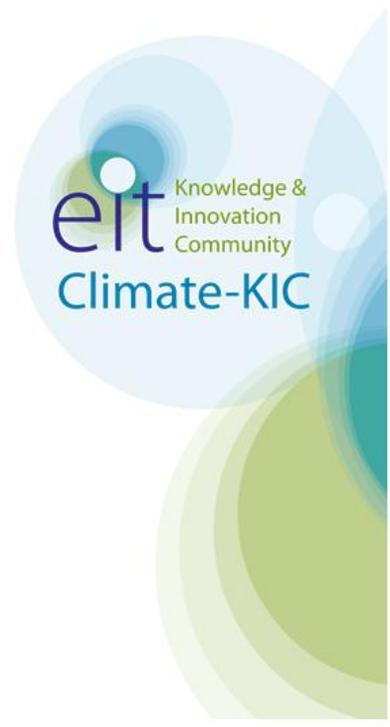


START-UP BUN

One Size Fits All?

Identifying Strategies of Climate-KIC Incubators



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1 Introduction

Europe is currently facing major financial and environmental challenges. While Europe's economic growth stagnates, sea levels continue to rise. In order for the world to face the energy and climate crises, new technologies are needed that break with the current regime of fossil fuels. Established companies that have made their fortune relying on this regime find it hard to make the transition towards more environmental friendly technologies. Innovation literature argues that these 'radical innovations' should therefore come from outsiders who have no commitments to the current regime (Christensen 1997). Besides a major source of innovation, entrepreneurship is an important driver of economic growth as well (Schumpeter, 1947). Entrepreneurs are therefore increasingly regarded as Europe's solution to both its financial and ecological crises.

Established in 2010 as an initiative of the European Institute of Innovation and Technology (EIT), the Climate Knowledge and Innovation Community (Climate-KIC) has recognized the need for cleantech entrepreneurship. Being a network of academic, governmental and corporate partners, Climate-KIC aims to integrate research, business and technology to transform innovative ideas into new products, services and jobs (Climate-KIC, 2012).

Some of the Climate-KIC affiliated universities aim to deliver more high-tech start-ups by creating incubators: organizations that facilitate the process of creating successful new small enterprises by providing them with a comprehensive and integrated range of services and (Adegbite, 2001). Given the position of Climate-KIC, there is a unique opportunity for these incubators to share experiences and best practices in order to better support start-ups. An initial analysis of the Climate-KIC incubators revealed significant differences in their structures, goals, and environments. This study therefore aims to provide first insights into these differences by comparing the Climate-KIC incubators with each other. This study takes a two-step approach by answering the following research questions:

Incubator Necessity: what are the major challenges for high-tech entrepreneurs?

Incubator Support: what strategies do the Climate-KIC incubators pursue in order to help high-tech entrepreneurs overcome these challenges?

This study was conducted in collaboration with Utrecht University. This document is based on a master thesis by Marijn van Weele, which will be referred to as Van Weele (2012), and is available upon request. This study is based on a qualitative multi-case comparison of 6 Climate-KIC affiliated incubators. A total of 67 interviews have been conducted, which were combined with a thorough literature review in order to answer the research questions posed above.

The remainder of this document is structured as follows. First of all, the theoretical framework will explore the resources that start-ups need to survive and grow, and the strategies pursued by incubators in order to provide these resources. Then, the research methodology is outlined. This study continues with the first part of the results, in which the main challenges of high-tech entrepreneurs are discussed. The second part of the results discusses the strategies pursued by the Climate-KIC incubators, followed by a brief discussion and conclusion.

2 Theoretical Framework

This section develops a theoretical framework that enables us to interpret our data. It starts with exploring the necessary resources for start-ups, and the role of incubators in providing these resources. It then continues with exploring the different strategies of incubators, and concludes with a conceptual model.

2.1 Resources as a competitive advantage

In order to understand the main challenges of entrepreneurs that cause start-ups to fail, we first need to understand what entrepreneurs and start-ups need to succeed, so we can identify their most important shortcomings. This study uses the Resource Based View (RBV) for that purpose, which has been applied extensively in prior conducted studies on incubators (e.g. Rothaermel & Thursby, 2005; McAdam & McAdam, 2008; Todorovic, 2010). According to the RBV firms can be seen as a bundle of resources (Wernerfelt, 1984; Barney, 1991), with resources being "stocks of available factors that are owned or controlled by the firm" (Amit & Schoemaker, 1993 p. 35). Resources are increasingly valuable when they are scarce, unique, inimitable, durable, idiosyncratic, non-tradable, and non-substitutable. These resources, along with firms' unique capabilities to combine and deploy them, create a firm's competitive advantage (Oliver, 1997).

In contrast with established organizations, which can refer to their past performance, entrepreneurial firms do not have a track record, and therefore struggle to acquire the necessary resources, as stakeholders do not know if the new venture is trustworthy (Bruton et al., 2010). For high-tech new ventures in particular, the novelty, uncertainty and complexity of their technology make it difficult to assess their value and obtain financing. Furthermore, the products or services in high-tech industries tend to have a shorter life compared to more conventional industries. Combined, these factors make high-tech start-ups a high-risk investment, which is why they find it difficult to acquire sufficient resources (see e.g. Westhead & Storey, 2010).

Incubators can be seen as a mean to help high-tech ventures overcome these difficulties and acquire the necessary resources in order to create a competitive advantage. The RBV distinguishes between different types of resources and capabilities. The following list is not exhaustive, but it provides an idea of the most important resources that start-ups need to survive and grow, and how incubators can help them by providing these resources:

- **Physical Capital** includes the physical technology used in a firm, the firm's plant and equipment, its location, and access to raw materials (Barney, 1991). Incubators can provide start-ups with the necessary physical infrastructure by giving them access to office space, a car park, meeting rooms etc. University affiliated incubators can also provide access to specialized physical capital, such as university libraries and laboratories (Quintas et al., 1992).
- **Financial Capital** is defined as all different monetary resources available for the discovery and exploitation of the venture idea (Barney, 1997). Given the difficulties of high-tech start-ups in attracting funding, incubators can help by providing start-ups with different forms of financial resources. Some incubators take an equity stake in their client firms through seed capital; others help start-ups in an indirect manner to find external investments by providing advice to start-ups on how to raise money and linking them to venture capitalists (Costa-David et al., 2002). Furthermore, many incubators provide financial capital in an indirect manner, as they are (partly) publicly funded, which enables them to charge rents below market price. Finally, incubators can offer financial benefits through the pooling of shared resources (Chan & Lau, 2005).
- **Human Capital** relates to the stock of experience, talent and motivation that entrepreneurs bring to a firm, and can be developed through education and training (Honig, 2001). Knowledge and educational level, as well as management, entrepreneurial, and working experience are recognized as the most important human capital factors that influence the success of entrepreneurs (Grant, 1996; Conner & Prahalad, 1996; Davidsson & Honig, 2003). University affiliated incubators may facilitate the technology transferring process, as the proximity to university laboratories and research groups offers easier access to scientific know-how and expertise (Etzkowitz, 2002). Finally, a high level of ambition is another human capital factor of successful entrepreneurs (Davidsson, 1989).
- **Social Capital** is the ability of actors to extract benefits from their social structures, networks, and memberships (Davidsson & Honig, 2003). The entrepreneur's network can give 'social access' to resources provided by others, and can therefore be regarded as a substitute to compensate for critical resources that the actor does not control itself (Adler & Kwon, 2002). As start-ups usually have not yet had enough time to develop their own network, an incubator with an established network can provide significant benefits by acting as a mediator to connect tenants to the outside world (Bergek & Norrman, 2008). Tenant firms can thereby gain access to e.g. venture capitalists, local governments, potential clients, or specialized technical knowledge. Besides connecting tenant firms to the external network of the incubator, tenant firms can also benefit from interaction with each other, as they often struggle with similar problems (Chan & Lau, 2005).
- **Credibility** can be defined as the trustworthiness, expertise and reliability of an actor (Van Rijnsoever et al., 2012). Credibility can help start-ups to access other resources, such as social and financial capital. As mentioned before, new (high-tech) ventures do not have a track record yet, which causes them to suffer from a lack of credibility which makes it difficult to access critical resources (Vohora et al., 2004). This constraint can be compensated by being associated with an incubator: it gives client firms status and credibility from which they can benefit when interacting with potential clients or investors, (Rothschild & Darr, 2005).

