Deep Tech Study Finland 2023

Tesi

Foreword

Deep tech, encompassing breakthroughs in areas like AI, biotechnology, and quantum computing, is crucial for significant economic and societal advancement. Its growing popularity is evident globally, with Finland being a prominent example. We believe, Finland excels in deep tech, backed by its strong research tradition and a burgeoning startup ecosystem. The increasing investment in Finnish deep tech startups reflects the sector's rising significance.

Collaboration among government, investors, corporations, and universities is key to deep tech development. This multidisciplinary effort is essential, as deep tech investments require specialized knowledge and a longer-term perspective compared to traditional startups.

Looking ahead, Finland's focus on deep tech is expected to continue, driving economic growth and innovation. This mirrors a global trend where deep tech is increasingly recognized for its potential to address complex challenges and propel societies forward. Thus, Finland's experience highlights the broader global shift towards valuing deep tech's transformative capabilities.

At Tesi, we have long contributed to the Finnish deep tech ecosystem through active collaboration with stakeholders, significant investments into companies and funds, and by providing key insights through our research. We will continue these efforts and aim to bolster the ecosystem even further.

Authors

Juha Lehtola
Director, VC

Tuomas Rekonen
Investment Manager

Henri Hakamo
Chief Strategy and Research Officer

Klaus Majanen
Senior Analyst

Tatu Hämäläinen
Trainee

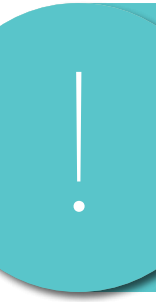
Findings & Insights

Investments are in a downturn	At the end of October, Finnish deep tech companies had raised €180 million since the beginning of the year. **In H1 of 2023, the investments decreased 42% compared to H1 2022.** The drop is partly due to the natural funding cycles of individual companies, but on the whole, it seems likely that we won't reach the record levels of 2022. Domestic VCs hold considerable amount of dry powder and are able to fullfill the seed and early stage capital demand. The primary challenge is that new companies are being founded somewhat infrequently, which leads to less new VC funded companies, and stagnating early stage activity.
Later stage funding is a growing bottleneck	As we stated in our previous research, Finland lacks investors with credible capacity to act as an lead investor in large rounds. This has previously lead to prolonged fundraising processes, and large syndicate sizes. We expect that this challenge will be emphasized in the near future, as: **1. the late stage capital demand by our estimate will in all likelihood reach record highs in 2024 2. the global late stage investments have experienced significant headwinds.** There is already some weak evidence of prolonged funding cycles as a result of this phenomenon. On the other hand, this provides a unique opportunity for investors to cherry-pick from a wide selection of promising opportunities.
Areas of interest	In 2023, **we have seen increasing activity in sectors like quantum and energy**. Finland has been at the frontier of quantum for some time with companies like Bluefors and IQM leading the way. Currently, we are seeing an influx of new companies raising substantial rounds (e.g. Algorithmiq series A ~ €13 million) in the space. Similarly, energy-related technologies are gaining popularity as the transition into a greener future needs novel solutions to pave the way for a sustainable reality. **In addition to sector-specific findings, deep tech business models are something we pay close attention to**. Capital-intensity is quite common the in deep tech landscape and something that may be off-putting for some investors. However, we see significant potential in capex-heavy and manufacturing related scaleups. We can alreadty identify a cohort of promising companies, e.g. Spinnova, have already proved feasibility, and scalinfg their manufacturing and continuing commercial expansion.
Strong growth despite slight slowdown	Many new companies from different categories have grown into substantial size. By our estimation, the total revenue of the ecosystem has grown over 40% a year, and reached over €900 million in 2022. However, the median revenue growth slowed down to 12% in 2022 from 22% in 2021. Neverthless, the upper quartile has proven resilient with revenue growth of 81%, with companies such as Iceye and Spinnova growing strong towards midcap and hopefully beyond.

Scope of the Research

Background & Purpose

- Our mission is to enhance the transparency of the ecosystem by fostering collaboration among an increasingly diverse group of market participants, thereby creating a comprehensive perspective. This year, we have broadened our list of Finnish deep technology companies through collaboration with **VTT, Voima Ventures**, and **Business Finland**. An updated list necessitates an update of our report.
- Moreover, in light of the recent downturns observed in both global and domestic private equity & venture capital markets, we recognize the importance of diligently tracking and disseminating market developments.



Limitations

- We recognize that our study may not include all deep tech companies in Finland, moreover lists are always subjective. However, we aim to co-operate within the other industry players to create a public, up-to-date and holistic list. We are commited to ongoing research agenda within the field.
- Tesi's data model is used as the main datasource, which includes multiple different datasources, including Pitchbook, Dealroom, Talouselämä (Finnish media), Bureau van Dijk (Orbis), Mergermarket, and other datasources. The data utilized may be partially incomplete or faulty. Research also includes already bankcrupted companies.

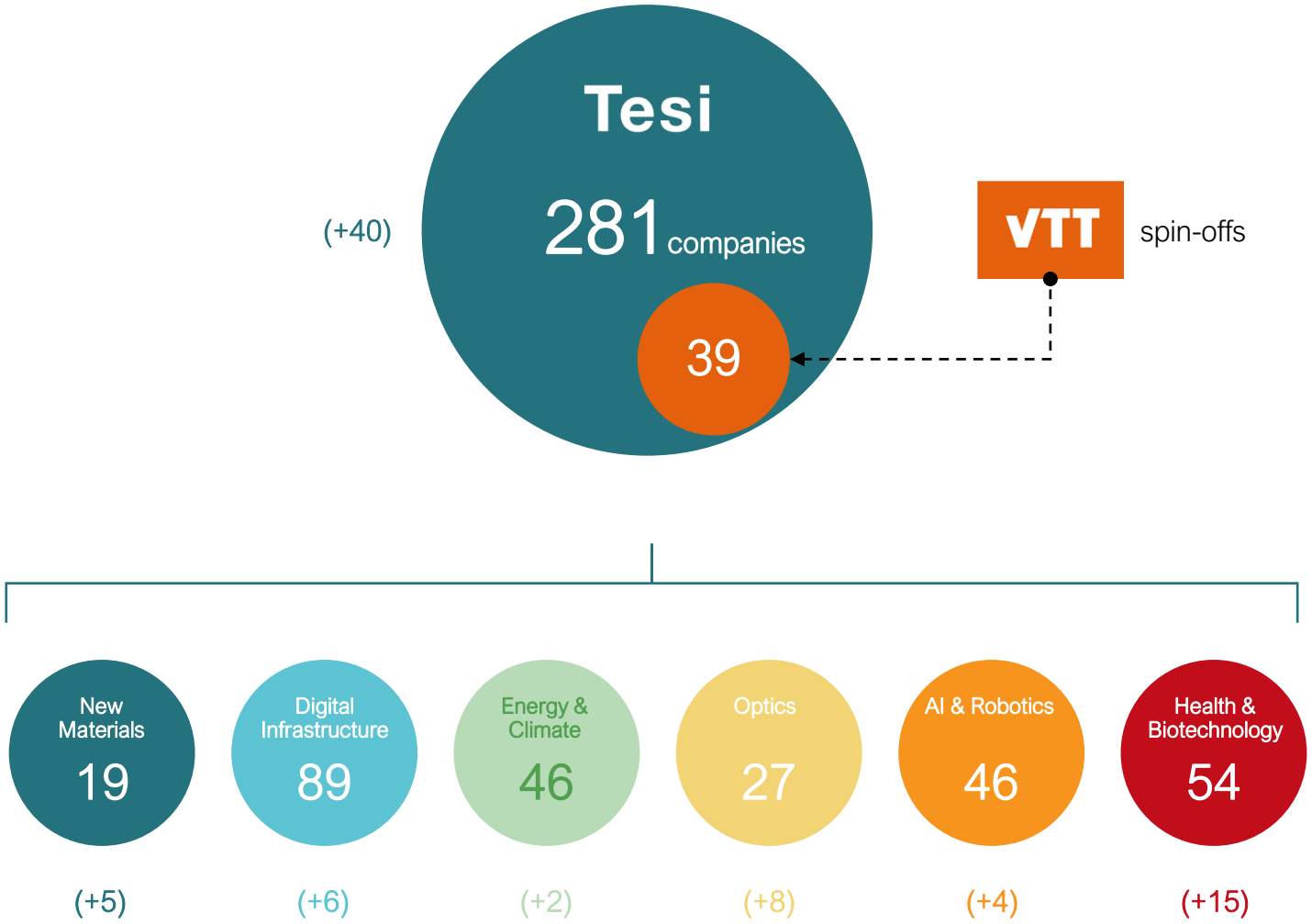
What has changed compared to our last report?

As a part of our commitment to continously enchance the quality and coverage of our list of Finnish deep tech companies, we have implemented some changes[1]

- We deleted 15 companies from our list, as they were deemed out of our scope
- We added 55 new companies to our list through collaboration with different stakeholders

[1] Comprehensive list of changes to the list can be found from the appendix

Tesi's Definition of Deep Tech



Voima Ventures | BUSINESS FINLAND | VTT

This year, we have collaborated with **Voima Ventures**, **Business Finland**, and **VTT** to improve the quality and coverage of our research.

Collaborating with market participants has proven to be instrumental especially in expanding our list of deep tech companies. **We welcome all deep tech market participants to join in future research endeavours** as we strive towards continous improvement.

- Tesi's selection is hand-picked from the Finnish ecosystem, mainly from (VC-) funded companies. These companies have been manually screened and categorised as "deep tech" by our investment team members, and experts from collaborating organizations. Our criteria for deep tech companies:
  1. Science and research-based
  2. High technological barrier
  3. Company operates at the technological frontier
- We have identified 281 deep tech companies in Finland that can be divided into six categories (55 added and 15 removed after 2022 study[1])
- Digital infrastructure still is by far the largest category (89 companies), even though most new companies were added to health & biotech (+15) and optics (+8)

[1] Comprehensive list of changes to the list can be found from the appendix

Tesi's Deep Tech Description and Taxonomy

We consider companies to be deep tech if they are based on important scientific or engineering innovation with strong disruptive potential and high barriers to entry

New Materials

Companies developing new materials through technological innovations, including for example sustainable subsitites for plastic and textiles

Digital Infrastructure

Companies developing physical and/or digital systems, including sensors, IoT, (embedded) systems, computing, networks and electronics

Energy & Climate Technology

Companies developing new energy and/or climate related technologies, for example carbon capture, new energy storage technologies

Optics

Companies developing optics and imaging solutions including the generation, detection and manipulation of light

AI & Robotics

Companies developing artificial intelligence and robotics, inclunding computer vision, machine learning, speech recognition

