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# Obstacles to Growth for Greentech Startups

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Executive Summary

Without bold and innovative solutions to the problems posed by climate change, humanity is on a direct path to both social and environmental catastrophe.

Greentech startups — those working with clean energy, sustainability, and similar — are future key players in designing a better world. However, like many other tech sectors, these companies still struggle to grow and reach their full potential. In this report we asked Danish green startups about barriers to growth and determined the most common ones; namely, regulatory hurdles and funding. Others including market readiness and expansion were also identified as issues, but on a slightly smaller scale. The findings are illustrated in three case studies.

The question now is whether these barriers are exclusive to the green startup industry, or whether they are common across all fields. We cannot say with certainty that these problems are unique, but we can say that lowering these barriers through regulatory and social change are key to the future growth of green startups.
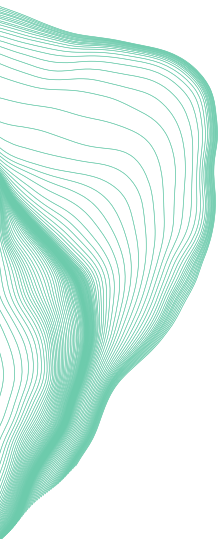
Introduction

Background

Denmark has a reputation of being a leader in the green technology sector, with many companies who for decades have worked towards sustainable solutions, including large corporations like Grundfos, Ørsted, and Vestas. What is less known is the status of startups that operate in this field, who can be the future major players in the industry. Despite the need for green-focused companies, there are still several barriers to growth that Danish greentech startups face. One major barrier is the lack of funding available for these companies. While there are various sources of funding available, including government grants and private investors, many greentech startups struggle to secure the necessary funding to scale their business and bring their solutions to a wider audience.

Finally, Danish greentech companies may also face challenges related to talent acquisition and retention. With a relatively small pool of qualified human resources available in Denmark, companies may struggle to find the talent they need to grow their business. Additionally, because the greentech sector is still relatively new, personnel may not have the specialized skills and knowledge needed to work in this industry. This means that companies may need to invest in training and development programs to help their employees develop the skills they need to succeed in the greentech sector.

We hypothesize that many of the following potential barriers affect the Danish green startup ecosystem. In order to test this hypothesis, we developed a brief survey meant to provide green startups with the opportunity to rate the proposed barriers by how much of a problem they actually pose to growth. To further deepen our understanding, we also conducted interviews with selected green startups to hear whether there are other barriers to growth that we had not considered.

Definitions

On their journey from founding to funding, startups go through multiple stages of growth. Where exactly these stages are delineated can vary, but we have decided to use the stage descriptions provided by the prestigious Silicon Valley accelerator, Y Combinator. To paraphrase:

01 **Seed stage** startups are the youngest and riskiest, with small teams working on developing their product and searching for their ideal customer base;

02 **Series A** startups have a working product and are closer to product-market fit, with some initial revenue and happy customers, but they still need to validate and scale their business;

03 **Growth stage** startups have identified their product-market fit and are focused on scalability, with significant funding and a growing team;

04 **Scale stage** startups are the most established, with multiple employees and significant funding, and are closest to IPO, with specialized roles across all departments.

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The current report focuses on the barriers to growth for startups who are primarily in the seed and Series A stages, since these are the companies that are in a more "high-risk" part of their journey where the barriers to growth are larger and more critical to the survival and continued growth of the company.

In a schematic way the first life phases of a greentech startup look like this:

01.
Establishment

02.
Technology development

03.
Public grants

04.
Testing

05.
Commercialization

Various public grants (i.e. Innofounder and Innobooster) are offered and, based on the information from the case studies discussed later, play a large role in helping these green companies to establish themselves early on in their journey.

Commercialisation is indeed a challenging step, as customers often are unaware of the technical possibility offered and working in foreign markets is costly. However, competition is limited, as the startups are focussing on very narrow market segments, where quality and specific features are among the USPs.

Cooperation with larger companies is vital for many startups to further enable innovation and sales. Testing of their technology with large users provides valuable inputs in the innovation process as well as the basis of sales.

The case studies discussed later on in this report are in either the growth or scale stages, but the survey group contains startups from across the different stages. However, all of the startups surveyed are defined as "green" startups. According to Investopedia, Green startups *"seek to leverage technology to create environmentally-friendly products and to encourage social good."* Furthermore, they contend that *"green startups face unique challenges in attracting the right investors and competing with traditional growth-only focused entrepreneurs."*

In other words, green startups are focused not solely on growth; rather, they are also in pursuit of an environmental impact, which can affect their ability to scale quickly.

Moreover, green companies are often characterized by a real passion for the product and its potential impact on people and the world. When a company is focused purely on growth and profitability, they are able to cut corners and ignore considerations that a green company needs to respect, such as sustainability.
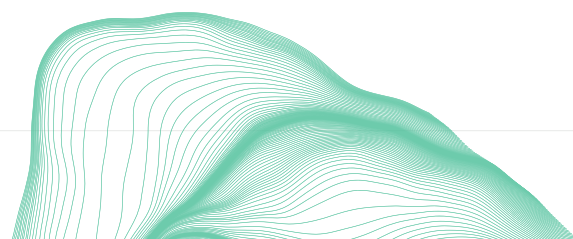
Target Audience

This report, while developed for the Danish Business Authority, contains information that is useful for several stakeholder groups. For one, companies and investors in this sector can gain from reading this report as it contains information that will develop the conversation on how best to support green startups and the overall ecosystem. Moreover, public institutions and regulators may learn from the challenges faced by startups and potentially develop processes to streamline their processes so as to support these companies without sacrificing the due diligence to ensure the startups and their products meet necessary standards.

Methods and Sample Group

Sample Group

We surveyed a group of 36 companies working with green and sustainable technologies who were involved in the annual TechBBQ Summit that took place in September of 2022. The startups represent a range of growth stages, although they primarily come from the seed and Series A stages.