Start-ups need a solid resource base to survive and grow. When one or more of the aforementioned resources are absent, (new) firms will struggle to gain a competitive advantage and experience growth. They are therefore constrained by the lack of resources, which we will refer to as 'resource constraints' in the remainder of this document.

2.2 In which ways do incubators differ?

The previous section already showed how incubators differ from each other, as they may provide different resources. However, incubators not only differ in terms of resources with which start-ups are provided, but also in terms of the strategies they pursue when transferring these resources to tenants. After a review of relevant studies, van Weele (2012) identified three dimensions on which the resource transfer strategies of incubators differ: *when* resources are delivered, to *whom*, and the *assertiveness* of the incubator in delivering the resources. These dimensions are therefore the starting point for this study as well, and are discussed in more detail in the remainder of this section.

2.2.1 *When: Tenant Maturity*

The study of Clarysse et al. (2005) shows that the maturity of supported projects differs across incubators. This dimension is therefore included in this research as well, and we use the model of Vohora et al. (2004) in order to distinguish different phases in the development of (university) spin-offs, with a 'critical juncture' in between each phase that has to be overcome in order to move to the next phase:

- **1. Research phase** Knowledge and technology is developed that might be commercially attractive. In order to start any commercial activities, the researcher needs to realize that the technology serves a (potential) market need, i.e. the critical juncture in this phase is 'opportunity recognition'.
- **2. Opportunity framing phase** When an opportunity is recognized, the opportunity needs to be evaluated based on its technology and market potential. The critical juncture in this phase is 'entrepreneurial commitment': when the outcome of the evaluation is positive, the business idea needs the commitment of an entrepreneurial team in order to transform the idea into a viable business.
- **3. Pre-organization phase** Next, strategic plans are implemented on which resources and competences to acquire and develop. An important activity in this phase is obtaining finance, as this is usually the key for moving into the next phase. It is critical for the entrepreneurial team to obtain 'credibility' in order to acquire the relevant resources (such as financial capital) that are needed for the company to become operational.
- **4. Re-orientation phase** The first revenues are generated in the re-orientation phase. During this phase, the company receives feedback from initial customers as well as investors, suppliers, etc., and needs to react and change based on this information.
- **5. Sustainable returns phase** Finally, the company needs to reach a 'sustainable returns threshold' in order to move towards the 'sustainable returns phase' where the company has found an effective business model and ensures further rounds of investments.

2.2.2 *Whom: Selection & Specialization*

There are substantial differences between incubators regarding the type of firms they support. Prior literature identifies two relevant dimensions: selection and specialization:

- **Selection Criteria** Both Clarysse et al. (2005) and Roberts & Malone (1996) point at the influence of a selection strategy. Bergek & Norrmann (2008) show that the selection process of incubators differs in terms of strictness. In a 'picking the winners' selection policy, incubators only allow high-potential ventures in the incubator, resulting in a strict selection process and an extensive review of tenants prior to entering the incubator. Incubators following a 'survival of the fittest' selection policy apply less rigid selection criteria, allow a larger number of firms, and rely on markets to naturally separate the winners from the losers over time.
- **Specialization** Incubator literature points at specialization as being another important dimension in the selection policy of incubators, besides selectivity. Most scholars tend to agree that incubators that specialize in a particular sector or industry outperform those that do not (Hansen, 2000; NAEC, 2004). A possible explanation for this finding is that specialized incubators create more complementarities between tenant firms, thereby making the community a more valuable resource for tenant firms who can learn from interacting with each other (Chan & Lau, 2005; Hughes et al., 2004).

2.2.3 *Assertiveness: Strong Intervention vs. Laissez-Faire*

Finally, different incubators play different roles in guiding tenants through the venture creation process. Roberts & Malone (1996) explained why parent organizations may be required to take a more proactive approach in

environments that are not favorable to entrepreneurship. A proactive role can be reflected in the intensity of support (i.e. the type and amount of resources that are delivered), but also in the incubator's level of involvement. Rice (1992) describes how some incubators take a demand-driven approach, with the entrepreneur taking the lead and requesting the incubator for ad-hoc business support if he or she requires it. On the other end of the spectrum, some incubators take a more proactive or even aggressive approach, in which the entrepreneur is subjected to an ongoing review process. These differences reflect the incubator's perceived role in the venture creation process: on the one hand, some incubators take a 'laissez-faire' approach, in which the entrepreneur receives a substantial amount of freedom, and is left alone unless the entrepreneur explicitly asks for support. Other incubators have a 'strong intervention approach' meaning that they regard themselves as manager of the venture creation process, proactively guiding the entrepreneur through this process (Bergek & Norrman, 2008). Rice (1992) suggests that proactive forms of intervention are more effective, as reactive intervention tends to focus on short-term problems or crises, instead of addressing longer term issues. Also, the incubator will use the intervention as a catalyst for change, challenging the entrepreneur's way of doing things. Entrepreneurs may resist the challenge and change that result from the intervention, and may therefore become hesitant to ask the incubator for advice as they get more experienced with the intervention process.

2.3 Conceptual Model

Figure 2.1 shows the conceptual model that is used in this study. It shows five different resources that start-ups need to survive and grow, that can be supplied by the incubator. Start-ups can be constrained when they lack particular resources, resulting in 'resource constraints'. The resources are transferred from the incubator to the start-up through a particular incubator strategy, which consists of four dimensions: tenant maturity, assertiveness of the incubator, its selection strategy, and (industry) specialization.



Figure 2.1. Conceptual Model

3 Methodology

In order to gain in-depth insights into resource constraints of entrepreneurs and incubator strategies, this study uses a qualitative multi-case comparison research design. The incubators that were studied in this research are all part of Climate-Knowledge & Innovation Community (Climate-KIC). Climate-KIC is one of three 'KICs', the independent operational parts of the European Institute for Innovation and Technology (EIT) that put the innovation agenda of EIT into practice. Every KIC consists of partners from all three sides of the 'knowledge triangle': research, higher education, and innovation-entrepreneurship-business. Climate-KIC has 12 academic partners, 8 of which have an incubation program. A total of six incubators had agreed to co-operate in this study. Within the sample of six incubators, most incubators distinguished different phases and incubation programs, resulting in a total of 13 incubation programs. Despite the focus of Climate-KIC, the incubators hosted both businesses in the cleantech industry and in other sectors as well. Three incubators were located in the Netherlands, one in the United Kingdom, one in France, and one in Switzerland.

Data was gathered through semi-structured interviews. All incubators were visited for a period ranging between 1 and 14 days in order to conduct face-to-face interviews on site. When possible, the data obtained through the interviews was complemented with data from written documents, such as annual reports, mission statements and policy documents. Interviews were mainly conducted with incubator staff and incubated entrepreneurs. When possible, interviews with local investors and technology transfer officers (TTOs) of the affiliated university were conducted in order to provide extra insights.

A total of 67 interviews were conducted. A highly diverse sample of 42 entrepreneurs was interviewed, with entrepreneurs being active across different sectors (ranging from biotech to ICT and services), across different development stages (ranging from entrepreneurs who had just joined the incubator to 'graduates', entrepreneurs

who have graduated from the incubator), and with various backgrounds (ranging from first-time ex-student entrepreneurs to senior, serial entrepreneurs). The incubators in this sample differed in terms of age of the incubated entrepreneurs: in some incubators, the majority was recent graduates, whereas for others, entrepreneurs typically joined the incubator after they gathered substantial working or research experience. One similarity, however, was the general technical background of the incubated entrepreneurs. As mentioned before, all incubators had at least one university as affiliate or founding partner, which usually was an institute of technology. Furthermore, three incubators had also created links with established research institutes or large private organizations with significant R&D departments. Given that a large part of the incubated entrepreneurs found their way into the incubator via the incubator's partners, it is not surprising that over 80 percent of the interviewees had some kind of technical or engineering background (e.g. mechanical engineering, biomedical sciences, and environmental sciences).

