

**Tesi**

# Defence

Market study on Finnish military product  
and dual use companies

2024

# Foreword

In light of the return of war to Europe, the notion of robust defence capabilities has resurged. This has sparked increased activity in the business sphere, including the rise of new defence technology firms and heightened investor interest.

Tesi has been actively investing in defense firms for years, though a consolidated view of the industry and key trends has primarily resided in the minds of specific individuals. At the same time, the defence industry and its stakeholders have traditionally been conservative in publicizing their activities.

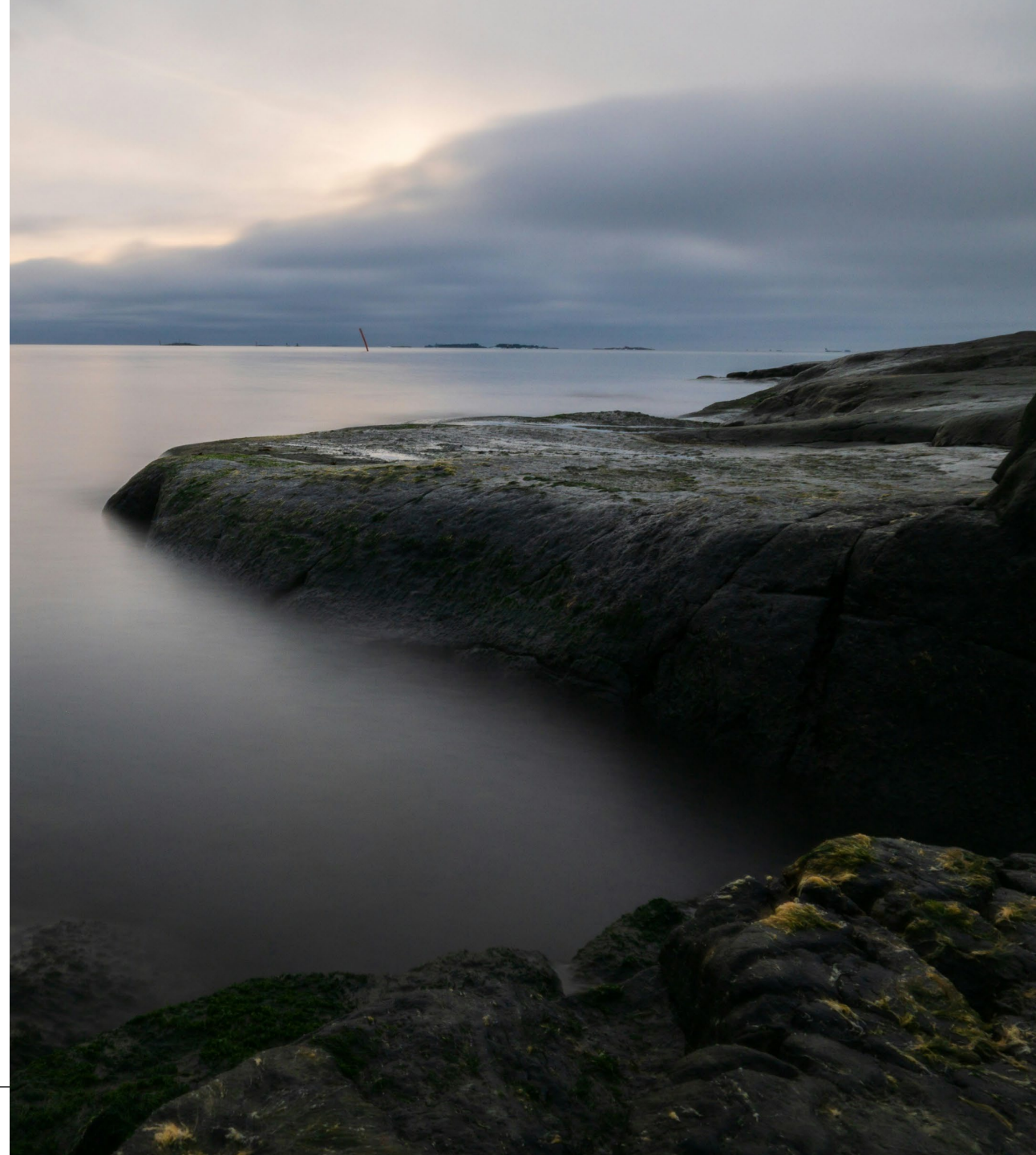
In response, we have now conducted the first Tesi Defence market study. This review offers an overview of the current state and historical development of the Finnish defence industry, with a particular emphasis on investment opportunities in emerging ventures. The study provides a detailed snapshot of defence firms in Finland, categorized by firm type, key technologies, and customer segments.

As part of our mission to promote economic growth, innovation, and investment, Tesi has decided to release select insights from this study to engage investors and other relevant stakeholders.

The analytical work behind this study was made possible through collaboration with a wide range of internal and external partners. Special thanks to Iina and Lauri for their dedication and thorough data collection over the summer months. Your contributions were essential to the success of this study.

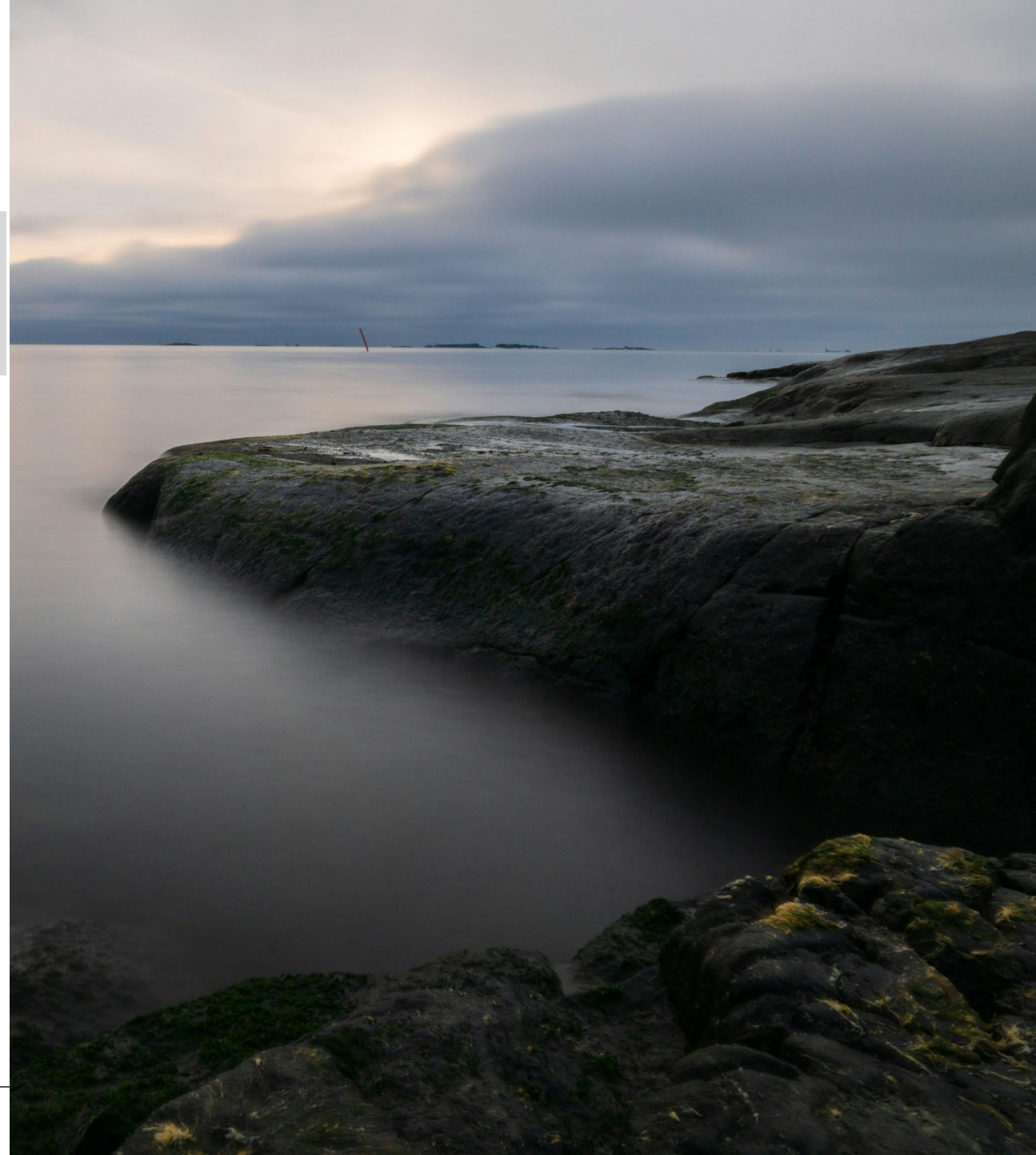
Jakob Sandell

Research Manager



# Agenda

- Executive summary
- Background and context
- Market overview
- Financial development
- Funding and ownership



# The Finnish Defence industry is a mix of well-known traditional manufacturing firms and emerging startups – AR/VR and robotics quickest growers

## Executive summary – market overview

- The interest in the Defence industry has grown significantly due to geopolitical tensions around the world, and Finland is no exception. Despite media attention, rising sales levels and increased investments, the European defence industry as a whole is still underfunded. Thus, we have set out to navigate the Finnish Defence industry by categorizing firms according to their activities and diving deeper into their financial development, funding structure and data on decision makers and owners.
- We have aimed at establishing a comprehensive view on the Finnish Defence industry, yet focused on the emerging growth firms most relevant for Tesi's investment activities.
- We have identified 368 Defence firms in total, with some 144 of them being high-growth firms focused on either military technologies or dual use applications. The remainder of firms are typically established firms with long track records or primarily provide professional services to military forces (and other customers). Although 50% of Defence firms are in Uusimaa, they are generally quite scattered around the country with many of them in small municipalities.
- Although the oldest Defence firms are from the 19<sup>th</sup> century, the industry as a whole is quite young with the peak in founding activity in 2016. In addition to new firms being founded, established ones are maturing to larger sizes. The most notable verticals within Defence as a whole are information technology and manufacturing, whereas niche verticals such as AR/VR and robotics display the highest revenue growth figures among emerging miltech/dual use ventures.
- There are only a handful of pure miltech startups in Finland, and most emerging ventures are dual use firms whose applicability is mostly in support, logistics and C4I<sup>1</sup> activities. The most prominent subcategory of startups is Sensing, connectivity and cybersecurity.
- Although the Finnish Defence Forces are experienced in arctic warfare, arctic knowledge isn't visible in most Defence firms' offering. The clear exception is firms targeting Naval customers, where over 60% of the identified firms possess significant arctic experience.
- Defence firms in general seem to be open for exports, with most of them having their online presence either both in Finnish and foreign languages, or only foreign languages. The multiplication in granted export licenses for military equipment between 2022 and 2023 indicate significant growth in future exports.

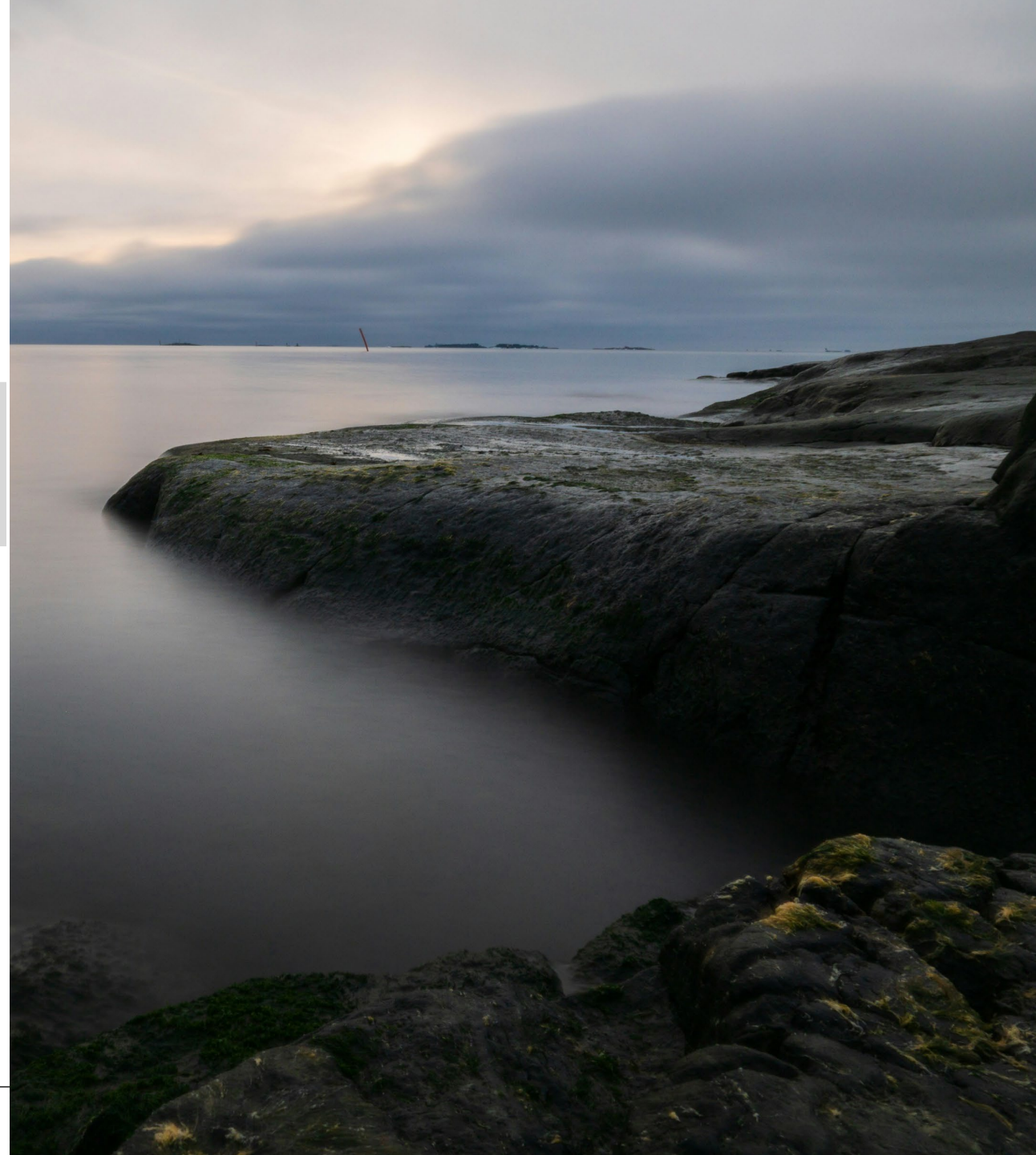
# Geopolitical instabilities translate to growing revenues and investment needs – the role of domestic investors is significant especially in early stages

## Executive summary – financials, funding and ownership

- The five different categories used in this report have very different financial characteristics: the dual use technology category has by far the highest revenue growth rates around 30-40%, whereas Established defence, basic manufacturing and professional services are profitable but mostly lack double-digit growth rates. Miltech firms, by far the smallest category, typically display moderate growth rates and positive but weak profitability.
- Dual use technology and miltech firms' sales development has been strong, and accelerating, in recent years. With total sales around €235m in 2022, they have grown at a median CAGR of 5-8% in recent years. VC investments in these emerging firm categories have similarly grown, with a peak year in 2022 due to large investment rounds in a few notable dual use technology firms.
- Most Defence firms are privately held by Finnish owners, and VC funding is notable only in Dual use technology and Miltech firms. The Finnish government is also a notable investor through its' investment firms.
- Most board members are Finnish males. The share of newly appointed foreign board members increased gradually between 2014-22, but retracted in 2023. The current share lies at 21% (with a further 2% being dual citizens). The share of female board members has also increased in recent years, with 18% of current Defence firm board members being female.
- Investor syndicates are typically quite diverse in terms of investor nationalities. Deals below €2m are typically done solely with Finnish investors, but in later rounds cross-border syndicates are the norm.