Overview on green ecosystem. Characteristics of green startups Greentech startups cover a large share of the total startup ecosystem. TechBBQ's startup database at Dealroom lists over 500 greentech startups in Denmark out of a total of about 4.000 verified companies, equal to approximately 12.5%.

These greentech startups have young founders, who are passionate about sustainability and work hard for improvement of the state of the world.

A common characteristic of greentech companies is innovativeness. The startups are enthusiastic about new technologies, making use of AI, advanced software, IoT, as well as physical products. For example, used coffee grounds are a key resource for at least three companies: Kaffe Bueno uses coffee grounds to produce food, cosmetics, and more. Beyond Coffee uses the grounds to grow a variety of high-quality, edible mushrooms. Grounded Cups has developed a technology for production of cups made of coffee grounds and recycled plastic. These startups are also examples of a passion to work within the circular economy, where as little material as possible goes to waste and is instead reintegrated into the value chain.

Another characteristic is that Danish greentech companies, more often than not, are born global. Many of these companies' founders are expats themselves and/or have expats on the staff. As a small country, Denmark often does not have a large enough domestic market for a company to grow sustainably, so the companies must operate internationally from the beginning.

A large share of staff is often non-Danish, again because Denmark's small size makes it difficult to recruit experts with very specific competences. Recruiting employees from non-EU members would be more frequently used without the rules for work and residence permissions. Even so, Denmark's policies around hiring foreign labor from outside the EU often make it difficult to hire talent from abroad, which can be a barrier to growth for green companies, as well as any other company that requires employees with highly specialized knowledge.

Survey Design

The quantitative survey was administered by a TechBBQ employee who asked the questions and recorded the responses from the respondents. Data was collected either in person at the TechBBQ event or over the phone. The survey was composed mainly of closed-ended questions that aimed to identify the main barriers to growth for greentech companies in Denmark, and a few open-ended questions meant to elaborate on the responses in the closed-ended questions. The final survey consisted of about 20 questions and took 10-15 minutes to complete. We asked about various barriers to growth, and asked respondents to rate these on a scale

Results and Discussion

Case Studies

To better understand the barriers that green startups face in Denmark, we conducted 30-60 minute semistructured interviews with three Danish companies. Specific information relating to the companies' difficulties with growth is briefly described here, and elaborated upon in the Discussion section later on in the present report. The three case study startups represent various development stages and are at different distances from establishing consistent revenue streams.
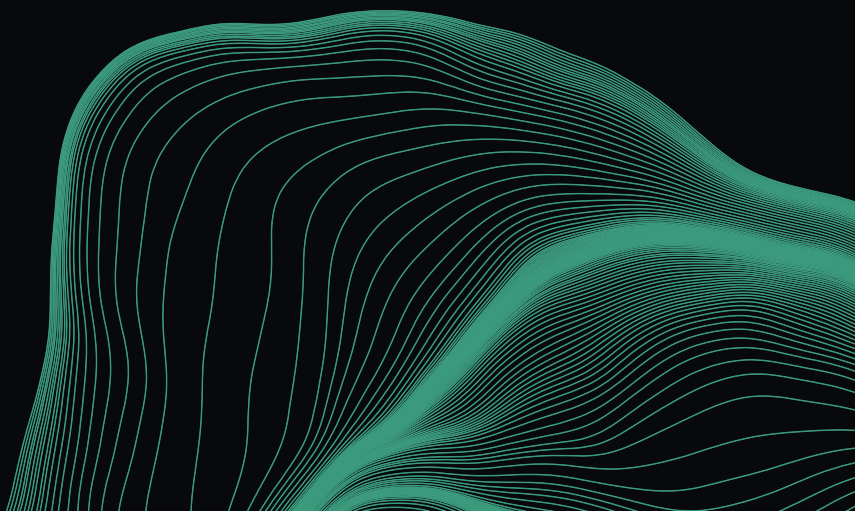
Case 1

FuelVision
RESPONSIBLE AVIATION

FuelVision

FuelVision is a company that works with airline pilots to streamline fuel use and reduce unnecessary waste of resources. They work directly with pilots and airlines using an application developed in-house that monitors fuel efficiency at all stages of flight, and provides actionable feedback for the user to save fuel on future flights. Up to 14% of the fuel consumption can be saved by using the application.

FuelVision was established in 2020, when the two pilot founders were made redundant from Norwegian.

The primary barrier identified by FuelVision for their growth is entry into the aviation industry, which is cautious towards new technologies, and in general hesitant to be a first mover, which is reflected in the industry's low degree of digitalization. It is therefore difficult to enter the industry as a small company with an innovative app.
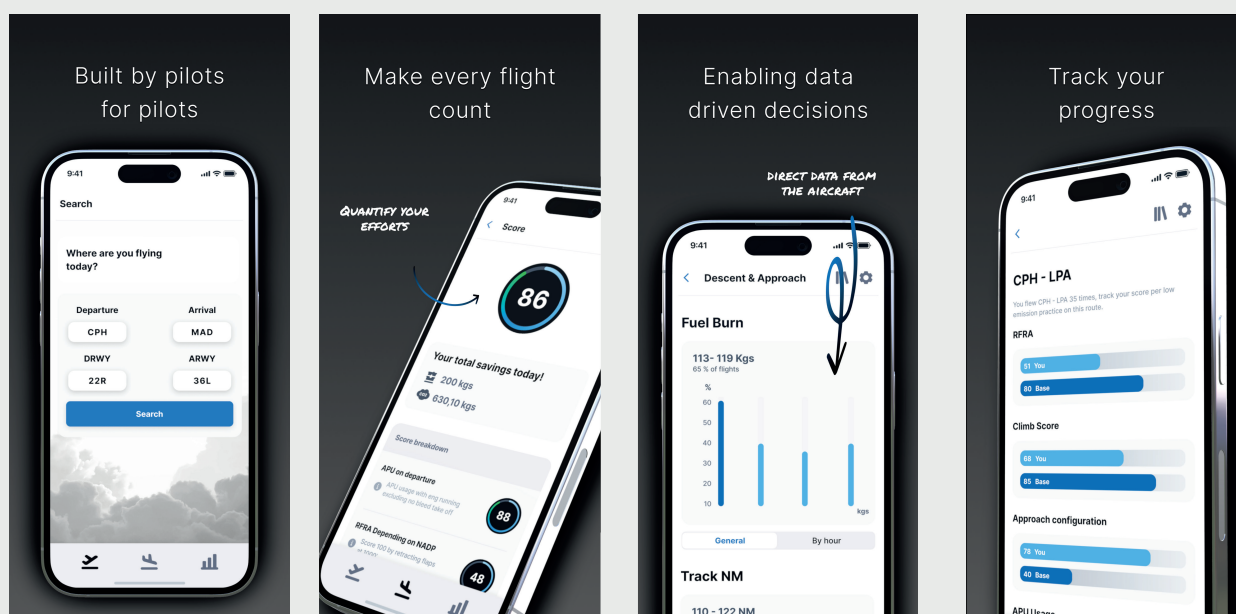
However, today 69% of the pilots of Jettime use the app on a regular basis. FuelVision has also received funding from Jettime. Sales efforts are going on, and more users are acquired. At the same time, the app is still in development in order to optimize its potential. Earlier successful tests with Great Dane Airlines were carried out. In order to grow further, Fuel-Vision needs lower barriers to entry into their industry, financial investment, and more personnel who are qualified to market and grow the business.