In order to provide insights into different perspectives, a distinction was made prior to data analysis between data coming from entrepreneurs and data coming from incubators. Entrepreneurs who were incubated at the time of the interview, as well as graduates and entrepreneurs who did not yet participate (fully) in the incubation program were grouped as 'entrepreneurs'. Incubator management, incubator staff, TTOs of the affiliated university, investors, and 'Entrepreneurs In Residence' (experienced entrepreneurs who are partly employed by the incubator to function as a sparring partner for incubated entrepreneurs) were grouped as being part of the incubator. Data was coded and analyzed using NVIVO, a qualitative data analysis software program. Resource constraints were identified and classified based on the various resources that were identified in section 2.1. Incubator strategies were identified by exploring the resources with which tenants were supported, as well as the processes through which resources were delivered, based on the dimensions identified in section 2.2 (maturity of tenants, selection & specialization of the incubator, and the assertiveness of the incubator).

4 Resource Constraints

In this section, the resource constraints of entrepreneurs are identified. This was done by combining existing studies and data on entrepreneurship with the data from 67 interviews conducted at 6 incubators. During the interviews, incubators were asked to identify those resources that they felt entrepreneurs were missing. Entrepreneurs were asked to identify those resources provided by the incubator that were most valuable, reflecting any constraints in the entrepreneurs' resource base. Entrepreneurs and incubator were largely aligned, as two major constraints were identified: a lack ambition, and a lack of business-related knowledge (van Weele, 2012).

4.1 Ambition: independence over high-growth

The first major constraint identified by incubators related to the entrepreneurs' level of ambition. Closer inspection of the data shows that this constraint has multiple dimensions. First of all, many students don't have the ambition to become an entrepreneur, as one TTO illustrates: *"Students are not yet aware of entrepreneurship as a possible career path. When a student wants to talk about patenting or protecting something, my first question is: have you thought about starting a business out of this? The majority hasn't thought of it, or doesn't want to take the risk"*. Secondly, when the decision has been made to start, incubator management and staff described how entrepreneurs lack a certain 'drive' or ambition to pursue high-growth: *"it's all about the entrepreneurial drive: what is your goal? Where do you want to go? A lot of entrepreneurs are happy when they have one or two customers. There is no bigger plan behind it. [...] To really go for it, set ambitious goals. People are happy with what they got. They're playing it safe"*. Another incubator manager supported this point: *"Most importantly, I think that a lot of entrepreneurs achieve their first successes quite quickly: they have a good initial idea, allowing them to focus on that single idea, further refining it. They attracted some subsidies; maybe even have a first customer. And a lot of entrepreneurs never make it out of that phase. Rather than taking the leap of faith; trying to attract senior management that will enable their company to really grow, but that means to give up a part of their company. They don't take that step"*. The last quote provides an explanation of the lack of ambition: rather than aiming for high-growth, which often means to give up part of the company to an investor or senior management, the data suggests that technological entrepreneurs were mainly motivated by a strong desire to be their own boss.

The lack of ambition identified by the incubator is reflected in the entrepreneurs pointing at the incubator's entrepreneurial community as a key resource. The community of tenants played an important inspirational role,

helping entrepreneurs to set more ambitious goals, as one entrepreneur explained: *“Besides the practicalities that you can discuss with each other, the community creates an environment in which everyone is running, trying to create something from scratch. That inspires. The company across the hall just got another round of investments, your neighbor is working on his first round as well; everybody is pursuing their own dreams. It stimulates me to start running as well”*. Another entrepreneur further illustrated this point: *“It's really good to have the venture atmosphere, like-minded people around you. You see a startup going bankrupt, but also see that the guy is still alive and found a new job. Being in this environment is good, as it takes the fear of failure away. (...) It's a positive culture, you get the entrepreneurial spirit”*.

The finding that both incubators and entrepreneurs identify a lack of ambition as a resource constraint is in line with previous conducted studies. For example, the Global Entrepreneurship and Development Index shows that EU countries are outperformed by other developed countries such as the U.S., Israel or Singapore on the ‘entrepreneurial aspirations’ variable. EU countries particularly fall behind on the ‘ambitions for high growth indicator’ (Acs & Szerb, 2011). This is disturbing, as a high level of ambition is an important characteristic of successful entrepreneurs (Davidsson, 1989). The technological background of incubated entrepreneurs provides a possible explanation. Roberts (1989) concluded that, in line with our data, high-tech entrepreneurs do not necessarily have a need for high-achievement, and are instead mainly driven by a strong desire to become independent and be their own boss.

4.2 Knowledge: product development over business development

The second constraint of entrepreneurs relates to their knowledge. Given that 80% of the interviewed entrepreneurs had a technological background (e.g. engineering, biomedical sciences, ICT, etc.), it is not surprising that their knowledge was unevenly distributed, as they lacked the skills and knowledge required for exploring the market and business development. This was illustrated by one incubator manager: *“There has to be a strong market focus. A lot of ideas we get, people think only from the product itself, like a researcher or so who hasn't thought of customers at all”*. As a result, the entrepreneurs risked that their companies got too far separated from the market, i.e. that they will struggle to find customers. This point was illustrated by another incubator manager: *“I think that entrepreneurs in general - and starting entrepreneurs in particular - do not pay enough attention to sales. [...] Selling their product, really making clear 'this is what I do', that's a thing that a lot of entrepreneurs struggle with. How are you going to make money?”*.

The interviewed entrepreneurs agreed with the aforementioned incubator managers, as business related knowledge was identified by entrepreneurs as the second key resource provided by the incubator. This knowledge could be accessed through multiple ways, for example through coaching, as an entrepreneur illustrates: *“What was important from the beginning was the coaching. If you don't know anything about entrepreneurship, you have to look for help and for people that have gone through the process, who have created a company”*. The external network of an incubator was highly valued when it gave entrepreneurs access to additional knowledge and expertise (again on non-technological subjects) through a network of specialized consultants: *“What's also nice is access to the professional network of the incubator. For example, we had an event a couple of weeks ago where a professional tax attorney held a workshop about the new legislation, and the impact thereof on high-tech firms. [...] They have all kind of things: legal, IP, financing, tax, etc. It's nice, especially if you don't have these people in your own network”*. Finally, peer-to-peer interaction within the entrepreneurial community provided a useful way for entrepreneurs to develop this particular knowledge: *“Everybody has to deal with customers, the business plan, sales, strategy, the bank, legal matters. So it's very useful to talk about these things”*.

Prior studies on incubators and entrepreneurship further stress the importance of business-related knowledge, and the absence of this resource in incubated, high-tech entrepreneurs. In a study among 27 venture capitalists, Kakati et al. (2003, p. 447) concludes that *“it is not the unique products relative to competitors that brings success, rather it is the firm's ability to meet the unique requirements of customers that brings success”*. This conclusion supports the finding of this study that a strong market focus is essential for businesses to become successful, and hints at the importance of business skills to develop such a focus. Other studies concluded that incubated entrepreneurs are often at the forefront of their particular research field, but lack knowledge and experience on how to start and manage a viable business (see e.g. Carayannis et al., 1998; Chan & Lau, 2005; Vohora et al., 2005).

4.3 The 'unconsciously incompetent' entrepreneur

The previous paragraph showed that the interviewed entrepreneurs all cope with similar struggles, despite operating in entirely different industries or countries: their common technological background causes them to be driven by a desire to be their own boss instead of having ambitions for high-growth, and it causes them to lack the necessary business knowledge.

The previous paragraph showed that entrepreneurs identified business-related knowledge and the entrepreneurial community as the incubator's key resources. Entrepreneurs were also asked for their reason to join the incubator, reflecting their search for a particular set of resources, reflecting the resources they perceived as missing from their business. Surprisingly, entrepreneurs were mainly looking for physical capital (in the form of office or laboratory space) or financial capital (in the form of funding): *"At one point, we decided to start our own business, to go for it. So we quit our job, and we realized: we don't want to start the business out of our private homes. We wanted an office to start, a place where we could work on our company. So I believe we ended up here via the internet, via Google"*. Furthermore, many entrepreneurs came from a parent organization (often a university) that was either a founding or core partner of the incubators, which makes starting in the incubator an obvious step, as an entrepreneur explained: *"When you start a new company from this university, this incubator is a pretty obvious choice. All the well-known and successful examples come from this incubator"*.

This shows that, although entrepreneurs refer to the inspirational role of the community and the access to business related knowledge as the most important resources provided by the incubator, entrepreneurs are not able to recognize the importance of these resources when they join the incubator. This suggests that entrepreneurs initially underestimate the importance of these resources. Closer inspection of the data provided an explanation for this.