Health & Biotechnology

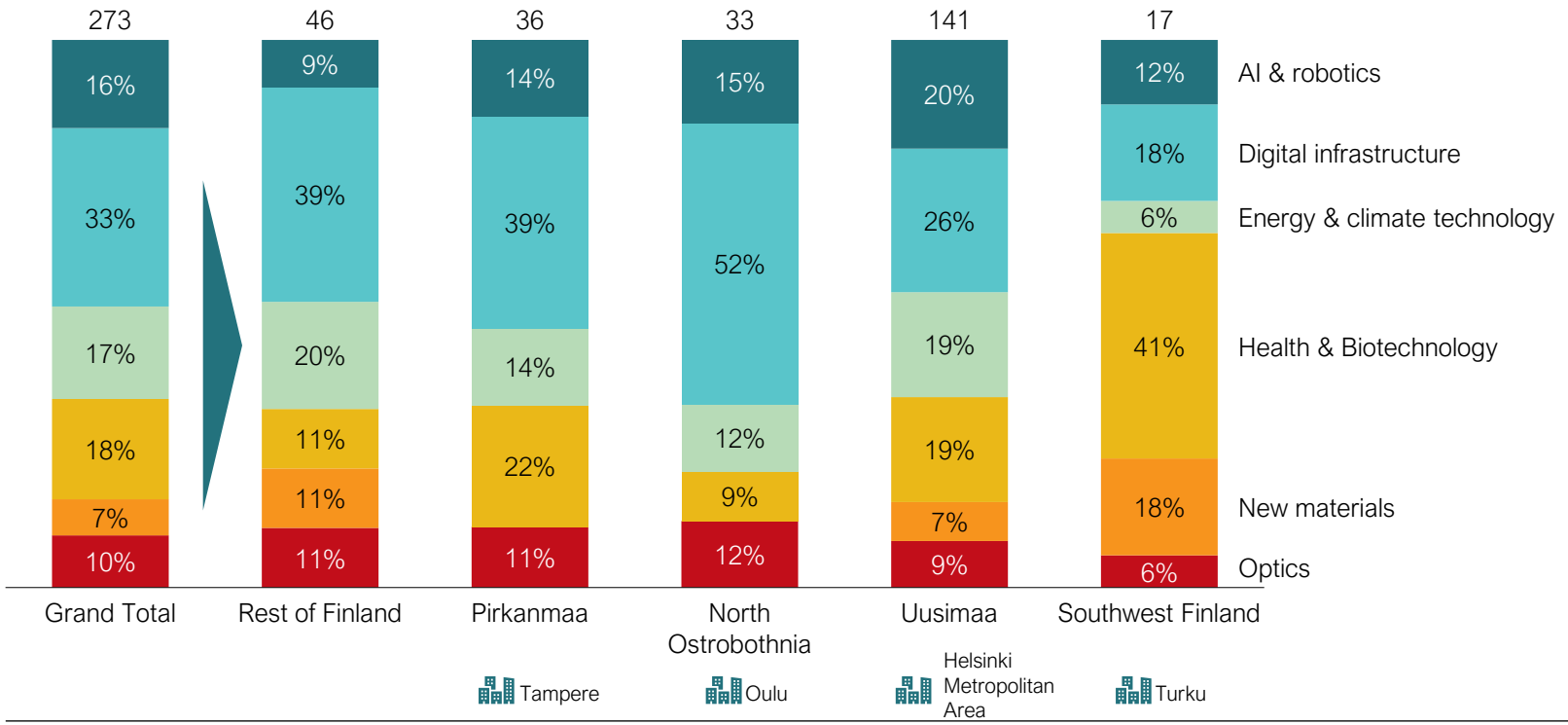
Companies developing biotechnological applications for healthcare and medicine, and technologically advanced medical devices

Deep Tech is Concentrated Around Universities – with Regional Differences in Ecosystem Composition

- Deep tech companies are heavily concentrated in the Helsinki metropolitan area. Over half of the identified deep tech companies have been founded in this region.
- Outside of the Helsinki Metropolitan Area, deep tech companies are concentrated near large universities. Tampere (33), Oulu (27) and Turku (14) account for the majority of deep tech company locations outside the capital region.
- Compared to Finland as a whole, the Turku region has the highest share of Health & Biotechnology companies while Digital Infrastructure is over-represented in Oulu. The Helsinki Metropolitan Area provides a fair representation of the Finnish ecosystem composition.

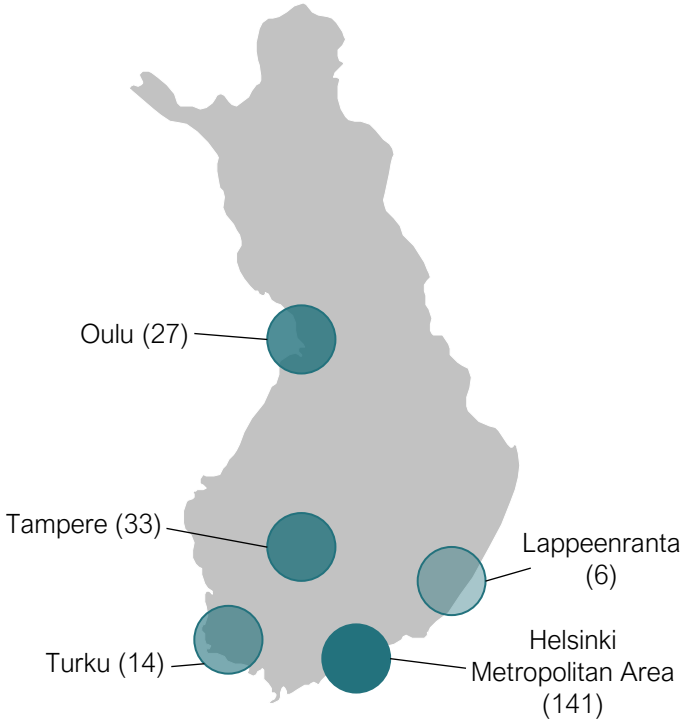
NUMBER OF COMPANIES PER REGION AND CATEGORY

% of companies in the region



DEEP TECH HUBS

number of companies



Declining Trend in the Number of Founded Companies

281 *companies*

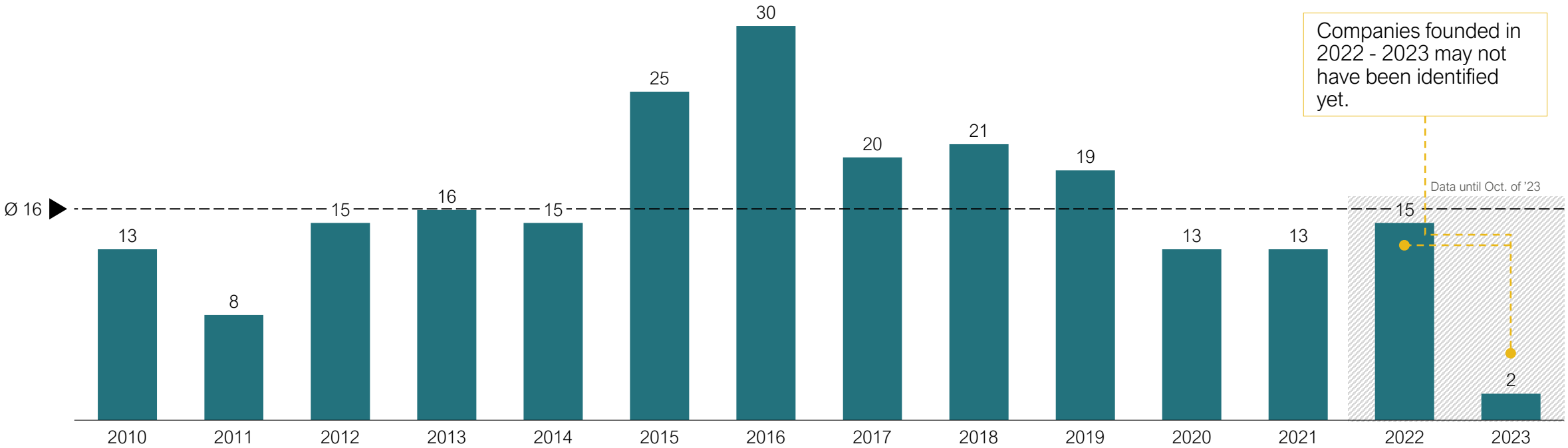
16 *companies founded yearly on average*

We have identified multiple research projects that have yet to be registered as companies.

We expect to see a positive uptick in the number of founded companies when and if these pre-commercial research projects are founded as actual companies.

NUMBER OF FOUNDED DEEP TECH COMPANIES

in number of companies



Investments to Finnish Deep Tech in 2023

Comments from the Market

Voima Ventures

Voima Ventures is one of the leading VCs focusing solely on deep tech across the Nordics. Voima has supported companies such as Solar Foods, Dispelix and Kuva Space.

Deal flow volume from the Finnish early stage deep tech ecosystem has slightly decreased. Oftentimes the bottleneck is getting a diverse enough team in place in order to convince investors. Considering the high quality of research done in local universities, there is clear room for increasing the amount of tech transfer companies established annually.

VC investment volumes as a whole have decreased globally during 2022-23 which has made the fundraising environment more challenging. Deep tech companies in general have longer development cycles which has put pressure on validating product-market-fit by commercial traction as soon as possible. Without proof from product-market-fit it has been difficult to raise large follow-on rounds. Decreasing investment volumes from large international VCs has further underlined the challenge. There have been downwards valuation corrections especially in later stages which opens up interesting opportunities for 2024.

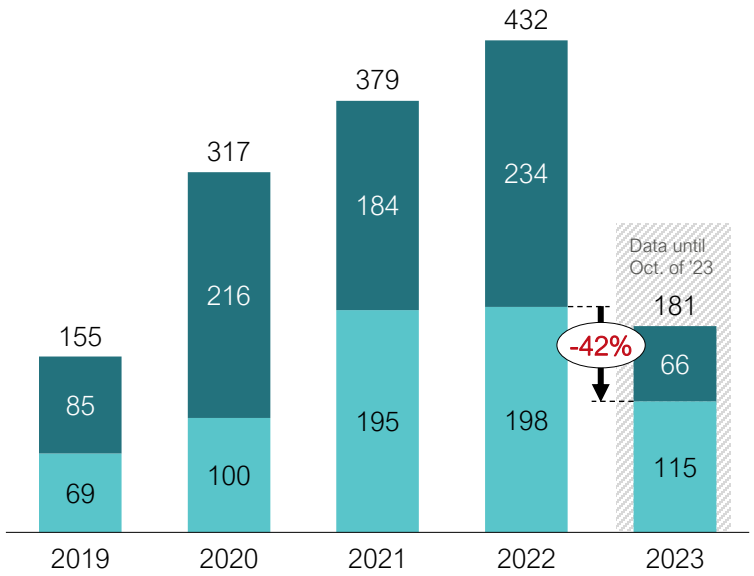
Topical themes in deep tech ecosystem reflect global development; race for quantum supremacy continues and we've seen quite a few new companies entering into the field, electrification and need for new ways of producing and storing energy as well as stabilizing the grid, sustainable food production companies have raised rather large rounds for validating scalable production capability. In health tech, non-medicine based treatment methods, diagnostics platforms and digital health are recurring topics which many startups are working with.

Jussi Sainiemi, Partner

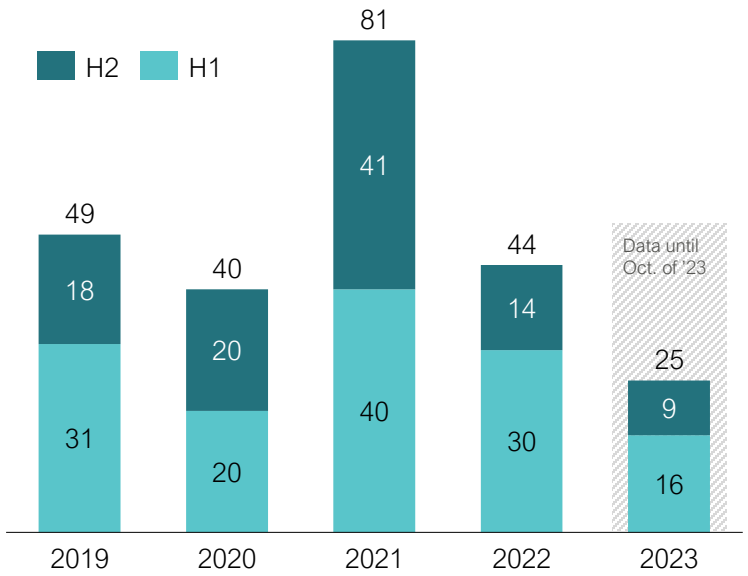
Prominent Investments in 2023 Despite Decreasing Activity

- The total invested capital decreased 42% to €115 million in H1 2023 from €198 million in H1 2022. The number of investments decreased 47% to 16 in H1 2023 from 30 in H1 2022.
- However, a single large investment round of Iceye (€118 million) accounted for the majority of the total invested capital in H1 2022. Similarly, large investments in H2 2022 included IQM Finland (€128 million) and Varjo Technologies (€75 million). In 2023, we haven't seen such large investment rounds.
- Despite the decline in the invested capital, there has been prominent investment rounds in 2023, including ReOrbit's €7 million seed funding, SpinDrive's €4 million Series A funding, and Norsepower's €28 million Series C funding.

