ATTRACTING FDI FROM THE US RENEWABLE ENERGY SECTOR

An Assessment of the Dutch Investment Climate and Motives of US Investors

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Master's thesis

December 4, 2012

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ABSTRACT

The emerging transition towards a renewable energy mix in Europe and the U.S. creates opportunities for businesses to invest in new technologies and markets. In this study, we assessed the opportunities for U.S. investors in renewable energy in the Netherlands, in order to find out how to effectively attract new foreign direct investment to the Netherlands. By conducting an explorative mixed methods study, we investigated the investment climate of the Dutch Energy sector, and evaluated underlying motives for U.S. FDI in the Netherlands. Results showed that the major strengths of the Dutch investment climate are namely the knowledge position of research institutes, location and logistical facilities, and costs of doing business, including fiscal rulings. The second part of the research showed that U.S. investors namely base their investment decision on favorable fiscal rulings: When the underlying motive was based on this aspect, this significantly increased the probability of investing in the Netherlands over other European countries. Regardless of the explorative character of this research, it is advised that the Dutch government should focus on keeping a competitive advantage on fiscal rulings, but also focus on more effectively promoting other assets of the investment climate, such as the strong position on research and expertise on renewable energy innovation, by including a strategic acquisition chapter in the Energy Key Sector policy framework.

PREFACE

During my internship at the Netherlands Foreign Investment Agency in Boston, I got the opportunity to plunge into the bustling ecosystem of the tech cluster in the Greater Boston area. I developed a large interest for the emerging cleantech and renewable energy industries. Not only compelling technological innovations caught my interest, but also their commercialization, mostly through venture capital-backed startups, spinning out straight from MIT and Harvard Business School.

These experiences, meeting people, together with a healthy dose of work at my job, might have posed a threat to a successful completion of my thesis research, if it weren't so that I indulged myself in the American urban style working ethos: Equipped with my Macbook and extra large filter coffee, I started writing up my research in my free time at the local coffee chain in my neighborhood in Brookline. I wrote the most on Saturday morning and on weekdays until the wee hours of the morning.

I would like to thank my thesis supervisor, prof. dr. Ron Boschma for supporting me with the writing of my thesis. Despite his busy schedule and wide array of obligations, he was able to provide clear feedback and give swift replies to the questions I sent by email.

Moreover, I would like to thank my internship supervisor, Mrs. Katja Berkhout, for making the adventure in Boston possible, and connecting me with the right resources for my research.

Wouter Sterk

Utrecht, December 4, 2012

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1 INTRODUCTION

1.1 Research background

The quick increase of global prosperity and global population growth caused a dramatic increase of global energy consumption. This level of energy use will increase even further in the coming decades. The International Energy Agency expects a 40% growth of global energy demand by 2035 (IEA, 2011). The recently published Energy Outlook by BP anticipates a growth of 39% in 2030 (BP, 2012). This increase asks for large investments to be able to comply with the demand within different sectors (e.g. power generation, fuels, heat generation) and within different parts of the value chains. On top of that, it becomes visible that the growth in global CO^2 output is stagnating, thereby contesting IPCC objectives. Although, energy consumption per unit of GDP shows a declining trend, it is expected to increase in the coming decade. Rapid GDP growth rates are currently overtaking sustainability policies within the field of energy efficiency or renewable energy generation, especially in emerging (non-OECD) countries. These developments will lead to emission above the critical level, around 450 ppm. (Deloitte, 2012).

The transition to a new energy mix that is currently taking place, particularly in Europe, the US and China, will lead to an increase of energy generation from renewable energy sources from 9% in 2010 to an estimated 25% in 2035. Except for natural gas, the share of fossil fuels will decrease within global energy consumption (IEA, 2011), partially initiated by government policies (stimulated by environmental or geopolitical concerns) and the falling tariffs for electricity generation per kWh by solar photovoltaics and wind. These technologies will probably reach grid parity within this decade (Bloomberg, 2012; Cleanedge, 2012).

