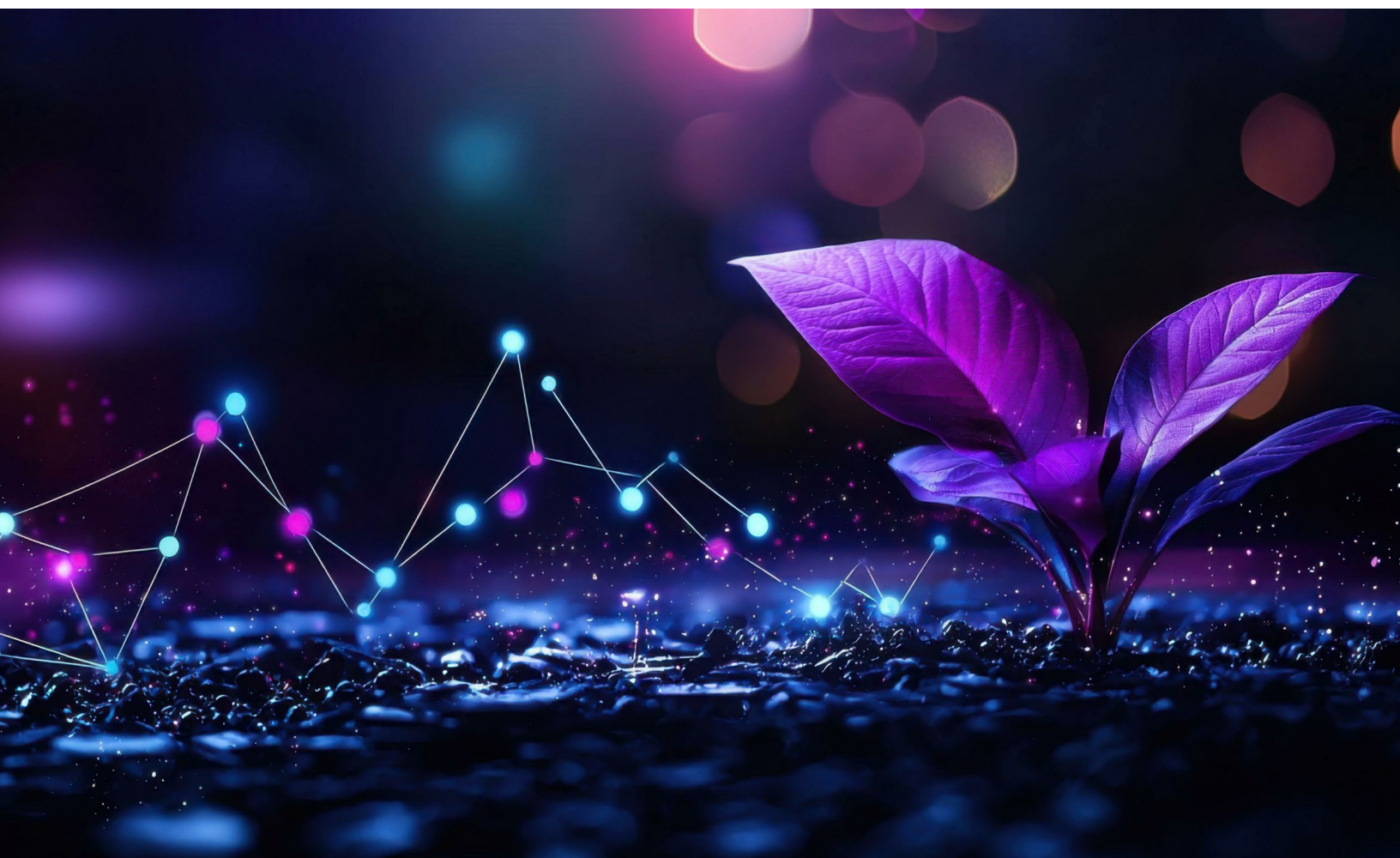


GUIDING GREEN LLC & ACS GREEN CHEMISTRY INSTITUTE

# SUSTAINABLE CHEMISTRY INVESTMENT REPORT

Q1 2025



Guiding Green



ACS Green Chemistry Institute  
Chemistry for Life®

The top of the page features a graphic with three stacks of coins of varying heights. Small green plants with leaves are growing out of the top of each stack. To the right of the coins, a glowing pink line graph with data points is visible against a dark blue background.

