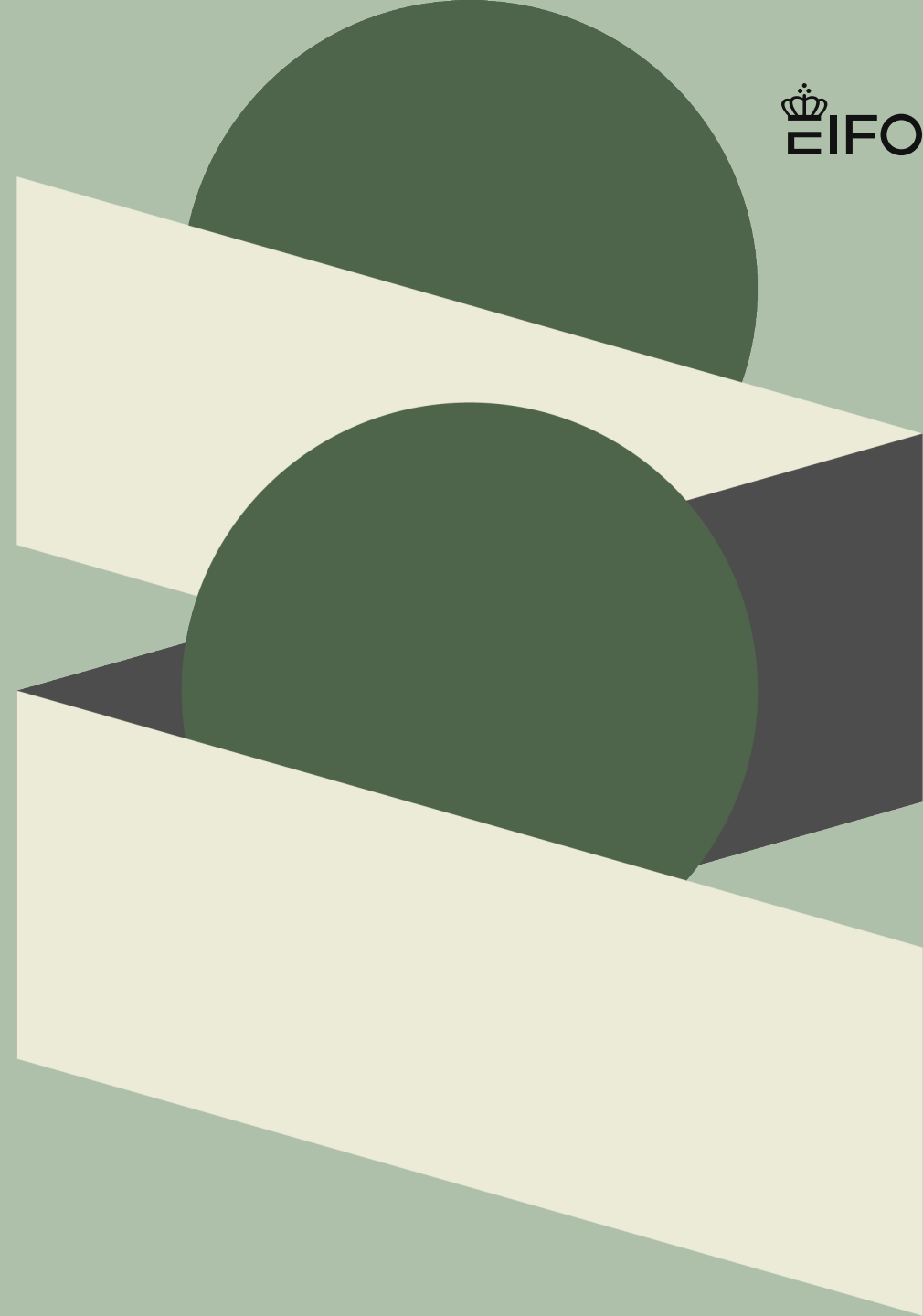


Green tech

Market Trends and Returns

December 2024



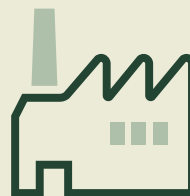
Key takeaways



European green-tech investments have demonstrated resilience amidst the recent slowdown in the broader venture capital market, with the Danish market standing out as particularly robust, as investment activity is projected to reach a historic high in 2024.



Danish green-tech investments and capital volumes are more heavily concentrated in the early venture stages compared to the broader venture capital ecosystem, implying higher risks and longer investment horizons in green-tech.



Green-tech ventures have a hardware focus about three times greater than the broader VC ecosystem – this higher CAPEX intensity, especially in the early stages, creates unique funding challenges for green-tech startups compared to other sectors.



Recent market developments, such as rising interest rates and the struggles of prominent Nordic green-tech ventures, **risk exacerbating existing funding challenges** by driving up CAPEX costs and increasing investor risk aversion toward green technologies.



Declining buyout and IPO activity across Europe has created a **tougher exit environment** for venture capital funds, leading to a drop in overall exit activity, notably for Danish green-tech ventures.



Differences in sector-specific valuation multiples and risk-adjusted returns across public stock indices suggest that **green-tech investments tend to yield lower returns** compared to the broader market and high-growth sectors that primarily rely on software technologies.

Green-tech venture capital market trends in Denmark

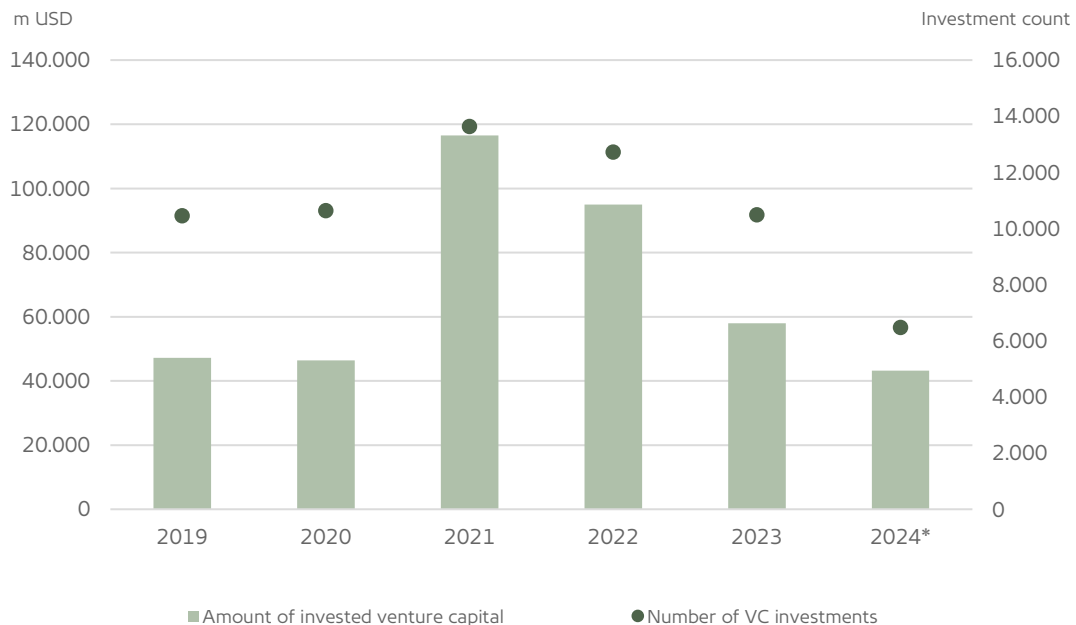


European venture capital activity slowed significantly from 2021 to 2023, however, green-tech investments showed greater resilience amid broader market downturns

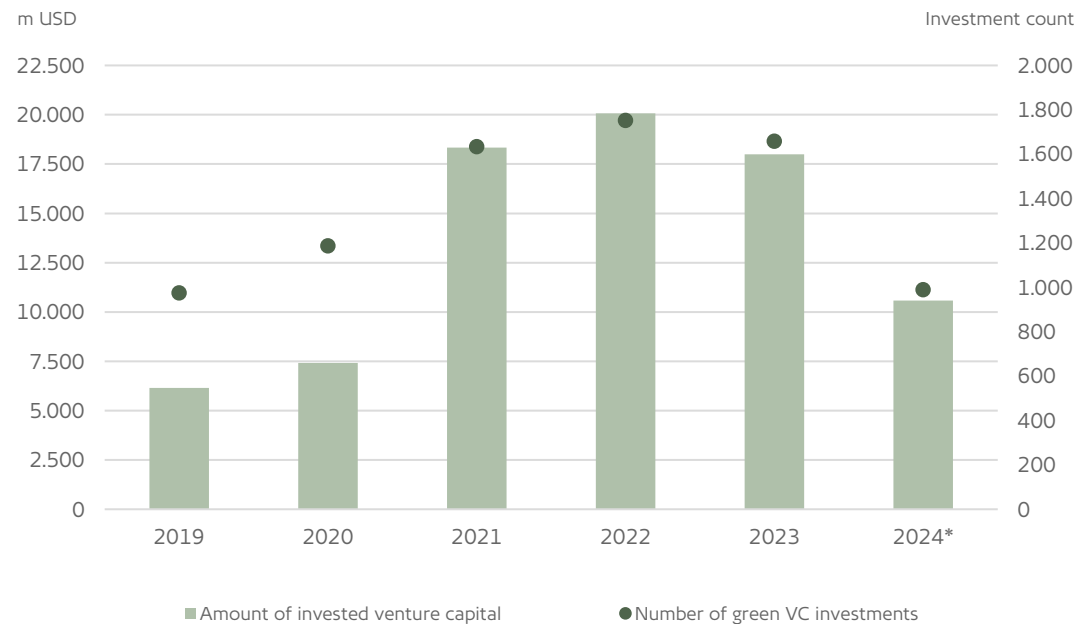
European venture capital activity dropped sharply between 2021 and 2023, with total invested capital declining by over 50 percent. This slowdown was largely driven by macroeconomic shifts, including high inflation and elevated interest rates, which dampened investor sentiment.

In contrast, green-tech investments displayed greater resilience to these market pressures. From 2021 to 2022, invested capital in European green-tech ventures rose by 10 percent and only saw a slight decline in 2023. Overall, green-tech capital dropped by less than 2 percent from 2021 to 2023, while the number of investments increased modestly. However, data from the first three quarters of 2024 suggests that European green-tech investment may also experience a notable slowdown this year.

Venture capital and number of investments, total European market



Venture capital and number of investments in green-tech, European market



Note: data for 2024 as of September 30th

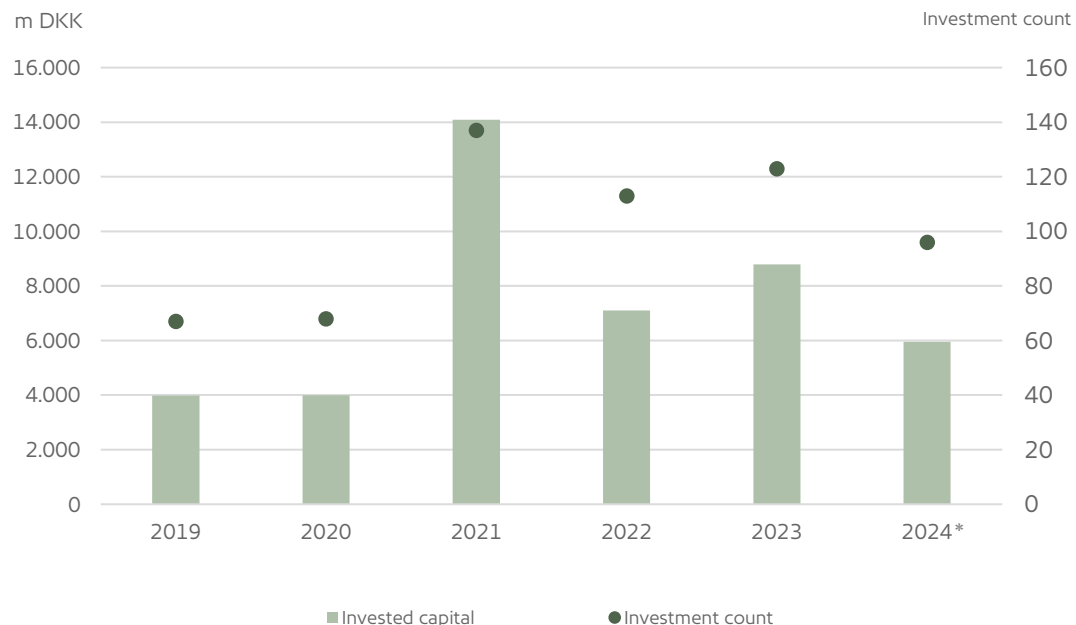
Sources: Dealroom and EIFO analysis.

