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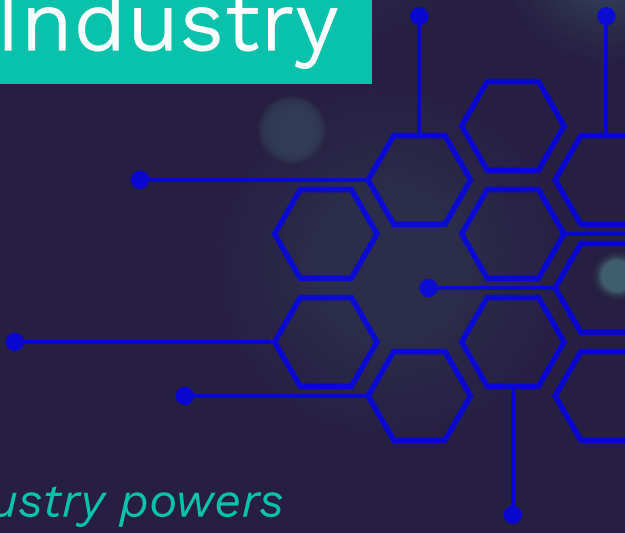
Fuelling Future Innovation:

Venture Capital in the Chemical Industry



The chemical industry powers everything, from medicine to mobility.

Yet in Europe, it's under siege: cost pressures, regulatory burdens, and fierce global rivals are eroding its competitive edge. With China and the Middle East rising fast, **will Europe lose another core pillar of its economy?** This whitepaper explores how we can turn **today's crisis into tomorrow's opportunity.**

Introduction

Chemicals are essential building blocks of our everyday life and experience a **steadily growing market**. Including a wide range of products, from plastics and pharmaceuticals to fertilizers and fuels, global turnover amounted to an estimated **USD 5.6 trillion** in 2024.[1]

With over EUR 200 billion annually[2], it ranks among the **top three largest industries in Germany by revenue**, home to global leaders like BASF, Bayer, Evonik, Covestro, and Lanxess or FUCHS.

However, the German chemical industry is increasingly confronted with **enormous challenges**. The end of cheap Russian gas has dramatically **increased production costs**, forcing companies like BASF and Evonik to scale back operations. The European Union's active **regulation** continues to bring additional challenges to the table.

Sustainability requirements and their uncertain future are threatening core business models of an industry that is responsible for more than **5.8% of emissions globally**.[3]

While over here, these challenges add up to existing competitive disadvantages such as high labour cost, long permission timelines, and high environmental standards, the **chemical industry is flourishing in other regions** of the world, such as **Asia and the Middle East**.

[1] Own calculation based on: https://www.americanchemistry.com/chemistry-in-america/news-trends/blog-post/2024/solid-economy-provides-boost-to-chemical-production
[2] https://www.vci.de/vci/downloads-vci/publikation/chiz-historisch/chemiewirtschaft-in-zahlen-2024.pdf, page 44.
[3] https://ourworldindata.org/ghg-emissions-by-sector.

China alone has increased its global market share f**rom 19% to 43%** between 2008 and 2023[4], while **Europe** is on a **steady decline**.

At the same time, **foreign players** are exploiting the favour of the hour, rapidly **expanding into the European market** and acquiring what were once the crown jewels of European industry.

For example, Abu Dhabi-based company **Adnoc** is increasing its stake in OMV/Borealis and **acquired Covestro** for USD 16 billion.

Automotive's crisis alone is already devastating.

Should we now risk losing yet another pillar of the German economy?

Europe's global dominance in the past and nowadays' wealth were always rooted in leading the global race for technological progress.

While **China and the US** are competing heavily in **frontier technologies** such as AI and Industrial Automation, Europe is now experiencing a **unique window of opportunity** to reclaim its leading position **in areas like the chemical sector**.

In the end, this might be one of Europe's current opportunities to keep up in the global race, **defend its values and preserve stable supply chains.**

[4] CEFIC The Competitiveness of the European Chemical Industry, page 75.

State of the European Chemical Industry

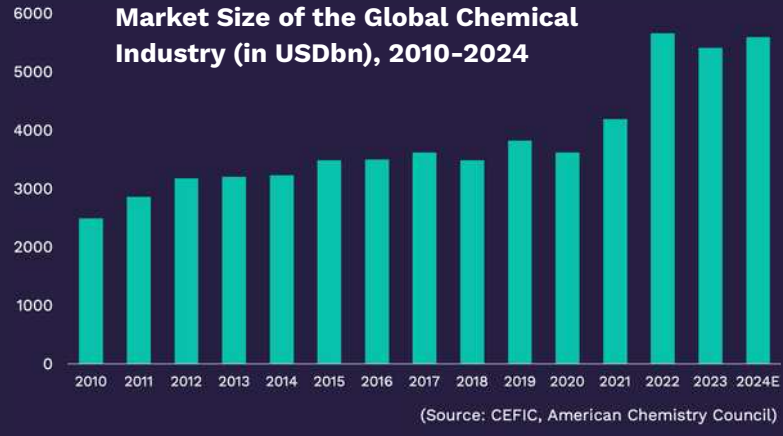
The chemical industry is **pivotal** in the global economy, serving as a cornerstone for numerous sectors, including manufacturing, agriculture, and healthcare.

It is a broad industry that incorporates all different types of product-producing industries whose generation is based on heavy use of chemicals.

With an estimated global market size of **USD 5.6 trillion in 2024**, it contributes significantly to economic growth and technological advancement.

Regionally speaking, **Asia** produces the **largest share** of the global chemicals market by far.

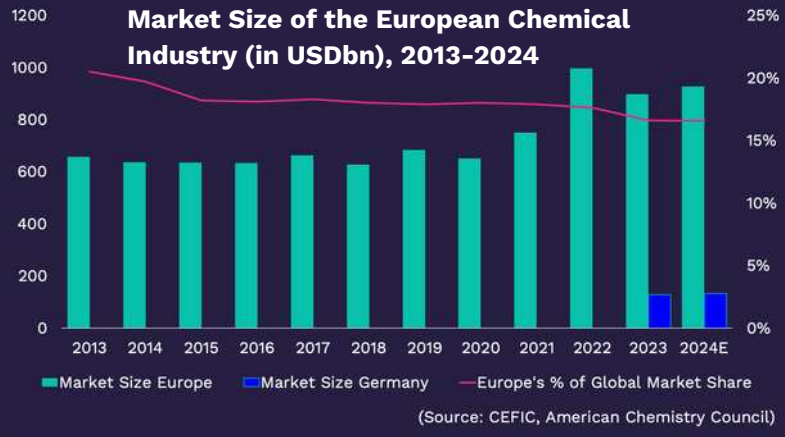
It has consistently accounted for **more than 50%** of the global chemicals market since 2012.[5]



[5] https://www.statista.com/statistics/302081/revenue-of-global-chemical-industry/.

Europe accounted for around **17%** of global market share in 2024, with an estimated market size of **USD 927 billion**.

However, Europe's share in the global chemical market has **declined by around 4%** between 2013 and 2024.



Within Europe, **Germany** has the **largest share** and accounted for around **27%** of the European chemical market in 2023.