The growing industry around renewable energy generation, energy efficiency and biofuels, also creates opportunities for the Dutch Energy Key sector (Dutch: *Topsector Energie*). These top

sectors serve as policy instruments, which aim to stimulate entrepreneurship and innovation within strong Dutch industry sectors or clusters. At the same time, the United States is a key player when it comes to the development and export of renewable energy technologies. Large-scale projects within the field of solar, offshore wind, bio-energy or smart grids technologies create exporting opportunities for Dutch businesses (TWA, 2010). On the other hand, the Netherlands can be an appealing location when it comes to foreign direct investment from the US. American businesses that expanded their business to the Netherlands, regard the location within mainland Europe (Bloomberg, 2012; Ernst & Young, 2012) the fiscal climate, low business costs (KPMG, 2012), availability of skilled employees (NFIA, 2011) and highly competitive economy (World Economic Forum, 2012) as important assets, among other factors.

The inward flows of investments from foreign companies to the Netherlands, in the form of new subsidiaries, i.e. foreign direct investments (FDI) provide different advantages for the Dutch economy: It creates employment and contributes to the knowledge economy (Ministry of Economic Affairs, Agriculture & Innovation, 2012; Berenschot, 2007). It has been perceived that globalization and internationalization of the national economy do not only lead to the relocation of jobs to low-wage countries, but also create new jobs in the Netherlands (Centraal Bureau voor de Statistiek, 2012). To stimulate FDI, economic diplomacy is an effective instrument, and is therefore a priority of the Dutch government (Rijksoverheid, 2010; Moons & Bergeijk , 2011; ESB, 2011).

Several studies have been conducted on the Dutch investment climate (Wintjes, 2005; Boston Consulting Group, 2008; Weterings et al. 2011; NFIA, 2011; KPMG, 2012) and the investment climate of the Energy sector specifically (ECORYS, 2010). Nonetheless, there have been no recent studies, which specifically assess the investment climate of the Dutch Energy sector, with a focus on renewable energy subsectors, such as the solar photovoltaics, or wind power industries. Also the Energy Key Sector policy only gives limited attention to this matter

(Topsector Energie, 2012a). On top of that, there are no studies that specifically focus on identifying opportunities to foster new investments from the United States within the renewable energy sector. This research aims to give a first start, by identifying the strengths of the Dutch investment climate for businesses within renewable energy, coming from the US It will also seek out how this can be utilized, in order to successfully attract new inward investments in the future.

1.2 Policy background: An overview

Dutch industrial policy on renewable energy has been in existence for less than a decade. The 2004 and 2008 issues of the annual Industry White Papers (Dutch: *Industriebrieven*) by the Ministry of Economic Affairs, touched upon the renewables sector (see: Ministry of Economic Affairs, 2004; 2008). In 2008, the first Energy Innovation Agenda was published, which concretely dealt with the energy transition. In 2010, the Innovation Platform made several recommendations around the topic of renewable energy (ECORYS, 2010).

In 2010, the Rutte-Verhagen administration proposed a new industrial policy, which defines 9 Key sectors (Dutch: *Topsectorenbeleid*). These are sectors in which the Dutch economy carries a strong market position. One of these key sectors is Energy, in addition to Agrofood, Creative Industries, Water, Chemicals, Logistics, Life Sciences, Horticulture and High Tech. (Agentschap NL, 2011)

The main characteristics of the industrial policy for these Key sectors include: a shifting focus towards tax cuts, as an alternative for subsidies; a cutback in rules and regulations; more extensive access to corporate financing; better usage of the knowledge infrastructure by corporations; and a better alignment of fiscal regulation, education, and diplomacy with corporate interests.

The Key sector Advisory Team (Dutch: *Topteam Energie*) pinpointed several ambitions and concrete goals on the Energy sector. These are merged in a the Innovation Contract (Dutch: *Innovatiecontract*), a white paper in which government, research institutes and corporations outline industrial policy and set goals and agreements (see: Topteam Energie, 2012). The relevant points concerning renewable energy and sustainability are listed below:

- First of all, the Innovation Contract has set an ambition to decrease 20% of CO2 emissions in the Netherlands by 2020. Next to that, 14% of the total energy mix needs to be produced from renewable sources. Moreover, energy efficiency efforts need to be stimulated.
- Second, the contract states that it supports the strengthening of the Dutch knowledge economy by increasing innovation budgets. Also, efforts should be made to get electricity tariffs for renewable energy generation more competitive. Policy instruments to carry these innovations include a feed-in tariff system (SDE+) and the 'Green Deals', a system where the government supports private projects that involve sustainable development, but need an extra stimulus to become profitable.
- Third, next to innovation in conventional (transition) technologies, such as LNG, the contract specifically identifies following clean energy technologies, where the Dutch industry (potentially) gains competitive advantage, and where efforts should be made: Smart Grids, Offshore Wind, Solar Energy & Bio Energy (See also: ECORYS, 2010).
- Fourth, a Human Capital Agenda has been conceived, which aims to decrease the growing shortage in engineering and science graduates and professionals. The contract mentions that this agenda is necessary in order to achieve the energy transition to renewable sources, as innovation is determined by human capital.
- Finally, contrary to the internationalization agenda's for the Key sectors Agrofood and Chemicals, the final internationalization agenda for Energy is still work in progress. According to Topteam Energie (2012) this agenda will focus on export, international

cooperation on innovation in new technologies, European regulations, development aid, and the most relevant for this report: the strategic acquisition of foreign direct investors. Nonetheless, a recent document, the 'internationalization offensive' (Topsector Energie, 2012a), shows that a strategy for the acquisition of foreign investors in the different energy sub sectors still needs further investigation.

With the Key Sector Policy, the Dutch government aims to place the Netherlands in the global top 5 of knowledge economies in 2020, increase its R&D expenditures to 2,5% of the GDP in 2020, and establish Knowledge & Innovation consortia within the different key sectors, in which public and private parties participate for more than EUR 500 mln in 2015, of which 40% is financed by businesses.

1.3 Problem definition

The main research objective is defining opportunities to promote new investments from US investors within renewable energy to the Dutch Energy Sector, by analyzing the investment climate of the Dutch energy sector, and on the other hand, finding out the motives of American firms, when they want to expand their operations to Europe, and consider the Netherlands as a location. This will lead to the following research question:

Which strengths and opportunities can be defined for the investment climate of the Dutch Energy sector, and how could these be used to attract FDI from the renewable energy sector in the United States?

This main research question will be answered by the following sub questions:

1. Which strengths, weaknesses, opportunities and threats can be identified within the current investment climate of the Dutch energy sector?
2. Based on which motives do American firms in the energy sector invest in the Netherlands, when it comes to an expansion of their operations to Europe?

3. How can the Dutch government effectively attract new renewable energy investments from the US?

1.4 Research strategy

To give an answer to the research question, this research will be conducted through a mixed methods research approach; a term that is employed by Layder (1993) and Bryman (2012) to refer to a research method that combines both quantitative and qualitative research methods, which complement each other.

To answer the first question, a qualitative research strategy will be used to assess the investment climate of the Dutch Energy sector. This will be done by conducting a SWOT analysis, which defines (S) Strengths, (W) Weaknesses, (O) Opportunities, and (T) Threats. Data will be gathered through extensive literature review and complemented by semi-structured expert interviews with key opinion leaders, which were held during my internship at NFIA. These interviews were conducted with business leaders, consultants and government officials. The SWOT analysis will provide an overview of unique selling points (USP's) of the Dutch energy sector, based upon the findings by the literature review and interviews (See Chapter 4).

The second sub question will be answered through a quantitative research strategy. Through logistic regression analysis, we will try to find out if there are motives that have a significant influence on the investment decision of businesses that consider the Netherlands as a location for their investment. For this research, we will use a database with past investment projects within the Energy Key sector, where the Netherlands Foreign Investment Agency has given support, and where the investor, or parent company is from American origin. For this research, we conducted a query, which resulted in 129 cases. This data is derived from Achilles, the CRM database that is used by NFIA and regional development agencies, and contains all information concerning investment projects and correspondence with (foreign) investors. Based on information in this database, we can define the motives from the different investors, and

their choice for the Netherlands or another European country as a location for their expansion (See Chapter 5).

The third part of this research will answer the final sub question: based upon these findings, how can we define opportunities to (more) draw new investments from the United States to the Netherlands? It will look at how the strengths of the investment climate corresponds with motives of foreign investors. Based upon these findings, policy recommendations will be made (See Chapter 6).

1.5 Relation to internship project at NFIA

This research paper has been written during my internship period at the Netherlands Foreign Investment Agency (NFIA) in the city of Boston, Massachusetts. This internship gave me the position of Project Associate, with a specific focus on cleantech & renewable energy industries. Although this internship did not qualify as a graduation internship (*afstudeerstage*), I aimed to align my thesis research as much as possible with my activities in Boston, and gain as much as possible from the available resources.