# Summary

This inaugural edition of the Sustainable Chemistry Investment Report offers real-time insights into the innovation ecosystem supporting the commercialization of products and services that deliver high performance without harm to people or the planet. Trends can be identified to monitor, evaluate, and help position startups and investors alike for optimum benefit. However, tracking investment in sustainable chemistry presents unique challenges. Unlike Carbon Tech or Climate Tech, which are typically categorized by application, Sustainable Chemistry is defined by the intentional design of technologies. This fundamental difference makes it more difficult to capture investment trends using conventional reporting frameworks.

Respecting these challenges, the data from Q1 2025 is striking:

- **Over \$6.6 billion** was invested in sustainable chemistry ventures, representing more than 30% of total venture capital in all chemistry-related sectors.
- The shift in U.S. federal leadership contributed to a **90% reduction in grant funding for sustainable chemistry, compared to Q1 2024.**

The success of this report lies not only in its findings, but in the process to develop it. This effort reflects a strong commitment to transparency, and establishes a foundation for refining how investment in sustainable chemistry is evaluated and reported in the future.

## INTRODUCTION

While terms like *ClimateTech*, *CleanTech*, and *CarbonTech* are general classifications that help define an investment landscape tied to environmental sustainability, there are no universally accepted definitions for these classifications. They are sometimes used interchangeably, and at other times hierarchically (e.g., carbon tech as a subcategory of climate tech).

These classifications typically emphasize the application of a technology - namely, whether it is designed to address a specific environmental impact. However, how a technology is developed also plays a critical role in shaping its life cycle impacts. This is where Sustainable Chemistry enters the conversation.

Though not a new concept, sustainable chemistry has been defined by several entities, including the Organization for Economic Co-operation and Development (OECD, 1999), the Expert Committee on Sustainable Chemistry (ECOSChem, 2023), and the U.S. National Science and Technology Council (2023). For the purposes of this report, we adopt the ECOSChem definition:

*Sustainable chemistry is the development and application of chemicals, chemical processes, and products that benefit current and future generations without harmful impacts on humans or ecosystems.*

Monitoring investment in sustainable chemistry is essential to building a more complete understanding of the innovation ecosystem needed to bring such products and services to market. While measuring investment activity in this space is undoubtedly complex, the urgency of the sustainability challenge compels us to prioritize progress over perfection.

As we forge ahead, we do so by focusing on the larger purpose and the methodology.

## PURPOSE

- To inform the broad chemistry, business, and investment community of the investment trends
- To encourage and enable innovators to incorporate design principles and related metrics
- To support investors in identification of entities in alignment with their business or portfolio parameters

## METHODOLOGY

The *sustainable chemistry* vertical, as defined in this report, encompasses companies involved in the manufacture of chemicals, chemical products, and processes intentionally designed to minimize hazards to human health and the environment. Included venture capital (VC) deal types: grants, accelerator/incubator investments, angel and seed rounds, early-stage VC, and later-stage VC funding.

### Chemicals, Products & Processes

Although chemistry underpins a vast array of products and industries, not all fall within the intended scope of this analysis. This report focuses specifically on the development of chemicals and materials—including raw materials, intermediates, and end-use products - used in applications, such as energy production and storage, environmental remediation, and sustainable manufacturing. The scope also includes chemical processes that enable or improve the development of such materials.

### Sustainable by Design

Incorporating green chemistry and engineering design principles at the earliest stages of development is essential for maximizing value for startups, investors, and society at-large. These practices are foundational

to minimizing cost, enhancing operational flexibility, facilitating regulatory compliance, and reducing risk—key attributes of a resilient and successful enterprise.

Improved access to user-friendly, low- or no-cost tools and sustainability metrics is critical to enabling innovators to integrate safer design principles early in the innovation cycle. These tools not only guide product and process development but also serve to articulate value to prospective investors. Future iterations of this report may include mechanisms to highlight companies that actively use such tools as part of their design and development strategies.