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# Given the rising global interest in Defence and skyrocketing VC investments, we have set out to map the Finnish Defence landscape

## Background and objectives

### Global perspective<sup>1</sup>

- The global security environment has undergone significant changes over the past years, profoundly impacting the defence industry. The Russian invasion of Ukraine and tensions between China and Taiwan have led many countries to reassess their strategic defence landscapes.
- 1. An unprecedented boost in revenue expected for the defence industry as many countries increase their military budgets.
- 2. The rise in military spending can drive innovation by implementing commercial technologies in defence applications and increasing the use of private capital in defence.
- 3. The private funding for defence innovations is still limited. GP-LP agreements, ESG considerations, and other factors are posing challenges.

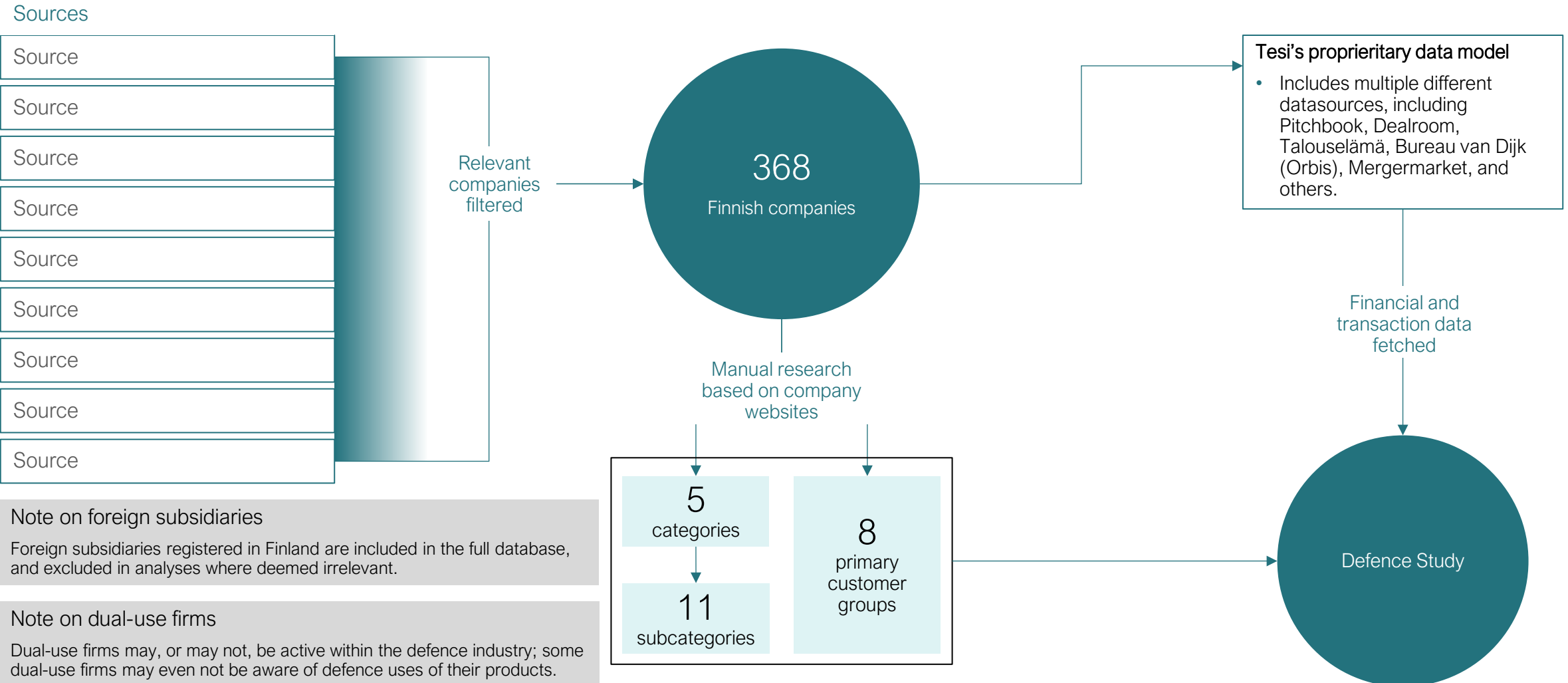
### Finnish perspective<sup>2</sup>

- The escalating geopolitical tensions and NATO membership have led us to reevaluate our strategic defence landscape.
- 1. The geographic position as a NATO border country sets an even more critical need for increasing domestic production and technology development.
- 2. Finnish domestic market is relatively small, but the new era of increasing NATO and EU collaboration presents a unique opportunity for the industry. The average export level (~40% in 2022) of the defence sector is expected to rise.
- 3. Finland is dedicated to meeting NATO two-percent guideline, with an estimated defence budget of 6.2 billion in 2024. Additional resources can be directed for the procurement of new capabilities and increasing and updating material and ammunition stocks.

### Tesi's objectives

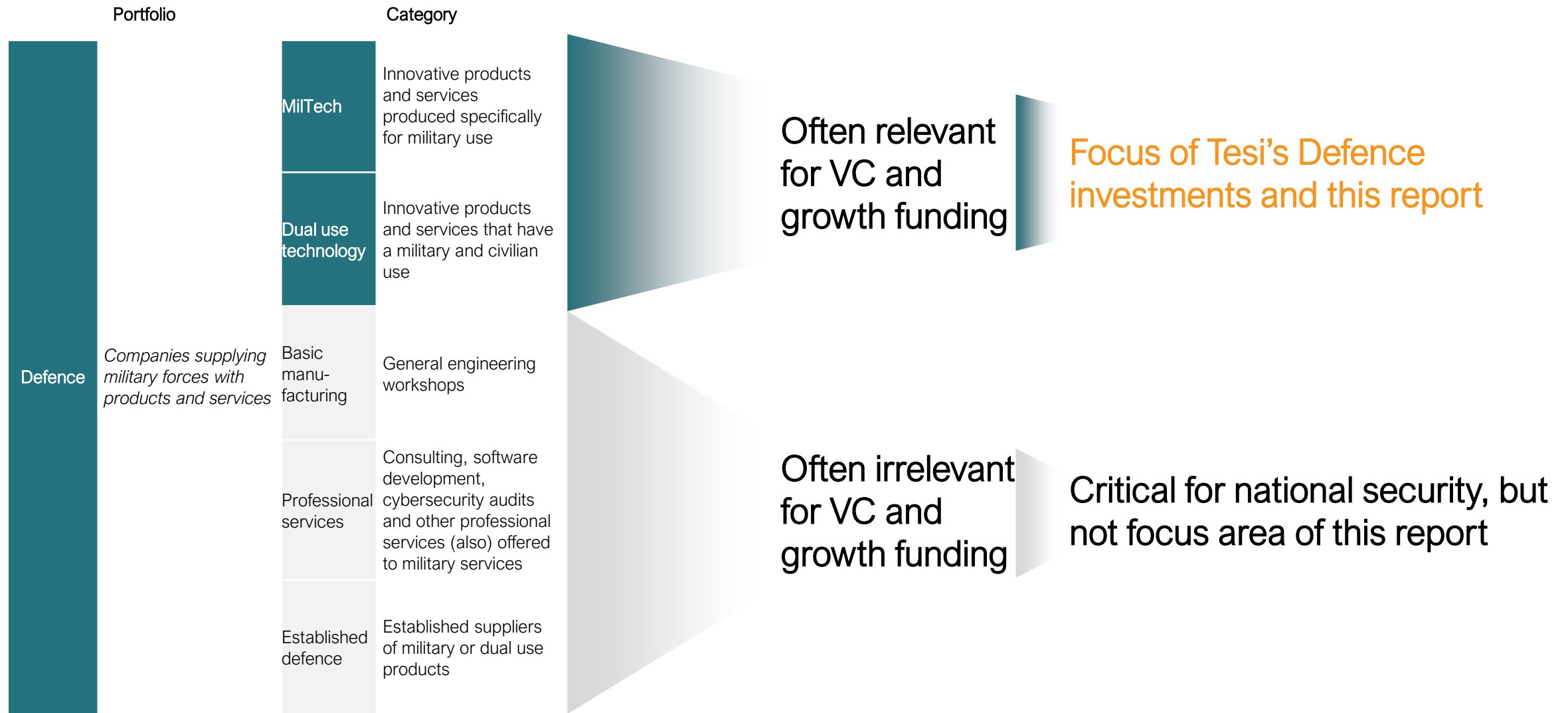
- To support our investment activities and understanding of the market, we have set out to provide an overview of the current state and historical development of the Finnish defence industry with a focus on investment opportunities in emerging ventures.
- Tesi has an industry-focused mission aimed at promoting economic growth, innovation, and investments. Given this mission, we have decided to publish select elements of our study to showcase the industry to investors and other relevant stakeholders.

Defence firms have been identified from industry sources a handful of industry associations and other sources, and then vetted by high-level desktop research












We have looked at the entirety of Finnish Defence contractors, but focused on emerging growth firms in focus of Tesi's investment activities



# In addition to a five-category division of firms, we have viewed firms through a tech-based subcategorization

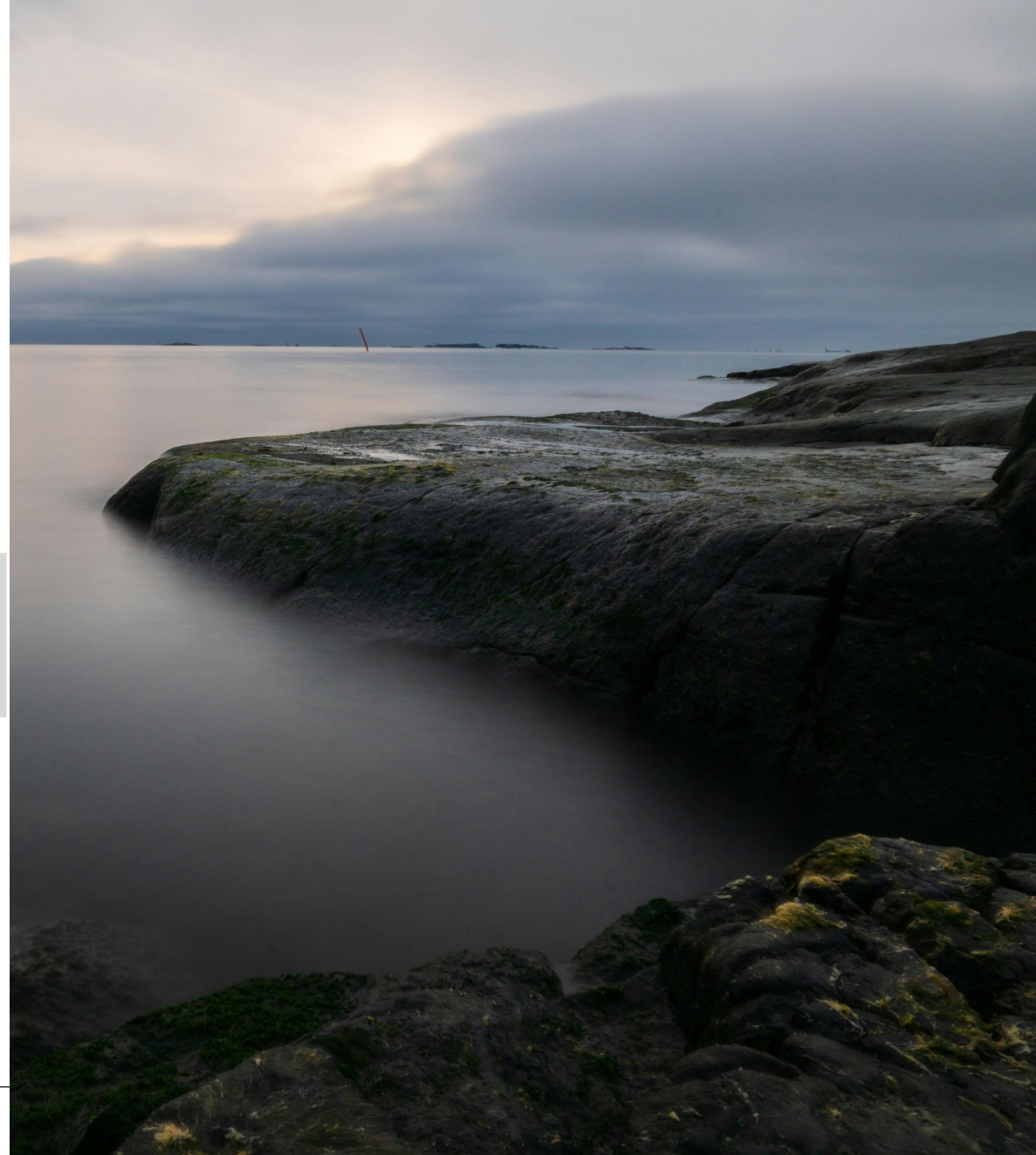
Portfolio	Category	Subcategory			
Defence	Companies supplying military forces with products and services	MilTech	Innovative products and services produced specifically for military use	Biotechnology	Living systems to produce a wide range of technologies and capabilities, from fighting global pandemics and avoiding surprises to reducing logistics and sustainment costs and increasing energy efficiency.
		Dual use technology	Innovative products and services that have a military and civilian use	Quantum	Study of physical properties at small, even atomic, scales. Defense applications include atomic clocks, quantum sensors, quantum computing, and quantum networks. Quantum sensors promise the ability to provide unprecedented accuracy in position, navigation, and timing
		Basic manufacturing	General engineering workshops	Advanced materials & manufacturing	Innovative new materials and novel manufacturing techniques that can dramatically improve many capabilities. Materials that have higher strength, lighter weight, higher efficiency, and can handle more extreme temperatures will have the potential to better protect service members and enhance their ability to accomplish their missions.
				Space	Space technologies include space flight, Space communication and other technologies needed to maintain space operations.
		Professional services	Consulting, software development, cybersecurity audits and other professional services (also) offered to military services	Human machine interfaces	Human-machine teaming & augmented and virtual reality. Highly immersive realistic training environments provide real-time feedback to enhance warfighter performance. Intuitive & interactive human-machine interfaces enable rapid mission planning and command by providing a common picture to geographically distributed operations.
				Sensing, connectivity and cybersecurity	Next-generation wireless networks, advanced sensors, electronic warfare & information security
		Established defence	Established suppliers of military or dual use products	Energy generation and storage	Includes solar wind, bio-based and geothermal technologies, advanced energy storage, electronic engines, and power grid integration. From more efficient batteries to diversifying energy sources & reduced fuel transportation risks, renewable energy generation and storage add resilience and flexibility in a contested logistics environment.
				Advanced computing and software	Advanced computing and software technologies include supercomputing, cloud computing, data storage, computing architectures, and data processing.
				Semiconductors & microelectronics	Microelectronics are circuits and components that serve as the "brain" to human-made electronic functional systems. Virtually every military and commercial system relies on microelectronics.
				Autonomous Systems	Expanding capabilities of software applications to perform tasks that currently require human intelligence. Autonomy is the engineering discipline that expands robots' abilities to perform tasks while limiting the need for human interaction. Includes unmanned aerial vehicles.
		Other	All other industries that have a direct military use, but do not fit into the above categories		