Danish VC activity mirrored the European market's slowdown after 2021, yet green-tech investments remained resilient – in 2024, Danish green-tech is set to reach a historic high

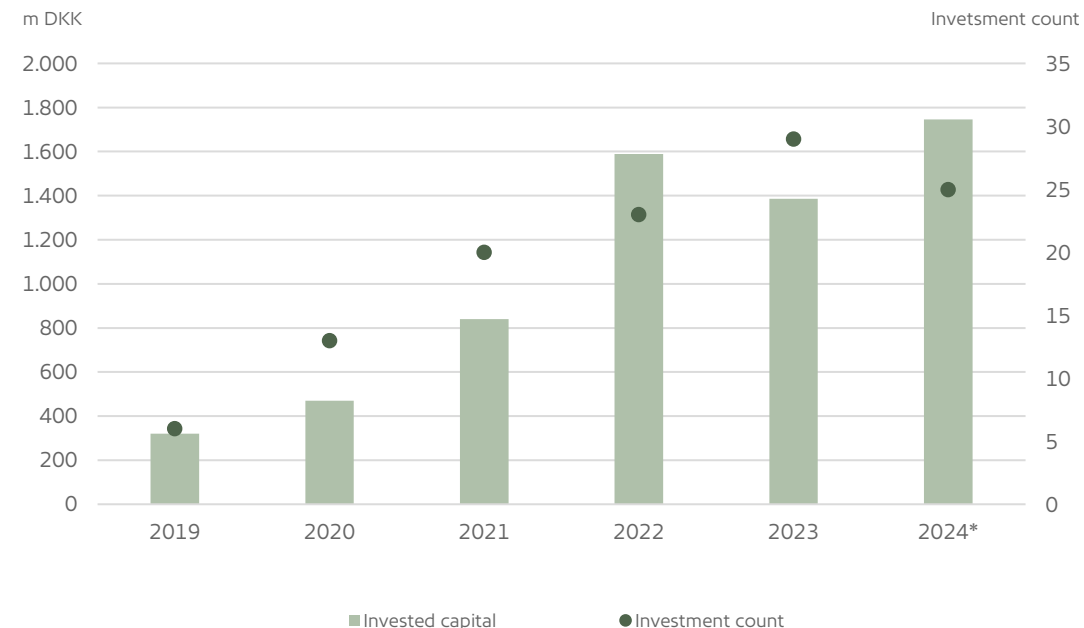
Following trends in Europe and the U.S., the Danish venture capital market experienced a downturn in 2022, with invested capital dropping by 50 percent. However, unlike the wider European market, Danish VC activity rebounded slightly in 2023, with invested capital increasing by 24 percent.

While the overall Danish market activity declined between 2021 and 2022, green-tech investment surged, with invested capital rising by nearly 80 percent. From 2019 to 2023, the number of green-tech investments in Denmark grew nearly fourfold, while the total capital allocated to Danish green-tech companies more than tripled. Investment activity in green tech has been particularly robust in the first three quarters of 2024, with capital raised already surpassing previous full-year totals. If this momentum continues, 2024 will likely set new records for both the number of green-tech investments and total invested capital.

Venture capital volumes and number of investments, total Danish market



Venture capital volumes and number of investments in green-tech, Danish market



Note: data for 2024 as of September 30th

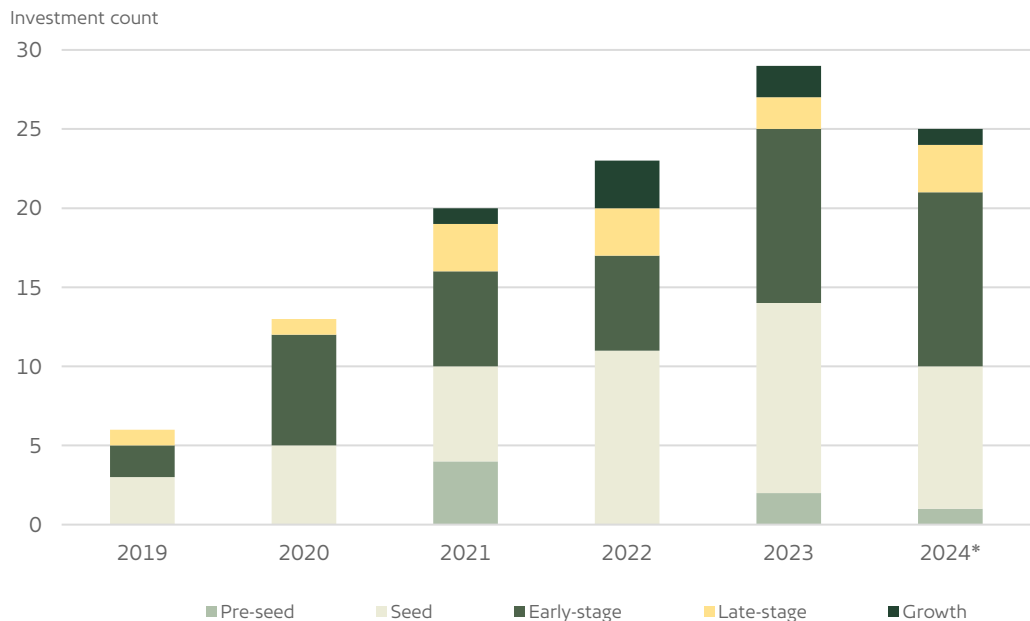
Source: EIFO analysis.

Green-tech investments in Denmark are concentrated in early venture stages, which typically involve higher risks and longer investment horizons

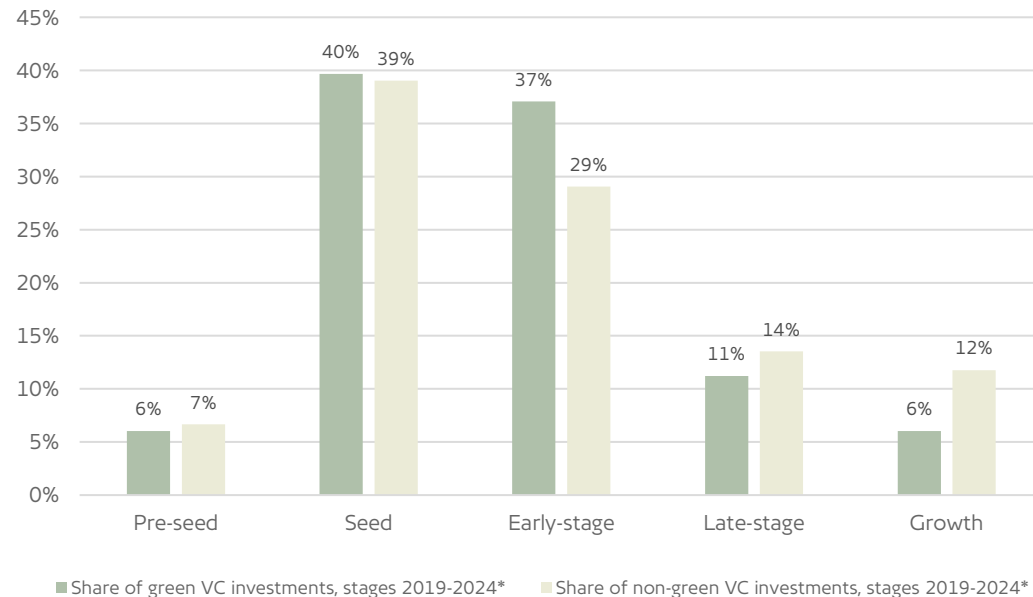
Historically, most Danish green-tech investments have been directed toward the earliest venture stages (Pre-Seed, Seed, and Early-Stage), focusing primarily on young startups. Over time, the share of investment rounds at these initial stages has seen a slight increase.

When comparing the stage distribution of green-tech vs. other-tech VC rounds, a clear trend emerges: 83 percent of green-tech VC deals occur in the earliest stages, compared to 75 percent for non-green VC investments. Early-stage investments generally carry higher risk and require longer time horizons than later-stage (Late-stage and Growth) investments. This stage distribution suggests that green-tech VC investments are often associated with longer timelines and less established companies, potentially presenting a higher risk profile relative to non-green VC-backed companies.

Number of green-tech investment rounds across stages



Share of Danish venture capital rounds across stages, green-tech vs. rest of market



Note: data for 2024 as of September 30th

Source: EIFO analysis.

Danish green tech shows a higher concentration of capital in early venture stages, likely due to a limited number of mature companies and higher capital needs in early development

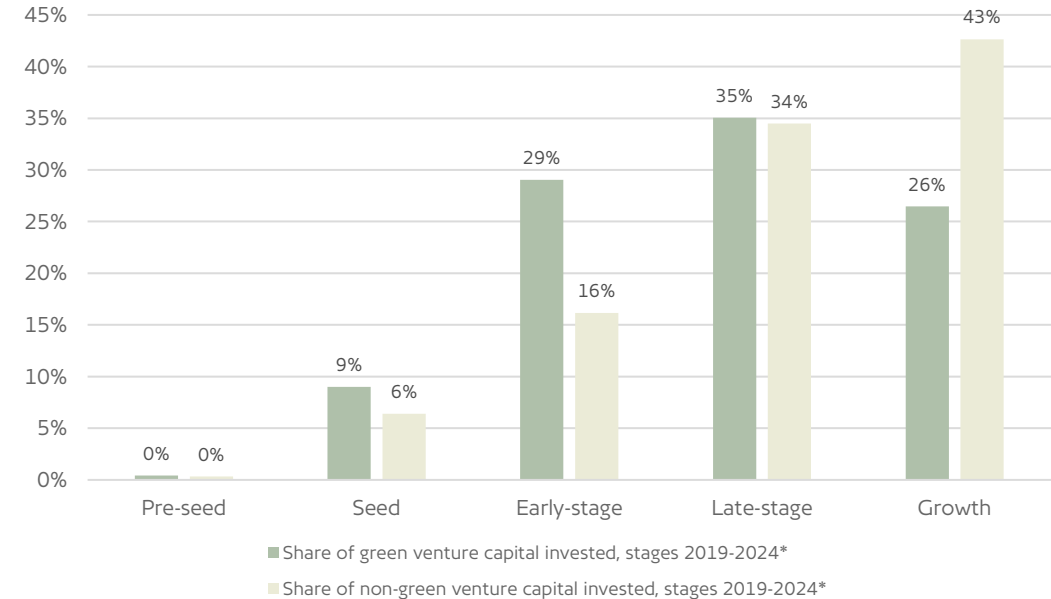
The share of capital invested in early-stage green-tech ventures (Pre-Seed, Seed, Early-Stage) has steadily increased from 2019 through the first three quarters of 2024. Between 2019 and 2024, 38 percent of green-tech capital was concentrated in these initial stages, compared to only 22 percent for the broader market.

This capital distribution likely reflects the limited number of mature (Late-stage and Growth) green-tech companies in Denmark, as well as the generally higher capital demands for green-tech startups, which are typically more hardware-intensive than other sectors.