FuelVision is in the Series A stage, where more investors are needed and the technology is still being developed and modified. Financing proves an obstacle for a fast development and organizing the time consuming sales. The founders work without salary.

> **We contribute to solve one of the most imminent problems of our time, as transport is not close to finding solutions of reducing its heavy CO2 emissions.**
>
> Søren Wistisen, Co-founder

FuelVision shows a competitive advantage - strong relationship to the users. "Built by Pilots, for Pilots" is the essence of the company's ethos.

Case 2

KVASIR
TECHNOLOGIES

Kvasir Technologies

Founded in 2018 as a spinoff company from DTU Chemical Engineering, Kvasir Technologies has developed a process by which biowaste can be converted into a fuel similar to heavy fuel oil, which is commonly used by cargo ships in the shipping industry. Recently, they began research and development on a process to produce fuel for the aviation industry. One founder made his PhD at DTU on the bio fuel subject, and the other founder comes the bunker industry.

Financing proves not to be a problem. In April 2023 Maersk Growth and VÅR Ventures provided 15m DKK to Kvasir.

The primary barriers identified by Kvasir in their interview were funding and bureaucratic and regulatory hurdles. Firstly, seeking funding is a time-consuming process and requires a great deal of effort and many meetings.

Secondly, in order to develop fuel that will be used in heavy industries like shipping and aviation, there is a great deal of testing and certification required to ensure that the product meets the necessary standards.

It seems that Kvasir develops smoothly, as financing is coming, when need is, testing is carried out with later users and talents apply unsolicited. However, much R&D as well as testing has to be conducted before sales is possible.

Kvasir is also in the Series A stage, and will be lifted to the next stages, when the technology is ready for the market.
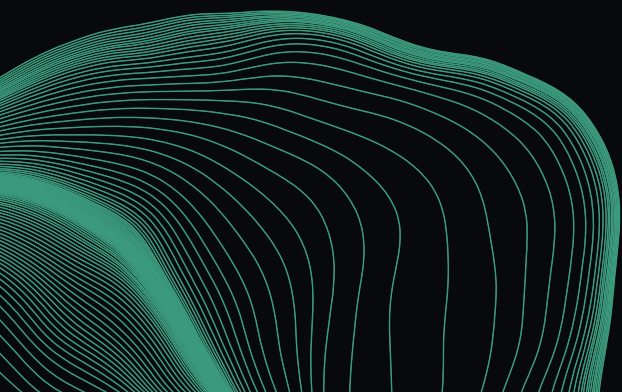
> *We are lucky in Denmark. We have universities, who are leading within new bio fuel technologies and some of the most progressive shipowners in the world.*
>
> *Anders Bak Kristoffersen, COO & Co-founder*

leapcraft

Leapcraft

Leapcraft is a Danish company that uses Internet of Things (IoT) and AI technologies for a sensor system to optimize indoor air quality while reducing emissions and avoiding unnecessary noise. The system can measure 13 parameters and can be an integrated part of a ventilation system.

The company sells B2B and B2C. SaaP is offered to professional users, mainly in real estate. Furthermore, Leapcraft has a cooperation with Swedish Lindab, a large ventilation company. It supplies Lindab with a control unit for indoor climate and Lindab is an investor. Other professional customers includes ABB, Velux, and Deutche Bahn.

> **" The Danish market is interesting for us, because the sustainability agenda is high in the minds and there is a positive political momentum.**
>
> *Vinay Venkatraman, CEO, Leapcraft*

Leapcraft is indeed working internationally with software development in India, production in Lithuania and sales in Europe and USA. Having the head office in Denmark is an advantage, because the environment is much concerned about sustainability and many users are at the technical forefront. Leapcraft is in Scale Stage, where the revenue is stable and growing and the potential for further growth is large. A capital input will fuel the growth.

Conclusion of Case Studies

The three Case studies illustrate the struggle at the paths to growth. The obstacles are not the same for these startups. The customers of FuelVision are hesitating towards new systems; Leapcraft is searching for an investor. Kvasir is in a somewhat easier position as it is concentrated on technological development of the biofuel production.

The case studies show typical elements of startups:

01 Founders from abroad and foreign employees.

02 Public grants enabled technical development in a beginning phase. EIC (a EU programme for startups) plays a role - Kvasir obtained it, and FuelVision applies for it.

03 The products offer considerable savings of conventional energy, but in case of FuelVison and Leapcraft customers are hesitating, as the technology is new and disrupt the usual routines. It might be easier in case of Kvasir, because the number of customers is limited.