# Most firms can be assessed to serve one primary military branch

Primary user	Land	Sea	Air	Space	C4I	Support and Logistics	Multi-use
Example customers	 <p>Maavoimat</p>	 <p>Merivoimat</p>	 <p>Ilmavoimat</p>		 <p>Pääesikunta</p>	 <p>Logistiikkalaitos</p>	
Description	<p>Military operations and capabilities related to ground forces. It includes the equipment, personnel, and infrastructure required to conduct land-based warfare.</p>	<p>Naval operations and maritime defense. It includes the fleet, submarines, and maritime surveillance systems used to control and defend sea territories.</p>	<p>All aspects of aerial warfare and defense. It includes aircraft, unmanned aerial vehicles (UAVs), and air defense systems that support air superiority and ground support operations.</p>	<p>Military operations in outer space and space warfare. Countries with nascent military space capabilities usually organize them within their air forces.</p>	<p>Centered around the systems and infrastructure that facilitate command and control, communication, data processing, and intelligence gathering. It is essential for strategic planning, real-time decision-making, and effective coordination of military operations.</p>	<p>Practical aspects of maintaining and supporting military operations. It includes the management of supplies, equipment maintenance, transportation, training &amp; simulations, and other services that ensure military readiness and sustainability.</p>	<p>Multi-domain operations that clearly span across more than one branch of military service and where a primary user cannot be clearly defined.</p>

# Agenda

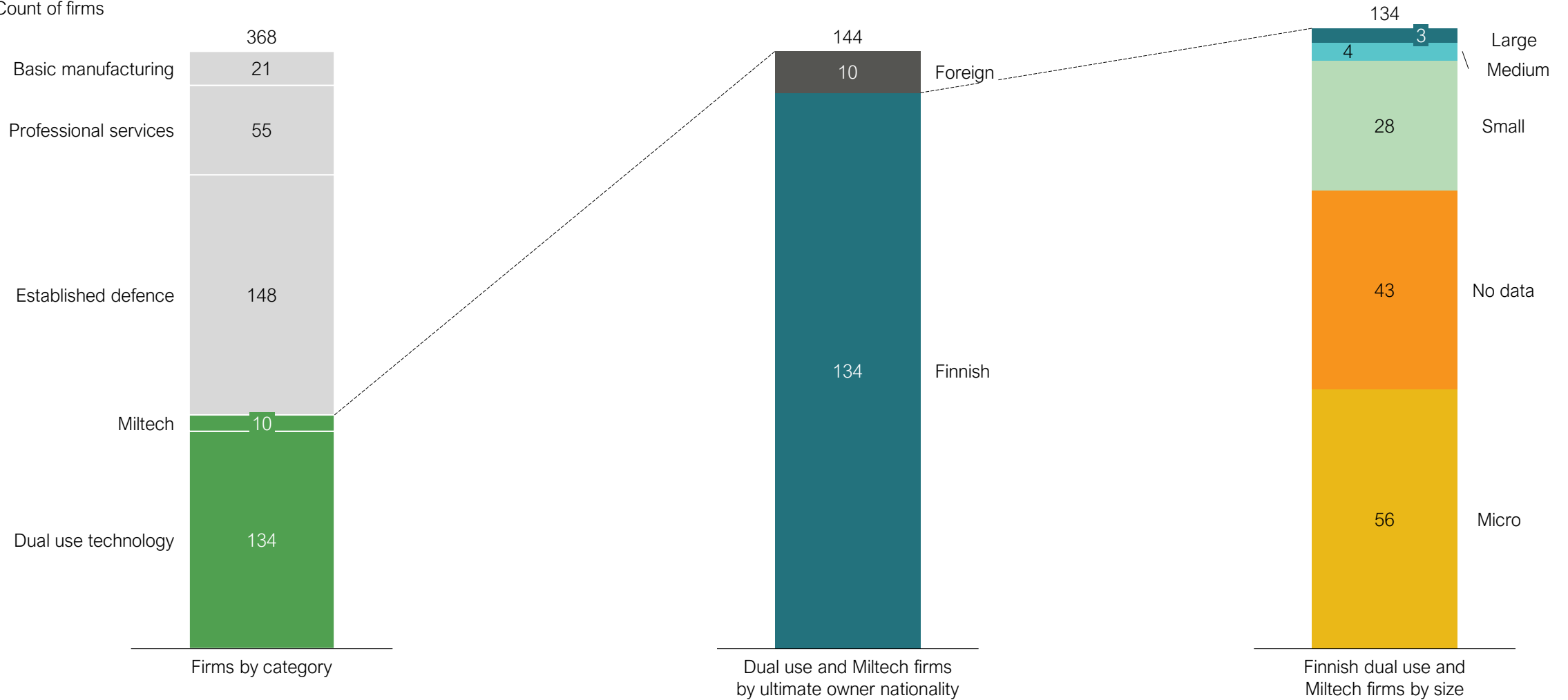
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# There are 300+ firms active in Defence in Finland, with 130+ of them being innovative startups in Finnish ownership