Its market size was **USD 129 billion** in 2023, and it was estimated to be **USD 133 billion** in 2024.[6]

The chemical industry traditionally encompasses a diverse range of **sectors**, including **petrochemicals**, **basic inorganics** (other inorganics, industrial gases and fertilizers), **polymers** (plastics, synthetic rubber and man-made fibers), **specialty chemicals** (dyes & pigments, crop protection, paints & inks and auxiliaries for industry) and **consumer chemicals**. In the following, petrochemicals, basic

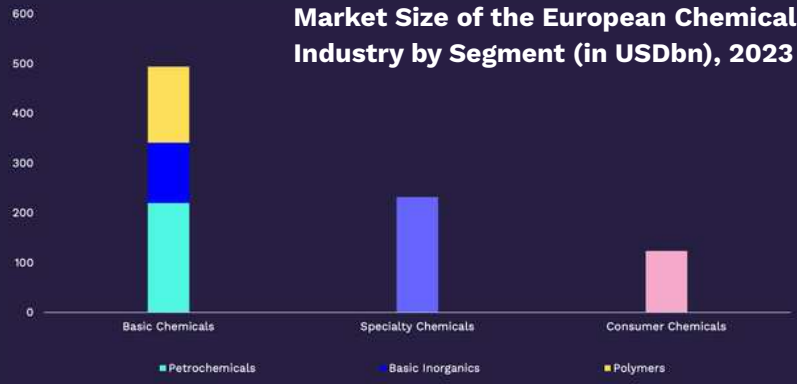
[6] CEFIC Data Files 2024 Facts and Figures.

inorganics and polymers are collectively referred to as basic chemicals. With a market size of around **USD 494 billion** in Europe in 2023, basic chemicals account for the largest of these sectors.[8]

resulting **sanctions** have affected Germany's chemical industry to this day.

An **embargo** on **cheap** Russian **oil and gas** made producer price indices soar.

Market Size of the European Chemical Industry by Segment (in USDbn), 2023



(Source: CEFIC,)

Challenges of the Chemical Industry

In February 2022, **Russia** invaded **Ukraine**, and the

Inorganic basic chemicals experienced an increase of up to **61.5%**, while the **producer price index** rose around **24.6%** for the overall industry compared to 2021.[9]

Timing could not be worse,

[8] CEFIC Data Files 2024 Facts and Figures.
[9] https://www.vci.de/vci/downloads-vci/publikation/chiz-historisch/chemiewirtschaft-in-zahlen-2024.pdf, page 24f.

since these **dynamics** add up to an already increasingly difficult environment for chemical production in Europe.

In the last 30 years, **China** has **emerged** as the global **manufacturing powerhouse**, increasing its share in world's gross output **from 5% to more than 35%**, while other **G7 nations** are on a steady decline.[10]

In chemicals, the shift is even more distinct: **Europe's** global market share **declined from 23% to 13%** between 2008 and 2023, while **China's** piece of the cake **grew from 19% to 43%**.[11]

China's generally rapid **economic development** and corresponding **rise of domestic demand** has been substantial for this. Another driver is the dwindling **global competitiveness of** European industry, not only resulting in reduced exports, but also in a rising share of **imports to cover the scarcely growing local consumption.**

Consequently, Europe is experiencing a historic exodus of its chemical industry.

Absolute production volumes have **decreased by 21%** since 2021 and increasingly deviate from manufacturing, something that has not happened for more than 20 years.[12]

Utilization rates of only **around 75%** fundamentally challenge the industry's unit economics and result in a growing number of **plant closures**. In recent years,

[10] https://cepr.org/voxeu/columns/china-worlds-sole-manufacturing-superpower-line-sketch-rise?utm_source=chatgpt.com.
[11] CEFIC The Competitiveness of the European Chemical Industry, page 75.
[12] https://ec.europa.eu/eurostat/databrowser/view/env_chmhaz/default/table?lang=en.

these dynamics have even notably accelerated, with **21** major sites and **11 million tons** of production capacity **announced to close in 2023/24**.[13]

At the same time, China's chemicals market is growing rapidly at **13%** CAGR, attracting significant investment from both local and foreign players.

BASF, for instance, is currently building a new Verbund site in Zhanjiang (Guangdong province) in South China, which represents the **largest foreign investment in BASF's history**.[14]

In the next years, they increasingly focus on high growth markets such as China, planning to invest around **€16 billion** between 2025 and 2028.[15]

With more than EUR 155 billion investment in property, plant and equipment in 2023[16], China already surpasses investment in all other regions of the world combined.[17]

Since the **Paris Agreement** in 2015, **Europe** has further built a reputation as the official **world champion in climate regulation**.

Adding to already high environmental standards, such as REACH, this regulation progressively evolves into a **major threat to domestic manufacturing**.

In particular, **Phase IV of the EU Emissions Trading Scheme (ETS)**, a cap-and-trade system for CO_2 emissions, induces **rising pressure** on domestic chemical production.

[13] CEFIC The Competitiveness of the European Chemical Industry, page 7.
[14] https://www.basf.com/global/en/who-we-are/organization/locations/asia-pacific/our-engagement-in-china.
[15] https://report.basf.com/2024/en/_assets/downloads/entire-full-report-basf-ar24.pdf?h=bgn5lq-I.
[16] https://www.vci.de/ergaenzende-downloads/kb-china-2024-en.pdf.
[17] https://itif.org/publications/2024/04/15/how-innovative-is-china-in-the-chemicals-industry/.

Chemical manufacturing alone is one of the key emission sources, responsible for **5.8% of global GHG emissions**.[18]

Considering the vast impact of **fuels** as one of their major product groups, the number is even higher. If these emissions are not reduced, companies are confronted with **mounting costs** for their operations in Europe, with carbon becoming a major financial line item.

European Trading System (ETS)[19]

- Cap on chemical company's total CO_2 emissions.
- Allowances are reduced every year.
- Carbon price of €60-100/ton.

At the same time, **retrofitting existing plants** for any measures to reduce emissions comes at a huge cost and is rarely economically viable.

While technological solutions for emission reduction are often already available, their **unit economics can't yet compete with established processes**.

Alternatives, such as point-of-source **carbon capture**, increasingly turn out to be an overall cheaper scenario compared to redesigning entire branches of the value chain.

Consequently, the chemical industry still screams for **solutions that decrease production costs** and **add to the sustainability goals.**

[18] https://ourworldindata.org/ghg-emissions-by-sector.
[19] https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/about-eu-ets_en#what-is-the-eu-ets.

Startups as Innovation Booster

Startups have a Promising Chance in the Chemical Industry

Chemical startups possess distinct **advantages in developing and commercializing sustainable technologies**.

Their agility and innovation-focused culture enable them to adapt **quickly to market demands and regulatory changes**, facilitating rapid pivots towards sustainable solutions.

This flexibility allows startups to develop novel, environmentally friendly chemical processes and products that larger corporations with more established product lines might overlook.

Moreover, startups have the unique opportunity to **build their brand identity around sustainability** from inception.

This approach appeals to environmentally conscious stakeholders, including consumers, investors, and potential business partners.

By leveraging their sustainable practices for competitive advantage, startups **can command premium pricing for their eco-friendly offerings**, creating a strong value proposition in an increasingly environmentally aware market.

Overcoming Industry-Specific Challenges

Despite these advantages, chemical startups face **significant obstacles** in scaling production and establishing market presence.

Scaling production often requires **substantial capital investments** in specialized **equipment and facilities**.

Additionally, the **complexity of process optimization** and **quality control** at industrial scales presents a considerable challenge and specific knowhow.

Startups must also navigate stringent **regulatory compliance and safety considerations** inherent to chemical manufacturing processes.

To mitigate these challenges, startups employ various strategies.

Many opt to **utilize contract manufacturing organizations (CMOs)** to minimize initial capital expenditure. This approach allows startups to **focus** their resources **on research and development** while leveraging **existing manufacturing infrastructure.**

Another common strategy involves **targeting niche markets or applications** for an initial go-to-market strategy. This focused approach allows startups to **establish credibility and generate initial revenue streams**, providing a foundation for future expansion.

Additionally, **forming strategic partnerships** or

securing investments from established chemical companies can provide startups with valuable resources, expertise, and market access.

