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Factors enhancing the internationalization process of born-globals: A comparative case study of the role of governmental support in the Montreal cleantech sector.

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Abstract – English

Purpose: The concept of 'born-global' companies is relatively new and the role of government in the process of internationalization has not been widely discussed. The number of born-global companies in Canada in the cleantech sector is rising and these firms have a direct effect on the Canadian economy. This study is set to determine the role government support has on the internationalization process of born-global companies in the cleantech sector in Montreal and its neighbouring regions as well as other factors that enhance the process of going abroad.

Design/ Methodology/ Approach: A multiple case study is used, consisting of six companies at different stages of internationalization in the cleantech sector. Data collection consists of interviews and secondary data. Interviews from three government agencies and Ecotech Quebec are used for the purposes of triangulation.

Analysis and Findings: This study discusses the mechanisms that allow government support to create positive impact on born-global companies. Government agencies do so by providing funding and financing opportunities, mentorship, consulting, and information pertaining to creation of a business and the process of setting up international operations. It was observed that government support has a positive effect on internationalization process of born-global firms, particularly within the market entry and speed of expanding operations abroad. It was also discovered that governmental assistance aids companies in network creation and validation of technology.

Research Limitations: The definition of 'born-global' firms vary therefore so is the criteria for their selection. Companies used in this study are at different stages of internationalization process and might require different support.

Originality and Value: This paper discovers specific factors that enhance internationalization of born-global firms and evaluates the effect of government assistance. There are no equivalent studies available.

Keywords: born-global firms, internationalization, cleantech sector, government support, market selection, speed of internationalization

Sommaire

Objectifs: Le concept d'entreprise à vocation internationale est relativement récent, et le rôle de l'État dans le processus d'internationalisation n'a été que très peu étudié à date. Il existe de plus en plus d'entreprises 'born-global' dans le secteur des technologies propres, un secteur de plus en plus important au développement économique du Canada. La présente étude a pour objectif de mieux comprendre l'impact du soutien gouvernemental sur le processus d'internationalisation des entreprises à vocation internationale oeuvrant dans le secteur des technologies propres dans la région de Montréal et ses environs, ainsi que d'autres facteurs pouvant faciliter le processus d'internationalisation.

Méthodologie: Nous avons eu recours à une étude de cas multiples consistant en six entreprises du secteur des technologies propres, situées à différents stades du processus d'internationalisation. La collecte de données s'est faite principalement sous la forme d'entrevues. Nous avons également employé des données secondaires. Des entrevues effectuées auprès de trois agences gouvernementales ainsi qu'Écotech sont employées à des fins de triangulation.

Analyse et conclusions: Cette étude examine les mécanismes qui permettent au soutien du gouvernement de créer un impact positif sur les entreprises 'born-global'. Les organismes gouvernementaux le font en offrant des possibilités de financement, de mentorat, de consultation et d'information sur la création d'entreprise et le processus de mise sur pied d'opérations internationales. Nos recherches démontrent que le soutien gouvernemental a un effet positif sur le processus d'internationalisation des entreprises 'born-global', notamment en ce qui a trait à l'entrée sur les marchés et la vitesse à laquelle elles effectuent leur expansion à l'étranger. Nos données démontrent par ailleurs que le soutien gouvernemental peut favoriser ces entreprises au niveau de la création de réseaux et de la validation des technologies.

Limites de la recherche: La définition, et par conséquent les critères de sélection, d'une entreprise à vocation internationale ('born-global') varient d'une étude à l'autre. Les entreprises sélectionnées pour la présente étude sont à différents stades du processus d'internationalisation et risquent ainsi d'avoir besoin de différentes formes d'assistance gouvernementale.

Pertinence et originalité: La présente étude cherche à la fois à définir des facteurs spécifiques contribuant à l'internationalisation d'entreprises 'born-global' ainsi qu'à évaluer les effets du soutien gouvernemental à cette fin. À notre connaissance aucune autre recherche semblable n'a encore été réalisée.

Mots-clés: Entreprises à vocation internationale, born-global, secteur des technologies propres, secteur cleantech, soutien gouvernemental, choix des marchés, vitesse et mode d'internationalisation

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My journey at HEC Montréal started a year and a half ago and I could not have imagined what a rewarding experience it would be. I had the opportunity to expand my knowledge on international business as well as learn many new things. I had the pleasure of meeting new people, making new friends and connecting with many professional individuals. I had the opportunity to work together with several professors on interesting projects and attend informative events. Writing a thesis had its challenges, the biggest one being able to narrow down my research topic. With the assistance of my thesis director I was able to find my niche and concentrate on a topic that was interesting to me.

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List of Abbreviations

B2B – Business to Business
BDC – Business Development Bank of Canada
BIAP – Business Innovation Access Program
CAIP – Canada Accelerator and Incubator Program
CAPEX – Capital Expenditure
CCMM – The Chamber of Commerce of Metropolitan Montreal
CMM – Montreal Metropolitan Community
CNRC – National Research Council Canada
CRD – Collaborative Research Development program
CRSNG – Natural Sciences and Engineering Research Council of Canada
CTA – Canadian Technology Accelerator
DEC – Canada Economic Development
EDC – Export Development Canada
IP – Intellectual Property
IRAP – Industrial Research Assistance Program
JV – Joint Venture
MESI – Ministry of Economy, Science and Innovation Quebec
NCE - Network of Centres of Excellence
NSERC - Natural Sciences and Engineering Research Council of Canada
R&D – Research and Development
ROI – Return on Investment
SDTC – Sustainable Development Technology Canada
SME – Small and Medium-sized Enterprises
TCS – The Canadian Trade Commissioner Service

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Chapter 1: Introduction

For the past 20 years a new breed of company began to be talked about, the born-global firm. A consultant from McKinsey & Company by the name of Michael Rennie first introduced this concept in 1993 based on the Australian exporting industry. Rennie (1993) discusses the rise of this phenomenon and these firms' ability to successfully compete on the international level with large companies that were already established. This topic was explored further by many authors especially Cavusgil and Knight (2015) who suggest that the beginning of born-global firms came in the 1980s, when globalization was picking up its speed and many new firms were reaching out to customers abroad. Nonetheless, it is a relatively new area of research, which started to be discussed more and more in the early 2000s. This phenomenon may also be referred to as international new ventures or global start-ups. Even though there have been numerous papers written by prominent authors there is still much left unknown. Cavusgil and Knight (2015, p. 3) point out that not only do those countries with smaller domestic markets, such as Australia, produce these companies, but even countries with large domestic markets, such as the US, see an accelarated growth in internationalization and born-globals creation.

The number of born-global companies is rapidly increasing each year due to improved communication and transportation systems, low trade barriers and customers with a global mindset. These types of companies are becoming the new norm and range from technology firms to online retail. Gary A Knight and Cavusgil (2004, p. 137) say that "the born-global phenomenon is heartening because it implies the emergence of an international exchange system in which any firm, regardless of age, experience, and tangible resources, can be an active international business participant". Given the increasing presence and potential of born-globals, it is important to study them over a period of several years, from their inception all the way to maturity. Kuivalainen, Sundqvist, and Servais (2007) mention that it is important to come up with a clear and unanimous definition of this phenomenon and what exactly it means to be a born-global firm before proceeding with other research on the matter. Fan and Phan (2007, pp. 1127-1128) suggest that it is important to focus on the economic and non-economic context in which internationalization decisions of born-globals are made. This way it will be possible to see what factors affect the creation and success of these companies and what can be improved in the

future. Sui, Yu, and Baum (2012, pp. 530-531) recommend studying the influence of factors such as international experience and strategic orientation on the individual level, as well as the role and significance of external environment, on born-globals.

The Canadian cleantech industry has a significant impact on the Canadian economy. It consists of over 800 companies, mostly SMEs, throughout Canada and employs 50,000 Canadians (SDTC, 2017). It is also a profitable industry as it has $12 billion in revenues and is constantly growing, with $6 billion in export revenues (SDTC, 2017). While cleantech companies lack private investors due to high risk, the Canadian government provides assistance to these companies in order to help them grow and reach foreign markets.

Rennie (1993, p. 51) brings up an important fact that the government plays an important role in the increasing number of born-global firms, suggesting that firms that are looking to export are lacking "credibility, access to finance, market information, technology and international mindset". All these elements are integral for born-global companies in order to reach international market. Governmental agencies are able to provide many services and guide firms on a successful path to internationalization but not all companies access or rely on this assistance. Government agencies must therefore pay attention to the growing concerns of these firms in order to "establish a competitive advantage, increase exports and job growth (Rennie, 1993, p. 51). Support from government is a critical factor for born-global companies and Rialp, Rialp, and Knight (2005) point out the importance of further exploring the factors of the process of internationalization for these firms. Laanti, Gabrielsson, and Gabrielsson (2007, p. 1113) mention that government subsidies are an important source of financing for born-globals especially during the establishment of the company stage as well as during the development stage.

The purpose of this paper is to explore the factors that help enhance the internationalization process of born-globals and determine what factors companies appreciate. In particular, the objective is to detail the role of government agencies and the assistance they provide, as well as reveal if specific actions or specific government levels have a greater impact. This paper will also provide a conceptual model developed based on the research on the

internationalization process of born-global companies and government assistance.

Chapter 2: Literature Review

As mentioned in the introduction, this chapter concentrates on the born-global phenomenon and therefore the literature review will concentrate on the research regarding born-global firms as well as the internationalization process of firms. It also discusses the specific process of internationalization that the born-global companies follow. It explains some of the factors that contribute to firms going abroad such as market selection, speed of internationalization and government involvement. Following that, the paper will discuss some of the aspects that are not widely discussed in research papers to date.

2.1. Born-Global Firms

The literature review mostly consists of defining the born-global phenomenon from its earliest days to present. This provides the ability to see the evolution of the meaning of born-globals as well as the differences and similarities between different authors.

Many authors (Madsen, Rasmussen, and Servais, 2000; Kuivalainen, Sundqvist, & Servais, 2007; Fan and Phan, 2007; Sui, Yu, and Baum, 2012; Hennart, 2013) base and develop their definition and understanding of the born-global phenomenon on two authors, Gary A Knight and Cavusgil (1996). Gary A Knight and Cavusgil (2004, pp. 124-137) describe born-global firms as companies that internationalize during the inception period and expand into the foreign market quickly and effectively. The cornerstone of this success is the ability to innovate and have access to knowledge-based resources, as well as have the ability to utilize technology and rely on management that is globally focused. Fan and Phan (2007, pp. 1114-1115) describe born-global firms as companies that internationalize in their early stages and this process represents a larger part of their operational capacity. The authors also mention that in order to reduce risk and cost, founding managers should either have been exposed to, and have experience in this type of business in the past, or have the ability to learn quickly. Authors also mention that born-global firms that specialize in niche markets (i.e. specific technology) will be able to conduct business more easily with customers and suppliers who also specialize in the

same type of niche market. Hennart (2013, pp. 117-127) describes born-global firms (BGs) or international new ventures (INVs) as firms that sell niche products at low information, transportation, and adaptation costs to expert customers dispersed throughout the world, and are based in a country with a small home market for the product or service. The author also mentions that these companies do not differentiate when acquiring foreign or domestic customers, thus making them accidental internationalists.

Madsen, Rasmussen, and Servais (2000, p. 247) define born-globals as "firms that were established after 1976 and have reached a share of foreign sales of at least 25% after having started export activities within three years after their birth". These firms tend to have a large share of foreign sales, increased geographic scope and specialized productions but often lack resources due to being smaller sized firms. These types of firms came to be due to increasing globalization around the world and more evolved and global consumers. The authors suggest that as the target market becomes more narrow and specialized, the products become more innovative and firm relationships aid in the internationalization process. Born-globals are becoming more prominent because of developments in technology, communication and transportation sectors as well as the fact that more founders and managers have international experience and connections globally. These firms rely on their global networks in foreign markets in order to gain access to local distributors, customers and partners. Moen (2002, p. 156) suggests that those in charge of decision making in the company should have a global outlook and be able to adjust to fluctuating market conditions, both at home and abroad.

Kuivalainen et al. (2007, pp. 253-263) describe born-global firms as companies that internationalize rapidly, precisely within three years from inception and have at least a 25% share of foreign sales. The authors also state that globalization of the market and customer needs play an important role in the creation and success of these firms because they lower the costs of doing business abroad. The article differentiates between two types of born-global firms, "apparently born global" – conduct business/export to nearby markets at around 25% export ratio, and "true born-global" – conduct business in many distant markets. Sui et al. (2012, pp. 520-529) describe born-global firms as companies that start exporting early, from inception, with the majority of their exports reaching global markets, making most of their revenues derived

from exporting. These firms internationalize much sooner and more rapidly than non-born global firms. The authors also mention that born-globals tend to work in harsher and more aggressive environments and be a lot more committed resource-wise. Compared to the article by Sui et al. (2012), the authors (Sui & Baum, 2014, pp. 821-827) built upon their previous definition by suggesting that these firms are able to increase their competitive advantage due to that fact that they concentrate on a certain niche market through innovation of the firm and those who work within it.

Gleason, Madura, and Wiggenhorn (2006, pp. 97-115) agree that born-globals participate in international operations from their launch with the help of technological advancements and lowered entry barriers. They also say that these firms are diversified in their products for a given market and get support from venture capitalists. The article suggests that managers and executives of born-globals possess a lot of collective international experience. These companies engage in rapid internationalization and diversify their sales. Born-globals tend to be a lot riskier than domestic companies but the returns and long-term benefits are much higher. Freeman, Hutchings, and Chetty (2012, p. 425) propose that the internationalization process of born-globals is rapid and so is their adoption of technology in order to generate profits. In order to reduce risk, the foreign markets are at times chosen by cultural proximity, though this does not mean that born-globals will not venture into a culturally non-proximate market if it is deemed beneficial and profitable.

Tanev (2012, p. 5) defines a born-global firm as one that is set to exploit a niche market globally from its inception. The author also suggests that these types of firms are made up of eight characteristics. The first characteristic is having international activity from inception or right after it. Born-globals will begin doing so by means of exports and eventually throughout the process of internationalization attain business partners abroad. Second, born-globals have limited financial, tangible and human resources. Third, born-global firms come from many different industries and sectors, not solely the technology sector. Fourth, the management and founders of these firms have an international outlook. They are able to take risks when reaching new markets and have the ability to adapt and innovate. Fifth, born-globals tend to specialize their product depending on the market they are in. Given that these firms target niche markets, they utilize

differentiation strategies to attract customers. Many large non-born-global firms are not able to do so because these niche markets might be too small for them to concentrate on. Sixth, due to technological advancements, born-globals are able to provide products of great quality. Seventh, born-globals rely on information and communication technologies to be able to precisely narrow down their target market in each country they are going to or are in. Eighth, born-globals have the ability to maintain flexible global operations because they use external agencies for distribution purposes in each market. This gives them the ability to enter or exit any new market relatively quickly and efficiently.

2.1.1. Internationalization Process

The process of internationalization is an important process for any firm that is planning on going global and reaching new markets, especially for born-globals, given that their resources are more limited and their domestic market might be too small or oversaturated. The standard process however does not fit in with the concept of born-globals and calls for a change in theory or, at the least, adjustments. Before discussing the steps these firms take to rapidly succeed in going abroad, the concept of internationalization should be examined further.

One of the most prominent theories, proposed by Johanson and Vahlne (1977, pp. 23-27), that discusses the Uppsala Model and how firms learn and acquire knowldege before going into a foreign market. Here, a lack of knowledge of these markets is an impediment but does not necessarily prevent success. The authors suggest that this is a gradual process that each firm partakes in, which controls the speed and mode of internationalization. Decisions are made in progressive stages over time from gaining experience in domestic market and moving to international markets in order for the firm to begin exporting, creating channels and creating subsidiaries. They divide the model into two parts; market knowledge and market commitment. Market knowledge refers to what the firm knows about the foreign market and is based on a firm's own experience, while market commitment refers to the resources that it commits to that foreign market. The former leads and justifies the latter in form of firm's future potential opportunities and risks. Through this model a firm can grow gradually, seek long term profits and decrease risk.

Carlson (1966) suggests that the primary issue for firms that are planning to go abroad face is the lack of knowledge about the market in question and conducting business there. This increases the levels of risk for the firm. Another factor that influences internationalization is the amount of control a firm will have over their business practice abroad as well as by whom and how these decisions will be made. Fligstein (1985) proposes that firms imitate actions and business choices of other organizations, especially those that are larger in size than theirs. This way the degree of success increases and the decisions made are validated by past success of firms in a similar field. By learning from the fortunes and mistakes of others, firms going into foreign markets can avoid certain actions or take on others.

Models like the Uppsala Model have an impact on the firms' decisions in regards to foreign markets through the process of obtaining knowledge and education about given markets, but also suggests that the model cannot predict internationalization behaviour and is too narrow in its scope (Carlson, 1966; Forsgren, 2002). Firms learn through conducting business with others, such as from their business relationships and their networks. The process of internationalization is not necessarily a slow one because the knowledge acquired through working relations and interactions with other organizations aids firms in the process of going global. Firms can mimic the behaviour of other companies and can learn how to deal in potential situtations in the future through experiences that other firms had in similar situations. Experiential learning acts as a driving mechanism for internationalizing and influences the decisions about firms' commitments (Forsgren, 2002; Kraatz, 1998; Lane & Lubatkin, 1998).

Johanson and Vahlne (2009, pp. 1411-1420) revisited their original Uppsala Model after 30 years and made several significant adjustments due to changes in the market and business practices. Their present view incorporates the aspects of relationships and networks connectivity instead of breaking up factors into independent variables. They have now adjusted their model to incorporate trust-building and knowledge creation though relationships. Networks are linked to each other and therefore provide insidership, which is a key to internationalization and allows firms to learn, build trust and strengthen their commitments. If there is no interconnectedness then the firms are inclined to have liability of outsidership (Johanson and Vahlne, 2009). Relationships facilitate a learning process which in turn provides further activities to all other

aspects of the business and speed up the internationalization process. Moreover, firms not only learn from their partners but also from their partners' partners. Knowledge becomes shared and works its way down to all parties involved directly and indirectly (Hagg & Johanson, 1982; Johanson & Vahlne, 2009; Kogut, 2000). The authors suggest that insidership is an essential element and plays a significant role in the value of a firm's networks. These relations will ease the transition to new markets as firms learn more about markets abroad where they might not have had any experience in previously. Johanson and Vahlne (2009) also propose that if a firm is lacking knowledge in a specific market, it can utilize someone who is familiar with it and whom the firm has trust in. As such, trust may act as a substitute for knowledge, which is also a precondition for commitment. In this standpoint, the internationalization process of a firm involves progressive learning and development of commitment, through opportunity and use of networks.

Olejnik and Swoboda (2012, pp. 466-470) propose three different patterns of internationalization: traditional, born-global and born-again global. These patterns change throughout the years due to market and technological changes and are determined by growth orientation, communication expertise, capabilities, marketing and the outlook on internationalization. Traditional and born-again global firms are older firms who decided to go abroad later. Depending on what type of pattern a firm is considered to be, the level of commitment also vary in regards to global markets (Bell, McNaughton, Young, & Crick, 2003; McNaughton, 2003; Olejnik & Swoboda, 2012).

Kuivalainen, Sundqvist, Saarenketo, and McNaughton (2012, pp. 450-452) propose that the process firms must go through when going abroad is a certain pathway, consisting of different phases, and is based on the behaviour of the firm. Factors influencing the internationalization process are divided into three levels: managerial, firm and environmental (Kuivalainen et al., 2012). At the managerial level the factors are mindset, experience, and entrepreneurial orientation. At the firm level the factors are resources, knowledge, strategic orientation, networks, capabilities and liabilities. Finally, at the environmental level the factors are industry, uncertainty, distance, country of origin, and other environmental factors such as technology, competitors and customers. The main characteristics that determine a firm's

internationalization path are timing, scope and scale. Kalanit Efrat and Shoham (2013, p. 538) point out the importance of choosing the right entry modes in order to successfully internationalize because that will affect the performance and longevity of the firm abroad. The way a firm decides to enter a foreign market is directly related to how much commitment they are willing to make and how much risk they are willing to take on (Agarwal & Ramaswami, 1992; Sharma & Blomstermo, 2003). High-commitment entry modes are not a good fit for born-globals given that they lack resources, especially financial to make these types of investments at the beginning.

Freixanet (2012, pp. 1065-1077) explain that due to globalization, lowered barriers and open borders, as well as a free flow of capital and goods, there are many new possibilities for firms that want to internationalize. Small to medium sized (SMEs) firms will have more difficulties going abroad due to lack of resources, capabilitites and motivation, therefore not taking full advantage of the possible new markets. The author suggests that firms should use public and private services available to them in order to make this transition possible. Firms that use export promotion programs can increase their competitivness and participate on the global scale. Companies, particularly small ones, that engage in foreign sales and have a larger variety of products tend to have founders and managers who have a well-developed social network (Brush, Edelman, & Manolova, 2002, pp. 1-11). This network, along with international competencies and inclinations, will improve the chances of successful internationalization. Brush et al. (2002) also mention that technology and telecommunication improvements help small firms connect more quickly and easily with customers, suppliers and foreign markets. The use of government assistance is also available for these firms in terms of educating them on laws abroad, international finance, as well as approaches of acquiring customers. In short, the resources and capabilities possessed by a firm are critical in the process of internationalization and its ability to compete globally.