My internship at the NFIA comprised a threefold project: First off, I worked on developing a value proposition of the Dutch cleantech sector, by assessing the investment climate through literature review and interviews. Based on this proposition, I developed various marketing materials, such as presentation slides and web content. Second, I conducted an extensive market research, in which I mapped the cleantech ecosystem in New England and Eastern Canada. The goal was to find out which businesses were present and in which subdomain there were operating (e.g. solar, wind, bioenergy, energy management and smart grids). Although the market research covered an area that stretches from Rhode Island to New Brunswick, Canada – the overall majority of cleantech related companies is situated in (eastern) Massachusetts, comprising over 63% of all New England cleantech businesses. (Mass High Tech, 2012). The third part of my assignment was to identify target companies: Which

businesses would possibly be considering international expansion? And what is the best strategy for NFIA to convey the advantages of the Dutch business climate? Next to this project, I organized events, organized the Dutch presence at several seminars (e.g. the Venture Cafe at MIT, the XSITE 2012 IT, Health & Cleantech event, The Cleantech Open), which all gave inspiring insights into Boston's bustling technology community.

NFIA is the investment promotion agency (IPA) of the Netherlands and is part of the Dutch Ministry of Economic Affairs, Agriculture & Innovation. NFIA supports foreign companies that want consider international expansion in Europe, by advising them on locations, permits, incentives, network and providing them with networking and channel partners. Moreover, their task is to promote the Dutch business climate, through the attendance & sponsoring of events and trade shows. NFIA has offices in the United States, covering North America (New York, Boston, Chicago, Atlanta, San Francisco), Asia (Tokyo, Osaka, Taipei, Shanghai, Beijing, Guangzhou, Seoul, Delhi, Singapore and Kuala Lumpur), the Middle East (Dubai, Tel Aviv) and an office in Brazil (São Paulo). All offices are brought under at the Dutch embassy & consular network, and closely cooperate with their economic departments. Moreover, NFIA collaborates with regional development agencies (e.g. NV NOM, Amsterdam inbusiness & OOST NV) and port authorities (Port of Rotterdam, Port of Amsterdam & Amsterdam Schiphol Airport), which all focus on strengthening the economic structure of the Netherlands.

1.6 Structure of the paper

This paper is structured as follows: Chapter 2 will provide a theoretical framework, based on an extensive update of recent literature on the relationship between the firm and its environment. It will touch upon regional competitiveness and the locational behavior of multinational firms. In this chapter, Porter's Diamond of National Competitiveness will be discussed, as well as the eclectic paradigm, among other models within economic geography, economics and international business studies. Chapter 3 will discuss research methods. It will outline the main

aspects and critiques of a mixed methods research. Moreover, a research design has been provided per sub question. Chapter 4 will provide the SWOT analyses, which answer the first sub question. Per sub domain of the Energy Key sector, an analysis is provided for, solar, wind, bio-energy and smart grids technology. Chapter 5 will provide the research for the second sub question. It will provide the analysis and results of the logistic regression analysis. Chapter 6 will answer the third sub question and present policy recommendations, based upon results of the SWOT and logistic regression analyses. The paper will end with Chapter 7, which will give a conclusion and topics for discussion.

2 THEORETICAL FRAMEWORK

2.1 Introduction

This chapter aims to answer the question 'What is the relationship between the enterprise, its locational behavior and its environment?' By discussing theories from both international business studies and economic geography, we will give an overview of different theories related to regional and national competitiveness, the locational behavior of firms and their mutual relationship.

Section 2.2 will discuss the dynamics and mutual dependence between businesses and their environment. Section 2.3 will focus on the business environment, by addressing different theories on regional and national competitiveness, and will elaborate on Porter's Diamond of National Competitiveness. Section 2.4 will zoom in on the micro level: It will discuss theories, which explain locational strategies of multinational firms and their subsidiaries. The concluding section will tie the most important elements from these different theories together, by presenting a conceptual model.