Sum of venture capital investments in Danish green-tech ventures across stages



Share of venture capital invested in Danish companies across stages, green tech vs. rest of market



Note: data for 2024 as of September 30th

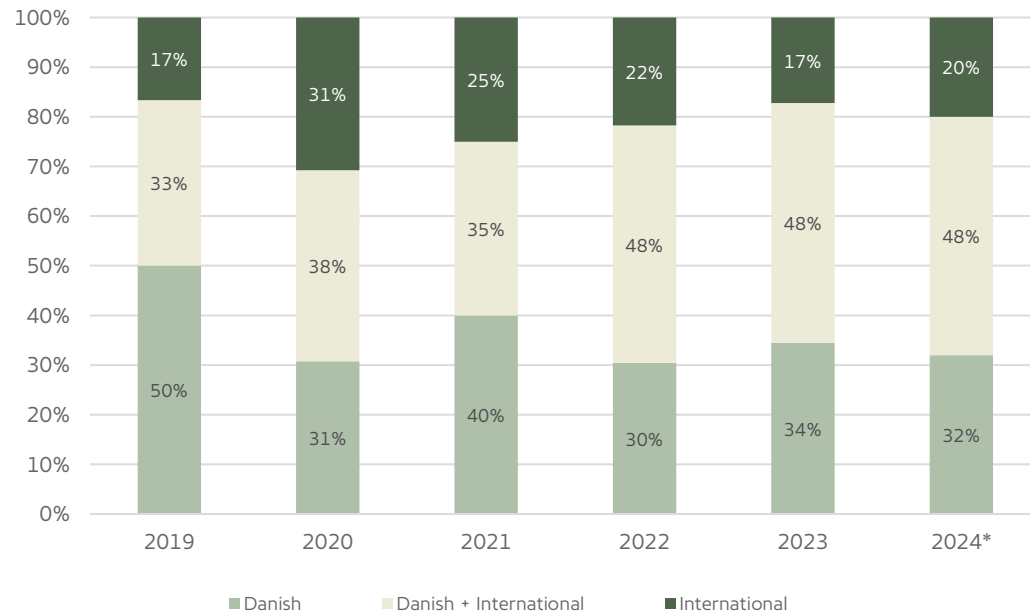
Source: EIFO analysis.

International investor participation in Danish green tech has increased since 2019, driven by a rise in syndicate rounds between Danish and international investors

The share of green-tech investment rounds with international investor participation has steadily grown from 2019 through the first three quarters of 2024, largely due to a greater number of syndicate rounds involving both Danish and international investors. This pattern aligns with the broader Danish venture capital market, though international investor participation dipped slightly from 2022 to 2023 – likely reflecting the impact of geopolitical challenges and rising interest rates, which led some investors to refocus on domestic markets.

Among the top 10 most active green-tech investors from 2019 to 2024, EIFO stands out with 49 VC rounds, followed by The Footprint Firm (14) and Rockstart (8). Of these top 10 investors, only three are international, based in the Netherlands, Sweden, and Finland.

Share of VC investment rounds in Danish green-tech companies split on investor origin



List of top-10 most active venture capital investors in Danish green tech, 2019-2024*

Investor	Investor origin	Number of investments 2019-2024
EIFO / Vækstfonden	DK	49
The Footprint Firm	DK	14
Rockstart	NL	8
PreSeed Ventures	DK	7
Nordic Alpha Partners	DK	6
Novo Holdings	DK	6
Planetary Impact Ventures	DK	5
byFounders	DK	4
Kinnevik	SE	4
Nordic Foodtech	FI	4

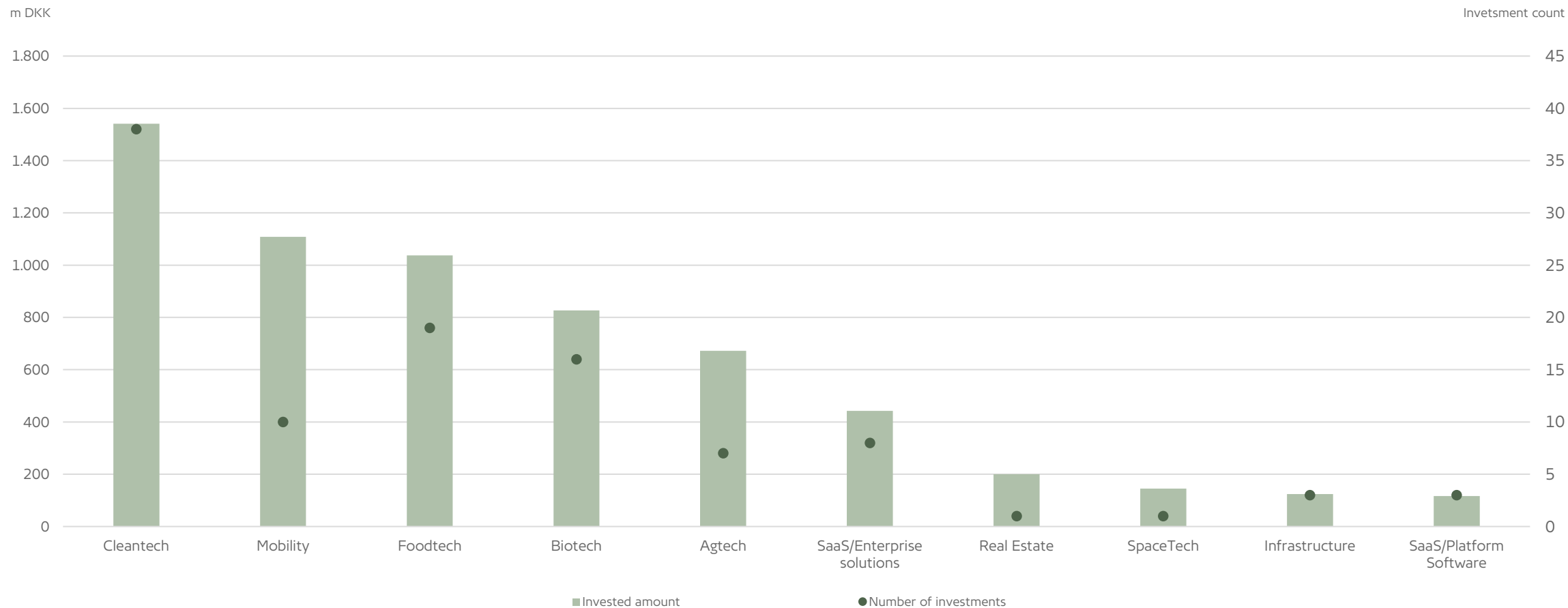
Note: data for 2024 as of September 30th

Source: EIFO analysis.

Top 10 verticals for Danish green-tech investments

From 2019 through the first three quarters of 2024, Cleantech led Danish green-tech investments, with over 1.54 billion DKK invested across 38 rounds, making it the top vertical in both deal count and capital raised. Mobility ranked second with 1.11 billion DKK invested across 10 rounds, followed by Foodtech with 1.03 billion DKK invested across 19 rounds.

Danish green-tech investments and invested capital across top-10 verticals, cumulated 2019-Q32024



Note: data for 2024 as of September 30th

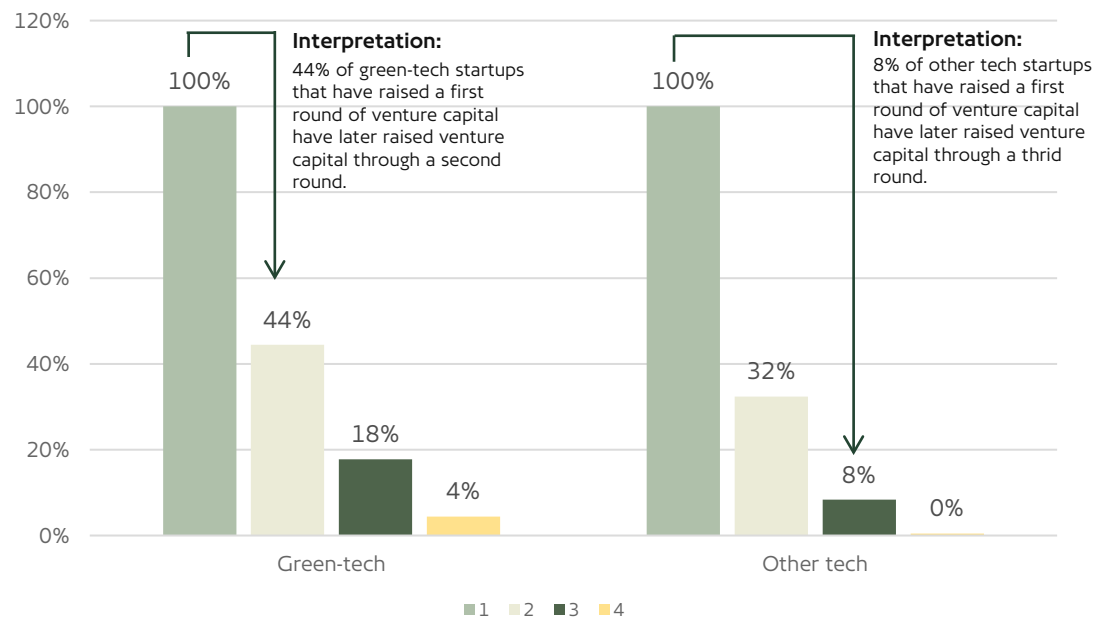
Source: EIFO analysis.

Danish green-tech startups show higher graduation rates and slightly larger median first funding rounds compared to the broader Danish VC ecosystem

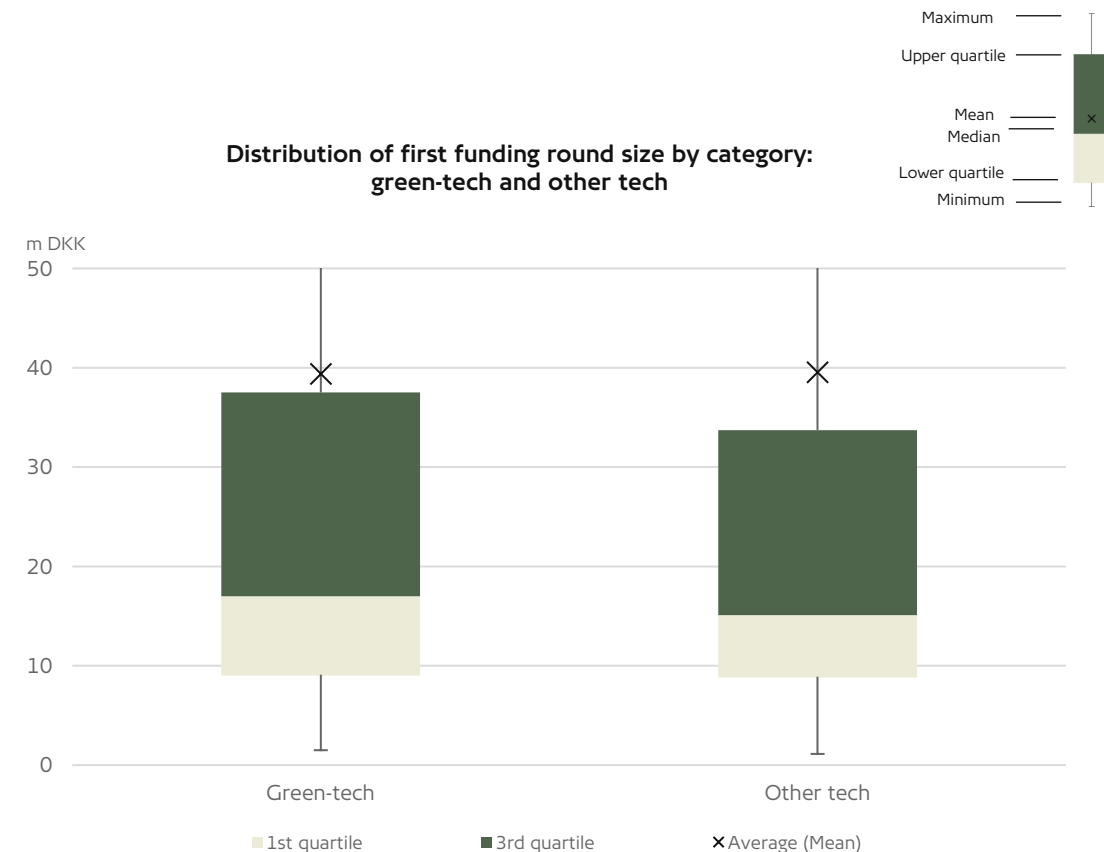
Among 65 Danish green-tech startups that raised initial VC funding between 2018 and 2022, 44 percent secured a second round, 18 percent raised a third, and 4 percent achieved a fourth round. This graduation rate surpasses that of non-green tech ventures, where only 32 percent of 316 first-time funded startups raised a second round, 8 percent raised a third, and none reached a fourth round.