2.1.2. Internationalization Process of Born-Globals

Madsen and Servais (1997, pp. 561-567) propose that born-globals do not directly follow traditional internationalization models because they do not internationalize in a gradual manner. When it comes to market reach, entry modes and policies, born-globals have a more evolutionary

approach. Usually firms take time and conquer the domestic market before going abroad in order to reduce risk and uncertainty stemming from their lack of knowledge about foreign markets. The authors suggest that there are three factors that gave rise to born-globals and their internationalization process: 1) the market conditions have changed over time, 2) new technological advancements around the world, which facilitate easier communication, production and transportation, and 3) founders and managers have greater capabilities and have more international experience. Due to changes in the market, firms are now beginning to specialize and concentrate on niche markets. The domestic market might no longer be profitable enough, or already well saturated, and for that reason firms tend to look into expanding into foreign markets much sooner than before. Due to rapid technological developments, innovation increases and companies are now able to cater products for different needs in different countries, therefore need to be available globally more rapidly (Andersen, Blenker, & Christensen, 1995; Madsen & Servais, 1997). The authors also indicate that many firms already have networks and relations around the world and participate in global sourcing, and for this reason it is now easier to reach these markets. Firms also tend to internationalize earlier on because they are able to receive financing from different sources, not only domestically but from institutions in different countries as well. This lowers already reduced entry barriers. Founders and managers in born-globals usually tend to have international experience, whether it is in form of living abroad, working abroad or being educated abroad, which increases their competencies and skills and helps them develop relationships on the global level. Because of already existing international exposure, the psychic distance is decreased (Madsen and Servais, 1997), and this mobility and flexibility between individuals, cultures and languages opens up more means of communication within the company and abroad. As the market becomes less differentiated, new opportunities arise and the born-global firms are able to hire people from different backrounds and countries who will add to the capabilities of the firm and facilitate the internationalization process.

Sharma and Blomstermo (2003, pp. 739-740) suggest that before entering a foreign market, born-global firms have existing knowledge about it and the selection process of an entry mode is based on said knowledge as well as the knowledge provided to them by their network ties. Much of the time, firms will export to countries that are culturally similar because their existing knowledge can be easily applied there. The authors mention the relevance of network

ties and propose that the weaker ones, those that are emotionally low and do not take much time, are more suitable for born-globals because they build stronger connections with foreign firms and so increase their knowledge base. Born-globals are more experimental and innovative when entering foreign markets because they do not have previous experience in that area. The authors suggest that these firms' internationalization process and choice of entry modes is guided by knowledge gained through their networks.

2.2. Market Selection

Born-global firms are heavily involved in exporting from their inception or shortly thereafter (Gary A. Knight, 1997; Gary A Knight & Cavusgil, 1996; Oviatt & McDougall, 1994; Preece, Miles, & Baetz, 1999). There are some differences between the large companies that are already established compared to start-ups. Firms that have just begun their activities do not have many resources and will rely on personal relationships and networks, as well as on possible joint ventures due to the need of establishing new distribution channels (McDougall, Shane, & Oviatt, 1994). Due to psychic distance (Moen & Servais, 2002, p. 58), born-globals will tend to export to those countries they consider 'closer' and most similar to them, and will only later expand to countries that are 'further' away from them given their success.

Born-globals require a significant amount of funding in order to reach foreign markets and start exporting. Moen (2000) suggests that concentrating on a niche market will increase the chances of success of exporting. Born-globals have an easier time internationalizing and selecting a desired market because the reduced entry barriers give them better access to this market (K. Efrat & Shoham, 2012). Other factors that play a role in rapid exporting for born-globals are the advancements made in technology, communications and transportation (K. Efrat & Shoham, 2012; Varma, 2011). The uncertainty, challenges and risks associated with going abroad push born-globals to export to markets where physic distance is low (Moen & Servais, 2002; Trudgen & Freeman, 2014). Trudgen and Freeman (2014, p. 571) also suggest that if firms select physically distant markets, it is an indication of long-term future plans.

2.3. Speed of Internationalization

Casillas and Acedo (2013, pp. 15-17) discuss the fact that the speed of internationalization is not

widely studied because the majority of researchers' efforts go to looking at entry modes and market selection. The authors define speed as a "relationship between time and a company's international events, which involves identifying milestones for the internationalization process itself and differentiating between companies that progress through an established process and those that internationalize according to other patterns". Speed is measured as a length of time based on accomplishing certain goals, while the concept of time relates to dates and specific periods. There are three types of speed discussed: 1) growth of international concentration, 2) increase of commitment of resources, and 3) change of range of global markets (Casillas & Acedo, 2013). The first type of speed refers to the volume of sales a firm makes from abroad. The second type of speed refers to the amount of resources committed to business practices abroad, such as the number of workers and assets there. The third type of speed refers to the number of countries the firm is present in and their distance from the home market. The authors divide the factors of speed into three categories: individual level, interorganizational level and firm level. Casillas and Acedo (2013, p. 25) propose that the individual level consists of sub-factors such as foreign experience, education abroad and global vision. The interorganizational level consists of social networks, international alliances, and rivalry and imitation, while the firm level consists of resources, age and location.

Loane and Bell (2006, pp. 468-478) discuss the importance of networks to the speed of internationalization. They look at both existing networks that the firm has established as well as the need for building new networks. Firms need to utilize their networks in order to gain knowledge about a new or a potential market, this also helps them stay ahead of their competition. What the authors have found is that a large percentage of firms relied on new network creation when it comes to going abroad because their existing networks are not sufficient enough. Firms aspire to internationalize quickly in order to capture a new market and create new opportunities for themselves regardless of the distance of said market. The network approach discussed by Loane and Bell (2006, p. 471) proposes a behavioural perspective of the international activities led by the these firms, and define rapid internationalizers as "those new ventures that exhibit an innate propensity to engage in a meaningful level of international business activity at or near inception with the intent of achieving strategic competitive advantage". Their study also found that firms choose to create new networks over strengthening

the old ones in order to cater to their needs. Network building and creation does not stop once the firm has made its way abroad because it is a continuous process where firms may want to internationalize further and faster.

Prashantham and Young (2011) theorized that there is a difference between the speed of internationalization at the start of the process versus the time between different international activities. The former refers to the time and speed it takes a firm to go abroad from inception and the latter refers to the speed of conducting business abroad. Both forms of speed are critical to consider in order to increase the chances of success and knowledge creation abroad. Zahra and George (2002) classify the internationalization process into 3 main factors: extent, breadth/scope and speed. Each firm takes different steps in the internationalization process and speed affects many factors, within the firm and outside the firm. Kiss and Danis (2008, p. 388) examine the role of social networks on the speed of internationalization, depending on different levels of institutional development and its strong or weak ties. The authors refer to strong ties as having trust and emotional connections that are developed over time, whereas weak ties have less emotional involvement and fewer interactions. Here, weak ties are not necessarily considered as negative, as they facilitate relations with external agents and provide more leeway for international opportunities. Firms that come from countries with less developed institutions require larger and stronger networks to facilitate rapid internationalization, whereas firms from countries with more developed institution require networks with weaker ties. In order to speed up the process of conducting business in foreign markets, firms need to have weak ties in those markets in order to have access to market information and knowledge of business practices there.

2.4. Internationalization Process and Government Involvement

In their study, Spence and Crick (2006, p. 531) compared the internationalization process of high-tech SMEs from Canada and UK and the government solutions provided to both. Canadian firms require government assistance in overcoming cultural distance, for example in markets like Europe, whereas in the UK such assistance is not required for that market due to proximity. Government agencies can facilitate the internationalization process by helping firms overcome obstacles that are associated with business practices within different cultures. Authors also mention that government agencies in Canada provide firms with possible opportunities in

different markets and whether or not such markets will be potentially profitable. Another factor that is discussed is the ability to receive financing through government contracts for projects abroad. In both UK and Canada, executives who have been involved with government organizations were better informed on foreign market conditions and business practices. Government support needs to be better tailored to firms' experiences and cater more to the individual needs of the companies rather than simply provide general assistance (Chaudhry & Crick, 2002; Spence & Crick, 2006).

In his study, Crick (1997, p. 136) examines the outlook of managers of SMEs from the UK on export assistance programs depending on the stage of their internationalization process as well as knowledge of programs available to them. Government policymakers set up different schemes to encourage and facilitate firms with foreign operations, however they are restricted in what they can offer due to regulations of other countries. Government agencies need to be flexible when it comes to rules and regulations if they truly hope to enable firms in the export process (Albaum, 1983; Crick, 1997; Gill & Brady, 1982). Some of the assistance provided to SMEs takes the form of programs such as seminars, counseling and export financing, market development programs, such as distribution of sales to foreign firms, trade shows and market analysis (Crick, 1997, p. 140). Government assistance varies from country to country and also depends on the type of relations the home country has with the host country. The author mentions that larger firms will have no problems exporting whether or not they utilize government assistance because of financial resources, though this is not the case for SMEs given their constraints due to smaller size. For this reason, the support provided must be more effective. At times, a given firm may not utilize or request the resources available to it, making government assistance inefficient because of a specific managerial outlook on it. The author suggests that to maximize the benefit of these limited government resources to firms, government support needs to be personalized to the individual needs and commitment stages of each firm.

Korhonen, Luostarinen, and Welch (1996) discuss government policies in Finland towards inward international operations, such as imports through franchising, licensing and agreements. Government support is more focused on facilitating outward operations, such as

exports (Korhonen et al., 1996; Robles & Hozier, 1986). The government does however provide help to inward flows in technology sectors, and direct investments through tax breaks, though this aid is primarily geared towards exporting operations. The authors suggest that government must create links between inwards and outwards flows to better support internationalization process (Korhonen et al., 1996; R. K. Luostarinen, 1994; Welch & Luostarinen, 1993). Some of the information that firms might inquire about relates to rules and regulations, duties, contracts, insurance, transportation, as well as technology for inbound operations. The Finnish government provides general support for SMEs in the form of financing without specific emphasis on inward internationalization. R. Luostarinen and Gabrielsson (2006, p. 795) discuss Finnish born-globals in high-tech, high-design, high-service business sectors and classify them into three initial stages of development (research and development, domestic, and entry) and into four main stages (starting, development, growth, and mature). They suggest that it is a difficult task for government to provide support to born-globals due to the fact that it is a relatively new phenomenon and they do not follow the standard internationalization pattern. Like in the study mentioned above, it is suggested that government also put efforts into promoting inward operations because firms will require both at some point. Born-globals require more assistance than standard companies because they go abroad much sooner, need more resources, and need to establish a customer base outside the domestic market, making themselves known abroad and have different strategies for each foreign market (R. Luostarinen & Gabrielsson, 2006, p. 796). By providing these firms with support in the areas of marketing and implementation, they will be able to navigate founders of born-globals into the global market. By widening the variety of services provided, government will be able to support not only exporting efforts, but also all the other steps required when internationalizing rapidly.

Preece et al. (1999, p. 260) conducted a study involving small technology-based firms from Ontario in order to understand the importance of sales from abroad and the number of different areas their revenue is coming from. Some aspects that play a role for these firms are the amount of resources they have, their attitudes towards internationalizing, the age of the firm and the types of government assistance that support their international activities. Small firms require guidance in order to stay competitive at home and abroad. The authors suggest that the types of assistance provided is at times questioned and not always utilized when needed, but is deemed

beneficial by firms who require export resources. The study showed that many of these small technology-based firms relied on government support because they required certain resources that they were lacking. Some of the services that are available to them are foreign trade shows, support groups, information seminars in order to aid managers in developing a more globally-focused mindset (Preece et al., 1999, p. 275). In this study, Albaum (1983, p. 68) looked at the levels of awareness and the extent of use of government assistance of small manufacturers from Oregon, Washington and Idaho as well the perception they have towards the services offered. Some issues that small firms may face when internationalizing are competition abroad, deficiency of clients, documentation needed for foreign markets, distribution abroad and financing. The author suggests that government support is often not utilized of because it is either not known of or does not seem effective to the firms. Some of the assistance that is available is in form of export promotions and other programs from business oriented government departments. The study suggests that some feel that the support is not significant because the different stages of firms' development are not recognized and grouped together, or the selection process is biased.

2.5. Research Gap

Evidently there is a certain aspect of literature that has not been explored in great depths when it comes to born-global companies internationalizing and the effect government support has on that process. Through the process of the literature review, three outcomes became evident, which explain why the government invests resources into the development and internationalization of born-global firms. These outcomes are market selection and entry, speed of internationalization and overall internationalization performance. In order to make the government's efforts more effective, it is of value to know what aspects of support companies find most valuable and beneficial, as our understanding of the process is limited.

As suggested by McDougal et al. (1994), firms rely on networks for the purposes of selecting their markets and distributing their products. Such help is available through different governmental agencies as discussed by Crick (1997) through provision of market development programs and market analysis. Reduced entry barriers allow born-globals to access new markets with more ease as suggested by Efrat and Shoham (2012). Literature suggests that the support provided by governmental agencies has a positive effect on market selection and market entry for

born-global companies when going abroad because of the variety of services that these agencies offer.

Kiss and Danis (2008) suggest that the speed of accessing foreign markets stems from the development of institutions and what they offer in terms of market information, while Albaum (1983) points out the importance of having access to the right information when trying to rapidly internationalize. Loane and Bell (2006) mention that the speed of internationalization is linked to the number of networks that firms have established. Government agencies at home have access to and ties with government agencies abroad, making it possible to link firms with the host country quicker and therefore positively affecting the speed of internationalization.

As proposed by Spence and Crick (2006) firms require assistance from the government when beginning the process of conducting international activities. Given that firms will face obstacles in the internationalization process it is crucial to have assistance from the government in order to establish successful business practices abroad. Preece et al. (1999) propose that government agencies have the ability to provide support and resources to firms who are in need of them. Luostarinen and Gabrielsson (2006) discuss the importance of providing born-globals with assistance because they do not follow the standard internationalization process in their quest to successfully perform abroad. Literature suggests that government support positively affects the overall internationalization performance of born-global companies.

A conceptual model will be built in this paper in order to explain the factors contributing to a successful internationalization of born-globals and the mechanisms that allow it to happen. In particular, this model aims to detail the role of government agencies and reveal whether or not specific actions or specific government levels have a higher impact on born-globals. The outcome should help better understand the conditions for success in the internationalization process of born-globals, the role government agencies play in it and what companies appreciate most in the support that they receive.

Chapter 3: Research Question and Objectives

Considering the availability of information regarding the born-global companies and the role of government during the internationalization process, the research question is: *"How does governmental support influence the internationalization process of born-globals in the cleantech sector of Montreal?"* This paper is examining the factors enhancing the internationalization process of born-global firms, specifically support provided by the government.

The objectives of this paper are:

1. To explore the link between governmental assistance and the internationalization performance of born-global companies, in particular market selection and speed

2. To compare born-global companies and the effect governmental assistance has on them

3.1. Conceptual Model

A conceptual model (Figure 1) was developed for this paper based on the literature presented in Chapter 2. This model is designed to assist in creating the interview questions discussed in the following chapter and provide guidance for the analysis.

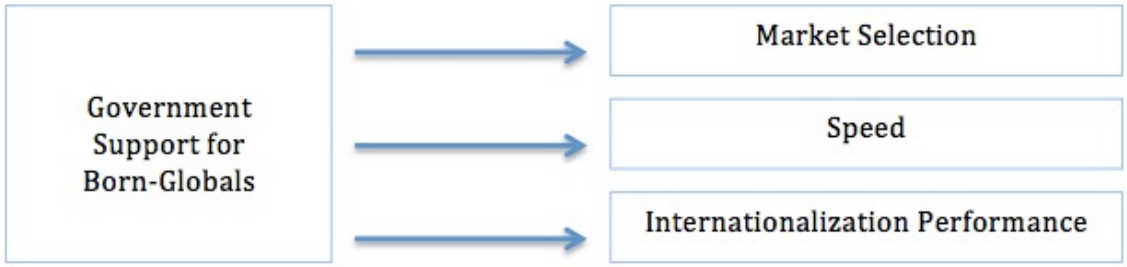

Figure 1: Conceptual Model

Chapter 4: Research Context

This chapter examines the cleantech sector of Quebec, Écotech Québec, and outlines what types of services the organization offers to firms in the cleantech industry. Three levels of government

(federal, provincial and municipal) are also examined along with the summaries of their offerings to firms that are planning to internationalize, or are in the process of internationalization.

4.1. Écotech Québec

Écotech Québec is an autonomous non-profit organization located in Montreal. The creation of this organization stemmed from the booming number of companies in the cleantech sector in Quebec. It consists of approximately 500 member companies in the cleantech industry, 70% of which have international activities (Ecotech, 2016). In order to be considered a part of the cleantech sector, companies and their products/services/technologies must "significantly reduce negative impacts on the environment, offer users superior performance at lower cost and help improve quality of life by optimizing resource use" (Ecotech, 2016).

Écotech Québec's mission is to "mobilize key players of the green economy to create the most favourable conditions for the development and growth of companies, and encourages end-users to increase the deployment of clean technologies" (Ecotech, 2016). It is the first organization in Canada that unites key players in the clean technology sector in Quebec such as innovative companies, centers for research and development/technological transfers, large end-user companies, financial sector, and training and professional development organizations and institutions (Ecotech, 2016). The sector is classified into 8 categories: air, energy efficiency, green chemistry, renewable energy, residual waste, soil & groundwater, sustainable mobility and water (Ecotech, 2016). Members of Écotech Québec receive many benefits such as having access to financing opportunities, generating business through the network, networking with other members and government representatives, receiving privileged information regarding the industry and its development, as well as opportunities to meet international buyers (Ecotech, 2016). The organization also assists non-member firms in the cleantech sector. Firms that are part of Écotech Québec have access to Cleantech Network International, an umbrella organization that brings together clean technology firms from Asia, Europe and the United States. This provides companies with the ability to collaborate with a wide variety of other firms on new and innovative ideas.

4.2. Federal Government

4.2.1. The Canadian Trade Commissioner Service

The Canadian Trade Commissioner Service (TCS) is a part of Foreign Affairs, Trade and Development Canada and aims to assist companies on the international level. TCS was created in 1894 and helps companies "succeed in foreign markets by promoting the economic interests of Canada in the global marketplace" (TCS, 2016). TCS's mission is to increase Canadian prosperity as their work has an overall effect on the country, companies and Canadians. TCS plays an important economic role, as the global economy is constantly evolving and one fifth of all jobs in Canada are "linked to the international trade" (TCS, 2016). Many Canadian companies are very successful in the global market and TCS provides them with services across Canada as well as around the world. Some of their services include "on-the-ground intelligence, qualified contacts, partnership opportunities and practical advice on foreign markets to help make better, more timely and cost-effective decisions" (TCS, 2016). Most of the services provided by TCS are 'soft' services though it has recently begun small funding programs for companies going abroad. TCS helps companies who are thinking of internationalizing, companies who are already in the process of internationalization, as well as companies that are already established by providing the following support (TCS, 2016):

- Country information: market facts, market reports, visit information
- Information on specific sectors around the globe
- Guides on exporting and business strategies
- Knowledge centre that provides online resources regarding exporting
- Information regarding different events and conferences in Canada and abroad
- Information regarding trade missions to help network and receive investment opportunities
- There are some funding programs to help increase innovation and reach the global market: Canadian International Innovation Program, Going Global-Innovation and EUREKA international research and development network
- Collaboration opportunities with different networks and countries. Agreements were specifically created to successfully partner and work with other countries

4.2.2. Export Development Canada

Export Development Canada (EDC) is a Canadian credit agency that specializes in exports (EDC, 2016). It provides support to Canadian companies that are planning to engage in international opportunities and reach global markets. EDC is a Crown corporation that relies on self-financing and does not take political directions from the government. Some of the services it provides are: insurance, financing, connecting products and small business solutions to Canadian firms and investors as well as international customers (EDC, 2016). EDC also provides assistance in inward and outward Canadian direct investment. The agency works together with several partners such as other financial institutions and cooperates with the Government of Canada.

EDC provides financial solutions that address the challenges companies face when they go abroad. In order to be independent from the Canadian government and remain self-sufficient, EDC relies on the interest it collects from loans and premiums from insurance products (EDC, 2016). EDC maintains a standard in the companies it works with and makes sure that all projects are "financially, environmentally and socially responsible" (EDC, 2016). EDC works with TCS in order to match up SMEs that do not have an international presence with international opportunities in order to create stronger relationships between companies and other countries. EDC also works with Business Development Bank of Canada (BDC) to provide services and financial support for firms looking to internationalize (EDC, 2016). Some of the services that are offered by EDC are as follows (EDC, 2016):

- Provision of information relating to exporting
- Provides country information
- Provides export financing
- Information regarding international opportunities
- Provides trade credit insurance, post bonds and political risk insurance
- Protection against risk

4.2.3. Sustainable Development Technology Canada

Sustainable Development Technology Canada (SDTC) is a "not-for-profit foundation that finances and supports the development and demonstration of clean technologies which provide solutions to issues of climate change, clean air, water quality and soil, and which deliver economic, environment and health benefits to Canadians" (Canada.ca, 2015). The foundation provides funding to Canadian companies in the cleantech sector. SDTC collaborates with government agencies, private companies and universities to provide the best possible support. It operates "at arm's length and receives funding from the Government of Canada" (SDTC, 2017). The foundation works together with entrepreneurs and assists them with their innovative products in order to benefit the Canadian economy. SDTC provides coaching and funding opportunities (SDTC, 2017) for those companies that meet the eligibility criteria and connects them with their extensive network.