Collaborations between startups and established chemical companies offer reciprocal benefits. For startups, these partnerships can provide **access to industrial-scale expertise and production facilities**, **established distribution networks, and customer relationships.**

They may also open doors to **strategic investment or acquisition opportunities**. Established companies, in turn, gain **access to innovative technologies and agile research and development processes**.

These partnerships allow them **diversifying their product portfolios** with sustainable offerings and **reducing internal R&D budgets** in times of harsh economic environments, besides **enhancing their corporate image** through association with innovative startups.

Several successful collaborations illustrate the potential of these partnerships.

BASF, for example, partnered with Pyrum Innovations to source pyrolysis oil from recycled tires for sustainable chemical production, supporting circularity and industrial scaling.[20]

Similarly, **Bayer** intends to use IonKraft's plasma technology for coatings on its agricultural packaging as part of their collaboration.[21]

[20] https://www.pyrum.net/corporate-news/basf-unterstuetzt-pyrum-in-der-finanzierung-des-aktuellen-rollout-plans-mit-zunaechst-25-mio-eur-2/.
[21] https://www.handelsblatt.com/unternehmen/industrie/energie-plasma-koennte-kohle-und-wasserstoff-in-der-industrie-ersetzen/100105559.html.

On global level, **Dow and LanzaTech** partnered to launch a high-performance cleaning ingredient made from recycled carbon, enabling circular solutions in the home care market.[22]

The Chemical Startup Landscape

Many entrepreneurs out there take the **risk** but also value the **opportunity** to build a company in the chemical industry. Our map categorizes startups based on their core focus areas, including **Going Circular, Going Climate Neutral, Safe & Sustainable Chemicals, and Going Digital.**

This structured approach allows stakeholders to **quickly identify** promising startups in specific areas of interest and facilitates connections that drive industry-wide progress. As these companies mature, their **impact** on the chemical industry will be **pivotal in shaping a more sustainable and technologically advanced future.**

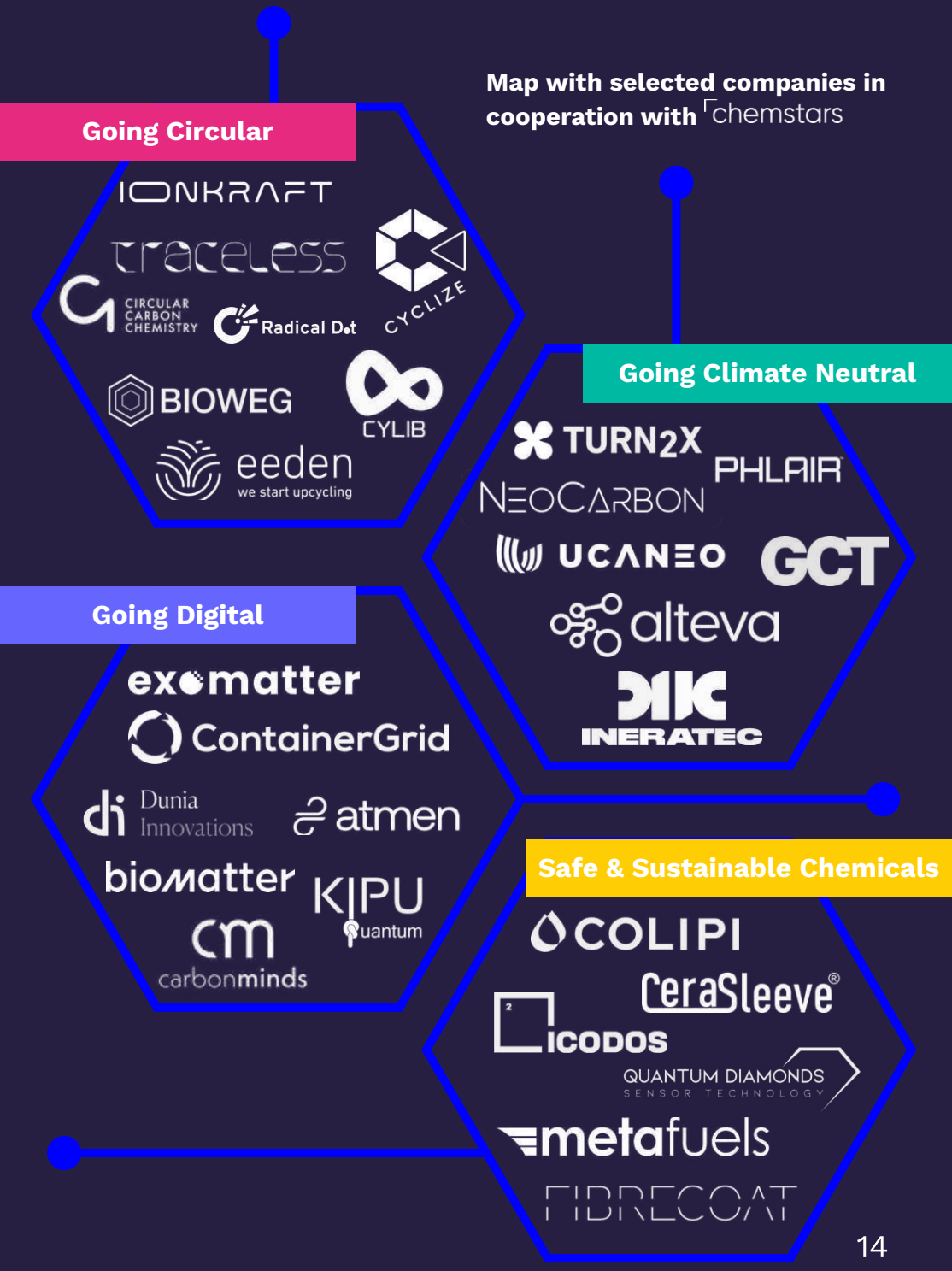
This map (see Airtable overview) is a work in progress, and we see it as an initial effort to gather innovative startups in one central location. If your startup is not yet featured, we would be happy to get to know you. You can **directly add** it via Airtable.

Otherwise, feel free to contact us via LinkedIn or pitch@uvcpartners.com.

Going Circular	**Going Climate Neutral**
Going Digital	**Safe & Sustainable Chemicals**

[22] https://corporate.dow.com/en-us/news/press-releases/dow-launches-bio-degradable-cleaning-solution.html.

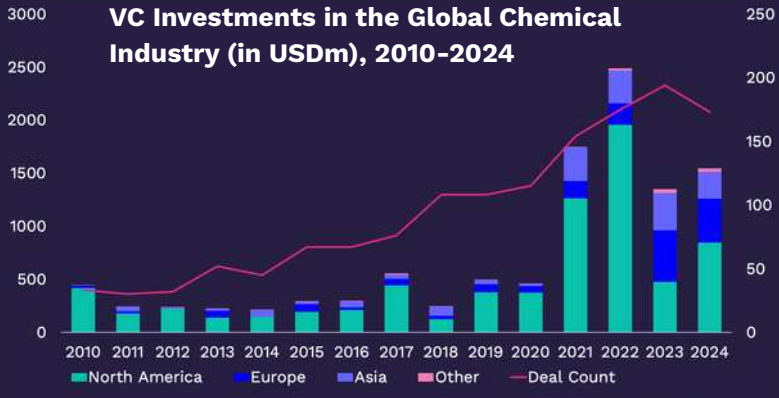
Map with selected companies in cooperation with chemstars



Financing Activities in the Chemical Industry

For developing and scaling such innovative ideas, financial resources are required. One of these can be **venture capital (VC)**. The landscape of VC investment in the chemical industry has undergone a significant transformation in recent years. Historically, the sector has attracted limited VC interest compared to more "straightforward" fields such as **enterprise software** or healthcare.[23] However, a **paradigm shift** is occurring, with a **notable increase** in VC engagement within the chemical and materials science domains.