TOTAL INVESTED CAPITAL
in million euros



NUMBER OF INVESTMENTS
in number of investments



NOTABLE EARLY STAGE INVESTMENTS IN 2023
in euros

spindrive	€4m
reorbit	€7m
STEADY — ENERGY	€2m

NOTABLE LATER STAGE / GROWTH INVESTMENTS IN 2023
in euros

Wirepas	€22m
NORSEPOWER	€28m
PAPTIC®	€23m

Active Sector in 2023: Quantum

SemiQon™

SemiQon builds silicon-based quantum processors for the million-qubit era. The company aims to realize the promise of quantum computing through powerful, resilient, and cost-effective quantum processors.

€2.2m
Seed

Voima Ventures

QUANSCIENT

Quanscient provides novel cloud and quantum computing powered simulation technology. Quanscient offers fully digital R&D processes with a unique combination of native multiphysics algorithms, advanced cloud computing, and the prospect of future quantum integration.

€3.9m
Seed

MAKI.VC

algorithmiq

Algorithmiq develops quantum computing algorithms for drug development and discovery. The company's algorithms accelerate and optimize drug development by simulating the chemical activity of molecules.

€12.8m
Series A

inventure

PRESIDIO VENTURES

Tesi

Active Sector in 2023: Energy

STEADY — ENERGY

Steady Energy is building small nuclear reactors for residential and district heating applications efficiently, safely and carbon-neutrally.

€2m Seed

YES VC

LIFE LINE VENTURES

VEN SUM POWER

Vensum develops technology that makes sure the most is made of power conversion.

€3.8m Seed

LIFE LINE VENTURES

GRID.VC

spindrive

SpinDrive's frictionless active magnetic bearings providing high rotational speeds and energy efficiency without the risk of equipment downtime or maintenance breaks.

€3.9m Series A

RHAPSODY VENTURE PARTNERS

INNOVESTOR

NORSEPOWER

Norsepower providers mechanical sails, and its Norsepower Rotor Sail™ technology provides wind-powered propulsion for cargo and cruiseships.

€28m Series A

mirova

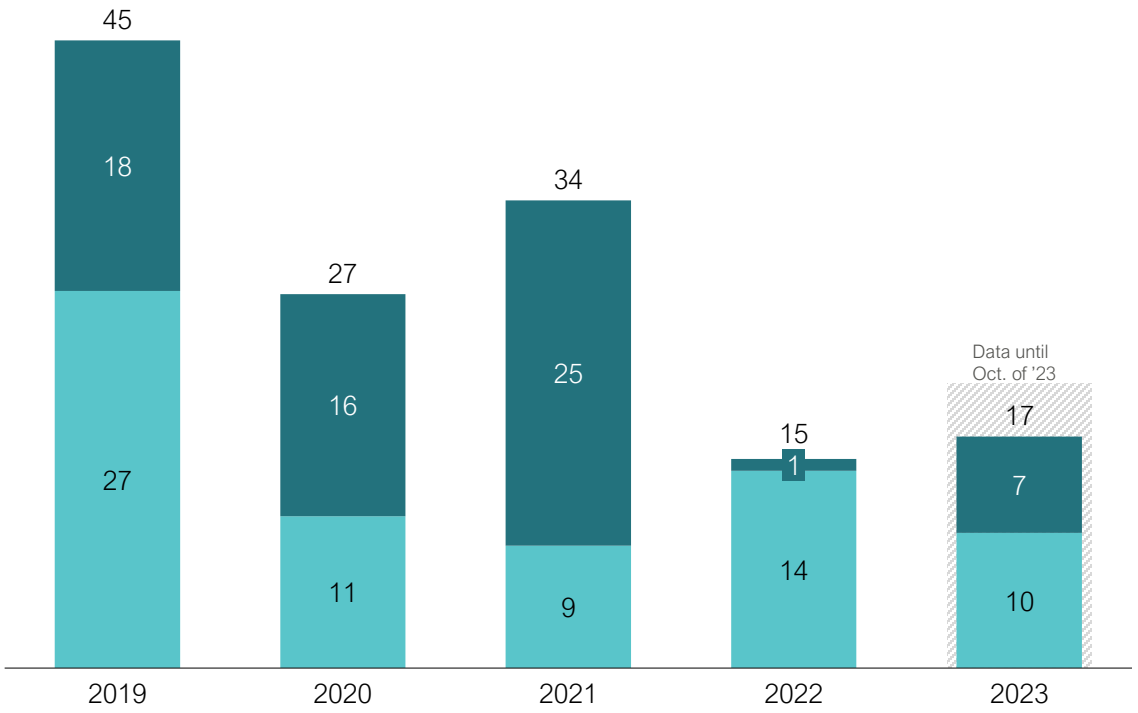
Tesi

Climate Investment Founded by OGCI

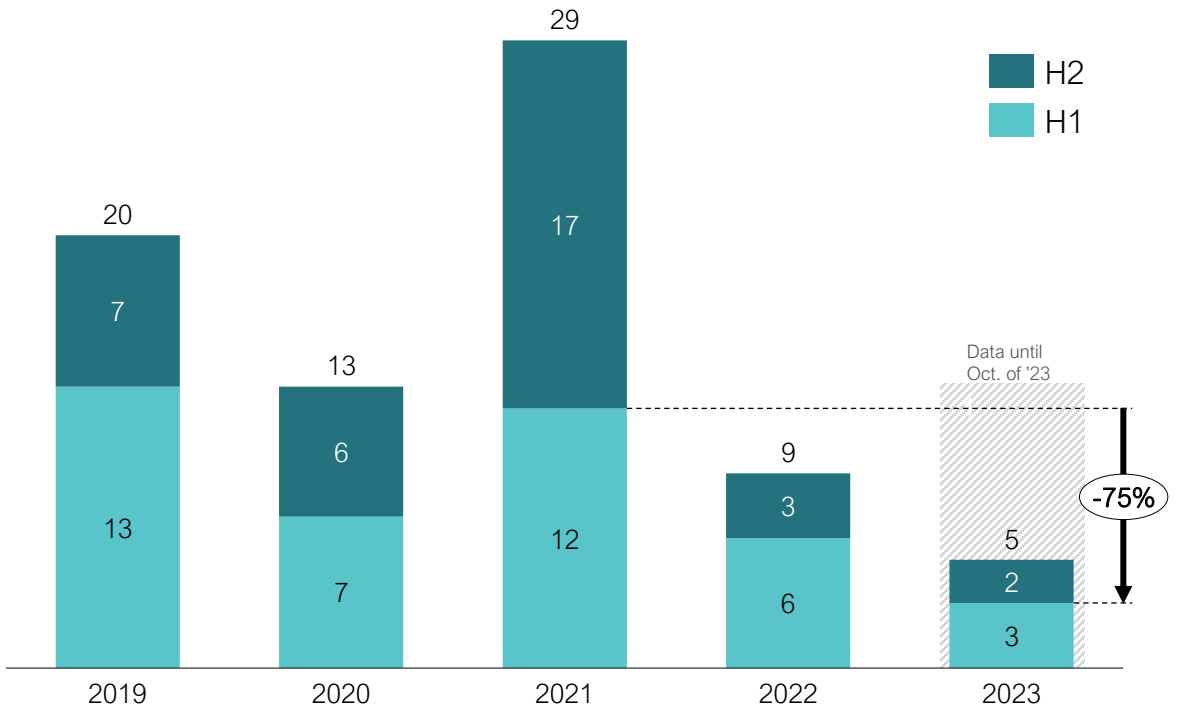
First Round Investments Remained Stable in H1 2023

- The number of initial investments has decreased after 2021. In H1 2023, only 3 companies raised their first investment rounds compared to 12 in H1 2021.
- However, when considering the sum of first round investments, the initial investments remained stable in H1 2023. It is worth noting that H2 2022 was an extremely inactive period with only €1 million in initial investments.
- Considering that funding rounds are published with lag, the figures for initial investments may well grow considerably for 2023.

DEVELOPMENT OF FIRST ROUND INVESTMENTS
in million euros

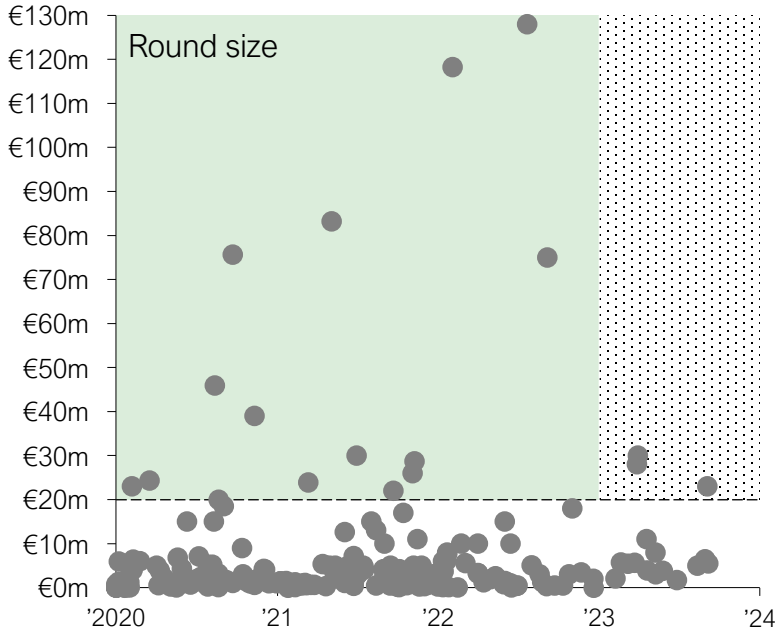


DEVELOPMENT OF FIRST ROUND INVESTMENTS
in number of companies



Late Stage Funding Demand Will Reach Record Levels in 2024

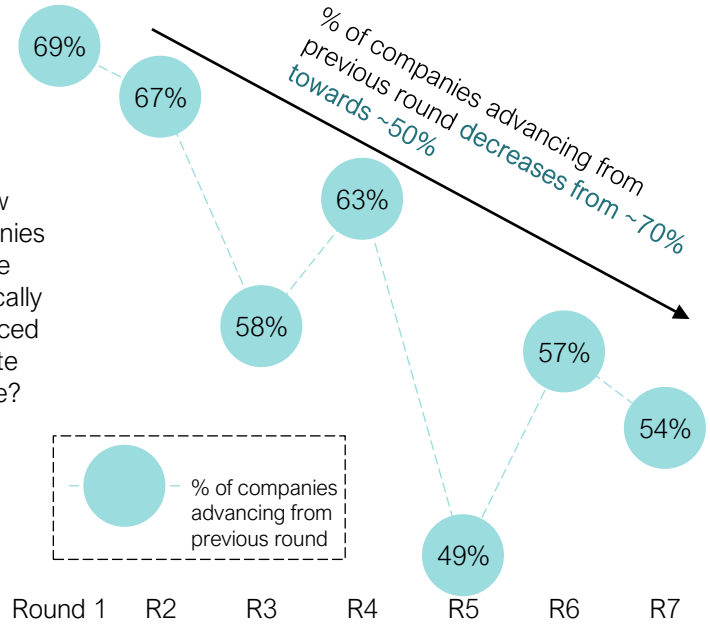
Recent development in large funding rounds



- Since 2020, large investment rounds have become somewhat common, as numerous deep tech companies (like ICEYE, IQM, Varjo, and Oura) have experienced remarkable success. Before 2020, larger rounds were usually more related to exits, than growth funding.
- In 2023, large rounds are rare as the fundraisings have slowed down especially on larger rounds. Many companies also have sufficient runways until 2024.