4.2.4. Business Development Bank of Canada

Business Development Bank of Canada (BDC) is "Canada's business development bank and the only financial institution devoted exclusively to entrepreneurs. It is a financially sustainable Crown corporation and operates at arm's length from its sole shareholder, the Government of Canada" (BDC, 2017). BDC provides support to entrepreneurs and small and medium-sized businesses during all phases of their business development no matter what industry they are in. Services provided by BDC are in place to support and help grow Canadian businesses and include the following (BDC, 2017):

- Financing (loans for projects and working capital)
- Indirect financing (solutions for financial intermediaries)
- Venture capital
- Growth and transition capital
- Growth equity
- Consulting
- International expansion

4.3. Provincial Government

The Ministry of Economy, Science and Innovation Quebec (MESI) aims to support business growth, entrepreneurship, science, innovation and investment (MESI, 2016). MESI is in charge of employing digital strategies and advises the Government of the new developments in the Quebec region in regards to job possibilities, economic success and sustainability. The objective of MESI is to support businesses in different sectors and in different territories with regards to international trade. Given that Quebec has a small market it is important to support local companies that are looking to reach foreign markets, which in turn also aids in the creation of more jobs. The Ministry works with several government agencies as well as budget-funded agencies to provide support to those who seek it. Some of the activities that MESI provides are (MESI, 2016):

- Support of entrepreneurs
- Business creation and development
- Coordinates with the government in regards to investments
- Provides assistance programs (business development, business strategies, guidance)
- Promotes goods and services from Quebec abroad and promotes the interest of Quebec in international trade negotiations
- Provides financing options (business start-ups, equipment purchases, infrastructure)
- Facilitates tradeshows
- Provides support in venture capital and investments
- Helps create partnerships with buyers abroad

4.4. Municipal Government

The Chamber of Commerce of Metropolitan Montreal (CCMM) promotes Montreal's businesses and acts on their behalf to promote the city and its companies, and is involved in "economic development, advocating a philosophy of action based engagement, credibility, proactivity, collaboration and innovation" (CCMM, 2017). CCMM takes part in promoting firms locally and internationally. ACCLR Business Services is CCMM's program that fast-tracks business creation and provides services relating to internationalization. Many services are available to the companies including the following (CCMM, 2017):

- Business development (events, networking activities, market studies)
- International trade to increase competitiveness (guidance, seminars, export documentations, export financing, training, trade missions)
- Business intelligence (personalized market research, government subsidies and programs information)
- Funding (help creating business plans, grant information)
- Workforce (information on employee training, wage subsidies, management)

Chapter 5: Methodology/Data Collection

This chapter is devoted to discussing the type of research, the research methods used and the justifications behind them. It will also describe the research design of the study in order to successfully identify the units of analysis and link the data to the research question at hand. Data collection, case selection and analysis will also be described in this section.

5.1 Research Method: Case Study

There are three types of research suggested by Yin (2014): exploratory, explanatory and descriptive. The purpose of exploratory research is to "identify the research questions or procedures to be used in a subsequent study", while the purpose of explanatory research is to "explain how or why some conditions came to be". The aim of descriptive research is to "describe the phenomenon in its real-world context" (Yin, 2014, p. 238). This study will utilize a combination of explanatory and descriptive case study types since it aims to identify and explain some of the factors that lead born-global companies to internationalize faster than others as well as their approaches to market selection and entry. This combination will further aid in investigating the effect and influence of governmental support has on their internationalization process.

Yin (2014) suggests that there are five different research methods: experiments, surveys, archival analysis, histories and case studies. In order to determine the most favourable method three conditions must be considered: a) type of research questions, 2) extent of control over

behavioural events and 3) degree of focus on contemporary as opposed to entirely historical events.

The type of research question is an important factor to consider (Hedrick, Bickman, & Rog, 1993) given the need for categorization based on five types of questions: 'who', 'what', 'where', 'how' and 'why'. In the present study, the research question is "How does governmental support influence the internationalization process of born-globals in the cleantech sector of Montreal?" As suggested by Yin (2014, p.10), the 'how' question is more explanatory in nature and will be more successful if it uses case study, history or experiment as a research method. This study is looking at the influence government support has on born-globals from their inception to internationalization stages and how these factors affect the process. This type of question "deals with operational links needing to be traced over time" (Yin, 2014, p.10). Therefore, the research method chosen is a case study, as it is one of the preferred methods described and is most suitable for this study.

Yin (2014, p. 12) further suggests that a case study is used when the events examined are contemporary and cannot be manipulated but specific behaviours, as well as it involves observations and interviews. This study is looking at a comparative relationship between born-global firms and government agencies, as well as the factors that contribute to internationalization and are therefore out of researcher's control. In order to gather the data, interviews will be used as a primary data source as well as available documentations and information as a secondary data source. For the purposes of this study a multiple case study approach will be used. Each born-global firm will be analyzed as a case, and government agencies and the cleantech sector will be used as support materials in order to draw a comparative conclusion through a triangulation approach (Yin, 2014, p. 120). "Case study is used in many situations, to contribute to our knowledge of individual, group, organizational, social, political, and related phenomena" (Yin, 2014, p. 4) and this consequently justifies the chosen research method, as the study is investigating a contemporary phenomenon and within its real-world context (Yin, 2014, p.16-19). The role of the case study method is to "explain, describe, illustrate and enlighten" and as such, this paper aims to explain and describe the relationship between born-globals and government agencies, illustrate the factors contributing to

internationalization process and enlighten as to what improvements can be made (Yin, 2014, p.19).

5.2 Research Design

There are five components for a case study as suggested by Yin (2014, p. 29): 1) case study's question, 2) its propositions, if any, 3) its unit(s) of analysis, 4) the logic linking the data to the propositions, and 5) the criteria for interpreting the findings. This process is established in order to aid in collecting, analyzing and interpreting data in order to draw any possible relations (Nachmias & Nachmias, 1992, pp. 77-78).

5.2.1. Study Question

As previously discussed the research question in this study is "How does governmental support influence the internationalization process of born-globals in the cleantech sector of Montreal?" This subject is relevant and important to date, as there is a rise in born-global companies as well as a limited amount of literature available on the subject.

5.2.2. Units of Analysis

In order to correctly identify the cases, two steps need to be taken: defining the case and bounding the case (Yin, 2014, p.31). This study is set around the phenomenon of born-global companies and their internationalization process and their relationship with the governmental agencies in terms of going abroad. Therefore, the primary unit of analysis studied is an entity – in the case of this research, a company. The level of analysis is the firm. Information collected from each company will be analyzed and compared forming a multiple-case study, where each individual firm is a case and as Yin (2014, p. 57) pointed out "each case must be carefully selected so that it either a) predicts similar results or b) predicts contrasting results but for anticipatable reasons". To distinguish the units of analysis, bounding the case is a crucial factor in order to determine the scope of data collection (Yin, 2014, p.34). In this study, each case is a company based in Montreal or its neighbouring regions and part of the clean technology sector, as well as a member of Écotech Québec. For the purposes of creating a comparative case, both born-global and not born-global firms will be analyzed. Each company must have international activities or be in the process of initiating their internationalization process. Subsequently, the

data collected from governmental agencies and Écotech Québec will be utilized as support material.

5.2.3. Links Between Categories and Data

Yin (2014, p. 36) suggests, "The actual analyses will require that you combine or assemble your case study data". The categories are based on the literature and are accepted as known factors, and the conceptual model and a rationale has to be established in order to link the categories to the data gathered. Table 1 links the categories, expected observations and aspects to be examined.

Table 1: Linking Categories to Data

Categories	Expected Observations	Aspects to be Examined
Market Selection	1) Markets entered 2) Types of activities conducted 3) Portion of sales from abroad 4) Assistance received during internationalization process	• Link international presence with governmental assistance • Link the progress of going abroad with governmental assistance
Speed of Internationalization	1) Time from inception of the firms to international activities 2) Reasons for speedy internationalization 3) Plans for expansion to new countries and the timeline 4) Assistance received from the inception of the firm 5) Capabilities of the firm	• Link the time it took to go abroad and the governmental resources used • Link reasons for rapid internationalization and government assistance
Internationalization Performance	1) Success of the company (measurements based directly on each firm's criteria) 2) Barriers to internationalize 3) Assistance needed for internationalization (future) 4) Networks and connections established	• Link funding and services provided by the government to companies' overall performance • Link companies' abilities to perform abroad and the

	5) Validation of technology	assistance they received from the government to do so

5.2.4. Criteria for Interpreting Findings

The method of analysis is pattern matching. This method is based on linking the new data to the already available one and comparing between expected observations and empirically based patterns (Yin, 2014). The method for interpreting findings will be further discussed in section 5.6. Given that this paper's level of analysis is firm, six companies will be analyzed as individual cases. Analysis will first be linked to categories listed in Table 1 and then common patterns will be identified.

5.3. Quality of Research Design

There are four design tests to establish the quality of the research: construct validity, internal validity, external validity and reliability (Yin, 2014, p. 45). In order to satisfy the construct validity test, a triangulation approach will be used and the data gathered will come from multiple firms at different stages of the internationalization process. Born-global firms were chosen on the definitions provided in the literature review chapter. To satisfy the criteria of being a company in the clean technology sector, chosen firms are members of Écotech Québec. Firms were chosen at different stages of internationalization process to investigate the factors that aided them to do so. Due to the fact that this study is partially explanatory, internal validity is also a factor to consider and a pattern matching – explanation building technique will be used to help develop it. Conducting a multiple case study and using analytical generalization will satisfy the external validity test. Steps conducting the study will be documented and replicated for each case to satisfy the reliability test.

5.4. Data Collection

For this study, documentation and interviews will be the sources of case study data. Documentation is an important part of case study research in order to "corroborate, verify and provide specific details" (Yin, 2014, p.107). The majority of the information will be gathered online and consists of company information, company reports, media posts as well as information regarding governmental services available to firms. Interviews are the most

significant aspect of the case study and are divided into prolonged case study interviews, shorter case study interviews and survey interviews (Yin, 2014). For the purposes of this study, shorter case interviews will be used. A shorter case interview lasts approximately an hour and follows an open-ended discussion while still following an interview protocol (Yin, 2014). The interview will consist of set questions but still remain open-ended in order to have a flow to the discussion. The questions are created based on the literature and the conceptual model. Interviews will be recorded in order to provide verbatim and accurate information but only if the interviewees agreed to so in writing. Some company names are changed as per request of the interviewees for privacy purposes. The interview guides are available in Appendix A, the transcripts of company interviews are available in Appendix B, the transcript of Écotech Québec interview is available in Appendix C and the transcripts of government agencies are available in Appendix D.

5.4.1. Triangulation

This study uses both primary and secondary data. The primary data was collected through interviews of firms, Écotech Québec as well as governmental agencies. Secondary data was collected through online sources: websites, company reports as well as articles sourced from ProQuest. Data triangulation provides several sources of evidence and assists in the development of a converging line of inquiry - providing a more convincing conclusion (Yin, 2014, p. 120). The triangulation of data also strengthens construct validity of the research and findings. In order to avoid mistakes and misinterpretations Marschan-Piekkari and Welch (2004, p. 115) suggest using this technique to produce a complete representation of the study.

5.4.2. Case Selection

The case selection process is an important step for this study as mentioned by Marschan-Piekkari and Welch (2004, p.112) and should include selection criteria as well as identifying the type of organizations being selected. This research is a comparative study and is based on multiple cases. Its purpose is to compare the phenomenon and explore different dimensions in order to come to a conclusion (Marschan-Piekkari & Welch, 2004, p.114). The selection criteria for each case is as follows:

- A firm should be based in Montreal or its neighbouring regions
- A firm should be a part of the clean technology sector

- A firm should be a member of Écotech Québec
- A firm should have some sort of dealings with a governmental agency (federal, provincial and/or municipal)
- A firm that is qualified as a 'born-global' should be either beginning or be in the process of internationalization
- A firm that is not qualified as a 'born-global' should follow all the other criteria mentioned above (for the purposes of comparison)

5.5. Cases

5.5.1. Aquartis

Aquartis is Quebec-based company located in Beloeil. It was founded in 2010, but product marketing commenced in 2014. Aquartis "manufactures and delivers high-performance and reliable grey water recycling systems" (Aquartis, 2017). The company began conducting international activities in 2016. The idea of internationalization started with the inception of the firm due to a limited market in Quebec. The company currently has a presence in Martinique, Brazil, Chile and Morocco. The company has relied on several governmental agencies for assistance. Only 5% of its sales come from abroad but within the next few years the company plans to make majority of its sales abroad. The new market that is being explored at the moment is the US, specifically California. Aquartis has been a member of Écotech Québec for 3 years.

5.5.2. Effenco

Effenco is a Montreal-based company that was established in 2006. The company "develops the world's most flexible and efficient heavy vehicle hybrid solutions to reduce fleet fuel costs and GHG emissions" (Effenco, 2017). At the moment, the firm has international activities in 3 countries in Europe (UK, France and Germany) and the US, and holds patents in 12 countries where it plans to conduct business. The first activity outside of Canada was in 2009, in the US, and subsequently in 2013 it expanded across the Atlantic. The idea to go abroad came at the inception of the company due to the fact that Effenco's technology can be used and applied anywhere. The company has received some governmental assistance. Last year, 50% of sales came from abroad and the ultimate goal is to reach 90-90% within the next few years. Future

plans include concentrating on the Western European market. Effenco has been a member of Écotech Québec for 6 years.

5.5.3. TM4

TM4 is a Quebec-based company, located in Boucherville. It was founded in 1998 and has been conducting international activities from its inception due to a limited market in Quebec and Canada. The company is focused on developing, producing and commercializing electric traction systems. Its electric motors are used to drive electric vehicles and all of their related power electronics and control electronic systems (Interview – Appendix B, 2017). The firm conducts international activities in 25 countries. The major countries consist of Western European nations, China, India, US, and Australia. About 80% of company sales come from abroad. Future plans include a greater coverage of the European market. The firm has received some governmental assistance. TM4 (2017) has been a part of Écotech Québec for about 6 years.

5.5.4. Aeponyx

Aeponyx is a Quebec based company, located in Trois-Rivieres. Aeponyx is a "fabless micro optical switch semiconductor chips designer and manufacturer. The chips are targeted at fiber optic access to the Cloud and optical switching in the Cloud" (Aeponyx, 2017). The firm was founded in 2012 and began its international activities in 2014. Internationalization was planned from inception as the company deals with B2B customers. At the moment, international activities are conducted in the US, Sweden, Finland and Germany. Aeponyx relied on governmental assistance in order to reach the foreign market. By 2021 the company plans to have 100% of sales from abroad. The next market that the firm is working on reaching is China. The company has been a member of Écotech Québec since 2016.

5.5.5. Company A

Company A[1] is a Quebec-based company, located in Laval. The company was founded in 2012 and began conducting international activities in 2015. The company did not plan to expand outside of Quebec or abroad from the beginning but due limited market began international activities to the US. The company's mission is to develop water treatment technologies for the

[1] Company name has been made anonymous as per the consent form

big water consumer – a car wash business, for example, and in the near future in hotels and big commercial complexes. About 75% of sales come from outside Quebec and about 5% come from outside Canada. The company's product is in demand in California, Texas and Pennsylvania but they are not planning to rush into expansion. The firm did not rely on governmental support and only relied on some training and tax credits. The company has been a member of Écotech Québec for about 3 years.

5.5.6. Company B

Company B[2] is a Quebec-based company, located in Thetford Mines. The company was founded in 2013. It does not currently conduct international activities but is in the process of acquiring contacts for future international activities. The company is focused on reducing greenhouse gas emissions, providing an alternative by processing biomass and producing products that are used as bioenergy. The product can be used by industrial facilities as well as in agriculture, replacing fossil fuels. The company relied on government assistance in the form of a substantial subsidy, as it was necessary for the formation of the business. The company also relied on the assistance of the private sector as half of the company was sold. Company B plans to have international activities within the year and has begun creating contacts in the US and Europe as well as Latin America and Africa for production. The company has been a member of Écotech Québec for a year.

5.6. Data Analysis

To produce empirically-based findings, the data collected must be analyzed in an appropriate manner. For this study a form of pattern matching, called explanation building, will be used. The explanation building technique incorporates an "initial statement, comparison of findings and causal links that might lead to recommendations and final explanations" (Yin, 2014, p.147-149).

The fist level of analysis is a single case study and is based on six firms. Each case is described and linked to the categories based on the criteria in Table 1 to generate findings. The summary of observations will be presented in Table 2.

[2] Company name has been made anonymous as per the consent form

The second level of analysis, cross-case analysis, is based on six cases within the cleantech sector. A cross-checking technique is used for "commonality and integrating the data in one single framework through a meticulous case comparison" (Marschan-Piekkari & Welch, 2004, p.119). The results are established by comparing the effects of governmental support on the companies. This will include regrouping observations made in the first level of analysis, then identifying patterns and evaluating categories for the purposes of pattern matching. The criteria for interpreting findings are:

- Observed: five or six observations out of six correspond with the category
- Partially observed: two to four observations out of six correspond with the category
- Not observed: zero or one observation out of six correspond with the category

The first level of analysis allows for theoretical testing within the categories, which are based on the conceptual model. The second level of analysis allows for testing the validity. Analytical generalization will be used to confirm external validity through drawing inferences and comparing cases based on governmental assistance and degree of internationalization.

Chapter 6: Analysis and Findings

This chapter describes two levels of analysis. Level 1 analysis is developed based on observations mentioned in Table 1. Each firm is analyzed individually in correspondence to each category. The information is based on the interview transcripts in Appendix B. A summary of observations is provided following the analysis in Table 2. Level 2 analysis is cross-case, and is based on the six companies from the cleantech sector that are discussed in Level 1 analysis. The summary of observations is followed by the evaluation of categories in Table 3 based on the criteria in section 5.6. for pattern matching.

6.1. Level 1 Analysis: Individual Cases

6.1.1. Aquartis

Observations for Market: The firm began its operation in 2010 but only started marketing their products 4 years later in 2014. The time lapse came from the need to make a pilot project and to

test it, in order to obtain validation of the product in Quebec. Given that the company manufactures water-recycling systems, it was necessary to go abroad as Quebec is a small market. The international activities began through an international representative and the first sale abroad was in 2016 in Martinique. At the moment, the foreign markets consist of the Caribbean area and the company also has sales representatives in Brazil, Chile and Morocco. The original development strategy consisted of covering as much of an international market as possible but after considering the time and cost aspects, the decision was made to concentrate on priority markets. The main focus of short and long-term development at the moment is the US, primarily California. Other international projects are taken on if they are deemed attractive to the company. Only 5% of sales come from abroad as of now, but the company is certain that in the near future almost all sales will be international. Aquartis received financial support from MESI, a provincial government agency. This support aided in the exportation process and subsidized a portion of expenses while going abroad. Quebec and federal delegations (federal council abroad) also provided support to internationalize. TCS is providing assistance while abroad through Canadian embassies, for example in Los Angeles to assist with future international activities there.

Observations for Speed: The time it took from the inception of the firm to internationalization is 6 years. The need to go abroad was pressing due to a limited market in Quebec. The new market that is the primary target for the firm is California. The company received governmental support from the federal government before the internationalization stage. CNRC provided financial support 3 times and helped subsidize the engineers' salaries. Before receiving support from CNRC for the engineering portion of the product, the firm had to create a pilot project to showcase its technology. Government support was received in 2015, before the company started international activities. The company also received support from CRSNG in the form of a project subsidy, by collaborating on a project with the Water Technology Centre in Montreal. Governmental support was necessary for the existence of the company because CNRC's subsidy assisted in salary payments.

Observations for Performance: The success of the firm is measured in a milestone approach. In order to supply the product there was a need for its validation. Validation came from working

with a research centre in Montreal as well as from CNRC, because they invest in companies that they deem beneficial to the Canadian economy. Another milestone for the firm was getting reference customers in order to generate more sales in the future. The main challenge at the moment is financing, and the company is in the process of carrying out its first equity-financing round with angel investors in order to fuel growth. Regulations in different countries play a big role in market selection and it is important to be aware of all of the government regulations abroad. An important factor that played a role in the internationalization process is the establishment of the network and connections. TCS assisted the company in introductions with big firms in the industry and potential customers. This free service provided valuable contacts that otherwise would have been hard to attain. At the beginning, access to government assistance and services was difficult because of the volume of information and the need to understand all of the programs available as well the criteria to qualify. The founder of the company was still in university during the formational stages of the company and received mentorship assistance from the entrepreneurship centre at UQAM. A representative from CNRC provided the company with a guide to all of the business aspects. MESI's representative assists the company by providing relevant information on different available programs that would suit the company. Aquartis received significant support from Ecotech Quebec, from mentorship to networking where it is possible to meet like-minded entrepreneurs and share information. The company still requires further assistance in order to create more products and expand its capabilities. In order to increase its reach abroad, the company will continue using TCS and take advantage of programs through DEC, which allows the company to receive a loan of 50% of the expenses at 0% for 5 years.

6.1.2. Effenco

Observations for Market: The company began its operations in 2006 and is now active in the UK, Germany and France. The company had a pilot project in the UK where the technology was demonstrated to potential customers and strategic partners, such as manufacturers. The company has also made sales in Dublin, Ireland in the past, but is not active there at the moment. There is representation and collaboration with manufacturers in Germany in order to integrate the company's technology. One of the customers is in Quebec but it is a multinational company based in France, and Effenco is working on bringing the technology to France through this firm.

Last year, about 50% of sales came from abroad and in the future it is foreseen that 90-95% of sales will be international. At the moment, the company is concentrating on its markets in Canada, US and Western Europe. The company received a loan from EDC for production, and this source of financing assisted with the purchase orders.

Observations for Speed: It took 3 years from the inception of the company to reach the international market in the US. In 2013, it was able to go further abroad to the UK. Given that the technology can be applied anywhere, the company planned to go abroad as soon as possible. The patents were submitted internationally to about 10-12 different countries with the goal of having international activities. At the moment, there are no plans to reach new markets, but instead to concentrate on the markets at hand. The government assistance the company received was limited. There is an R&D tax credit, which provided an indirect assistance. The company did receive a grant from SDTC during their demonstration phase. The grant also allowed for the allocation of a part of funds towards other pilot projects. The assistance was received between 2010 and 2015, as there were several projects the company worked on with SDTC. Government assistance was essential and even though the grant had a significant impact on the company it was not sufficient in terms of funding. Government support assisted in the proof of concept, demonstration and R&D stages, though more funds need to be distributed for company to be able to reach the foreign market faster.

