of 2021, despite coming in under expectation. The third of the slow-moving variables, R&D spend, was flat in the final quarter of 2021 and was one of the only variables to beat its expectations.

The CIA's Q4 2021 Business Survey was the second time the CIA has collected data on energy costs and the cost associated with importing and exporting. Energy cost rises were once again felt across the board and were broadly in line with what was expected and experienced in the third quarter of 2021. The cost of importing and exporting continued to rise however at the slower rate than in the third quarter but still faster than what was expected. More respondents experienced an increase in raw material prices than did increase their output prices however both were exceptionally high. This disparity in the rise of input and output prices is reflected in the contractionary margins data, all of which has led to members feeling less optimistic in the final quarter than they did in third.

Expectations for the first quarter of 2022

Table 3 displays the diffusion indexes for what is expected for each of the 19 variables in the first quarter of 2022. The key takeaway from this table is that, after a couple quarters of slowdown and the modest growth reported in the final quarter of 2021, despite persistent and severe rises in input prices, the cost of trade and geopolitical tensions, respondents are highly optimistic for the first quarter of 2022.

Table 3

	Diffusion index Q1 prediction
Total sales	68.2
Domestic sales	60.7
Exports	63.1
EU exports	64.3
Rest of the world exports	60.7
New orders	60.0
Production levels	65.1
Employee numbers	58.0
Capacity utilisation	64.0
R&D spend	52.3
Business investment	62.8
Your level of business optimism	54.5
Time to deliver	55.7
Raw material (input) prices	89.5
Cost of importing	76.7
Cost of exporting	74.4
Your energy costs	84.1
Finished goods (output) prices	83.3
Your company / site profit margins	47.6

Strong growth is expected in total sales with a reversal of what was seen in the fourth quarter as exports are expected to perform slightly better than the domestic market. Respondents have reported in recent quarters that rest of the world exports have consistently outperformed EU exports however, despite the introduction of full customs checks between the UK and EU, this is expected to change in the first quarter of 2022. Respondents have reported that rest of the world exports recovered quicker than EU, therefore this change is likely a reflection of EU exports catching up.

Understandably after seeing the strong sales data, new order, capacity utilisation and production levels are expecting strong growth. The typically slower moving variables, employee numbers, R&D spend and business investment are expected to be less slower moving as companies struggle to recruit staff to satisfy demand and bring investment forward to take advantage of the Government's super deduction and general market conditions.

For the first time since the beginning of the pandemic respondents expect to be more optimistic in the first quarter than they were in the final however the industry is far from being without challenge, the severity of which must not be understated. The significant rises in the prices of inputs and outputs, importing and exporting, and energy are expected to continue albeit at a marginally slower pace than what was experienced in the final quarter of 2021. Time to deliver products and companies profit margins are moving in the correct direction however remain below the desired level.

Expectations for a year from now

Table 4 displays the diffusion indexes for what is expected for each of the 19 variables one year from now.

Table 4

	Diffusion index 12 month prediction
Total sales	72.7
Domestic sales	57.1
Exports	72.6
EU exports	67.9
Rest of the world exports	71.4
New orders	70.2
Production levels	72.1
Capacity utilisation	69.8
Employee numbers	61.4
R&D spend	58.3
Business investment	70.2
Your level of business optimism	64.8
Time to deliver	44.2
Raw material (input) prices	69.8
Cost of importing	66.3
Cost of exporting	62.8
Your energy costs	76.1
Finished goods (output) prices	75.6
Your company / site profit margins	57.1

The pattern of strong total sales growth driven by exports rather than the domestic market expected in the first quarter continues when looking a year ahead with the rest of the world slightly outperforming EU.

Understandably the correlation between new orders, production levels and capacity utilisation continues with all three expected to experience strong growth. The ‘slower’ variables, employee numbers, R&D spend and business investment, are all expected to grow with an investment led recovery predicted as companies undertake previously postponed investment and take advantage of the government’s super deduction.