2.2 The enterprise and its environment

Business operations are undoubtedly embedded in their environment: Companies (re-)locate and expand, in order to utilize new market opportunities, but they are also dependent of governments and environmental (place-bound) assets. On the national level, examples include fiscal benefits or certain incentives or the availability of certain infrastructure, the quality of major transport hubs or the availability and quality of skilled labor. Simultaneously, the needs of companies, as well as their environments, change over time. Figure 2.1, based on Atzema et al. (2002, p.28) shows a chart, which contains the most notable factors that influence these changes.

On the enterprise level, one will notice that a) technological developments, b) product innovation, c) internationalization and d) corporate strategy strongly influence adjusted locational preferences, and thus might lead to expansion or relocation: Technological developments involve the automation of manufacturing or the rise of telecommuting. Automation decreases the need for available and skilled of labor, and decreases the need to stay at a specific location. Developments in IT and the rise of telecommuting also decrease attachment businesses to their location. Product innovation, i.e. R&D, or the manufacturing of a new product, might lead to the need for certain location factors that require relocation in order to obtain. Changes in corporate strategy may lead to a reassessment of current locations where certain operations are conducted. Vertical disintegration may lead to a relocation of a certain activity, since that may lead to a need for third party suppliers in the proximity. To conclude, internationalization and globalization has led to an increasing competition in the global marketplace. Also, value chains are being organized increasingly on a global scale. Not only does this lead to increasing amounts of FDI in recipient countries, it also brings about adjusted locational preferences: In the Netherlands, manufacturing is being outsourced to low-income countries, while at the same time, financial services and (regional) headquarters flock to Amsterdam (NFIA, 2011; Boston Consulting Group, 2008)

Figure 2.1 The interplay between the enterprise and its environment, based on Atzema et al. (2002, p.28)

