

Executive summary

The Danish Board of Business Development (DBBD) has identified 11 sector strongholds within Denmark, which have been selected on the basis of their sizeable economic footprint, international competitiveness, leading companies and excellent knowledge base. The DBBD and the Ministry of Higher Education and Science have each identified a further two emerging industries, which have been singled out due to their high growth potential. This report examines the entrepreneurial ecosystems of three of the strongholds – advanced production, energy technology and food and bio resources. It focuses on the role played by start-ups and scale-ups in these sector strongholds, the barriers they face and the policy measures that can increase their contribution to stronghold development. Many of the policy recommendations offered for the three case study sector strongholds are also relevant for start-up and scale-up support in other sector strongholds and emerging industries in Denmark.

The report commences with a mapping of the relevant programmes and policies that are currently in place in Denmark. This sheds light on the diverse range of policy actors and initiatives that each play a role in supporting start-ups and scale-ups in Denmark. These include the 14 national cluster organisations, the six regional business hubs, the broad network of business incubators and accelerators, and a variety of funding organisations, including the Danish Growth Fund and Innovation Fund Denmark. A quantitative analysis of the economic contribution of start-ups and scale-ups in the 15 sector strongholds and emerging industries is also provided, using new data compiled by the Danish Business Authority and Statistics Denmark. For this purpose, start-ups are defined as businesses aged 0-5 years old, and scale-ups are defined as businesses that experience annualised growth in employment or turnover of at least 10% over a three-year period, having had at least 10 employees at the start of this period.

The analysis shows that the scale of start-up and scale-up activity differs across the different sector strongholds and emerging industries, with implications for the degree to which start-ups and scale-ups can drive the sectors and need to be a focus of policy attention. In 2019, the share of start-ups in the business population ranged from 26% in environmental technology to 44% in tourism. The share of start-ups in the business population is relatively even across sectors, with the value falling within five percentage points of the all economy average of 32% in eight of the 15 sector strongholds and emerging industries. Scale-ups are significantly rarer than start-ups, and their prevalence varies more strongly across the sectors. The share of scale-ups in the business population ranges from as low as 1.0% in the animation, games and film industry to 5.6% in advanced production. Despite their relative scarcity, scale-ups accounted for 34% of employment in the life science and welfare technology sector and 54% of revenue in the energy technology sector in 2019. The population of start-ups declined in nine out of the 15 sector strongholds and emerging industries between 2010 and 2019, while the number of scale-ups increased in all of the sectors. There are further differences in whether the different sector strongholds are producing new firms growing to a large size. While there are new companies that have grown substantially in the food and bio resources (Faunaphotonics) and advanced production sectors (Technicon), this appears to be less common in the energy technology sector. Furthermore, no unicorns have spun-out of universities in any of the three sectors.

Following these analyses, the report provides a detailed assessment of conditions and policies for start-ups and scale-ups in each of the three case study sector strongholds – advanced production, energy technology and food and bio resources – including specific policy recommendations for each sector. The chapters are informed by a series of interviews with Danish and international stakeholders involved in the sectoral start-up and scale-up ecosystems, together with an examination of relevant examples of international policy practices. The case study sectors cover a variety of knowledge bases and modes of innovation, meaning that lessons can be applied to other sector strongholds and emerging industries with similar characteristics.

Sector-specific policy recommendations

The report concludes that each case study sector should develop some dedicated measures for start-ups and scale-ups adapted to their own contexts, including the following:

Advanced production

1. **Develop funding models** that address the long timeframe needed for deep-tech and hardware start-ups and scale-ups to become sustainable businesses.
2. **Encourage closer collaboration between advanced production companies and universities.** This should cover inter alia: joint applied research, joint development of products, joint exploitation of intellectual property (IP), students involved with spin-out companies, and syllabus development and planning.
3. **Increase the representation of start-ups and scale-ups** in the membership, committees and strategy making processes of the Manufacturing Academy of Denmark (MADE) national cluster organisation in order to secure more start-up and scale-up focused projects and initiatives and their inclusion in broader cluster projects.
4. **Broker effective relationships between larger firms and smaller firms**, with the former playing the role of first customers, innovation partners, and technology development advisors for start-ups and scale-ups, including through more active participation in incubators and accelerators.
5. **Promote a closer and more systematic co-operation between MADE and regional entrepreneurial ecosystem actors**, since spatial proximity better supports start-ups and scale-ups.