## Firms by category, ownership and size

Count of firms

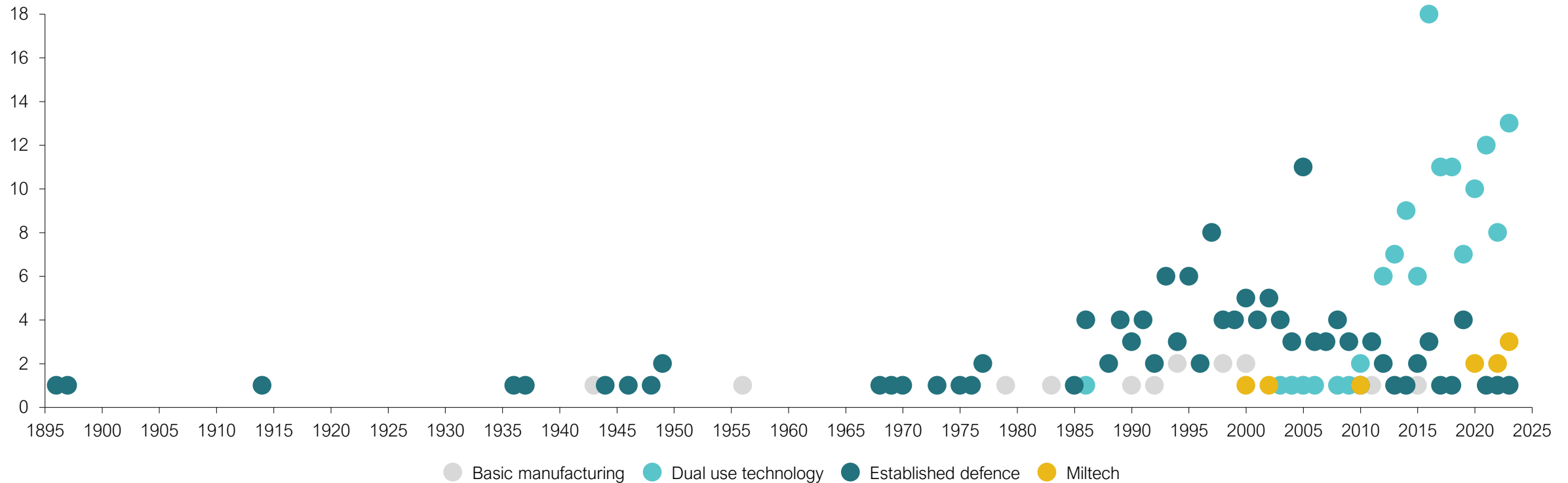


# The Finnish defence industry is seeing a new renaissance – majority of new entrants are dual use firms

## Defense firms by subcategory and year of founding

Count of firms founded each year

Excluding professional services

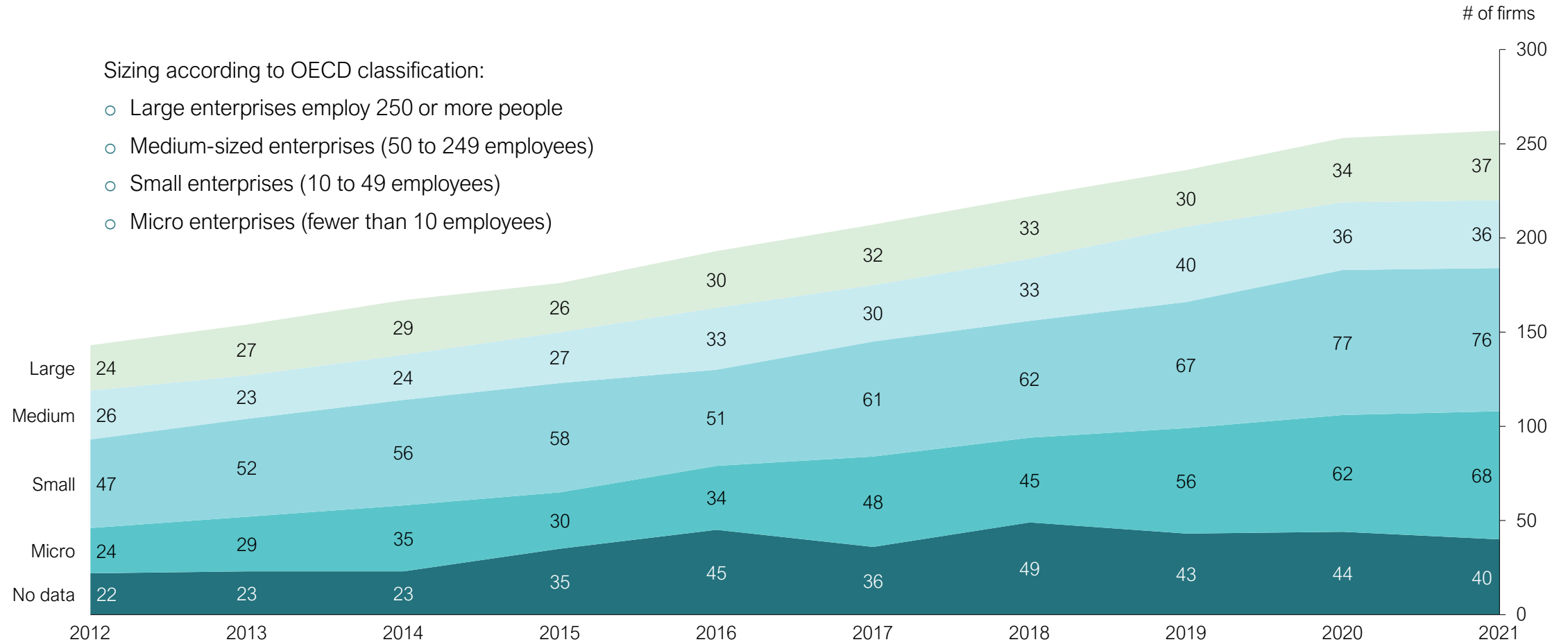


# In addition to new firms popping up, previously established are growing to the next size class

## Defence firms by size class

Count of firms

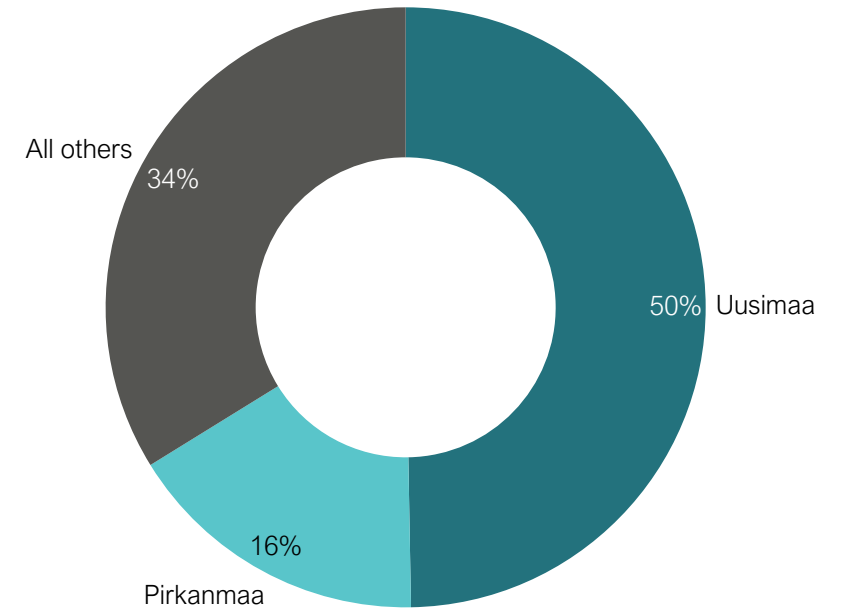
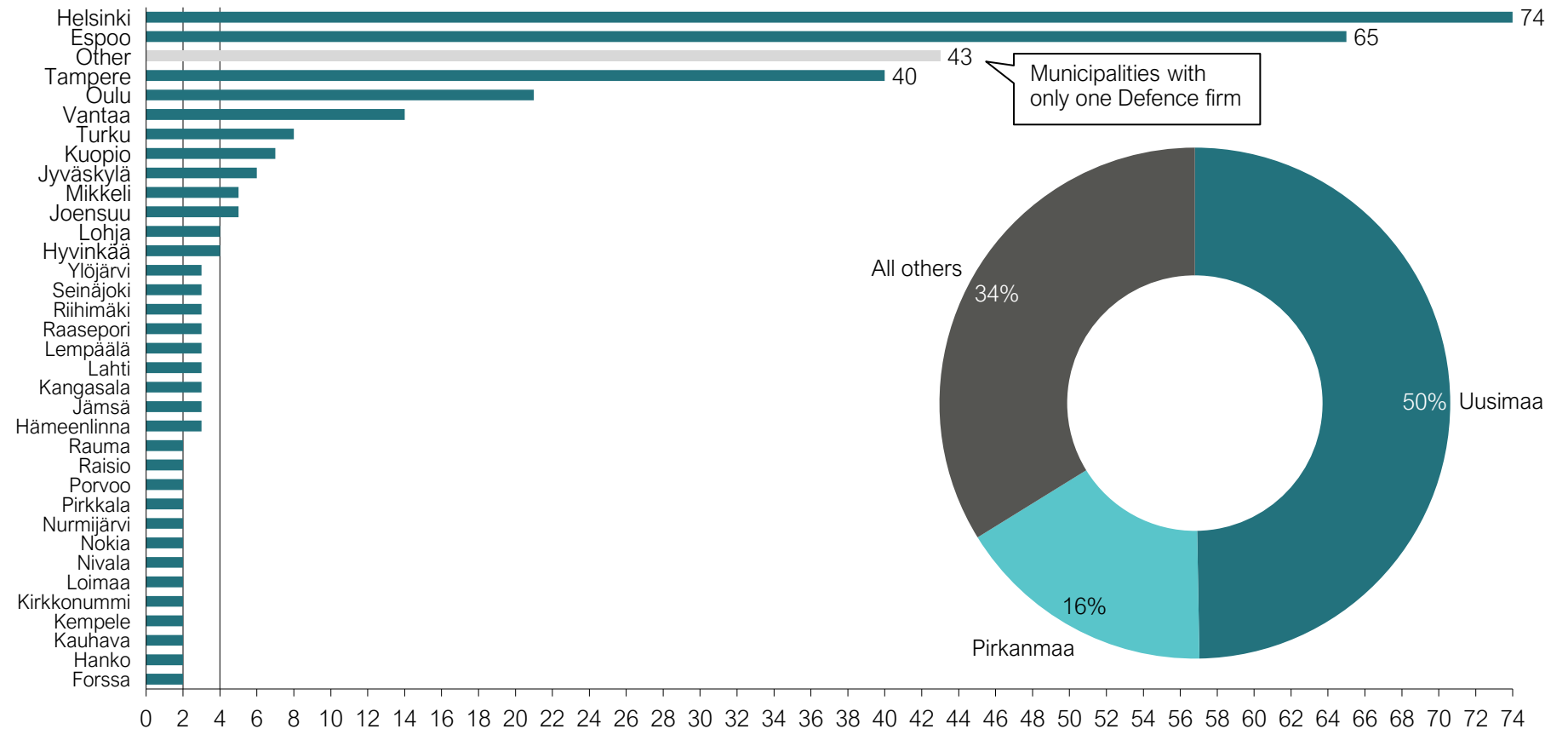
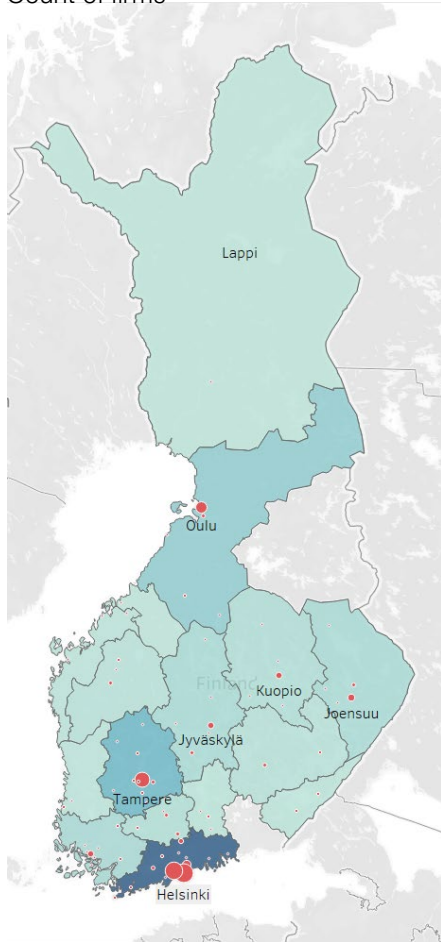
Excluding professional services



# The Helsinki region and Tampere are the largest Defence hubs in Finland, but firms are spread across the country

## Firm headquarters by city and county

Count of firms







# Most Finnish defence firms focus on support activities

## Firms by category and primary customer

Count of firms

	Land	Sea	Air	Multi	Space	Support & logistics	C4I	Total
Miltech	7					2	1	10
Dual use technology	3		6		4	86	35	134
Basic manufacturing						21		21
Professional services		1				49	5	55
Established defence	10	12	4	5		88	29	148
<b>Total</b>	<b>20</b>	<b>13</b>	<b>10</b>	<b>5</b>	<b>4</b>	<b>246</b>	<b>70</b>	<b>368</b>

# There are very few pure miltech startups in Finland

Categories by count of firms, latest sales, count of transactions, total transaction value

Count of firms in #, €m, #, €m

Category	Number of firms, #	Latest sales, €m	# of deals, 2014-23	Deal value, 2014-23, €b
Basic manufacturing	21	273	No identified transactions	No identified transactions
Dual use technology	134	283	298	1,2
Established defence	148	49 790	50	11,5
Miltech	10	28	No identified transactions	No identified transactions
Professional services	55	2 484	No identified transactions	No identified transactions

## Bottlenecks in the Miltech market?

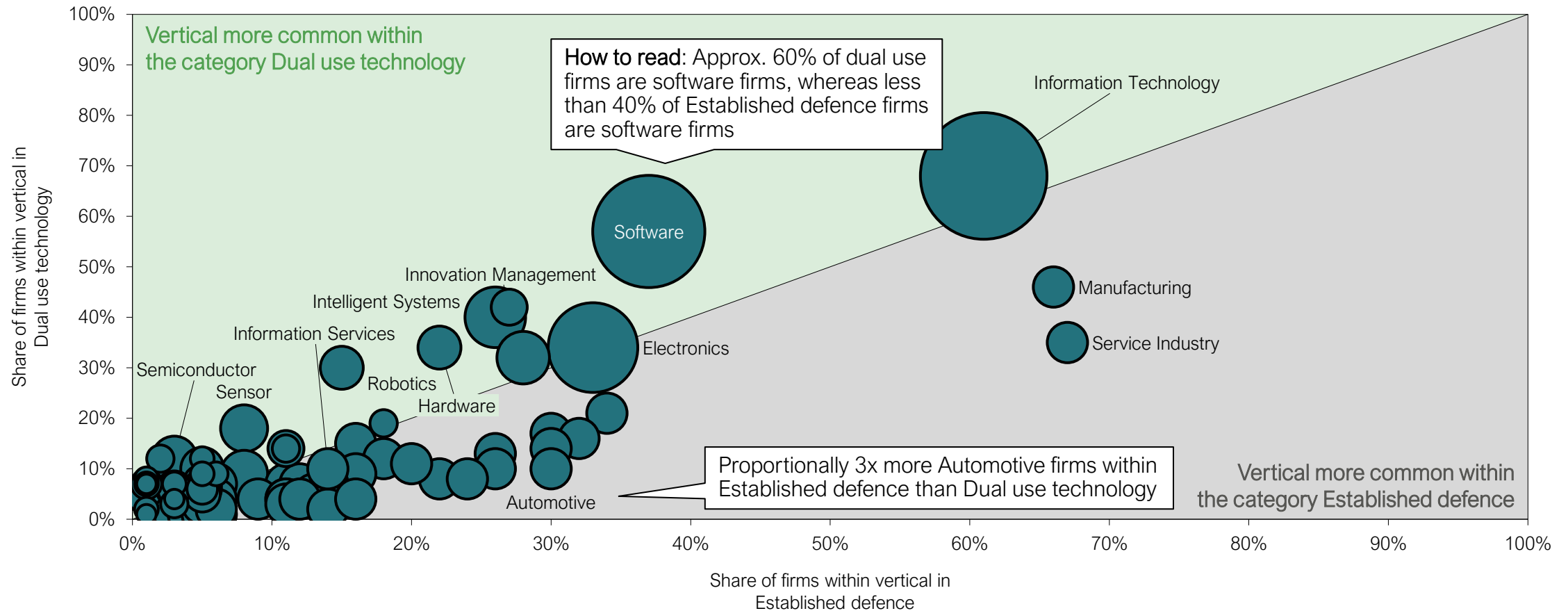
- Very few companies focus solely on defence equipment and are clearly innovative
- The large number of sources and significant overlaps in them suggest a limited number of defence-focused startups
- Possible obstacles include the size and difficulty of the target market, the limited activity of the Finnish Defence Forces in the startup scene, and GP's restrictions on investments to military startups

Note: Many firms within the categories Basic manufacturing, Established defence, and Professional services generate most revenues beyond defence purposes. Talouselämä estimates the total Defence industry's revenues at approx. €1,9b in 2021.

# Dual use technology firms are likelier to be in emerging industries such as software and semiconductors, compared to the more traditional firms in Established defence

## Verticals comparison, Dual use technology vs. Established defence

Share of firms within vertical (%)

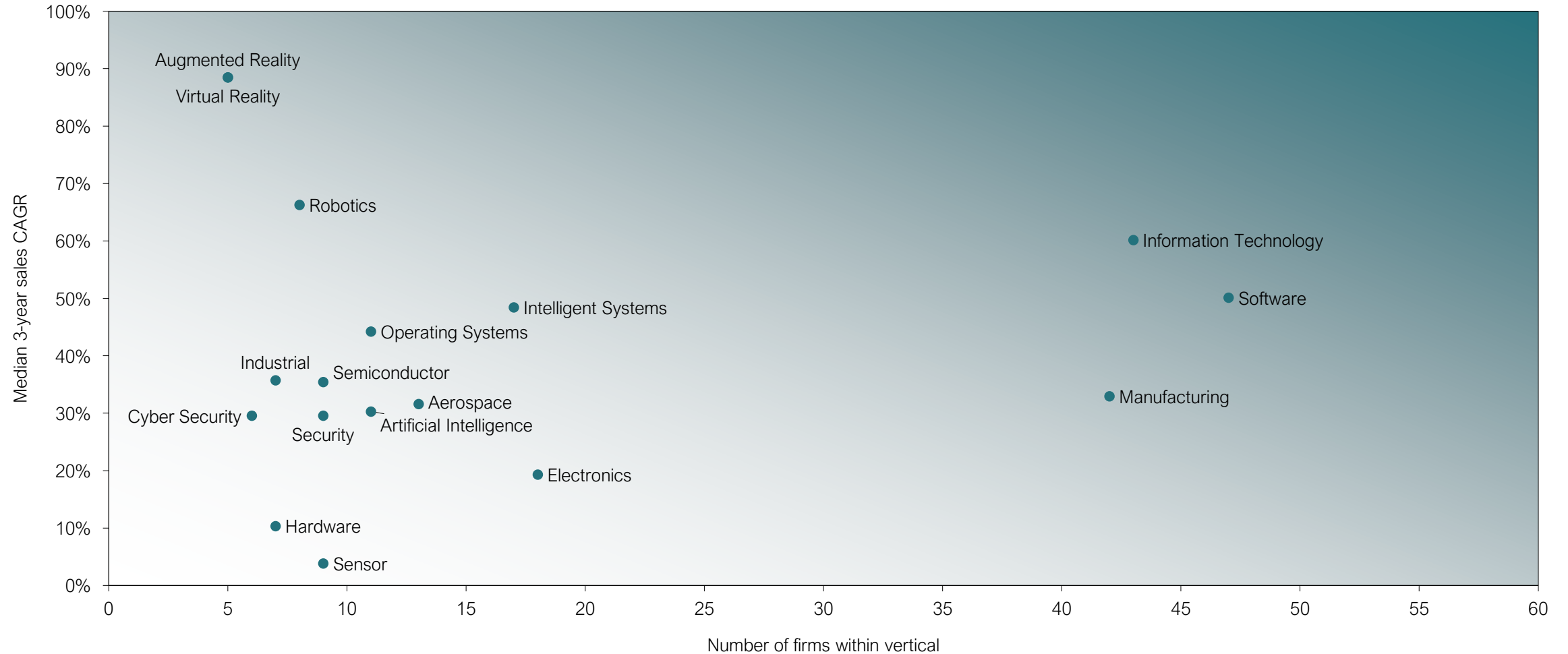


# AR/VR and robotics are some of the highest growth verticals in emerging Defence firms

## Key verticals in Dual use technology and Miltech

Dual use technology and Miltech only

Number of firms within vertical; Median 3-year sales CAGR (%)



