

NOVEMBER 2022

CIA Fourth Quarter Economic Report 2022

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RESPONSIBLE CARE

Current shape of the industry

CIA

CHEMICAL
INDUSTRIES
ASSOCIATION

UK CHEMICAL INDUSTRY 2022 IN NUMBERS



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



Over **21%** of UK R&D spend



Salaries over **34.3%** higher than manufacturing and **48.3%** higher than the whole economy average



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



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

* Gross Value Added

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. This section assesses the UK chemical industry's performance against that of the wider economy and is followed by a look at what challenges lie ahead. The second section presents the results and further analysis of our own Q3 2022 Business Survey. Unless otherwise specified figures are for the chemical industry excluding pharmaceuticals.

Turbulent and uncertain are two words that are beginning to describe more and more situations in 2022. From energy markets to chemical production or UK politics to global geopolitical affairs, 2022 has been anything but business as normal.

In the last three months we have had three Prime Ministers, three Chancellors, multiple Cabinet reshuffles, numerous fiscal events surrounding energy support and tax cuts, inflation reached double digits, market intervention from the Bank of England, and the Bank of England increased interest rates to 2.25%.

While UK headline inflation reached the 40 year high of 10.1% in the year to September 2022, in the same period input prices in the manufacturing and chemical industry grew at double (20.0%) and triple (30.9%) the pace respectively. Input prices in the chemical industry have risen faster than output prices for the last 19 consecutive months inflicting sustained downward pressure on chemical producers' margins.

Despite a positive revision from the ONS, chemical production is still estimated to have fallen 9.0% between January and August 2022 however remains 3.8% above pre-pandemic levels. Internationally, between January and July 2022 the three largest chemical producing regions, China, the US and the EU experienced falls in chemical output of 2.5%, 1.7% and 6.5% respectively.

Despite slowly beginning to soften, the UK labour market remains tight with vacancies remaining over 50% higher than pre-pandemic. Despite these tight conditions pushing up pay, rises are not keeping pace with inflation which leads to a real terms fall in pay.

Turning to the survey which received responses from over half of the CIA's membership, respondents to the CIA's Q3 Business Survey reported their first fall in sales since the second quarter of 2020 when the first pandemic lockdown was in full force. Sales are expected to continue falling through the final quarter of 2022 and into 2023 before hopefully recovering in the latter half of next year.

Despite the Government's welcomed support regarding commercial energy cost this winter, energy prices remain the biggest challenge for the majority of chemical manufactures. There are serious concerns for what follows the Government's Energy Bill Relief Scheme (EBRS) and the CIA is working closely with the Department for Business, Energy and Industrial Strategy to inform the review into the scheme.

Shortage and price increases of raw materials and labour are the second and third biggest challenges facing the industry. Over 90% of respondents felt the situation surrounding labour cost increases were worsening while 79.2% and 69.2% of respondents felt the same way about energy and raw material prices.



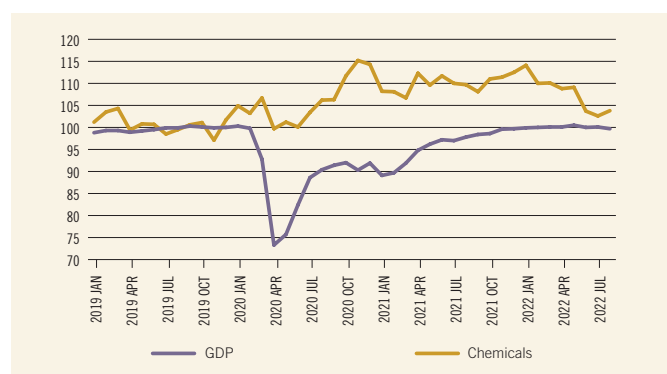
Steve Elliott
Chief Executive
Chemical Industries Association

Troubles persist through the second half of 2022

GDP and Chemical production

Since our last economic report the ONS published updated national accounts which, in line with Blue Book 2022, revised their estimates for UK GDP and production. Revisions vary in size and typically get larger with the more detailed industry you look at, aka sectors receive minor revisions while subsectors receive larger ones. UK GDP received a negative revision. UK GDP was previously thought to have fallen 9.4% in 2020 however this was revised to a 11.0% fall, the greatest annual economic contraction since the 'Great Frost' of 1709. The latest data from the ONS shows that UK GDP is yet to surpass its pre-pandemic level with output in August 2022 0.3% below pre-pandemic. Monthly consensus forecasts published by the Treasury display that the UK is expected to enter a technical recession in the final quarter of 2022. GDP is expected to have fallen 0.3% in the third quarter of the year which is predicted to be followed by a 0.5% fall in the fourth. Annually, UK GDP is expected to grow 3.9% in 2022, the fastest out of the G7 economies, before falling 0.3% in 2023.

Graph 1: Monthly index of UK GDP and chemical production, Q4 2019 = 100

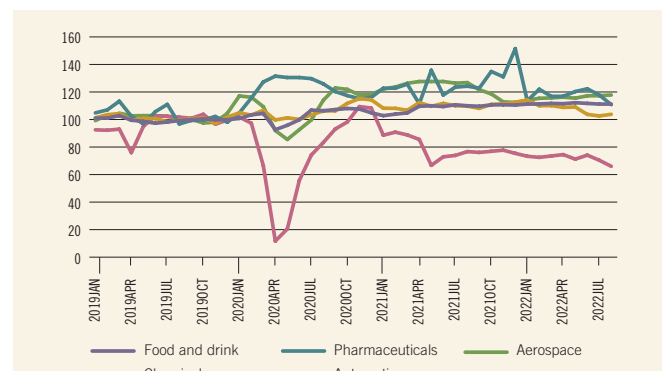


Source: CIA Analysis of ONS data

Focusing on the chemical industry, Graph 1 displays the monthly index of UK GDP and chemical production between January 2019 and August 2022 with the pre-pandemic final quarter of 2019 equal to 100. Chemical output received a positive revision however has still experienced significant falls through 2022. Chemical production fell 9.0% between January and August 2022 however remains 3.8% above pre-pandemic levels. Graph 1 highlights the fact that although the chemical industry has had a turbulent 2022, this comes after a two year period of strong growth through challenging business and economic conditions.

