



# Status of the new Agri-Food Ecosystem

Study on growth hurdles and limiting factors

NOVEMBER 2022

# Objectives for this report | Outline hurdles for agri-food start ups and drive “Handlungsmotivation” at business and political stakeholders to overcome them

The current inflation and disrupted supply chains have led to a strong increase in food prices and supply disruptions which hit EU consumers

At the same time, increasing focus is set to the agri-food industry for its sustainability/ESG profile: globally it is the 3rd largest GHG emitter, the largest consumer of fresh water, the main user of land and largest driver of land use change, with significant impact on biodiversity

Thus, the pressure to change on the agri-food industry remains high given

- Demand for reliable production of cheap, yet healthy food
- Demand for more sustainable production triggered by changing consumer requirements and regulation (e.g., EU farm to fork strategy)
- Increased competition for land to produce food, bio-materials/bio-fuel, renewable energy, carbon capture (afforestation)

To meet these targets and make the demanded change happening, innovation is key. Therefore, a powerful and disruptive ecosystem of agri-food start-ups, which challenge the status quo, plays a vital role

However, compared to global leaders like USA, Israel or Singapore, the German agri-food start-up ecosystem is a laggard. The number and success of start-ups are significantly lower than in leading countries

Therefore, we aim at looking at the ecosystem from an inside-out perspective, surveying start-ups and founders, to

- Better understand the start-up ecosystem and its demand
- Identify hurdles for more start-up activity and opportunities to overcome them

The survey has been conducted twice (2020 & 2022) to measure and monitor the progress over time

# Executive summary | German agri-food ecosystem lacks structures, external VC funding and decisive governmental support

## Which insights **still hold true** in 2022?

- 1 German agri-food market is characterized as **“one-deal-market”** with few start-ups accounting for a large share of total funding in the market (Gorillas, Flink & Infarm account for >80% of VC funding)
- 2 There is a **significant gap between desired and actual agri-food funding by VCs and angel investors**, substituted by stronger use of own savings, as well as family & friends
- 3 **Technological readiness is considered high** (60-70% with technological readiness level of 7-10), but revenues fall short of expectations - likely caused by **missing market access**



## What **changed** in 2022 survey vs. 2020?

- 1 Current macro-economic environment with cost of capital being significantly higher than 2020 is reflected in **significant shift of priorities: Cash flow safeguarding, profitability and focus on achieving break even** are much more on top of mind for founders than two years ago. On the other hand, internationalization and growth are seen severely less important
- 2 Since 2020 a significant trend among Agri-food founders is observed towards **ESG/ sustainability impact as bus. objective**
- 3 **Access to corporate players has seen significant worsening** (grade 4.0, down from 3.6) compared to 2020, hindering market access for start-ups



**AGRI-FOOD  
START-UPS**

# German agri-food ecosystem | In the 2022 survey we observe a shift of business focus from consumer tech towards the upstream part of the agri-food chain

German Agri-food ecosystem

Survey participants

# participants (n)



	2020	2022
<b>Upstream</b>		
<b>BioTech</b> <ul style="list-style-type: none"><li>• Agri biotechnology</li><li>• Bioenergy and biomaterials</li></ul>	24%	29%
<b>AgriTech</b> <ul style="list-style-type: none"><li>• Novel farming systems</li><li>• Farm mgmt. software, sensing and IoT</li><li>• Farm robotics, mechanization and equipment</li></ul>	33%	50%
<b>Midstream</b>		
<b>FoodTech</b> <ul style="list-style-type: none"><li>• Innovative Foods</li><li>• Bio-energy/bio-materials</li><li>• Midstream technology</li></ul>	24%	18%
<b>Downstream</b>		
<b>ConsumerTech</b> <ul style="list-style-type: none"><li>• InStore retail and restaurant tech</li><li>• eGrocer</li><li>• Restaurant marketplaces</li><li>• Online restaurants and meal kits</li></ul>	19%	3%

## German agri-food ecosystem | In line with international databases like AgFunder, we clustered the start-ups in 4 categories

German Agri-Food Ecosystem

Survey participants

# participants (n)



Upstream

### BioTech

- Agri biotechnology
- Bioenergy and biomaterials

2020

- 10
- 0

2022

- 11
- 0

### AgriTech

- Novel farming systems
- Farm mgmt. software, sensing and IoT
- Farm robotics, mechanization and equipment

- 3
- 10
- 1

- 7
- 6
- 5

Midstream

### FoodTech

- Innovative Foods
- Bio-energy/bio-materials
- Midstream technology

- 10
- 0
- 0

- 6
- 0
- 1

Downstream

### ConsumerTech

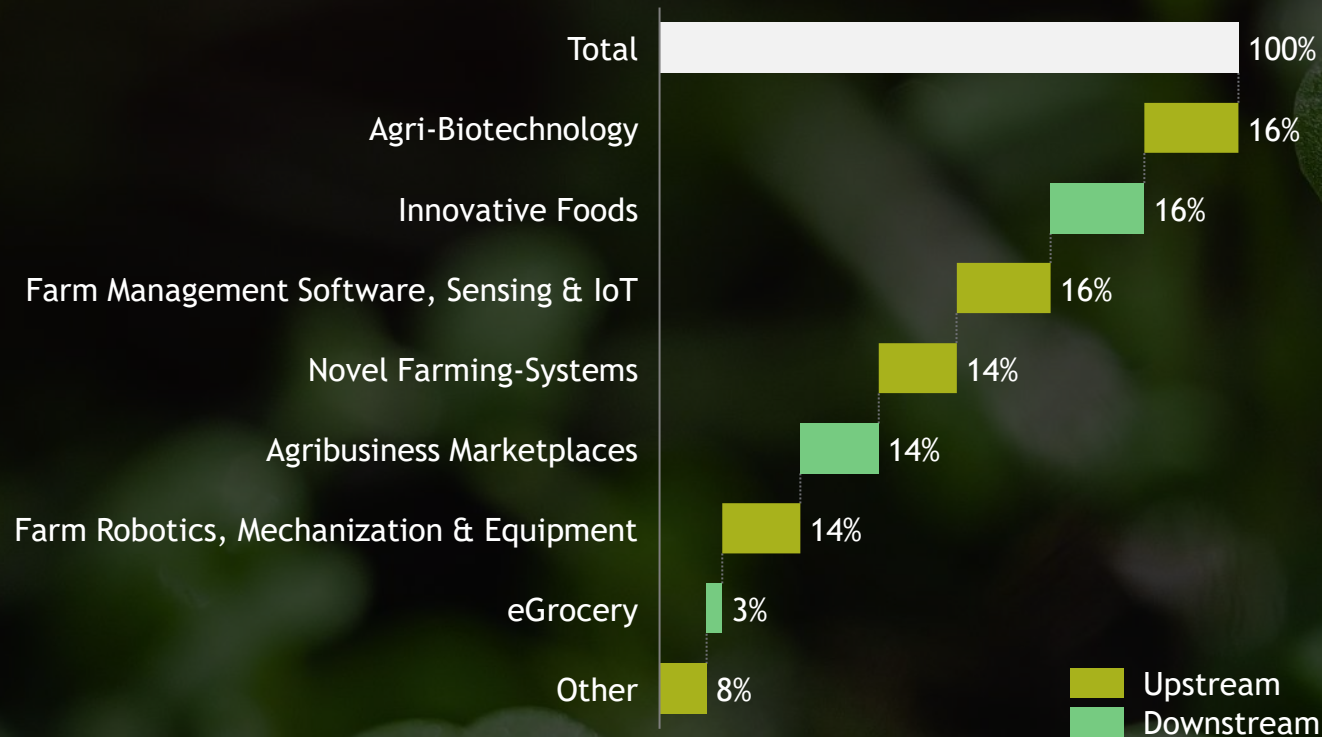
- InStore retail and restaurant tech
- eGrocer
- Restaurant marketplaces
- Online restaurants and meal kits