Historical funding dynamics[1]

How companies have historically advanced to late stage?



What happens between rounds?

Median time to first investment	2-3 years
Median time to following round	18 months
Median uptick in round size between following rounds	1.5-2.0x
Average uptick in round size between following rounds	2.0-2.5x

What can we expect in 2024?

€450-650m total late stage funding demand estimate*[2]:

*Based on the approximation of historical graduation rate curve

- An analysis of historical funding dynamics against recent company financing rounds produces two compelling insights:
  - Firstly, less substantial rounds likely occur in 2023 than one might expect. This is an indication of prolonged fundraisings, as a result of recent downturn in global VC-markets.
  - Secondly, later stage capital demands in 2024 are expected to reach new highs
- Our estimate doesn't properly account for substantial jumps in round size. Such instances are common in capital-heavy industries like new materials, where advancing from feasibility to manufacturing necessitates significantly more investment. Thus, our estimate only represents the lower bound of total capital demand in 2024.

[1] Numbers aren't adjusted, e.g. some companies don't fundraise as they have reached positive profitability or have made an exit. These companies aren't excluded in this analysis. [2] Estimate of total capital invested (in rounds over €10 m) in FY2024 and H1 2025.

Raising Later Stage Funding Remains a Growing Challenge for the Ecosystem

Globally, later stage VC slowed down considerably in the current market enviroment[1]

- There is a substantial decline in later stage fundraisings and investment activities worldwide, a trend that sharply contrasts with the peak observed in 2021. Notably, growth funding experienced a 28% reduction in 2022, with later stage venture capital investments witnessing an even steeper decline.
- This downturn has direct implications for Finnish deep tech companies (and other later stage companies as well). The investment ecosystem for these companies is increasingly global, especially for larger funding rounds, making them vulnerable to shifts in international market dynamics.

Later stage funding of Finnish Deep Tech is highly dependent on international capital

- Finland has seen an incredible flow of new VCs. Still, it lacks credible growth or later stage investors with the capacity to act as a lead in larger rounds. Typical investment sizes of domestic VCs are only around €2-3 million.
- Hence, 95% of large rounds in the past have contained foreign investors, and in all likelihood the distribution will stay the same in the future.

Growing demand for later stage capital from Finnish deep tech companies

- The demand for capital is expected to grow in 2024-2025 based on the historical funding dynamics. Many companies will be looking to raise considerable rounds (>€10m).
- As previously stated, the capital demand estimate below is only a conservative estimate what late stage funding landscape might look like. In any case, the need for foreign capital is evident.

Conservative estimate of late stage funding demand for FY'24 and H1 '25

Based on the historical ecosystem funding dynamics[2], funding demand is based on only companies with already moderately sized pre-existing rounds

10-13 rounds with round size over €10m

€450-650m late stage funding demand

5-8 rounds with round size over €20m…

…and 5-6 rounds between €10m and €20m

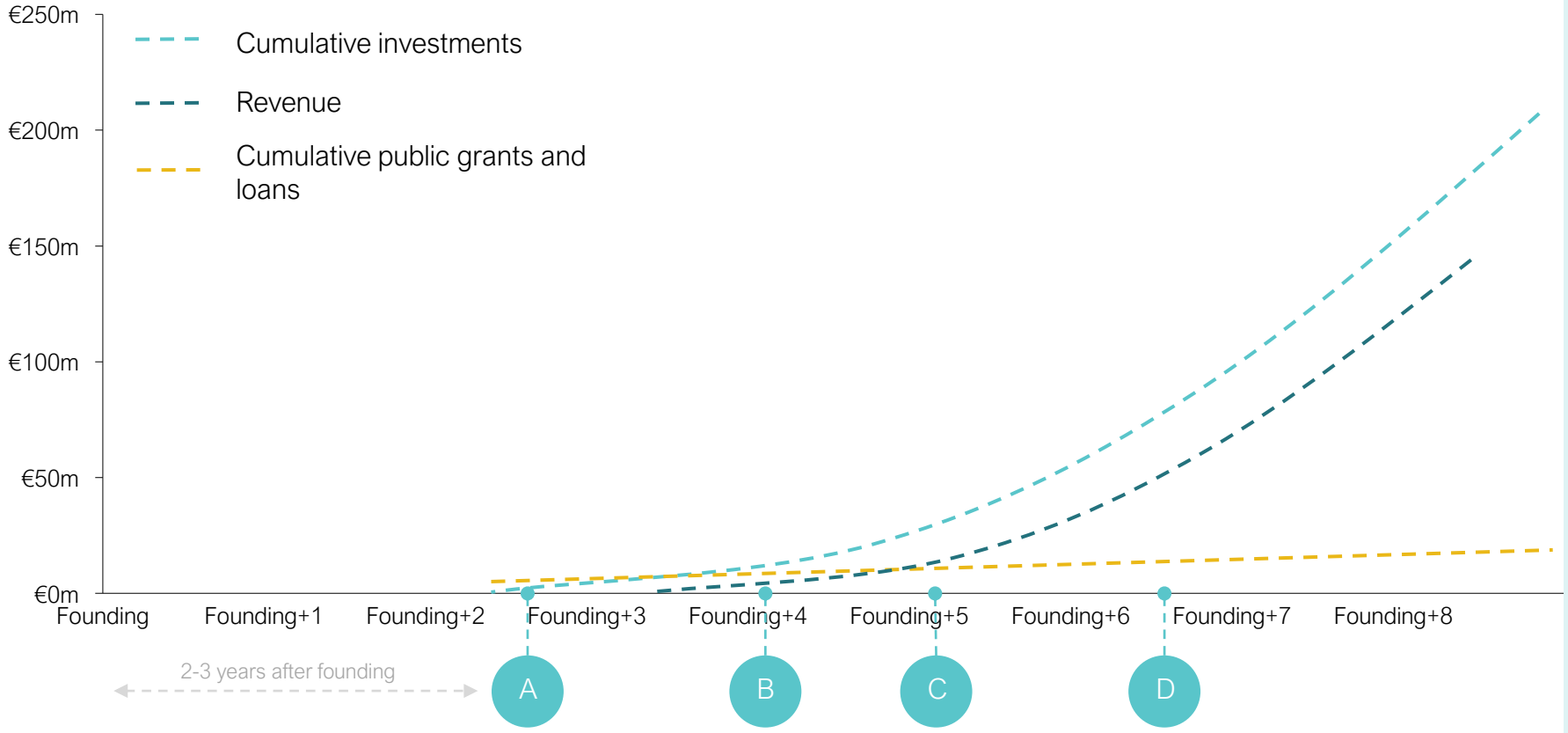
81% of the estimated capital demand is expected to go to large rounds (>€20m)

Raising later stage capital will be a growing issue for the Finnish deep tech ecosystem

- Our research from the previous year drew attention to the shortfall of clear lead investors in sizeable deep tech funding rounds. This concern persists, and we anticipate an amplified impact on the more mature companies as the ecosystem moves forward.
- The magnitude of this challenge is expected to intensify due to escalating pressures from both demand and supply aspects. An increasing number of Finnish companies are projected to seek later stage capital from international markets, coinciding with the current headwinds facing later stage funding landscape.
- This provides a unique opportunity for counter-cyclical investors, as the potential deal flow will likely be the widest and highest quality Finland can offer.

[1] Bain Global Private Equity Report 2023 [2] Estimate is based on the historical upticks of round sizes between rounds, historical timing of rounds, and the historical graduation rate

Typical Development of a Successful Deep Tech Company



	A	B	C	D
Valuation uptick	-	1.5-2x	2.5x	1.5x
Size of funding round	€10-20m	€10-20m	€30-40m	>€40m
Revenue at the time of the round	<€1m	€1-5m	€5-10m	>€10m

Deep tech companies often start to generate revenue 3 years after founding. In years 5 to 7, successful companies have often grown to be medium-sized, and grow through the size class in a few years.

Companies gather capital in advance as the cash flows are typically as large (and as negative) as revenue.

Valuation upticks between rounds are typically between 1.5x and 2.5x.

Bridge rounds are not uncommon even amongst successful deep tech companies. Even though the data is hard to find, we can guess that such actions are as relevant as ever, due to prolonged fundraising cycles (as indicated in p.15) .

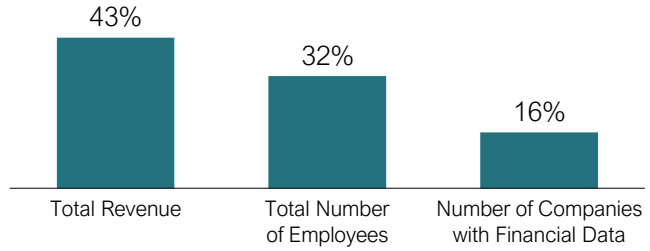
Revenue doesn't seem to be the only factor VCs consider, as it varies widely accross companies. Investors understand building something truly unique takes time. Still, on larger round sizes there needs to be significant proof of commercial viability


Growth of the Ecosystem

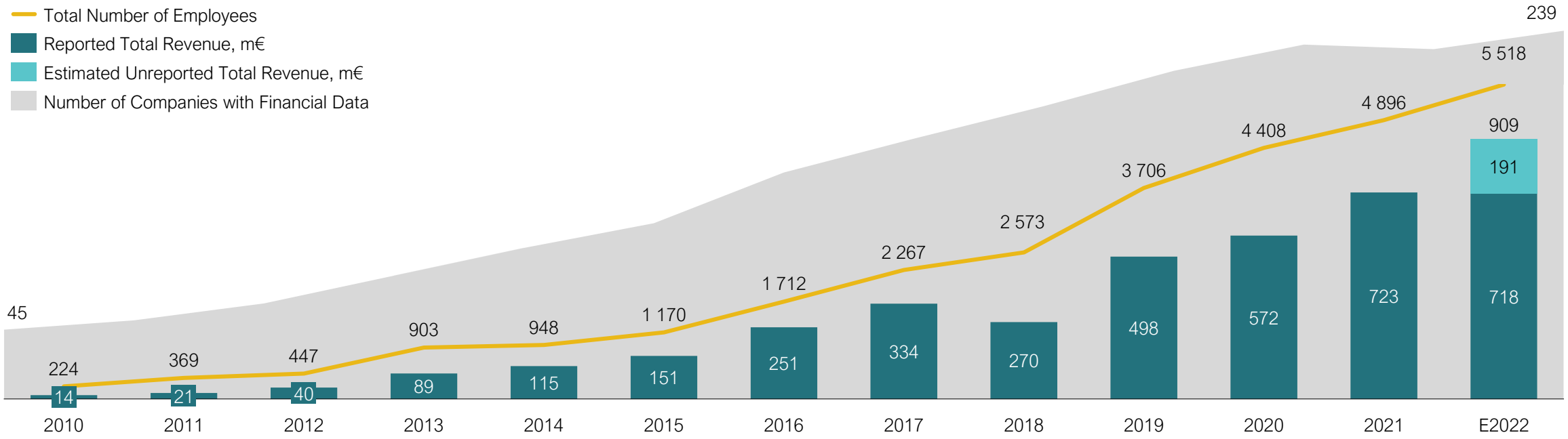
Deep Tech Ecosystem Continues to Grow

- The total revenue of deep tech companies has increased to €723m in 2021 from €14m in 2010. The number of employees working in deep tech has increased to ~4900 in 2021 from ~220 in 2010. The revenue and employee growth rates significantly outpace the growth in the number of companies.
- The reported total revenue of deep tech companies in 2022 (€718 million) remains almost stable compared to 2021 despite the fact that not all companies have published their results for 2022. Hence, we estimate that the total revenue of the ecosystem in 2022 increased from 2021 and reached €900m.
- In addition, many companies have expanded their operations overseas, which might not be visible in the presented figures

COMPOUND ANNUAL GROWTH RATES
2010-2021



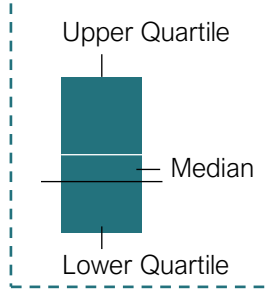
DEVELOPMENT OF TOTAL REVENUE AND TOTAL NUMBER OF EMPLOYEES IN DEEP TECH[1]
million euros, number of employees, number of companies



[1] 59 companies have published financials for 2021 but not yet for 2022. For these companies, the estimated sales and number of employees in 2022 is based on the median sales growth and personnel growth of the deep tech companies that have published financials for 2022.