Additionally, median first-time funding rounds are higher for Danish green-tech startups at 17 million DKK, compared to 15.1 million DKK for the rest of the market, reflecting potentially greater capital needs in the early stages of green-tech companies compared to other industries.

Graduation rates, green-tech and other tech



Distribution of first funding round size by category: green-tech and other tech



Note: Graduation rates are calculated based on Danish venture backed companies that have received first investment between the years 2018-2022. Maximum funding rounds for Green-tech and Other tech are not displayed in the selected scale. Maximum funding round for Green-tech is: 350 million DKK . Maximum funding round for Other tech is: 612 million DKK.

**Macroeconomic and
market trends – challenges
for green-tech ventures**



Green-tech ventures face a set of distinct challenges compared to the overall venture capital ecosystem, which may have an adverse effect on funding opportunities

Traditional venture capital funds tend to favor investments in highly scalable software companies due to their low capital requirements, faster growth potential, and ability to achieve profitability more quickly compared to deep-tech ventures developing hardware-intensive technologies. In the European green-tech sector, the share of ventures focused on hardware technologies is approximately three times higher than the overall European VC ecosystem, indicating that green-tech startups face unique funding challenges. These challenges may make it more difficult for green-tech ventures to secure the necessary funding, as investors must be prepared to offer more patient capital and accept higher CAPEX requirements in the early stages of a company's lifecycle – investment dynamics that do not always align with typical venture capital models.

1. Higher capital requirements:

Green-tech ventures often require substantial investments early in their lifecycle. This might involve building large-scale infrastructure like solar farms, developing advanced battery technologies, or production plants for biosolutions processes. These capital-intensive needs can be challenging to meet through traditional venture capital, which often favors more capital-efficient software startups.

2. Long development timelines:

The development cycles for green tech is typically much longer than those of conventional tech startups. Green-tech projects, such as developing new types of renewable energy or sustainable materials, can take years to move from concept to commercialization. This extended timeline can strain investor patience and startup runway.

3. Scalability issues:

Scaling up from prototype or pilot stage to full commercial deployment is a significant challenge for green tech. Green-tech solutions often face engineering challenges when scaling to industrial levels. This scaling phase is critical but often underestimated in terms of time and resources required.

4. Funding gaps:

Green-tech often faces a "valley of death" in funding between initial research grants and later-stage venture capital. This gap is particularly pronounced for capital-intensive projects that are too risky for traditional project finance but too large for typical VC rounds. Bridging this gap requires innovative financing models and often a mix of public and private funding.

5. Technological uncertainty:

The cutting-edge nature of green-tech innovations means there is often significant uncertainty about their ultimate viability and performance. For instance, a new type of solar cell or biological process might show promise in the lab but face unforeseen challenges in real-world applications. This uncertainty, linked to the technological risk, can make it difficult to attract investment and early adopters.

6. Complex value chains:

Success in green-tech often depends on multiple players across a complex value chain. For example, a new green hydrogen technology might require coordination between energy producers, storage facilities, transportation networks, and end-users. Navigating these interdependencies adds layers of complexity to scaling and commercialization efforts.

7. Market adoption challenges:

Convincing customers to adopt new, potentially disruptive technologies can be an uphill battle for green-tech. Green-tech solutions often compete with established, less expensive (though less sustainable) alternatives. Overcoming inertia and demonstrating clear value propositions is crucial but challenging.

8. Regulatory hurdles:

Green-tech sectors often operate in highly regulated environments. Green-tech companies must navigate complex environmental regulations, energy policies, and sustainability standards that can vary widely between jurisdictions. Compliance can be time-consuming and costly, potentially slowing down innovation and market entry.

Rising interest rates compound existing challenges for green-tech ventures by increasing costs and investor risk aversion

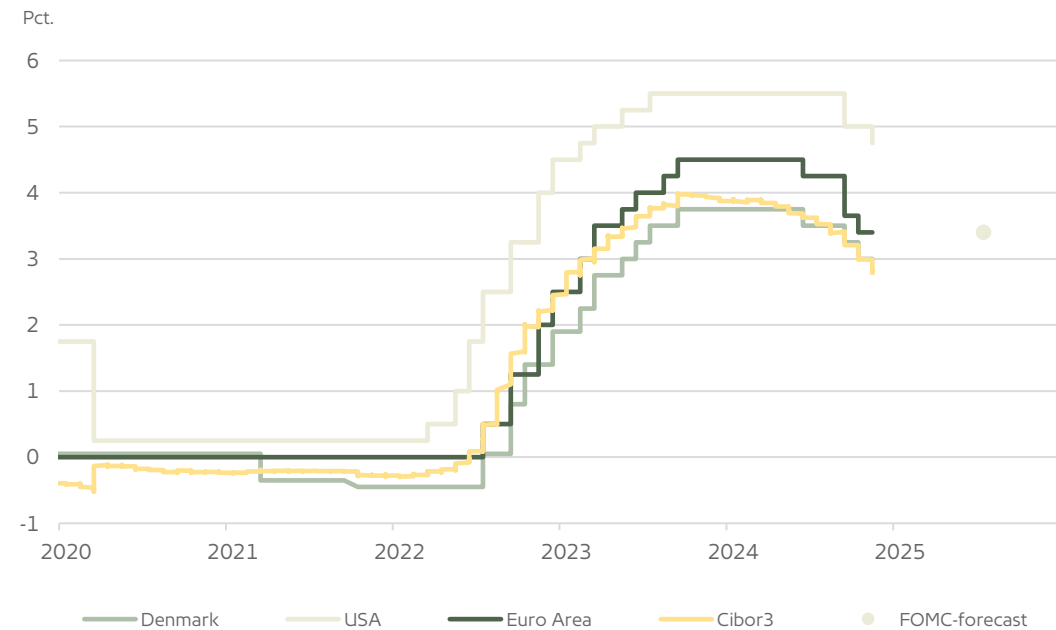
The inflation surge in 2021 and 2022, which exceeded 10 percent in the Euro Area, was primarily driven by soaring energy prices due to Russia's invasion of Ukraine and global supply chain disruptions limiting goods availability. In response, central banks worldwide raised interest rates to combat inflationary pressures. From June 2022 to September 2023, the European Central Bank (ECB) raised its key monetary policy rate by 4.5 percentage points, with the Danish central bank following suit.

High interest rates have a disproportionate impact on capital-intensive and hardware-driven sectors, which are particularly prevalent in green-tech. These ventures typically require large initial investments and extended timelines before they can generate returns, relying heavily on external capital to cover costs over several years. As borrowing costs rise, financing these long-term projects becomes significantly more expensive. Additionally, high interest rates shift investor preferences toward shorter-term, lower-risk opportunities with quicker returns. This environment is particularly challenging for green-tech startups, which face longer paths to profitability amid market uncertainties. The combination of rising financing costs and increased investor caution makes it difficult for capital-intensive green-tech ventures to secure the funding necessary to scale in competitive markets.

12-month percentage change in consumer prices



Leading monetary policy rates and forecast



Note: 12-month percentage change in consumer prices, Denmark, USA and Euro Area and forecasts based on OECD Economic Outlook and Økonomisk Redegørelse, August 2024. Leading monetary policy rates. Forecast is based on the Federal Open Market Committee's (FOMC) projected appropriate monetary policy, September 2024.

Sources: OECD, Eurostat, Økonomiministeriet, Danish Financial Benchmark Facility, Danmarks Nationalbank, ECB, Federal Reserve.

Recent market trends could shift investor sentiment in green tech, potentially increasing the hurdles for green-tech ventures to obtain necessary levels of funding

Market headwinds and investor caution are impacting prominent green-tech companies, as project delays and financial challenges lead some investors to scale back on green investments. Elevated risks in high-CAPEX green tech, such as hydrogen and battery ventures, are pushing investors to prioritize resilience and profitability.

Market challenges for prominent green-tech companies

Several prominent green-tech companies are struggling in current market conditions and major green infrastructure projects are being postponed.

Examples of prominent venture-backed green-tech companies that are currently facing headwinds include i) the Swedish battery manufacturer Northvolt – which has been grappling with financial challenges, production delays, cancelled orders, safety concerns, workforce reductions, and a reassessment of its operational scope, leading to a strategic downsizing of its ambitious expansion plans – and ii) the Danish electrolyzer company Green Hydrogen Systems – which has faced financial losses, supply chain challenges, production delays, and slower-than-expected revenue growth, leading to missed targets and a need for strategic adjustments.

Moreover, recent setbacks in green infrastructure projects have highlighted challenges in the rapidly evolving renewable energy sector. For example, Ørsted's *Flagship One* project in Sweden and *Green Fuels for Denmark* have faced delays and reassessments. Similarly, the Denmark-Germany hydrogen pipeline, initially slated for 2028, has been postponed to 2031, illustrating the complexities and uncertainties in developing large-scale green energy infrastructure and investing in companies that are reliant on the development of critical infrastructure.

Investor setbacks and shifting sentiment in green tech

The recent financial struggles of high-profile green-tech firms, including Northvolt and Green Hydrogen Systems, have led some major investors to adopt a more cautious stance. Large institutional investors, such as ATP, have cited these challenges as reason to scale back on green investments, focusing on more rigorous risk evaluations moving forward. Factors like elevated interest rates, inflation, and delayed project timelines are further increasing the risk profile of capital-intensive green technologies. PFA has expressed a similarly cautious outlook, suggesting that green investments now require a higher threshold for risk due to these pressures. This emerging trend reflects an increased awareness of the difficulties in realizing short-term returns from hardware-intensive green projects.

In contrast, some pension funds, such as Velliv, remain committed to green investments, viewing current setbacks as temporary and potentially beneficial for long-term valuation. This divergence among investors suggests that while certain funds may reduce exposure to high-risk green projects, others still see opportunity in assets that could be undervalued in the current climate. This difference in perspectives signals a shift in green investment strategies, with investors recalibrating their approach based on individual risk tolerances and market outlooks.

Implications for VC funding in green tech

The challenges facing established green-tech companies, combined with investor caution, may reshape venture capital interest in green projects. Venture investors are likely to respond by adjusting their strategies, focusing on green ventures that show clear paths to profitability and robust financial fundamentals. High-CAPEX projects, particularly those in hardware-dependent areas like hydrogen and battery technology, might see reduced funding unless they can demonstrate scalability and resilience against economic fluctuations.

However, some investors' ongoing commitment to green tech suggests that venture capital in the sector won't disappear but may become more selective. Green ventures with strong partnerships, promising financial metrics, or lower capital requirements are better positioned to attract funding. In this environment, start-ups that can balance innovation with risk management will stand out, as investors prioritize sustainability and potential returns. This selective funding approach could ultimately foster a more resilient and strategically aligned green-tech sector, albeit with fewer speculative ventures receiving backing.