- 2
- 4
- 1
- 1

- 0
- 1
- 0
- 0

# Status of the agri-food ecosystem in DE | Majority of start-ups active in bio-tech, novel food, digital farming, and marketplaces

## Participating start-ups by category



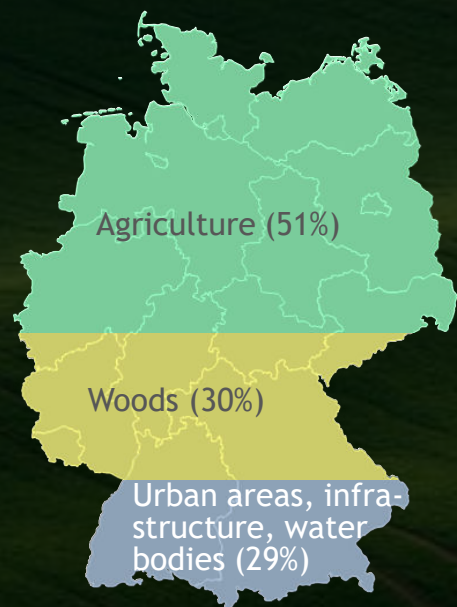
## Key findings and observations

- **Start-up activity is not correlated to sector-split of German economy.** Traditional German strongholds like mechanical engineering or autonomous production systems are less present compared to its role in the German economy
- **Higher focus on upstream activities** (67% technology for farming and agricultural production) than downstream ones (33% food production and retail)—in particular strong focus on bio-tech, digital solutions (software, sensors and IoT) and innovative food, incl. alternative proteins (novel food)
- **High concentration with respect to topic-clusters**—top-6 categories account for >80% of start-ups

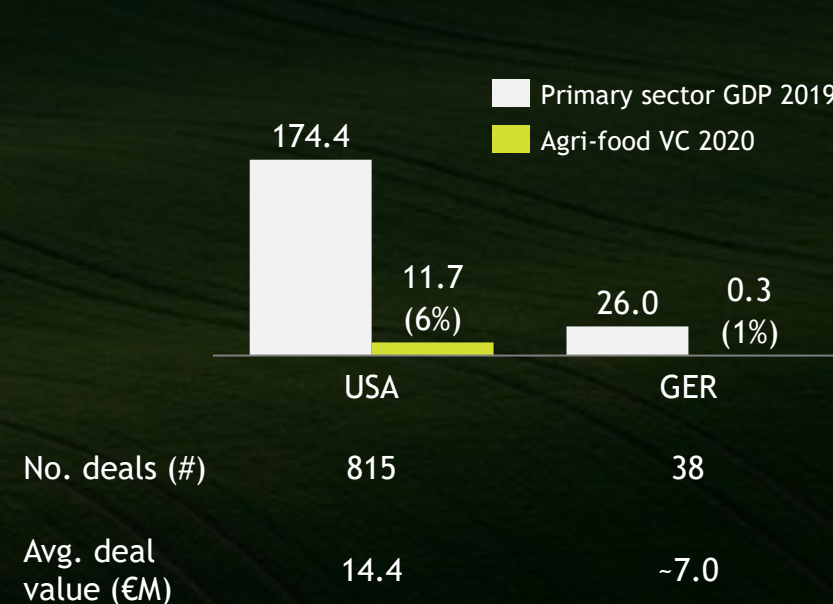
# Laying the land | In the US VC investments for agri-food start-ups is equal to 6% of primary sector GDP—in DE it is only 1%, showcasing massive catch-up need!

Relevance of agri-food sector in Germany and its contribution to overall economy and climate impact


	Production value (B€)	Employment (K)
Inputs	45	230
Farming	60	540
Food + NBS <sup>1</sup>	365	3.630
<b>Total</b>	<b>470</b>	<b>4.400</b>
(Share of DE total)	(8%)	(12%)
-----		
Exports	€75B	
Self-sufficiency ratio	Ø > 100% (30-150%) <sup>2</sup>	
-----		
Agriculture land	18 M Ha	
Livestock	12 M LLU <sup>3</sup>	
CO2 emissions	66 M t (9%)	
-----		
Subventions	~ €6B p.a.	



VC investments into agri-food in relation to primary sector GDP (B€)<sup>4</sup>



	USA	GER
No. deals (#)	815	38
Avg. deal value (€M)	14.4	~7.0

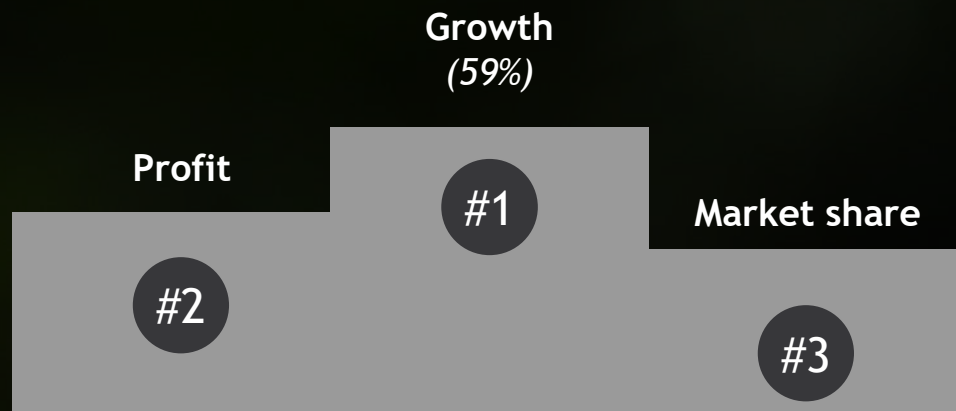
 Financing and support of agri-food start-up ecosystem is significantly below needed share given relevance for Germany

1. NBS = Nature-based Solutions (Bio-fuel, Bio-Materialis); 2. 30% for fruits at lower end, 100-120% for meat and dairy and 150% for potatoes; 3. LLU = Large Livestock Unit (=Großvieheinheit); 4. \$/€ f/x rate of 0.89 as 2019 average Sources: Situationsbericht Landwirtschaft, BMEL, Eurostat; Destatis; BCG Analyse

# Founders ambition and strategy | ESG impact has become extremely relevant for founders in 2022, while the importance of growth declined

## Strategic targets of start-ups (2020)

What are the key strategic objectives of your start-up?