4.3.1 Ambition

Closer inspection of the data provides a possible explanation for why entrepreneurs initially did not perceive ambition as a resource constraint: entrepreneurs become increasingly ambitious when they spend time in the inspirational environment of the incubator. When entrepreneurs enter the incubator, they are mostly driven by a strong desire to be their own boss, instead of pursuing a strategy of high growth. In this situation, their (initial) level of ambition is sufficient to achieve these goals. When they spend time in the incubator, the observation that other tenants pursue strategies of high growth, and are successful as they attract external capital, experience growth, get acquired by a larger company, etc., causes the 'newcomers' to set more ambitious targets as well. When they do, they realize the importance of the inspirational role of the community as an important resource. Scholars of the 'behavioral theory of the firm' have realized long ago that aspiration levels are formed by (1) the firm's performance history and (2) by the comparison with the performance of similar others (Cyert & March, 1963; Greve, 1998). When start-ups join the incubator, they typically do not have a performance history yet, which means that the influence of similar others (i.e. tenant firms, as the selection process of the incubator causes at least some similarities among tenants) is even greater for this specific type of organization.

4.3.2 Business knowledge

The inability of starting entrepreneurs to recognize the importance of business related knowledge implies that entrepreneurs are initially not aware of this resource being important for their success, or they do not actively search for this resource, and therefore do not experience the lack of it as a constraint. Closer inspection of the data supports these assumptions by identifying three barriers to recognizing this resource's importance and developing it.

First of all, one incubator manager described that many starting entrepreneurs are 'unconscious incompetent'. Unconscious incompetence occurs when individuals do not know how to do something, but not necessarily recognize that they lack the knowledge, and may deny the usefulness of the skill (Gordon Training International, 2012). Given their background, technological entrepreneurs tend to prioritize technological development of their product or service over business development. Not only do they not possess the skills required for business development, they also do not realize that they lack the necessary skills, and may not be convinced that executing these activities is indeed necessary for the success of their business. Looking back on the start of his entrepreneurial career, a serial entrepreneur illustrated this point: *"When you're a first time entrepreneur, often you lack the knowledge of the entrepreneur and the ecosystem. But you don't realize it"*.

Secondly, entrepreneurs are hesitant to develop these resources, as they lie outside their zone of comfort: given their engineering background, technological entrepreneurs are insecure about activities outside their comfort zone (i.e. business development), or simply do not like them, as was illustrated by an incubator employee: *“they go into their comfort zone. And their comfort zone is the product or service they are developing. And being vulnerable, exploring the marketing side, they often do not like this. It is safer to answer an e-mail of an existing customer”*. Another incubator manager raises a similar argument: *“We’re working with high-tech start-ups, with entrepreneurs who are not familiar with sales, financing, liabilities, and they hate these things”*.

Finally, the chaotic day-to-day business of early stage ventures presents another barrier to develop these resources. One entrepreneur illustrated this: *“Basically, when you’re an engineering start-up, you have very little time to think. You are basically sucked into details. As you don’t have an assistant, you have to manage things by yourself. And you tend to lose sight of obvious priorities”*. Activities such as writing a business plan, exploring markets and business development usually have a longer-term orientation, and can therefore easily be neglected, as was illustrated by an incubator manager: *“During the daily business, entrepreneurs often forget to thoroughly think about their business plan. Because they turn on their computer, and they got an email from a new customer, or they have to make small adjustments on their website, etc. But they’re not doing what’s most important: working on their business model, or their plan on how to enter the market, when will they be able to show the first results, do they have sufficient liquidity?”*. Combined, these three barriers create significant barriers for entrepreneurs to recognize the importance of business-related knowledge and to develop this particular resource, even though this resource is crucial to their success.

We already discussed how entrepreneurs become increasingly ambitious as they spend time in the incubator, thereby decreasing the ambition resource constraint. The nature of the aforementioned barriers suggests that they decrease over time as well. As entrepreneurs gain more experience with activities related to business development, they become more aware of the importance of this resource, and their own (in)competences in acquiring it. Furthermore, entrepreneurs get more comfortable with these activities, and they may be better able to prioritize and manage their time. Moreover, the growth of the business and the hiring of additional employees enables the founder to focus on long-term strategic issues. The data suggests that the three barriers indeed decrease over time. For example, an incubator manager illustrated how experienced entrepreneurs suffered less from the aforementioned limitations: *“We see that entrepreneurs with more working experience, or who already started their own business before, are the ones that make the most use of our services. And those that are completely new to entrepreneurship are the ones that sit in their offices with the door closed, and we need to stimulate them to participate in the program. They don’t see the opportunities that we offer to them”*. The decrease of the barriers was illustrated by an entrepreneur as well, when he discussed the importance of activities related to business development: *“You have to be aware of the importance of these activities. But it takes time to get there ... At first, you don’t understand it... Later, you start realizing that it’s important”*.

5 Incubator Strategies

Next, the resource transfer strategies of incubators were analyzed using the three dimensions (tenant maturity, selection/specialization and incubator assertiveness) derived from prior studies. Figure 5.1 shows the assertiveness of the incubator plotted against the maturity of tenants. Appendix A contains a brief description of every incubator.

Figure 5.1 shows that the Climate-KIC incubators differ strongly in terms of both tenant maturity and incubator assertiveness. An interesting observation is that, after a business has been established in the pre-organization phase, incubators pursue a highly assertive strategy, which tends to become more demand-driven in later phases. As we will see in the remainder of this chapter, the assertiveness of the incubator is strongly influenced by the resource constraints and barriers of entrepreneurs that have been identified in section 4. Figure 5.1 also shows three ‘groups’ of incubators, which follow similar strategies.