Exit environment and returns on green-tech investments

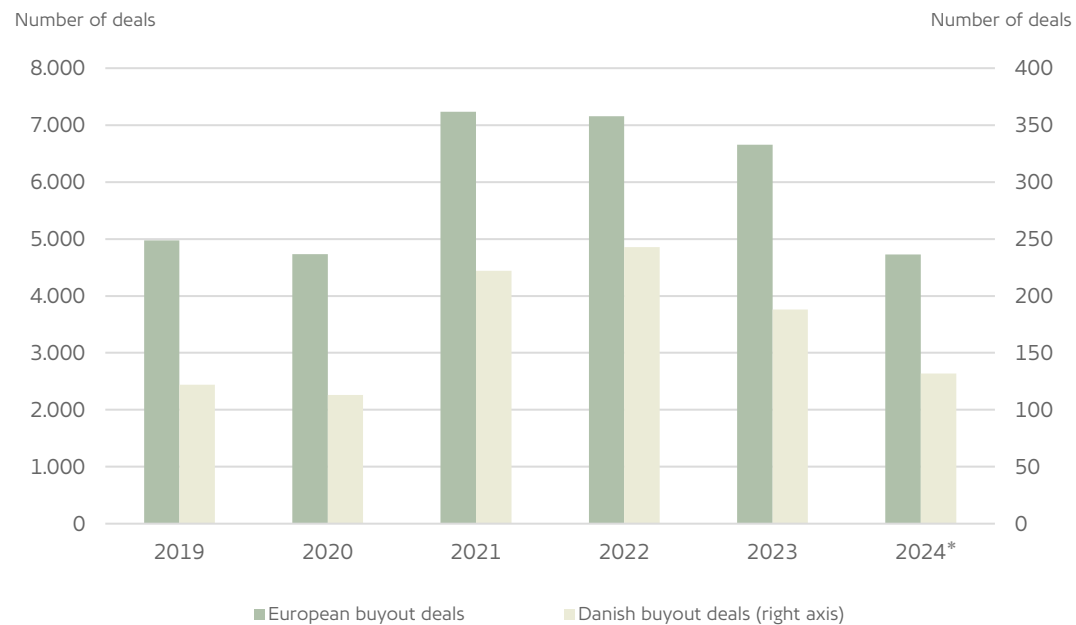


Venture capital investors are facing a tough exit environment as European and Danish buyout and IPO activity has declined from 2021 highs

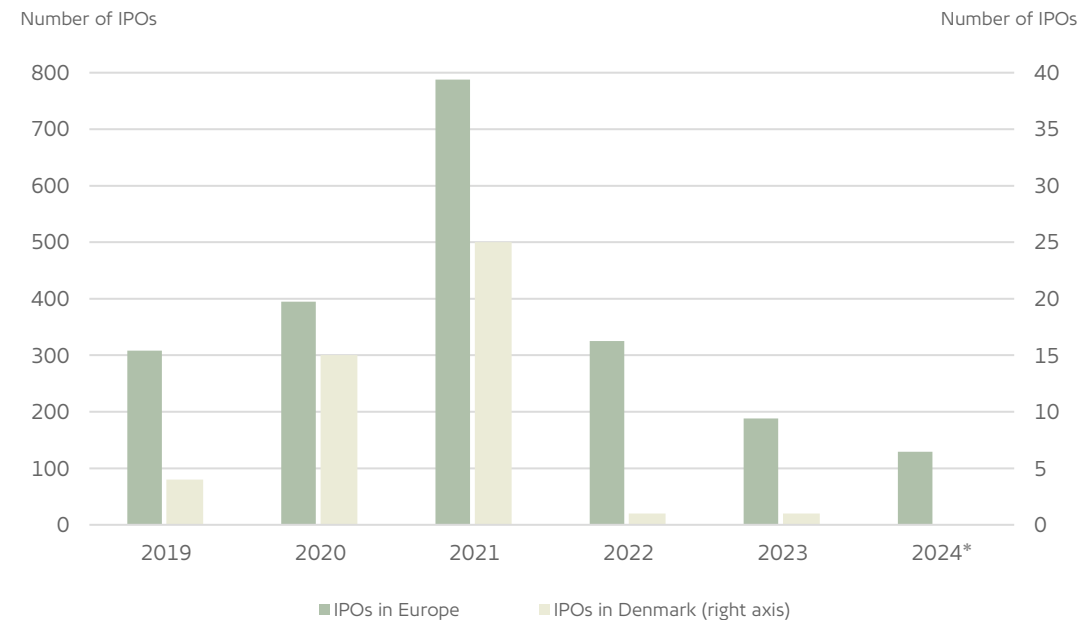
Recent years have seen a significant slowdown in exit markets for VC investors. Buyout activity in Europe and Denmark dropped by 8 percent and 15 percent, respectively, from 2021 to 2023. Similarly, IPOs fell sharply, with Europe seeing a 78 percent decline and Denmark a 96 percent drop from 2021 to 2023. In the first three quarters of 2024, Denmark has experienced a complete halt in IPO activity.

This downturn in key exit markets could negatively impact investors' ability to achieve timely exits and lucrative exit multiples, potentially forcing a reassessment of return expectations in the short run.

Number of buyout deals in European and Danish companies



Number of IPOs in Europe and Denmark



Note: data for 2024 as of September 30th. Exit-data has been sourced from PitchBook, which uses a slightly different taxonomy than Dealroom and EIFO. The green-tech figures presented on this slide have been constructed based on compiling exit activity across the following verticals: Cleantech, Climatetech, Foodtech, Agtech, Mobilitytech/Micro-mobility.

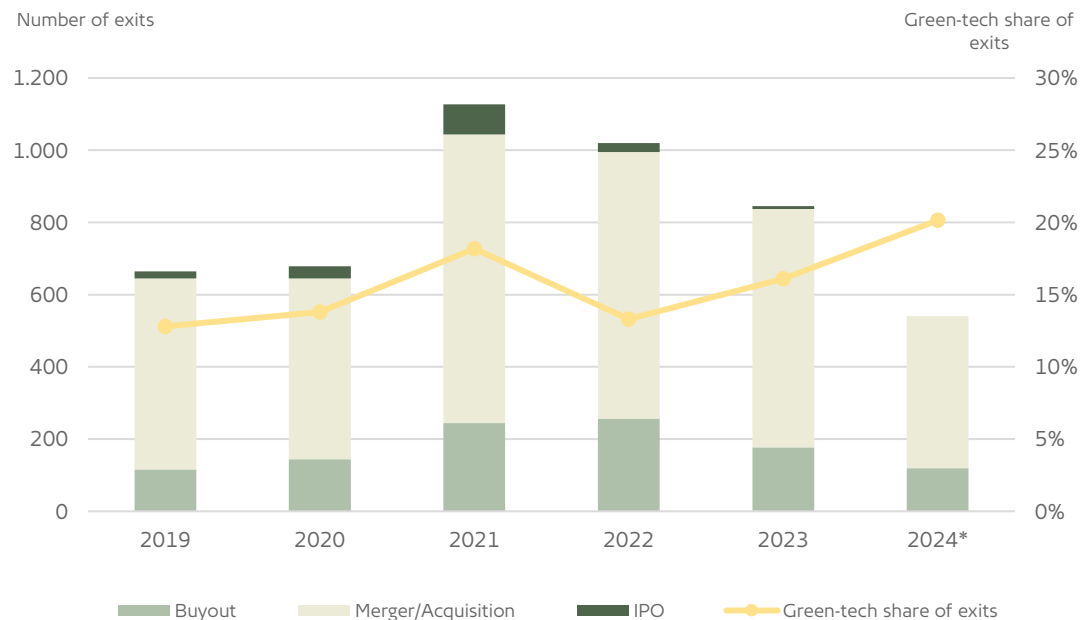
Sources: PitchBook and FBV.

European and Danish venture-backed exits have been declining in recent years – the share of green-tech exits has been growing in Europe but decreasing in Denmark

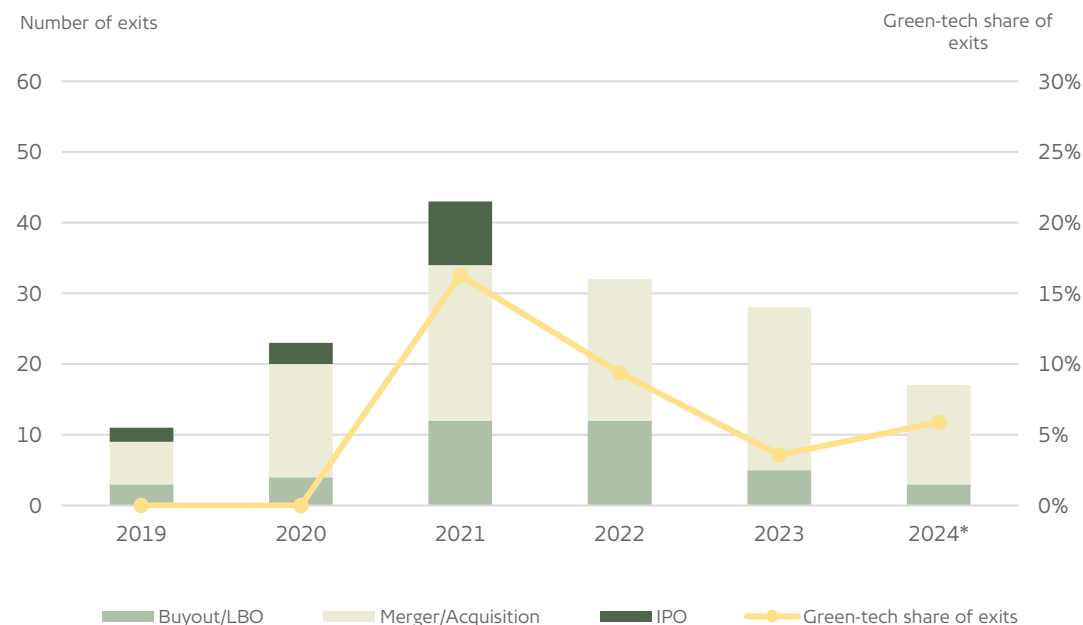
European venture-backed exits have declined 25 percent from 2021 to 2023, with fewer IPOs taking place, likely due to macroeconomic trends and increased investor uncertainty, which have made IPO exits riskier. Denmark has followed a similar trend, with venture-backed exits dropping 35 percent from 2021 to 2023. Notably, no IPO exits have occurred in Denmark since 2021.

Green-tech companies have made up an increasing share of European exits, rising to 16 percent in 2023 and reaching a record 20 percent in the first three quarters of 2024. However, the share of green-tech exits in Denmark has been declining, falling to 4 percent in 2023 and only rising slightly to 6 percent in Q3 2024. As more green-tech companies reach exit-ready maturity and more funds seek exits, the slowdown in exit markets could challenge investors’ ability to secure lucrative returns.

Number of venture-backed exits in Europe and green-tech exits as share of total market



Number of venture-backed exits in Denmark and green-tech exits as share of total market



Note: data for 2024 as of September 30th. Exit-data has been sources from PitchBook, which uses a slightly different taxonomy than Dealroom and EIFO. The green-tech figures presented on this slide have been constructed based on compiling exit activity across the following verticals: Cleantech, Climatetech, Foodtech, Agtech, Mobilitytech/Micro-mobility.