Observations for Performance: The company has two measures of success - repeat sales from customers or those who have witnessed the demo, as well as strategic alliances with manufacturers who will integrate the company's technology and sell it in specific markets. The validation of the products came from working on demo projects together with SDTC. There are certain barriers to internationalization by being a foreign company. Having a good quality product and local partners abroad helps reach and cater to the foreign customers. Access to government support became more convenient with time. At the beginning, the information was found online and through networking. The company was also a part of the incubator that was able to direct it to appropriate government outlets. Through Ecotech Quebec and government representatives, more doors opened up for different types of government services. At the moment, the company requires more financial assistance for internationalization. Export Quebec,

TCS and resident trade commissioners provide a great deal of assistance in terms of connections and networking. Government agencies have an easier time liaising with government agencies in foreign countries and this type of support reduces the amount of time and money spent on procedures related to administrative services. Ecotech Quebec provided the company with a great number of networking opportunities and introductions; it also helped the firm better understand government practices during the internationalization process.

6.1.3. TM4

Observations for Market: The company began its operations in 1998 and conducts international activities in nearly 25 countries. The markets are quite diversified, covering most of Western Europe, China, India, US and Australia. The company deals directly with international customers and has an established distribution network. The company also has a joint venture in China for production and sales of core products. Aside from this joint venture, about 80% of sales come from abroad. TCS has been helpful in establishing the firm's joint venture in China. The trade delegation provided networks and connections as well as helped organize meetings in foreign countries.

Observations for Speed: It took about a year for the company to carry out its first international venture, as the first major customer was international. It was necessary for the company to internationalize rapidly because of the industry it is in and the fact that the market in Canada is too small. The company chose countries that had large original equipment manufacturers such as the US (in the Detroit area in particular), Germany, France, Japan and China. At the moment, the company is concentrated on designing a strategy for the European market to establish a local presence and support European customers. The North American market is covered by support from Montreal, and the Asian market is covered from a plant in Beijing. The importance of the European market is linked to potential sales but the company lacks distributors there. The firm relied on many grants for the R&D and commercialization phases, specifically from SDTC and also received some financial support from CNRC. The company relied on governmental support for the development of new products and R&D phases, more so than for the internationalization phase. Due to the field that the firm is in, being involved with government is essential in order to

be sustainable. The support received from governmental agencies defines the scope of the projects and whether or not the projects will move forward.

Observations for Performance: The measures of success of the company evolved with the growth of it. At the beginning of the commercialization stage it is important to have a functional product, test customers and positive results. With the market being more mature now, the importance lies in large commercial success and a worldwide presence. Internationalization barriers varied from country to country depending on the foreign country's policies, specifically when the foreign government requires some of the parts of the product be produced in that country. Governmental assistance helps in validating specific technologies that are included in company's new products. TM4's shareholder is Hydro Quebec and that has opened many doors for the company, specifically finding the right grants and subsidies. While Hydro Quebec is a public company and does not have access to the grants, TM4 is a private company that is eligible for grants. There is a dedicated team within the company that concentrates on grant applications and finding new opportunities. More assistance will be required in the future from TCS as they play a large role in setting up new ventures abroad. The company relies on strong networks cultivated over the years through government, TCS and Hydro Quebec. Ecotech Quebec has provided networking and event opportunities. They have also provided information regarding governmental funding and changes in public policies.

6.1.4. Aeponyx

Observations for Market: The firm began its operations locally in 2012, and was not satisfied with the market. At the moment, the company is in the R&D phase and by 2019 will be ready to reach international market. This period of time is sufficient for the company to develop their product and file international patents. At this stage the company is communicating with customers worldwide, notably in the US, Sweden, Finland, Germany and China. The first prototype is scheduled to be ready in fall 2017. Aeponyx aims to reach $100 million in international sales by 2021, that is 100% of its future sales. The company relied on Export Quebec for financial assistance to aid in travel and business expenses.

Observations for Speed: It will have taken the company 5 years from inception to internationalization, assuming that the first prototype is ready by fall 2017. The company intended to internationalize from the beginning because it is a B2B company and its target customers are large equipment manufacturers, so the market in Quebec and Canada is too small. It is forecasted that 95% of shipments will be worldwide. The five key future markets for the company are the US, China, Sweden, Finland and Germany. Aeponyx has received assistance from NSERC through a CRD program to assist during the R&D phase. The company has also received support from CNRC and three of their programs, IRAP program, BIAP program and CAIP. Other governmental agencies the company relied on are SDTC and NCE, provided assistance during the process of transferring technology to industrialization. The majority of financial assistance received from 2013 was utilized for the R&D phase and about 20% of funds have been used for IP protection, business development and industrialization. The funds received in the future will be used for industrialization, business development and scaling up. Governmental assistance was fundamental for the company because it is in the hardware business and financing the business privately would therefore not have been possible. Without this support the company would simply not have been able to operate.

Observations for Performance: The company is not yet commercialized and just closed its financing round. This is a unique situation in the hardware space and a big milestone because it is not often a company can accomplish this before having a product. At the moment, the success of the company is measured by the amount of funds raised as well as the number of customer agreements signed because there are no international sales yet. The company does not see any entry barriers into the foreign market, as their product is extremely innovative. Information regarding access to government assistance came from several sources, such as online and university sources. The company participated in an activity named ‘innovation 360’ through which it met a Professor who was working on similar technology. A collaborative project was created with the assistance from NSERC. CNRC assigned a representative to Aeponyx who was able to direct them to different programs as well as a representative from MESI who in turn provided further assistance. To finance equipment purchases the company will be looking at CAPEX investments in the future. For export and financing the company plans to rely on the Créativité Quebec program as well as EDC. In the process of receiving government support, the

company was also able to validate their product, as SDTC has very rigorous criteria in the cleantech sector, which they subsequently applied during their selection process. Ecotech Quebec provided the company with visibility, networking opportunities and several contacts in the cleantech sector, and moreover connected the firm to the appropriate government entities for the assistance it required.

6.1.5. Company A

Observations for Market: The company began its operations in 2012 and had a new group of investors in 2014. A lot of the company's projects are outside of Quebec, in Ontario and Montana, US. Most of the sales for Company A are from Canada, Ontario and Alberta. About 75% of sales are out of Quebec and about 5% of sales are from outside of Canada. The demand in the US is high, especially in Texas and California but the company would like to grow gradually because the cost of business development is high. The company has been able to sustain itself without much government assistance but will require it in the future for expansions abroad.

Observations for Speed: The company began its international activities in 2016, 4 years after inception. Upon learning more about the market and ROI, potential clients and investments lead the company to conduct international activities. Its anticipated future market is in the US, specifically in the states of California, Texas and Pennsylvania, as there is a high demand for the company's product there. Recently, Company A met with a large firm in California regarding potential future business dealings. The company has not relied on government assistance thus far aside from receiving some training. The reason is the time required to deal with governmental agencies and potentially not having enough resources to complete the paperwork and applications. Receiving government support is not off the table and the company hopes to receive assistance in the future, but views this as a gradual process. The company did take advantage of the R&D tax credit. Ecotech Quebec provided the company with some information regarding governmental assistance and the different programs available. What is more, the company has conducted its own research into governmental assistance.

Observations for Performance: The success rate would be measured in the potential funding received from the government. For example in Ontario there are municipal grants available for water saving technologies but the company was not able to apply yet as they are not in the specific region to be eligible. The main barrier to internationalization is its capacity, as the company is still relatively small. Company A is holding back and not rushing to expand. Even though similar technology exists abroad, it does not work as well. The validation of the product comes from having a superior quality product that is a better alternative to what is available on the market at the moment. As such, the firm believes it can provide a better alternative once it expands production. The company requires funding for R&D and business development, as the costs of internationalizing are high especially because it tests the technology itself. Representatives from the company believe that access to government support is not easy for a small company, as they do not have the ability to wait for an extended period of time for funds like a big company would. The company has a desire to grow and expand but the wait time for application processes and funding is making this difficult to execute rapidly. Ecotech Quebec has provided the company with patent assistance as well as networking opportunities. The company was also able to obtain a client through them based in France, providing an opportunity to bring the technology there in the future.

6.1.6. Company B

Observations for Market: The company began its operations in 2013 but does not conduct international activities yet. It is in the process of creating contracts and attracting potential buyers. The company plans to internationalize within the year. Company B has met with hedge funds that are interested in renewable energies and has begun identifying potential markets. There are also discussions in the works with European clients. The company is in the process of performing maintenance work and improving its facilities to be able to run at full capacity before expanding to foreign markets. The company does not have international operations as of yet, but it will mostly rely on the financial backing of their private investors who have purchased half of the company.

Observations for Speed: The company is set to internationalize in 2017, 4 years after inception. The company was aware from the start of the need to go abroad as that is where the most

valuable market is. The priority markets for the company will be the US and Europe for sales and Latin America and Africa for production. The company requested a subsidy in early 2014 and received it in July 2015 from the Ministry of Energy in Quebec. The funding was for a total of $3 million for the demonstration phase that is distributed in parts, depending on the stage of the project. Company B also received assistance identifying clients and making contacts. Governmental support was fundamental for the existence of the company as it is a start-up with a new technology that has not been implemented yet. After receiving government support the company was better able to attract private partners given that the risk for them was reduced.

Observations for Performance: The company has set milestones for the receipt of their subsidy. They must meet certain criteria before each sum is released to them for use. It is a lengthy process to receive the different installments of this subsidy, which can take up to 60-90 days, though without this assistance the company would have needed to take out a loan. Company B applied for a bridge loan but was not eligible. What is more, there are some barriers related to internationalizing that the company is facing, such as the capacity to meet the technical standards of the product. Once the criteria are met, the firm will be set to go abroad. The company was able to validate its technology through governmental support. Upon receiving the funding in question, the company was able to secure private investments and sold 50% of the company to a major private group. Representatives from the company found that many of the funding programs available are intended for already established companies with a few years of experience. The company therefore relied on the 'Technoclimat' program funded by the Quebec Green fund to find out about governmental financial assistance that it was indeed eligible for. The company hopes the government will be able to set up a more integrated approach for those firms that have already received government funding in order to reduce lead-time. Ecotech Quebec provided the company with networking opportunities and educated them on the market. They also assisted in connecting the company with potential clients and governmental entities.

6.1.7. Summary of Level 1 Analysis

Level 1 analysis is based on linking the categories to observations for each individual case. The summary of observations is shown in Table 2. The observations are analyzed in the following section.

Table 2: Summary of Observations Level 1 Analysis

Observations	Aquartis	Effenco	TM4	Aeponyx	Company A	Company B
Market: Inception	2010	2006	1998	2012	2012	2013
Market: Markets entered	Martinique, Brazil, Chile, Morocco	UK, US, Germany, France, Dublin (no longer active)	Nearly 25 countries: most of Western Europe, China, India, US, Australia	No markets entered, 1st international prototype to be ready by Fall 2017, Talking with foreign customers in US, Sweden, Finland, Germany and China	Montana, US	No markets entered yet, Discussions in the works with potential European and US clients
Market: Types of activities conducted	Exports, Sale representatives	Exports, Patents	Exports, Joint venture	In the process of applying for patents	Exports	Contract negotiations with foreign clients
Market: Sales from abroad	5%, most sales will come from abroad in the near future	50% in 2016, 90-95% forecasted for the near future	80%, aside from JV in China	Forecasted $100 million in sales from abroad by 2021 (100% of sales)	5% of sales from abroad, number will increase due to high demand in the US	No sales from abroad yet
Market: Assistance received (going abroad)	MESI, TCS, Quebec delegation, federal delegation	EDC	TCS	Export Quebec	No government assistance for international markets	Will mostly rely on financial support from private investors
Speed: Reaching foreign market	6 years 2016	3 years 2009	1 year 1999	5 years Fall 2017	4 years 2016	4-5 years Set to go abroad within the year (2017-2018)
Speed: Reasons	Limited market in Quebec	Reaching a larger market	First major customers were abroad, Small market in Canada	Target customers are large B2B equipment manufacturers, Canadian market is limited	Market knowledge, Clients	Valuable markets abroad
Speed: Future plans	California, US	Concentrate on target markets	Designing strategy for European market	US, China, Sweden, Finland and Germany	California, Texas and Pennsylvania, US	US and Europe for sales, Latin America and Africa for production

Speed: Assistance received	CNRC, CRSNG	SDTC, R&D tax credit	SDTC, CNRC	NSERC (CRD program), CNRC (IRAP, BIAP and CAIP), SDTC, NCE, R&D tax credit	Limited: some mentoring, R&D tax credit	Ministry of Energy Quebec
Speed: Capabilities	Support was essential for existence of the company	Support assisted in proof of concept, demonstration and R&D stages	Government support defines scope and ability to take on projects	Support was essential for the existence of the company	Looking to receive government support in the near future to keep up with the growing demand	Support was essential for existence of the company
Performance: Success measurement	Milestone approach: validation, reference customers	Repeat sales, Strategic alliances with manufacturers	Evolved with growth, 1st having a functional product, 2nd commercial success, 3rd worldwide presence	Milestones are measured by the financial assistance received and number of customer agreements signed	Will be measured by success of obtaining government support	Milestones set based on the criteria of the subsidy received to receive funds in fractions
Performance: Barriers	Regulations abroad, Financing	Being a foreign firm, Financing	Varied depending on the country and its policies	No barriers have been encountered thus far	Having the capacity to expand operations, Financing	Capacity to meet technical standards
Performance: Access to support	Difficult at first (understanding criteria, a lot of information), Mentorship from UQAM, CNRC, MESI, Ecotech Quebec	Became easier with time, Directed by an incubator to government agencies	Hydro Quebec as a shareholder provided many opportunities, Dedicated team within the company to apply for grants	'Innovation 360' program, CNRC representative, MESI representative	Difficult for a small firm due to long lead times for applications	Big portion of funding is meant for more established firms, Technoclimat program funded by Quebec Green fund
Performance: Assistance (future)	Financing, DEC (for future loan)	Financing	Venture set up abroad	CAPEX investments for financing, Créativité Québec and EDC for export support	Funding for R&D and business development	More accessible information
Performance: Networks	Introductions done by TCS, Ecotech Quebec	Ecotech Quebec, Export Quebec, TCS	Ecotech Quebec, TCS, Hydro Quebec	Ecotech Quebec	Ecotech Quebec	Ecotech Quebec
Performance: Validation	Working with research centre in Montreal,	SDTC	Through government and Hydro Quebec	SDTC	Product is superior to those on the market today	Through government support, Ministry of

	CNRC					Energy Quebec

6.2. Level 2 Analysis: Cross-Case

This section provides analysis between the firms within the cleantech sector. The data analyzed is provided in Table 2. Criteria for the evaluation of patterns in each category is discussed in Chapter 5, section 5.6 and are as follows:

- Observed: five or six observations out of six correspond with the category
- Partially observed: two to four observations out of six correspond with the category
- Not observed: zero or one observation out of six correspond with the category

6.2.1. Market: Observations and Findings

Observations

Inception: Companies began their operations between years 1998 to 2013. All firms are based in the province of Quebec, in Montreal or its neighbouring regions.

Markets entered: Aquartis, Effenco, TM4 and Company A conduct international activities. These firms conduct business abroad around the world. Aeponyx and Company B are in the process of internationalization. The former is set to reach the foreign market in the fall of 2017 and the latter is in the process of contract negotiations with foreign customers.

Types of activities conducted: International activities of each firm vary as each firm is at a different stage of the internationalization process. A more established firm, TM4 exports its products and has a joint venture in China. Other international activities include representation abroad and patents held in foreign countries. Aeponyx is in the process of applying for patents abroad and Company B is in the process of communications and negotiations with future clients.

Sales from abroad: Sales from international markets vary for each firm. Aquartis and Company A's sales are at 5% but are in the process of increasing due to acquisition of new clients, with the former foreseeing majority of sales from abroad in the near future. Effenco and TM4's

international sales are at 50% and 80% respectively given that they have been in business for a longer period of time. Aeponyx forecasts its international sales to be at 100% by 2021. Company B is yet to determine its sales from abroad after the finalization of international contracts.

Assistance received for internationalization: All companies with the exception of Company A and Company B relied on governmental assistance in order to internationalize. Governmental agencies that provided support include: MESI (Export Quebec), TCS (Quebec and federal delegations) and EDC. Company A found it difficult to find the right program for support but is in the process of gathering information about possible forms of assistance it can rely on in the future. Company B is set to mostly rely on the support of its private investors. The firms that did receive government support and funding for internationalization found it essential for the success of reaching the foreign markets.

Findings

Market: *Government support positively affects market selection and entry factors during the internationalization process of born-global companies by providing information regarding foreign markets and their laws concerning business activities, educating firms on financing and funding opportunities and connecting them to potential clients.*

The sample shows that governmental assistance is an essential factor in the process of internationalization for born-global firms. Firms that used government assistance were able to accomplish the goal of selecting and reaching the foreign markets successfully. Effenco and TM4 have a significant portion of their sales coming from abroad and relied on the support of EDC and TCS. The reason for that might also be based on the fact that these firms have been in business for a longer period of time than the other four firms. Aeponyx has relied on governmental assistance from Export Quebec for the process of internationalization before having international sales in order to apply for patents abroad. Company A is in the process of finding the suitable funding opportunities from governmental agencies because the representatives of the firm know the importance and the necessity for it. Overall, government assistance creates a positive impact on born-global companies. The longer the company has been

in business the stronger its ties to different government support systems. Born-globals appreciate the support, specifically when reaching markets abroad and found programs and funds provided by MESI (Export Quebec), TCS and EDC to be of high value when selecting potential markets. At this time, only four out of 6 cases have relied on and deemed necessary to use governmental support for the process of entering foreign markets. Given that one of the cases is in the process of obtaining government support, it cannot be considered for the purpose of this research because the effects of the support are unknown. It is observed that there is a relationship between governmental assistance on market entry as there is a positive effect in four out of six cases, therefore patterns in 'Market' category can be partially observed.

6.2.2. Speed: Observations and Findings

Observations

Reaching foreign markets: The internalization process on average took 4 years, given that Aeponyx and Company B will reach the foreign market as forecasted. TM4 is the only outlier, going abroad after just 1 year from inception.

Reasons for rapid internationalization: The commonality for early internationalization in all six companies is the limited market in Quebec and Canada. Cleantech is a growing sector around the world and the demand for products in this industry is high. There is a large number of foreign customers who are ready to use and invest in cleantech products. In the case of TM4, the first major customers came from abroad and in case of Aeponyx, whose target customers are large B2B equipment manufacturers, there is a pressing need reach to them.

Future plans: The future endeavors of each firm vary, but the common factor is expanding their presence abroad and reaching more markets. Aquartis and Company A are concentrating on the US market; whereas the rest of the firms are planning to cover several new markets at once. The only exception is Effenco, where the company is concentrating on its current target markets before setting up strategies to reach new areas.

Assistance received from inception: All firms have relied on governmental assistance from their inception. Government agencies that provided support include CNRC, CRSNG, SDTC,

NSERC, NCE and Ministry of Energy Quebec as well as the R&D tax credit. The only exception is Company A as it only received the R&D tax credit but no other major assistance from the government. All firms relied on mentorship and guidance in the process of setting up their operations in order to set a base and start internationalizing.

Capabilities of the firm: All of the firms agree that support from the government was an essential part of setting up the business. Without the assistance the firms would not have been able to operate given the limited market in Quebec and the industry they are in. Funding helped the companies through the demonstration and R&D phases. It also gave companies the ability to take on big international projects. In case of Company A and its minimal reliance on government support, the company is aware of the benefits that government support provides, and are at the stage of securing it in order to keep up with the growing international demand for its products.

Findings

Speed: *Government support positively affects the speed of internationalization for born-global companies by providing mentorship and consulting opportunities, and giving access to funding options that accelerate the firms' progress through demonstration, R&D and internationalization stages.*

The sample shows that government support plays a vital role in the time and rate that it takes a company to set up its operations and begin the process of internationalization. Firms that used assistance from the government were able to reach the stage of internationalization quickly. Given that the market in Quebec and Canada is small for the cleantech sector, firms realize early on that there is a need to reach foreign markets. Government funding and mentoring gave firms the ability to successfully carry out the demonstration and R&D phases and have the products ready for international customers. Government agencies also assisted in providing market reports and strategy plans for taking the companies abroad. The mechanisms underlying the relationship between government agencies and born-globals are the services provided, that allow companies to conduct international activities faster. Government support positively affects the speed of internationalization for born-globals, be it in form of mentorship or funding. Company A is the only case that did not rely on governmental assistance as the other cases did but is aware of the

potential benefits the agencies provide and is in the process of seeking support. It is observed that there is a relationship between governmental assistance and the speed of internationalization as there is a positive effect in five out of six cases, therefore patterns in 'Speed' category can be observed.

6.2.3. Performance: Observations and Findings

Observations

Success measurements: Each firm has its own measure for success depending on what stage of internationalization it has reached. Aquartis, Aeponyx and Company B base their success on milestones achieved. In case of Aquartis the milestones consist of technology validation and acquisition of reference customers, while Aeponyx's milestones consist of government support received and number of international agreements signed with foreign customer, and Company B's milestones are based on the criteria set out to comply with their subsidy agreement. The other three firms base their success on acquiring new international customers, having repeat sales, creating alliances and receiving funding.

Barriers to internationalize: There are some commonalities in barriers that exist for internationalization, the main one being financing as seen in cases of Aquartis, Effenco and Company A. Regulations in foreign countries also act as barriers, particularly for the cleantech sector given that each country's policies differ. Other barriers include meeting technical standards and having the capacity to supply the foreign market. One firm that is yet to encounter major barriers is Aeponyx and the likely reason for that is the significant governmental assistance it received and the fact that it is not yet fully internationalized, but is set to do so by fall of 2017.

Access to governmental support: The degree of access to government support varied between firms. Aquartis and Effenco found it to be difficult at the beginning to understand all the available programs and applications for receiving assistance. By doing research and being a part of an incubator, the access to information became greater. Agencies that were able to assist and lead the firms to appropriate programs are CNRC, MESI as well as Ecotech Quebec and Quebec

Green fund. TM4 being a more established company has a dedicated team in charge of grant search and applications, and moreover receives guidance from Hydro Quebec who is its shareholder. Issues with accessing government assistance include long wait times and lack of funding for less established firms.