One Size Fits All? Identifying Strategies of Climate-KIC Incubators

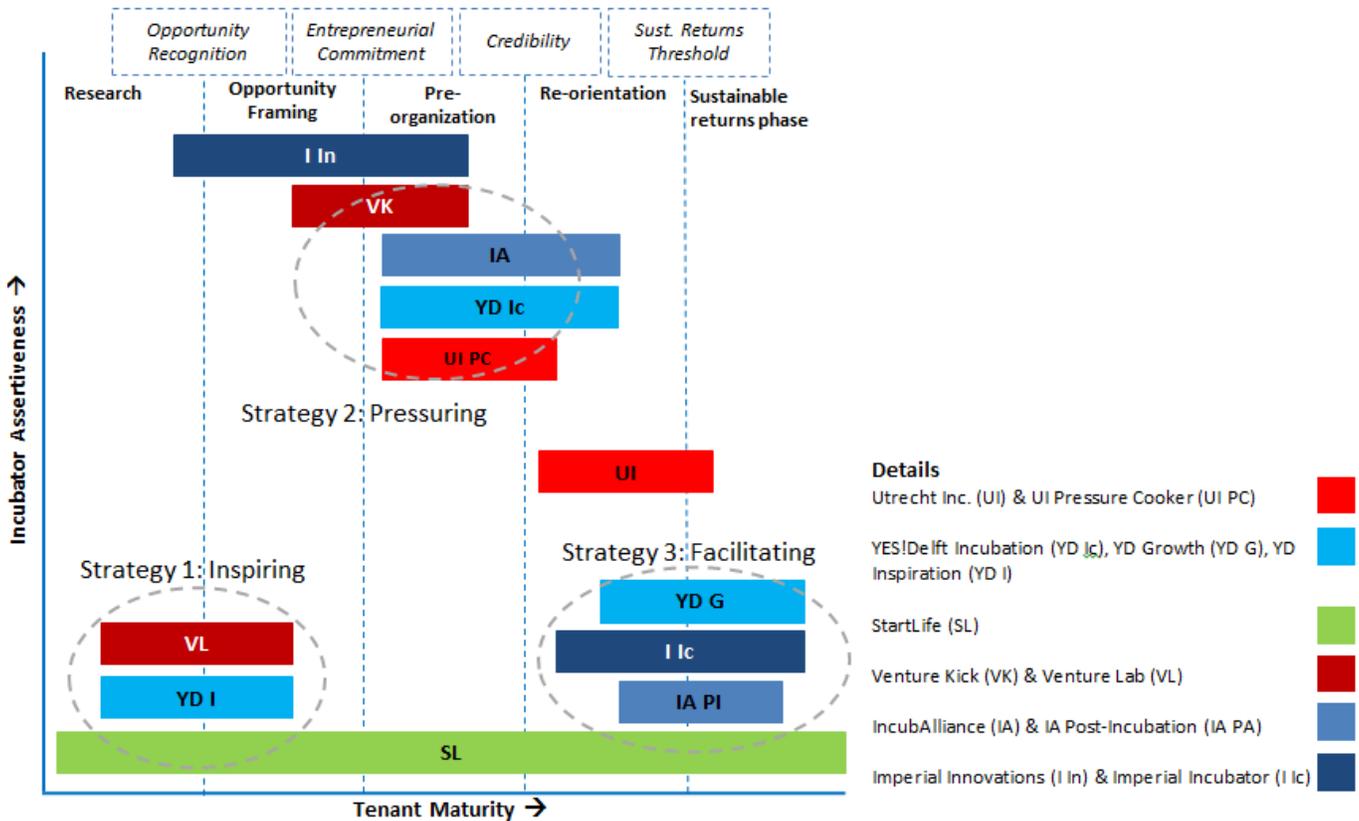


Figure 5.1: Assertiveness / Maturity Climate-KIC Incubators

5.1 Strategy 1: Inspiration

Figure 5.1 shows that Venture Lab, StartLife and YES!Delft pursued a similar ‘inspiration’ strategy. The inspiration strategy takes place when entrepreneurs had not yet established their business, so in the research or opportunity framing phase. It aimed to create awareness about entrepreneurship and to teach (potential) entrepreneurs in the necessary skills, by organizing master classes, guest lectures, workshops and courses on entrepreneurship, for example on how to write a business plan. By doing so, the incubators mostly aimed to show students and staff that entrepreneurship is a possible career path, thereby compensating the ‘low awareness’ constraint identified in section 4.1. One entrepreneur illustrated the essence of this strategy: “I chose an elective course in which students work on a business plan under supervision. That was a nice opportunity to test the ideas I had in the back of my mind to start a business. It ended with a competition, and I was picked as one of the winners by the jury. That’s what persuaded me to explore the possibilities of really becoming an entrepreneur”. Role models played an important role in this strategy as well. An incubator manager explained how they often invited successful entrepreneurs to act as a role model and inspire students: “We just ask the entrepreneurs to tell their story from the moment they left the pre-incubation program. The students in the class then think: this guy here, who actually looks like me, except that he now has a company, but he still has the look of the phd. He made it. I can do it”. Incubators did not only use this strategy to create awareness on entrepreneurship, it was also a way for potential entrepreneurs to become familiar with the incubator, and thereby create a pipeline of tenants to enter the incubator once a free spot is available. The barriers for (potential) entrepreneurs to participate in the program were very low, and usually the only requirement was to register for the course or master class. This strategy therefore had a survival of the fittest selection strategy, with the aim to trigger as much entrepreneurs as possible (almost without any selection) and rely on a natural selection process distinguish the real entrepreneurs. This was the only strategy with such a selection policy. All other strategies followed a picking the winners selection policy, as the costs associated with failure were much higher. The inspiration strategy has a laissez-faire approach, as (potential) entrepreneurs could choose whether or not to participate in the program. Although this strategy might be an effective way to promote entrepreneurship and trigger people to take the first step towards entrepreneurship, teaching entrepreneurs the skills required more than one or two master classes, as we will see in the other strategies discussed.

5.2 Strategy 2: Pressuring

Section 4 revealed that, once entrepreneurs had made the commitment to start a business, they suffered from a lack of business related knowledge, and were further constrained in the development of this resource by three barriers. Entrepreneurs are (1) unconscious about their incompetence, (2) hesitant to step outside their zone of comfort, and (3) primarily focused on short-term issues. Some incubators adopted a highly assertive and proactive strategy in which they put substantial pressure on the entrepreneurs, in order to break through these barriers. Incubators used various 'pressure mechanisms' to do so.

First of all, some incubators made participation in workshops and master classes mandatory for companies that wanted to enter the incubator, which meant that the incubator decided which resources the tenants develop: *"We require our entrepreneurs to participate in the master class program if they want to enter the incubator. If they are not willing to, than we know that the entrepreneur does not know himself well enough, because we know that everyone needs it"*. This forced entrepreneurs to think about long term strategic issues during the day-to-day business. One entrepreneur illustrated why this was difficult, but very useful as well: *"As an entrepreneur you're putting in so much hours and effort every day to work on your business. So it's pretty tough when you're forced to leave your office for two or three days every six weeks. No phone, no e-mail... But it's very useful to take a step back once in a while, to take a strategic overview of your company: am I still doing the right things? It forces you to think about stuff that is important, but not yet urgent"*.

The second pressure mechanism was the competition between start-ups, for example when a group of start-ups competed for a pre-seed fund: *"It's really pressing. You have to hurry. You have to realize that what you said, that you will do. If you don't, you know you'll never get to the next round. And as it is a competition, you know that the others will do their best as well. So it's always challenging. We were competing with other great start-ups. So I was afraid"*. This competition element also compensated for a lack of ambition or sense of urgency that was described in section 4.1: *"You have between stage 1 and stage two three months. It's not you come back when you're ready. You come back in three months. What we look at is the ability of the entrepreneur to behave as an entrepreneur. That's the sense of urgency"*

The third pressure mechanism was a very assertive incubator manager or coach, which some entrepreneurs even described as aggressive: *"The coaching sessions were very tough. We presented our ideas, and the coaches were just asking good questions. How will you make revenue? Who's going to buy it? Why? What is the competition? A lot of questions that we couldn't answer, because we approached our business in an academic way: we have an idea, the customer will be there. So it was very tough feedback"*. Another entrepreneur further illustrated this strategy: *"Our coach made us rewrite our executive summary fifteen times. And every time, he said: What you've done is completely ****... The funny thing is: we actually don't need an executive summary yet. But through this exercise, we were forced to say what really matters in our company. We are trying not to lose ourselves too much in technical detail"*. The incubator thereby actively guides the entrepreneur through the venture creation process, as an entrepreneur illustrated: *I think it's good for first-time entrepreneurs to be confronted, for them to face reality. You want to raise millions? It doesn't work like that. And it's good to have somebody to tell that and who can tell you, if you want to organize meetings with VCs and business angels: "no, you're not ready". We don't like that as first time entrepreneurs. We don't like anybody to tell us what to do. But I think it's useful"*.

Although this strategy had a focus towards knowledge related to business development, incubators with a pressuring strategy gave tenants (in)direct access to a comprehensive range of resources. Another interesting observation was that the incubators provided strong incentives for tenants to participate in the program: high amounts of price money as financial capital, physical capital in the form of free office space, or credibility when entrepreneurs received a venture award as they beat their competitors. These incentives can be regarded as a reward for entrepreneurs to follow the incubator's advice and guidance. The pressuring strategy was mostly observed in the re-orientation phase, shortly after entrepreneurs had made the commitment to start their business. The three barriers were highest in this early stage, which suggests that this proactive strategy is therefore most appropriate. Given the incentives, the extensive guidance provided by the incubator and the provision of the other resources, the costs associated with failure were very high. Incubators with a pressuring strategy therefore followed a strict selection policy, 'picking the winners'. A credible incubator manager with significant entrepreneurial experience was a key resource for the incubator in order to guide the entrepreneurs (either directly through manager-tenant coaching and interaction, or indirectly by incentivizing / obliging the development of particular resources). When incubator managers lack the experience, the incubator risks to guide the entrepreneur in the wrong direction, as one incubator manager illustrated: *"As an incubator, you have to be*

*extremely confident to take such a proactive role and to guide entrepreneurs. It requires a lot of experience. And you risk guiding the entrepreneurs in the wrong direction". This point was supported by an entrepreneur, who didn't feel that his incubator manager was credible enough: "Don't tell the incubator manager, but their coaching isn't valuable at all. I've collected a wide array of coaches myself, who, with all respect, are in a different league. In contrast with the incubator manager, they have a proven track record. They are serial entrepreneurs or CEO of multinationals". Another entrepreneur raised a similar argument: "It's difficult to find a good coach. At the start of our business, our university provided us with two coaches. But it was all ****. They tried to tell us what to do, but had no idea about what it's like in the real world. So it's important to have people who have been involved in a start-up, who have the experience".*