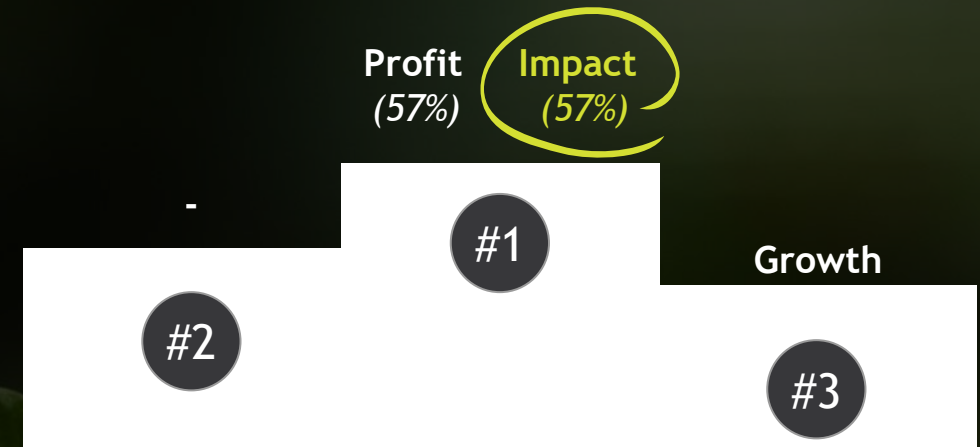


Not in Top 3: Impact, others

- Agri-food founders had **strong strategic aspiration to fast growth and profit realization** in 2020

## Strategic targets of start-ups (2022)

What are the key strategic objectives of your start-up?



Not in Top 3: Market share, others

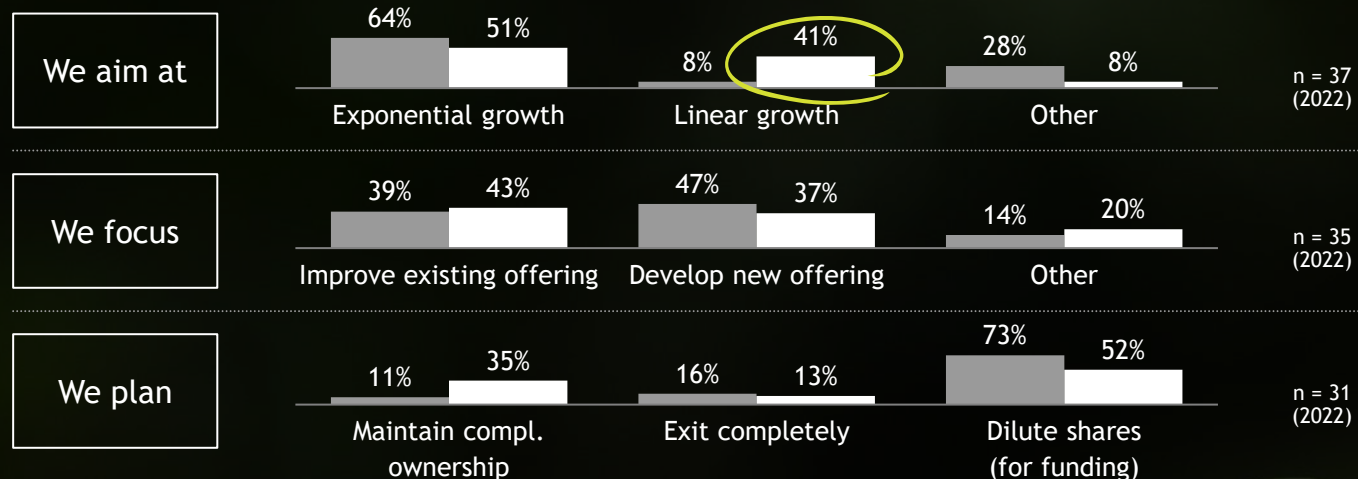
- **Significant trend** among Agri-food founders towards the strategic target to achieve a **higher ESG/sustainability impact** within last two years



# Founders ambition and strategy | While founders adjusted their ambitions regarding growth, the overall recommendation score improved slightly

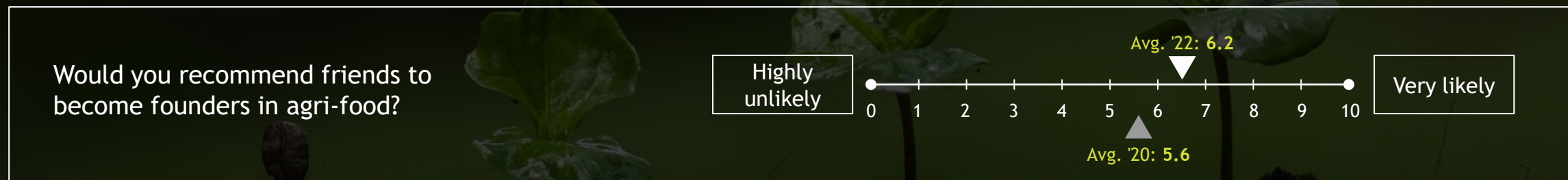
## Strategic targets of start-ups

Which of the following strategic choices are true for your start-up?



## Key findings and observations

- Exponential growth trajectory has been considered a key ambition, with a noticeable **shift towards more linear growth** in recent time
- Therefore, founders focus on a **mix of offering improvements and development of new offerings** and, realistically, most founders plan to **dilute their shares in order to get external funding**
- Though rising slightly over the past two years, the **sentiment among founders is bad** as net promoter score for becoming founder in agri-food is low