At present, no standardized methodology exists to systematically identify companies whose products or processes are designed to minimize human and environmental hazards. In the absence of such a framework, inclusion in this report required companies to exhibit one or more sustainability-related characteristics. The inclusion criteria were developed iteratively and validated against a set of reference companies known to align with sustainable chemistry principles. Future editions of this report will provide further transparency of the methods for evaluating alignment with green chemistry and green engineering design principles. The limited mention of specific companies in this inaugural edition reflects a deliberate decision. A more rigorous vetting process for company-level insights is currently under development.

### **Beneficial Impact**

The sustainable design of chemicals, products, and processes has the potential to yield broad benefits to both human health and the

environment. Therefore, this report does not restrict its scope based on specific applications, instead emphasizing the design intent behind the technology.

**Timeline.** The primary dataset for this edition covers deals completed in Q1 2025, benchmarked against Q1 2024. While it is more common to compare year-over-year totals or sequential quarters, Q1 2024 was selected as the comparative baseline to avoid seasonal distortions and fiscal year-end variations. The *sustainable chemistry* vertical was further defined by the following three characteristics.

**Limitations.** This inaugural report faced challenges in defining the full scope of relevant companies, accurately identifying sustainable chemistry practices, and refining sector classifications. Future editions will address these limitations through improved curation, expanded timeframes, and the integration of AI, machine learning, and accessible sustainability tools.

**Transparency.** The authors and sponsors of this report do not endorse or make claims regarding the safety or environmental performance of the companies referenced herein. The Sustainable Chemistry Investment Report is intended to evolve and become increasingly robust over time. **Transparency will remain a core principle** throughout this process. Readers are encouraged to contact the authors with questions, feedback, or recommendations for future editions.



# Sustainable Chemistry Deal Summary 1Q 2025

In the first quarter of 2025, sustainable chemistry attracted **\$6.6 billion in venture capital (VC) funding**, involving **377 companies across 386 deals**, and accounted for **36% of total investments** in the broader chemistry-related industry sector. An additional 428 deals, representing 394 companies, were reported without specified deal sizes. In total, **814 sustainable chemistry deals** were completed, involving **771 companies**.

This marks a **\$140 million increase** compared to Q1 2024, which recorded **\$6.46 billion in deal value** across **629 deals involving 599 companies**. Including deals without reported sizes, Q1 2024 saw a total of **1,607 deals involving 1,453 companies**.

## VC Capital Investment in Sustainable Chemistry as a Segment of All Chemistry (1Q 2025)

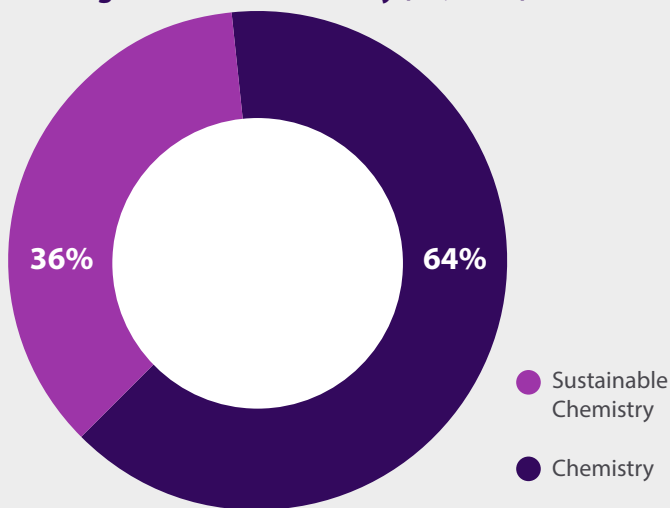


Figure 1. VC Capital Investment in Sustainable Chemistry as a portion of All Chemistry

## SECTOR OVERVIEW

As shown in Figure 2, **large deals exceeding \$100 million accounted for 60% of total capital investment in sustainable chemistry** in Q1 2025, up from 51% in Q1 2024. The **alternative energy sector, particularly fusion technologies, led this activity** in the first quarter.