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Quantitative Survey Results

Each question had approximately 35 responses from the response sample of 36 startups with illustrations. The questions were developed by TechB-BQ based on our knowledge of startups' growth and common barriers, but we also left room in the survey for responding startups to provide additio-nal information about other barriers they face which we may not have con-sidered. The following section will analyze each of the obstacles asked about in the survey both individually and in aggregate.

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Obstacle 1

# The product(s) is/are not ready for the market

This question is to identify whether the early-stage startups, who may have an idea and perhaps a prototype, feel that their company's early stage of development is a main issue for their growth. The results show that 30.3% of the respondents see this obstacle as a major problem, which indicates that many of the companies surveyed are likely still quite early stage, and require further development before market entry. How ever, 47% of respondents answered that this obstacle was either not a problem (25.8%) or a slight problem (21.2%), indicating that these companies have a product that is ready (or almost ready) for market.

A major problem

Somewhat a problem

A slight problem

Not a problem

30,3%

25,8%

21,2%

22,7%
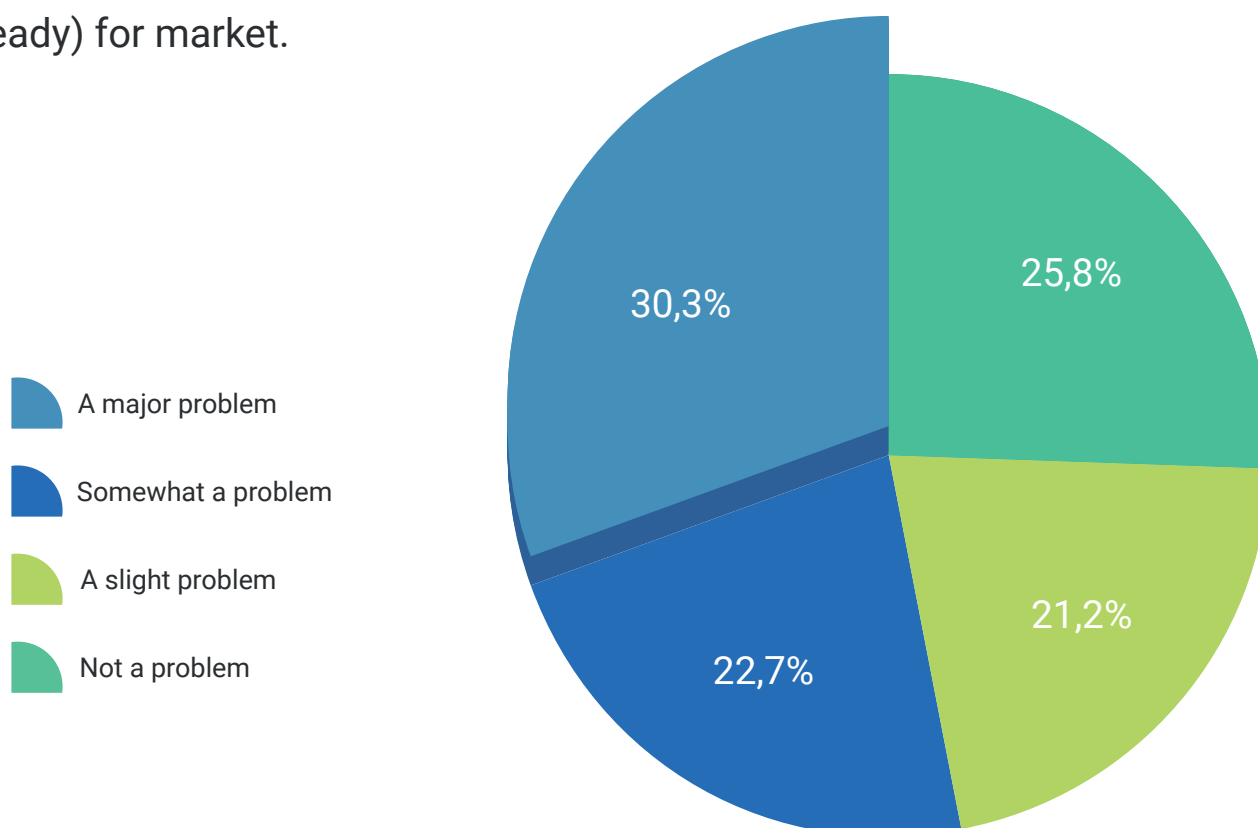
Obstacle 2
Obtaining adequate financing

This question centers around an issue that nearly all startups face at some point in their journey— often more than once: obtaining funding. 43.9% of respondents identified this as a major problem, which is unsurprising given that without adequate funding, startups cannot do many of the activities required for growth such as marketing, research and development, and talent acquisition and retention. Interestingly, almost one third of respondents rated this as a slight problem (24.4%) or not a problem (13.4%), which indicates that these particular companies have been able to procure funding without too much trouble, or are at a stage where funding is not their primary focus.