# Observed key issues | German agri-food ecosystem is facing a lack of structural support, funding and market access



Structures supporting entrepreneurship in the agri-food system



External funding, in particular venture capital



Access to markets to turn technology into products/offerings

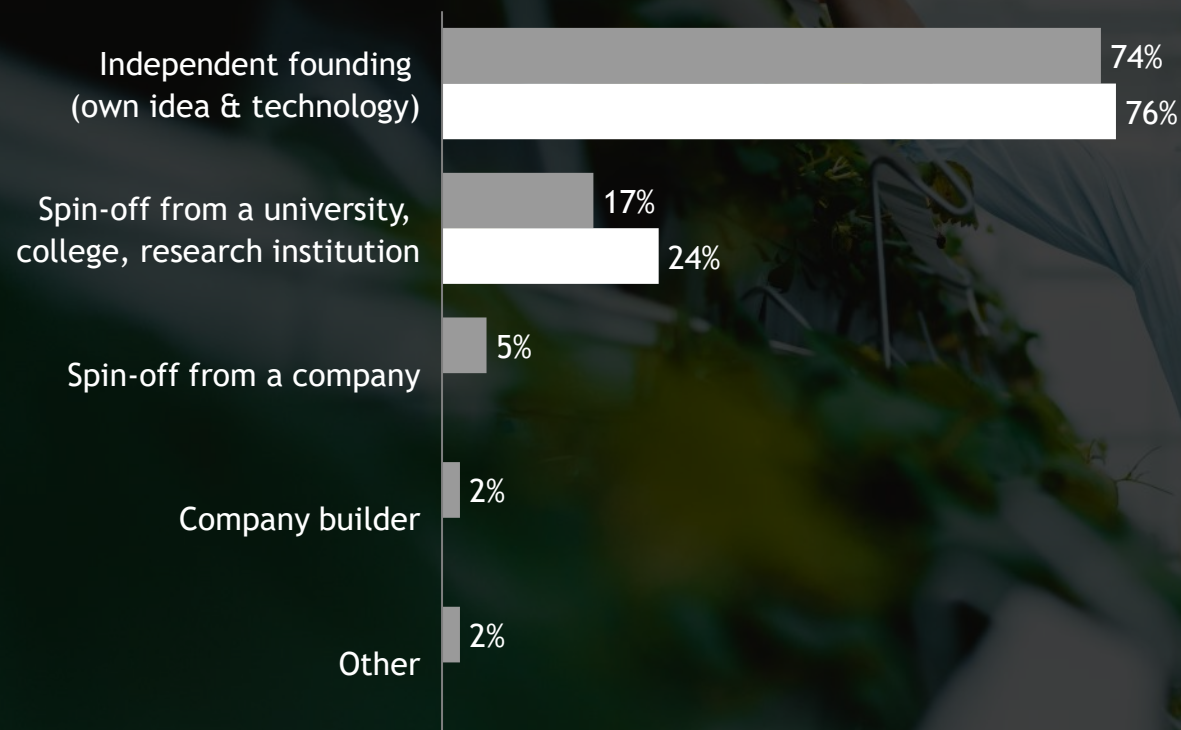


Governmental support & business environment which helps progress of agri-food system

# Issue #1—Lack of support structures | Less than 25% of agri-food start ups originate from dedicated institutions like universities or company builders

## Origin of surveyed start-ups

What is the origin of your start-up?



## Key findings and observations

- **Vast majority of founders (~3/4) start their companies independently** without assistance from institutions designed for support of entrepreneurship
- **The share of start-ups originating from universities is on a fairly low level, but rising (17% 2020 vs. 24% 2022).** This indicates a certain shortcoming of entrepreneurship in university curricula and a lack of support structures for creating spin-offs
- **The share of start-ups originating from company builders is extremely low with <2%.** This, in comparison to international standards, indicates a complete lack of structured support programs like incubators and accelerators for the agri-food sector

# Issue #2 & #3—Lack of funding and market access | Liquidity & profitability new in top 5 growth hurdles compared to 2020

## Major hurdles for growth

What are the key challenges for further growth of your start-up?



## Key findings and observations

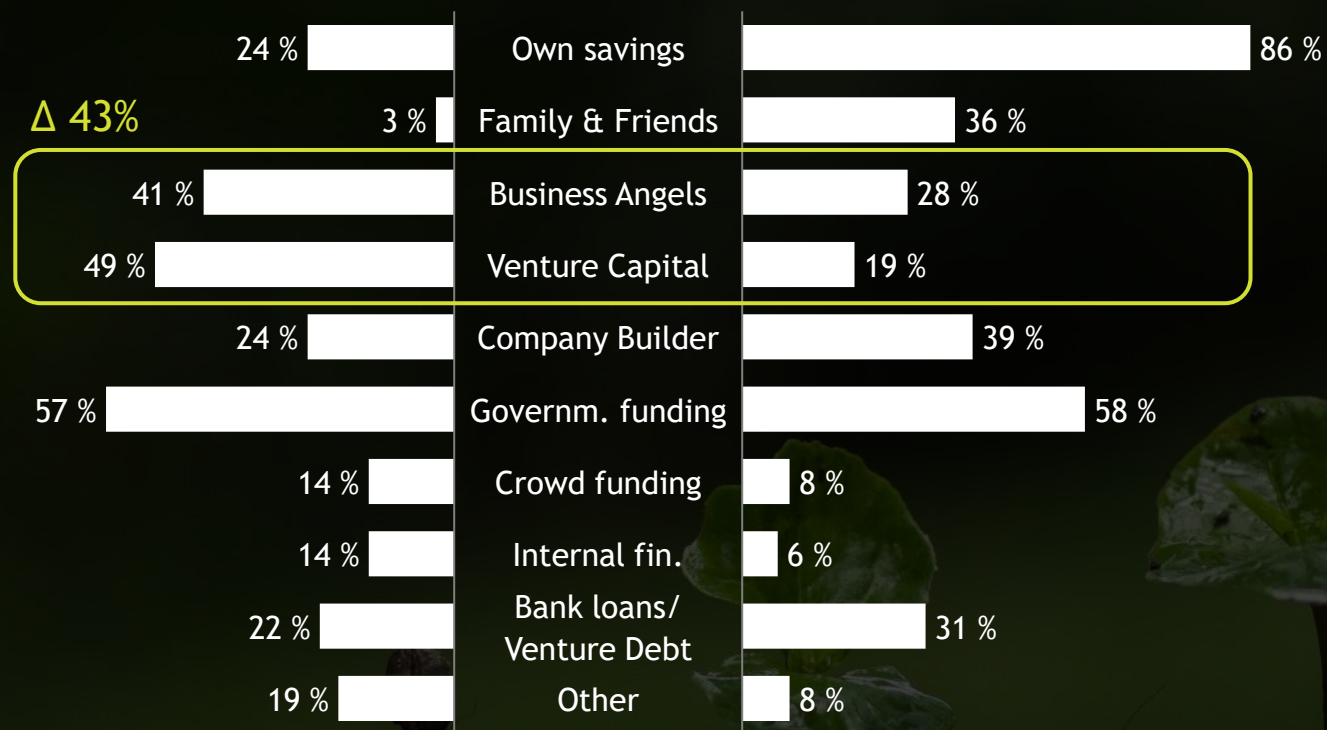
- **A strong rise in the relevance of cash flow/liquidity and profitability 2022 vs 2020** indicates changed market landscape due to rising interest rates and fear of a recession ("Grounding" of start-up industry)
- **Other major hurdles for further growth include missing market access and lack of capital/access to capital**, while legal & regulatory issues rank low
- **Recruitment of capable personnel not seen as key hurdle**, indicating structural ability to provide enough talent
- Relevance of **internationalization is reducing**, likely due to more conservative growth plans

# Issue #2—Lack of external funding | Founders prefer external funding from VCs, business angels or government, while in reality own savings are key source

## Preferred vs. actual sources of funding (2022)

What are preferred sources of funding?