The largest single investment during the reporting period was a \$900 million Series A round in March 2025 for Pacific Fusion, a company founded in California in 2023. Other notable deals include Helion, based in Everett, Washington, which secured a \$425 million later-stage VC round in January, and Marvel Fusion, headquartered in Munich,

Germany, which closed a \$121 million later-stage VC deal in March.

## Deals Exceeding \$100 Million in Sustainable Chemistry

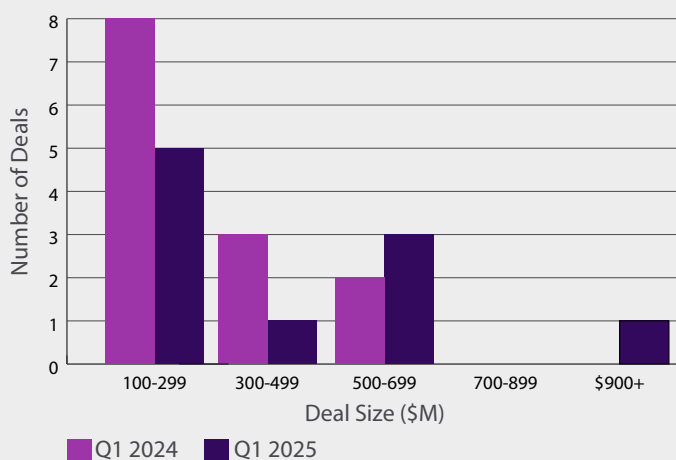


Figure 2. Deals exceeding \$100 million

The **energy sector currently dominates** the sustainable chemistry investment landscape. However, **investment in materials and business products & services (B2B)** remains critical for advancing the design of safer, less hazardous products and processes. As shown in Figures 3 and 4, the selected industry segments serve as a foundational framework for analyzing this evolving space. More detailed segmentation and analysis are planned for future reporting periods to further refine understanding and track emerging trends.

## Capital Invested by Sector

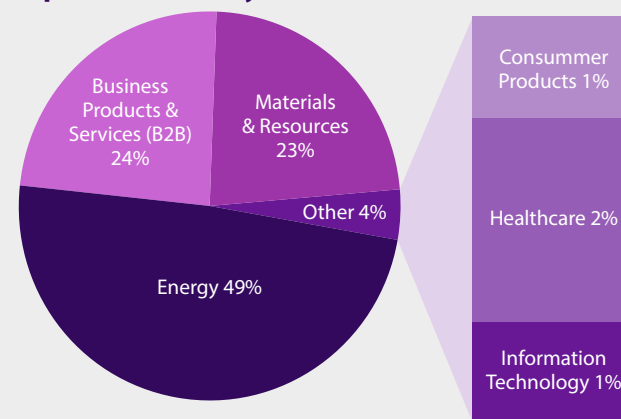


Figure 3. Capital Invested by Sector

## Deal Count by Sector

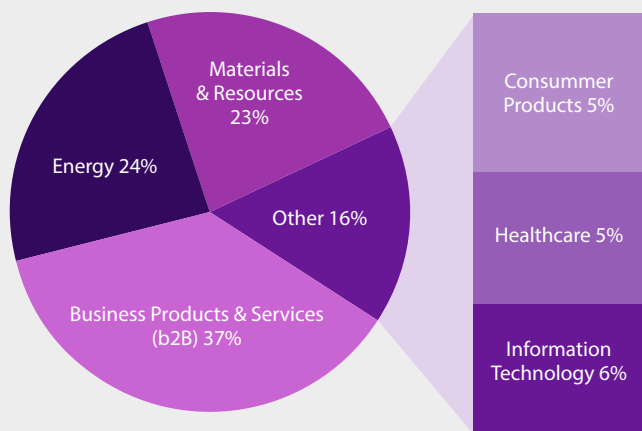


Figure 4. Deal Count by Sector

In Q1, the **Energy segment** was the largest, attracting \$3.2 billion across 93 venture capital (VC) deals. **The Business Products & Services (B2B)** and **Materials & Resources** segments combine for 60% of the deals, securing \$1.58 billion and \$1.52 billion respectively. These two segments often overlap, as many B2B companies actively produce materials, underscoring the fluid boundaries within sustainable chemistry. **The Information Technology** segment, while essential as an enabling technology for integrating sustainable chemistry, saw lower investment. Advancements in artificial intelligence and machine learning to improve accessibility of materials and more efficient safer chemical design are attracting investors, although these technologies may also be captured in the B2B segment as a service. **The Consumer Products** segment had notably lower investment activity, totaling \$50 million across 19 deals, which could reflect various factors, including inherent limitations within the dataset to identify these companies. The authors recognize the limitations of the current classification method and expect to perform further analysis in order to be positioned to provide a more informative and consistent perspective of the sustainable chemistry investment landscape in the future.