Future assistance required: Financing is required by the firms in order to continue developing their products and reaching new markets. All firms except Company B have the need for more funds in order to keep up with the growing demand for the products from firms in the cleantech sector. Company B relies on financial support from its private investors but would like a more accessible platform for government assistance programs. Aquartis is dependent on DEC for its future loan and Aeponyx will utilize CAPEX investments and EDC for exporting support. Assistance is required to increase internationalization performance, expand to new markets, and set up ventures as well as for R&D and business development.

Networks and contacts: All six companies relied on Ecotech Quebec to assist them with networking and connections to government agencies, players within the cleantech sector and potential clients. Other agencies that assisted in network creation are TCS – specifically abroad, and Export Quebec. Networking opportunities provide companies with new prospects and provide a better insight into the industry.

Technology validation: In order to apply for funds to assist with internationalization, reach international markets and find private investors, all firms with the exception of Company A relied on governmental agencies to validate their technology. The following agencies were used: CNRC, SDTC and Ministry of Energy Quebec. TM4 also relied on their shareholder, Hydro Quebec for product validation. Company A believes that its product is superior to those offered on the market at the moment. There is a potential for Company A to validate its technology through government agencies once it obtains funding from them.

Findings

Performance: *Government support positively affects the overall internationalization performance of born-global companies by liaising with foreign government officials on firms' behalf, validating their technology and providing them with networking opportunities and new business contacts.*

The sample shows that government support is an important factor in the overall performance of firms during the internationalization process. Firms that relied on governmental assistance are able to validate their technology and attract private investors. Government agencies also assist companies in making connections within the industry and abroad as well as expand their networks. All firms use the services of Ecotech Quebec, an organization that is partially funded by the government, and in many cases Ecotech Quebec steers firms towards governmental programs that they might benefit from as well as inform them of grants they can apply for. By providing assistance, government agencies positively impact born-globals and their performance abroad. All firms with the exception of Company A have benefited in several ways from support provided by government agencies and plan to continue relying on their services and funding in order to conduct international activities. Company A is still in the process of obtaining a high enough degree of assistance from the government to see results. It is observed that there is a relationship between governmental assistance and the overall process of internationalization as there is a positive effect in five out of six cases, therefore patterns in 'Performance' category can be observed.

6.2.4. Summary of Level 2 Analysis

This section provides the results of the Level 2 cross-case analysis based on the six cases discussed in detail in Level 1 analysis. The results are summarized in Table 3 based on the criteria in section 5.6. and further discussed in Chapter 7.

Table 3: Summary of Results Level 2 Analysis

Categories	Analysis
Patterns in Market	Partially Observed
Patterns in Speed	Observed

Patterns in Performance	Observed

Patterns in categories Speed and Performance are observed. There is a link between government support and speed of internationalization, and government support and internationalization performance. Patterns in Market category is partially observed due to the fact that not all firms received government support for international activities because the firms are at different stages of their internationalization process.

Chapter 7: Discussion

This paper concentrates on factors that enhance the process of internationalization of born-global companies in the cleantech sector. The two identified factors are market entry and speed, with a focus on governmental support provided to these companies. Market category examined whether or not government support has a positive effect on born-global companies entering new international markets. The link was partially observed. It was identified that companies that received assistance from the government were able to successfully enter foreign markets. The firms that were in the process of obtaining government support stated that lack of funding was the cause for not reaching new international markets. Born-globals regard the support received from government as an integral part of their achievements and the resources provided to them as important factors for the establishment and continuity of their international business practices.

There were other factors that seemed apparent, relating to the amount of sales from abroad and the number of international markets reached, particularly the number of years the company has been in business. Companies that began their operations earlier were able to achieve better results than those that began their operations later. This is largely due to the fact that these firms were more aware of the available support and had more connections within the industry and with government agencies. It was also observed that funding provided by the government agencies depends on the stage that the firm has reached. Companies believe that there is more funding available for the demonstration and R&D phases than for internationalization. The amount of government support received by a firm throughout the demonstration and R&D phases influenced its ability to receive backing from private investors

because the risks for them are reduced. It was also observed that there is very limited assistance for born-global companies from foreign governments once they reach the foreign market, as the foreign government's principal interest is to support their local firms.

Furthermore, while the Uppsala Model suggests that companies gradually set up international operations after creating a solid market domestically (Johanson and Vahlne, 1977), this does not appear to be the case for born-global firms. Due to a limited domestic market for the cleantech sector, companies feel the need to internationalize rapidly. It is observed that by obtaining support from the government, companies increase their market knowledge and reduce the risks associated with international operations. The primary issue identified with reaching foreign markets is financing, which is in contrast with Carlson's view (1966) that the primary issue is lack of knowledge regarding these new markets. It is observed that innovative products and technology produced by born-global firms give the companies an advantage in the international market and reduce the entry barriers as suggested by Moen (2000), Efrat and Shoham (2012) and Varma (2011).

In an interview with a representative from EDC it was apparent that this Crown corporation understands the importance of assisting born-global companies in the cleantech sector with the efforts of going abroad, "so we are willing to take on more risk in the cleantech space than we do in other sectors" (EDC Interview, Appendix D, 2017). EDC assists firms in the internationalization stage but "because our mandate and our solutions are only on the export side that means that most of the companies that we serve are somewhat mature financially" (EDC Interview, Appendix D, 2017). This is similar to the information disclosed in an interview with an International Trade Advisor from MESI: "To benefit from the services of Export Quebec, a company must already have started to export out of Quebec or be ready to do so" (MESI Interview, Appendix D, 2017). It is evident that due to the born-global phenomenon and its characteristics, government organizations must be able to adapt to their process of internationalization in order to assist them.

Speed category examined whether or not government support has a positive effect on born-global companies rapidly internationalizing from inception. The link was indeed observed.

It was identified that government assistance influenced companies in their goal of reaching foreign markets quickly. Firms that are in the process of seeking out government support agree that they see the benefits of it and are looking to receive backing from governmental agencies. It was identified that funding and mentoring provided by government agencies aided firms through the demonstration and R&D phases and ready their products for the international market. This corresponds to Spence and Crick (2006) who suggested that Canadian government agencies provide support programs that will increase the firms' opportunities to successfully take their product from Canada to the foreign market.

It was also observed that the sample companies encountered some issues in obtaining the support they needed. The main issue was with the time it took to prepare the applications and the amount of time it took to receive the funds. This is a concern for born-global companies because the innovation and production of their products depend on it, particularly given that domestic sales are not as high due to a small market in Canada. Firms require financial assistance for the demonstration and R&D phases in order to quickly roll out the products internationally. This goes in hand with Laanti et al. (2007) who suggest that companies need support in terms of funding and development from the innovation stage to the commercialization stage. On the other hand, it appears that there are in fact many opportunities available for born-global firms, specifically through Ecotech Quebec, an organization that provides support to firms in the cleantech sector. "We support the firms. We connect members with other members. We connect members to clean technology firms. We work with other associations that are more specialized in a specific cleantech sector… at the municipal level we work with the CMM, at the provincial level, same thing we work with every ministry but the one that funds us is MESI and then at the federal level it is DEC" as stated by Victoria Smaniotto, Director of Branding & Internationalization at Ecotech Quebec (Ecotech Quebec Interview, Appendix C, 2017).

Moreover, it was identified that government support played an influential role in the existence of born-global firms, as without it the firms would not have been able to develop their products and get them ready for the foreign market. There is a correlation between government support and speed of internationalization, as it was observed that once companies invested time into finding the right programs for support provided by government agencies and assumed the

initial cost of time and money to prepare for grant applications and subsidies, more opportunities were presented to them due to their new connections. In an interview with a representative from TCS it was specified that "One thing that is specific for born-globals (younger companies with promising technologies that are looking for opportunities outside of Canada) is we have what you call the Canadian Technology Accelerator (CTA) which is actual a platform/way for firms to scale up and accelerate the development, developing a specific geographic sector" (TCS Interview, Appendix D, 2017). The options for assistance are available and as it was observed, those firms that put an effort into the research and application process greatly benefit.

Performance category examined whether or not government support has a positive effect on the overall internationalization performance of born-global companies. The link was observed. It was identified that assistance provided by government agencies gave firms the opportunity to create connections, develop their network, validate technology and improve the overall ability to go abroad. In an interview with a representative from TCS it was disclosed "TCS provides advice here in Canada first and helps them prepare to go abroad, and once they go abroad to help them further refine their market potential evaluation as well as provide them with contacts" (TCS Interview, Appendix D, 2017). Government agencies try to support the firms from the beginning of their internationalization process. The companies plan to continue working with, and relying on, the support provided, as it is observed that the benefits are apparent when it comes to the success of the business.

Upon their revision of the Uppsala Model, Johanson and Vahlne (2009) included relationship and network connections as important factors of internationalization. This is supported by the findings as firms relied on government agencies and Ecotech Quebec to introduce them to individuals and organizations that would assist them. In an interview with Victoria Smaniotto, Director of Branding & Internationalization at Ecotech Quebec, she mentioned "Some of them will ask us for special projects and funds. So special projects can be networking, can be promotion of their services to our companies, can be special studies that we can submit to them like advice on cleantech sector, and also representation if we ever have some very prestigious meetings or if we are invited to important events, we will invite them as well" (Ecotech Quebec Interview, Appendix C, 2017). There are many opportunities available for

born-globals in the cleantech sector however the issue occurs during the process of research for available support from the government. Companies found that the information is spread out along many different outlets and wish to see a more consolidated platform where assistance opportunities from federal, provincial and municipal governments are presented together.

It was observed that technology validation influenced the companies' ability to go abroad and seek out private investors. Private investors see government support for born-globals as a sign of reduced risk and tend to invest in the companies that are backed by these agencies. As Rennie (1993) suggested, government agencies need to invest into supporting born-global companies and provide an environment for them to grow. This will not only benefit the companies but also create more jobs and be advantageous for the Canadian economy. It was identified that companies who used accelerator programs and incubators were able to better expand their networks and gain more opportunities.

The role and the support provided by government agencies is recognized and valued by born-global companies. In this study, the firms interviewed are at different stages of their internationalization process. Some had more interaction and connections to government resources and some are still in the process of acquiring more support. Regardless of their stages of development, it was evident that all interviewees agreed that relying on and utilizing funding and mentorship from government is integral for the existence of the firms and for successful internationalization process. A representative from TM4 said that the level of government support at times dictates whether or not a project will be taken on, "I would say that the level of government support that we get helps us define the scope" and the company depends on its strong network of contacts within the government (TM4 Interview, Appendix B, 2017). When asked about the importance of government assistance, a representative from Aeponyx stated that the support was fundamental, "We would not be talking right now. It is impossible for a company like us, because we are in the hardware business and develop chips. So financing only privately is impossible" (Aeponyx Interview, Appendix B, 2017) and a representative from Effenco had a similar response, "It is essential because any government wants to give money to a local company and encourage local labour and R&D" (Effenco Interview, Appendix B, 2017). A representative from Aquartis stated that the support was necessary, "We would not be able to

achieve what we do without their help. For example the trade commissioner helped us obtain contacts and introductions to a lot of companies or big groups or financial customers. It would not be possible to do it without them" (Aquartis Interview, Appendix B, 2017) and a representative from Company B went even further to say "It was the matter of existence of the company. We have not succeeded in having the private sector/venture capital to receive 100% of the money we needed. As soon as the government provided that incentive, it reduced the risk and we succeeded in getting private partners" (Company B Interview, Appendix B, 2017). Born-globals acknowledge the significance of government involvement and assistance throughout the initial stages of the company to internationalization stages.

A revised conceptual model is presented in Figure 2. It incorporates key elements for each category. For Market category, the key factor is government assistance received during the internationalization stage. For Speed category, the key factors include reasons for rapid internationalization, government support received from inception of the firm and the overall capabilities of the firms. For Performance category, the key factors include networks and contacts that the firms obtained through government assistance, as well as the validation of technology they received through government support.

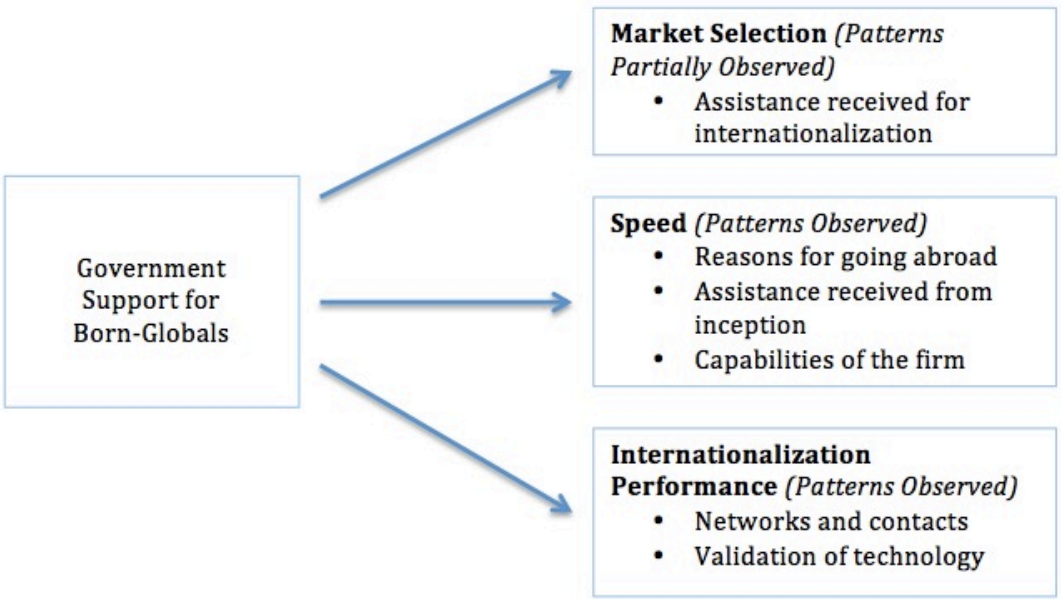

Figure 2: Revised Conceptual Model

Chapter 8: Conclusion

The objective of this research was to examine factors that enhance the internationalization process and the role government assistance plays in regards to the internationalization process of born-global companies as well as the significance of this support. The information supporting this study was gathered by interviewing companies who are members of Ecotech Quebec and are in the process of expanding their operations abroad. Six companies were interviewed and the data was analyzed with the support of the conceptual model and interviews from Ecotech Quebec and three government agencies.

This study confirms that governmental support has a positive effect on the internationalization process and assists companies in rapidly going abroad and entering foreign markets. It also became apparent how valuable this assistance is to companies, specifically in order to create new connections and expand their networks as well as to validate their technology in order to receive financial support from private investors. Born-global companies have a different internationalization process than standard companies who only go abroad once they have secured a solid standing domestically. This study shows that there is an ample amount of support available for born-global companies at the federal, provincial and municipal levels. It is in firms' best interest to seek assistance from governmental agencies as they are constantly implementing new strategies for supporting firms during the R&D, demonstration and internationalization phases. It was also discovered that more assistance, particularly financial, is needed for born-global companies to be more successful.

Chapter 9: Limitations

There are several limitations in this study that placed restrictions on methodology, sector/industry, theoretical framework and more specifically the concept of 'born-global' companies and analysis.

Methodology: The sample data was collected from firms based in Quebec only, where provincial and municipal government assistance may differ from the support offered in other provinces throughout Canada.

Sector/Industry: The study is based on born-global companies in the cleantech sector in Quebec. While there is criteria set in order to pick the best candidates for the sample, the issue is the fact that the cleantech sector in Quebec is growing and receives significant support from the government. This might not be the case for born-global firms in other sectors and/or in other provinces.

'Born-global' concept: The notion of 'born-global' companies is relatively new and the meaning of the term varies from study to study, making it difficult to accurately define. An in-depth literature review was conducted, in large part to determine the exact criteria for classifying a firm as 'born-global' and subsequently select companies for the sample. Limits arose when considering the number of years it took firms to internationalize (varying from 2 to 6) and their motivation.

Analysis: The six firms are all in the process of reaching international markets but are at different stages of the process, which might have had an effect on the analysis. Companies face different issues at different stages of internationalization and might therefore require different forms of assistance.

Chapter 10: Future Research

This research explored factors enhancing the internationalization process of born-global companies and the role of governmental support in the cleantech sector. Two factors were identified and discussed: market selection and speed of internationalization. Additional factors might be explored in order to determine other areas where government assistance plays a role, and what other forms of support companies might require during the process of going abroad.

This paper concentrates on the cleantech sector, as it is an area of high interest and has a significant influence on the Canadian economy. More sectors could be used in future studies to determine what similarities and differences exist between different sectors, and whether government assistance differs in form and/or effect from sector to sector. This research focused on six companies located in Montreal and its neighbouring regions. A larger sample size would provide more descriptive results. Also selecting companies from different provinces across

Canada would yield a better understanding of the different levels of support (federal, provincial, municipal) provided by the government agencies across the country and their effect on born-global firms.

More in-depth future studies might be conducted, and the findings confirmed, with a quantitative analysis, where the findings suggested in this paper are transformed into hypotheses. The analysis can be pushed further to explore why patterns in one of the categories are only 'partially observed'. Interviewing several representatives from firms and government agencies could provide more detailed responses. Another aspect that might be studied further is the importance of the technology validation government support provides to firms, and what role this factor plays in internationalization.

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Appendix A – Interview Guides

1.1. Firms Interview Guide

Part 1: Assistance

When was your company established?
Do you conduct international activities? Where? What kind?
How long after inception did you start international activities?
Did you intend to go abroad from inception?
Have you received any government assistance and what kind?
In what year did you seek government support?
Was this assistance helpful?
How did you find out about it?
Were you aware of different types of assistance, federal, provincial and municipal?
What is your success rate? How do you measure it?
Did you receive assistance from other sources that is not related to the government?

Part 2: Future

What do you think governmental agencies could do better?
What other assistance do you require?
How can the government attract more firms to receive support?

Part 3: Organization

Ask questions about the organization. What does it do? Details about the organization.
What proportion of your sales comes from abroad?
Are you planning on entering other markets?
What factors helped you and what factors acted as barriers?
How long have you been a member of Ecotech Quebec?
What benefits have they provided you with?
How did you find out about them?

1.2. Écotech Québec Interview Guide

Part 1: Assistance

What is your selection process for membership if any?
What support do you provide to your members?
Which government organizations do you work with? Which organizations provide federal, provincial and municipal support?
What assistance do they provide?

Part 2: Future

What changes do you wish to see in the interaction process of born-global firms and governmental agencies?
How are you planning to attract more members?

Part 3: Organization

Ask questions about the organization. What does it do? Details about the organization.

1.3. Government Agencies Interview Guide

Part 1: Assistance

What type of assistance do you provide to firms, specifically born-globals in the cleantech industry?
What is your selection process?
How do you attract these firms?
How do you advertise your services?
Do you reach out to firms or vice versa?
What benefits do you receive in return for your support?
What is the success rate?
Do federal, provincial and municipal agencies work together on funding opportunities or separately?

Part 2: Future

How do you plan to work closer together with the firms?
Are there any new initiatives in the works? / What other services will you provide in the future?
How can you attract firms better?
How do you know what firms need?

Part 3: Organization

Ask questions about the organization. What does it do? Details about the organization.
Do you and how closely work with Ecotech Quebec?

Appendix B – Firms Interview Transcripts

2.1. Aquartis

Aquartis – April 20, 2017 – 4.53pm (33 minutes)

Interview Guide For Firms

Part 1: Assistance

When was your company established?
I founded the company officially in 2010 but we started the marketing of our products 3 years ago in 2014.

Do you conduct international activities? Where? What kind?
We started about a year ago. We are manufacturing water-recycling systems, so the idea is to save water, so obviously our market is international and not really in Quebec. But we had to test and make a pilot project here in Quebec to validate our technology so that was in 2014 and 2016 and then we started the international process through an international representative. We made our first sale aboard 6 months ago in Martinique, so that was officially our first project. We tried to sell abroad for about 12 months now. Right now in Martinique, the Caribbean area and we have a sales rep in Brazil, Chile, and Morocco. I kind of changed my strategy in terms of international development, in the beginning I was really trying to conquer the entire world and go everywhere, and then realized that it costs a lot of money and takes a lot of time, so I decided to focus on priority market. Right now we are really focusing on the US, and more precisely on California, this is our main target in terms of short and long-term development internationally. We will take other projects in Morocco or elsewhere only if it is really interesting.

How long after inception did you start international activities?
In 2016, 6 years later.

Did you intend to go abroad from inception?
Yes, we intended to go abroad right away because the market in Quebec is small.

Have you received any government assistance and what kind?
We have received some help from the CNRC (National Research Council Canada – federal) for the innovation part: the engineering works, subsidies for engineers' salaries. We had some help for the export portion from the provincial government, MESI. They subsidized the portion of the expense to go abroad. We had help from CNRC 3 times. This is basically the financial help that we have. And we also have a lot of support from the Quebec delegation in different areas where we do some activities, and also from the federal delegations (federal council abroad). We work with the Canadian embassies for example in Los Angeles, they have a delegation of people there to help us, and I think it is a trade commissioner service. Financial support was received from CNRC (engineering part) and MESI (the exportation part). We did a research project with the Water Technology Centre in Montreal and the project was financed by CRSNG (Natural

Sciences and Engineering Research Council of Canada). They subsidized the project so their research center could do their work.

In what year did you seek government support?
The support we received was before we went international. The first help we got was from the CNRC (engineering part) but before being accepted to this program we had to show that we have a pilot project working technologically so we had to prove to them that we were a serious company. They give money but they invest in companies that they think will do well for the country. So we got help not from the beginning but probably in 2015, so we had a year of activities but it was before we started the international portion.

Was this assistance helpful?
I would say that the support is absolutely necessary. For the CNRC I think we have about $70,000 for salary subsidies. We would not be able to achieve what we do without their help. So that is the financial part. For example the trade commissioner helped us obtain contacts and introductions to a lot of companies or big groups or financial customers, that is a free service but we got some very valuable contacts from them. It would not be possible to do it without them

How did you find out about it?
It was a mix of many things. We heard from some programs in the media and the Internet. I founded the company when I was in university of Quebec in Montreal, they had an entrepreneurship center and a mentor there so we received information from them and also from local organizations that help jump-start business growth.