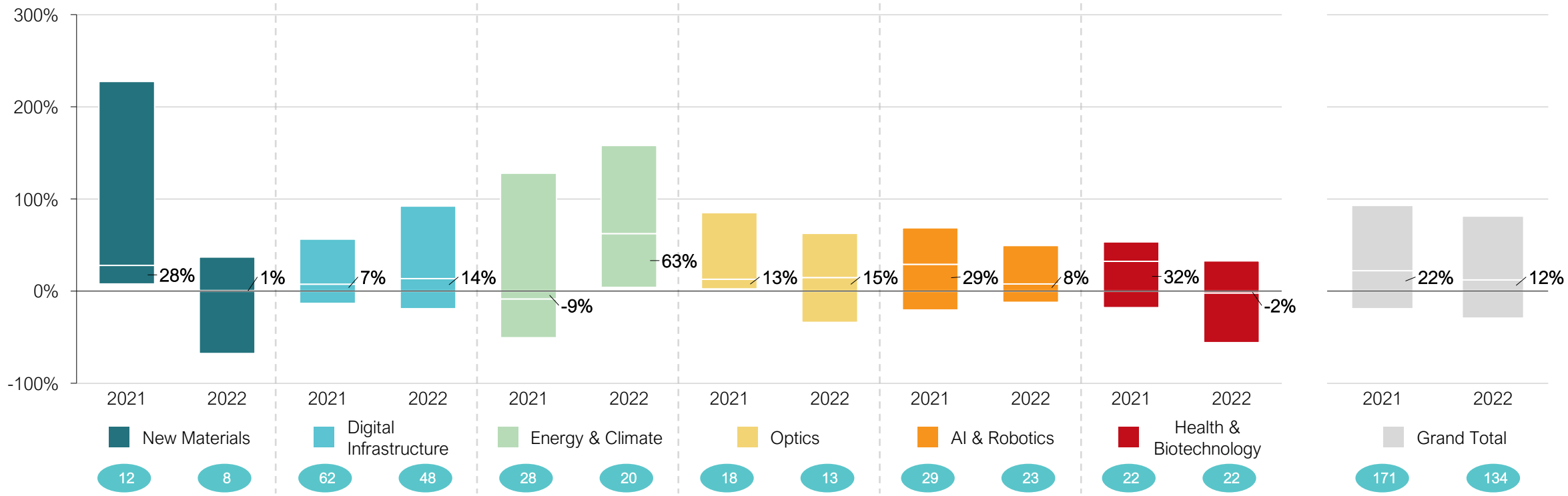
Growth of Deep Tech Companies Slowed Down in 2022, Still Upper Quartile Companies Have Experienced Substantial Growth

- Sales growth of deep tech companies decreased in 2022 compared to 2021 in all quartiles. The median sales growth was 12% in 2022 compared to 22% in 2021.
- The decline in growth is most prominent in Health & Biotechnology (-34p.p.), New Materials (-27p.p), and AI & Robotics (-21p.p.)
- Some categories experience an acceleration in growth. In Energy & Climate Technology, the median growth increased substantially (+71p.p.). Additionally, the growth increased moderately in Digital Infrastructure (+6p.p.) and Optics (+2p.p.).



SALES GROWTH (YoY) OF DEEP TECH COMPANIES PER CATEGORY, 2021 & 2022

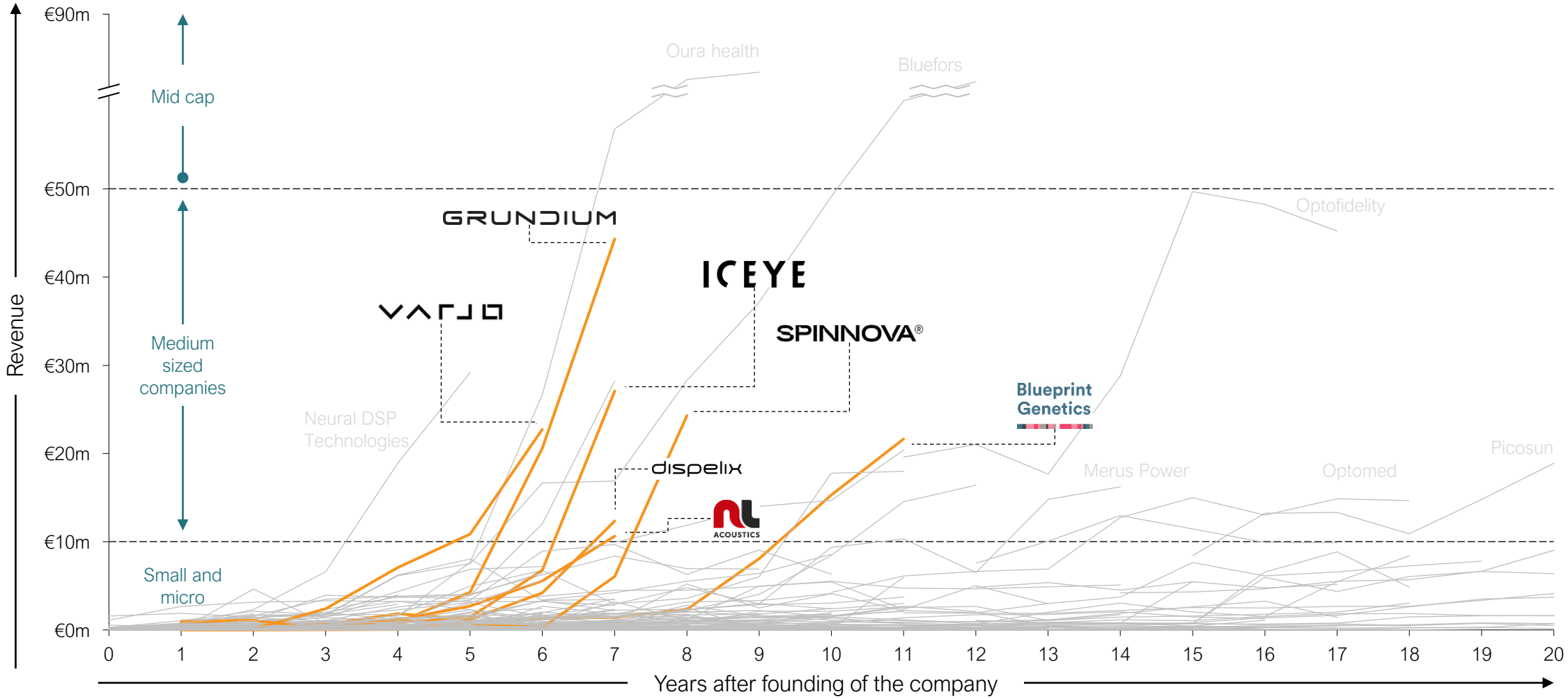
in percentage



[1] Number of companies that have sales growth data in the analyzed time period. 59 companies have not yet published financials for 2022.

New Companies are Breaking to Siginificant Size

Companies like Bluefors or Oura still are the largest players in the ecosystem, but new companies are growing fast to substantial size. Companies like ICEYE, Spinnova, and Grundium are growing at remarkable speed towards midcap and beyond.



Investor Trends

The Number of Investors is in Decline – International Investors Retracting the Most

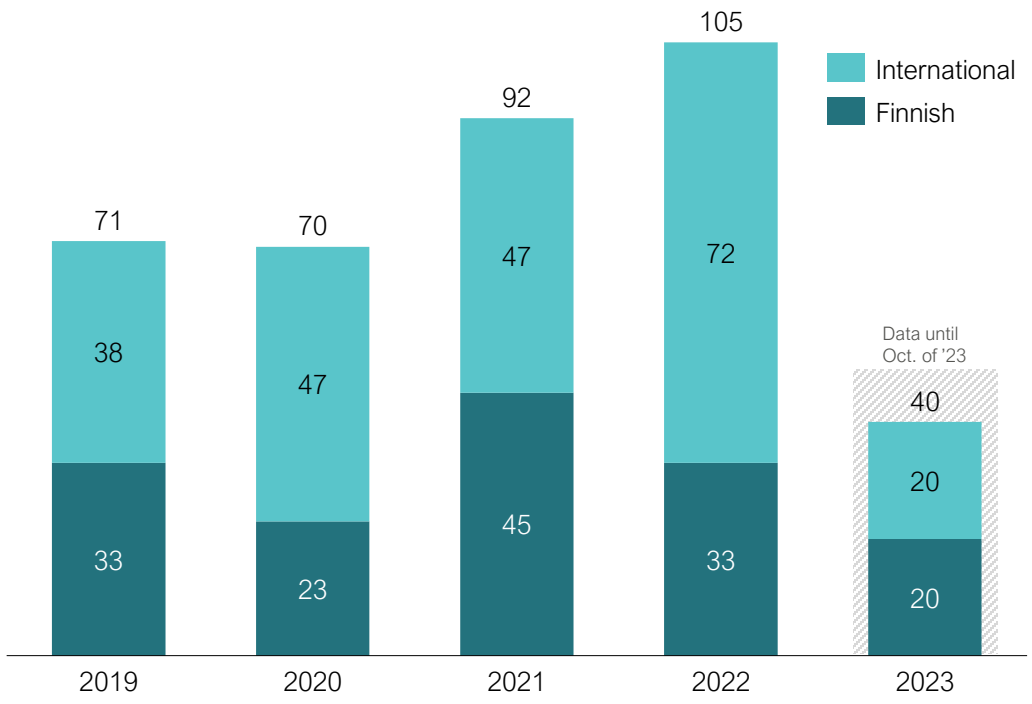
471

deep tech investors since 2008

- **The number of deep tech investors present at Finnish market has decreased in 2023** even more than the number of investments. This is due to the lack of large investment rounds in 2023 that typically consist of larger syndicates than smaller rounds. Especially the presence of international investors has severly declined so far in 2023.
- **VC/PE funds still represent nearly half of the investors in the ecosystem**, in line with past observations. Governmental investors have also remained stable in the past years.