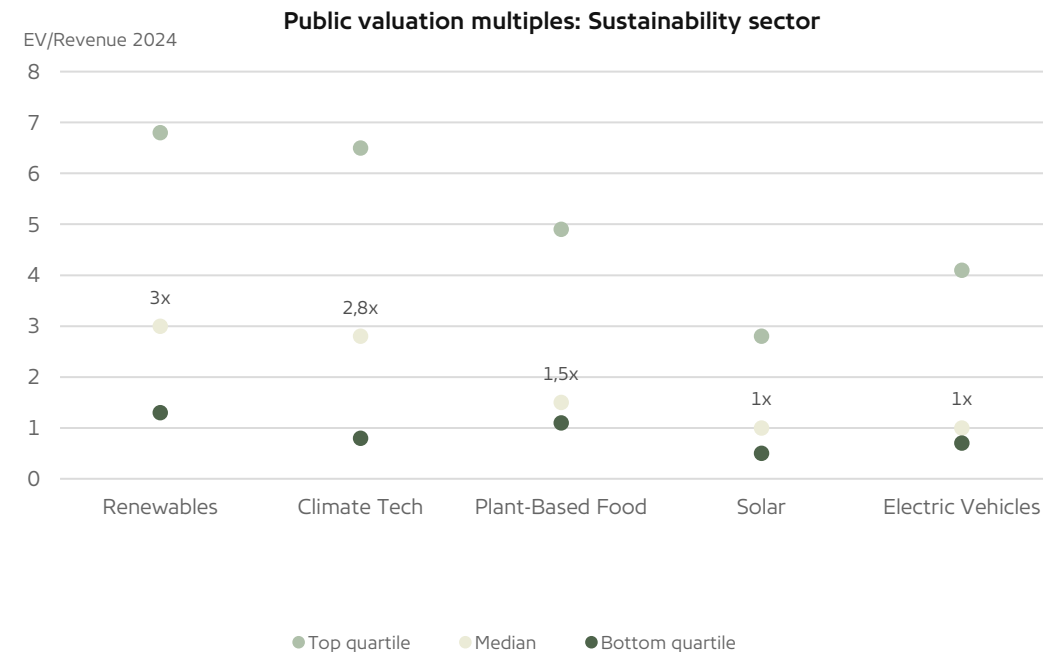
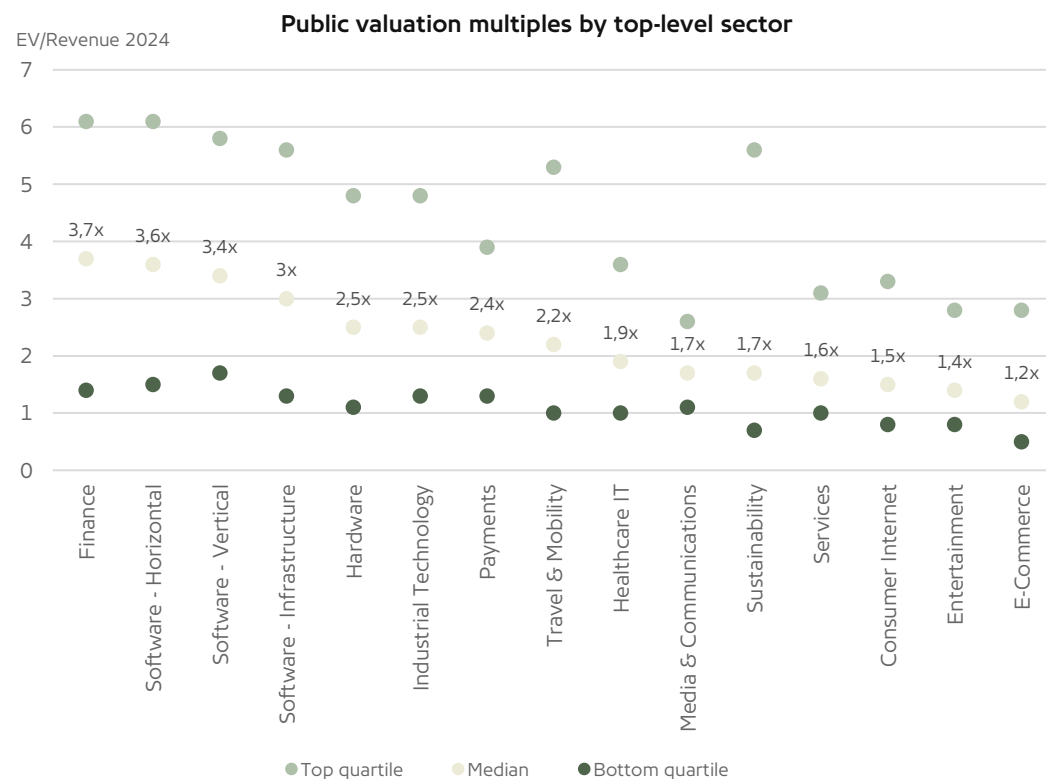
Sources: PitchBook, FBV and EIFO analysis.

Valuation multiples of publicly listed companies vary significantly between sectors – Hardware, Mobility, and Sustainability sectors all display median public valuation multiples below Software and Finance



At 3.7x, Finance has the highest median public valuation multiple of all top-level sectors. In comparison, companies in the Hardware sector have a lower median multiple of 2.5x, which is also below both Vertical- and Horizontal Software sectors. The Sustainability sector is notably lower, with a median valuation multiple of 1.7x. This data indicates significant sectorial variation in the valuation multiples of publicly listed companies.

Focusing specifically on the Sustainability sector, there is a notable distinction between subsectors. Renewables and Climate Tech companies demonstrate significantly higher valuation multiples compared to sectors like Plant-based Foods, Solar, and Electric Vehicles. Additionally, there is considerable variability within the Sustainability sector, with a large spread between bottom-quartile and top-quartile multiples. This may reflect differences in company maturity, growth potential, and business models across the sector's various verticals.



Note: A description of multiple-types is found in Attachment 3. Dealroom classifies the top-level Hardware sector as the sum of the following verticals: VR & AR, Semiconductors, Data storage, IoT, Consumer Electronics.

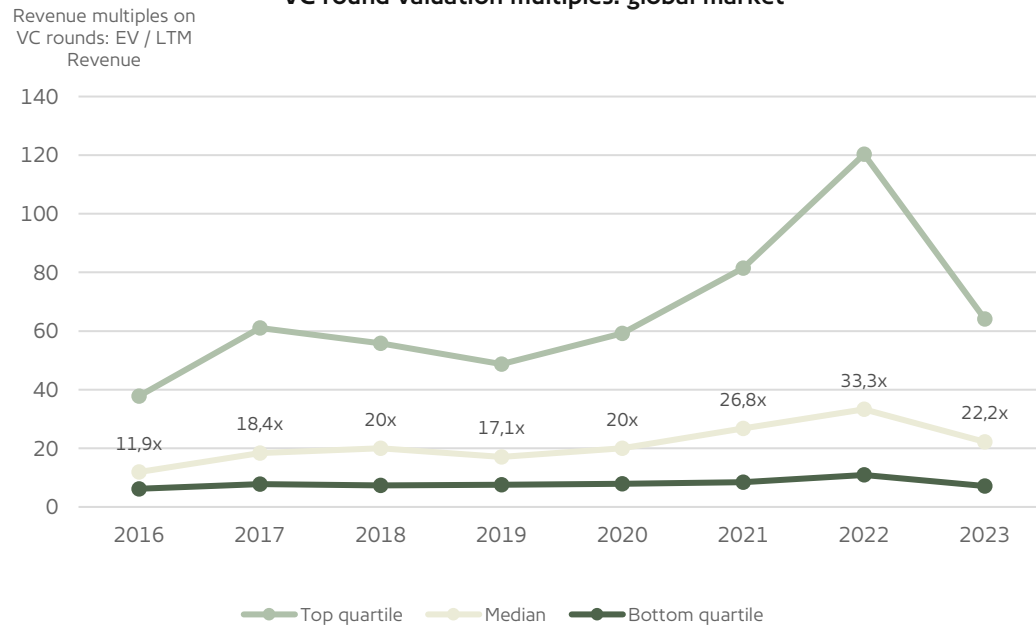
Median VC round valuations grew significantly between 2019 and 2022 but have since come back down in 2023 – with a median VC round multiple of 33x, the Energy industry ranks relatively high, while Foodtech is towards the bottom of the list at 12x



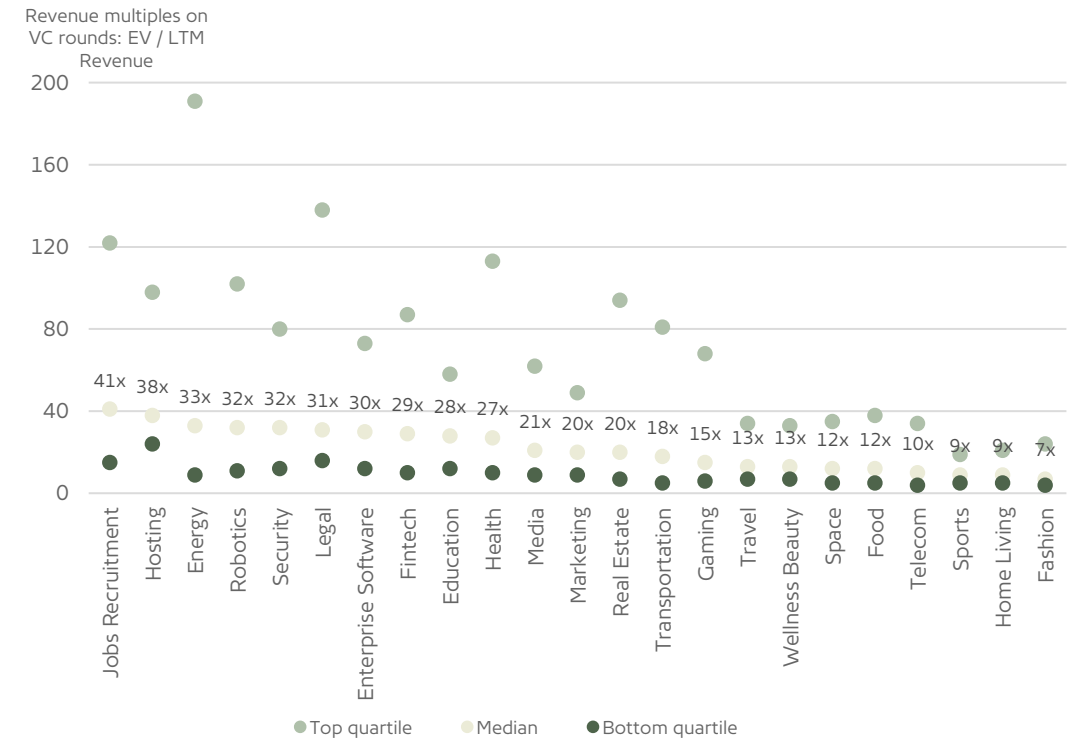
Global VC round valuation multiples grew significantly from 2019 to 2022, increasing from 17.1x to 33.3x. This rise was likely driven by the low-interest-rate environment during this period, which boosted the availability of private capital for venture investments and increased the number of deals being completed at higher multiples. Additionally, growing competition among VC investors to secure the best investment opportunities could have contributed to this trend. However, as macroeconomic conditions shifted and interest rates continued to rise throughout 2023, VC round valuations began to decrease, with the median round multiple dropping to 22.2x.

Looking at sector-specific VC round multiples, within green-tech related industries the Energy industry stands out with a relatively high median round multiple of 33x, though it also exhibits the highest variability across rounds. This variation may be due to the mix of hardware technologies, such as batteries, and software technologies for applications like smart grids and home energy efficiency as SaaS models. On the other hand, Foodtech is at the bottom of the list, with a median VC round valuation multiple of 12x.