5.3 Strategy 3: Facilitating

The lower right corner of figure 5.1 shows that incubators supporting more mature tenants generally pursued a more demand-driven strategy. This means that the incubator provided entrepreneurs with access to a similar range of resources as in the pressuring strategy, but it was up to the entrepreneur to take the initiative: *"There is a good understanding between our company and the incubator. When we run into a certain problem, we let them know, and they help us where they can".* Compared to the pressuring strategy, the facilitating strategy was less intense, not only regarding the assertiveness of the incubator, but also regarding the flow of resources: although the incubators provided tenants with a similar comprehensive range of resources, tenants relied less on the incubator's resources as they had developed a strong resource base themselves already. One incubator manager illustrated this process: *"The first phase of our program is more intense. As entrepreneurs and their companies mature, they start building their own network, and we also expect them to have their own advisory board after four of five years. So they become less dependent on our coaches".* Another incubator manager confirmed this: *"With our model the need for, what I call the ad-hoc business support, is less than before. Because those inexperienced companies; they come knock on your door every day".*

Many entrepreneurs experienced the freedom as a good thing: *"I think that an incubator should not get too involved with the companies: it's not a kindergarten. As an entrepreneur, you're running your company, and you should take responsibility for your own actions. An incubator should offer the opportunities to participate in workshops, open up their network, etcetera, but they shouldn't spoil the entrepreneurs".* As incubators did not intervene in the entrepreneurial process and let the entrepreneur take the initiative, this strategy was safer as well, as incubators did not risk guiding entrepreneurs in the wrong direction. However, this laissez-faire policy showed its limitations when entrepreneurs suffered from the three barriers identified in section 4.3. One incubator manager illustrated this in an example where entrepreneurs suffered from unconscious incompetence and a high workload: *"Sometimes, I just know that participating in a particular workshop would be extremely beneficial to some entrepreneurs. But they are not willing to go to the workshops we organize, because they feel too busy, and they do not see that these things could really help their business. But we can't force them".* This suggests that a facilitating strategy is most appropriate when tenants are mature, not only because they have a stronger resource base as was already suggested, but also because the three barriers have decreased. The incubators in the sample supported this finding, as the facilitating strategy was most observed in the re-orientation phase, when companies and entrepreneurs were more experienced.

5.4 Strategy 4: Investing

Imperial Innovations differed from the other incubators, as this was the only incubation program that applied an 'investing' strategy. Similar to the pressuring strategy, this strategy is characterized by a pro-active role for the incubator, as tenants were in an early stage, where resource constraints and barriers were highest. However, whereas the pressuring strategy tried to compensate the resource constraints of the technological entrepreneurs by providing access to business knowledge (through participation in master classes and workshops) and ambition (by placing them in an ambitious entrepreneurial environment), incubators pursuing an investing strategy tried to compensate the lack of business-related knowledge by bringing in external expertise. One incubator manager illustrated the essence of this strategy: *"An academic is like an engineer who builds a ship. Although he might be an expert on how to build the ship, this doesn't mean that he is the right person to be the captain of this ship. You could then try to teach him how to sail, but we think it's more effective to hire an experienced captain".* Therefore, an experienced captain, an external CEO, was recruited in order to complement the resources of the technological entrepreneur (who often became Chief Scientific Officer or an external advisor). Furthermore, the new business

was given access to financial capital in exchange for an equity stake and a board position for the incubator. In this strategy the incubator acted as an investor. With the appointment of a CEO and presence in the board, the incubator could have a major influence in the company, and therefore pursued a strong intervention strategy. As this strategy evolved around complementing the resources of the inventor, it took place during the pre-organization phase, when companies were still in the process of acquiring and developing a solid resource base. Given the large investments that had to be made, the costs associated with failure were highest of all strategies. The investing strategy therefore uses a strict 'picking the winners' selection policy. Although this strategy might be an effective way to complement the resources of the technological entrepreneur, it suffered from some limitations as well. First of all, it might affect the relationship between the incubator and the tenant firm, as an incubator manager illustrated when asked about his perception on taking an equity stake in tenants: *"It would change a lot in the sense that we would become a major shareholder in the companies here. Currently, we try to build a relationship with the companies in which we trust each other for 100 per cent. That might change when you take an equity stake. On the one hand, it's still your job as an incubator to help the companies. But on the other hand, you invest your own money as an incubator. This might create conflicting interests"*. Furthermore, this strategy might be unfeasible when the inventors are mainly driven by a desire to be their own boss, and thus hesitant to let the incubator take an equity stake in the company, as section 4 showed.

5.5 Strategy 5: Community Building

Finally, for all physical incubators (where tenants were housed on-site), the entrepreneurs pointed at the community as an important resource. Section 4 already showed how the entrepreneurs can develop business related knowledge and ambition by interacting with peers. Therefore, creating a community of entrepreneurs can also be regarded as an incubation strategy. Community building also created economies of scale, which was useful when accessing physical capital, as one entrepreneur illustrated: *"What makes it cheap being in an incubator are the shared facilities, such as the meeting rooms, the kitchen, the copier, internet, etc., that's all here. If we would have to pay that for ourselves, it would cost us a lot more money"*. The benefits caused by the economies of scale through clustering were not limited to physical resources. It also created critical mass which made it easier for start-ups to access other stakeholders, i.e. social capital. For example, almost all incubators had a network of 'preferred suppliers', who gave a discount to firms inside the incubator: *"The idea is that we make a deal with the consultants: if they are lucky, then a few of these companies will grow bigger and still make use of their services. The entrepreneurs can just walk in for a quick question; take about 45 minutes, without any charge. If they need additional support, then they can make another appointment, and we try to get the consultants to make the entrepreneurs a special deal"*. In contrast with Chan & Lau (2005) and Hughes (2004), who suggest that specialization in a particular sector is important for tenants to benefit from interacting with each other, several interviewed entrepreneurs suggested that being in a different sector is not a barrier at all: *"We're producing a tangible product, which is a bit uncommon in this incubator. But everybody has to deal with customers, the business plan, sales, strategy, legal matters... So it's very useful to talk about these things, even if the product you're delivering is totally different"*. The incubator only played a role in selecting the tenant firms, suggesting a laissez-faire strategy. At the same time, the composition of the group was important, as it influenced the dynamics of the group. In order for the tenants to take full advantage of the inspirational role of the community (i.e. access *ambition*), it was important to aim at a high level of ambition, as one incubator manager illustrates: *"I think it is important that the level of ambition is high for every company, that we play close attention to that as an incubator. When a newcomer enters the incubator, we want the established high-potential companies in our incubator to think: these new guys are extremely ambitious, we have to step up a notch, or they will get all the attention"*. Although community building might provide economies and scale, and contribute to the human capital of entrepreneurs, peer-to-peer coaching was not formal part of this strategy, and incubators therefore depended on the willingness of tenants to help each other out. This strategy was therefore observed only in combination with a pressuring or facilitation strategy (and therefore both in the pre-organization and re-orientation phase), in order to complement the benefits of the community with formal guidance by the incubator.

5.6 Strategies Compared

This section showed that incubators have developed different strategies in order to support entrepreneurs. Table 5.1 gives an overview of the different strategies and their characteristics. The resources and dimensions that were identified in section 2 helped to understand *how* incubator strategies differ: they differ in terms of resources with

which tenants are supported, the processes through which tenants are selected, the level of assertiveness of the incubator, and the development stage of tenants. The different strategies also helped to explain why different incubators have different key resources: the incubator manager for example is a key resource in the pressuring strategy, whereas the community is a key resource in the community building strategy.

The dynamic nature of the concepts identified in section 4 help to understand *why* incubators pursued different strategies: as ventures and entrepreneurs matured, their resource constraints and barriers tended to decline, which required a different strategy. In the pre-organization phase, entrepreneurs suffer from a lack of business knowledge, and were further constrained to develop this resource as they are (1) unconscious about their incompetence, (2) hesitant to step outside their zone of comfort, and (3) primarily focused on short-term issues. Therefore, incubators were found to take a highly assertive strategy. They pursued a strong intervention policy (in the form of a pressuring or investing strategy) in combination with strong resource incentives in order to ensure that the tenants focused on developing the appropriate resources. In line with Todorovic et al. (2010), we found incubators to focus on providing human capital, as this was the most important constraint of early stage startups (reflected in their level of ambition and business-related knowledge). As tenants matured, they created a stronger resource base and were less constrained by the three barriers in their decision-making process on which resources to develop. This was reflected in the incubators playing a facilitating role with a laissez-faire policy, in which the entrepreneur took the initiative. Furthermore, we found that later stage tenants relied less on the incubator’s resources, as they had developed a strong resource base themselves, which is in line with previous literature as well (McAdam & McAdam; 2008).