Graph 2 compares the chemical industry to the UK's food and drink, pharmaceutical, automotive, and aerospace industries, that along with the chemical industry are colloquially referred to as the 'Manufacturing five' or 'M5' industries.

Graph 2: Monthly index of production for the UK M5 industries, Q4 2019 = 100



Source: CIA analysis of ONS data

The aforementioned revisions to the data has significantly changed the shape and narrative of Graph 2 compared to previous editions. The percentage point (pp) difference between pre-and-post revisions for each industry's output compared to pre-pandemic is as follows:

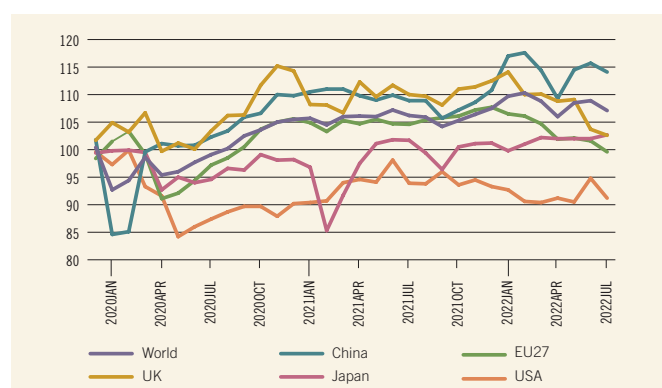
- Food and drink: +8.8pp
- Chemical: +8.0pp
- Pharmaceutical: -3.1pp
- Automotive: -19.3pp
- Aerospace: +53.0pp

The revised data for the food and drink, chemical, and pharmaceutical industry all seems feasible however it's unclear what has caused the large revisions to automotive and aerospace output. The CIA is in contact with the trade associations for these industries and will continue to monitor this data moving forward.

With that said, the latest data shows that in August food and drink, pharmaceutical and aerospace output was 11.2%, 10.8% and 17.8% higher than pre-pandemic while automotive output was 34.0% below.

Comparing internationally, 2022 has been challenging for most of the major chemical producing regions however downturns haven't been as significant as those experienced in the UK.

Graph 3: Monthly Index of Production for major chemical producing countries / regions, Q4 2019 = 100



Source: Multiple countries statistical agencies

The energy crisis triggered by Russia's illegal invasion of Ukraine has primarily affected Europe which is a large contributing factor to why the EU27 has been the worst performing major chemical producer through 2022. EU27 chemical output fell 6.5% between January and July 2022. In the same period global chemical production fell 2.3% driven by falls of 2.5% and 1.7% from China and the US respectively. Despite falling 9.0% in the period, Graph 3 highlights that the UK chemical industry was the most resilient to the pandemic downturn over the prior two years.

Prices

Rising prices, both for households and businesses, continues to be one of the greatest economic challenges. In the 12 months to September the UK's CPI inflation rose 10.1%, up from 9.9% in August and the highest level since February 1982. The Government's energy support packages for households, which is expected to cost the exchequer tens of billions of pounds, has partially insulated households against rising energy costs this Winter. In doing so it has reduced the expected peak of inflation, that is predicted to occur in October 2022, from mid-teens to around 11.0%. In an attempt to realign inflation with the Bank of England's 2% target in the mid-term, the monetary policy committee (MPC) has increased interest rates over their last seven meetings from 0.1% to 2.25%. It is likely that since the publication of this report the MPC further raised rates in their November meeting to 3.0%.

Table 1: Chemical output in January 2022 compared to pre-pandemic

Region	Latest Inflation rate (%)
Netherlands	16.8
Belgium	13.1
Italy	12.8
Germany	11.6
EU27	10.9
Euro area	10.7
United Kingdom	10.1
Ireland	9.6
United States	8.2
Spain	7.3
France	7.1
Japan	3.0
China	2.8

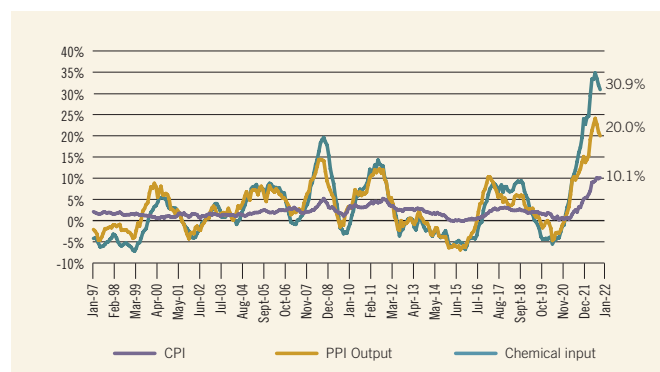
Source: Multiple countries statistical agencies