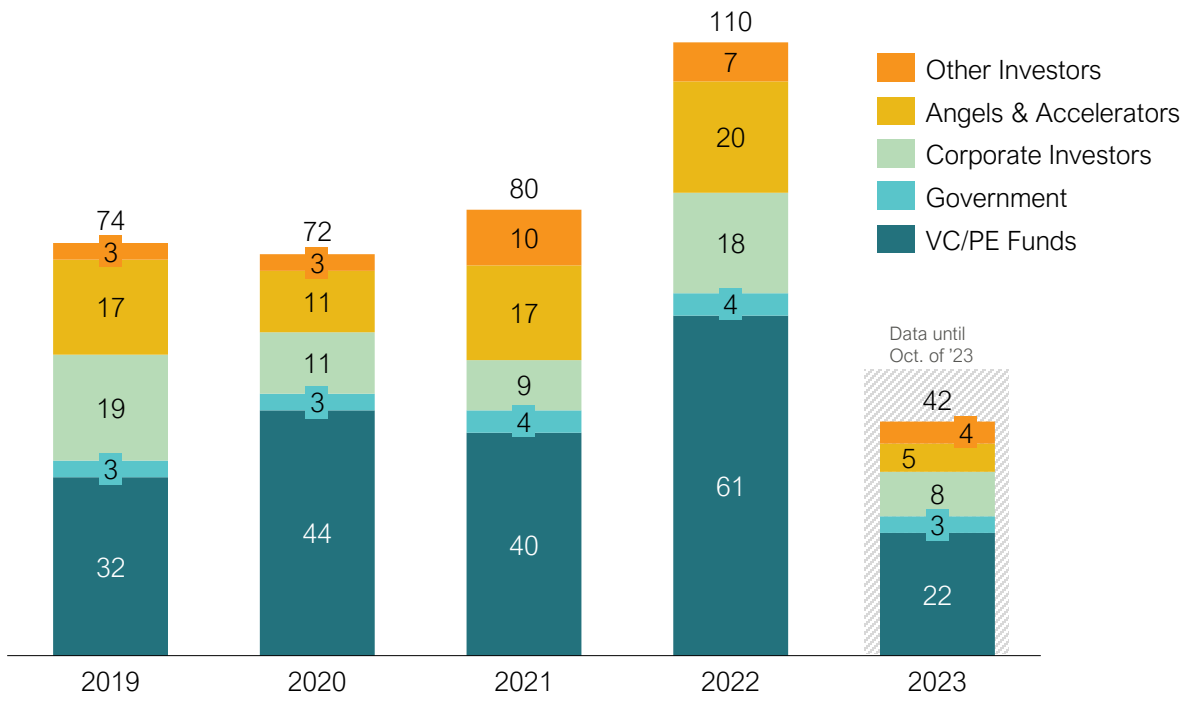
ORIGIN OF DEEP TECH INVESTORS[1]

in number of companies



TYPE OF DEEP TECH INVESTORS[2]

in number of companies



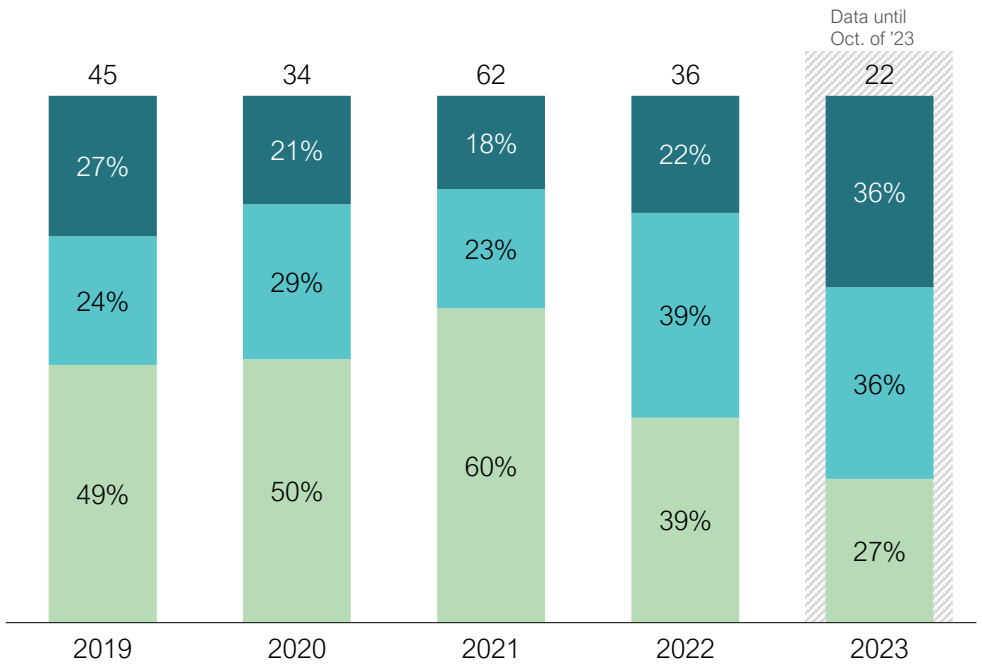
[1] Investors whose nationality is unknown are excluded [2] Investors whose type is unknown are excluded

Foreign Investors Play an Instrumental Role in the Finnish Deep Tech Ecosytem

- **Syndicates have become increasingly international in recent years.** In 2023, even though the number of international investors has been declining severly, more than a third of the syndicates have been purely international in 2023 compared to 22% in 2022. Further, 27% of syndicates have been comprised of only Finnish investors compared to 39% in 2022.
- **International investors are essential in larger investment rounds**, these rounds are rarely possible without international syndicates. In investment rounds over €20 million, only 5% of the syndicates are purely domestic.
- In smaller investment rounds, the role of international investors is less crucial, but still significant. In the smallest category (<=€2 million), 65% of the syndicates include only Finnish investors, and only 7% are solely international.

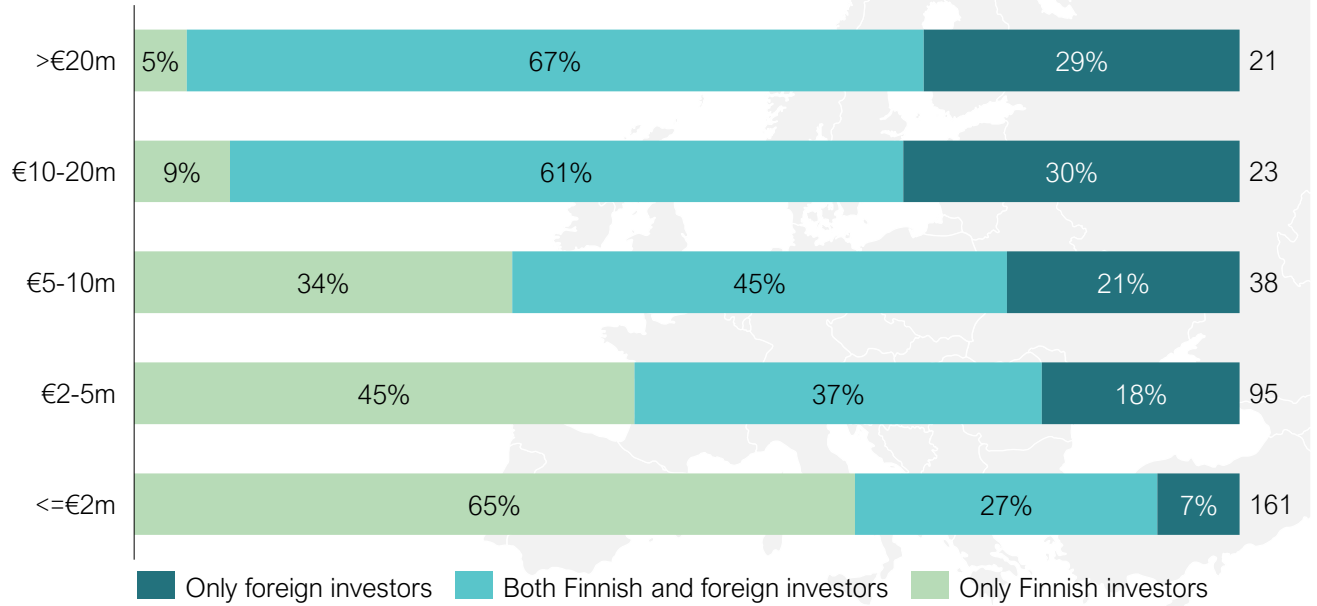
DEVELOPMENT OF INTERNATIONAL SYNDICATE STRUCTURES*

% of deals



SYNDICATE STRUCTURES BY ROUND SIZE*

% of deals in the seal size class



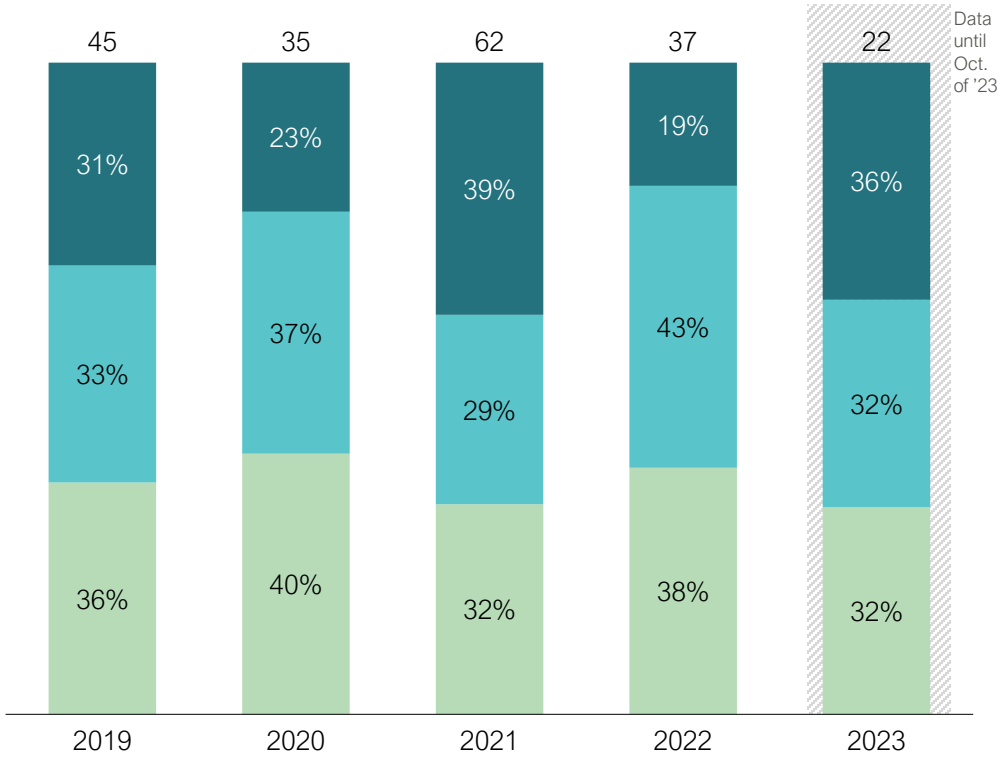
* Deals where all investors are not known are excluded

All Investor Types are Needed in the Deep Tech Ecosystem

- **The share of private funds in deep tech has remained relatively stable during the past years.** Since 2019. the share of syndicates that include only private funds has been 32-40%.
- In 2023, the participation has been balanced between different investor types, with purely private fund syndicates accounting for a third of all syndicates.
- **The need for all investor types remains strong**, which is especially true in the larger investment rounds (>€10m). In the largest category (>€20m), almost 90% of the syndicates include both private funds and other investor types.