A major problem

Somewhat a problem

A slight problem

Not a problem

43,9%

13,4%

24,4%

18,3%

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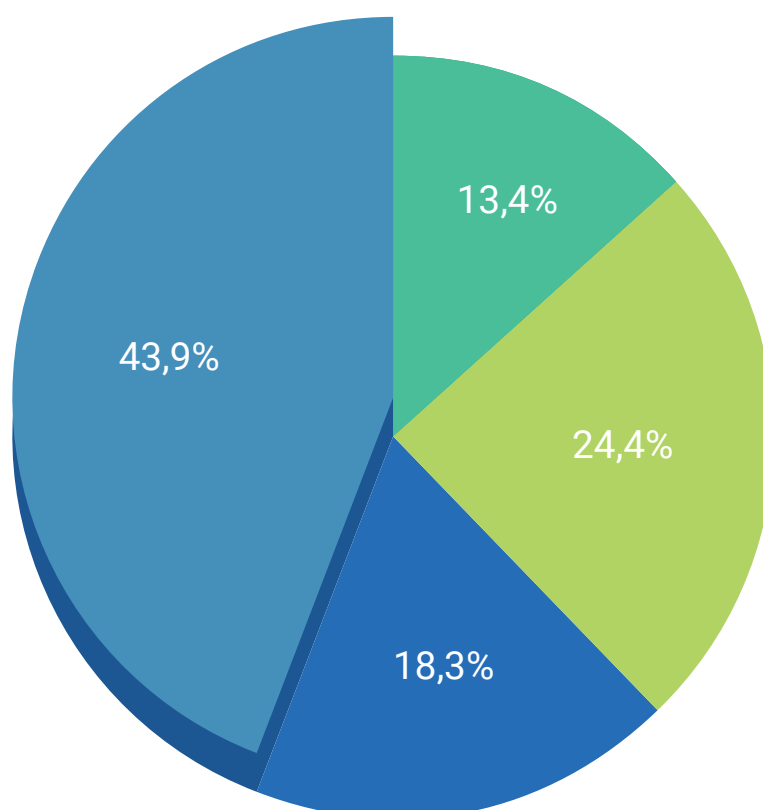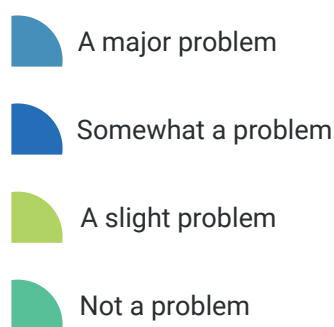
Lack of competent candidates in the labor market

This question examines the ability of the surveyed companies to identify and hire the right people to help them grow. The results of this question are quite mixed, with half identifying the obstacle as a major problem (36.4%) or somewhat of a problem (13.6%), while the other half saw this as a slight problem (24.2%) or not a problem (25.8%). These companies often require specialized knowledge for their development (engineers, environmental scientists, etc) in addition to more "standard" roles in marketing, business development, and so on.

- A major problem
- Somewhat a problem
- A slight problem
- Not a problem

36,4%

25,8%

24,2%

13,6%
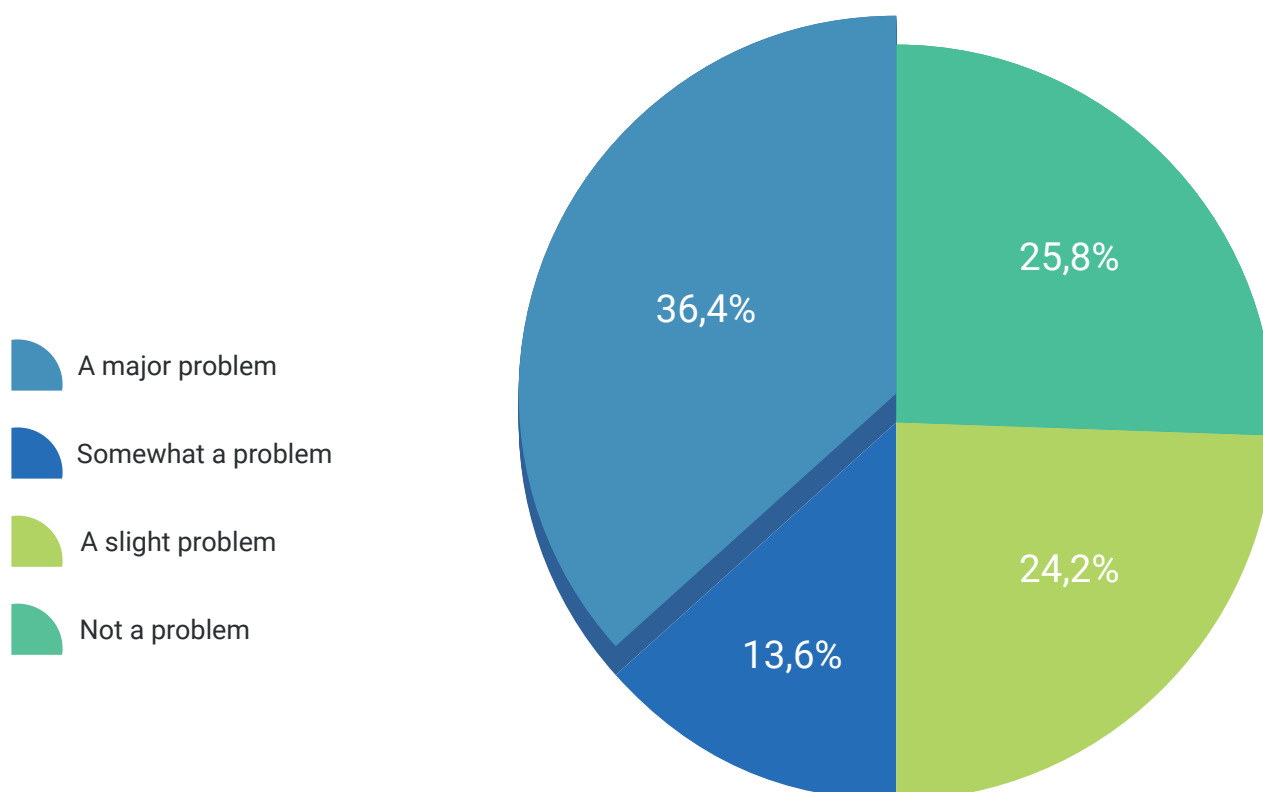
Obstacle 4

# Difficulty expanding to markets abroad

This question indicates that companies looking to expand may have some issues doing so. This could be due to a number of factors, but the fact that more than half of respondents identified it as either somewhat of a problem (25.4%) or a major problem (39.4%) illustrates that international expansion is a definite issue for the companies surveyed.