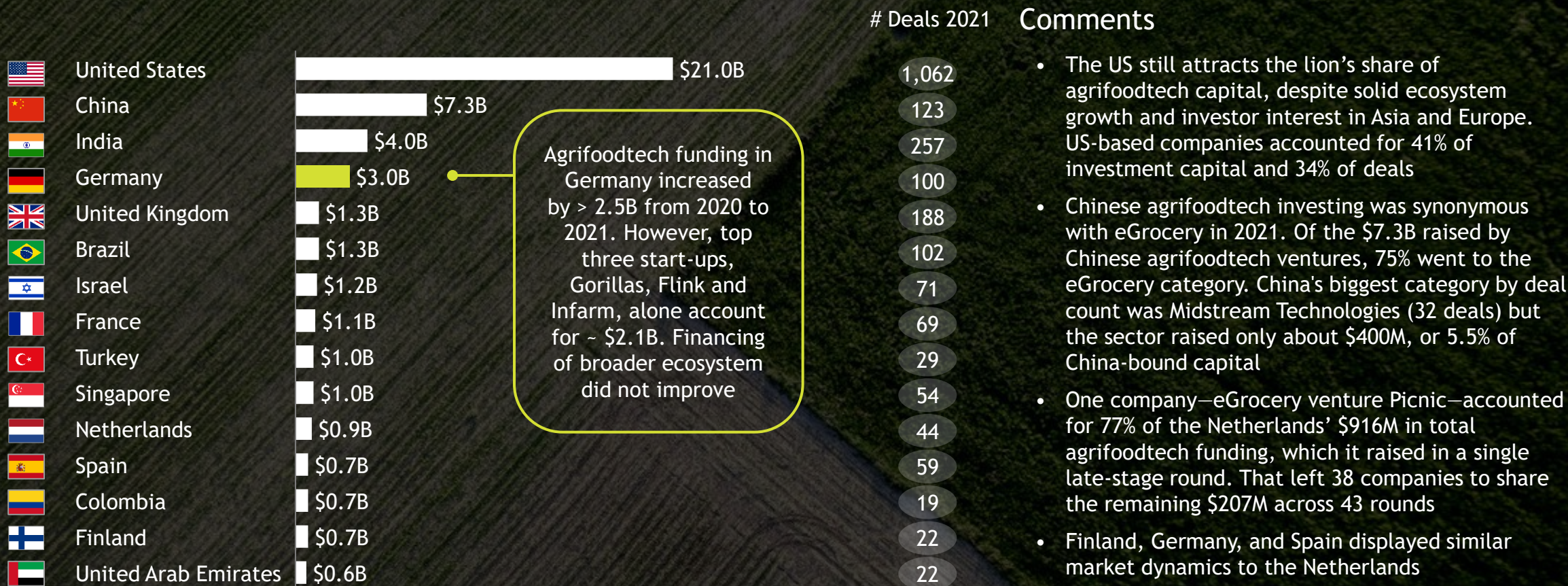
What are actual sources of funding?



## Key findings and observations

- **49% of start-up founders would prefer venture capital** as funding source, only 19% actually are VC financed
- **However, VC and business angels notably less used and sought after** compared to 2020 (still, gap between preferred vs. actual remains large)
- **Lack of external funding drives strong shift to use of own savings, government and family & friends** as funding source
- **Also, company builder (accelerators, incubators) are used at higher degree** than preferred. Given the structure and size of such programs in DE this can be mostly considered as interim-financing in range of some €10K

## Issue #2—Lack of external funding | On first sight, agri-food VC funding improved significantly in DE from 2020-'21, but 3 large deals blur the picture

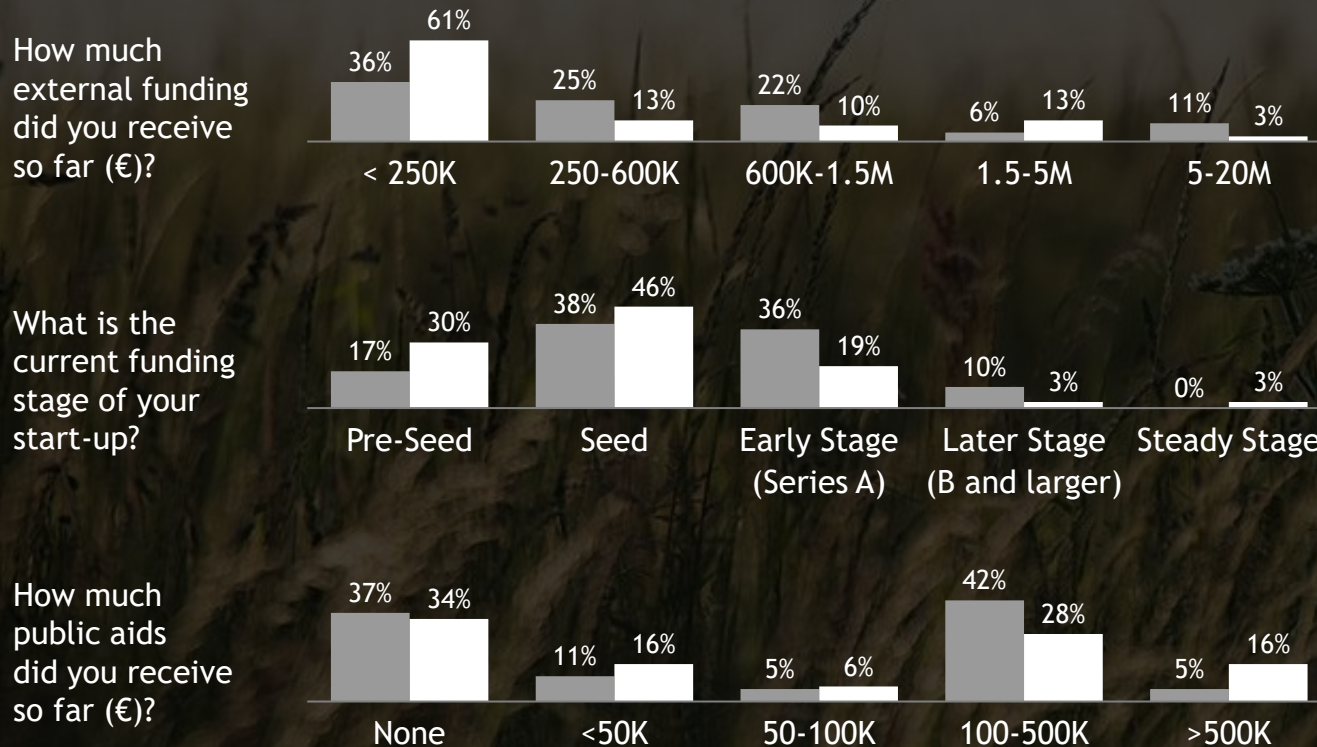


## Issue #2—Lack of external funding | In 2020, VC funding for agri-food in DE ranked #10 globally with ~ \$300M funding for 38 deals