VC round valuation multiples: global market



VC round valuation multiples by industry



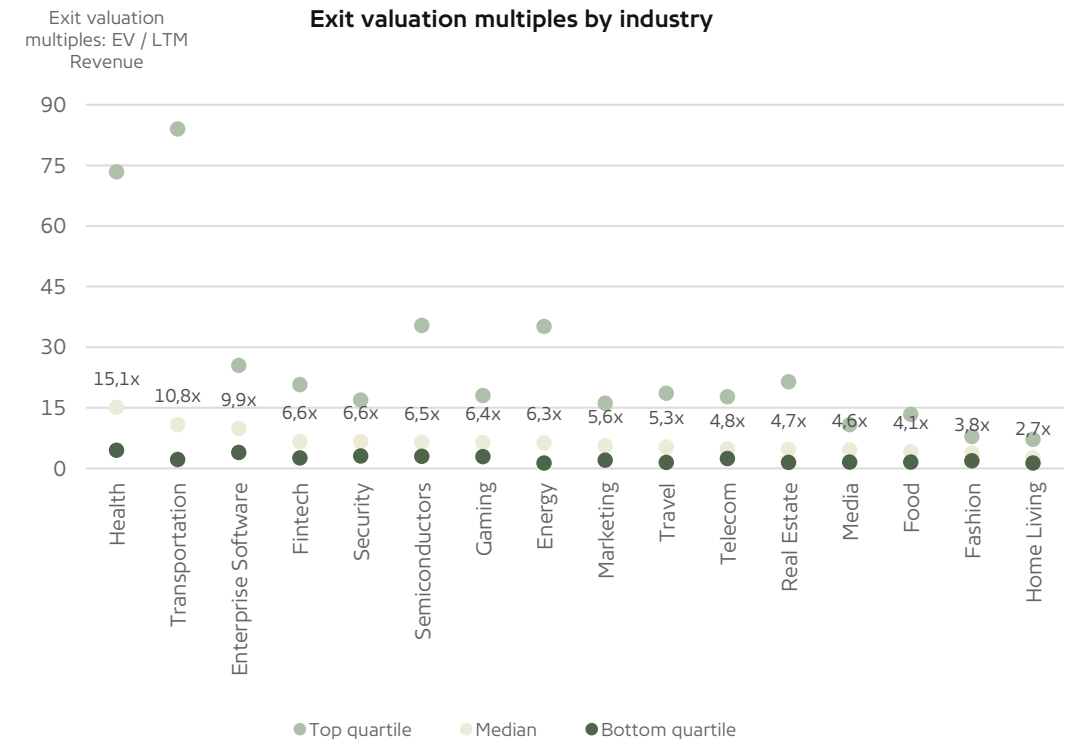
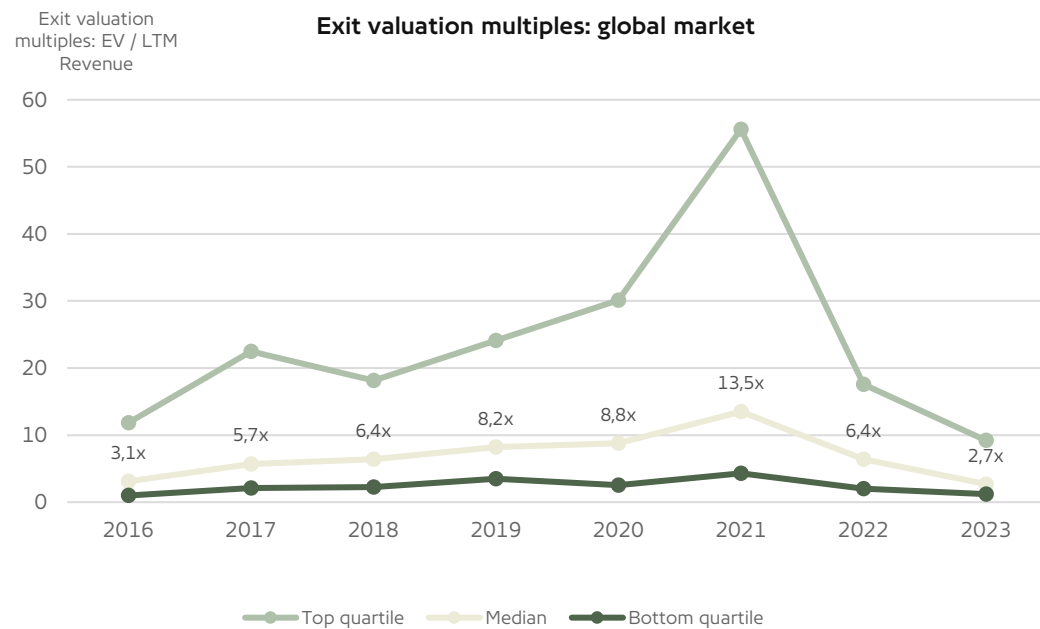
Note: A description of multiple-types is found in Attachment 3. The Energy industry also includes software technologies for e.g., smart grid and home energy efficiency as SaaS model – as well as hardware-technologies e.g., batteries.

Median exit multiples grew significantly between 2018 and 2021 but have since plummeted, reaching a historical low in 2023 – exits in the Health and Transportation industries have been highly lucrative, while exit multiples in Energy and Food have come out significantly below



Exit multiples grew significantly from 2018 to 2021, with median exit multiples across the broader global VC market more than doubling, peaking at a record high of 13.5x in 2021. However, in 2022 and 2023, these multiples declined sharply, reaching an all-time low of 2.7x in 2023. This downturn suggests that it became increasingly difficult for venture capitalists to complete lucrative exits as activity slowed across key exit markets, including buyouts and IPOs.

Looking at exit multiples by industry, Energy has dropped considerably compared to its higher ranking in median VC round multiples. While Energy companies achieved relatively high round multiples, their exit valuations have not mirrored this trend. Similarly, Foodtech, which had a lower ranking in VC round multiples, shows a similar pattern in exit multiples. These trends suggest that while green-tech companies, particularly in the Energy and Food sectors, may enjoy higher valuations at the point of investment, these valuations tend to decrease significantly at the time of exit.



Note: A description of multiple-types is found in Attachment 3. The Energy industry also includes software technologies for e.g., smart grid and home energy efficiency as SaaS model – as well as hardware-technologies e.g., batteries.

Broader markets and technology sectors have outperformed ESG-tilted and early-stage indices on price and risk-adjusted returns

From 2020 to 2023, broader European markets (MSCI Europe All Cap) and technology sectors (STOXX Europe 600 Technology) delivered higher price and risk-adjusted returns compared to ESG-tilted indices (MSCI Europe ESG Leaders, STOXX ESG-X) and early-stage high-growth companies (MSCI Small & Mid Cap Growth).

While ESG-tilted indices outperformed early-stage companies, they trailed broader market and technology indices on both price returns and Sharpe ratios, highlighting the stronger performance of mature and scalable sectors over recent years.

Indexed price returns and risk-adjusted returns: MSCI Europe Index (All Cap), STOXX Europe 600 Technology Index and Small & Mid Cap, Growth Index



Indices	Price return (%)			Sharpe ratio		
	1 YR	3 YR	Max (4 YR)	1 YR	3 YR	Max (4 YR)
MSCI Europe Index (All Cap)	27,4%	22,6%	39,6%	0,69	0,47	0,51
STOXX Europe 600 Technology Index	12,5%	18,6%	28,6%	1,13	0,52	0,47
MSCI Small & Mid Cap, Growth Index	11,0%	-3,0%	4,0%	0,44	0,16	0,27

Indexed price returns and risk-adjusted returns: MSCI Europe ESG Leader and STOXX ESG-X (total market)



Indices	Price return (%)			Sharpe ratio		
	1 YR	3 YR	Max (4 YR)	1 YR	3 YR	Max (4 YR)
MSCI Europe ESG Leader Index	21,6%	17,9%	29,7%	1,09	0,45	0,40
STOXX ESG-X: total market Index	16,8%	7,4%	12,5%	0,78	0,25	0,20

Note: a description of the Index constituents can be found in the appendix: Attachment 1. The methodology is described in Attachment 2. A similar conclusion has been drawn from comparing general market returns from global, Nordic and Danish stocks to returns in the ICB Sector Alternative Energy Index.

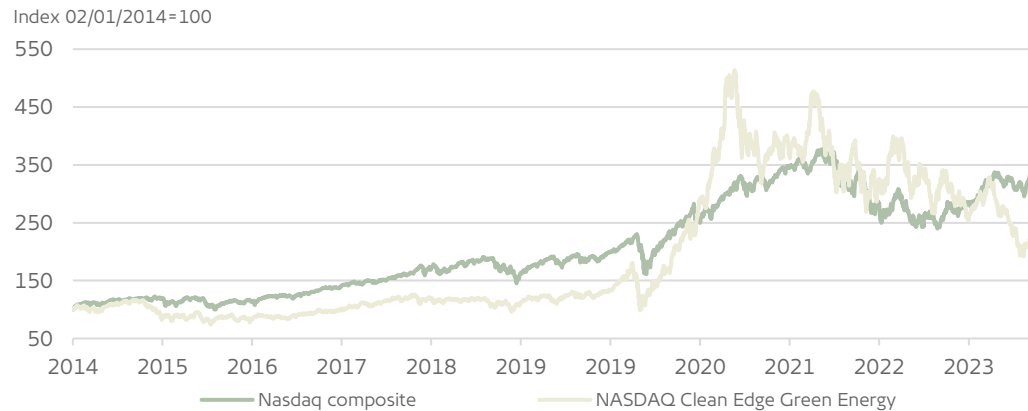
Sources: Nasdaq via Macrobond and EIFO analysis.

Asset-light industries tend to outperform asset-heavy sectors, such as Clean Energy and Industrials, on price and risk-adjusted returns

Over the past decade, asset-light industries like ICT and technology have delivered significantly higher price and risk-adjusted returns compared to asset-heavy sectors such as clean energy and industrials.

Clean energy stocks, despite benefiting from global sustainability trends, have shown high volatility and lower Sharpe ratios compared to the general market. Similarly, industrials and clean energy sectors have lagged behind ICT, which has consistently achieved higher price returns and Sharpe ratios, reflecting the challenges faced by hardware-intensive industries in generating competitive returns, likely due to differences in capital intensities and development cycles.

Indexed price returns and risk-adjusted returns: NASDAQ Composite and NASDAQ Edge Green Energy Indices



Indices	Price return (%)			Sharpe ratio		
	1 YR	3 YR	Max (10 YR)	1 YR	3 YR	Max (10 YR)
Nasdaq Composite Index	43,4%	16,5%	252,5%	1,09	0,45	0,73
NASDAQ Clean Edge Green Energy Index	-10,6%	-39,8%	88,3%	0,78	0,25	0,24

Indexed price returns and risk-adjusted returns: S&P 500 Information Technology, S&P 500 Industrials, S&P Global Clean Energy Indices



Indices	Price return (%)			Sharpe ratio		
	1 YR	3 YR	Max (9 YR)	1 YR	3 YR	Max (9 YR)
S&P 500 Information Technology	56%	48%	391%	2,72	1,12	1,16
S&P 500 Industrials	16%	29%	98%	0,78	0,46	0,50
S&P Global Clean Energy	-21%	-44%	60%	-1,16	-0,78	0,38

Note: a description of the Index constituents can be found in the appendix: Attachment 1. The methodology is described in Attachment 2. A similar conclusion has been drawn from comparing general market returns from global, Nordic and Danish stocks to returns in the ICB Sector Alternative Energy Index.

Sources: Nasdaq via Macrobond and EIFO analysis.

**Perspectives from existing
literature and market
participants**



Existing literature offers opposing views on differences in return profiles between general market and green-tech/impact investments – however, some findings suggest that impact and green-tech constrained VCs accept lower returns on investments



Some papers find that impact-oriented VC and growth equity funds accept lower financial returns in exchange for social or environmental objectives:

- › The paper *"Impact Investing"* by Barber, Morse, and Yasuda (2019) analyses investors' willingness to accept lower financial returns for social or environmental impact. The study finds that VC and growth equity impact funds, which target dual-objective returns, exhibit lower average financial returns compared to non-impact funds. Specifically, impact funds have a mean IRR of 3.7 percent, significantly lower than the 11.6 percent IRR for impact-agnostic funds (Table 4). This suggests that investors in impact-oriented funds often accept reduced returns to achieve social and environmental goals.
- › Furthermore, a Cambridge Associates analysis indicates that cleantech investments historically underperformed compared to the broader private equity and venture capital universe. Between 2005 and 2020, cleantech investments yielded lower gross deal-level returns, reflecting the unique challenges faced by the sector (Figure 4). This underperformance highlights the financial risks associated with cleantech, especially hardware-centric technologies, which are more capital-intensive and complex to scale compared to other VC sectors.

Other papers find no significant differences in returns on green-tech and impact investments compared to the broader equity markets:

- › An opposing perspective comes from a study by Kurnoga, Šimurina, and Fučkan, which finds no significant performance differences between ESG and conventional European equity indices. Through multivariate analysis, the authors examined various return measures, such as year-to-date, 3-year, 5-year, and 10-year annualized returns. Despite ESG indices incorporating sustainability factors, the study concludes that their performance is broadly comparable to that of traditional market indices, suggesting that integrating environmental, social, and governance (ESG) considerations does not necessarily lead to lower financial returns.