- A major problem
- Somewhat a problem
- A slight problem
- Not a problem

21,1%

14,1%

25,4%

39,4%
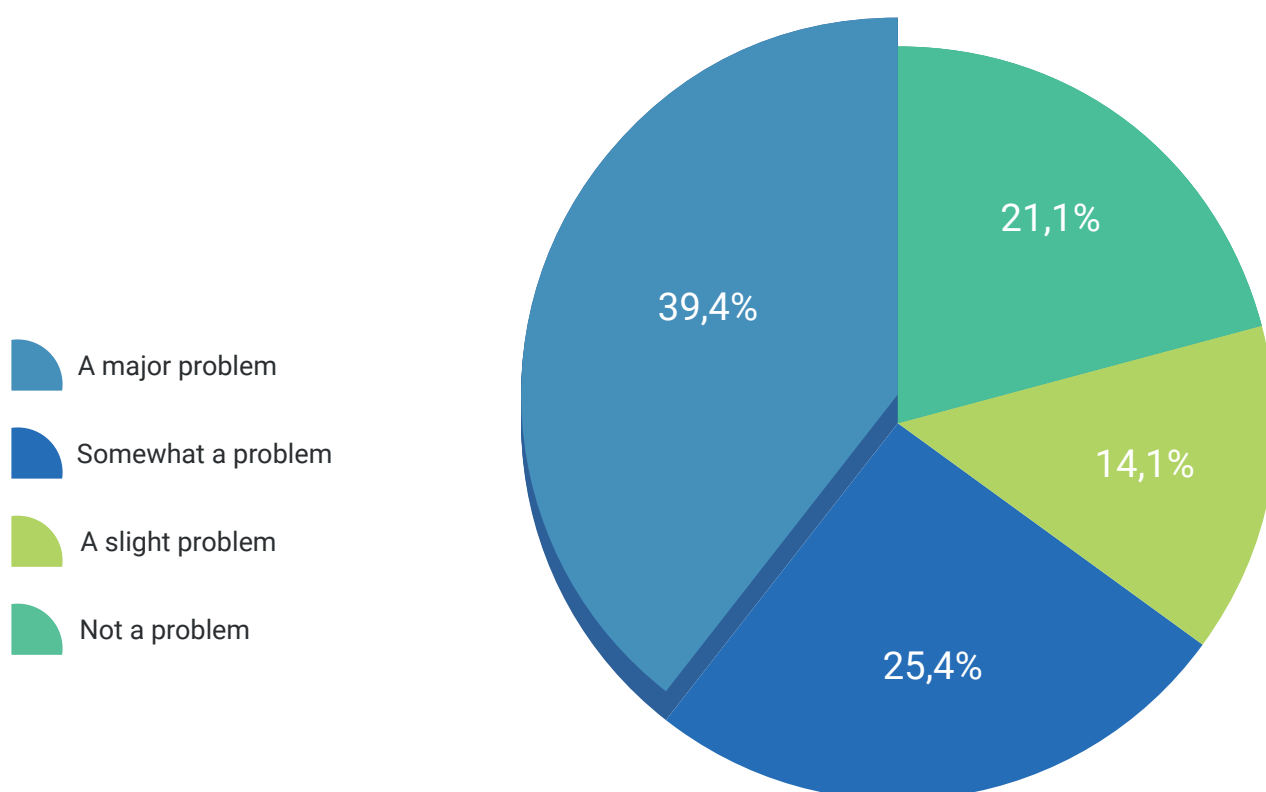
Obstacle 5

Competition in the field

Interestingly, only 5.5% of respondents identified competition in the field as a major problem, indicating that the companies have unique solutions with few competitors. This is corroborated by the interviews with Kvasir Technologies and FuelVision, both of whom identified only one direct competitor for their market. This speaks to the potentially untapped markets that these companies are aiming to reach, and that these green solutions are still relatively new, as there are so few competitors out there with a similar product and/or service.