## Issue #2—Lack of external funding | Across the start-up survey participants, the vast majority received only low external funding >€600k

### Size of external and governmental funding



### Key findings and observations

#### All survey-participants received external funding

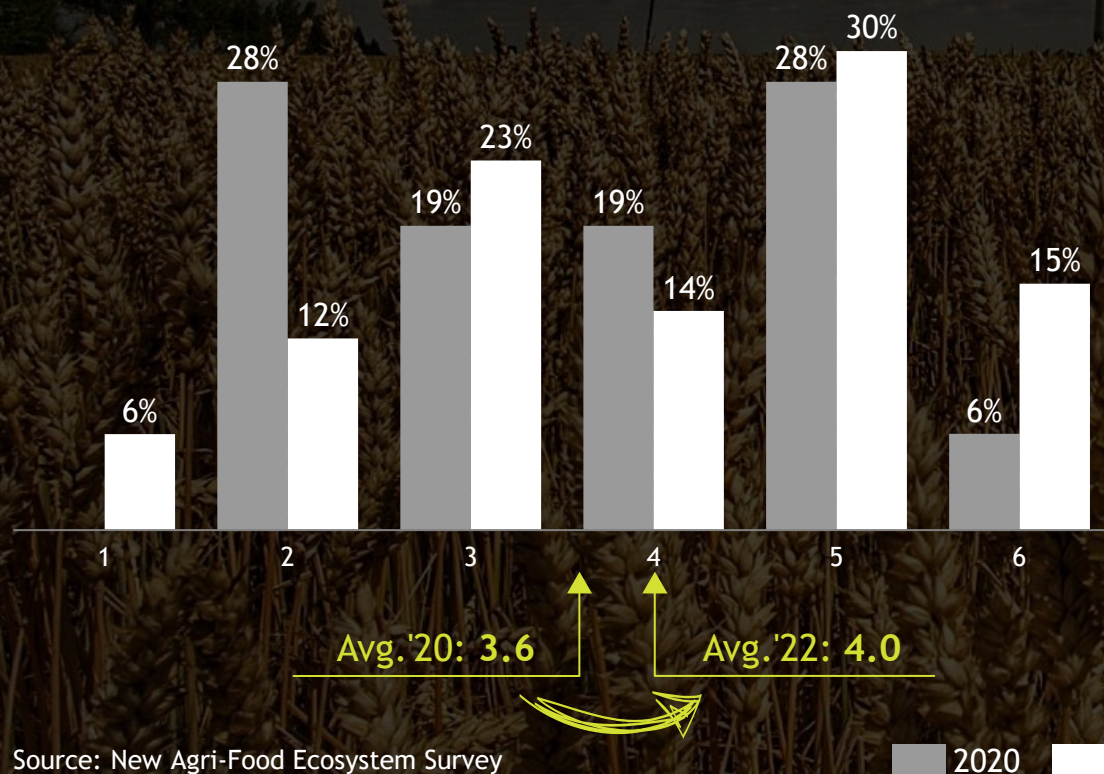
- All later stage funding has been sizable with > €5M (round B or higher)
- Seed and pre-seed funding mainly in range below €600K
- Wide spread for series A funding from €250-600k range to €1.5-5M range
- **Majority (>60%) of start-ups has received public aids**



# Issue #3—Lack of market access | On average, founders rate the ability to access established corporates for partnerships low—limiting GtM opportunities

## Access to corporate partners

How do you rate access to established corporations for partnerships?  
(1 is best, 6 worst grade)



Source: New Agri-Food Ecosystem Survey

2020 2022

## Key findings and observations

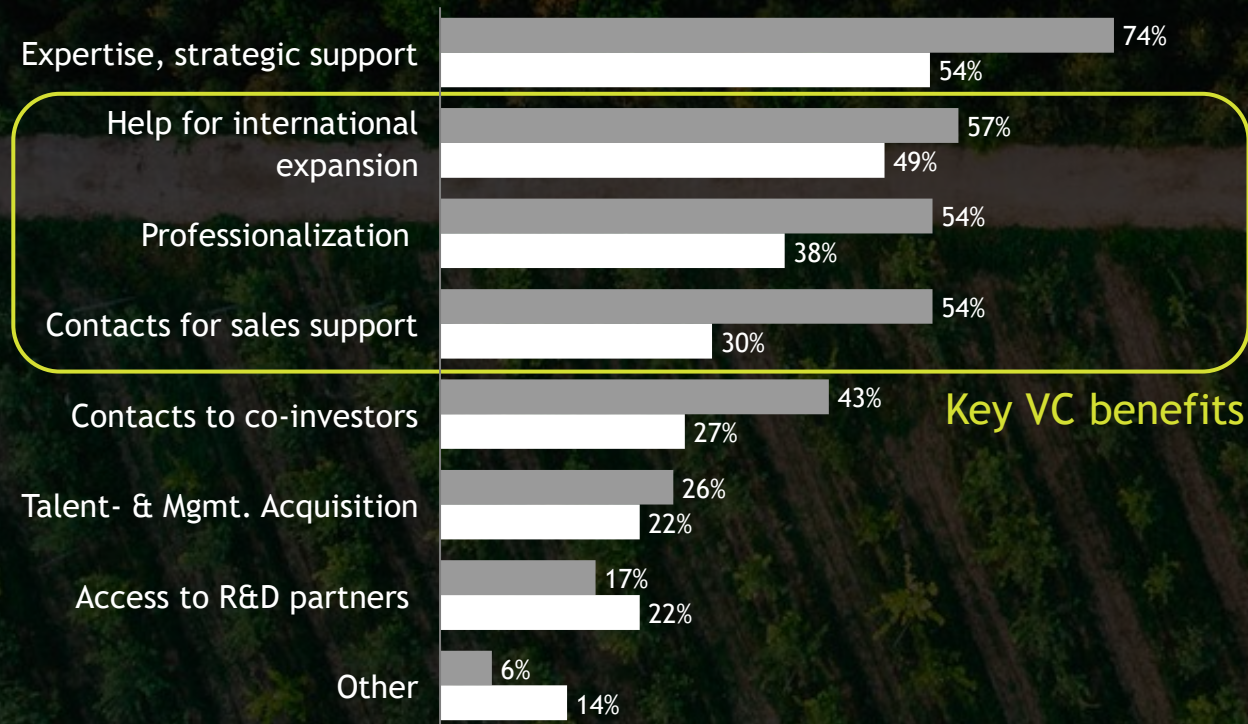
- **More than half of founders consider the access to established companies as difficult** (4 or worse) and ~45% would even rate it as “failed” (5 or 6 grade)
- Only less than 20% of founders see the access to partners as “good” or very good
- **The lack of partners primarily results in difficulties with market access and customer acquisition** as start-ups typically do not have capabilities and financing to meet customer acquisition cost for running an own sales force
- Since the first survey in 2020, the **ranking of access to corporate partners has further decreased**, implying a stronger internal focus of corporates in current economic situation of high uncertainty

n = 42 (2020) | 37 (2022)