# Manufacturing and IT-related innovators are the spearhead of Finnish Miltech and Dual Use technology firms

Miltech and Dual use technology firms by subcategory and primary customer

Miltech and Dual use technology firms only

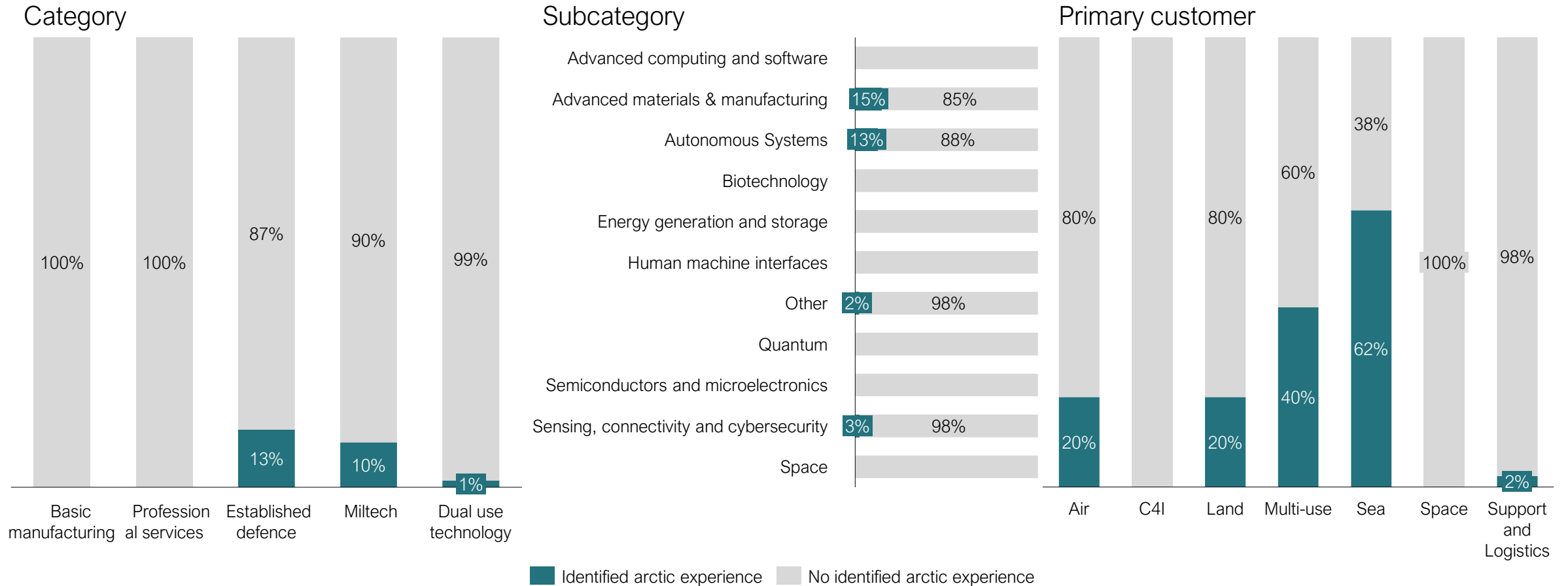
Count of firms

	Land	Air	Space	S&L	C4I	Total
Advanced computing and software				15	7	22
Advanced materials & manufacturing	5	1			25	31
Autonomous Systems	3	3			2	8
Biotechnology					1	1
Energy generation and storage					12	12
Human machine interfaces		1			5	6
Other		1				1
Quantum				3	1	4
Semiconductors and microelectronics					3	3
Sensing, connectivity and cybersecurity	2		1	14	32	49
Space			3	4		7
<b>Total</b>	<b>10</b>	<b>6</b>	<b>4</b>	<b>36</b>	<b>88</b>	<b>144</b>

# There aren't too many Finnish firms focused on naval products and services, but the ones that do, often have an specialized arctic focus

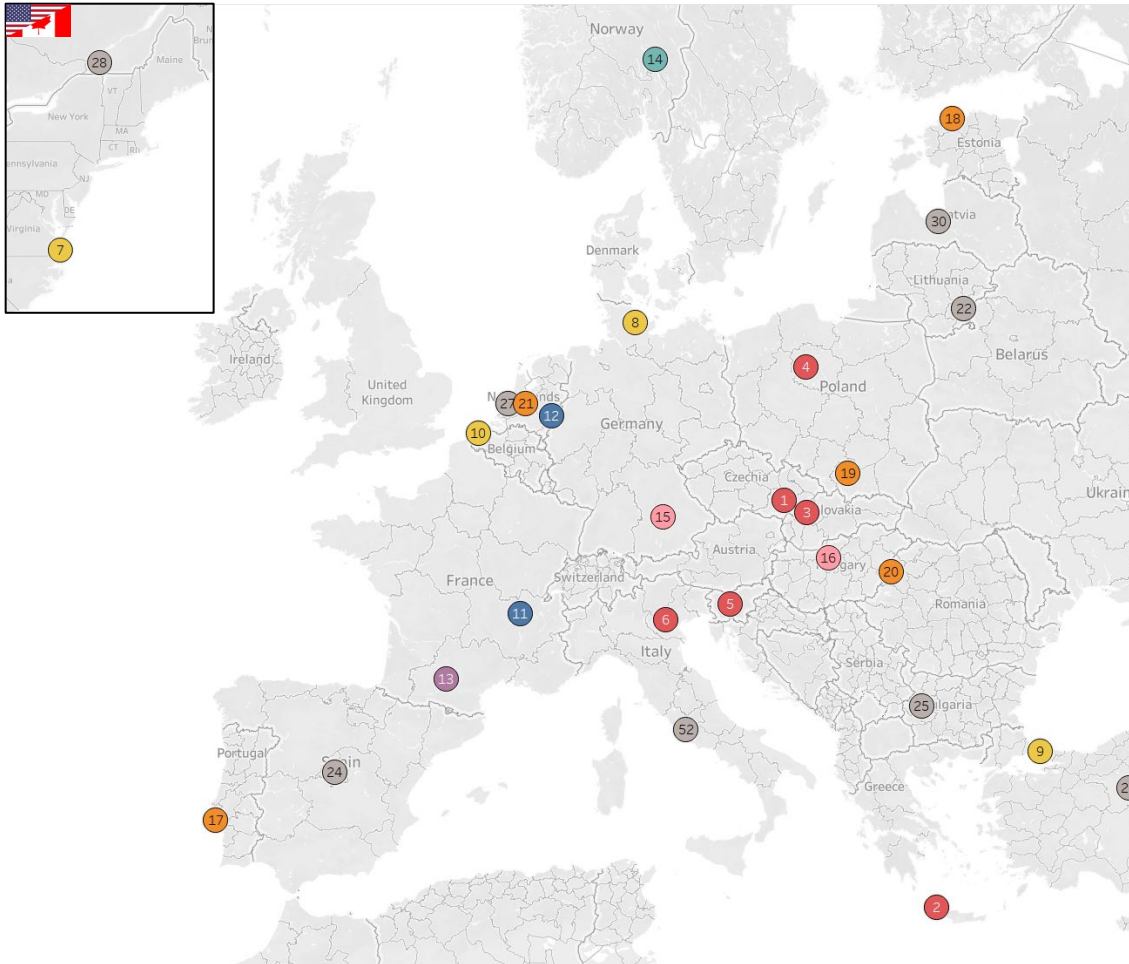
## Firms with identified arctic experience

Share within category, subcategory and primary customer



# Existing NATO Centres of Excellence are a varied mix of niche knowledge areas – most cannot be easily tied to a specific technology area

## NATO Centres of Excellence



Customer	#	Centre of Excellence	Technology area
Land	1	Chemical, Biological, Radiological and Nuclear Defence	Biotechnology
	2	Integrated Air & Missile Defence	n.a.
	3	Explosive Ordnance Disposal	
	4	Military Police	
	5	Mountain Warfare	
	6	Stability Policing COE	
Sea	7	Combined Joint Operations from the Sea	
	8	Confined and Shallow Waters	
	9	Maritime Security	
	10	Naval Mine Warfare	
Air	11	Air Operations	n.a.
	12	Joint Air Power Competence Centre	
Space	13	Space	Space
Multi-domain	14	Cold Weather Operations	n.a.
Support and Logistics	15	Military Engineering	
	16	Military Medicine	
C4I	17	Maritime Geospatial, Meteorological & Oceanographic	Sensing, connectivity and cybersecurity
	18	Cooperative Cyber Defence	
	19	Counter-Intelligence	n.a.
	20	Human Intelligence	
	21	Command and Control	
n.a.	22	Energy Security	Energy gen. and storage
	23	Modelling & Simulation	Human machine interfaces
	24	Counter Improvised Explosive Devices	n.a.
	25	Crisis Management and Disaster Response	
	26	Defence Against Terrorism	
	27	Civil-Military Cooperation	
	28	Climate Change & Security*	
	29	Security Force Assistance	
	30	Strategic Communications	



# The Finnish Defence Forces are a critical part of the Finnish Defence ecosystem, and their activity could be enhanced to better support critical innovations

## Role of the Finnish Defence Forces

The Finnish Defence Forces are a critical customer for Defence innovations

"The Finnish Defence Forces are known in these circles to be an extremely demanding customer, and then they know that if a company has been able to sell something to the Finnish Defence Forces, it is a very desirable reference. It has value in this market."

CEO, Finnish Defence and Aerospace Industries

"A Finnish defence company is not taken seriously in the international market if it does not supply its products extensively to the Finnish Defence Forces and is also their official partner."

Finnish Defence company  
in Hirvensalo (2020)

.. but they lack formal processes to support the development of innovations

The Finnish Defence Forces are not a very interesting customer in product development. The company cannot be sure whether the product development project will continue into production with the same company, or whether the project will be put out to tender after the prototype. In this case, there is a chance that the company that carried out the development work will not receive the actual project.

Hirvensalo: Puolustusvoimat PK-yritysten asiakkaana (2020)

.. and feedback is typically centered around quality control rather than end-customer feedback

"The companies mentioned that they do not receive any feedback on the quality or functionality of the product. After delivery, there will [only] be a mention of the approval of the quality of the product batch.

The lack of end-user feedback was an important observation from companies. [Many] companies identified the lack of end-user feedback as the biggest flaw in FDF's feedback system. **Some companies had no idea how and in what environment the product they manufactured would be used.** This affected the design and functionality of the product's features."

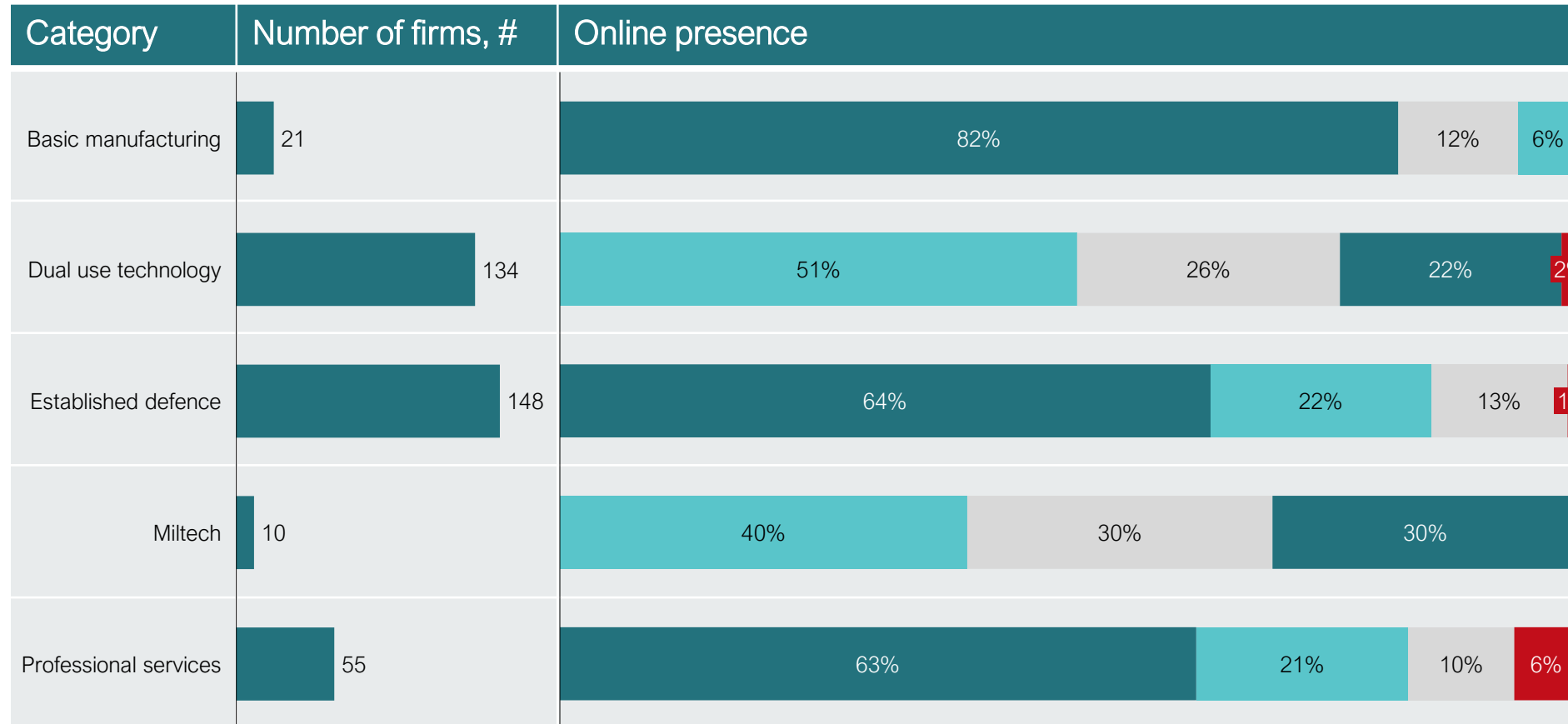
Hirvensalo: Puolustusvoimat PK-yritysten asiakkaana (2020)

# Finnish defence firms seem to be open for exports – very few have their webpages only in Finnish, whereas many emerging champions are only in English

## Categories by count of firms and share of webpages in Finnish or other languages

Excluding foreign subsidiaries

Count of firms in #, share of firms within each language category



### Online presence

- We've leveraged Vainu's website tracking to evaluate language versions of each firm's webpage to assess their geographical focus areas