The UK is not alone, Table 1 displays the latest inflation rates for some major economies, a larger table can be found in the appendix. In response to inflation reaching 8.2% the US Federal Reserve enacted a third 0.75% increase in their federal funds rate in as many months. The target range for the federal funds rate currently sits between 3.0% and 3.25% and at the time of writing this is expected to rise to 3.75%-4% in the Fed's November meeting. In the Eurozone inflation is higher at 10.7% driven by the energy crisis. Like the central banks of the UK and EU, the European Central Bank has

responded to inflationary pressure by rising its interest rate to 1.5%

The inflation rates compared above are measured using CPI which understandably is consumer facing. As the CIA represents a manufacturing industry, we are most interested in price movements within the manufacturing sector and chemical industry itself. Focusing back on the UK, input prices in the manufacturing sector rose 20.0% in the year to September while in the same period output prices rose a lesser 15.9%. Input price growth has accelerated quicker than output for the last 24 consecutive months inflicting the greatest challenge on manufacturers' margins in decades.

Graph 4: 12-month growth rates in UK CPI, PPI input and chemical input prices



Source: CIA analysis of ONS data

Graph 4 displays a timeseries of UK CPI inflation, manufacturing input inflation (PPI input) and chemical input inflation. Waterfall graphs displaying the contributions to CPI, PPI input and PPI output, as well as tables for chemical subsector input prices and chemical output prices can be found in the appendix.

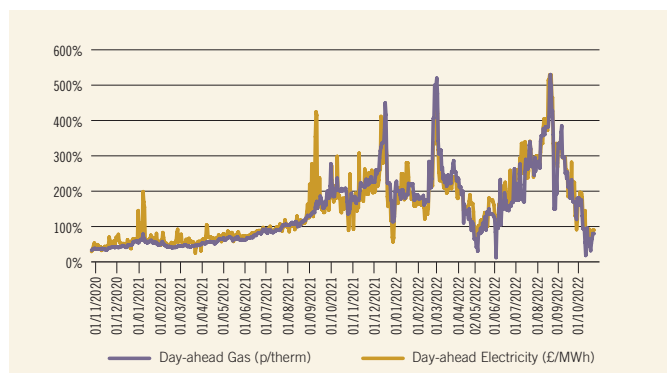
Graph 4 highlights the price pressures being experienced in the chemical industry and manufacturing sector as currently input prices in these sections of the economy are triple and double headline inflation respectively.

Focusing on the chemical data in more detail, input prices in the chemical industry rose 30.9% in the year to September while output prices rose 25.4%. Similar to the wider manufacturing sector, input prices in the chemical industry have accelerated quicker than output prices for the last 19 consecutive months. The disparity between input and output price growth in the chemical industry is larger than the manufacturing sector as chemical producers are beginning to reach the limit of passthrough of costs that doesn't completely erode their international competitiveness.

Chemical subsectors that are most reliant on raw materials from Russia, such as hydrocarbons and fertilisers, have understandably experienced the largest increase in input prices and have in turn passed through higher costs.

For the chemical industry, gas is not just a source of energy but a feedstock. Graph 5 displays the day head price for UK wholesale gas and electricity. Understandably these lines are correlated as on an average day around 40% of the UK's electricity supply is generated via burning gas

Graph 5: Day-ahead UK gas and electricity prices over the last 2 years



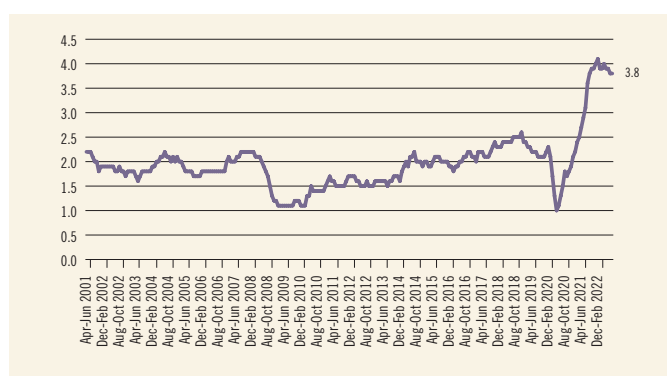
Source: CIA Energy Price Dataset / Inspired Energy

In recent weeks the price of gas has fallen as the EU finished filling up its stores and we are yet to experience a cold snap. Despite being positive in the immediate term, we are far from out of the woods as forwards contracts out till Winter 2023 remaining above 350p per therm. The Government's Energy Bill Relief Scheme should help to keep industrial gas prices around 220p per therm till April 2023 however there is lots of concern within the industry for what support will follow. Oil prices were easing before the Opec cartel decided to reduce its supply, pushing prices back up to around \$90 a barrel. The UK's cost of carbon remains above the EU's with the current differential around 20% as UK carbon costs around £70 per tonne.

Labour market

The labour market has begun to slowly soften in recent months however remains very tight. The number of people on payroll is 730,000 higher than pre-pandemic while the unemployment rate is 3.5%, the lowest level since February 1974. In spite of this, the employment rate remains 1.0 percentage point below its pre-pandemic level due to an increase in the economically inactive. Someone is economically inactive if they are aged between 16 and 64 and are not in or actively seeking work. There are 630,000 more economically inactive people currently than there were pre-pandemic. Predominantly these people are aged between 50-64 and have retired early or are long-term sick, or people aged between 16-24 and have stayed in education.