VC Activity has been Steadily Increasing Throughout the Past Years



[23] https://eqvista.com/industries-sectors-received-vc-funding/.

At **HTGF**, for instance, approximately **4-5%** of the overall deal flow in 2022 consisted of “chemistry or material science startups”, accounting for **40 to 70** seed-financing requests annually.[24] This reflects a **strong pipeline** of early-stage ventures in the field.

Corporate Venture Capital (CVC) arms are also highly active in this space. For instance, **Evonik** Industries' VC arm closed a record **10** new VC deals already back in 2021 and expected a similar pace in 2022, focusing on new materials, biotechnology, renewable energy, and hydrogen.[25]

This activity suggests a **maturing startup ecosystem** within the chemical industry, with growing interest from **both specialized and general VC investors**.

It is important to notice, however, that VC investments - like all other investment activities - are to some extent influenced by overall macroeconomic influences such as the general economic situation and high energy prices.

Major Investment Rounds

Due to the increase in VC activity in the chemical sector in recent years, there have been **significant funding rounds on a global scale**, showing the increased interest by VCs in the chemical industry.

Some of these companies having received major amounts of funding are the American startups Solugen, a renewable chemicals company, with **USD 637 million in total funding**,

[24] https://www.businesschemistry.org/article/my-personal-view-on-investment-in-chemistry-start-ups/.
[25] https://central-south-america.evonik.com/en/evonik-spends-venture-capital-on-sustainability-funds-azolla-ventures-and-chrysalix-175316.html.

and **Twelve**, a chemical tech company transforming carbon dioxide into valuable chemicals, with **USD 470** million in total funding. Similarly, although not on this scale, the European market has shown major funding rounds in recent years.

Norway-based **Reetec**, for instance, has received a total of **USD 117 million** to build its first full-scale production plant for separating rare earths.

The Belgian crop protection startup **Aphea.Bio** has collected **USD 109 million** in total for its efforts to produce natural alternatives to chemical pesticides and synthetic fertilizers.

Some of the major funding rounds of the European chemical market, especially in recent years, have also

Major Investment Rounds in the DACH Region by Sector (in USDm), 2021-2025

Name	Round	Size	Year	Lead Investors	Total Funding**	Founded
Ineratec	Series B	$129m	2024	Piva Capital	$149m	2016
Phlair*	Seed	$13m	2024	Extantia Capital	$13m	2022
Cylib	Series A	$59m	2024	Porsche Ventures, World Fund	$72m	2022
Traceless Materials	Series A	$39m	2023	United Bankers, Blue Oceans Partners	$39m	2020
eeden	Series A	$21m	2025	Forbion, HTGF	$21m	2019
Bcomp	Series C	$39m	2024	EGS Beteiligungen	$74m	2011
Amsilk	Series C	$35m	2021	Novo Holdings	$69m	2006
HQS Quantum Simulations	Seed	$14m	2022	UVC Partners, HTGF	$16m	2017

Climate neutral
Digital
Circular
Safe & sustainable

* Funded by UTUM Funding for Innovators
** Includes only equity funding before IPO/acquisition

(Source: UVC Research)

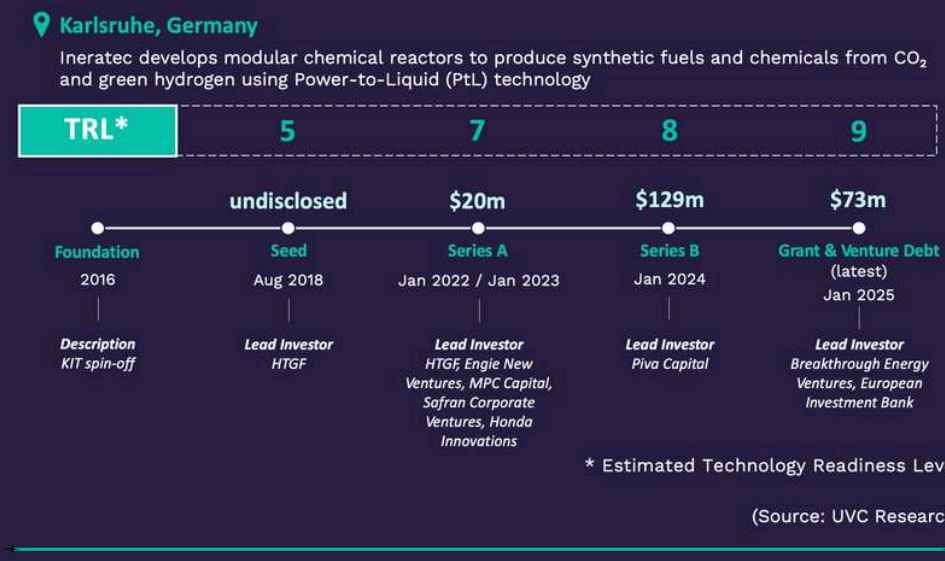
been made in the **DACH** region. With a particular focus on startups creating climate-neutral, circular, digital, and sustainable solutions, **VC investments have increased** since 2021.

The most notable example is **Ineratec's USD 129 million** funding round in early 2024, led by Piva Capital.

A closer look at some of these funding rounds reveals that a **first seed investment** is usually concluded **one to two years after foundation**, at an estimated **Technology Readiness Level (TRL) of around 5**.

Besides, startups such as the ones mentioned above, are often supported by **EU financing**, meaning investments by the **European Innovation Council (EIC) or the European Investment Bank (EIB).**

Funding History, Ineratec



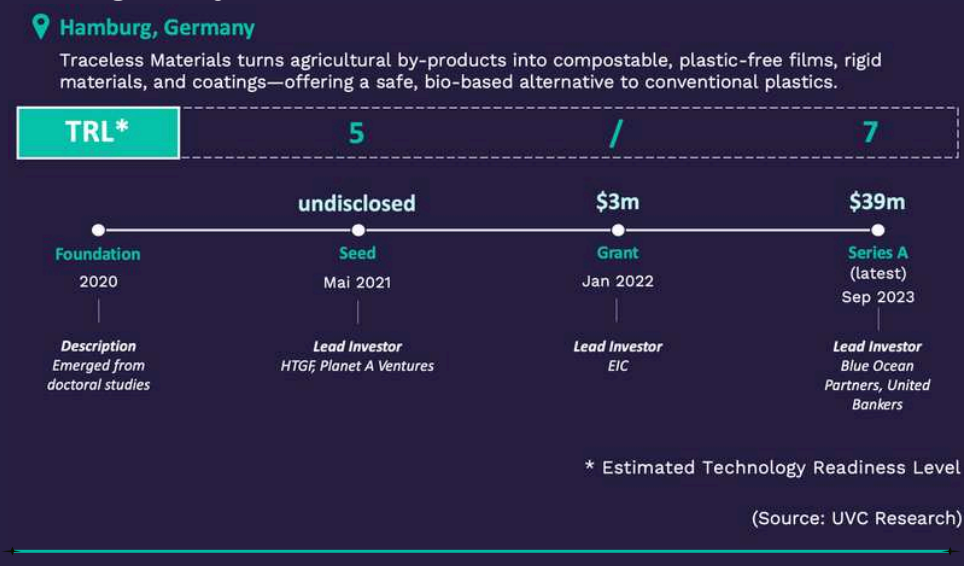
Ineratec, for example, was founded as a **spin-off from the Karlsruhe Institute of Technology** in 2016 and received its first external funding in the form of a seed round in August 2018, led by HTGF.

Its latest financing round in January 2025 included **USD 42 million** in venture debt from the European Investment Bank.

The circular bioeconomy scale-up **Traceless Materials** has also collected its first round of funding in Mai 2021, one year after its foundation in 2020.

As in the case of Ineratec, this round was led by HTGF and was followed up by an EIC grant later. The estimated **TRL level** as of the seed stage financing was **5** in both cases.