Energy technology

1. **Work with the private sector to develop a stronger sector-specific finance ecosystem**, including both early-stage finance and longer-term patient finance (aimed at the deep tech segment of the sector), potentially including R&D tax incentives adapted to start-ups and scale-ups.
2. **Establish an energy accelerator programme** that specialises in supporting start-ups and scale-ups in the sector, including access to experienced technology managers and market development and regulation experts. The accelerator should work with large firms and investors and include support for access to international markets as well as support with regulations.
3. **Focus on bringing more start-ups and scale-ups into the sector**, and especially into the supply chain, including start-ups and scale-ups based on use of energy data.
4. **Review the public procurement process and especially the early pre-tender stages to address current barriers** to the participation of start-ups and scale-ups. This should include simplifying the tendering process, facilitating participation in bidding consortia, raising awareness of opportunities, and increasing granularity of contracting.

5. **Develop physical infrastructure, including piloting and testing facilities and relevant science parks** to bring Denmark in line with competitor countries.

Food and bio resources

1. **Provide public sector support for improved physical piloting and testing facilities** for the food and bio resources sector, including state of the art facilities for a variety of tasks, such as handling waste, and access to capital equipment for piloting prototypes. This could include a national test centre.
2. **Address the funding gap faced by scale-ups when they reach medium size.** This includes finding ways to incentivise private investors to provide longer-term patient capital.
3. **Develop processes for public procurement of innovation from start-ups and scale-ups in food and bio resources.** This includes modifying pre-tender processes and introducing flexibility to procure products involving new types of food, ingredients or processes. Technical and legal competences for public procurement for innovation should be developed across government. Other public programmes should support start-ups and scale-ups with their procurement capabilities. Targets could be set for SME participation in public procurement for innovation in this sector.
4. **Support start-ups and scale-ups with compliance with food and drug regulations.** The Food and Veterinarian Administration can provide advisory support and materials and consult with the sector to improve regulatory ease for introducing new products to the market.
5. **Broker and facilitate closer dialogue between large firms and start-ups and scale-ups** in order to help start-ups and scale-ups to solve their innovation problems and to validate their products.

Cross-sector policy recommendations

In addition, there are start-up and scale-up measures that should be introduced across a broader range of sector strongholds and emerging industries. These include the measures proposed below. They are presented in priority order, although it should be noted that the actions would be expected to play out over differing timescales.

1. **Improve access to patient capital**, particularly for deep-tech firms, which tend to require larger funding rounds over more extended time horizons.
2. **Build collaborations between large firms and start-ups and scale-ups**, for instance by promoting the role of large firms as first customers for new firms and by involving large firms in the development of incubators and accelerators.
3. **Develop public procurement for innovation**, including measures to ensure that start-ups and scale-ups are involved in the bidding process.
4. **Build university-industry collaboration**, including by addressing issues related to intellectual property ownership, broadening evaluation metrics for researchers to include entrepreneurship activities, and providing targeted finance for universities to work more closely with start-ups and scale-ups.
5. **Provide longer-term and freer funding on a competitive bidding basis to the national cluster organisations** for the sector strongholds and emerging industries to enable them to take strategic actions not covered by funding tied to individual projects, backed up by regular evaluations of impacts achieved against bidding targets to secure funding continuation. These strategic activities should include pro-active work to find promising start-ups and scale-ups, matching them to potential partners and connecting them to resources.

6. **Build linkages between national cluster organisations and regional entrepreneurial ecosystem actors** to ensure appropriate regional-level projects and tailoring, reflecting the regional element of much cluster activity.
7. **Promote diversity in the populations of start-up and scale-up entrepreneurs** in order to tap into wider talent, alleviate skill shortages and secure equal opportunities in entrepreneurship.



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