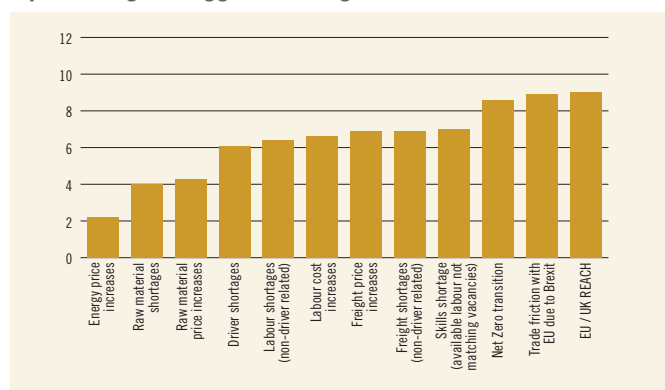
Prices are expected to continue to rise however for the first time since the pandemic began, output prices are expected to rise quicker than input prices as companies look to claw back margins missed through 2021. The reversal in the relationship between input and output price growth means margins will begin to improve and there is hope that easing of supply chain frictions will reduce companies time to deliver.

Challenges and Opportunities

The second section of the CIA’s Q4 Business Survey focused in more detail on the challenges being faced by members with a brief look at the opportunities within the industry.

The first question of this section asked respondents to rank 12 challenges faced by the industry from greatest to smallest with ‘1’ signalling the greatest issue and ‘12’ the smallest. If respondents felt one of the options was not a challenge they were provided an N/A option. Graph 13 displays all 12 challenges from greatest to smallest when looking left-to-right.

Graph 13: Challenges ranked from greatest to smallest with 1 representing the biggest challenge



Source: CIA Q4 Business Survey

This question was also asked in the CIA’s prior business survey and the responses are broadly aligned with the top four biggest issues being in the exact same order. The largest change was labour shortages and price increases are now a bigger issue than freight shortages and price increases. Energy price increases are felt to be the largest issued faced by the industry with 53.5% of respondents reporting it was the biggest challenge. Raw material shortages and raw material price increased were reported by 20.9% and 11.6% of respondents respectively to be the largest issue while 4.7% felt it was driver shortages. It’s important to note that the challenges to the right of the graph such as the net zero transition and EU / UK REACH, which currently are deemed to be the smallest challenges

of the option provided, does not mean they don’t pose a large threat to the industry. The fact they currently aren’t being as acutely felt as price increases and shortages is why they were pushed down the standings, they should not be overlooked or underestimated when discussing the future of the chemical industry.

The next question asked respondents whether the 12 challenges from the previous question were improving, worsening or remaining unchanged. Table 5 displays the diffusion indexes of the answers with figures above 50 indicating an improvement, below 50 worsening and 50 equals no change.

Table 5: Diffusion indexes

Challenge	Diffusion Index Q4	Diffusion index Q3
Raw material shortages	47.67	1.4
Labour shortages (non-driver related)	37.50	24.3
Driver shortages	42.68	12.2
Freight shortages (non-driver related)	42.50	14.3
Raw material price increases	9.30	20.3
Energy price increases	10.47	8.1
Freight price increases	21.25	23.6
Labour cost increases	10.00	13.9
Skills shortage (available labour not matching vacancies)	26.39	20.8
Trade friction with EU due to Brexit	45.83	41.7
EU / UK REACH	47.14	36.1
Net Zero transition	42.31	47.3

The data in Table 5 shows that all 12 challenges are worsening. For both energy and raw material prices 81.4% of respondents felt they were worsening while 80.0% and 60.0% of respondents felt that labour and freight costs were worsening respectively.

When asked about what the biggest near-term opportunity there was for respondents’ companies, understandable the responses were largely business specific however followed a few themes:

- 1 Increased capacity
- 2 Increased production
- 3 Increased efficiency
- 4 New products
- 5 Rebound of customer markets
- 6 Taking advantage of market conditions

In summary of the survey data, respondents to the CIA’s Q4 Business Survey reported their sixth successive quarter of sales and production growth. Growth in the final quarter of 2021 was modest and below expectation, signalling that supply chain bottle necks, energy and raw material prices, and labour shortages were beginning to weigh on production. Raw material and energy price increases were reported by 95.3% and 88.6% of survey respondents respectively in the final quarter and this broad-based rise in prices is expected to continue into the first quarter of 2022 and beyond. Respondents, however, were optimistic looking forward both 3 and 12 months that the industry will be in a better place than it currently is as many of the current challenges will have worked their way through.

Currently rising energy prices are reported to be the biggest issue faced by the industry with raw material shortages, price increases and driver shortages coming in second, third and fourth respectively. All the challenges set out for respondents are felt to be worsening with a majority 81.4% of respondents feeling that energy and raw material prices are worsening. Despite these challenges there are opportunities for UK chemical companies largely focused around increasing capacity and utilisation to take advantage of elevated demand.

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