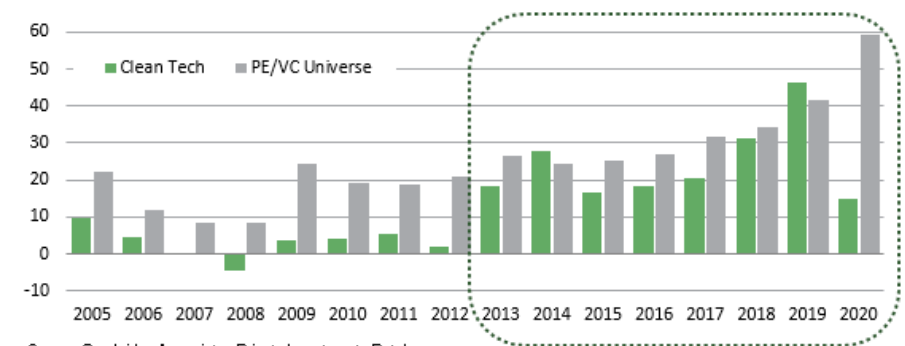
TABLE 4: PRIVATE EQUITY FUNDS' IRR AND IMPACT FUNDS' WILLINGNESS TO PAY (WTP)

	Private equity VC and growth impact funds	Impact-agnostic VC and growth funds
Mean IRR (%)	3.7	11.6
Median IRR (%)	6.4	7.4
Willingness-to-pay (percentage points)	2.5 – 3.7	–

Source: Barber, Morse, and Yasuda, "Impact Investing."

FIGURE 4 PERFORMANCE OF COMPANY-LEVEL INVESTMENTS MADE BY PE & VC PARTNERSHIPS IN CLEAN TECH (GLOBAL)

As of December 31, 2021 • Pooled Gross IRR (%) • From the Year of Initial Investment



Source: Cambridge Associates Private Investments Database.

Note: The paper "Impact Investing" by Barber, Morse, and Yasuda (2019) is based on data of 24,000 VC and growth equity investments by 3,500 investors from 1995 to 2014, reflecting 4,659 funds. Conducting desk research to identify capital sources, the authors coded investor types and impact objectives to narrow the sample down to 159 funds meeting the criteria to be considered impact funds. The Cambridge Associates analysis defines "cleantech" as investments in companies or projects developing non-fossil fuel energy sources, promoting industrial efficiency, recycling waste efficiently, or delivering environmentally beneficial products or services.

Sources: Barber, Morse, and Yasuda, "Impact Investing" (2019), GIIN, "Impact Investing Decision Making: Insights on Financial Performance" (2021), Cambridge Associates, "Climate Tech's Evolution: The Maturation to a Competitive, Returns-Focused Thematic Investment Sector" (2023) and Kurnoga, Šimurina, and Fučkan, "Performance Differences between ESG Indices and Conventional Market Indices: a Multivariate Analysis of Indices" (2022).

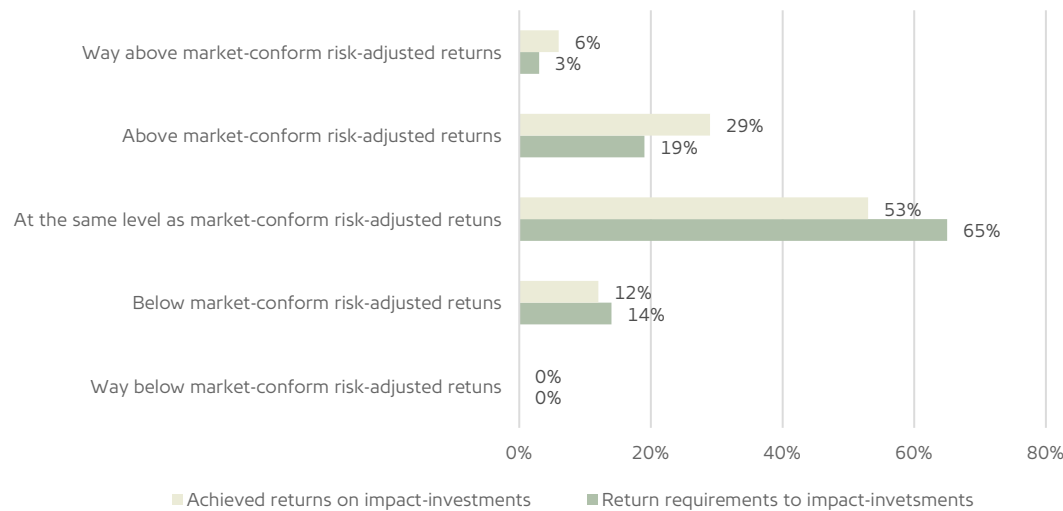
Most Danish impact investors set return targets at or above the level of market-conform risk-adjusted returns – however, a lack of cases demonstrating both market-level returns and genuine impact has been identified as a barrier to market growth



Return requirements for impact-investments and achieved returns:

- › In a recent survey by *Invest for Impact Denmark*, 87 percent of impact investors reported return requirements at or above risk-adjusted market-conform returns, and 88 percent of these investors achieved returns at or above this level.
- › Meanwhile, 14 percent of impact investors reported to have return requirements below risk-adjusted market-conform returns and that 12 percent of impact-investors have achieved a return below risk-adjusted market-conform returns.

Return requirements for impact-investments and achieved returns



The survey uncovered 8 barriers to growth in the market for impact investments:

- Lack of cases demonstrating both market-level returns and genuine impact
 - › A major barrier is the shortage of investment cases that show both competitive returns and measurable social or environmental impact, particularly felt by ESG investors with limited impact experience.
- Lack of political focus on mobilizing capital
 - › Investors cite the absence of political backing, such as regulation and incentives, as a key barrier to mobilizing capital for impact investments, deterring both existing and potential investors.
- Limited investment opportunities in impact-focused fund managers and/or companies
 - › There's a perceived lack of mature, scalable impact investment opportunities, leading to a bottleneck that restricts the flow of capital.
- Low risk tolerance among investors regarding financial returns
 - › Many ESG investors are wary of the risk-return profile of impact investments, fearing a trade-off between financial returns and positive social or environmental outcomes.
- Insufficient internal resources and expertise for impact measurement and reporting
 - › Especially challenging for smaller players, the lack of resources and expertise for impact measurement and reporting complicates scaling impact investments.
- Lack of financial incentives
 - › ESG investors identify insufficient financial incentives, such as tax breaks, to offset perceived risks and make impact investments more appealing.
- Lack of clear definitions and common understanding distinguishing impact from ESG/sustainable investments
 - › The ambiguity in definitions between impact and ESG investments leads to confusion, particularly among ESG investors new to impact.
- Shortage of impact-investment capital
 - › There's a fundamental market imbalance with demand for impact capital exceeding supply, especially for mature opportunities, which hinders growth in the impact investment market.












Note: The survey is based on responses from 50 private impact investors across investor types. Respondents reported that 79 percent of portfolio investments are allocated to companies focusing on environmental impact and 21 percent of portfolio companies are focused on societal impact. With this distribution taken into consideration, the findings of the survey may to a reasonable extent be considered as indicative for green-tech investments, but not necessarily for the venture capital segment.

Sources: Invest for Impact Denmark, "Det danske impact-investeringsmarked 2024: Indsigt, barrierer og vejen til vækst".

Appendix

Green-tech taxonomy

The analysis uses green-tech as an umbrella term for technologies that contribute towards climate-, resource and biodiversity related sustainable development goals, in line with the EU Taxonomy Compass (*Climate mitigation, Climate adaptation, Water, Circular economy, Pollution prevention, Biodiversity*)

Selected SDGs	#6: Clean Water and Sanitation	#7: Affordable & Clean Energy	#11: Sustainable Cities & Communities	#12: Responsible Consumption & Production	#13: Climate Action	#14: Life Below Water	#15: Life on Land
Description	Ensure availability and sustainable management of water and sanitation for all	Ensure access to affordable, reliable, sustainable and modern energy for all	Make cities and human settlements inclusive, safe, resilient and sustainable	Ensure sustainable consumption and production patterns	Take urgent action to combat climate change and its impacts	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Related green technologies	<ul style="list-style-type: none"> Wastewater treatment Water-saving Safe water/purification Desalination 	<ul style="list-style-type: none"> Solar energy Wind energy Tidal power Hydrogen Batteries/alternative batteries Alternative grids 	<ul style="list-style-type: none"> Air quality measurement Urban waste reduction/treatment Electric heating and cooling systems Micro mobility 	<ul style="list-style-type: none"> Food waste Sustainable fashion Circularity Sustainable materials Fermentation Alternative protein 	<ul style="list-style-type: none"> CCUS Carbon offset Biofuels EV-charging 	<ul style="list-style-type: none"> Marine conservation Seafood substitutes Overfishing Plastic pollution 	<ul style="list-style-type: none"> Forestry Biodiversity Wildfires Pesticides
Examples	 	 	 	 	 	 	  <small>OUT OF THE FOREST</small>

Please note that the categorization of the listed technologies and companies is subjective, and that many green technologies and companies may fit into multiple categories and address multiple Sustainable Development Goals.

Overview of stock indices included in the price and risk- adjusted return comparisons

Indices	Maturity focus	Sector focus	Geographical focus	Risk profile	ESG focus
MSCI Europe Index (All Cap)	All stages, broad exposure, moderate growth potential	Sector agnostic	Europe	Moderate	Low
MSCI Small & Mid Cap, Growth Index	Early to mid-stage, high growth potential, higher risk	Sector agnostic	Europe	High	Low
STOXX Europe 600 Technology Index	Primarily mature tech firms, some growth	Technology	Europe	Moderate	Low
MSCI Europe ESG Leader Index	Primarily mature firms with ESG focus	Sector-agnostic, ESG-tilted	Europe	Moderate	High
STOXX ESG-X: Total Market Index	All stages, broad exposure, ESG-tilted	Sector agnostic	Europe	Moderate	Moderate
Nasdaq Composite Index	Mix of mature and high-growth firms, high tech focus	Technology-heavy, sector-diverse	USA, Global	Moderate to high	Low
NASDAQ Clean Edge Green Energy Index	Primarily early to mid-stage, higher risk	Clean energy, green tech	USA, Global	High	High
S&P 500 Information Technology Index	Primarily mature tech firms	Information technology	USA	Moderate	Low
S&P 500 Industrials Index	Primarily mature firms	Industrials, hardware	USA	Moderate	Low
S&P Global Clean Energy Index	Primarily early to mid-stage, high growth potential	Clean energy, green tech	Global	High	High

Price and risk-adjusted return analysis of public stock indices

Methodology:

Price return is calculated based on daily log returns summed up to an annual returns. The reason for using logarithmic returns in this analysis is that it provides a more accurate picture of returns by accounting for volatility over time. Logarithmic returns capture daily price changes and allow for a better understanding of return development, especially in volatile markets. Unlike simple returns, which only consider the ratio between the starting and ending prices for the year, logarithmic returns offer deeper insights into compounded gains and risk, which are essential for assessing investment performance more precisely.

Volatility is calculated by first finding the daily standard deviation of daily log returns and then annualizing it by multiplying the value by the square root of the number of trading days in the given year.

Based on yearly price returns and volatility, the sharpe-ratio is calculated as a method of comparing risk-adjusted returns across the various stock indices. The sharpe ratio accounts for how much excess return (return above risk-free rate) an investment yields for each unit of risk taken (standard deviation/volatility). A higher sharpe-ratio indicates a more favorable risk-adjusted return, meaning investors are obtaining a relatively high return per unit of risk. Investments or portfolios with Sharpe Ratios above 1 are often considered attractive, as they provide better returns relative to the amount of risk taken. A Sharpe Ratio below 1 suggests that the return may not justify the risk. Negative Sharpe Ratios mean that the portfolio's return is lower than the risk-free rate, indicating an unfavorable risk-return tradeoff.

Rule of thumb for assessing sharpe-ratio: below 1 (suboptimal), around 1 (fair), above 1 (good) and above 2 or 3 (very good or excellent)

Assesment of sector variation in valuation multiples

Public valuation multiples, VC-round valuation multiples and exit multiples are sources from Dealroom. The data reflects global differences in valuation multiples across sectors.

Types of multiples data: Private and Public

	Advantages	Disadvantages
Public Multiples	<ul style="list-style-type: none">• Lots of publicly available data• Always real-time	<ul style="list-style-type: none">• Less relevant for private transactions (e.g. illiquid discount, strategic premium, early stage premium)
Private Multiples	<ul style="list-style-type: none">• More comparable when used for VC rounds or Exits	<ul style="list-style-type: none">• Data is very scarce• Not real-time

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