Funding History, Traceless Materials



The Funding and General Support Landscape is Broad

The funding landscape for chemical innovations is **diverse**, comprising **various sources** that provide different stages of development and risk profiles.

Non-dilutive funding mechanisms, such as **grants, subsidies, and revenue-based financing**, play a crucial role in supporting early-stage research and development without necessitating equity exchange.

Several programs and initiatives are instruments in **fostering early-stage R&D and innovation** in the chemical sector. Examples include the **Horizon Europe program**[26], which provides substantial funding for innovative projects across various industries, including chemicals. This is complemented by other EU financial instruments such as the **Recovery and Resilience Facility**[27], which supports the transition to a safe and sustainable chemical sector, and the **InvestEU Programme**[28], which boosts investment in research, innovation, and digitization.

At the national level, **Germany's SPRIND (Bundesagentur für Sprunginnovationen)**[*] supports radical new ideas and technologies, offering tailored solutions and funding for **high-potential projects** in areas like environmental technologies and sustainability.

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[26] https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en.
[27] https://commission.europa.eu/business-economy-euro/economic-recovery/recovery-and-resilience-facility_en.
[28] https://www.eib.org/de/products/mandates-partnerships/investeu/.
[*] https://www.bmbf.de/DE/Forschung/TransferInDiePraxis/AgenturFuerSprunginnovationen/agenturfuersprunginnovationen_node.html%22

Additionally, industry-specific accelerators like **chemstars**[29] provide specialized support for chemical startups. They are often **supported by large corporations actively contributing to build a startup ecosystem** in the chemical space. Regional initiatives, such as the **Bavarian Research and Innovation Agency (BayFIA)**[30] focusing on chemistry and bioeconomy, the **Chemie-Cluster Bayern**[31], further enhance the ecosystem of support for chemical innovation in Europe.

A **growing number** of VC firms are specializing in this domain, recognizing the **potential for disruptive innovations and substantial returns.**

Concurrently, major **chemical companies** have established **CVC arms** to **strategically invest** in promising startups and technologies that align with their **long-term** objectives and allow for **decreasing R&D budgets by externalizing innovation.**

[29] https://chemstars.de/.
[30] https://www.stmwi.bayern.de/fileadmin/user_upload/stmwi/e-paper/catalogs/2024-01-24_Cluster-Initiative-Bavaria/pdf/complete.pdf.
[31] https://projects2014-2020.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1562242272.pdf.

Chemical Industry Exit Activity

One of the major discussion points in investment meetings at VCs is often the **exit strategy and potential** in the Chemical Industry.

Especially comparing it to classical SaaS multiples, investors may consider Chemical Investments **unattractive**.

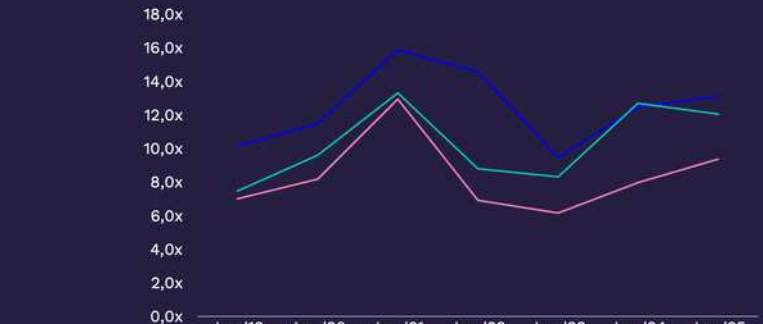
Therefore, we want to shed some light into the Chemical Industry Exit Activity.

Exit Multiples in the Chemical Industry

Exit multiples in the chemical industry have varied depending on the specifics of each M&A transaction and the strategic goals of the companies involved. The 2024 **acquisition of Covestro by ADNOC**, valued at **EUR 14.7 billion**, was completed at a revenue multiple of **0.9x**, reflecting the challenges posed by sustainability shifts within the sector.

In contrast, **Solenis'** acquisition of **Diversey** in 2023 commanded a **higher revenue multiple of 1.7x**, indicative of the target's specialized market position. Since we are often looking at producing or manufacturing chemical companies, EV/EBITDA **multiples are highly interesting**. Average EV/EBITDA multiples across the basic, specialty, and diversified chemicals segments have remained at around **11.5x**, **signalling stable, if modest, returns for investors.**

EV/EBITDA Multiples in the Global Chemicals and Resources Sector by Industry, 2019-2025



	Jan '19	Jan '20	Jan '21	Jan '22	Jan '23	Jan '24	Jan '25
Chemical (Specialty)	10,2x	11,5x	15,9x	14,6x	9,5x	12,5x	13,1x
Chemical (Basic)	7,5x	9,6x	13,3x	8,8x	8,3x	12,7x	12,1x
Chemical (Diversified)	7,0x	8,2x	13,0x	6,9x	6,2x	8,0x	9,4x

(Source: Leonard N. Stern School of Business)

Taking a closer look at **selected incumbents**, their multiples roughly match the **industry multiples** shown above, with average EV/EBITDA **multiples of 10.9x**.

EV/Revenue multiples settle at **2.0x** on average, remaining low, as has been the case in the chemical industry **historically**.

Therefore, it is important to consider the **potential** margins and EV/EBITDA multiples and take a closer look at the (more complex than for software) **financials** to identify the **potential beauty of chemical investments. Once a plant is built,** it can **produce millions of Euros in revenue,** potentially with **only a few off-takers due to high demand.** Thereby, potentially **attractive exit scenarios are possible.**

Incumbent Comparables for Exit Considerations of Startups in the Chemical Industry, 2024

In million €	Revenue	Revenue	CAGR (in %)
Year	*2024*	*2013*	
BASF	65.260	73.973	-1,1%
Lanxess	6.366	3.200	6,5%
Dow Chemical**	42.964	57.000	-2,5%
Linde**	33.005	8.630	13,0%
Air Liquide	27.058	15.200	5,4%
Wacker Chemie	6.402***	4.480	3,3%
EVONIK	15.157	12.750	1,6%
Bayer	46.606	40.157	1,4%
Covestro	14.179	11.238	2,1%
Celanese**	10.280	4.710	7,4%
RPM International** ****	7.335	4.250	5,1%
Fuchs Petrolub	3.525	1.832	6,1%
Albemarle**	5.338	2.500	7,1%

In million €	EBITDA	EBIT	EV	Total debt	Cash
Year	*2024*	*2024*	*Current**	*2024 Q4*	*2024 Q4*
BASF	7.771	3.123	65.870	24.000	3.680
Lanxess	445	-121	4.990	3.010	615
Dow Chemical**	5.305	2.411	40.380	17.670	2.570
Linde**	12.836	9.056	234.090	22.610	4.850
Air Liquide	7.291	4.786	113.660	12.450	1.920
Wacker Chemie	878***	460***	4.170	1.950	1.220
EVONIK	1.763	646	12.950	3.780	618
Bayer	8.807	24	55.770	40.810	8.090
Covestro	1.116	132	13.610	3.140	509
Celanese**	503	-320	18.600	12.950	962
RPM International** ****	1.077	906	16.950	2.330	269
Fuchs Petrolub	537	440	5.500	-	-
Albemarle**	-1.010	-1.598	13.790	3.660	1.830

	EV/ Revenue	EV/ EBITDA	EV/ EBIT	EBITDA Margin
BASF	1,0x	8,5x	21,1x	11,9%
Lanxess	0,8x	11,2x	-41,2x	7,0%
Dow Chemical**	0,9x	7,6x	16,7x	12,3%
Linde**	7,1x	18,2x	25,8x	38,9%
Air Liquide	4,2x	15,6x	23,7x	26,9%
Wacker Chemie	0,7x	4,7x	9,1x	13,7%
EVONIK	0,9x	7,3x	20,0x	11,6%
Bayer	1,2x	6,3x	2323,8x	18,9%
Covestro	1,0x	12,2x	103,1x	7,9%
Celanese**	1,8x	37,0x	-58,1x	4,9%
RPM International** ****	2,3x	15,7x	18,7x	14,7%
Fuchs Petrolub	1,6x	10,2x	12,5x	15,2%
Albemarle**	2,6x	-13,7x	-8,6x	-18,9%
Average (Mean)	**2,0x**	**10,9x**	**189,7x**	**12,7%**
Median	*1,2x*	*10,2x*	*18,7x*	*12,3%*

* 26.03.2025; ** in million $; *** As of 31.12.2023; **** Financial Year concludes end of May; Revenue, EBITDA & EBIT from 31.05.2024; Total Debt and Cash from 30.11.2024

(Source: Yahoo Finance)

M&A Activity has been Quite Steady Throughout the Past Years

M&A activity has been particularly **robust**, with over **20%** of industry revenue changing ownership between 2011 and 2021.