Graph 6: Manufacturing vacancies per 100 jobs



Source: CIA analysis of ONS data

Graph 6 displays the number of vacancies in the manufacturing sector per 100 employees. For the last year the number of vacancies per 100 jobs in the manufacturing sector has hovered around the 4.0 mark, significantly above the long-run average of 1.7, as demand for skilled labour outstrips supply. There were 90,000 job vacancies in

the manufacturing sector in the three months to September 2022 while in the whole economy there was 1.25 million which is over 50% higher than pre-pandemic. Staff recruitment and retention is a challenge across all areas of the economy, it is mitigated slightly in the chemical industry due to our generous pay compared to other manufacturing industries (+34.3%) and the economy as a whole (+48.3%).

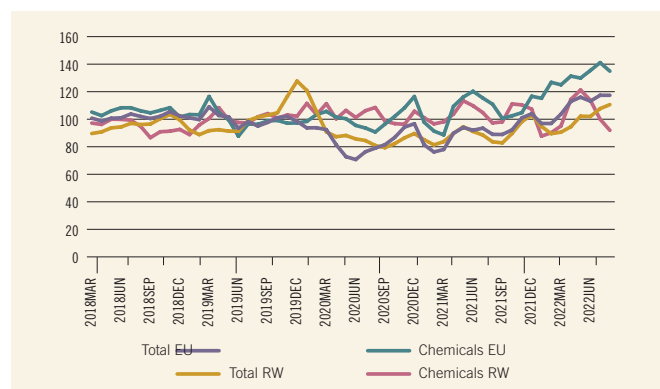
The tight labour market conditions have pushed up pay however it is not keeping pace with inflation. For the economy as a whole, growth in employees' average total pay (including bonuses) was 6.0% while growth in regular pay (excluding bonuses) was 5.4% the three months to August compared to the same period in the prior year. In real terms (adjusted for inflation), this equates to a fall in total and regular pay of 2.4% and 2.9% respectively. In the manufacturing sector, growth in employees' average total pay was 4.4% and growth in regular pay was 4.6%, real terms falls of 4.0% and 3.8% respectively. In the chemical industry growth in pay was stronger. Employees' average total pay grew 6.2% while regular pay grew 6.4%, real terms falls of 2.2% and 1.9% respectively.

Trade and investment

Trade and investment data are published monthly and quarterly respectively and are often volatile which leads to large revisions moving forward. Fair assessments of UK trade on both a macroeconomic and industry level have been challenging in recent years as postponed Brexit dates, end of transition periods, initiation of full customs checks, lockdowns, and global trade frictions have had material impacts on the data. It is worth bearing in mind how these events may cause a base effect when comparing current trade levels to prior periods.

With that said, Graph 7 displays the rolling three-month average index of chemical and total UK exports to the EU and rest of the world (RW) where the average monthly level in 2019 = 100.

Graph 7: Three-month rolling average of chemical and total UK exports to the EU and Rest of the World (RW), 2019 = 100



Source: CIA analysis of ONS data

Before scrutinising the data in Graph 7 it is important to note three further points:

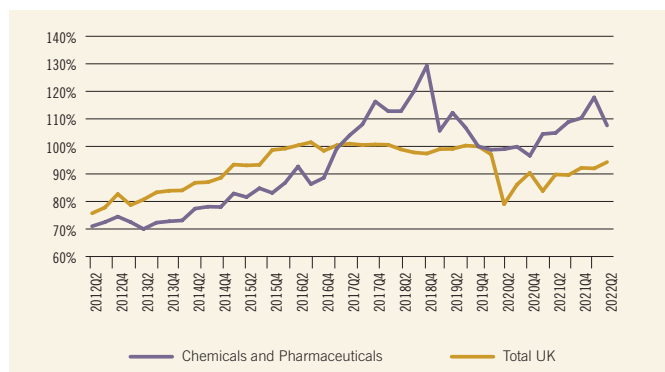
- 1) The trade data published by the ONS is in current prices and therefore does not account for inflation. Consequently, a proportion of the apparent rise in chemical exports between 2019 and 2022 can be attributed to an increase in prices.
- 2) Comparing actual monthly data to a previous year's monthly average, as is done in the graph above, doesn't account for seasonal adjustments.

3) Monthly trade data, especially at an industry level, is inherently volatile and is often subject to revisions moving forward.

Nevertheless, it is clear through the pandemic chemical exports were more resilient than total UK exports. Through 2022 there has been a sharp rise in the value of chemical exports to the EU driven by trade with Ireland, the Netherlands and Belgium. Conversely, the value of exports to the rest of the world have fallen sharply in recent months due to a fall in exports to US. Throughout this period there has been a steady rise in total UK exports to both the EU and rest of the world however this has not kept up with imports which has increased the UK's trade deficit.

Despite the challenges posed the chemical production through 2022, investment remains resilient.

Graph 8: Quarterly index of total UK and chemical and pharmaceutical business investment, Q4 2019 = 100



Source: CIA analysis of ONS data

Graph 8 displays the quarterly index of business investment for the chemical and pharmaceutical industry and UK as a whole over the last decade. The ONS does not provide data for business investment for the chemical and pharmaceutical industry separately. Despite falling 8.6% to £1.45 billion in the second quarter of 2022, chemical and pharmaceutical investment remained 7.6% above pre-pandemic levels. Total UK business investment rose 2.5% to £53.4 billion however remains 5.7% below pre-pandemic. Business investment is expected to fall in the second half of 2022 as companies protect cashflows ahead of a challenging Winter.

Rounding up the official data

In summary of the official data, the ONS has positively revised its estimates of chemical production through 2022 however it has still been a challenging year. Chemical output between January and August 2022 fell 9.0% however remains 3.8% above pre-pandemic levels. The CIA forecasts that UK chemical production will fall 3.5% on an annual basis in 2022 before a modest 1.0% growth in 2023. Despite experiencing the sharpest fall through 2022, there have been global headwinds for chemical production highlighted by the fall in chemical output between January and July in the EU, US and China of 6.5%, 1.7% and 2.5% respectively. It is also important to note that UK chemical output grew quicker in the prior two years than these regions.