## Issue #3—Lack of market access | Besides capital, founders also value VC funds for their networks to customers and partners, supporting sales & expansion

### Impact and benefits of professional VC investors

What do you expect from a VC fund alongside funding?



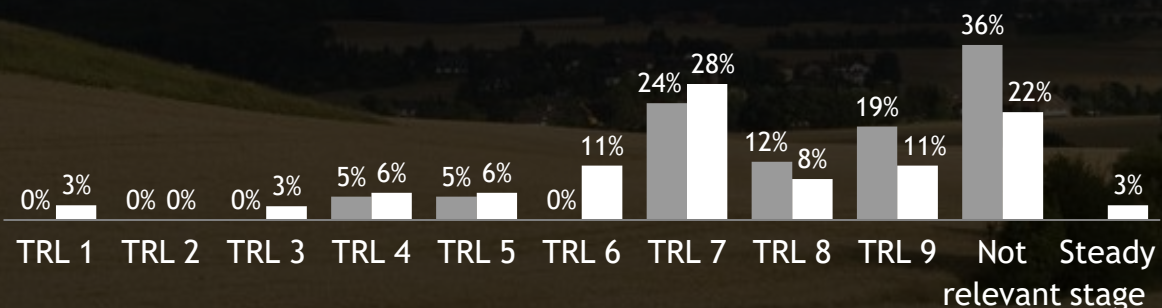
### Key findings and observations

- **The lack of VCs on the German market also leads to a lack in business contacts and expertise** for strategic development of start-ups and their professionalization
- **Especially for sales support and international expansion** VC contacts are considered highly helpful by founders
- **Given low share of VC engagement in agri-food start-ups, the difficulty of finding corporate partners is not mitigated by VC** fund experts and contacts, leaving many start-ups on their own
- Overall, the **perceived benefits of professional VC investors beyond funding has decreased vs. 2020**

# Issue #3—Lack of market access | While start-ups have high technology readiness levels, missing market access hinders revenue expansion

## Mis-match of technological readiness and sales

What is the technology readiness level of the technology for your products/offering? (Q1)



What is the expected sales for the upcoming year of your start-up? (Q2)

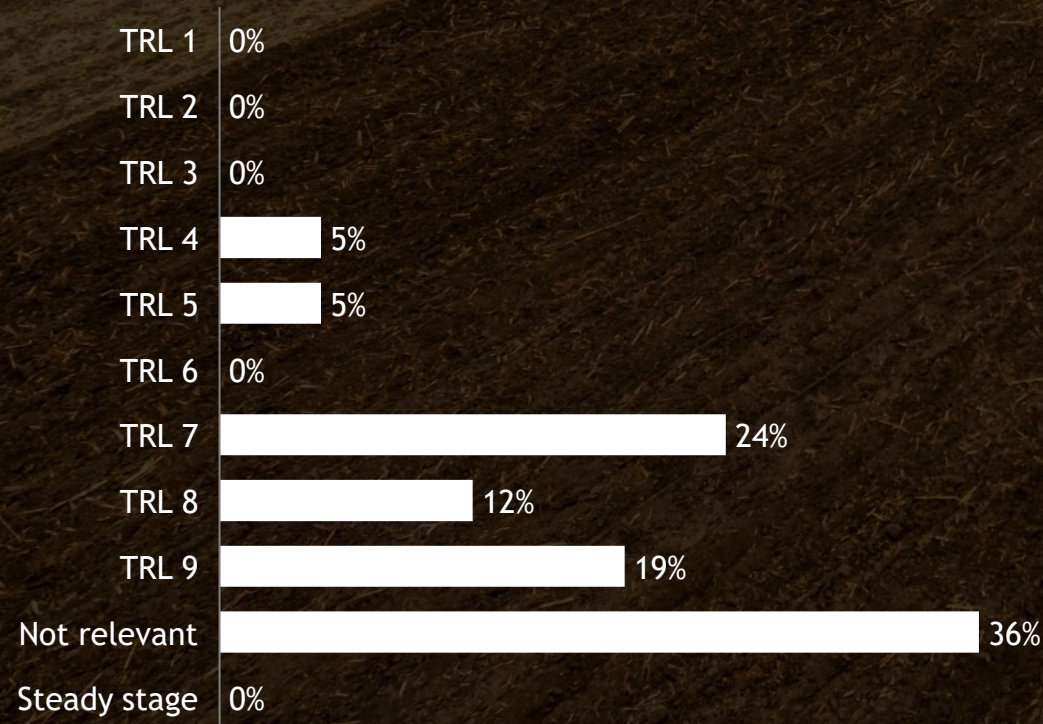


## Key findings and observations

- **Start-ups are active in technologies with high TRL** which limit the technological risk and enables fast commercialization of offerings and scale-up
- **However, the revenue expectation does not reflect technological maturity**, as all 2022 surveyed start-ups expect revenues of <€5M for next year
- A failure of monetizing mature technologies is usually caused either by missing product-market fit or by **missing market access**. In context with the key pain points mentioned by founders regarding access to partnerships, it can be concluded that at least a relevant portion of this issue is caused by missing market access

## Backup TRL | TRL levels describe the maturity of a technology

### Technology readiness level (in %)



### Description of technology readiness level

**TRL 1:** Proof of the basic principles

**TRL 2:** Elaborated (description missing)

**TRL 3:** Experimental confirmation of the (technology) concept at component level

**TRL 4:** Functional verification of the technology in laboratory (scale) at system level

**TRL 5:** Functional verification of the technology in simulated environment corresponding to the later use - in case of industrial use in the case of key technologies

**TRL 6:** Demonstration of the technology in simulated environment corresponding to the later use - in case of industrial use in the case of key technologies