This period has been marked by **several high-profile transactions** that have reshaped the industry, such as the merger of **Dow and DuPont** in 2017, followed by their subsequent split into three separate entities, and the acquisition of **Monsanto** by **Bayer** in 2018.

The rationale behind these M&A activities often stems from **companies seeking to consolidate their market positions, achieve economies of scale, or diversify their product portfolios.**

For instance, the **Dow-DuPont** merger seemed driven by the desire to **create more focused, specialized companies in agriculture, materials science, and specialty products.** Similarly, **Bayer's** acquisition of **Monsanto** seemingly aimed to **strengthen its position in the agrochemical and seed markets.**

Beyond that, the global market revealed some prominent startup acquisitions. Amongst those is the acquisition of US-based **Inpria** by the **Japanese JSR Corporation** for around **USD 514 million** in 2021, or the acquisition of **BioPhero,** a spin-off from the Technical University of

Denmark, by the agricultural science company **FMC Corporation** for **USD 200 million** in 2022.

The DACH market has yet to bring forward noticeable startup acquisitions,

first ones emerge in the broader chemical space with the acquisitions of **c-LEcta** in 2022 (EUR 137 million)[32] and **Jennewein** in 2020 (EUR 310 million)[33].

However, with lots of interesting startups emerging in this region, there are significant potential acquisitions to come.

Taking a closer look into the market of **potential buyers**, there are **several big players** out there that have the **financial capacity** to make high-value acquisitions.

These companies have been actively engaging in M&A activities, with an overall acquisition count of **81 among the 13 largest** players since 2015.

Many of these acquisition targets were startups, showing the need for external innovation amongst these large corporations.

Moreover, some of these players are not shying away from closing deals beyond an **acquisition price of USD 1 billion**, potentially paving the way for **substantial startup exits**. As several of these corporations are **based in Germany**, such as BASF or Bayer, the chemical startup ecosystem in the DACH region and Europe can **profit immensely**.

[32] https://biooekonomie.de/en/news/irish-kerry-group-acquires-enzyme-specialist-c-lecta.
[33] https://www.lto.de/recht/kanzleien-unternehmen/k/baker-mckenzie-hogan-lovells-chrhansen-erwerb-jannewein.

Acquisition History of Major Chemical Incumbents

Company	# of acq.	Highest acq.	Last acq.
BASF	11	$3bn	Jun 2022
Lanxess	6	$3bn	Aug 2021
Dow Chemical	3	-	Jun 2024
Linde	1	-	Jan 2023
Air Liquide	14	$13bn	Jun 2019
Wacker	2	$110m	May 2023
EVONIK	11	$625m	Jun 2023
Bayer	10	$63bn	Dec 2024
Covestro	1	$2bn	Sep 2020
Calanese	4	$11bn	Feb 2022
RPM International	13	-	Apr 2025
Fuchs Petrolub	4	-	Apr 2025
Albemarle	1	$200m	Sep 2021

Company	Significant acq.*
BASF	**Horta, Sculpteo, Isobionics, Innofil3D, EnerG2**, Solvay – Polyamides Business
Lanxess	**IMD Natural Solutions**, Chemtura, IFF Microbial Control
Dow Chemical	**Circulus**, Dow Corning, Univation Technologies
Linde	nexAir
Air Liquide	**Eove**, Airgas, Medidis, DiaLibre, Megamed, Oxymaster
Wacker	**Genopis**, ADL Biopharma
EVONIK	**Structured Polymers, Porphyrio, Alkion Biopharma**
Bayer	**Cara Care, Blackford Analysis, Targenomix, Vividion Therapeutics, Care/of, KaNDy Therapeutics**, Monsanto
Covestro	DSM - Resins & Functional Materials
Calanese	Dupont – Mobility & Materials
RPM International	**Arnette Polymers, Nudura**, Star Brands
Fuchs Petrolub	IRMCO Advanced Mtealworking, Strub Swiss Tribology
Albemarle	Guangxi Tianyuan New Energy Material

Company	Trend
BASF	Advanced Materials & Additive Manufacturing
Lanxess	Agrochemicals & Bio-based Ingredients
Dow Chemical	Circular & Polymer Technologies
Linde	Industrial Gases & Specialty Chemicals
Air Liquide	Medical Gases & Healthcare
Wacker	Biotechnology & Bioprocessing
EVONIK	Advanced Materials & Bio-based Tech
Bayer	Digital Health & Life Sciences
Covestro	Specialty Chemicals & Coatings
Calanese	Advanced Materials
RPM International	Construction & Specialty Chemicals
Fuchs Petrolub	Performance Lubricants & Metalworking Fluids
Albemarle	Battery Materials & Energy Storage

* Startups are marked in bold

(Source: UVC Research)

Private Equity as a Significant Player in the Chemical Industry

Private Equity has also played an increasingly significant role in the chemical industry, with **PE firms** executing between **USD 16 billion and USD 23 billion** in transactions annually between 2011 and 2021, accounting for **23%** of total transaction value on average.

Several especially **large deals** have been closed since 2017, reflecting PE firms' **growing interest** in the sector's potential for value creation through operational improvements and strategic repositioning. A notable example is **Lone Star's** acquisition of **BASF's** construction chemicals business in 2020, highlighting PE firms' **appetite for specialized chemical assets**.[34]

Startups can also consider an acquisition by PE firms as a **viable exit strategy**, with examples such as **Ara Partners'** acquisition of **Genery Energy** for around **USD 200 million** in 2022, signalling a growing interest of PE firms in investing in **late-stage** chemical startups.

The evolution of exit strategies in the chemical industry has been closely tied to these M&A and PE trends.

Companies have increasingly used strategic divestitures to streamline operations and focus on core competencies.

[34] https://www.accenture.com/content/dam/accenture/final/industry/chemicals/document/Accenture-Chemicals-The-Changing-Face-Of-MandA.pdf#zoom=40.

For example, **Covestro's** spin-off from **Bayer** in 2015 allowed both entities to concentrate on their respective areas of expertise in materials science and life sciences.

IPOs in the Chemical Industry

Initial Public Offerings (IPOs) play a **crucial role** in the chemical industry, providing an important **exit strategy** for VC investors and a means for companies to raise substantial capital for **growth and expansion**.

The chemical sector has seen a notable evolution in IPO activity

over the **past decade**, with an increasing number of **specialty chemical and materials science companies** going public.

For instance, **LanzaTech**, a carbon management company aiming to convert industrial waste gases into valuable chemicals, raised **USD 240 million** in its 2023 IPO.