- Pages only in Finnish
- Pages **only** in English or other foreign language
- Pages in **both** Finnish and foreign language(s)
- No information

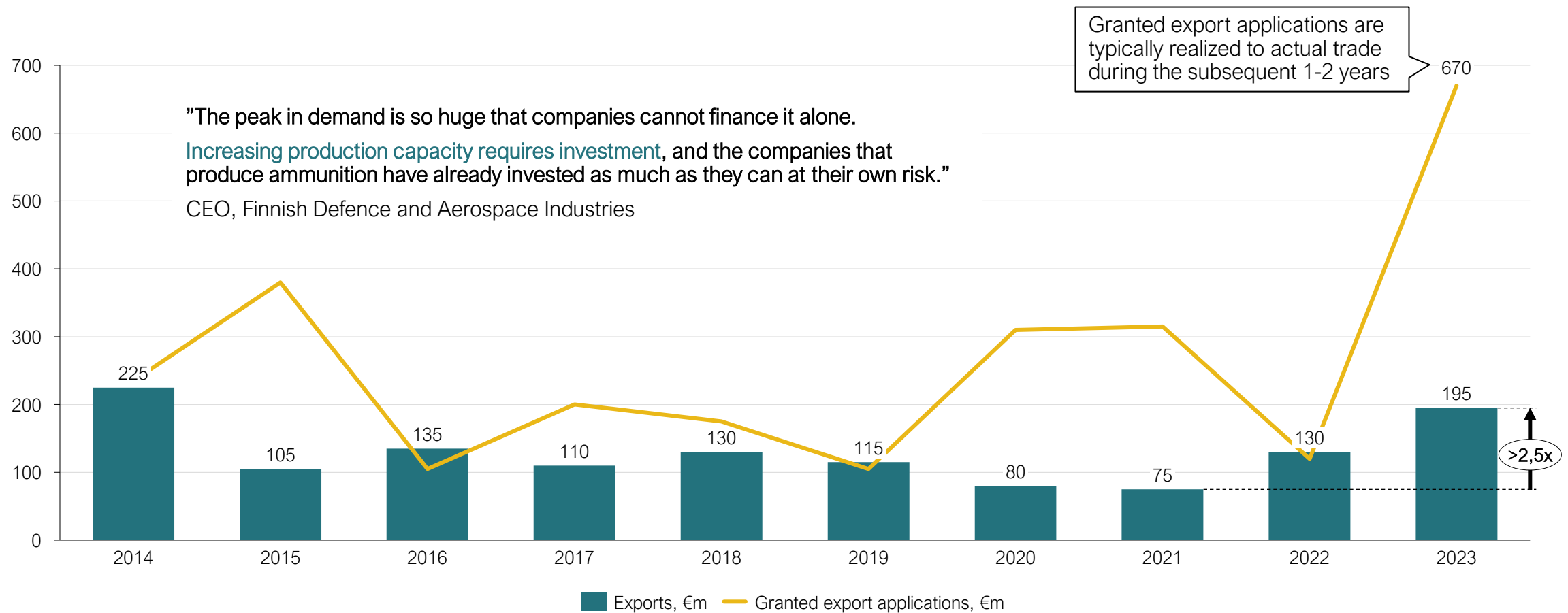
- The results indicate that most firms are open for business beyond Finnish borders – very few have their webpages only in Finnish.

# Exports of military equipment are skyrocketing, but the industry needs further investments to continue growth trajectory

## Exports of military equipment, 2014-23

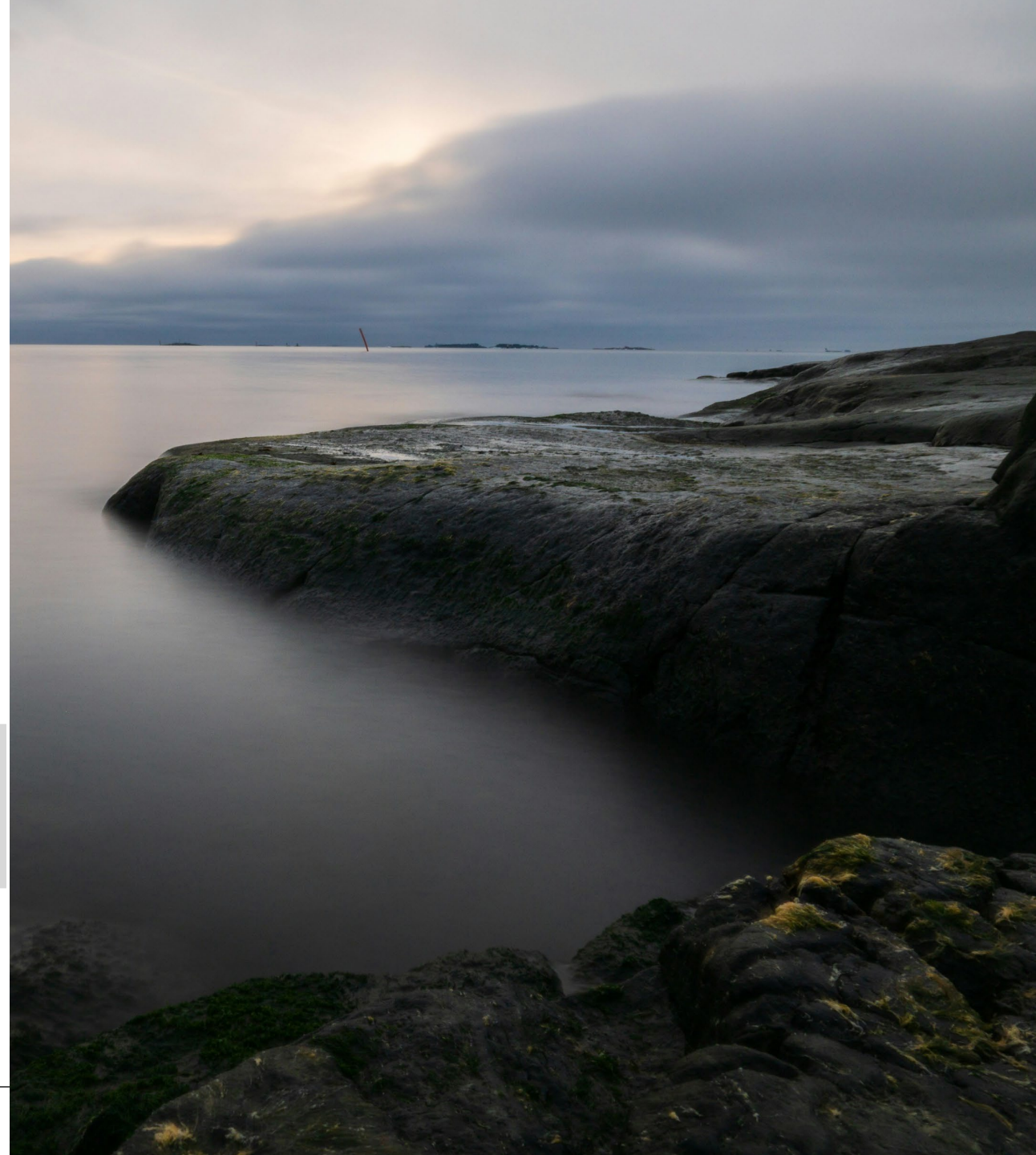
€m

Statistics do not include dual use equipment



# Agenda

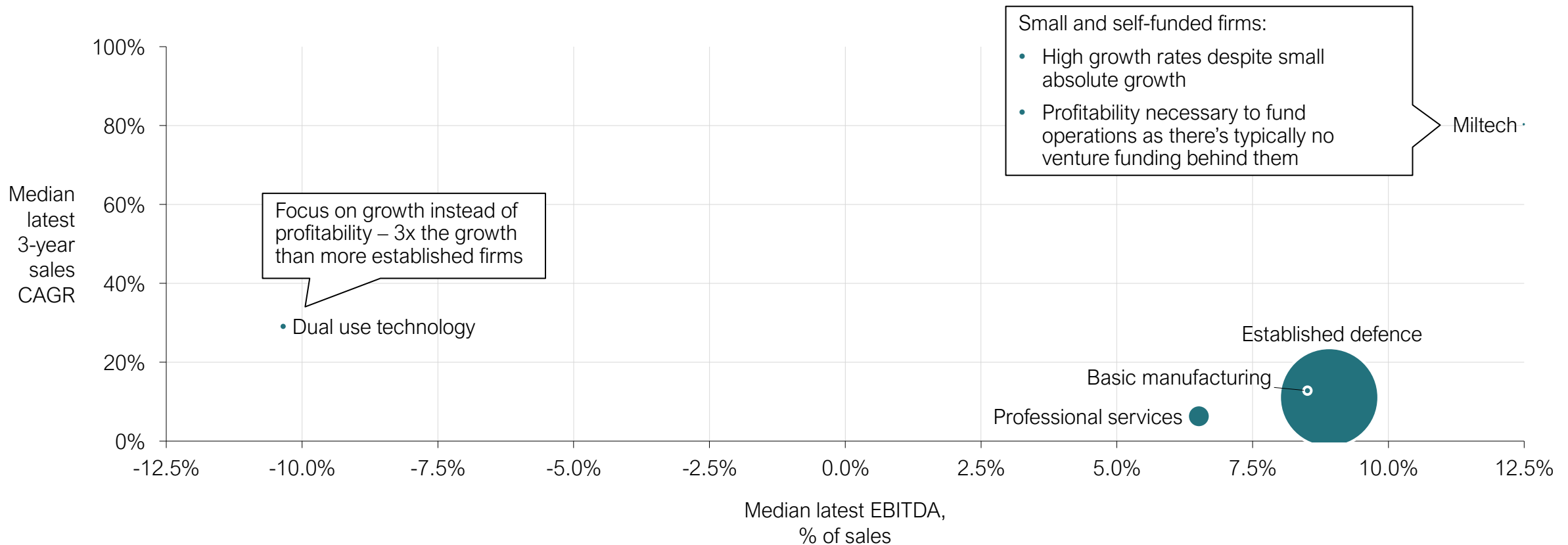
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# Firms have been mapped based on characteristics displayed on their website; very different growth and profitability prospects per category

## Categories by sales development, profitability and total sales

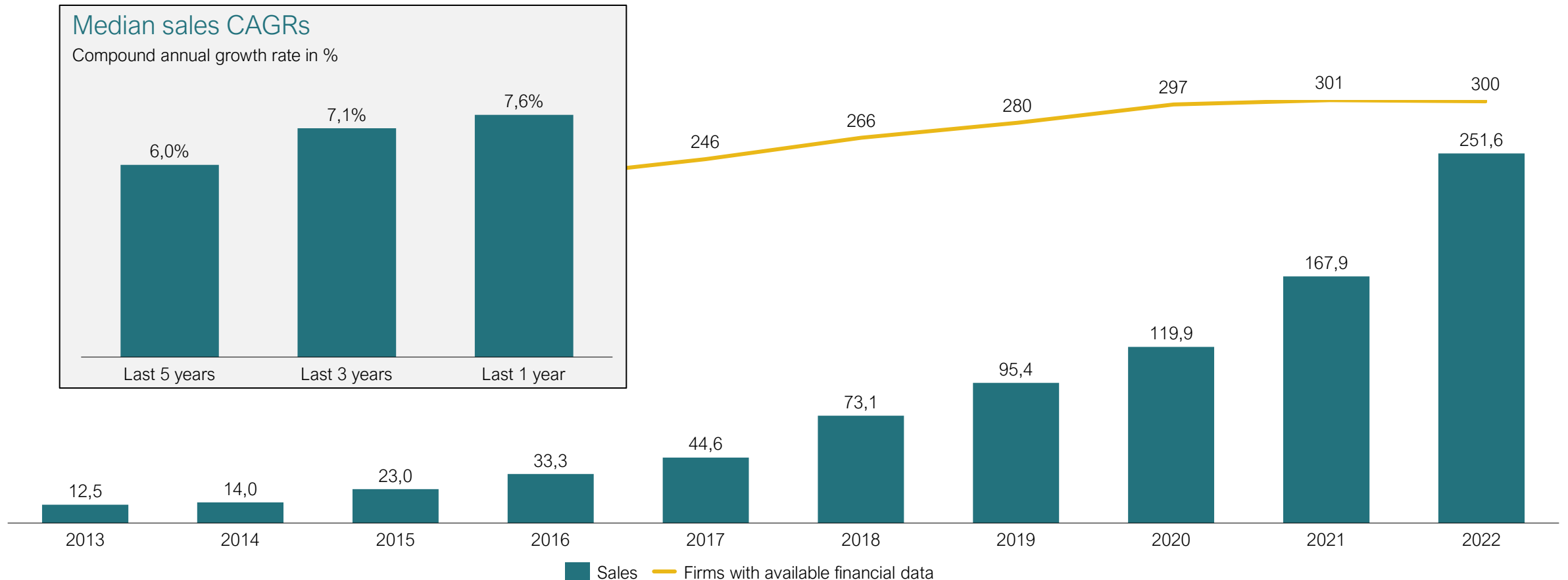
Latest sales corresponding to bubble size