**TRL 7:** Demonstration of the prototype (-system) in an operational environment

**TRL 8:** System technically developed, accepted or certified

**TRL 9:** System has proven itself in operational environment, competitive production in the case of key technologies

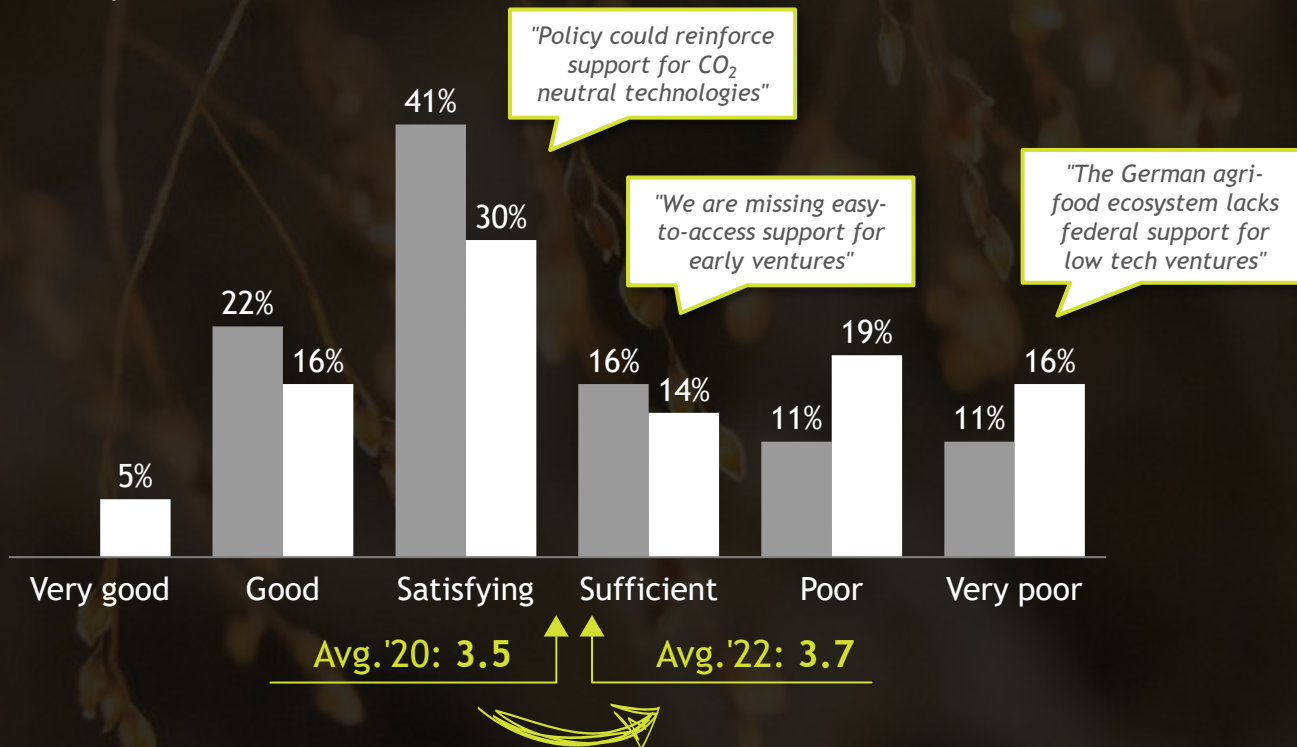
**Not relevant,** because not a high-tech product

**Steady Stage**

# Issue #4—Governmental support | Level of governmental support for agri-food start-ups in Germany consistently below satisfactory levels

## Satisfaction level with governmental support

Which school grade do you give for governmental support of agri-food start-ups in DE?



## Key findings and observations

- **Political support is rated with a 4+** in school grade terms in particular the fact that almost no 1 grades were given but ~25% of grades are given in the "poor" / "very poor" ranges is remarkable
- **Preferred governmental action is primarily linked to funding availability:**
  - Support early-stage VC offerings
  - Stronger gov. aid for pre-seed phase
  - Strengthening of business angel offerings
  - Creating invest opportunities for private investors
- This underscores most start-ups' ambition to **contribute to more sustainable agri-food system and a call for political framework** in which such business models and technologies can flourish

# Recommendations and call for action | Stronger political framework needed

## Structures and support for entrepreneurship

#1



- Increase entrepreneurship in agriculture and food tech. curriculums
- Increase spin-off support at universities
- Attract company builder (pot. PPP)

## External funding through VCs

#2



- Increase attractiveness of VC investments in ESG-positive industries (taxation, tax benefits)
- Diversify opportunities for the start-ups that do not fit the "one-deal-maker" bill

## Market/customer access and partnerships

#3



- Promote collaboration of established companies e.g., contribution to ESG
- Support "born global initiatives"

## Governmental support & business environment

#4



- Review and strengthen aid for founders (at founding stage)
- If needed establish (semi-) public fund similar to High Tech Gründerfonds
- Establish government as macro orchestrator of a strategic ecosystem intervention

# Authors



**Benjamin Subei**  
Boston Consulting Group



**Paul Plötner**  
Boston Consulting Group



**Sabeth Neumann**  
Boston Consulting Group



**Dr. Julia Köhn**  
German AgriFood Society



**Dominik Ewald**  
German AgriFood Society



**Mara Ciurletti**  
FTTF



**Thong le Hoang**  
FTTF

# Disclaimer

The services and materials provided by Boston Consulting Group (BCG) are subject to BCG's Standard Terms (a copy of which is available upon request) or such other agreement as may have been previously executed by BCG. BCG does not provide legal, accounting, or tax advice. The Client is responsible for obtaining independent advice concerning these matters. This advice may affect the guidance given by BCG. Further, BCG has made no undertaking to update these materials after the date hereof, notwithstanding that such information may become outdated or inaccurate.

The materials contained in this presentation are designed for the sole use by the board of directors or senior management of the Client and solely for the limited purposes described in the presentation. The materials shall not be copied or given to any person or entity other than the Client ("Third Party") without the prior written consent of BCG. These materials serve only as the focus for discussion; they are incomplete without the accompanying oral commentary and may not be relied on as a stand-alone document. Further, Third Parties may not, and it is unreasonable for any Third Party to, rely on these materials for any purpose whatsoever. To the fullest extent permitted by law (and except to the extent otherwise agreed in a signed writing by BCG), BCG shall have no liability whatsoever to any Third Party, and any Third Party hereby waives any rights and claims it may have at any time against BCG with regard to the services, this presentation, or other materials, including the accuracy or completeness thereof. Receipt and review of this document shall be deemed agreement with and consideration for the foregoing.

BCG does not provide fairness opinions or valuations of market transactions, and these materials should not be relied on or construed as such. Further, the financial evaluations, projected market and financial information, and conclusions contained in these materials are based upon standard valuation methodologies, are not definitive forecasts, and are not guaranteed by BCG. BCG has used public and/or confidential data and assumptions provided to BCG by the Client. BCG has not independently verified the data and assumptions used in these analyses. Changes in the underlying data or operating assumptions will clearly impact the analyses and conclusions.





[bcg.com](http://bcg.com)