- A major problem
- Somewhat a problem
- A slight problem
- Not a problem

5,5%

27,5%

35,4%

31,5%
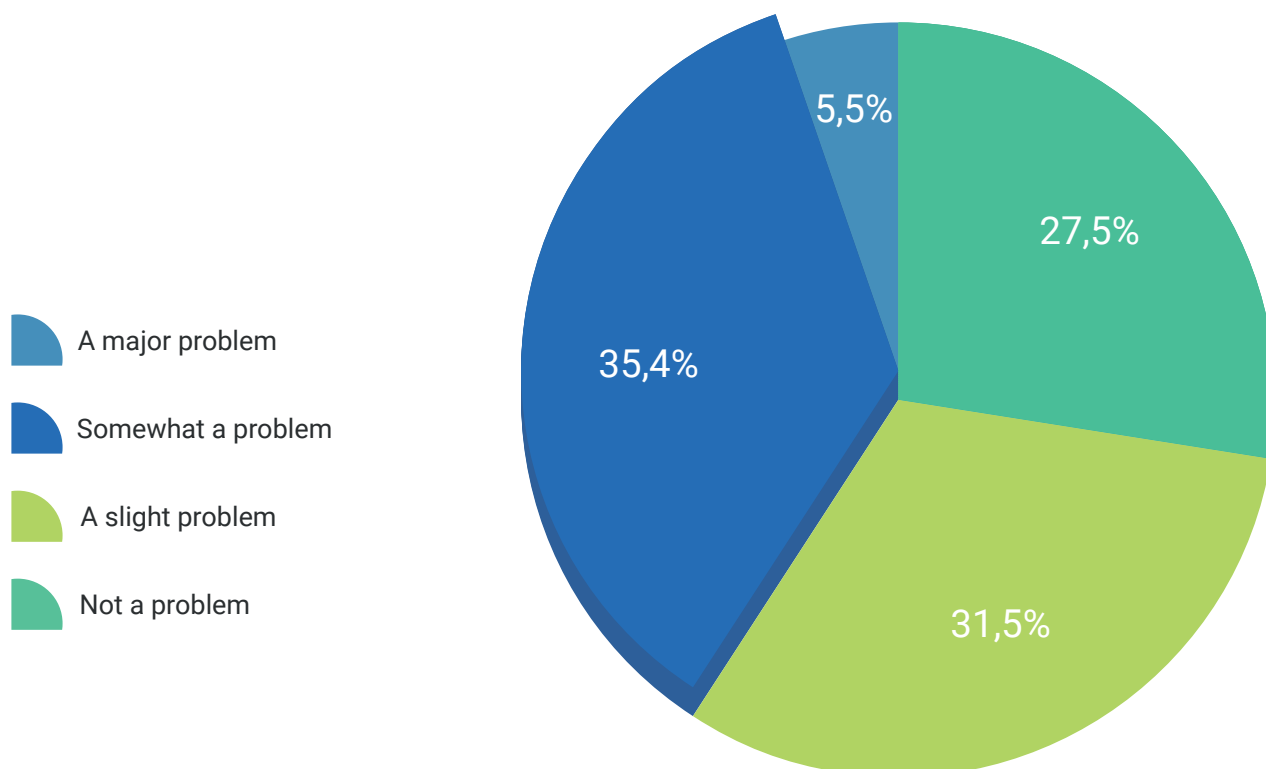
Obstacle 6

Lack of customer awareness and/or more need for marketing

This question indicates that lack of awareness and/or need for marketing is a key issue for the companies surveyed. More than three quarters of respondents said that this obstacle is either a major problem (30.8%) or somewhat of a problem (46.2%), which could mean that while the products and services these companies have developed are effective, it is difficult to show this effectiveness to the public and/or their target markets. In particular, it is likely that companies with very niche products that work within a single industry (e.g. maritime or aviation as with our case study examples) need to market to a specific group rather than the general public as a whole.

5,5%

17,5%

30,8%

A major problem

Somewhat a problem

A slight problem

Not a problem

46,2%
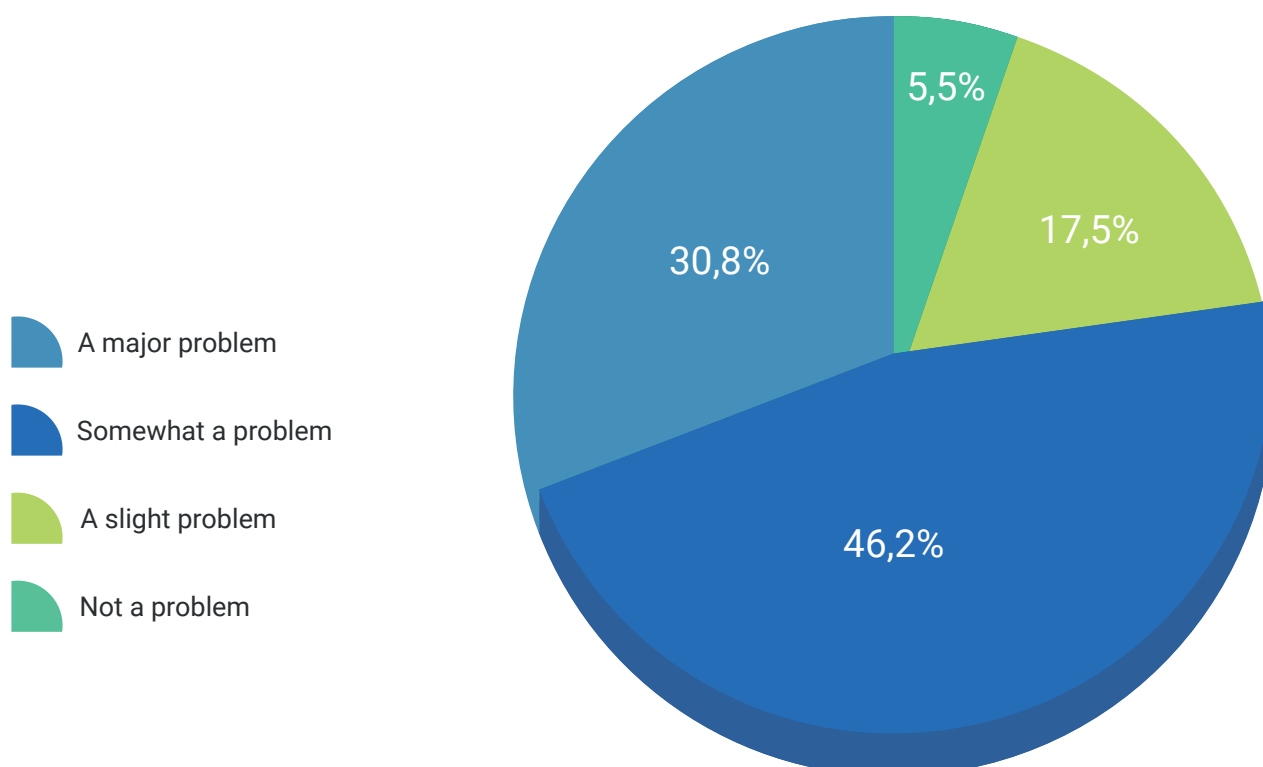
Obstacle 7

Authorities and regulators (e.g. bureaucracy, red tape, etc)

The final obstacle in the survey, "authorities and regulators," is clearly the greatest problem identified by the sample population. In fact, it is the only obstacle referred to by more than half of the responding companies (51.4%) as a major problem.

These results are supported by the interviews with FuelVision and Kvasir Technologies, given the need for products to undergo specific testing to be up to standard for highly regulated industries like shipping and air travel.