Prices remain elevated which is a situation that is expected to continue through 2023. The UK's headline rate of inflation is in double digits, input prices in manufacturing sector have risen by over 20% for the last six consecutive months while input prices in the chemical industry have risen by over 30% for the last six consecutive months. The gap between chemical input and output price growth is 5.5 percentage points as chemical producers begin to reach the limit of passthrough. This comes off the back of 19 consecutive months where input prices in the chemical industry have grown quicker output prices, inflicting sustained downward pressure on margins.

The labour market remains tight and despite signs of softening, this is not a situation that is expected to materially change in the near term.

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.

The CIA's Q3 2022 Business Survey was live between 26 September and 7 October 2022 and received responses from over 50% of CIA membership. This edition of the survey was split into three sections. The first and second sections contained the standard industry performance and challenges & opportunities questions. The third section focuses on the Energy Bill Relief Scheme (EBRS), aspects of the 'Mini-Budget', and rising interest rates. 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 third quarter of 2022 compared to the second and what member's expectations were for these variables in the final 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. 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 third quarter, the second column contains the diffusion index for what was expected for the third quarter when respondents were asked in the CIA's Q2 2022 Business Survey, and the third column contains the diffusion index for the performance in the second quarter of 2022. This allows comparisons to be made between the performance in the second quarter of 2022 compared to expectations and the prior quarter.

Table 2

	Q3 Actual	Q3 Expected	Q2 Actual
Total sales	43.1	48.9	57.4
Domestic sales	39.6	41.5	47.9
Exports	41.5	48.9	53.3
EU exports	37.7	43.6	51.1
Rest of the world exports	44.3	48.9	51.1
New orders	38.7	45.7	53.3
Production levels	33.7	53.2	48.9
Capacity utilisation	35.6	51.1	48.9
Employee numbers	49.0	50.0	52.1
R&D spend	51.9	46.8	51.1
Business investment	51.0	55.3	57.4
Energy costs	88.2	75.5	84.0
Input prices	81.1	79.8	93.6
Output prices	88.5	77.7	88.3
Cost of importing	77.9	75.5	89.4
Cost of exporting	71.7	74.5	86.2
Time to deliver	52.9	56.4	60.6
Margins	33.0	44.7	45.7
Optimism	32.1	36.2	35.9

Source: CIA Q3 Business Survey

Key take away

- Survey respondents reported their first fall in sales since the second quarter of 2020 as performance deteriorated quicker than expected.

After eight successive quarters of sales growth, respondents to the CIA's Q3 2022 Business Survey reported their first fall in sales since the height of the pandemic. A fall in sales was predicted for the third quarter of the year however the magnitude of the fall was larger than expected. The domestic market fared worse than exports with the rest of the world being a more resilient market than the EU. A fall in new orders highlights weakening demand for chemicals as economic activity slows. Production levels and capacity utilisation contracted in line with the falls in sales and orders.

It was positive to see that despite the fall in sales, orders and production, that employee numbers, R&D spend, and business investment largely remained unchanged. This is understandable however as these three variables are often referred to as the 'slower moving variables' as they tend to have the least volatility quarter-on-quarter due to plans being made on a multiyear basis.

It is unlikely to be a shock to anyone that costs continue to rise however, for the first time since prices started rising, more respondents reported increasing their output prices (80.8%) than experienced an increase in their raw materials (78.4%) however margins continued to fall. Further energy prices rises were reported by nearly 80% of respondents while increases in the cost of importing and exporting were cited by 59.6% and 49.1% of respondents respectively. Delivery times steadied however this comes after two years of increases. With all this data in mind, chemical business leader's optimism fell in the third quarter.

Expectations for the fourth quarter

Table 3 displays the diffusion indexes for what is expected for each of the 19 variables in the final quarter of 2022.

Table 3

	Q4 Expectation
Total sales	40.6
Domestic sales	32.1
Exports	37.7
EU exports	35.8
Rest of the world exports	40.6
New orders	36.8
Production levels	39.6
Capacity utilisation	40.4
Employee numbers	52.8
R&D spend	50.0
Business investment	44.2
Energy costs	76.0
Input prices	76.0
Output prices	73.5
Cost of importing	73.1
Cost of exporting	70.8
Time to deliver	50.0
Margins	34.6
Optimism	34.0

Source: CIA Q3 Business Survey

Key take away

- CIA members are expecting the fall in sales experienced in the third quarter of 2022 to accelerate into the fourth.

The domestic market is expected to continue to perform worse than exports with rest of the world again faring better than the EU, however sales to all regions are expected to fall. Order books are expected to continue to weaken leading to further falls in production and capacity utilisation.

As was experienced in the third quarter, in spite of weakening performance, employee numbers and R&D spend remain resilient. Conversely, business investment is expected to experience a modest fall in the final quarter of the year as companies attempt to preserve cash flows during a challenging Winter period.

Costs are predicted to continue rising with the return of the relationship that more companies experience an increase in raw material prices (67.3%) than do raise their output prices (58.8%) causing margins to tumble even further. Despite the Government's Energy Bill Relief Scheme, 61.5% of respondents expect energy costs to continue rising in the final quarter. Time to deliver should steady however 50.0% and 45.3% of respondents expect further increases in the cost of importing and exporting. Somewhat unsurprisingly, optimism among chemical business leaders continues to tumble.