## DEAL TYPES

As shown in Figure 5, the decline in sustainable chemistry venture capital (VC) deal count is most pronounced among grants and accelerators/incubators. When examining first-quarter investments year-over-year, **grants experienced the sharpest decline, dropping 75% in deal count, equating to almost 90% reduction in capital in Q1 2025** compared to Q1 2024. Accelerators and incubators saw a 60% reduction in deal count and a corresponding 40% decline in capital investment. Conversely, later-stage VC deals had only a slight decrease in deal count in Q1 2025 but more than 40% increase in capital, relative to the prior year. This substantial decrease in grant and accelerator/incubator funding paired with minimal impact on later-stage VC mirrors broader trends across all chemicals, chemical products and processes, indicating the trend is not unique to sustainable chemistry.

## Sustainable Chemistry VC Deal Count by Deal Type

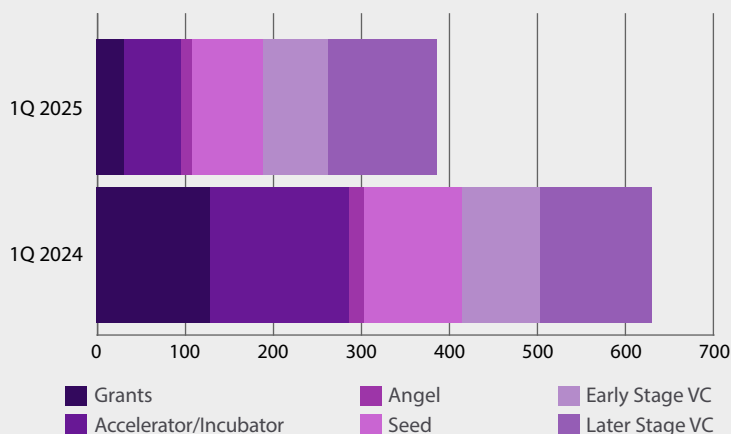


Figure 5. Sustainable chemistry VC deal count by deal type

## INVESTORS

With significant reduction in deal activity among grants and accelerators/incubators, changes in the investor profile were expected. As shown in Table 1, only two early stage investors (grants, accelerators/incubators), Tech Stars and Venture Kick, are listed among the investors with the most deals during the quarter. This is in significant contrast to Q1 2024 when two U.S. federal agencies were in the top three of the most active investors in sustainable chemistry. Since January 2025, the new policy measures notably affected the U.S. federal investment landscape in sustainable chemistry. Historically, pre-seed-stage startups have heavily depended on federal funding through the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. The current administration's policy changes, along with uncertainty around tax and trade policies, will continue to impact all investments, not limited to those directly funded by the U.S. government nor limited to sustainable chemistry.

Investor	Investor Type	Number of Deals
Alumni Adventures	Venture Capital	8
European Innovation Council	Venture Capital	7
Breakthrough Energy	Impact Investing	7
Lowercarbon Capital	Venture Capital	6
SFC Capital	Venture Capital	6
Bpifrance	Sovereign Wealth Fund	5
SOSV	Venture Capital	5
TechStars	Accelerator/Incubator	5
Venture Kick	Accelerator/Incubator	5
Amazon.com	Corporation	4

Table 1. Most active investors during Q1 2025

## REGIONAL DIFFERENCES

While recent political shifts have influenced investment patterns, regional differences in sustainability-related policy frameworks are longstanding. **Figures 6 and 7** compare sustainable chemistry investments across North America, Europe, and Asia, the only regions with over 100 deals recorded during the reporting period. These figures reflect the **location of the startup**, not the investor, though it is important to note that many investors have global portfolios.