A major problem

Somewhat a problem

A slight problem

Not a problem

51,4%

22,9%

8,6%

17,1%
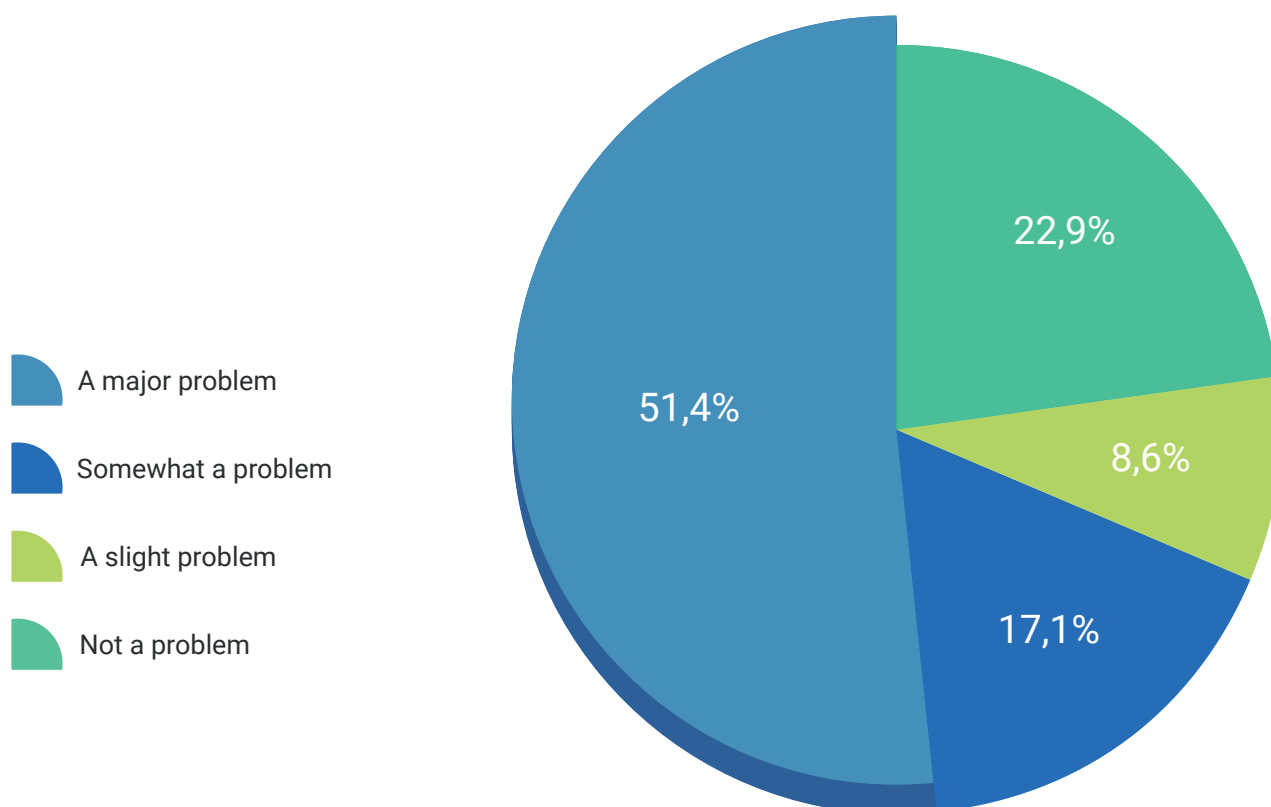
Conclusions

The field of greentech startups is indeed diversified with various technologies, customers and user segments involved - and so are the obstacles. Financing is certainly an obstacle, as it is for most startups, but it might be more significant in case of a greentech startup, if the investor will examine both the economical and the ecological sustainability. Green entrepreneurship is very popular right now. According TechBBQ's 2021 report on the Danish cleantech sector in Denmark, *"the Danish Cleantech sector has a net positive impact on economic growth, with exports totalling 81 billion DKK and a higher aggregate productivity rate than the economy's baseline, with 18,000 DKK more in added value per worker per year (2018 data)"* (TechBBQ 2021). Clearly the industry is profitable, in addition to being important to humanity. However, this popularity of green entrepreneurship comes with a drawback: now that so many companies are trying to carve out a piece of the green niche, there is more competition for limited funding which can lead to more startups failing due to lack of resources.

Next Steps and Recommendations

The results of the survey are interesting, but they also raise further questions; namely, whether green startups and startups in other industries are more alike than they are different. We think that a prudent next step for future research would therefore be to interview startups in other fields so as to better understand whether these barriers are unique to green startups, or whether these are issues faced by all startups regardless of their particular industry. Regardless of industry, TechBBQ and the Danish Business Authority will continue to support the Danish startup ecosystem and champion initiatives to help all companies. That said, we believe that we must place particular focus on the founders and teams involved in the green transition to help them flourish and guide the rest of the world to a more sustainable future.

10 Green Startups to Watch in Denmark

In the large and very diverse field of green startups, the TechBBQ team has picked 10 rising companies on the basis of these criteria:

- Dedicated and passionate founders
- Interesting and creative innovation
- Representing the industry: International oriented; mission to improve the state of the Earth; grants have been obtained

These companies all work within different parts of the green transition, and face many of the barriers to growth discussed in this report. However, they possess the will to overcome these obstacles and fulfill their missions.

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Milva	App to map materials in buildings to be demolished. Commercialisation started.	milva.io
grounded	Production of cups using coffee grounds and recycled plastic.	groundedcups.com
MicroChange	Cleaning of plastic in seawater and cleaning of lakes. In the phase of development	microchange.dk
REST DESTILLERI	Gin made in a sustainable way	restdestilleri.dk
beyond coffee	Beyond Coffee is an organic, circular mushroom producer in Copenhagen's Nordhavn.	beyondcoffee.dk
KAFFE BUENO	Utilises coffee by-products - as a platform to produce ingredients for Personal Care, Nutra-ceuticals and Functional Foods & Beverages.	kaffebueno.com
FuelVision RESPONSIBLE AVIATION	An app for pilots, that results in immediate fuel savings in aviation	fuelvision.io
ReFlow®	A digital platform to assess CO2 footprints in a lifecysle perspective	re-flow.io
KVASIR TECHNOLOGIES	A technology for production of fuel oil from bio waste	kvasirtechnologies.com
leapcraft	A sensor system for control of indoor climate and energy consumption	leapcraft.dk

Conclusion of 10 Green Startups to Watch

Above list is a fascinating illustration of the creativity among the greentech startups and the numerous ways of achieving environmental benefits. The list bodes well for the future of Denmark´s greentech sector and the technologies are applicable for the world. This gives hope in the fight for global sustainability.

References and Further Reading

TechBBQ Report on Danish Cleantech

Investopedia on Green Startups

Y Combinator on Startup Stages

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