While the companies' future development is yet to be shown based on the stock price development after the IPO, this example **highlights investor interest in innovative chemical technologies.**

Funding Timeline until IPO, LanzaTech

(Source: UVC Research)

Successful IPOs not only provide **returns** for early-stage investors but also **validate the potential of emerging technologies and business models** in the sector.

This, in turn, can **attract more VC money** to chemical startups, creating a virtuous cycle of innovation and investment.

Moreover, the public *market's appetite for sustainable and technologically advanced chemical companies is influencing VC investment strategies,*

with an increased focus on startups that have **strong potential for future public offerings**.

*As the chemical industry continues to **transform**, IPOs are likely to remain a **key component** of the industry's financial landscape, **bridging the gap** between private innovation and public market capital.*

That said, the IPO landscape in Europe, especially in the DACH region, remains underdeveloped in this context, largely because many of the most promising chemical startups are still relatively young.

Investment Hypotheses in the Chemical Industry

As we have seen, the chemical VC investment activity is **still in its early days** and obviously there are some facts that we currently are not very much used to in the VC industry.

These include **longer development times** until exit (see LanzaTech example), different exit considerations and **not yet many startup/ VC success stories**.

However, we believe, that **high returns are possible** due to the **pressing challenges** of a highly important industry with an underlying **extremely big market size**.

Investment Opportunities in the Chemical Industry

Green Chemistry, Circular Processes and New Materials

The growing **focus** on sustainability and green technologies in the chemical industry offers substantial investment opportunities for VCs.

The development of **bio-based chemicals** derived from renewable **biomass sources** is a **key area** of interest, as it reduces reliance on fossil fuels and aligns with **global sustainability goals**.

Additionally, the creation of

environmentally friendly solvents to replace toxic or hazardous **alternatives** represents another promising avenue for investment.

Innovation in **sustainable polymers**, particularly in the realm of **biodegradable or recyclable plastics**, is also attracting significant attention to address pressing environmental concerns.

The success of green chemical startups in these areas demonstrates the potential for high returns on investment.

Drop-in **green substitutes** are especially interesting for food, medical, and cosmetic applications due to several regulations requiring highly pure (food-grade) ingredients to bring recycled plastic (and recycled content) into **new plastic products**.

Therefore, companies are looking 1) to **change** their **packaging** and **include recyclate** and 2) to introduce **green drop-in substitutes**.

This is **barely** available in the market, which is why companies like **Resycure** or **Ionkraft** are working on solutions to increase the use of recyclates in packaging. **Biovox**, for example, is developing a medical grade bio plastics substitute.

Additionally, the chemical industry is experiencing a **shift towards green energy**, and this is not only the case due to the high energy prices in Europe and the

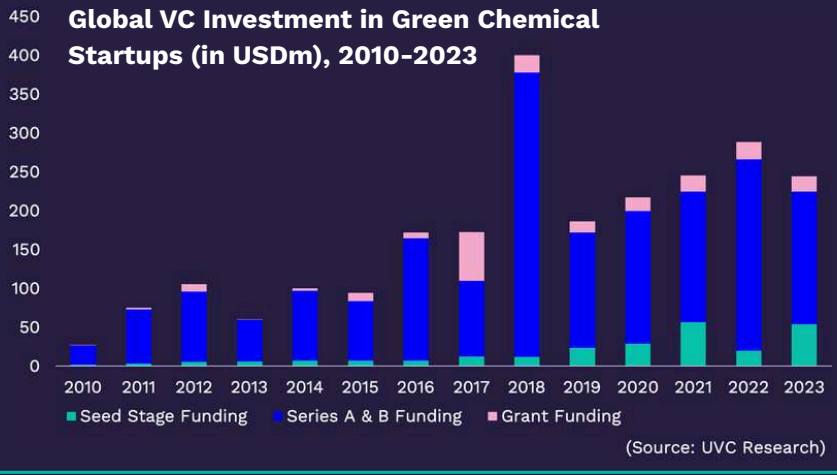
current shortage of conventional energy supply.

The chemical sector **is the largest industrial energy consumer worldwide**[35] and has achieved a **51%** reduction in specific energy consumption between 1990 and 2022.[36]

Increasing energy efficiency and sustainability in the form of **green energy**, therefore, remains one of the industry's key targets. Considering the spike in Europe's energy prices in recent years, this trend has only accelerated.

With startups like **Radical Dot**, which is **genergating energy during their plastic recycling process**, or startups focusing on supporting the switch to sustainable industrial process heat, such as **Celsio**, **Hyperheat** or **SolidWatts,** a vast landscape of **solutions** for generating green and efficient energy is **emerging** in the DACH region.

This offers significant opportunities for VC investments in the chemical industry.



[35] https://www.iea.org/energy-system/industry/chemicals.
[36] https://cefic.org/a-pillar-of-the-european-economy/facts-and-figures-of-the-european-chemical-industry/energy-consumption/.

Circular Economy, Calling for Advancements in Recycling Technologies and Waste Valorisation

Another opportunity is provided by the industry's shift towards **circularity and decarbonization** which presents opportunities for **disruptive innovations**.

Currently, over **90%** of plastic waste - which is composed of more than **80% carbon** - ends up being **burned, landfilled, or polluting the environment**, rather than being recycled.

The development of chemical recycling technologies to **break down polymers** into their **constituent monomers** is a **critical area of research**, as it enables a true circular economy for plastics.

Companies such as **Radical Dot**, **Cyclize** and others are working on recycling solutions to **free up** the otherwise **"wasted" carbon**. Furthermore, innovations in **carbon capture and utilization (CCU)** technologies, which **convert CO2** into **valuable** chemicals and materials, are **gaining traction** to address climate change while creating new value streams.

Potential breakthrough technologies in these areas include **electrochemical CO2 reduction** for chemical production and **advanced catalysts** for efficient plastic depolymerization. These innovations are particularly significant as they **address the industry's primary challenge of decarbonizing** while **maintaining cost competitiveness**.

New technologies also evolve in **textile, plastics or fibre recycling**. The textile recycling startup **eeden**, for example, raised a **USD 20.5m** series A funding round in April 2025.

These companies will **find demand** if they can prove positive **techno-economic analyses**, and this is what, in the end, matters also for the investor.

Digitalization, such as the Implementation of AI, Advanced Analytics, and Connectivity in Chemical Production

Moreover, the use of **AI and machine-learning** tools in the chemical industry, particularly for **designing molecules and materials**, has transformed this field in recent years. Navigating complex **multidimensional input-output relationships** with machine learning has become possible through significant advances in computing, and many areas of material and molecular products are **rich in data through access to high-throughput experimental and computational techniques**.

Companies like **Biomatter** or **HQS Quantum Simulations** are working in this area. There are several successes that serve as **potent demonstrations of the future capabilities of digitalization in molecular/material sciences**, such as predicting new **protein folding**, the creation of large-scale datasets for **in silico design** of catalysts, designing new materials through a **combination of data mining**,

training simplified **predictive models**, searching a large chemical space for a **"functional" fit**, or designing formulations using machine learning models based on **high-throughput data**.

Similarly, a high innovation potential is expected to be achieved by **optimizing chemical supply chains and forecasting product demand**.

This improved **access to data** enables new startups to **challenge the traditional chemicals market**, and the use of machine learning algorithms **enables a deeper understanding** of chemical supply chains.[37]

[37] https://www.sciencedirect.com/science/article/pii/S2451929421004745#:~:text=Digitalization%20in%20chemistry%20will%20enable%20development%20of%20more,that%20are%20both%20safe%20and%20sustainable%20by%20design.

Challenges for Investments in the Chemical Sector

Long Development Times

VC firms face several significant challenges when investing in the chemical industry.

One of the primary obstacles is the extended path to market for chemical innovations.

The chemical industry typically requires extensive research, development, and testing phases, which can lead to prolonged commercialization timelines.