At the beginning it was more difficult because I was only looking at websites and trying to understand every program and see how it could fit, and see if we are good with the admission criteria. The CNRC (National Research Council Canada) they kind of give you a guide to handle all your business practices. So when we had a representative who helped us understand the business and provide us with any help he could give us. Same thing with MESI - provincial, we have a guy who is responsible for our business and he helps us with the information for any program that MESI has. Now it is pretty easy for us, we just have to call one of the guys and ask him to give us the information.

Were you aware of different types of assistance, federal, provincial and municipal?
We did not do any profound research in the beginning. We just heard about different programs and applied to them. So it was an ongoing research of programs. And there are always new programs.

What is your success rate? How do you measure it?
It is kind of a milestone approach. At the beginning I was trying to have the viable technology that I could sell. So then we had the product and we made the foundation project with the research center in Montreal so they validated our technology. That was the first milestone. And then we had to make some sales, so I was trying to get a reference customer. I wanted to sell my product to some big companies so that I could use the names to generate better sales with other customers. So that was our big focus last year. So we had some pretty interesting reference customers and now our main challenge is financing. I was actually in Quebec today for that. So

we are doing our first equity-financing round with angel investors to raise a lot of money to fuel our growth. So that is kind of my actual challenge and being able to say I succeed in this challenge when I get all the financing I need. After that, we have some sales forecasted and we want to achieve them.

Did you receive assistance from other sources that is not related to the government?
The other help we received was talking to mentors, so that is more private help, as well as counseling.

Part 2: Future

What do you think governmental agencies could do better?
Well I think there are many programs that are very good in Quebec and in Canada for different challenges that we faced like innovation and exportation. The one thing I would say, as you know Ecotech the cleantech cluster, and the one project that they have that I like is to encourage the government to use their infrastructure and their vehicles and their assets to be pilot projects for young cleantech technologies. So a company that designed a fuel saving device can use the provincial government vehicles to test it. And for example our water-saving technology, they can use in provincial buildings to test our technology and to validate our technology. And after that to be able to say that the government of Quebec is our client. That would really help commercially. It might be complicated but the idea is really good. So aside from giving money and advice, utilize their assets to build or test out products.

What other assistance do you require?
With the money that we are trying to raise our objective is to industrialize the company and add some products. So we need to review some engineering parts of our products. For example there are some parts that we manufacture manually and we need to be quicker. And also improve our industrial engineering. And also the other big part is international marketing and development. For that we obviously want to use the trade commissioner services and take advantage of the programs like DEC (Canada Economic Development). It is a program where they give you a loan of 50% of your expenses at 0% for 5 years. And also take advantage of the provincial help.

How can the government attract more firms to receive support?
They have really good connections in all the small cluster and accelerator programs for all the help that a small company can get. So I think it is pretty easy to find the right program but probably many young start-up companies do not apply for any kind of help thinking that it might be a complicated process or that they will not get any help because you need to show them (governmental agencies) that you have a good business plan and do your homework. I think it is not really hard to find a program.

Part 3: Organization

Ask questions about the organization. What does it do? Details about the organization.
Well the mission of Aquartis is to manufacture innovation for water saving. So we basically manufacture systems that recycle water in buildings. For example, multi-house buildings or hotels that will collect the grey water (so the water coming from showers, bathtubs, and lavatory)

and our system will treat this water and then pump it to feed toilet flushing and irrigation. So it is really a system that enables water recycling. We also have some commercial or industrial applications. But the idea is always to recycle water. There are treatment systems, so we do not do systems only to create viable water for drinking or to treat the sewers water for disposals; it is always for recycling and to reduce the water consumption of a building.

What proportion of your sales comes from abroad?
Now it is 5% only but in the future it will probably be the majority of our sales.

Are you planning on entering other markets?
The new market we are trying to reach is California.

What factors helped you and what factors acted as barriers?
Aside from financing, regulations play a big role. There are some regulations locally that prevent water recycling for sanitary or public health reasons. There are also places where there are no regulations about that, so it is kind of a grey zone. And there are also regulations that encourage that. So we really depend on the regulations locally. Many regulations are improving and are now more enabling water recycling and encouraging it. Regulations are big factors. For us when we choose the market, we look at the basic stuff like the cost of water, water scarcity. Since most of our products are used in new buildings, we look at the number of new buildings that are built every year and the size of construction industry.

How long have you been a member at Ecotech Quebec?
I think it is our 3rd year now.

What benefits have they provided you with?
Well I really love Ecotech because it is a very focused cluster for us. Aside from mentoring they inform us on specific programs for us, they do a lot of lobbying, so the government can put in their budget the money for cleantech companies. They also can put us in contact with potential customers. They often have networking activities so we can speak with other entrepreneurs like us and share information and benefits.

How did you find out about them?
I think it was a friend that told me about them. He met the CEO at a networking event and told me about the organization and I became a member.

2.2. Effenco

Effenco – May 11, 2017 – 9.04am (45 minutes)

Interview Guide For Firms

Part 1: Assistance

When was your company established?
It was established in 2006.

Do you conduct international activities? Where? What kind?
Yes. Right now in the UK, Germany and France. Not necessarily that we have dollar exchange in these countries but we are active. So I mean of course representation in order to get sales over there. In the UK we did sell, we did a pilot, so basically we put a demo of our technology there with customers and our strategic partners (in our case they are manufacturers – basically an industry that could integrate our technology. So we did sell there and do a demo. In Dublin we sold, but no longer active there at all. In Germany we are doing representation at the moment, we are collaborating with manufacturers who would integrate our technology. And in France we have a customer that is a French multinational and they are our customers here in Quebec but they are based in France, and basically they want to use our product in Paris. So we are working with them to bring the technology there. Of course working with French manufacturers also to integrate our technology over there.

Did you intend to go abroad from inception?
I mean yes, our technology can be applied anywhere and our patent, first and all the other patents since then were submitted to 10 or 12 countries if I remember (on all continents except Antarctica). So obviously our intention was to go everywhere even before we did.

If yes to #2, how long after inception did you start international activities?
In the US we started in 2009, across the Atlantic (in the UK) in 2013.

Have you received any government assistance and what kind?
Yes and no. It was always a stretch. I mean of course when you get R&D tax credit. Naturally these R&D projects are for any of your markets, so indirectly it helps. There is one grant only so far that we got some money from to help demo, it is called Sustainable Development Technology Canada (SDTC). It was a project, it was not only for demo and we were allowed to take some of the money and do pilots elsewhere. Basically everything gets down to money and that is the big struggle. So yes we got some grants but it is never enough.

In what year did you seek government support?
Between 2010 and 2015 I would say. There were several projects. We had 2 projects with SDTC and the 1st lasted 4 years, the 2nd one overlapped with it.

Was this assistance helpful?
It was essential. There is no doubt. It is essential because any government wants to give money to local companies and encourage local labour and R&D. When you try to demo, or pilot, or try to enter a new market it is almost impossible to get money locally (host country) because the government wants you to establish a shop and R&D right away. Which is kind of impossible. So if your government wants you to export, they need to give you money to spend it elsewhere. Government assistance helped but it was not enough, we need more.

How did you find out about it?
At first I found information through the Internet and networking. Now it is hard to say because I know them all. And of course Ecotech, and as you know more agents in the government they align you to different grants. We were part of a business incubator when we started, so they

direct you to different grants. To be honest any entrepreneur can find information or grants because it is not really tough in today's world.

Were you aware of different types of assistance, federal, provincial and municipal?
Yes of course. The further you go from home it is a bit tougher because the network is not there. So you really need to go deeper to search. I would say municipal assistance is a bit tougher because it is a bit unorganized. There are also so many municipal organizations so you would need time to find them all. Of course you are going to be looking for the most strategic and biggest ones. From what I know any municipal funding comes from federal level. I do not think there is so much funding available on the municipal level.

What is your success rate? How do you measure it?
Obviously it cannot be profit because by definition anything that is subsidized cannot bring any profit. There are two ultimate measure of success for us. First is repeat sale from the customers or anyone who has witnessed the demo and second is the strategic alliance with a manufacturer/ integrator of our technology in a specific geography (in order to integrate it and sell it in a specific market – having a strategic partner that will commercialize for you).

Did your success/failure depend on the assistance you received?
We would literally not go. We would not try. We have a project in France and I do not know if and how we will go because we are trying to get some help right now. There are not enough sources of funding available. There are 3 commercial activities (proof of concept, early demo, R&D) – it is easy to get financing for that in Quebec and Canada. Basically from proof of concept to commercialization – it is very hard to get money for it. This is where you need to get equity. It is tough especially if you are not a software company. There are many programs but they are reluctant to provide funds. A demo can be sold to initial customers to show the product but it is not profitable. And there are some programs that give you money and help you in the beginning a little bit. When you talk to grant agency very often when you start they are lukewarm with the funds but when you tell them that you are planning to take the product abroad under the grant program they limit you even more. We have a customer, a manufacturer and a project abroad and let us say we deploy 20 units to prove that we have the technology in the UK and we do the exact same project in France. And the grant agency will say that they will not use the public money from British or French taxpayers and give it to a Canadian company to bring their technology here. So the foreign government does not want to give you money to bring your technology there and the government here (Canada) is not pushing enough to help you financially to export your technology. So there is a gap between local and foreign. For the local government of course some of the money will be spent abroad but at the cost of exporting because everyone wants to export but all the core competencies like R&D stays here because that is where the company's headquarters are.

There have to be exportation programs because when the government gives you money it is a very small fraction. Very often they will pay for conferences and trips. The will give you money for advisors but that is not what we need. We just need money to bring our technology abroad. In 11 years we only spent money once on advisors. There are so many grants for that, but that is not what I need. We need to bring our technology abroad to the customers.

Did you receive assistance from other sources that is not related to the government?
Equity. That is the only other source that I know. Others that are not grants but still government related – Export Development Canada (EDC). It was a loan for production. It is a source of financing but it is basically to finance our purchase orders. And it is great. It is a work in progress loan.

Part 2: Future

What do you think governmental agencies could do better?
There are a few things they are doing very well. The trade commissioner services (either from the federal or provincial government) are great and we use them. Some things could be better, it depends on the individual but they have to keep the service.

Give us money to do the 1st sale abroad and support us in going abroad. And by definitions they are not profitable (1st sale) as there is always a payback when you start commercializing in another country because you have so many expenses in the beginning due to distance. Supporting 1st sales abroad because the local government in foreign countries will not do it because they will not support R&D from a foreign country. So the exporting country needs to support the 1st sales and right now there is a chasm there. I will give you an example. There is a program in Quebec from MTQ (Ministry of Transportation Quebec) called Ecocamionnage program (eco-trucking) – incentive/voucher program. So every time a customer (in Quebec) buys a system, the technology is already eligible and de facto they get a 50% discount. So this helps us tremendously to sell our product in Quebec. There are very few pockets for trucking industry that such programs exist (Quebec, New York, California and Chicago as far as I know in the Western world). The program should extend to other pre-selected geographies so lets say you want to go to Europe and they say for 50 systems we will give you 50% discount to your French or English customers to help you export. This program is great because it is simple and works.

What other assistance do you require?
I think everything we need is money because the rest is great. The other thing is financial support for a commercialization activity is there but I think however very often people including those from government say that the commercialization abroad cost is underestimated. And yes it costs a lot. Then you go to a program and they give you $50,000 per year and you are only allowed to apply for it once. That is not a lot of money as it is a small fraction. There is a misalignment between the reality that everybody acknowledges and the programs. I am very grateful and we have a lot of support but I remember a few times we applied to programs but you could only apply once and they did not give you a lot and after they were surprised that we were not finished commercializing abroad. Align the amount of money and the timing/duration of programs to every type of business and their reality of exporting. A sales cycle for technology differs so the programs should be aligned to support them. Everything else that we need we get it from Export Quebec, trade commissioners and resident trade commissioners in the host countries. Besides money the only thing you need after is connections and networking. I will give you an example. If we were to apply for a grant in France and we ask Export Quebec to directly liaise with grant administrators in France to increase our chances of being accepted. We did not get the grant but we did get the exact information we needed and did not waste time and money travelling there to try and get this grant.

How can the government attract more firms to receive support?
Effenco got a lot of public money since its inception. Grant applications are very structured and they push you to think and structure yourself. There is a lot of money for R&D and demo. There should be a better scope that is more aligned for needs for exports and 1st sales. However for the grants, technology is a competition all over the world. If Quebec wants to be a leader in the electric transportation sector they need to provide more money for it, especially if you compare it to California and China. You cannot expect to be a leader without doing the expenditures. If the government wants to be a leader in a specific sector, they have to invest more money.

Part 3: Organization

Ask questions about the organization. What does it do? Details about the organization.
Effenco stands for Efficiency Energy Company. The goal at the inception of the company was to make road transportation cleaner and very fast it became the efficiency of heavy trucking.

What proportion of your sales comes from abroad?
Last year it was maybe 50% of $1million, but we expect it will be maybe $2 million next year. Ultimately 90-95% of our sales will be from abroad.

Are you planning on entering other markets?
No for now it is Canada, United States and Western Europe.

What factors helped you and what factors acted as barriers?
Being a foreign company is hard. What helped us is having good partners locally abroad to cater to foreign customers. Having a good product. The government assistance we received. What helped us in Europe is price of fuel, same in the US – macroeconomics.

How long have you been a member at Ecotech Quebec?
I would say since 2011-2012.

What benefits have they provided you with?
Very good networking and introductions, lobbyism (defending our interests) and helping to understand better how the government works.

How did you find out about them?
I was not the one who was introduced to them but probably through networking.

2.3. TM4

TM4– April 25, 2017 – 3.00pm (43 minutes)

Interview Guide For Firms

Part 1: Assistance

When was your company established?
In 1998.

Do you conduct international activities? Where? What kind?
Yes of course. Well we are active in nearly 25 counties right now. The major countries would be most of Western Europe, China, India, US, Australia. So it is pretty diversified. We have sales of the products, dealing directly with international countries and through the distributors and the distribution network that we have established. We also have a joint venture in China for the production and sales of our core products.

Did you intend to go abroad from inception?
We sort of knew that going international was necessary. More specifically because we target ground transportation market, which is quiet small in Canada compared to other countries. So we knew that we had to go Detroit, Germany, France, Japan and China because that is where the big OEMs (original equipment manufacturer) are located.

If yes to #2, how long after inception did you start international activities?
From the beginning from 1998-1999. The first major customers of TM4 were international.

Have you received any government assistance and what kind?
Well we are in an odd position because we are a private company but our only shareholder is Hydro Quebec, which is owned by the government. So of course it is a unique situation to be in. If we put that aside then yes we received different types of governmental support that we are eligible to since we are a private company. And so it comes from different grants for R&D or commercialization of projects to being involved in consortium of companies that are working together on specific projects with government funding. We have a good share of government support since the beginning on of out activities. There is STDC (Sustainable Development Technology Canada). Of course there is Quebec government directly that financed some initiatives. Hydro Quebec is a shareholder so it is not governmental support because it is more of our investor. We also received some funding through National Research Council of Canada, mostly financial support.

In what year did you seek government support?
We are in a field that depends on a lot of government policies and being involved in vehicle electrification we knew that from the start that we ourselves would need some support of the government and the industry itself to be sustainable and to be encouraged, we would need to receive government support in form of subsidies. Some policies do not touch us directly but enabling our industry to grow.

Was this assistance helpful?
Yeah, for us it was not directly linked to any international projects but it was more for developing new products or validating specific technologies that are included in products. And of course there are some projects that keep going even when you get out of the R&D stage and transition to the commercialization phase. But I would say the biggest impact would be on product development and R&D stage. Of course the products that came out of these projects were mostly used internationally because of the relatively small scale of the market in Canada.

How did you find out about it?

Well it might have been through Hydro Quebec at first that probably opened some doors in that regard when it comes to finding the right grants or subsidies available for specific projects. Hydro Quebec itself is a public owned company so they not eligible for that type of grants but us as a private company we have access to them. I have been here for 7 years so I have not been here from the start but we have resources inside the company that are dedicated to following on grant applications and making sure that when there are new opportunities to get new funding for R&D projects or new technologies or consortium of companies that are initiating a new project on electric vehicles that we have access to them. We have developed a good knowledge internally where to look and of course a good network of all the governmental agencies that provide the support.

Were you aware of different types of assistance, federal, provincial and municipal?

I would say mostly half and half for provincial and federal levels. Municipal level is not that important for us because we are not in Montreal, maybe if we were we would have access to more funding. Being in Boucherville, which is a small suburb of Montreal, there is not that much incentive or funding, available from municipal level.

What is your success rate? How do you measure it?

I would guess when you start as a company that wants to sell technology and products that are a bit new, as the market evolves out criteria for success also change. I would say at first when you are in the early stages of commercialization whether the project is funded by governmental support or not, just to complete a project and have a functional product and a test customer and some positive results of the product being used, inside a vehicle in our case. That would be considered success especially if it is a product that we can sell at large afterwards. But now that the market is more mature we expect more out of every project we do. So if we put recourses into developing new products or technology or improving some designs that we already have, we cannot just have limited success or a very focused market for it, we want it to be a large commercial success. As the market grew our expectations for a successful project changed. Perhaps early on it was okay to have just a few test customers for a specific product and move on to another project. But now we really want to have a worldwide commercialization of our products and that includes of putting them into thousands of vehicles.

Did your success/failure depend on the assistance you received?

I would not say success/ failure depends on government support, well in fact sometimes just starting a project, if we do not have the government support we cannot start a project. Once the government is involved and we have the funding I guess what will make success/failure is the product and innovation that fails to be commercialized. Maybe it is a good concept but it is hard to produce at a large scale or if for some reason the customer base does not show up, or a key customer for a specific product coming out of a project for some reason backs out of the project, or goes bankrupt or changes focus, that would be a failure. But it is not that relevant to the level of government support that we have. I would say that the level of government support that we get helps us define the scope of the project and decide if we go forward with it, but after that success/failure is not based on their involvement. There have been cases where government changes have switched focus or funding away from projects that have been started by their predecessors, that is one way that government can be either helping or contributing to the failure of a project but that is not a direct consequence of the funding process itself.

Did you receive assistance from other sources that is not related to the government?
Yes there has been funding received through associations I guess from private companies that wanted to encourage our innovations. I would say when it comes to funding our company besides our own sales and government subsidies or grants, our shareholder Hydro Quebec has been the main contributor to our success and to our ability to stay in business when the market was in infancy state. Hydro Quebec shared the ownership of TM4 with different private companies over the years that have been contributing to some projects that we had, but now they bought back the shares so we are back to having Hydro Quebec as a shareholder.

Part 2: Future

What do you think governmental agencies could do better?
I would think the communication is still not as good as it could be. The platforms on the Internet and the many communication channels we have now, it is easy to reach out to companies. But sometimes when you are a company that is trying to get access to some funding you do not really know where to look. Now we are lucky because we developed over the years our network of contacts in our expertise field but I would think it is not the case for all of the companies. And maybe if there were a more comprehensive platform where the funding opportunities are shown or listed that would be helpful. But at our level right now we do not have a problem with this because we have skilled people that deal with it and because of our network of contacts we are pretty much first in line when there are new opportunities, so we know about them early on. But I would say it is different for other companies.

What other assistance do you require?
Well there is a good service in some countries from the trade delegations and the trade commissioner of the Canadian and even Quebec delegations abroad. Of course setting up our joint venture in China they played a big role in guiding us through that process. So the people on our end, the Canadian trade delegation and that is the case in many countries, there are some very good and proactive people. So we sometimes rely on their own networks to organize meetings if needed. We also participate in trade missions when they are doing trade missions in specific countries and sometimes they will provide funding for participating in conferences and exhibits that are related to our field. So this is also how we get support from the different governmental organizations.

How can the government attract more firms to receive support?
We are in a field where companies cannot really rely on the domestic market. So having from the start to export, from the government to target external market and define a plan for how to get the first customers or distributors or agreements in place for a specific market is very important for a new company. I would say that it has been improving over the past years and at the Quebec level, there have been some good assistance created like Export Quebec, which is more focused on helping companies getting into foreign trade and foreign activities and so they will assist for instance of you need to find an agent or even have access to an office in a specific country. And they will also assist you when it comes to finding out the cost of conducting business in that country. So there are some good resources but it feels like they could be consolidated in one place because right now it is all spread out over different entities. That may be the part that is confusing for some companies.

Part 3: Organization

Ask questions about the organization. What does it do? Details about the organization.
We are a company that is focused on developing and producing and commercializing electric traction system, so that is electric motors that are used to drive electric vehicles and all of the related power electronics and control electronic systems. We have in Boucherville about 125 people, mostly engineering resources and technical resources from mechanical design, software design and electronics. And we are developing our products here, we have a pilot production plant and quiet extensive validation facilities here in Canada. And in 2012 we also set up a joint venture for the production of these electric parts in China because the Chinese market is the biggest one right now and you need to be there locally if you want to have a chance to get significant market shares. So we started as a company that was mostly focused on customer driven projects, so a customer would come to us asking for a specific part for an electric or hydro vehicle and we would develop something customized for their needs. But now that the market is much more mature and there are more customers than before, so we have developed standard product lines that we offer that we develop and produce.

What proportion of your sales comes from abroad?
If we exclude the joint venture and just focus on TM4, I would say its 80%.

Are you planning on entering other markets?
So looking at Europe; we are very focused on designing a strategy for Europe because right now we cover the North American market quiet well out of Montreal area. We cover Asia very well out of our Beijing plant. So we need to have some local presence for supporting our customers in Europe, so we are looking at what would be the most relevant market for us to set up an office in, probably we are looking at either France or Germany. So that is our next step as a company, because European market is very interesting in terms of potential sales and right now we have distributors but that is not enough, we need to be directly present. Because we are in the industry where it is very important to cultivate and develop great relationships that last and being in the country or a region is very important.