Expectations for twelve months' time

When the CIA presented the following findings back to survey respondents it was broadly expressed by members that all forecasts looking out further than three-to-six months come with high levels of uncertainty and may well be subject to large revisions. Therefore, the data in Table 4 and accompanying comments should be used as a gage of the sentiment of the industry rather than rigid forecasts.

Table 4

	12-month prediction
Total sales	51.9
Domestic sales	44.2
Exports	48.1
EU exports	47.2
Rest of the world exports	49.1
New orders	53.8
Production levels	53.8
Capacity utilisation	53.8
Employee numbers	50.0
R&D spend	51.9
Business investment	49.1
Energy costs	75.5
Input prices	66.0
Output prices	65.1
Cost of importing	68.9
Cost of exporting	65.4
Time to deliver	47.1
Margins	37.7
Optimism	46.2

Source: CIA Q3 Business Survey

Key take away

- Respondents hope that the fall in sales experienced in the second half of 2022 will recover by the second half of 2023.

Although an expected increase in sales is a positive indication, it is unclear which region will be the driving force as a fall is expected

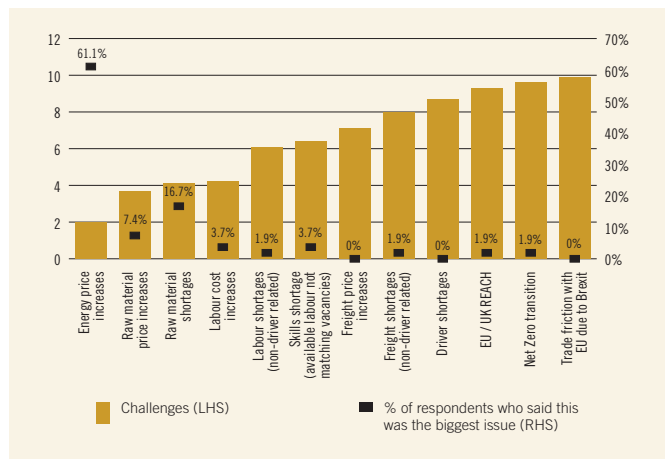
in the domestic market, EU, and rest of the world. New orders, production levels and capacity utilisations are expected to experience modest improvements as the economic climate hopefully stabilises and inventories replenish. The slower moving employee number, R&D spend, and business investment variables are expected to continue with their steady nature.

CIA members feel that the price increases experienced in energy costs, raw materials, importing, exporting, and output, are here to stay over the next 12 months. Lead times are expected to experience modest improvements while margins continue to fall.

Challenges and Opportunities

The second section of the CIA's Q3 Business Survey focused in more detail on the challenges being faced by members which was then followed by a look at the opportunities that members identify. The first question in 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.

Graph 9: Biggest challenges – small the blue bar, bigger the challenge!



Source: CIA Q3 Business Survey

This question has been asked in the last five CIA business surveys and the top three issues have remained unchanged, although there has been some jostling for position between second and third. Energy prices remains the largest current issue faced by the industry with over 61% of respondents reporting it to be the single biggest challenge. Raw material price increases and shortages were second and third with 7.4% and 16.7% of respondents reporting them as the largest issue respectively.

Labour costs and shortages remain the fourth and fifth largest issues, cementing the challenges surrounding recruitment and retention as one of the largest challenges currently facing the industry.

It is crucial to note that the challenges deemed the 'smallest' in this data still pose a serious threat to the industry in the mid-to-long term. They however are not being felt as acutely as the soaring input costs and supply frictions. It is therefore important that these challenges, including REACH, the net zero transition, and trade friction with the EU, are not underestimated. This point was reiterated by CIA members when they were presented with the data and the CIA will continue work in these areas opposite government and other stakeholders.

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
Energy price increases	13.2
Raw material price increases	21.2
Raw material shortages	46.1
Labour cost increases	4.9
Labour shortages	34.0
Skills shortage	29.0
Freight price increases	31.4
Freight shortages	53.5
Driver shortages	57.9
EU / UK REACH	44.6
Net Zero transition	47.8
Trade friction with EU due to Brexit	48.9

Source: CIA Q3 Business Survey

Understandably, the largest current challenges are predominantly felt to be worsening while the longer-term challenges are predominantly remaining unchanged. Just over 90% of respondents felt the situation surrounding labour cost increases were worsening while 79.2% and 69.2% of respondents felt the same way about energy and raw material prices. It was positive to see that driver and freight shortages were felt to be improving. Hidden within the contractionary diffusion indexes for EU / UK Reach, net zero, and Brexit trade friction is that 89.1%, 87.0% and 97.8% of respondents respectively said that these challenges remained unchanged.

Moving onto opportunities, when asked what the biggest near-term opportunity was for respondents' companies / sites, understandably the responses were largely business specific however followed a few themes:

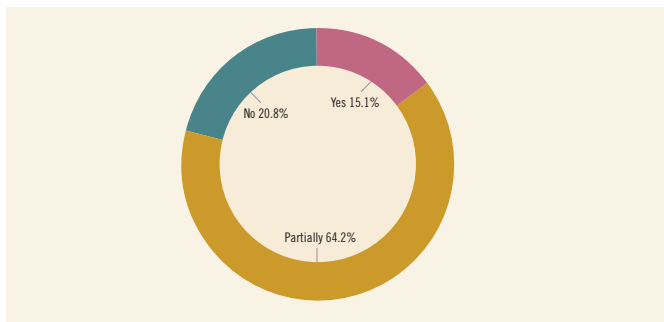
- 1) Improve energy efficiency
- 2) New products / projects
- 3) Increasing capacity / production
- 4) Growth in end markets

Given the state of the energy market it is understandable that members see energy efficiency as an area of opportunity. It was positive to see that some members felt that there were opportunities to increase output or bringing new products to market.