The **average time** from concept to commercialization in the chemical industry is approximately **10 to 15 years**, compared to 2 to 3 years in the SaaS sector. Often an issue are the long lead times for **parts of plants** that have to be provided by **suppliers**.

Additionally, the next iteration for the development stages of the plants should include **learnings from the previous**, adding more time to plan. For example, the development of **Dupont's Sorona®** bio-based polymer took **over a decade** from initial research to full-scale production.[38]

This extended timeline can significantly **impact VC investment strategies**, often necessitating **longer holding periods** and potentially **affecting returns** on investment.

[38] https://sorona.com/.

High Capital Requirements

Another major challenge for VCs in the chemical sector are the high capital requirements. Chemical startups typically require substantial **funding for research facilities, specialized equipment, and materials** before achieving first revenues.

In later stages, **significant CAPEX** is required, while competing with depreciated assets of established players.

Another so far insufficiently addressed challenge is the financing of so-called **first-of-a-kind (FOAK) plants**.

However, the **options for non-dilutive** funding are also **growing** as explained earlier. In the end, an investor must calculate very precisely the potentials, costs, but also implied returns.

Regulatory Landscape is a Driver but also a Risk

The complex regulatory landscape of the chemical industry presents an additional hurdle for VC investors.

The sector is subject to stringent regulations, including **environmental, safety**, and **product-specific guidelines**, with the EU's **REACH regulation** affecting over **21,000 substances**.

In the US, the **Toxic Substances Control Act (TSCA) regulates over 86,000 chemicals**. These regulations can significantly impact **product development timelines** and

costs, with companies spending an average of USD **2.3 million per substance for REACH registration**.[39]

Commercial Traction Evaluation

Also, the concept of **Extended Producer Responsibility (EPR)** is gaining traction, with regulations holding manufacturers **accountable** for the **entire lifecycle of their products**.

VCs must **carefully consider** these regulatory difficulties and associated compliance costs when evaluating potential investments, as these factors can significantly impact a startup's **time-to-market** and **overall viability**.

The need for regulatory expertise and the potential for regulatory changes add **layers of complexity** to investment decisions in this sector.

Furthermore, the requirement for **offtake agreements** presents an additional complication for early-stage companies seeking VC funding.

Especially at **FOAK (first-of-a-kind) stage**, when startups are looking to build their first large-scale plants, many VC firms in the chemical sector require startups to secure offtake agreements before providing funding.[40]

These agreements, which **guarantee** in the best case a certain level of **future sales**, can be **challenging** for early-stage companies to obtain, particularly when **dealing with novel or unproven technologies**.

[39] https://www2.deloitte.com/us/en/insights/industry/oil-and-gas/chemical-industry-outlook.html?ctr=textlinkVerB&id=us:2em:3na:4diUS176768:5awa:6di:110723:mkid-K0190617&sfid=0035Y000042PWGKQA4.

[40] https://sifted.eu/articles/how-to-secure-an-offtake-agreement.

This requirement adds another layer of complexity to the fundraising process for chemical startups and can **significantly impact** their **ability to secure VC investment.**

In the best case, there are take or pay offtake agreements in place or worked on from a **very early stage**.

Competition from Incumbents

Competition from established **players with depreciated assets** is another significant challenge for VC-backed startups in the chemical industry.

Incumbent chemical companies often operate with fully depreciated production facilities, allowing them to maintain **lower operational costs**.

This cost advantage poses a considerable challenge for startups, requiring VCs to **carefully assess the competitive landscape and potential differentiation strategies** when considering investments.

The **ability** of startups to **compete effectively** against these established players is a **critical factor** in investment decisions.

Incumbents may also work with companies in their early phases **to learn** from their technology and **adapt** their own processes.

Understanding the Different Nature of Chemical Investments

Beyond these primary challenges, VCs in the chemical sector must also contend with additional considerations.

One such factor is investor **perception**. One may **underestimate** the complexities and challenges specific to the chemical industry, potentially leading to **overly optimistic expectations** regarding timelines, required capital, and financing experience required, especially for CAPEX-heavy businesses.

The time until a **relevant amount of product** can be produced is relatively long.

However, once ready, there could be millions in revenue per year with only one production facility with attractive margins.

Thus, **exit multiples are lower**, but if absolute revenue or better EBITDA numbers are considered **once a plant is live**, this is a **comparable high-potential exit**.

If there are **misaligned expectations amongst the investors and founders**, this can **create difficulties** in fundraising and managing investor **relationships** throughout the investment lifecycle.

Conclusion

Europe's chemical industry must adapt or decline

The chemical industry stands at the intersection of **forced transformation** and **technological opportunity**.

Europe, which was **historically a leader** in the field, has seen its **share** of the global chemical market **decline** from over **20%** in 2013 to around **17%** in 2024.

Germany, while still accounting for **27%** of Europe's chemical output, faces competitive **disadvantages** such as **high energy and labor costs, long timelines, and regulatory burdens**.

The **end of cheap energy imports** and increasing **sustainability mandates** have strained existing business models, as can be seen by the **scaling back of operations** by incumbents like BASF and Evonik.

Startups signal the direction of future competitiveness

Despite these challenges, emerging chemical startups offer a **promising countertrend**.

These ventures are increasingly focusing on **circular, climate-neutral, digital, and sustainable solutions**.

In parallel, **VC engagement is rising**. With some structural challenges remaining:

Long development cycles of up to 15 years, high CAPEX requirements, regulatory costs, and difficulties securing offtake agreements make **investment timing and capital allocation critical**.

Exit opportunities have been **limited in the past** compared to other sectors, with **IPOs still underrepresented** in the DACH region.

Conditions for breakthrough innovation are improving

Yet, as **data** on recent deal flow and major funding rounds **shows**, the **startup pipeline is strong**, the regulatory environment is increasingly supportive, and the **demand for sustainable materials and processes is growing rapidly**.

For investors with **domain expertise and long-term vision**, the chemical sector presents an opportunity to **back fundamental innovations** in a changing industry, with **attractive return potentials**.

Transformative capital must meet transformative ambition

Venture capital still is **high risk**, but also **high return,** and should **support transformative, category changing startups**.

Only this way we will be able to support the **highly important** chemical industry in Europe and **decarbonize**.

Software alone cannot save our climate,

yet alone make our world better, we will need the **hardware part to be added to software** for making a change.

Private money can support this activity whilst delivering attractive returns.

– End –

About the Authors

If you are an investor, a startup, an accelerator, a public insitution or a corporate active in the Chemical Industry, please do reach out to us!

Jana Petry is an Investment Manager at UVC Partners with a strong focus on early-stage investments in climate/clean tech, and future of work solutions. She has played a central role in the firm's investments in high-impact ventures such as Reverion, Cyclize, Radical Dot, both as investor and board advisor.

Carl Kuzinski has a background in Chemical Engineering from the Technical University of Munich, with studies also taking him to Scotland and India. He has worked in startups across various growth stages and gained valuable VC experience at a DeepTech fund in Paris.

Lukas Götz is currently studying Management & Technology at the Technical University of Munich with a specialization in Computer Engineering. He has worked in an early-stage startup in Barcelona and is particularly interested in data analytics and Machine Learning.

About UVC Partners

UVC Partners is a leading venture capital firm that invests in European B2B tech startups. With more than €600 million in assets under management, the VC typically invests between €1 to €10 million initially and up to €30 million per startup in the areas of DeepTech, ClimateTech, Mobility, and Software/AI. UVC Partners' investment portfolio includes Flix, Isar Aerospace, planqc, Proxima Fusion, Reverion, Tacto, TWAICE, DeepDrive, STABL, and many more. All portfolio companies benefit from the team's extensive investment and exit experience, their ability to build sustainable category leaders, and the network of UnternehmerTUM enabling them to speed up market entry.

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