What factors helped you and what factors acted as barriers?
Well there are some policies; it is a very country-by-country type of barriers so they are all specific to a country I would say. It is not a problem on the Canadian side to sell; it is more of how to get in to some countries. So for instance in the US where they have a requirement based on the 'Buy American' act, when it comes to content of American parts inside vehicles for instance buses that transit authorities will issue tender for, so even though we are 30 minutes away from the border it does not change anything because we are not an America company. So sometimes the big challenge we have and the fact that the cleantech industry, especially when it comes to transportation is still driven by government instances it means that sometimes the government that gives the incentives will require local content or local companies to supply parts. So in the same way I would guess a company from outside of Quebec trying to compete with us would find it difficult because of the government support we get here and the fact that we have a good network and are very well positioned, we have been receiving the support from government for many years so companies trying to compete with us find it difficult. So it is the same for us when we go to Germany for instance where you have big companies that are

supported by German government and we are trying to compete from the outside, it can be difficult. So it is the same thing worldwide, in China if you are not producing there you are not getting any significant market share. So that is a struggle for every company and the fact that I mentioned that the cleantech industry is very driven by government policies means that they will tend to favour local companies in order to award the incentives that they provide in order to help grow the industrial and technological sectors of the country.

How long have you been a member at Ecotech Quebec?
I guess thinks Ecotech Quebec has existed but I am not sure. I think might be 5-6 years.

What benefits have they provided you with?
There are a lot of networking and get together events with industry peers, finding opportunities to work together for Quebec based projects. I think it is one of their goals and then also of course they will give us access to a lot of documentations, sometimes studies or also they will be able to help us find financing or grants that are available whether they are securing funding for specific projects or just notifying us that the government will be announcing funding of some sort. So the fact that they are a group that is closer to the political sphere than we are as a company sometimes means that they have early knowledge of what is coming in terms of public policies and potential financial support options.

How did you find out about them?
I think it was through networking through other type of company group or industrial network group that have been together for a while. Ecotech has a focus on cleantech so we already knew a lot of companies that partnered with Ecotech and that brought us to the loop as well. And Hydro Quebec as a company was aware of what they were doing and lead us to participate as an active member.

2.4. Aeponyx

Aeponyx – June 9, 2017 – 11.45am (36 minutes)

Interview Guide for Firms

Part 1: Assistance
When was your company established?
2012

Do you conduct international activities? Where? What kind?
Yes, started selling locally but were not happy. So we went back into R&D mode and we are still in R&D mode but in about 2 years from now once we file our patents we start talking to customers and all of them are international. As we were developing the product we maintained a lot of communication with a lot of customers worldwide. So those customers are in US, Sweden, Finland, Germany and China at this moment. We will deliver the first prototype to them this fall.

Did you intend to go abroad from inception?
Yes. It is because we are a B2B and our target customers are large equipment manufacturers. Some have local presence here but normally more on the R&D side. The real business that they

have for selling product is abroad so 95% of my shipments will be worldwide. Products that will be shipped within Canada but then those products will be redistributed worldwide. My key customers are B2B, and are abroad.

If yes to #2, how long after inception did you start international activities?
5 years.

Have you received government assistance and what type? If no, why not?
Yes we have. The 1st one we received was from NSERC (Natural Sciences and Engineering Research Council of Canada) and they helped us during the R&D process. It was a Collaborative Research Development (CRD) program – collaboration with a university. The 2nd assistant we got was from the NRC (National Research Council Canada). We used their IRAP program and their BIAP program. We also used the Canada Accelerator and Incubator Program (CAIP). We also received assistance from SDTC (Sustainable Development Technology Canada). We also received assistance during the process of transferring technology to industrialization form Network of Centres of Excellence of Canada. We used a small program from Quebec government, which is called Export Quebec (for travel and business assistance). Also the R&D tax credit.

In what year did you seek government support?
Late 2013. Mostly for R&D, that is the majority of the money we have. The majority of the money received so far probably 80% of money is related to R&D, and about 20% for IP protection, business development and industrialization. The money forward is going to be more for industrialization, business development and scaling up.

Was this assistance helpful?
Fundamental. We would not be talking right now. It is impossible for a company like us, because we are in the hardware business and develop chips. So financing only privately is impossible.

How did you find out about it?
As a team we knew about some programs from web research, from university. The initial idea and one of the 1st patents came from university. When we started the company we started selling some products and we found some problems. So we went to an activity called 'innovation 360' and met a professor who was working on similar technology. When we met the team there they suggested some programs to start like NSERC to develop a collaborative project. Then we found NRC ourselves and the agent at the NRC helped us a lot. They assigned a representative to direct us to the right locations. Then I spoke to MESI and normally they have local people who can guide you to programs.

Were you aware of different types of assistance, federal, provincial and municipal?
I was aware of about 30% of programs. Then we started doing research and talking to people. To us the most fundamental program were from NCERC, NRC – IRAP program, SDTC – you can build a project, received a grant ($1.9 million) and gave us a recognized stamp (because the process is very rigorous in the cleantech sector) and when they give you a grant they do due diligence so after that you can go out and raise more money from private investors. SDTC acted as a quality stamp for the cleantech industry because they evaluate your technology, they validate the positive impact on environment and they validate the business in the market.

Did your success/failure depend on the assistance you received?
We are not yet commercialized but we just closed a financing round. Which is unique in the hardware space to raise money before having a product but it is because we have very innovative technology and we are fixing a very important problem. We have been able to validate the market and the customers. And we are about to provide the first prototype and go to production next year. Is raising money a success, I believe so. Is signing a customer agreement a success, we are getting there, it is almost done.

Did you receive assistance from other sources that is not related to the government?
We received private money. We had a chance to have an early investor and he invested $1.25 million into the project. That helped us from 2012 to now. And now with the grant and seed round we are in a very viable state right now.

Part 2: Future

What do you think governmental agencies could do better?
The Quebec government is not doing a lot. The only thing that they have done recently is that they created 2 funds –'Ecofuel' and 'fonds innovexport'. These two funds combine government money and private money to build funds for start-ups and innovators. 'Fond innovexport' targets companies that want to export; it is an early stage company fund. Those are great example of what the Quebec government finally doing something useful. Which is basically creating a fund that lets real investors and entrepreneurs manage the funds and seek companies instead of having government representatives and all the paper work. Organize great accelerators and incubators and combine them with programs for funds so the entrepreneurs will be able to get assisted from day 1. SDTC is basically funded by Canadian government but managed by a private entity, which is good. The Canadian government can support these start-ups better than Quebec government except Export Quebec – easy to use. There is a lot of paperwork and time spent waiting. Instead of having 5 programs that do their own administration, you get a big one to analyze the technology and innovation to focus the money on the firms who are innovative.

What other assistance do you require?
The next program I will be looking at is CAPEX investment to finance equipment purchases. I am looking at programs like 'Créativité Quebec' program and also Canada Economic Development and EDC. To help finance equipment and export projects. You need EDC to export – they are well build, well organized, support the companies, they give you insurance on receivables, they can finance large projects and find you customers who want to work with Canadian firms.

How can the government attract more firms to receive support?
They have to work together with incubators and accelerators. Some entrepreneurs do not need incubators to start but some do. Some firms need guidance and the government should ask them what it is they need.

Part 3: Organization

Ask questions about the organization. What does it do? Details about the organization.

We are an optical semi conductor company. We build optical chips for telecom and datacom. We are the world leader is silicon photonics and MEMS. So the technology that we have, we are the first ones world wide to do it. We invented the technology and will be the leader in the market that is opening up.

What proportion of your sales comes from abroad? Or are you planning on going abroad?
Our business plan is to reach $100 million by 2021 and sales to come 100% from abroad.

Are you planning on entering other markets?
The key markets are the US (most important), China, Sweden, Finland and Germany. Those would be the top 5.

What factors helped you and what factors acted as barriers?
There are no barriers.

How long have you been a member at Ecotech Quebec?
1.5 years.

What benefits have they provided you with?
They provided us with visibility, a few contacts. It is very difficult to be in the cleantech sector. They also connect you to the right government entities and they do that well.

How did you find out about them?
Ecofuel.

2.5. Company A

Company A – May 10, 2017 – 9.00am (30 minutes)

Interview Guide For Firms

Part 1: Assistance

When was your company established?
In 2012 and we had a new group of investors in 2014.

Do you conduct international activities? Where? What kind?
We have some projects in the states in Montana and in Ontario. A Lot of projects are outside of Quebec.

Did you intend to go abroad from inception?
No intention to go abroad from inception. But understanding the primary market and ROI, potential clients and investments are out of the province led us to international activities.

If yes to #2, how long after inception did you start international activities?
International activity in the US started about 1.5 years ago.

Have you received any government assistance and what kind?
No government assistance. We got some training but that is it. The concern is having to go through extensive and time-consuming processes for government assistance. Not knowing the programs and being afraid of not having resources to do all the paper work.

In what year did you seek government support?
Government support is still on the table, we did not say no to it. So it is a process.

How did you find out about it?
I would still consider government support. We did some research. We met with Ecotech and different programs were presented to us from the round table. But when we go back to reality it is on the to do list.

Were you aware of different types of assistance, federal, provincial and municipal?
We had a feeling.

What is your success rate? How do you measure it?
In Ontario there are municipal grants for water saving technology but we have not applied yet because we are not in the specific region for it yet. In the city of Toronto there is a good program to apply to but we are just around the perimeter of the borders to be eligible for this program. One of our clients applied for it so we cannot because you cannot apply twice.

Did you receive assistance from other sources that is not related to the government?
There is a research development tax credit. So we kind of have that support.

Part 2: Future

What do you think governmental agencies could do better?
I would drill it down to the help that they provide to companies such as ours. Like in Ontario they are charging for water consumption. So at a point where the technology is available in the market, the government should put tax water consumption. So an example would be if you choose to pollute then there is a tax, you want to spoil the water then there is also a tax. This would bring a big change to the market. The big water consumers would need to change. Encourage the firms to use cleantech technology. For instance in Europe that is how they work. They do not say we will support you with grants, they say we will charge you if you are doing the wrong thing and not utilizing any saving technologies. The technology is there but government is not raising the bar. So in California the government said that the cars should not pollute more than a certain level or otherwise you will have to pay a big tax. The more you use the more you pay. Municipal government is the closest to the customer. Municipality is responsible for water consumption and they do not charge for that, they are giving the water away to car wash industries and big water consumers. Here in Montreal we are loosing 40% of the water from the river through its treatment. Therefore the charges should be for water consumption and water that you return to the sewer. Municipal taxation should be worked out for large water consumers in Montreal.

What other assistance do you require?

It is always capital and funding. We are spending a lot on R&D and the project. We test the technology ourselves. It is really expensive in terms of business development and to go to the US or anywhere in Canada. Business development assistance is required.

How can the government attract more firms to receive support?
Easier application process, the government must really understand what the day-to-day life of a start up and an entrepreneur is. We feel like we are feeding the machine. When you have a big company you have specific people in charge of getting funding. Big corporations get grants easier even if it takes some time. In a small company you have no time to feed the big system and wait for 2 years. The programs take too long for a small company. It is risky for us to invest. I will give you an example of a client in Quebec to reduce greenhouse gas emission, it cost $12,000 in consult fees and more than 1.5 to prepare the paper work. We are still waiting for their answer but we cannot produce the project (to decrease greenhouse gas emission for $84,000). We need that money to do the project.

Part 3: Organization

Ask questions about the organization. What does it do? Details about the organization.
To develop water treatment technologies for the big water consumer – like car wash business and in the near future in hotels and big commercial complexes. The mission is to save millions of liters of water.

What proportion of your sales comes from abroad?
Most of our sales are in Ontario and Alberta. About 75% of sales are out of Quebec and about 5% of sales are out of Canada. But there is a huge demand in the US. I could go to Texas tomorrow but because of the cost of business development we want to be careful. We want to spread slowly but surely. We could go to California or Texas but we need to wait and grow.

Are you planning on entering other markets?
There is a very high demand right now in the US. There is demand in California, Texas and Pennsylvania. We have met with a big company in California.

What factors helped you and what factors acted as barriers?
No barriers to go outside of the province, we were welcomed. Our technology is very attractive and many are looking for this kind of technology. We are entering a market where there are companies for example in California that are similar to ours but their technology does not work well. This is helping us. We found a new alternative for it, something new. So we are filling a need and a gap that is there. But to go to US we need to have the capacity for it because we are a small company. So we are holding back and doing it one step at a time.

How long have you been a member at Ecotech Quebec?
The company has been a member for about 2-3 years but myself for 6 years.

What benefits have they provided you with?
In previous life for another company that I was a part of - yes. For this company we had a meeting for the patent for the IP. We were invited to join Export Quebec for a conference in

Louisiana. We have a client who was introduced to us from the Ecotech network. And this client is having operations in Quebec but they are based in France. There is a possibility to bring our technology to France with them.

How did you find out about them?
I found out about it from the President of Ecotech when I was a part of a mission abroad.

2.6. Company B

Company B – June 19, 2017 – 10.02am (26 minutes)

Interview Guide for Firms

Part 1: Assistance

When was your company established?
In 2013.

Do you conduct international activities? Where? What kind?
Not yet. We started creating contacts. We have not started delivering our product on the larger scale as of yet.

Did you intend to go abroad from inception?
Yes eventually. In fact from what we see the most valuable market for us is the international market. We can start locally to implement our business but sooner than later we need to go abroad. We are planning to go US and Europe for the sales part. For the production part we can go else where like Latin America or Africa but that is in the longer term.

If yes to #2, how long after inception did you start international activities?
N/A

Have you received government assistance? If no, why not?
Yes we received $3 million subsidy from the government to start our first demonstration project. Ministry of Energy in Quebec provided us with this funding. We have not received assistance from any other government agency.

What type of assistance did you receive?
Subsidy. We also received some assistance in identifying clients and making contacts.

In what year did you seek government support?
We requested the subsidy in early February 2014 and received it in late July 2015. So we waited a year and a half. We started building the request in late 2016.

Was this assistance helpful?
It was the matter of existence of company. We are a start-up with a new technology that has not been implemented at this scale yet. We have not succeeded in having the private sector/venture capital to receive 100% of the money we needed. As soon as the government provided that

incentive, it reduced the risk and we succeeded in getting private partners. We already had a form of commitment from the private sector to be there if the government was supporting us, as well as the government was asking for a private sector back up in order to conserve government money.

How did you find out about it?
Through a structured governmental program called 'Technoclimat'. The program is funded by the Quebec Green fund.

Were you aware of different types of assistance, federal, provincial and municipal?
No, not really. From what we have seen most of the programs are not intended for technology start-ups like us. Most of the financial support is intended for already established companies with at least a few years of existence where you can provide financials.

Did your success/failure depend on the assistance you received?
Yes the success absolutely depended on government assistance.

Did you receive assistance from other sources that is not related to the government?
From private sector, so we have a private company investing in our company. We sold 50% of our company to a major private group, so it became our private financial partner.

Part 2: Future

What do you think governmental agencies could do better?
I would say first of all to accelerate the time to analyze and respond to requests. We have seen it many times, where government gives a certain time to submit the proposal and it takes a long time to process. Have more funds available and a wiser way to use that money in the selection of the projects. Sometimes it is not clear what the criteria are. The selection process is very complicated.

What other assistance do you require?
Probably have a one-window approach. If we have a government incentive then after when we need to receive permits so we have to start over the paperwork. If at least once the project-funding request is considered as acceptable then we can start working on permits to save time but with the government structure now, we need to wait. When you are a start-up you are low on resources, so the government can advise and remind you on your applications. Make information more accessible and unilateral for all government agencies to reduce wait time.

How can the government attract more firms to receive support?
Increase efficiency. Create advertisements on projects that succeeded who were supported by the government. Once you have the money, you do not get the money upfront. As an example we received the letter from the Minister of Energy that our project was approved, and then it took 2-3 months to sign the contract with the government. Then within that contract there are milestone, and the money is given piece by piece by achieving the milestones. So the first milestone is when you sign the contract, but you need to make sure you have enough money between milestones. Therefore you need to manage your cash flow. Once the milestone is achieve you submit a report

with the work you have done, and then the government takes time to review it and then you wait to receive another part of funds, around 60-90 days. It was very helpful receiving the government incentive but if we did not have a financial partner who would help us in the meantime we would have had to take a loan. A loan is more complicated. We went to the bank to get a bridge loan but it was impossible to get that from a regular bank.

Part 3: Organization

Ask questions about the organization. What does it do? Details about the organization.
The mission of our company is to reduce greenhouse gas emissions by providing an alternative energy source (alternative to the fossil fuels) by using residual forest biomass.

What proportion of your sales comes from abroad? Or are you planning on going abroad?
Within a year we plan to internationalize. We attended a meeting with hedge funds that are interested in new renewable technologies. We started making contacts in US and identifying potential markets. We are in advanced discussions in Europe for potentially our product. Once our facility is up and running, we started the production on small scale and we are in the process of performing some maintenance work and improvements on our facility to be able to run it at 100% of its capacity. So once we stabilize the production and the quality of production we will start international activities. It is a priority for us as it is the most interesting market for our product.

What factors helped you and what factors acted as barriers?
For now the barrier we are seeing is more related to our capacity to meet the technical standards of the product. If we meet the technical standards, so far we do not see any other major obstacles. We might find some issues while working on it but no major obstacles have been identified.

How long have you been a member at Ecotech Quebec?
Personally I have been a member since the beginning and for this company since 2016.

What benefits have they provided you with?
So far just networking opportunities and understanding what others are doing. Connecting with clients and governmental entities.

How did you find out about them?
I was aware of Ecotech before this company and participated in some activities. So as soon as I started with this company I identified Ecotech as a partner and convinced the company to become the member.

Appendix C – Écotech Québec Interview Transcript

3.1. Écotech Québec

Interview Guide for Écotech Québec– March 31, 2017 - 1:54pm (34 minutes)

Part 1: Assistance

What is your selection process for membership if any?

So we are more in a pull strategy then a push strategy. So 90% of our members come to us. Some we have already worked with and tell them to become a member, but at the beginning we just worked with them at some point. Some of the companies we do not have as members today but we do not really work in having them we do more lead nurturing. We provide information and ideas on potential opportunities and if they want to become a member then it is perfect. We do not really campaign or anything. Regarding the membership there are 2 things. The first thing we are not an association, we are not an industrial association, because an association will only support its members and advocate for its members only and will do activities for its members only and do any kind of services for members only or with a very specific rate for the members and completely different rates for non-members. In our case it is not this, because we are funded partially by the government and so we have the mandate to cover the cleantech sector in Quebec. If you are a member or not so the potential opportunities I will send them to 2,000 companies while I have '450' members. If you are a member you get a little bit more, you can be on our board, you can be on our task force, I will have a better relationship with you because I know you a little bit more. And so the third thing about the selection process, is when they come to us they usually call us or apply on our website and we do a very modest due diligence and check what segments are they playing in (meaning are you a developer of clean technology, do you have any know-how, any intellectual property, do you have an innovation, do you have a patent), because cleantech is really about innovation, new processes, new ways to do stuff better than the standard competition. And when I say better it is not only by innovation as well as it has to reduce your impact on the resources and on the emissions. You have to reduce the energy consumption or water consumption of your client or you have to reduce the environmental footprint or air, on soil, on any natural resources and/or you have to develop technology that helps to reduce the greenhouse gas emission of the client. So it is really the environmental part. So it is 1) Innovation, 2) Environment (environmental benefits, reduction of environmental footprint) and 3) Competitiveness. So if you are selling something that has no value on the market maybe because of the price or it is incomparable to any other (could be disruptive innovation), we also want to be very realistic so the product has to be competitive on the market, because there is an economic side to it. So this is for 'pure play', but then members could also be any kind of stakeholders who have a component with cleantech, so that can be a user of clean technology – so our goal would then be to bridge innovators, so the sellers to the users (supply-demand). It is important for us to have companies like Bell or Cascade that need clean technologies. So you can be a member or a non-member we will still work with you. So members are any kind of firms but it has to be relevant to our work, which are the 'pure play' cleantech developers. Research centers are very important as well for the development of better innovation and you have to get involved with the universities and their research.

What support do you provide to your members?

We support the firms. We connect member with other members. We connect members to clean technology firms. We work with other associations that are more specialized in a specific cleantech sector. We connect members or anyone from the cleantech sector – we are an umbrella for the entire cleantech sector. If you are the user it is interesting for us, if you are a financing organization it is also important for us, because 90-100% of the time firms need funds. We also work strongly with other associations, because cleantech is very broad, we have 8 subsectors and there are associations that are more specialized in more lets say wind turbines, solar panels, so we work with them to also engage their members.

Which government organizations do you work with? Which organizations provide federal, provincial and municipal support?

So at the municipal level we work with the CMM (Montreal Metropolitan community). We have fund coming from them. We also work with the City of Montreal and many other municipal organizations. When we are talking about funding it's with the CMM. At the provincial level same thing we work with every ministry but the one that funds us is MESI (Ministère du Développement économique de l'Innovation et de l'Exportation). And then at the federal level its DEC (Canada Economic Development).

What assistance do they provide?