The most notable trend is an **80% increase in venture capital investment in North America in Q1 2025 compared to Q1 2024**.

This surge is largely attributable to two of the three large fusion energy deals occurring in the United States, significantly boosting regional capital totals.

In terms of deal volume, North America has demonstrated relative stability, especially when compared to Europe and Asia, where fluctuations in both capital and deal count have been more pronounced.

### VC Deal Count by Region

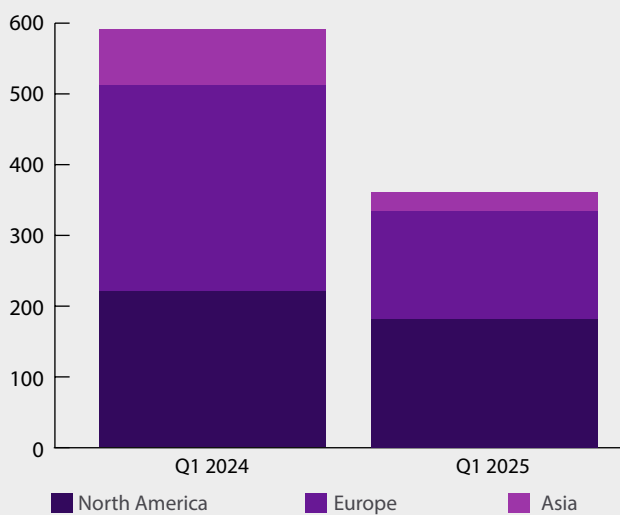


Figure 6. VC deal count by region

### VC Capital Investment by Region

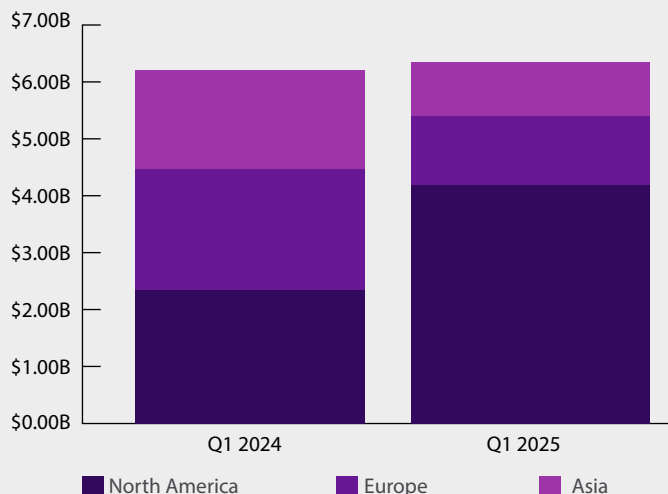


Figure 7. VC capital investment by region

When evaluating the distribution of deal types across North America, Europe, and Asia, a key distinction emerges: **Asia recorded no accelerator/incubator investments in Q1 2025**, and **only 2% of capital** in the region was allocated to **pre-seed or seed-stage investments**. In contrast, **pre-seed and seed deals accounted for approximately 50% of total deal volume** in both Europe and North America. However, the capital allocation differed significantly: **15% in Europe** versus just **4% in North America**, a figure likely skewed by the large fusion energy investments previously discussed.

While a concentration of investment in later-stage companies is expected, **early-stage funding remains essential** to support the advancement of emerging innovations toward commercialization. Over time, **longitudinal trend analysis** will be valuable for identifying persistent regional differences, particularly in relation to government policy, funding mechanisms, and tariff structures that may influence support for early-stage sustainable chemistry ventures.

# Conclusion



The purpose of this inaugural edition of the *Sustainable Chemistry Investment Report* is to provide early insight into the innovation ecosystem driving the commercialization of products and services that deliver high performance without compromising human or environmental health. While limited in scope and time frame, this report offers an initial snapshot of investment activity, with the goal of identifying and tracking trends that can inform and benefit both startups and investors.

**This report marks only the beginning and much work lies ahead.**

The authors welcome feedback from stakeholders to ensure that future editions continue to deliver value and relevance to the broader community. Together, we can strengthen the foundation for innovation and sustainable growth in the chemical enterprise.

**Source:** PitchBook Data, Inc.

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