# Dual use technology and Miltech firms are growing quickly, and their growth rate is accelerating each year

## Dual use and Miltech firms' sales development and availability of financial data

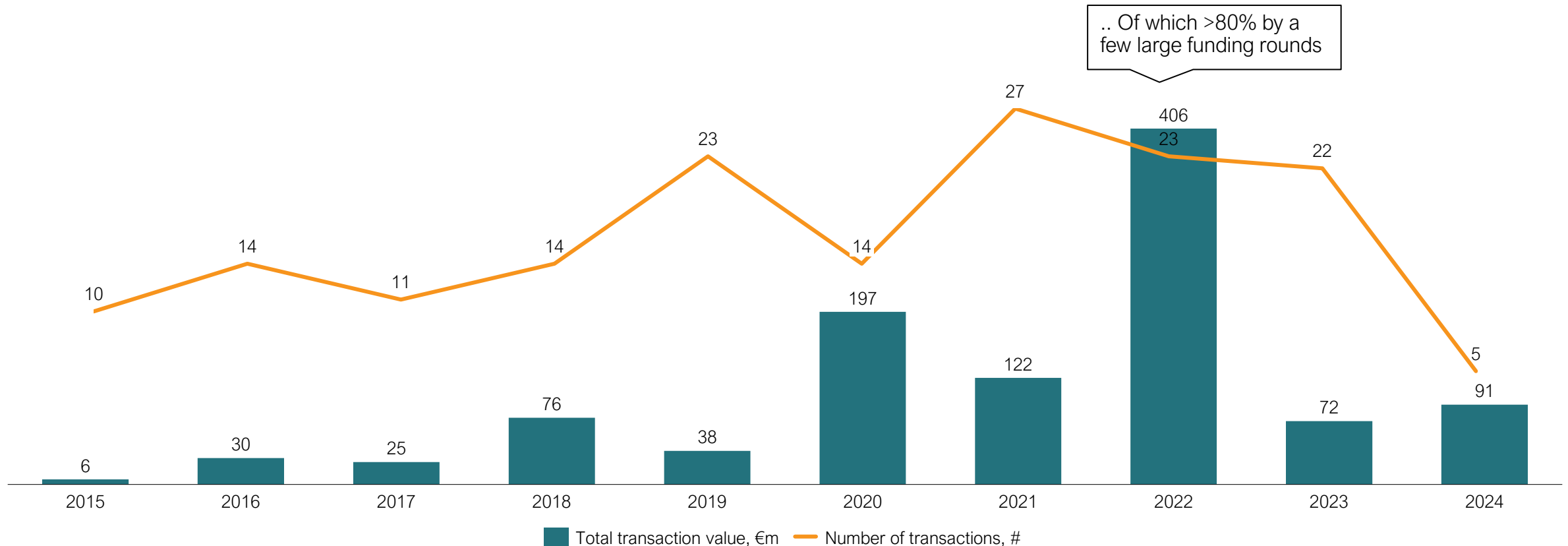
€m



# 2022 was the peak year in Defence VC investments due to large rounds by a few dual use technology firms

## VC investments in Defence, 2015-24YTD

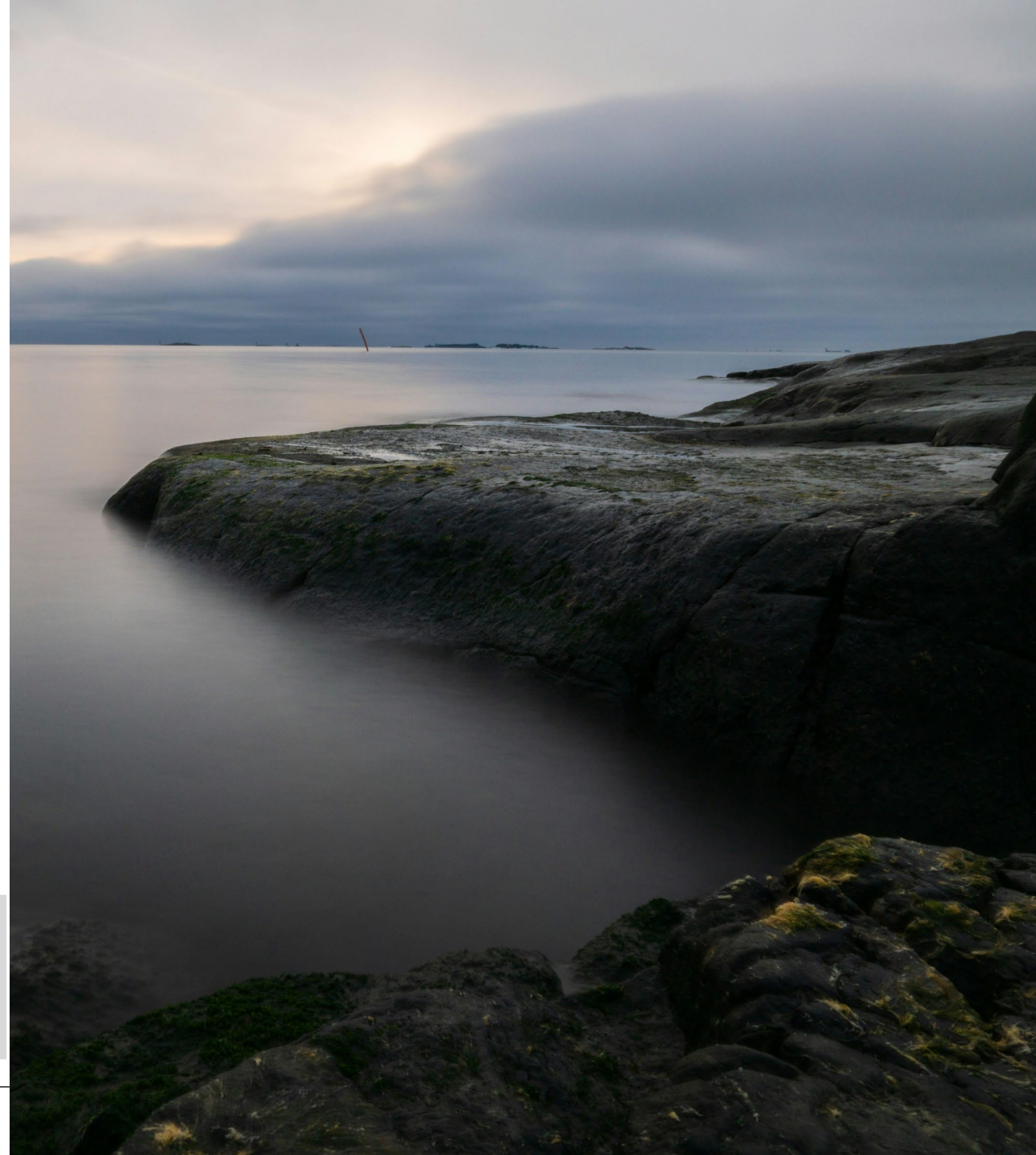
Total transaction value in €m; Count of transactions



Close to all VC investments in the Dual use technology category – none in Miltech

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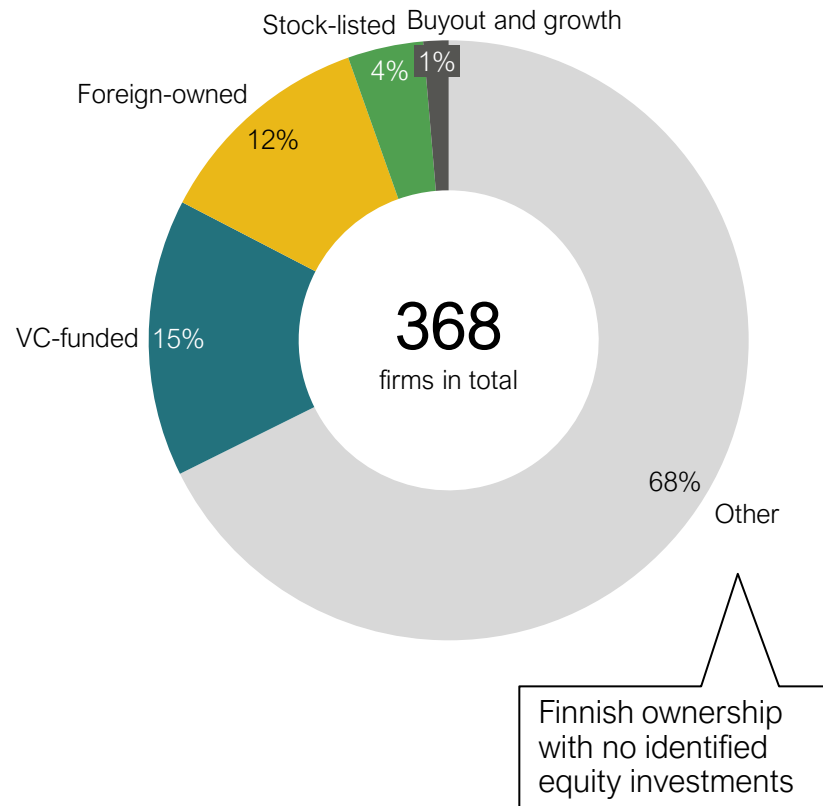




# Most Defence firms are in private Finnish hands – VC-funding notable only in Dual use technology ventures

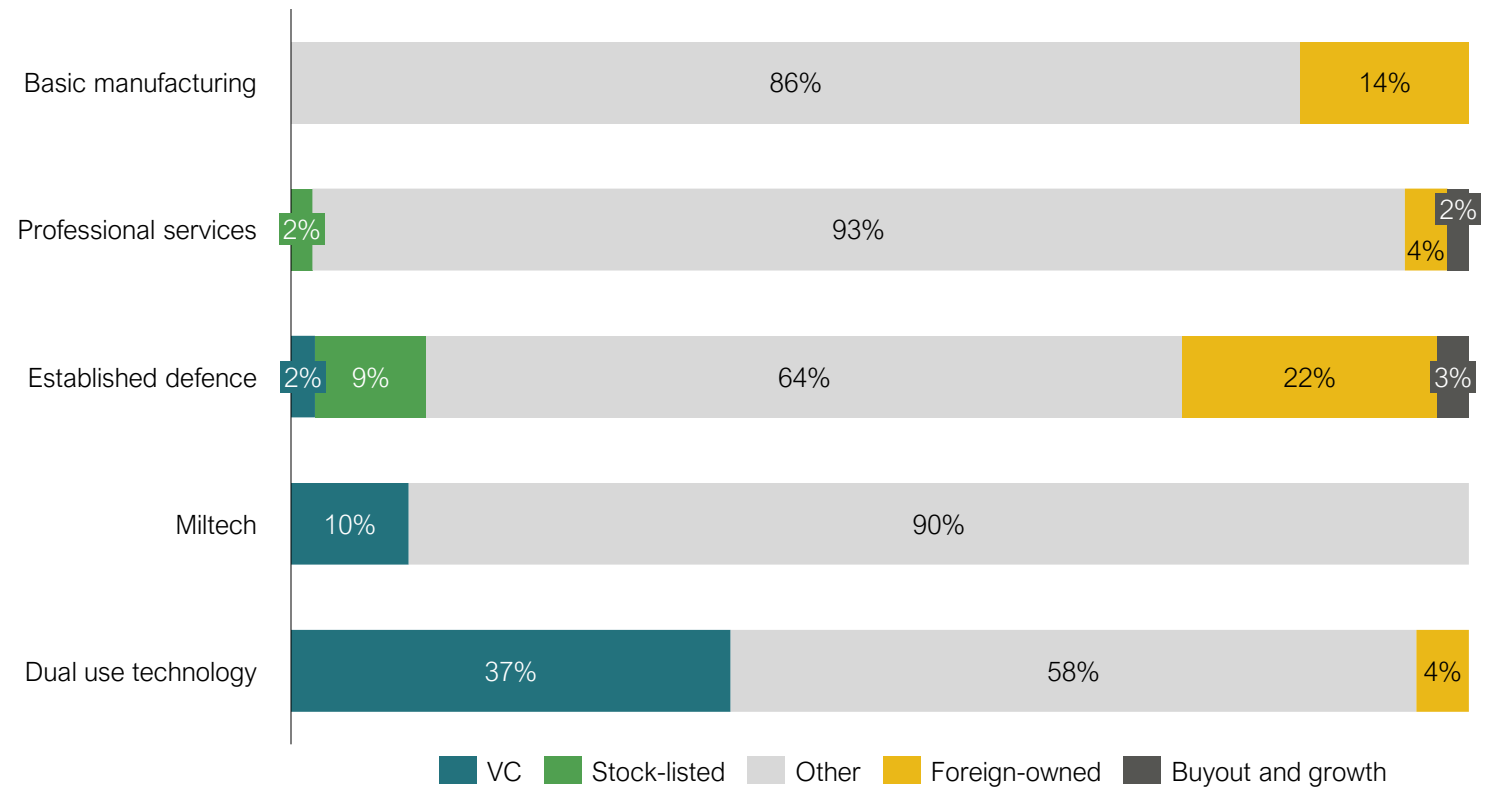
## Defence firms by funding

% share of total



## Funding by category

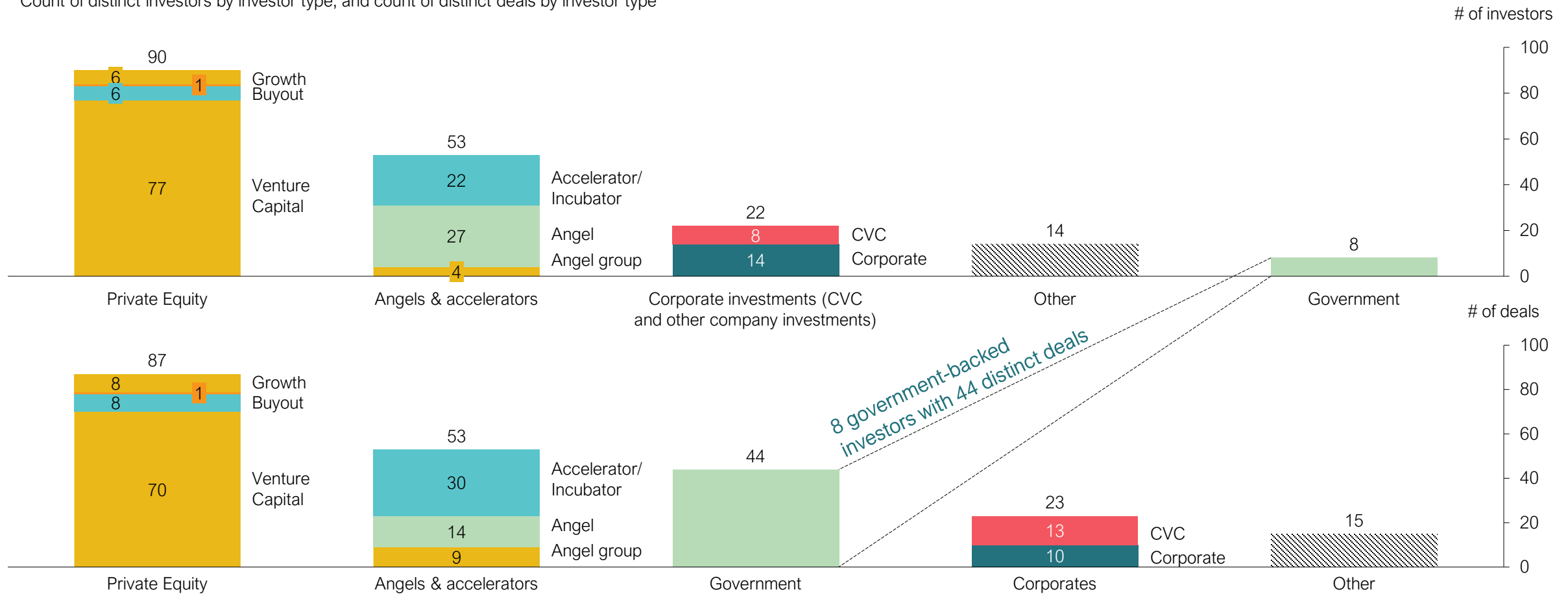
% share within category



# VC funds are the most prominent individual investor category among Finnish defence firms

## Investor types in Finnish Defence firms, 2010-23

Count of distinct investors by investor type, and count of distinct deals by investor type