The Energy Bill Relief Scheme, 'Mini-Budget', and Interest Rates

The final section of the survey focused on the Government's Energy Bill Relief Scheme (EBRS), 'Mini-Budget' and rising interest rates.

Graph 10: Does the Energy Bill Relief Scheme provide sufficient support?



Source: CIA Q3 Business Survey

When asked whether the EBRS provided sufficient support for their business / site, 64.2% of respondents reported 'partially', 15.0% said yes and the remaining 20.8% said no. The chemical industry is diverse, made up of both energy intensive businesses and non-energy intensives as well as companies who use gas as a feedstock. The diversity of the industry explains the range of responses displayed in Graph 10.

The main concern surrounding the scheme is what comes next once the six-month deadline is concluded. The Government is expected to publish in early January 2023 a review into the EBRS which should detail what level of support will follow it and who will be eligible. The CIA is working closely with the Department for Business, Energy and Industrial Strategy to inform the review to make sure adequate support is provided for the chemical industry and other manufacturing industries following the conclusion of EBRS.

Respondents acknowledged that any price support improves international competitiveness however highlighted that the price promised by the scheme only makes us as competitive as the EU. UK energy prices remain tenfold higher than in the US and significantly higher than the Far East – the two largest chemical manufacturing regions.

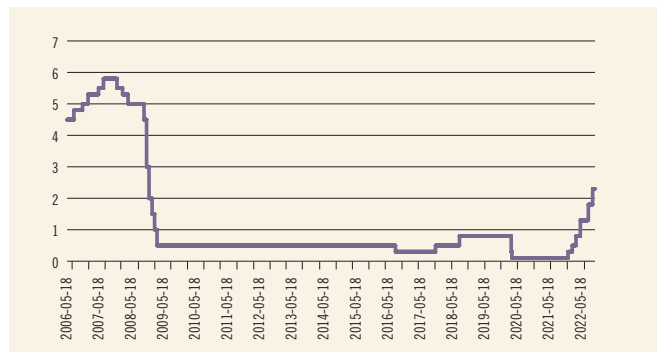
Moving onto the 'Mini-Budget', responses to the survey were collected before the former Chancellor, Kwasi Kwarteng, left office and therefore before the current Chancellor, Jeremy Hunt, rolled back most of the measures from the Budget. The areas of the Budget that the CIA collected data on, the Annual Investment Allowance (AIA) and Investment Zones, happen to be some of the only areas that survived the rollback.

Currently the AIA is £1 million per year which was a temporary increase from its £0.2 million level. It was announced in the Budget that the AIA will stay at £1 million permanently. When asked how this would impact investment decisions, 88.5% of respondents reported it would cause no change with the remaining 11.5% split evenly between it causing a permanent or temporary increase. The common theme around this question was that members would invest if they needed to, government policy had little impact on that decision but was a welcome bonus.

Up to 40 Investment Zones were planned to be spread across regions of the UK. It is thought that these are still under consideration however the total amount is likely to be smaller. Investment Zones feel like Freeports with a new name and are expected to deliver the same economic benefits as well as experience the same economic challenges. When asked about Investment zones, 81.6% of respondents said regardless of their

location it would have no impact on operations or investment levels. The remaining 18.4% of respondents reported that if they were already in the zone then they'd likely increase investment. No respondents said they'd move into the zone if they were located outside which is understandable given the logistics of moving any aspect of a chemical manufacturing plant.

Graph 11: UK Interest rate



Source: Bank of England

The final question in the survey asked respondents if the rising interest rates impacted their investment decisions. Given the asset rich nature of the industry as well as the high level of overseas ownership, only 9.8% of respondents reported that rising interest rates would impact investment decisions. The remaining 90.2% of respondents cited other business conditions as the cause of any change to investment levels.

Final thoughts on the survey

Respondents to the CIA's Q3 Business Survey reported their first fall in sales since the second quarter of 2020 when the first national lockdown was in full effect. This fall is expected to continue through the final quarter of 2022 and into the first half of next year. Employee numbers, R&D spend, and business investment levels which tend to be decided on a multi-year basis remain resilient as sales fall however a modest fall in business investment is expected in the final quarter of 2022 as companies preserve cashflows.

Continuing the theme witnessed in recent surveys, cost pressures continued to rise in the third quarter of the year and are not expected to reverse in the coming quarters. Output prices cannot keep pace with the rising cost of energy, raw materials, and trade leading to a significant squeeze on margins.

It is near impossible to accurately predict business conditions in 12-months' time however chemical producers are hopeful that the fall in sales experienced in the second half of 2022 will have recovered by the second half of 2023.

Energy costs remain the largest challenge for chemical manufacturers, raw material costs and shortages, and labour costs are the second, third and fourth biggest challenges facing the industry. The situation surrounding labour costs was felt to be worsening by 90.2% of respondents while 79.2% and 69.2% felt the same about energy and raw material prices respectively.

Turning to the 'Mini-Budget' and EBRS, only 15.0% of respondents feel the EBRS provides sufficient support while there are big concerns about what comes next. The £1,000,000 AIA and announcement of Investment Zones have received a rather muted response from membership. Changes in investment decisions are being dictated by market forces rather than the rising of Bank Rate.