Our results suggest that there is no ‘one size fits all’ strategy, as this section showed that every strategy had its specific strengths and limitations. This is reflected in the observation that most incubators in this sample were found to be a combination of multiple strategies, to ensure a good fit between the incubator and the tenants in each phase. For example, some incubators in the sample started with an inspiration strategy in order to create awareness and a pipeline of (potential) entrepreneurs. Then, a community of entrepreneurs was created, that were being subjected to a pressuring strategy in the early phases of the businesses, and a facilitation strategy as businesses matured but were not yet ready to be completely independent.

	Inspiration	Pressuring	Facilitation	Investment	Community Building
Development phase	Research & Opp. Framing	Pre-organization	Re-orientation	Pre-organization	All
Assertiveness	Laissez-faire	Strong Intervention	Laissez-faire	Strong Intervention	Laissez-faire
Resources provided	Human Capital, Social Capital	All (strong incentives)	All (to a lesser extent)	Financial Capital, Human Capital	Social capital
Selection process	Survival of the fittest	Picking the winners	Picking the winners	Picking the winners	Picking the winners
Examples	YES!Delft, Venture Lab	Venture KICK, Incuballiance	YES!Delft Growth, Imperial Incubator	Imperial Innovations	Utrecht Inc., YES!Delft

Table 5.1 Incubator Strategies

6 Conclusion

This study aimed to provide deeper insights into the major challenges of high-tech entrepreneurs, and the strategies that incubators pursue in order to help entrepreneurs overcome these challenges. In order to do so, section 2 developed a resource-based theoretical framework based on prior literature that enabled us to study these questions. Existing literature was combined with Section 3 provided a research design in which 6 Climate-KIC incubators were studied, with 67 interviews conducted with both entrepreneurs and incubator management.

Section 4 showed that entrepreneurs face very similar challenges, even though the Climate-KIC incubators operate in completely different environments. Given their affiliation with top-level universities and other research institutes, the underlying technology of the Climate-KIC start-ups is outstanding. However, entrepreneurship requires risk-taking and ambition to turn good ideas into successful businesses (Davidsson, 1989). It was found that entrepreneurs are constrained by a low level of ambition, which can be explained by Europe’s cultural

characteristics (Acs & Szerb, 2011) and the fact that technological founders primarily have a desire to become their own boss, instead of aiming for high-growth (Roberts, 1989). The second major constraint relates to the entrepreneurs' knowledge base. Given their primarily technological background, founders tend to prioritize product development over business development, and they thereby risk that their business becomes too far separated from the market. From a resource-based perspective, the entrepreneurs do not possess the right set of business-related knowledge and skills. Furthermore, we identified three barriers that cause difficulties for entrepreneurs in developing this particular resource: (1) it lies outside their zone of comfort, (2) entrepreneurs are unconscious incompetent, and (3) they tend to focus on short-term issues.

Because of these three barriers, entrepreneurs are hesitant to develop business-related knowledge. Therefore, Section 5 showed that incubators targeting early stage tenants (that suffer most from these three barriers) pursue a highly assertive and pro-active strategy in order to break through these barriers, and force tenants to prioritize business development. Incubators have multiple ways to do this, for example by making participation in particular workshops mandatory, by providing financial incentives, by letting start-ups compete with others, by bringing in a more balanced management team, or by providing pro-active and assertive coaching. When tenants mature, they become aware of the importance of business development, and therefore need less guidance. Furthermore, they develop a stronger resource base, and are therefore less dependent on the incubator. This is reflected in incubators pursuing a more demand-driven, facilitating strategy for mature ventures.

Incubators were found to increase the level of ambition of entrepreneurs by creating a community of entrepreneurs. Firms and individuals base their aspiration levels on the comparison to similar others (Cyert & March, 1963). So when 'newcomers' enter the incubator, they get inspired by other like-minded and ambitious start-ups. This causes the newcomer to set more ambitious targets for themselves as well. The importance of this process was reflected in the fact that many entrepreneurs pointed at the inspirational role of the entrepreneurial community.

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Appendix A: Case Descriptions

A.1 YES!Delft

Young Entrepreneurship Society Delft (YES!Delft) was established in 2005, by Delft university of technology and the city of Delft, with the aim of creating more high-tech jobs in the Delft region and to stimulate the valorization of knowledge generated at the university. The program is divided into four units: inspiration, education, incubation and growth. First of all, YES!Delft aims to inspire students and staff, and create awareness about entrepreneurship. In order to do so, YES!Delft organizes activities such as workshops, awards and competitions for entrepreneurial students and staff (such as the Delft Entrepreneurial Scientist Award) and guest lectures given by successful entrepreneurs. The inspiration program not only has the function to create more awareness for entrepreneurship, it also creates a pipeline of companies ready to move into the (physical) incubator. The initial incubation phase lasts three years, during which the start-ups get access to a comprehensive range of resources. After three years, when the companies are getting more mature and independent and rely more on their own resources, they move to the growth phase, where the support program is adapted to the specific needs of the companies in this phase. Tenants pay commercial rates for the office space, but pay a relative small fee to make use of the other resources.

Development Phases: the 'inspiration' part of YES!Delft aims at staff and students who have not yet recognized an opportunity, or are in the early opportunity framing phase. Given that entrepreneurs are required to work full time on their business in the 'incubation' phase, they have shown entrepreneurial commitment, and are therefore in the pre-organization phase. The 'growth' phase stretches until the sustainable returns phase.

Assertiveness: interaction is both entrepreneur and incubator initiated. However, participation in the full training program is mandatory for every entrepreneur in the incubation phase, which suggests a strong intervention approach of the incubator. In the growth phase, companies are more on their own.

Resources: In the incubation and growth phase, the incubator offers tenants access to a full range of resources, of which the workshop program and community are identified by interviewed entrepreneurs as being most critical to their success. In the growth phase, companies have developed a relatively strong resource base, and therefore rely less on the incubator's resources.

Selection process: a selection committee judges the business plans, which have to be quite sophisticated, thereby suggesting a picking the winners approach. The inspiration phase has a survival of the fittest selection policy.

A.2 Utrecht Inc.

Utrecht Inc. is a physical business incubator in the Utrecht region in the Netherlands. Utrecht University and Utrecht University of applied sciences are among the founding partners of Utrecht Inc., but the incubator does not solely focus on the creation of spin-offs from these academic institutes. Utrecht Inc. uses a 'pay for service' model, where firms pay a monthly fee, based on the size of the office space that the firm rents. As the fees paid by tenant firms only account for a small amount of the incubator's budget, the rents and fees are partly subsidized and below commercial rates. The incubation process starts with 100 – day 'pressure cooker' stage, during which companies work on their business plan. At the end of the pressure cooker, the companies pitch to an advisory board to see if they are ready to move into the incubator.

Development phases: most entrepreneurs apply for a position at the incubator when they need office space, indicating that the barrier 'entrepreneurial commitment' has overcome, and that companies are in the pre-organization phase. When companies leave, most of them have their first revenues, indicating they are in the re-orientation phase.

Assertiveness: during the pressure cooker phase, the incubator pursues a strategy of strong intervention, with intensive and assertive coaching by the incubator. The incubator has a laissez -faire dominated approach after this phase.

Resources: the incubator offers tenants access to a full range of resources, of which the external network of the incubator, as well as the community, are ranked as being most important.

Selection process: after the 'pressure cooker' phase tenants pitch to the advisory board, who determine if the tenants can get a place in the incubator. Companies are required to have a sophisticated business plan.