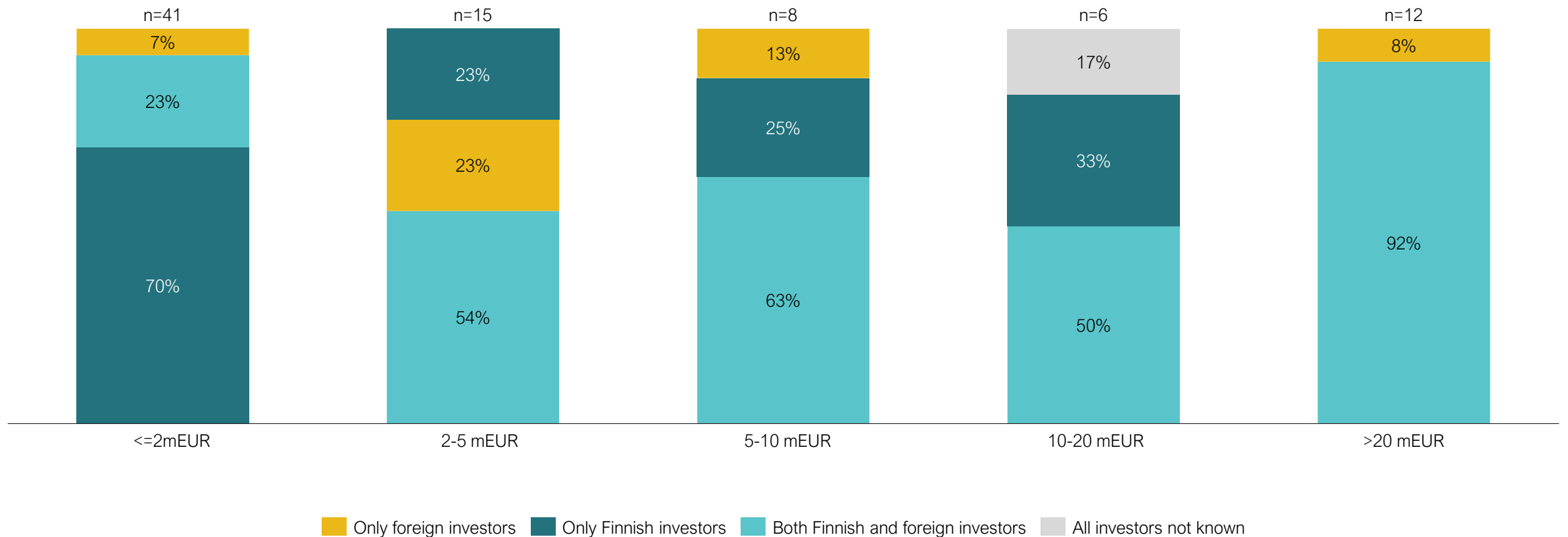


# Most early-stage deals are done by purely Finnish syndicates, but even small rounds may consist of only foreign investors

## Investor syndicate nationalities by investment size, 2010-23

Share of transactions by types of investors involved, % of total

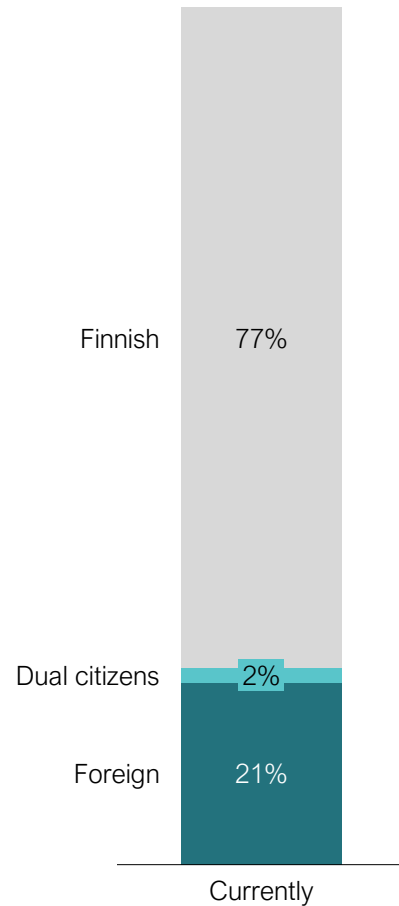
VC, Growth and Buyout deals only



# Around a fifth of board of director members are foreign – the share of newly appointed foreigners was increasing until 2023

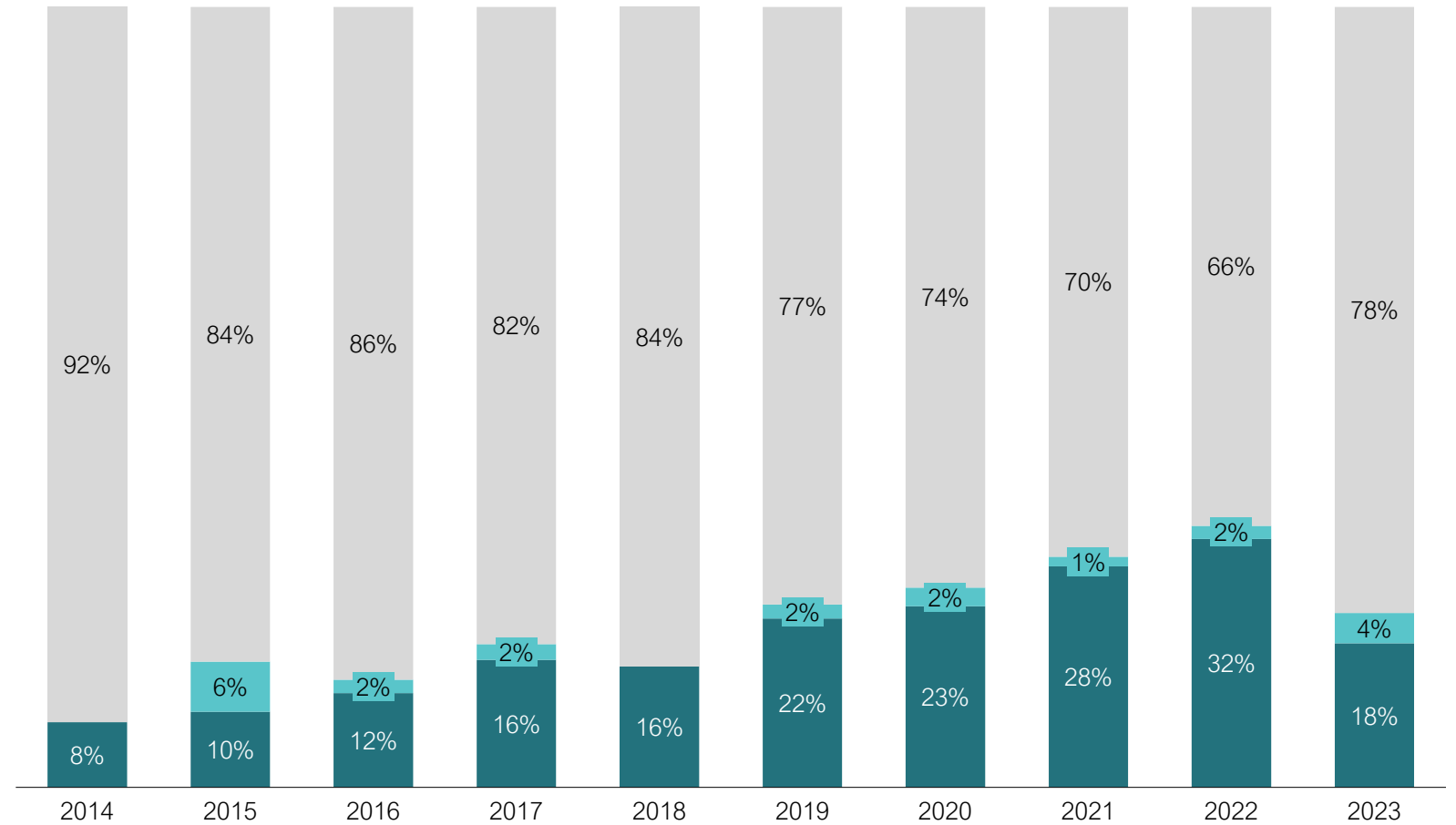
## Board members by nationality

% of total



## Newly appointed board members by nationality and appointment year, 2019-23

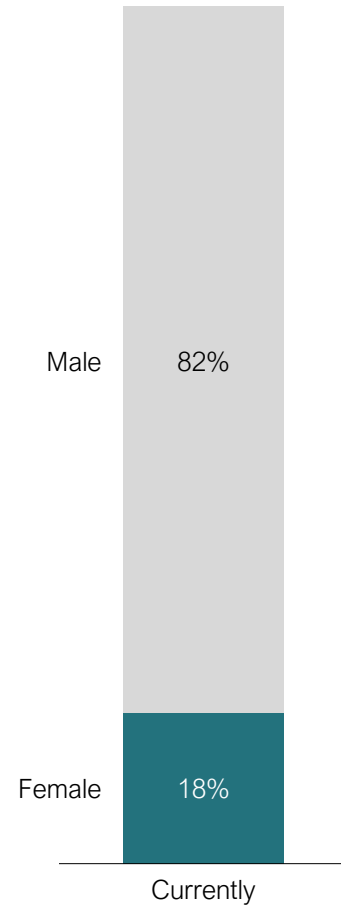
% of total in each year



# The share of female board members in Defence firms is around a fifth, and growing year by year

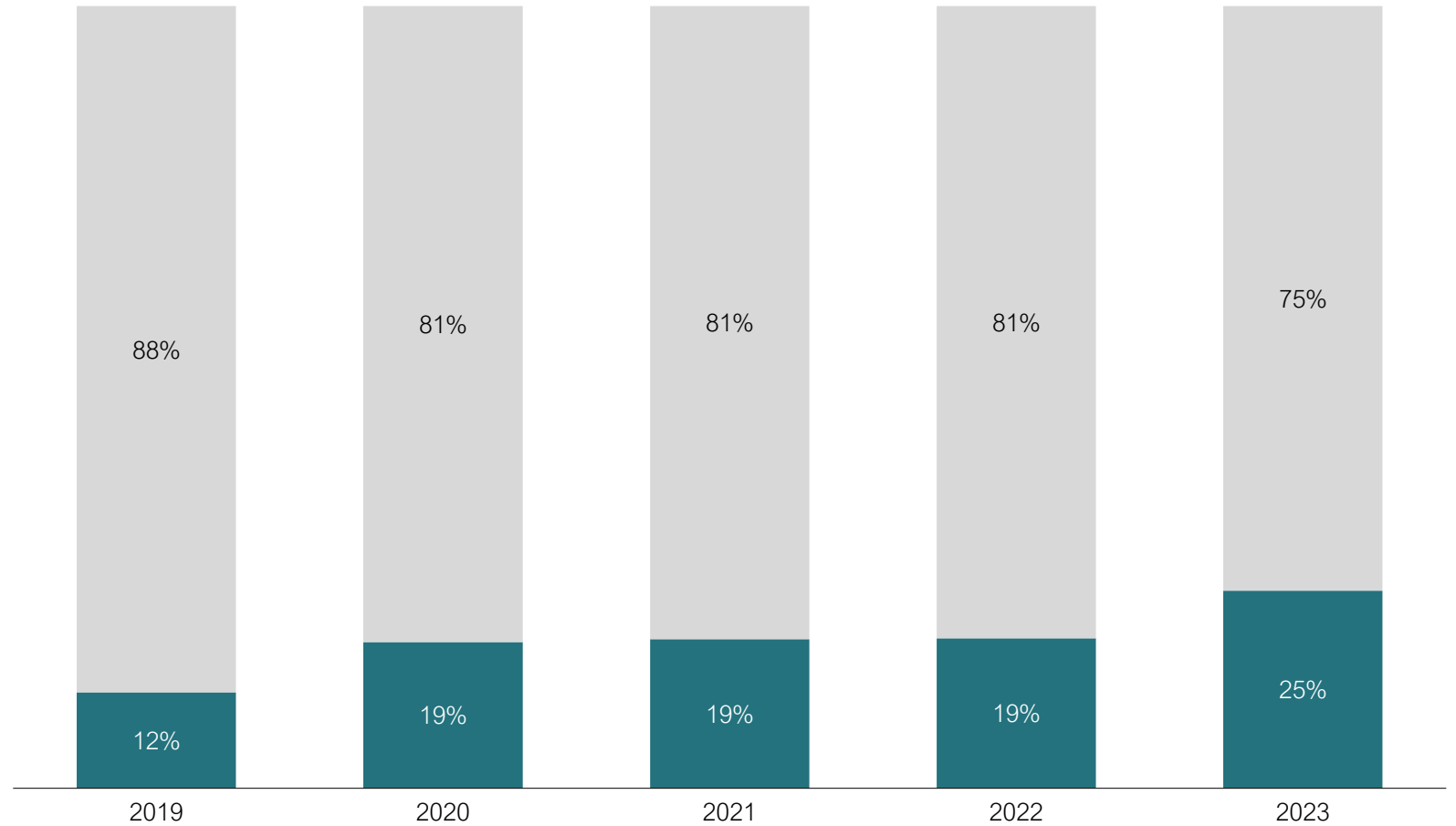
Board members by sex

% of total



Newly appointed board members by sex and appointment year, 2019-23

% of total in each year



# For more information, please contact



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The background of the image consists of several overlapping, semi-transparent, light orange arcs that create a sense of depth and movement. These arcs are arranged in a way that they appear to be part of a larger, abstract pattern, possibly representing a stylized sun or a series of concentric waves. The overall color palette is warm and minimalist.

**Tesi**