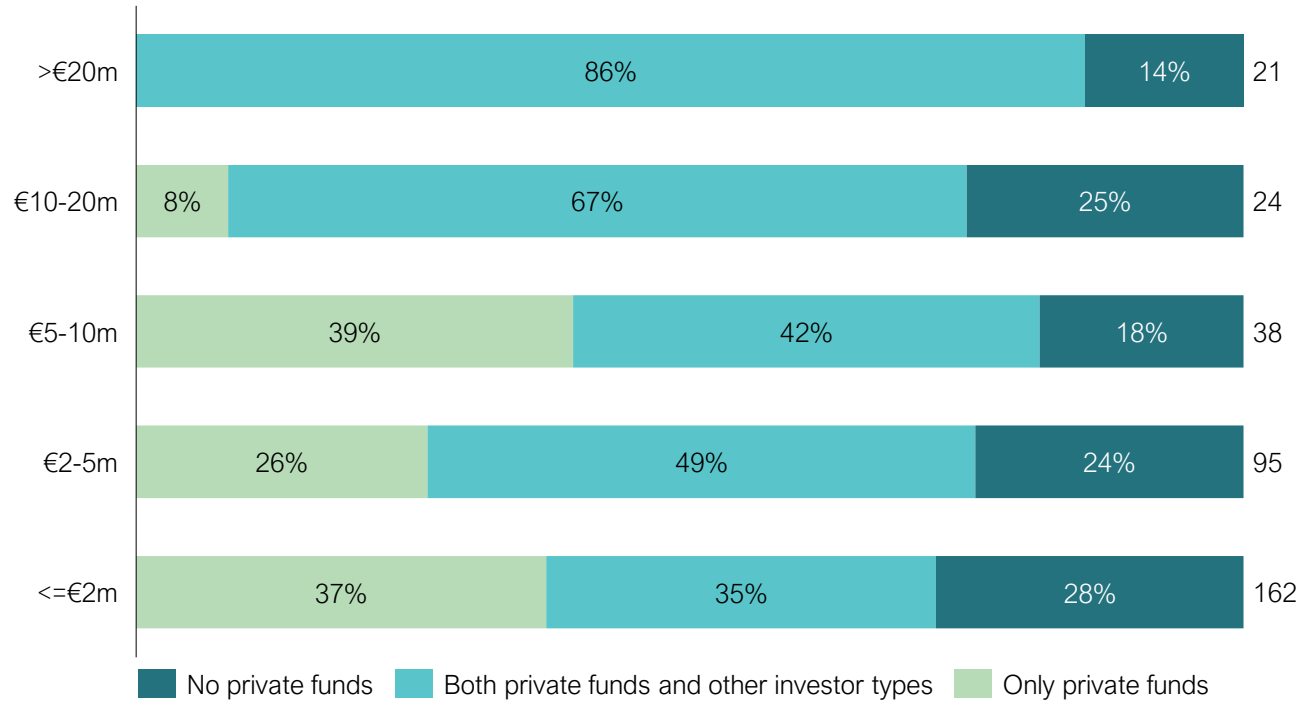
DEVELOPMENT OF INTERNATIONAL SYNDICATE STRUCTURES*

% of deals



SYNDICATE STRUCTURES BY ROUND SIZE*

% of deals in the seal size class



* Deals where all investors are not known are excluded

VTT and Business Finland as a Part of the Finnish Deep Tech Ecosystem

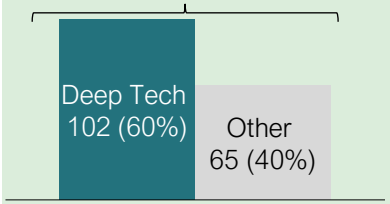
Business Finland is a Significant Contributor to the Development of the Ecosystem

Research stage → founding → early stage startup

Research to Business (R2B) is Business Finland's funding program directed to project teams in Finnish universities ready to commercialize their research

Key facts about R2B:

167 companies founded between 2012 and 2020



~15-20 new companies founded yearly

36% of Finnish deep tech companies originate from R2B

Funding type: **Grant**

Median amount: **€350k**

The number of project teams in the program have been somewhat decreasing since the program was incepted. Especially universities outside of Helsinki metropolitan area produce less new R2B companies than previously. In part, this might be a symptom of otherwise increased supply of other funding sources.

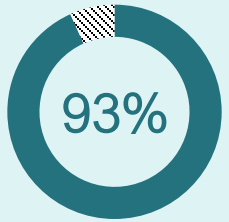
Companies who graduate the program receive the first investment round considerably earlier than other companies (or deep tech companies). This might indicate that **the program succesfully produces relatively mature and commercially viable companies.**

> *Recently there haven't been any significant changes to the flow of project teams in to the program. Helsinki metropolitan area especially keeps producing promising teams. In addition, some companies are about to be founded from universities new to the program*. - Business Finland

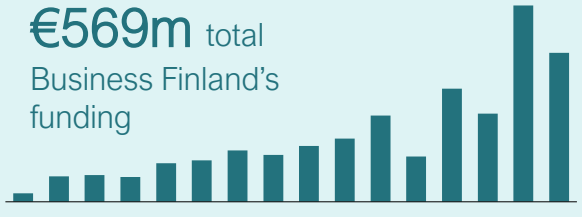
Business Finland is significant source of funding for deep tech companies. 10 companies have received more than €10 million from Business Finland.

Key facts about Business Finlands funding of Finnish deep tech:

93% of deep tech companies have received some type of funding from Business Finland



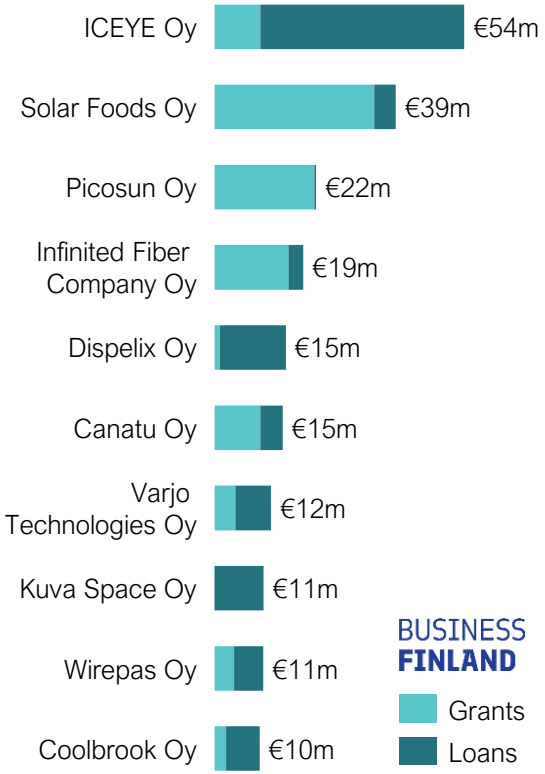
€569m total Business Finland's funding



€1.2m median amount of total funding received

59% of funding are loans

Top 10 deep tech companies with most funding from Business Finland



Most relevant funding instruments especially for early stage deep tech companies include: **Deep Tech Accelerator**, **Tempo**, and **Nuoret Innovatiiviset yritykset (NIY, "Young Innovative Companies")**

Many Deep Tech Companies Originate from VTT

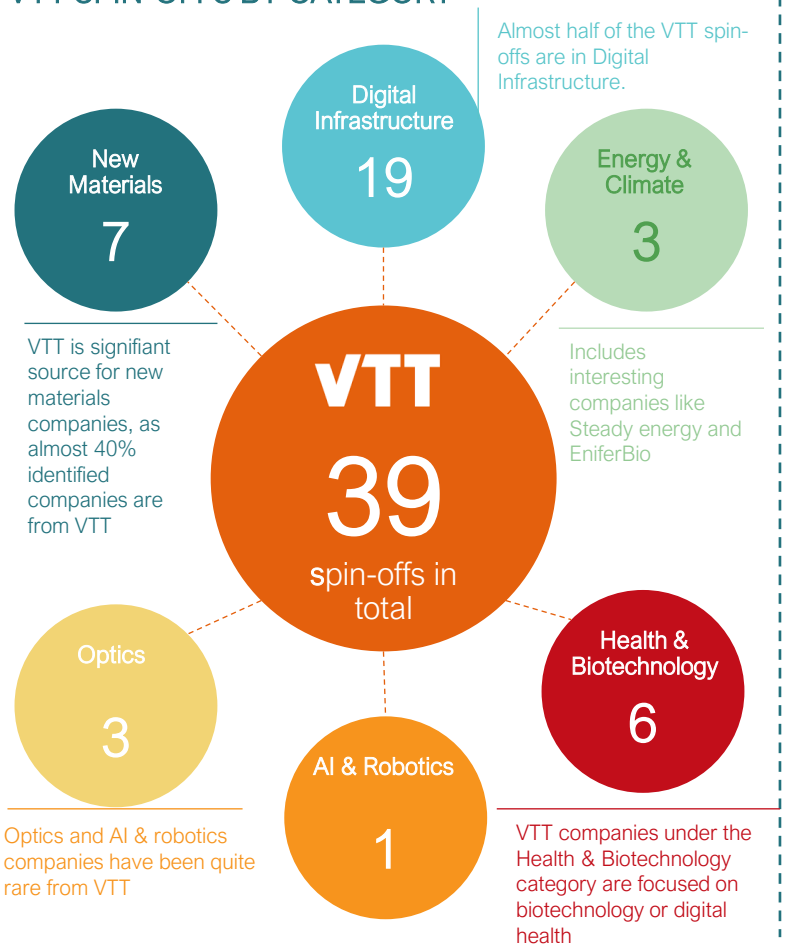
VTT is a research institution owned by the Finnish state, whose mission is to develop sustainable solutions for their customers and society. Their science-based incubator VTT Launchpad delivers VTT's strategy to renew industries and society by spinning off companies built on VTT's technologies.

- Many deep tech companies originate from VTT's incubator. Even though VTT's spin-offs represent 14% of all companies in Finnish deep tech, they have raised a significant portion of the total invested capital in deep tech in the past years. In 2022, the share was 36%.
- According to VTT, early stage funding in 2023 remains as available as before, but deep tech companies that are raising later stage funding have more challenges. A key factor is that the market lacks notable Finnish growth investors.

EXAMPLE COMPANIES

IQM, TACTOTEK, eniferBio, KUVA SPACE, SPINNOVA®, SOLAR FOODS, INFINITED FIBER, PAPTIC®, dispelix