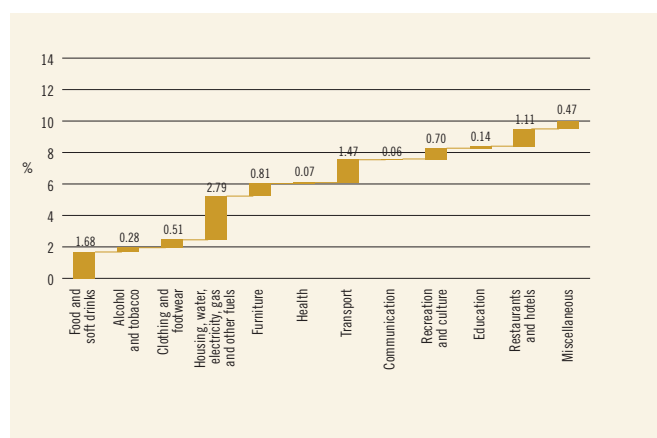
Appendix 1

Region	September Inflation rate (%)	Region	September Inflation rate (%)
Zimbabwe	280.0	Euro area	10.7
Sudan	125.0	Portugal	10.6
Turkey	83.4	Slovenia	10.3
Argentina	78.5	Sweden	10.3
Estonia	22.4	United Kingdom	10.1
Lithuania	22.0	Greece	9.8
Latvia	21.8	Ireland	9.6
Hungary	20.7	Luxembourg	8.8
North Macedonia	18.5	Mexico	8.7
Czechia	17.8	Cyprus	8.6
Netherlands	16.8	Finland	8.4
Poland	15.7	United States	8.3
Bulgaria	15.6	Norway	7.7
Slovakia	14.5	Malta	7.5
Russia	13.7	India	7.4
Serbia	13.6	Spain	7.3
Romania	13.4	Brazil	7.2
Belgium	13.1	France	7.1
Italy	12.8	Canada	7.0
Croatia	12.6	Iceland	5.9
Germany	11.6	Switzerland	3.2
Austria	11.5	Japan	3.0
Denmark	11.1	China	2.8
EU27	10.9		

Source: Multiple countries statistical agencies

Appendix 2

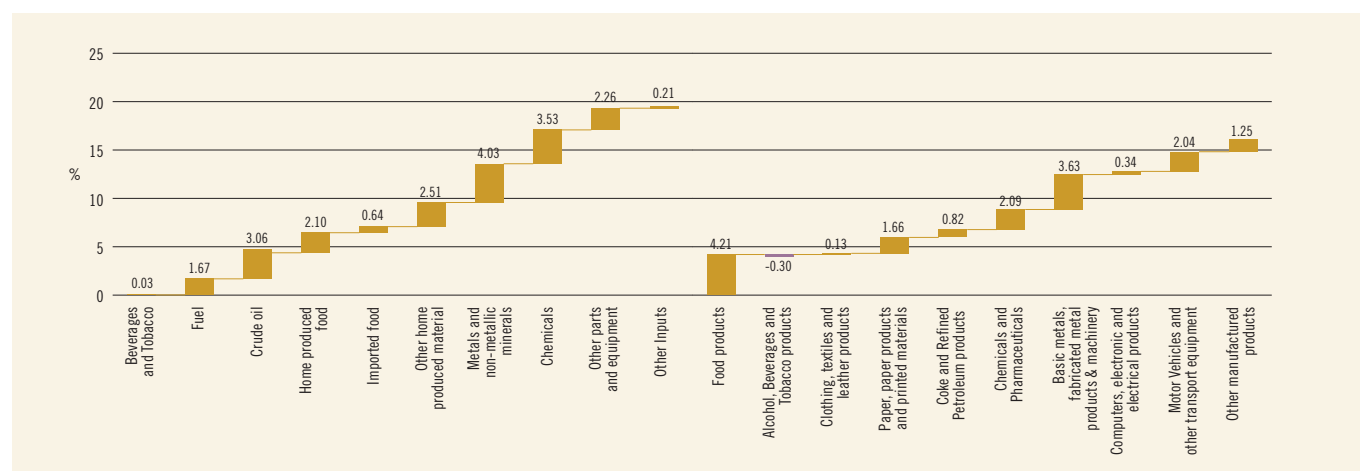
Contribution to September's 10.1% inflation rate



Source: CIA analysis of ONS data

Appendix 3

Contributions to September's 20.0% and 15.9% increase in manufacturing input and output prices



Source: CIA analysis of ONS data

Appendix 4

Chemical subsector	12-month growth of input prices in chemical subsectors
Industrial Gases; Other Inorganic Chemicals; Fertilisers & Nitrogen Compounds	49.7%
Petrochemicals	32.6%
Dyes & Pigments, Pesticides and Other Agrochemicals	27.9%
Paints, Varnishes and Similar Coatings	20.9%
Other Chemical Products	19.1%
Soap and Detergents, Cleaning and Polishing Preparations, Perfumes and Toilet Preparations	17.7%

Source: CIA analysis of ONS data

Appendix 5

Chemical product	12-month growth of output prices for chemicals manufactured in the UK
Fertilisers & Nitrogen Compounds	84.6%
Other Basic Inorganics	63.3%
Glues	37.0%
Other Basic Organics	24.8%
Dyes and Pigments	24.6%
Soap, Detergents, Cleaning & Polishing	23.0%
Plastics in Primary Form	17.8%
Paints, Varnishes & Similar Coatings	13.2%
Other Chemical Products	9.7%
Perfumes & toilet Prep	2.3%

Source: CIA analysis of ONS data

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