A.3 IncubAlliance

IncubAlliance has 20 founding or affiliated corporate and academic partnerships, all located on the high- tech region 'Saclay Plateau'. Corporate partners include large high-tech industrial organizations such as CEA (the French atomic

energy commission), EADS and EDF. IncubAlliance is a physical incubator, fully funded by local, regional and national governments. IncubAlliance distinguishes three phases in the venture creation process: pre-incubation, incubation, and post-incubation. During the (virtual) pre-incubation phase, firms are 'teased and challenged', in order to see if they are ready to move in for incubation. The incubation phase lasts for two years (for all start-ups), during which the start-ups get access to a comprehensive range of services. The start-ups do not need to pay for these services. After the incubation phase, firms should be ready to present to Venture Capitalists and attract capital. After 24 months, firms exit the incubation program, but have the opportunity to maintain their office inside the incubator, but they need to pay (commercial rates) for the office space. During this 'post-incubation' phase, firms do not receive any other form of (formal) support such as training or coaching. However, they are still able to take advantage of the business environment and may access the incubator's network on demand.

Development Phases: the fact that companies should be 'Venture capital ready' at the end of the incubation phase suggests a transition from the pre-organization phase into the re-orientation phase. The pre-incubation phase takes place in the phase prior to the re-orientation phase (the opportunity framing phase) and the post-incubation phase from the re-orientation phase into the sustainable returns phase.

Assertiveness: the incubator pursues a clear 'strong intervention' strategy during the incubation phase, as interviewed entrepreneurs indicated to be strongly guided by their coaches, who meet 'their' group of tenants on designated moments, which means that interaction is mainly incubator-initiated. During the post-incubation phase, the incubator takes a laissez-faire approach, and the interaction is mostly entrepreneur-initiated.

Resources: the incubator offers tenants access to a full range of resources, of which the coaching provided by the mentors and the community are ranked as being most important. Companies rely less on the incubator's resources in the post-incubation phase, when they have developed their own resource base, and have less opportunities to access the incubator's resources.

Selection process: the selection process is quite thorough, with representatives from all affiliated partners judging the entrepreneurs and their ideas, suggesting a 'picking the winners' selection strategy.

A.4 Venture Kick and Venture lab

Venture kick and venture lab are not affiliated with one particular university: everyone enrolled at a Swiss university can apply for the programs. Venture lab provides a wide array of entrepreneurial training modules at Swiss universities. It aims to create more awareness for entrepreneurship, and also functions to create a pipeline for the virtual incubation program, venture kick. Venture kick works with a three-stage pre-seed fund. In the first stage, eight entrepreneurs can present their project to a jury, of which 4 will be selected, and receive 10,000 CHF in pre-seed funding. Three months later, these 4 projects will again present their progress to the jury, and this time 2 projects receive another 20,000 CHF in funding. The third stage takes place 6 months later, and only one project will receive 100,000 CHF in funding. In each round, half of the projects will get additional funding, and half of them will drop out of the program. After each stage are the so called 'kickers camps'. In these two day sessions, the entrepreneurs are coached by the two founders, who are experienced entrepreneurs, and prepared for the next session. Venture kick is funded by private organizations, tenants do not have to pay to make use of the incubator's resources.

Development phases: venture lab aims at staff and students who have not yet recognized an opportunity, or are in the early opportunity framing phase. Venture kick is very clear about the criterion that entrepreneurs should apply with an idea, not yet with an established business. This clearly indicates that entrepreneurs join the incubation program during the 'opportunity framing phase': the opportunity has been recognized, but the business has not yet been established. During the later phases, some interviewed entrepreneurs already had contracts signed and were making first revenues, others didn't. This indicates that this incubation program runs somewhere until the pre-organization / re-orientation phase, depending on the particular business.

Assertiveness: All interviewees point at the assertive, sometimes even aggressive, approach of the incubator during the kicker camps. Still, entrepreneurs can approach the incubator management with questions, so there are forms of entrepreneur-initiated interaction as well, but incubator-initiated forms of coaching / kicking is the dominant form of interaction.

Resources: venture kick does not provide physical capital or trainings and workshops. Interviewed entrepreneurs regarded the financial capital and coaching to be most important.

Selection process: the entry barrier set to participate in the first round is low, but the selection process becomes more a picking the winners type as process continues and incentives become greater.

A.5 StartLife

StartLife is a sectoral valorization center focused on agro, food and living environment, and is partly financed by the province Gelderland and the ministry of economic affairs, agriculture and innovation. Wageningen University and Research (WUR) participates in StartLife, but StartLife is not a part of WUR. Every entrepreneur is assigned to a 'portfolio manager', someone who is responsible for a portfolio of start-ups in a particular sector, and functions as a contacts person, usually an expert in that particular industry. StartLife does not only support start-ups in the agro/food sector in the Wageningen region, but throughout Netherlands, and some of them even outside Europe. StartLife supports entrepreneurs and firms directly through a pre-seed or proof-of-concept fund, and gives them access to in-house expertise. StartLife is also able to connect entrepreneurs and SMEs to one of its partners, in order to provide physical capital (e.g. office or laboratory space) or human capital (e.g. external coaching or workshops).

Development phases: StartLife offers support throughout the entire venture creation process. On the one end of the spectrum, StartLife stimulates researchers to recognize and frame entrepreneurial opportunities through their involvement in 'developing a business plan' courses. On the other end, even SMEs that have outgrown the start-up phase can apply for the various types of funding.

Assertiveness: StartLife mainly uses a demand-driven and entrepreneur-initiated strategy in order to facilitate the entrepreneurs in the venture creation process.

Resources: the direct provision of financial capital is mostly valued by the entrepreneurs inside the StartLife network, as well as its external network that enables entrepreneurs to connect to external organizations.

Selection process: in order to be supported, projects have to fit in the agro / food focus of StartLife, and have to be innovative, scaleable businesses. In order to apply for financial support, firms have to fulfill the requirements set by the bank as well. The high percentage of projects that get selected (over 80 per cent) suggests a survival of the fittest selection strategy.

A.6 Imperial Innovations and Imperial Incubator

The Imperial Incubator is wholly owned by Imperial College, and is managed by Imperial Innovations, an AIM-listed investment and commercialization group which acts as Imperial's technology transfer office. Innovations originally focused solely on commercialising knowledge developed at Imperial College, but now makes investments across the UK's four leading research intensive universities: Cambridge, Oxford, UCL and Imperial College London. Imperial Innovations actively scans Imperial College for IP with the potential to be commercialized, and when the decision is made to commercialize technology through the creation of a spin-off, Imperial Innovations may invest in the new company, typically leading or co-leading investment rounds. Innovations also works to attract high quality management for new companies. The academic who leads the creation of the IP typically becomes an external advisor or Chief Technology Officer, and the company itself can move into the incubator. Spin-offs pay commercial rates for the office and laboratory space they rent. Imperial Incubator hosts both tenants in which Imperial Innovations invested in, as well as non-innovations, 'outside', companies. However, the majority of companies in the incubator are 'Innovations' companies: at the time of the visit, 13 of the 17 tenants housed in Imperial Incubator were Imperial Innovations portfolio companies.

Development Phases: Imperial Innovations is involved with businesses from the research phase and provides considerable guidance and, where necessary, capital during this phase in order to successfully build a business from research. Companies typically join the Imperial Incubator after a competent management team is formed and the company got its investment from Imperial Innovations. This indicates that the spin-off has made it past the pre-organization phase, and into the re-orientation phase.

Assertiveness: Imperial Innovations may not only recruit an experienced entrepreneur to become CEO of the company, they take seat in the board of directors as well (for portfolio companies). This indicates that Imperial Innovations pursues a 'strong intervention' strategy, having significantly influence. However, when companies enter Imperial Incubator, the need for additional resources and support is relatively low, given the maturity and strong resource base of the tenants. Imperial Incubator therefore takes a demand-driven strategy in which the entrepreneur takes the initiative: entrepreneurs still have access to a comprehensive range of resources, but interaction is mostly entrepreneur-initiated.

Resources: Imperial Innovations may provide start-ups with financial capital (investment) and human capital (a senior management team). Imperial Incubator offers tenants access to the basic physical infrastructure they need

(office space, laboratory space). Imperial Incubator may help in providing other resources as well, although the experienced management teams in combination with strong university IP and investments means that the spin offs have gathered a strong resource base themselves already. The provision of resources other than physical capital is therefore less relevant.

Selection process: given the relatively large investments, Innovations only selects the top projects to invest in. This is reflected in a picking the winners selection strategy