VTT SPIN-OFFS BY CATEGORY

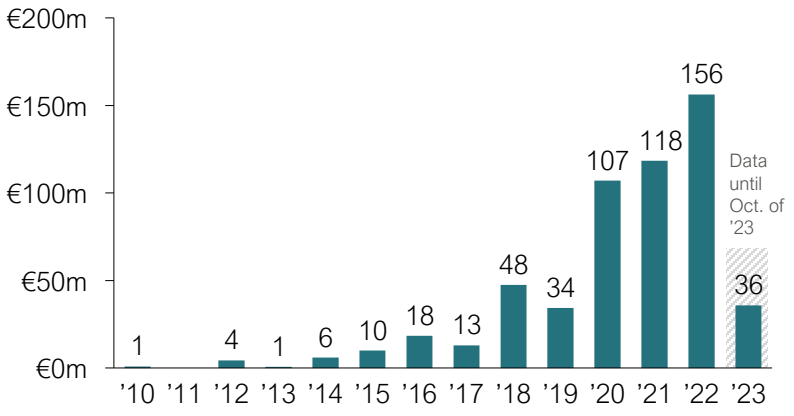


€554m
of total invested capital

87
investment rounds

YEARLY INVESTED CAPITAL TO VTT COMPANIES

in million euros

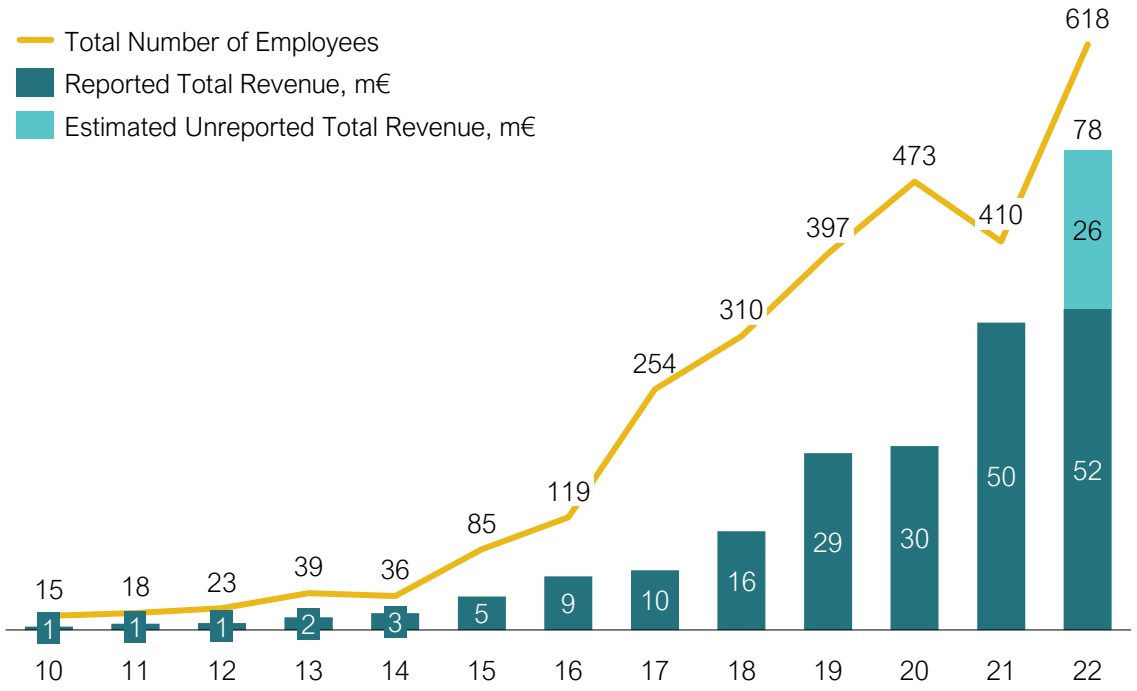


VTT Spin-Offs Account for almost 10% of the Deep Tech Market

- The total revenue of VTT spin-offs in deep tech has increased to €50m in 2021 from €500k in 2010. The total number of employees of VTT spin-offs in deep tech has increased to 410 in 2021 from 15 in 2010.
- We estimate that the total revenue of VTT spin-offs in deep tech increased to €78m in 2022, which equals to 9% of the estimated total revenue in deep tech in 2022
- The number of founded VTT spin-offs in deep tech peaked in 2014 when six comapanies were founded. On average, two VTT deep tech spin-offs are founded yearly.

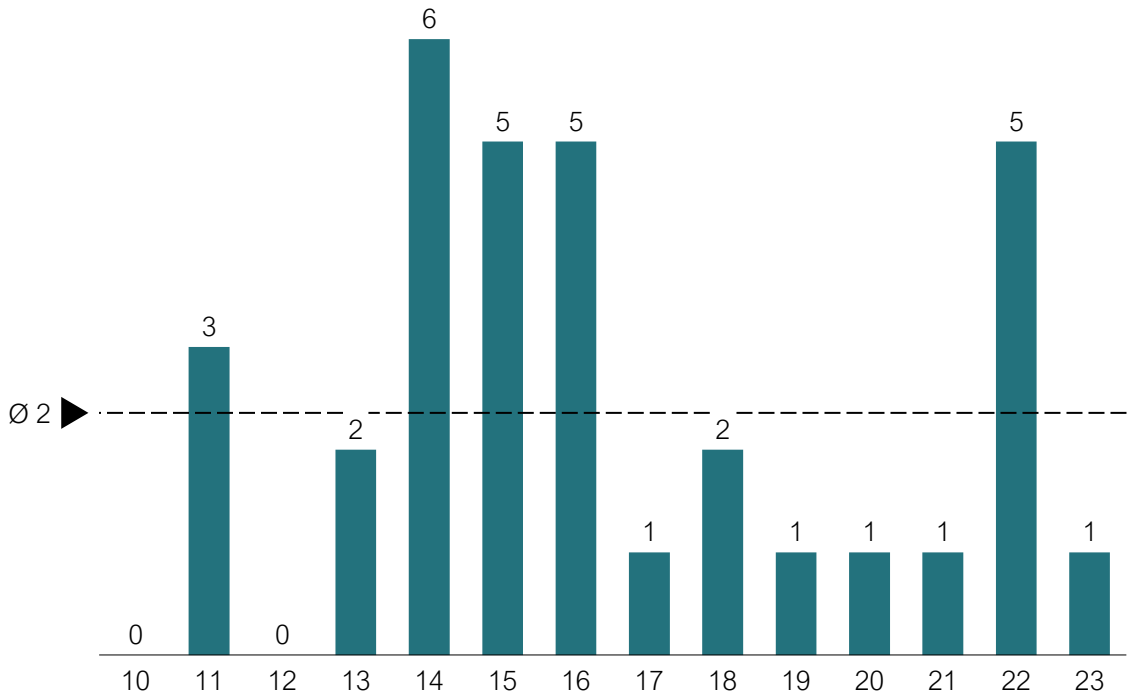
TOTAL REVENUE AND TOTAL NUMBER OF EMPLOYEES OF VTT SPIN-OFFS IN DEEP TECH[1]

million euros, number of employees



NUMBER OF FOUNDED VTT SPIN-OFFS IN DEEP TECH

number of companies



[1] 8 companies have published financials for 2021 but not yet for 2022. For these companies, the estimated sales and number of employees in 2022 is based on the median sales growth and personnel growth of the VTT deep tech spin-offs that have published financials for 2022.

Appendix

Tesi

Appendix 1 A: Companies Added to the List of Deep Tech Companies

Category	BusinessID	Company Name	Region
Health & Biotechnology	3153572-9	Adamant Health Oy	Uusimaa
New Materials	3326768-4	Carbonaide	North Karelia
Energy & Climate Technology	2419630-0	Coolbrook	Uusimaa
Digital Infrastructure	2516632-2	CoreHW	Pirkanmaa
AI & Robotics	3183859-4	CurifyLabs Oy	Uusimaa
Digital Infrastructure	3192521-7	Deep Scan Tech Oy	Uusimaa
AI & Robotics	3287235-6	DeepScan Diagnostics Oy	Uusimaa
Health & Biotechnology	2425894-6	Desentum Oy	Uusimaa
Digital Infrastructure	3317524-5	Dobbelgänger Oy	North Ostrobothnia
Health & Biotechnology	3107385-1	Epiheart Oy	Uusimaa
Optics	3241721-4	Evolase Oy	South Karelia
Optics	2546704-5	Inkron Oy	Uusimaa
Energy & Climate Technology	3289113-5	Ioncell	Uusimaa
Health & Biotechnology	2243920-9	MediSapiens Oy	Uusimaa
New Materials	2783362-7	Nordshield	Uusimaa
Energy & Climate Technology	3305240-5	Olefy	Uusimaa
Optics	2196958-2	Oplatek	North Savo
Optics	2673459-8	Picophotonics Oy	Pirkanmaa
Health & Biotechnology	2104311-4	PlexPress Oy	Uusimaa

Appendix 1 B: Companies Added to the List of Deep Tech Companies

Category	BusinessID	Company Name	Region
New Materials	3230144-9	Pure Luminescence Technologies	Southwest Finland
Digital Infrastructure	2671536-2	Qualvista Oy	Uusimaa
Optics	1910851-3	Reflekron	Pirkanmaa
AI & Robotics	3351521-1	Root Signals Oy	Uusimaa
Digital Infrastructure	3310749-6	Semiqon Technologies	Uusimaa
Health & Biotechnology	2025769-8	SoluCel Oy	Uusimaa
Health & Biotechnology	3202406-6	SonaiHealth Oy	Uusimaa
Energy & Climate Technology	3364479-3	Steady Energy	Satakunta
Digital Infrastructure	3324358-6	The Warming Surfaces Company	North Ostrobothnia
Health & Biotechnology	3359386-9	Thestra Oy	Southwest Finland
Energy & Climate Technology	2602564-4	Wicetec Oy	Uusimaa
Optics	3350803-8	Winse Power Oy	Pirkanmaa
Digital Infrastructure	2843339-3	Xiphera	Uusimaa
Health & Biotechnology	2079691-5	Zora Biosciences Oy	Uusimaa
Digital Infrastructure	3268277-1	hentoTouch	North Savo
Optics	3297177-6	Zeelta	Uusimaa
Health & Biotechnology	3212525-4	Probiont	Uusimaa
AI & Robotics	2989304-1	thtRobotics	Uusimaa
AI & Robotics	1719699-4	TrueFlaw	Uusimaa

Appendix 1 C: Companies Added to the List of Deep Tech Companies

Category	BusinessID	Company Name	Region
Energy & Climate Technology	2467832-6	Sansox	Päijät-Häme
Optics	2877613-4	SIR Analytics	Uusimaa
Energy & Climate Technology	2840502-6	Kleener	North Ostrobothnia
Health & Biotechnology	2793780-5	Innomost	Central Ostrobothnia
Energy & Climate Technology	2565701-7	Finno Exergy	Uusimaa
Digital Infrastructure	2986481-4	Fibrobotics	Pirkanmaa
Energy & Climate Technology	3284697-5	Elmery	Uusimaa
New Materials	3285966-1	LignoSphere	Uusimaa
Health & Biotechnology	3310669-6	PrecisionPhage	Central Finland
Energy & Climate Technology	3299862-9	CeLLife Technologies	Pirkanmaa
Digital Infrastructure	3012287-7	Ambrocio	Southwest Finland
Health & Biotechnology	3095190-7	Lakka Health	Pirkanmaa
Energy & Climate Technology	1007324-6	Conenor Oy	Päijät-Häme
New Materials	2752760-3	Palonot	Uusimaa
Energy & Climate Technology	2792876-5	Vuo Power	Uusimaa
Health & Biotechnology	2787049-5	Tezted	Central Finland
Health & Biotechnology	2838864-1	Biopotential	North Savo

Appendix 2: Companies Removed from the List of Deep Tech Companies

Category	BusinessID	Company Name	Region
Energy & Climate Technology	2651724-3	Aeromon Oy	Uusimaa
Energy & Climate Technology	2470226-9	Ampner Oy	Ostrobothnia
Energy & Climate Technology	2800638-3	Betolar Oyj	Central Finland
Digital Infrastructure	2799772-8	Bitwards Oy	Uusimaa
New Materials	2627752-6	Brightplus Oy	North Ostrobothnia
Energy & Climate Technology	2366305-0	Endev Oy	Uusimaa
Energy & Climate Technology	2373678-2	Veneo II Oy (Previous name: Enevo Oy)	Uusimaa
AI & robotics	2803113-2	Fleetonomy.ai Oy	Uusimaa
Digital Infrastructure	2861962-2	Maslog Oy	South Ostrobothnia
Digital Infrastructure	2126814-5	MultiTaction Oy	Uusimaa
Energy & Climate Technology	2309682-6	Meriaura Group Oyj (Previous name: Savosolar Oyj)	Southwest Finland
Digital Infrastructure	2355307-0	SCHOTT Primoceler Oy	Pirkanmaa
Energy & Climate Technology	2739393-2	Sulapac Oy	Uusimaa
Energy & Climate Technology	2331972-7	Verso Food Oy	Southwest Finland
Energy & Climate Technology	3200110-4	Volare Oy	Uusimaa

The removed companies have been revisited and deemed to be out of scope after re-evaluation