It depends upon request. Some of them will ask us for special projects and funds us for them. So special projects can be networking, can be promotion of their services to our companies, can be special studies that we can submit to them like advice on cleantech sector, and also representation if we ever have some very prestigious meetings or if we are invited to important events, we will invite them as well. And then of course visibility, it is all about having their logo everywhere. In terms of support – if they would not be here we would not have half of the funds we need. So they directly finance things like our salary because they believe our mission. So some projects attached and then it's the overall believe and trust that they have in our organization to support the cleantech innovation in Quebec. Another way they support and the industry or the sector is that they sit on several task forces. So we have committees on different hot topics for the sector like internationalization, so we will have someone from Export Quebec, someone from trade commissioner services, we have someone from DEC (they provide ongoing support as well with this because they give insight 4 times a year). We give them input (DEC) to design the proper programs for the internationalization of the companies, so the programs could be financing at every stage of the company, could be business intelligence, could be having trade commissioner of Quebec or Canada delegate in the target country (who serves as a lending hand for a cleantech company who wants to internationalize). In the development of the activities in the targeted countries, they (trade delegates) can find partners for the companies, they can do due diligence on this partner, they can provide support with the legal system, they can support with having direct contact with the government over there because there is a parallel hierarchy (government can talk to the government). So for example China, you need to involve critical officials in every piece of your development overseas and so if you go without the help of Canadian government or Quebec, you will not succeed or you will have more barriers to succeed. And also the funding, there is Can Export at federal level; there are other programs from MESI. So there is support in-kind and intelligence and networking both here in Quebec and overseas where we have presence and then there is funding support for the company that could

help the company to hire consultants to do the strategic plans for the development abroad, they can finance an employee or classes (for example if you have a very strong robust internationalization plan with Chile but you do not have anyone speaking Spanish in your company, so they can help with a translator, provide classes for Spanish and other tools). Our role is to promote these tools to the companies.

Part 2: Future

What changes do you wish to see in the interaction process of born-global firms and governmental agencies?
Well they have a role at every stage of internationalization of the company. More funding for business intelligence adapted to the needs of companies, market research, for employment of market development employees, for project demonstration abroad.

How are you planning to attract more members?
We conduct a pull strategy for individual application and prefer to develop the membership by creating collaboration with other innovation associations in Quebec rather than by trying to cannibalize their membership.

Part 3: Organization

Ask questions about the organization. What does it do? Details about the organization.
Echotech acts as a bridge between firms and government. We do not have any exclusivity to do this. They also go directly to our company or any other company. I can give them the email address. Because of the agencies found us, so I do whatever I can to please them as partners. For example I had submit a list of cleantech companies that are in China and they will do the follow up themselves. We act as a big brother to everyone. The main goal of Echotech is to work with the government toward a better working business ecosystem to develop clean technologies in Quebec and the second goal is to make bridges between all of the stakeholders.

Appendix D – Government Agencies Interview Transcripts

4.1. The Canadian Trade Commissioner Service

The Canadian Trade Commissioner Service – June 9, 2017 – 2pm (57 minutes)

Interview Guide for Governmental Agencies

Part 1: Assistance

What type of assistance do you provide to firms, specifically born-globals in the cleantech industry?

There is nothing specific to born-globals; to us a client is a client. Is someone qualifies as clients, and then we see what their needs are and how we can help. Whether it is a born-global or a company that has been around for 30 years – our process is the same. One thing that is specific for born-globals (younger companies with promising technologies that are looking for opportunities outside of Canada) so we have what you call the Canadian Technology Accelerator (CTA) which is actual a platform/way for firms to scale up and accelerate the development, developing a specific geographic sector. So our network currently operates in cleantech these accelerators in New York area, California area and Denver area. There is also an accelerator in France that started incorporating the cleantech aspect a year and a half ago. So the accelerator helps with the business development in a specific geographic region by providing contacts, putting companies in touch with potential partners, clients and venture capital firms; firms also get advice and mentoring. CTA have a competitive process, the companies have to apply there are specific deadlines every year. So if a born-global from Quebec in the cleantech sector approaches us and is interested in going abroad, so how our network operates is that I will be the one or the company will reach out to me, I visit the company and speak to people who are in charge of putting together a strategy for business development in Canada and outside of Canada. So we sit down and discuss who the company is, what is the value propositions, what they have done so far in terms of efforts abroad, what resources they have, what promotional materials they have, what is there business approach, do they work with agents – so I do an overview of who they are and try to see to what extent they are ready to go abroad and identify concrete areas that our network is able to help in. So basically that is what is called 'an outcall' to the company, I can help them develop a 1 pager for an application or corporate profile. I can help them figure out if there are any barriers to enter a market, so for the US there is the 'Buy America' provisions apply for the industry they are going after. So I work with them in Montreal, and lets say the company identified Mexico as their next step (what do you need to do there – participate in tradeshows and meet distributors and agents, or do you want to meet with a large potential client as a first step) and once we determine the need at that stage (for example to help validate if the assumptions of the market are right), so what I would do is put them in touch with my colleagues in Mexico or one of our offices in Mexico that are in charge of the cleantech sector that will be able to refine some of the company's questions and provide advice. For a lot of innovative companies the tendency is that they need to do a lot of business development themselves in the new market because their technology is new and they need to educate the end user and what the benefits of the products are. So TCS provides advice here in Canada first and help them prepare to go abroad, and once they go abroad to help them further refine their market potential

evaluation as well as provide them with contacts. 95-98% of what we do is a 'soft' service in form of advice and contacts, but we have a few small financing programs. One is called CanExport, which helps companies develop new markets by helping fund up to 50% of eligible expenses for a specific project. So lets say a company has not sold in US for the last 24 months and they are looking to make a few visits in the next few months, they need to register their IP, they will need legal advice, adapt their material – so the program can help cover some of those expenses. CanExport started in February 2016 - $10 million per year across Canada and across all sectors for 5 years. There is another program for companies that are looking for R&D partnerships called Going Global Innovation program, so if a company might need to travel to visit their partners – the program helps fund that.

What is your selection process?

We have performance indicators, my key indicator here is how many companies I visited in a year. So I need to go out and visit companies, proactively identify and reach out to companies. We try to select them based on our perception of where our network is strong, whether we know the company, whether the company had some international experience in the past, we also find companies through associations like Ecotech and colleagues abroad. The companies should have the potential to bring economic benefits to Canada and that our services will help them scale up. I need to know what is happening in the cleantech sector so I will meet with companies in several sub-sectors (renewable energy, soil) to understand the challenges they are facing. We are a tax-funded service we have to respond to everyone. I do some pre-selections of the companies I want to meet, but if there is a company that wants to meet me and fits our criteria it is part of my duty to see if we can assist them.

How do you attract these firms?

We are not in the financing delivery business so our challenge is to explain to companies what value we can have without giving money because for most companies government assistance means providing funding. Our role here is to try and position ourselves within different programs and reach out to companies and explain our value-added. I participate in Ecotech events and trade shows, give presentations as well as directly reach out to companies.

How do you advertise your services?

Going Global road show that explains the benefits of the services, trade shows, panels, Ecotech events.

Do you reach out to firms or vice versa?

We directly reach out to companies as well as they reach out to us.

What benefits do you receive in return for your support?

Well my salary. Also when I have a client that signs a partnership or gets a large client – that part is extremely rewarding and makes this job very interesting. We get real life feedback on the support we provide. We are evaluated on performance indicators so I follow up with the clients and see how things are advancing and if there is a successful milestone that we can claim within our network.

What is the success rate?

One of our marketing punch lines is that Canadian companies that do business with the TCS export 20% more than those that do not. It is hard to say, especially in cleantech, so sometimes you work with a company and for several reasons you stop (because things are going well in the market and the company is doing well), they are not necessarily going to follow up and say how the help I provided directly influenced their success.

Do federal, provincial and municipal agencies work together on funding opportunities or separately?

Companies complain a lot about the integration of services and who can do what. There is a lot of cooperation going between government agencies and departments but not enough. We all have different ways of operating. Lets say I am organized by sector and focus on cleantech; another government agency is organized regionally. So my clients are spread out regionally and I will work with a lot of different people. Not having a sectoral approach can make things harder.

Part 2: Future

How do you plan to work closer together with the firms?

The bottom line is to increase the number of Canadian exporters. Our network works with a lot of companies who export and have been exporting for several years, so I would be surprised if a company that exports does not know about our services. Very often when a company has an issue abroad they are definitely going to go to an embassy and start working with us. In order to increase the number of exporters we promote our services and let them know what we do and that the service is free/tax-funded. We help companies become exporters.

Are there any new initiatives in the works? / What other services will you provide in the future?

There are always new pilots to improve our services. So it could be enhancing or expanding the type of service we offer, better identifying what services we could offer to companies, finding new ways to help companies scale up abroad, how do we help companies get financing even though venture capital. Obviously the CTA side provides for a lot of new ideas into the department. Knowing how to make our network better to assists companies with their different needs. Our network is ever evolving. Finding a way to provide a one-stop shop for companies to help speed up the process of going abroad.

How do you know what firms need?

Based on the outcomes of the in-depth meeting we conduct, we identify their needs and identifying how we can support them. When you cover the same sector for several years, you see similar issues coming back – you identify horizontal issues that affect not only one company. And then we try and see how we can respond to that need. If it is something specific to a market we can set up a call with representatives in that market to get more information. We can set up seminars. We participate in various committees like Ecotech where topics are being brought up related to internationalization of companies.

Part 3: Organization

Ask questions about the organization. What does it do? Details about the organization.

The mission is to increase Canadian prosperity and to increase exports of Canadian goods and service. Increasing R&D collaborations, supporting the Canadian innovation system – which is something that our network does to a certain extent. As well as our department works to negotiate free trade agreements to open markets for various companies, helping with getting access to public procurement in different markets, IP protection.

Do you and how closely work with Ecotech Quebec?
I would say quite closely by our standards. We are very focused on the clients and meeting with them, and finding out what they need. We participate in Ecotech events as panelists, as presenters as well as sitting on committee. Ecotech helps us identify opportunities in the cleantech.

4.2. Export Development Canada

Export Development Canada – June 16, 2017 – 3.02pm (31 minutes)

Interview Guide for Governmental Agencies

Part 1: Assistance

What type of assistance do you provide to firms, specifically born-globals in the cleantech industry?
Now what we do, we operate on the principle that we want to compliment what the financial private market already does for these companies. When we look at the most common financial risks and challenges for Canadian exporter and we look at what solutions exist in the private market (banks, insurance) to address those needs, and we look if there is a gap between the overall needs and what the private market offers. When we identify the gap that is when we develop a specific solution. This is what we do for any company, any size, in any sector. We really do not any focus per sector or industry, expect when we are dealing with large Canadian multinationals, where we have special teams that are specialized by sector, but for the rest- we do not have a specialization per industry. EDC is financial independent from the government of Canada. We do not receive funds from the budge every year to be able to operate and support companies. With our mandate to support export, we have an also receive an obligation to remain financially independent. That means that we have to provide our support to Canadian companies in a fashion that will not put us at risk of not being able to meet the condition of remaining financially independent. And what that means is that all the support that we put in place relies on commercial principles. We are similar to a bank in that sense, we can only support projects that meet our own credit metrics and if they do not then we cannot support them because we are not doing grants. Because of our mandate we take on more risk, meaning that our credit parameters are a little a bit looser than what a bank would use but we still have some. If you look EDC and all other EDC-equivalent credit agencies around the world, most credit agencies work on the opposite model (receive funds from budget).

We are in cleantech because we are constantly doing analysis to be able to determine which industries around the world are growing and then we look if we have a lot of Canadian companies that can become supplier to those industries around the world. When mining industry was growing around the world, we saw that Canada has a lot of companies that are ready or can

become suppliers of that industry. So that became a priority sector for EDC. All these companies that we serve, just by the fact that they are exporting, it kind of implies that most of these companies financial somewhat mature; they are not beginning their commercialization phase because they follow a natural growth, meaning the company started doing business in Canada in whatever province they were, then they went to neighbouring provinces and eventually started selling outside of Canada. Because our mandate and our solutions are only on the export side that means that most of the companies that we serve are somewhat mature financially. Now that is very important when we look at cleantech because when we were doing the analysis that I mentioned before in terms of what industries were growing, we saw 6 years ago that the demand for clean technology was growing and trending to continue to grow for several years. And then we looked at Canada to see who can supply into this industry; we saw that our cleantech sector is very small. And then when we looked into the companies representing the sector, you see that most companies have two characteristics: 1) they are very young and 2) very small. The reason why EDC got involved is because we realized that there is a natural fit for our mandate. Almost all of the cleantech companies become exporters from day 1, and the same situation happened when there was a boom in telecommunications. They become exporters because the market is too small and because they found that foreign companies/clients were quicker in terms of adoption of new technology. And actually one of the issues that we had back in the telecommunication boom was that because these companies were becoming exporters very quickly and were finding a lack of financial support in Canada, a lot of them were simply acquired by foreign companies. So because we did not allow for the company to grow in Canada, the most likely solution if the technology is good is that the foreign company will buy it. So this is the risk that we have in the cleantech as well, if we do not support the sector and allow the companies to reach a reasonable size. So we saw that the cleantech sector is very small and very young and more companies are just starting to commercialize, but we saw that as soon as they start, most of them start exporting. So there was a natural fit with our mandate and we though that if we could help the sector at the stage it is in right now, maybe we could help it grow a little bit more, to the point where it could take part in the growth that we are seeing worldwide.

We did not create any solutions or specific program for cleantech but I mentioned before that we provide all of our support based on commercial credit principle. So what we had to do in cleantech, because of these companies are younger than the traditional companies we help in other sector, we decided to apply even looser credit metrics to the cleantech space in order to be able to adapt our existing solutions to a company in the early commercialization phase. So we are willing to take on more risk in the cleantech space that we do in other sectors. Now in terms of specific solutions, it depends on the context of the company. The number one request that we encounter, is when a young company has developed a piece of equipment and has only sold a few units up until now, but the technology is good they will often encounter a foreign buyer that will be placing a large order (in proportion to the size of Canadian company) and the challenge is to be able to accommodate the working capital that is required to produce the large order and deliver on the contract. Canadian banks support Canadian companies mainly based on the value of their balance sheet, specifically based on the value of the asset that they are financing. When a company gets a new order, it is neither accounts receivable, neither inventory, what that means is that order cannot be converted into a loan in Canada. So what EDC does in that context is essentially help the company to finance the cost of the large contract. There are two ways we can

do it, either we find a Canadian bank that is willing to put the loan in place and we guarantee the bank or we directly provide the loan to the company to finance the cost of the order.

What is your selection process?
When you look at the lifeline of a technology company, which is very much the same for cleantech, at first they have the R&D phase, then they usually have a demonstration phase and then they will start to commercialize. Now on that lifeline where EDC plays a role is only at the commercialization level. So prior to that when the company is still demonstrating their technology or researching it, we are not involved in that stage. The two reasons for that are: we do not have the technical expertise to determine whether this technology will work in the future and the government has another arm – SDTC and they have funds that are specifically allocated for the demonstration phase. Prior to the demonstration phase, what funds companies is equity from shareholders or venture capital.

How do you attract these firms?
Right now we have a dedicated cleantech team covering all provinces. So right now to the extent we are the marketing effort of EDC to reach out to these companies. The reality is that in the space that I mentioned where we want to pay a role, which is early commercialization – there is essentially no other lender trying to play a role there. So companies who are in that phase fairly quickly figure out who is there, and that EDC is one of the few ones and most likely they will reach out to us.

How do you advertise your services?
We have a good understanding of what is out there and there are a lot of new companies being created so our main concern is how do we manage the risk and how do we find creative solutions that can be adapted to the reality of any given company.

Do you reach out to firms or vice versa?
Firms mostly reach out to EDC.

What benefits do you receive in return for your support?
So because we have the obligation to remain financially independent that implies we apply commercial principles but that also implies that all of our support has a cost to it. The cost that we charge for any of the support that we put in place is simply reflected of the risk of the transaction that we take. So if it is a loan – it is interest rate, if it is any other type of solutions – it will be a fee. So there is always a cost associated to the support that we put in place and it is a reflection of the risk that we take.

What is the success rate?
There are different metrics that are used the main one that we are tracking right now is the number of companies that we are helping. Also since the Liberals came into party, they have a very green agenda as well and they want to use their agencies to support that agenda. The other metric would be the amount of money that we are deploying to our supports. So essentially the funds that are flowing out of EDC and the amount of companies that we being supported.

Do federal, provincial and municipal agencies work together on funding opportunities or separately?
From the federal, there is a strong desire and indication from the government to work on a more seamless base between their agencies. The ones that play a role in cleantech are BDC, EDC and SDTC. In the last scheduled budget all of these agencies received additional funds. So SDTC always operates on the model that they receive funds every year to be able to operate, BDC and EDC are both financially independent, but in this new budget both BDC and EDC received funds from the federal budget to be able to take on even more risk. So because the government gave money to its three core agencies, they want us to work in a more seamless model (being implemented as we speak). We have a relationship with BDC, but now there is a desire from the government to work specifically in the cleantech sector in a more seamless fashion (ideally the government would like to see a seamless transition from each stage of lifeline and from one agency to the other). At provincial and municipal level, we were together sometimes but it is more on the case-by-case basis because each of those entities has their own particular criteria, which might not be aligned to how we do it.

Part 2: Future

How do you plan to work closer together with the firms?
EDC has had the cleantech sector as a priority sector for the past 5 years. This year we determined that in order to do more than before we thought it was best to have a dedicated team to only take care of cleantech accounts, and this team was creating this February. The two main goals are to serve more companies and to develop an expertise in the sector in order to find ways where can take more risk than we are already taking in a sound way. A dedicated team will help better understand the challenges and help leverage tools that we already have.

Are there any new initiatives in the works? / What other services will you provide in the future?
To provide a seamless integration of R&D, demonstration and commercialization stages.

How can you attract firms better?
The need for funds will direct companies to EDC. Most of the cleantech companies in Quebec know each other, so if one company receives support from EDC, the word spreads quickly and we can see who is active in that space. There are still companies that we do not know, and my colleagues and I have a list of companies we are reaching out to them to see where they are at in the growth of the company. It is a mix of companies coming to us simply because they know we are active in this space and us reaching out to companies we do not know.

How do you know what firms need?
Through working with the firms.

Part 3: Organization

Ask questions about the organization. What does it do? Details about the organization.
What we do for all firms in Canada is provide financial solutions that address the most common financial risk and financial challenges that a Canadian company will face once they start doing

business outside of Canada. A Canadian company that only operates in Canada will never encounter the challenges that require the tools that EDC has. So we are very specific to the challenges that only arise once you start exporting.

Do you and how closely work with Ecotech Quebec?
I would say as close as we can by the nature of who we are. A very high percentage of the companies in the cleantech sector that we serve are members of Ecotech Quebec. So it was a natural fit for us. So when Ecotech Quebec has activities and events for their members, not all of those activities will be specific to the companies we are trying to reach out to. So we participate in the scope of the activities that are pertinent to the companies we try to reach out to.

4.3. Ministry of Economy, Science and Innovation Quebec

Ministry of Economy, Science and Innovation Quebec – June 21, 2017 – Email

Interview Guide for Governmental Agencies

Part 1: Assistance

What type of assistance do you provide to firms, specifically born-globals in the cleantech industry?
Pour toutes les entreprises, born-globals ou non, nous fournissons plusieurs forms d'appui. En effet, Export Québec a une équipe de spécialistes en développement de marché répartis au sein du ministère et dans les bureaux du Québec à l'étranger, offrant aux entreprises, de manière personnalisée:

- des conseils sur les marchés (validation de marché, information stratégique, pratiques d'affaires et autres);
- des services de repérage d'occasions d'affaires, de clients ou de partenaires potentiels;
- des services de planification de rencontres d'affaires.

What is your selection process?
Pour bénéficier des services d'Export Québec, une entreprise doit déjà avoir commencé à exporter hors-Québec ou être prête à le faire. Si ce n'est pas le cas, nous la référons à nos directions regionals et aux organisations d'appui à l'exportation les ORPEX.

How do you attract these firms?
Pour encourager les entreprises à utiliser nos services, nous faisons la promotion de ces derniers à travers différents salons et activités en lien avec les entreprises et ce pour différents secteurs. Également, nous mettons sur pied des activités, comme des missions commerciales dans lesquelles nous invitons les entrprises à participer et des invitations sont envoyées aux entreprises du secteur concerné et transmises par des infolettres du ministère.

How do you advertise your services?
Le ministère travaille en collaboration avec de nombreux partenaires afin de faire la promotion de ses services dans différentes activités. Les conseillers en affaires internationals se

déplacement régulièrement dans des événements de l'industrie liée à leurs secteurs, afin de promouvoir ces mêmes services. Le site internet du ministère fait également la promotion de tous les services offerts.

Do you reach out to firms or vice versa?
Les deux situations arrivent. Des fois des entreprises viennent à nous et à d'autres occasions nous allons vers elles.

What benefits do you receive in return for your support?
Aucun. Notre objectifs est d'appuyer les entreprises du Québec à continuer de croître en les aidant à consolider leurs marches et à s'étendre vers de nouveaux marchés.

What is the success rate?
Cela varie d'une entreprise à une autre et d'une activité à une autre.

Do federal, provincial and municipal agencies work together on funding opportunities or separately?
Il arrive que nous collaborions avec les autres gouvernements dans certaines activités spécifiques.

Part 2: Future

How do you plan to work closer together with the firms?
Nous continuons à participer aux activités de l'industrie, aux activités des associations et autres activités liées à l'exportation dans le but de continuer à promouvoir nos services, à bien connaître les entreprises et leurs besoins pour mieux les servir.

Are there any new initiatives in the works?
Nous organisons plusieurs missions commerciales pendant l'année dans nos différents secteurs.

How can you attract firms better?
De la publicité à plus grande échelle pourrait certainement nous aider à attirer davantage d'entreprises à utiliser nos services.

What other services will you provide in the future?
Nous continuons à améliorer nos services et à offrir différents programmes pour appuyer les entreprises dans leurs démarches.

Part 3: Organization

What does your organization do? Details about the organization.
Tel que mentionné dans mon précédent courriel, le ministère, plus précisément Export Québec, travaille avec les entreprises du Québec pour les appuyer dans leurs démarches d'exportation hors-Québec en offrant différents types de services (voir réponse 1).

Do you and how closely work with Ecotech Quebec?

Nous travaillons avec Écotech Québec de façon très rapprochée afin de bien connaître les besoins de l'industrie dans le secteur de l'environnement. Nous avons une personne responsable au ministère de conserver le lien avec l'association et de participer à leurs activités. Cette collaboration nous permet de mieux identifier les besoins des entreprises membres d'Écotech.