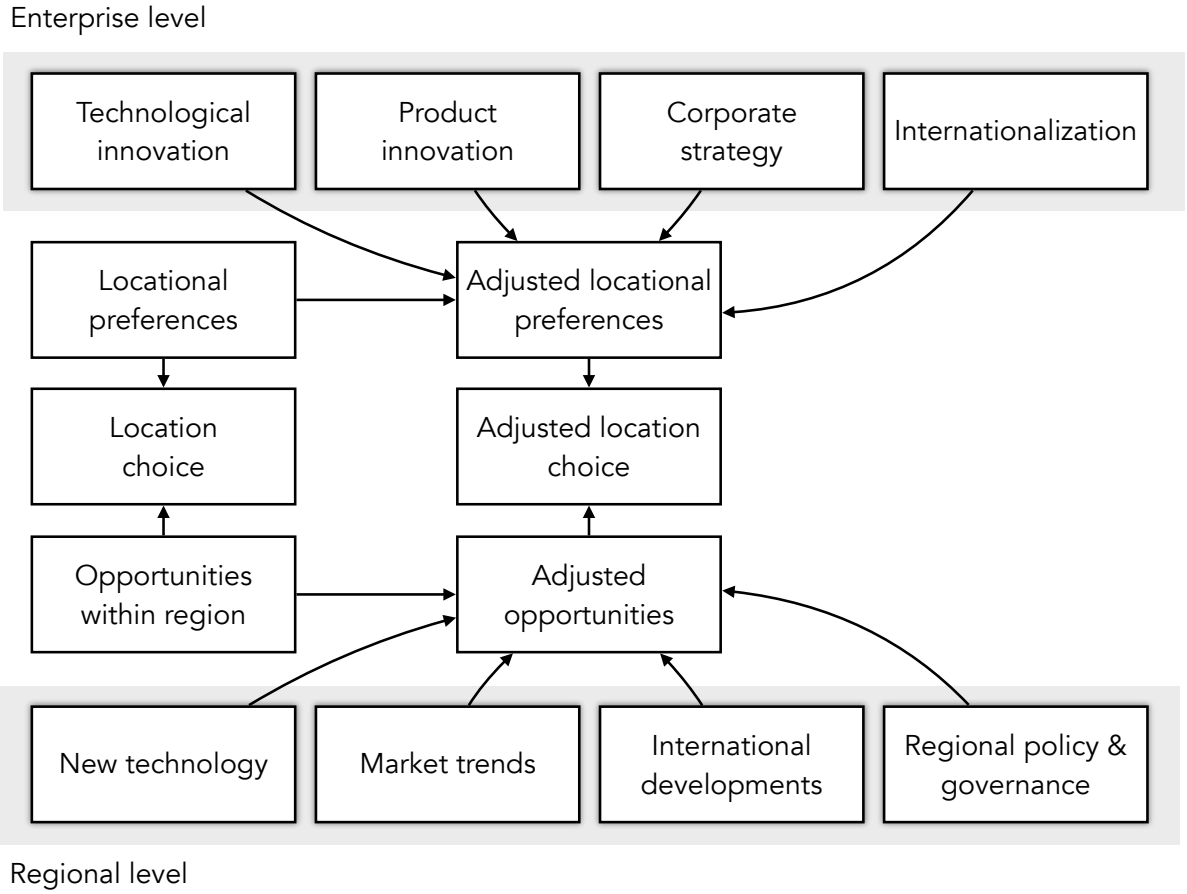


Figure 2.1 also shows that the different factors that influence opportunities of the region correspond with the boxes above. Technological innovation and certain product innovation are picked up better in some regions or countries than in others. For instance, the adaptation of new innovations within energy, such as smart grids and smart homes, or the piloting of electric vehicles. The openness for such innovations differs per market. The same holds for international developments such as economic globalization, European integration and the current economic downturn. Countries, such as the Netherlands gain from the open market, on account of its port infrastructure and hinterland connections. On the other hand, its economy is also prone to recession quickly during a global economic downturn (Masselink & van den

Noord, 2009) Finally, regional policies have an impact on the attractiveness of certain regions or countries: Government incentives or grants, infrastructure projects, real estate development, or investments in education all increase the quality of the environment for (new) business.

These conditions all constitute production environment (Dutch: *productiemilieu*): the whole of the external conditions that influences both the decision of situating a business at a certain location, as well as its functioning afterwards (Smidt, 1975). This production environment can be analyzed on different scales: the local, regional or national scale. Within economic geography, the focus has been more on local and regional levels, rather than the national level. Yet, in the recent years there has been a shift towards examining these environments at the national level, by which the competitiveness among different countries is analyzed (Atzema et al., 2002).

Smidt (1975) makes a distinction between the decision for a certain location, and the functioning of the company itself. When the company is looking for a new site for certain operations, it has already planned which activities it will run. The question remains which site will be the most suitable for these activities, and where the company will have the best prospect to achieve its goals. In other words: Which external factors adhere most to the company's motives?

When it comes to site selection, the *type of company* largely determines which location factors are important. For example, a large warehousing company, an IT provider or a manufacturer of sporting goods all require very different assets within a region. Moreover, the *type of activity* determines a lot: A regional corporate headquarters requires a different environment, than a factory of certain components. And an operation that solely focuses on product innovation and research & development, requires different assets compared to a European distribution center.

Regarding the assessment of different locations, this is conducted on the base of various factors, such as the quality of the local infrastructure, the availability of certain subsidies, the

fiscal climate, the labor pool and laws and permissions (e.g. on environmental pollution for factories, or privacy guidelines for internet companies). This assessment will often take the national, regional and local scales into consideration, but will start off with the assessment of different national investment climates. Within this research, the level of detail will be on the national level. The research will focus on the motives of American firms behind their location decision for their investment project, where they consider several European countries. But what makes a certain country or region competitive, compared to its (European) peers? We will zoom in to that in the following section, by discussing different models on regional competitiveness.

2.3 Regional and national competitiveness

Within recent years, policymakers and academia a lot of attention has been put on regional competitiveness. On the local, regional and national levels, places compete in order to find their space in a globalizing economy. National governments strive to enhance the economic structures within their borders, by stimulating productivity, innovation, growth and attracting foreign investment (OECD, 2012) On top of that, the European Commission is putting effort in improving competitiveness in order to match up with the US and BRICS countries' economic performance (European Commission, 2010) Even so, how does one define regional competitiveness? The European Commission (2010, p.4), defines the concept as follows:

> [Regional competitiveness] is the ability to produce goods and services which meet the test of international markets, while at the same time maintaining high and sustainable levels of income, or more generally, the ability to generate, while being exposed to external competition.

The European Commission regards productivity as an important determining factor. On the other hand, the OECD seems to put more emphasis on the competence in attracting foreign firms and skilled labor in its definition:

> A competitive region is one that can attract and maintain successful firms and maintain or increase standards of living for the region's inhabitants. Skilled labor and investment gravitate away from "uncompetitive" regions towards more competitive ones.

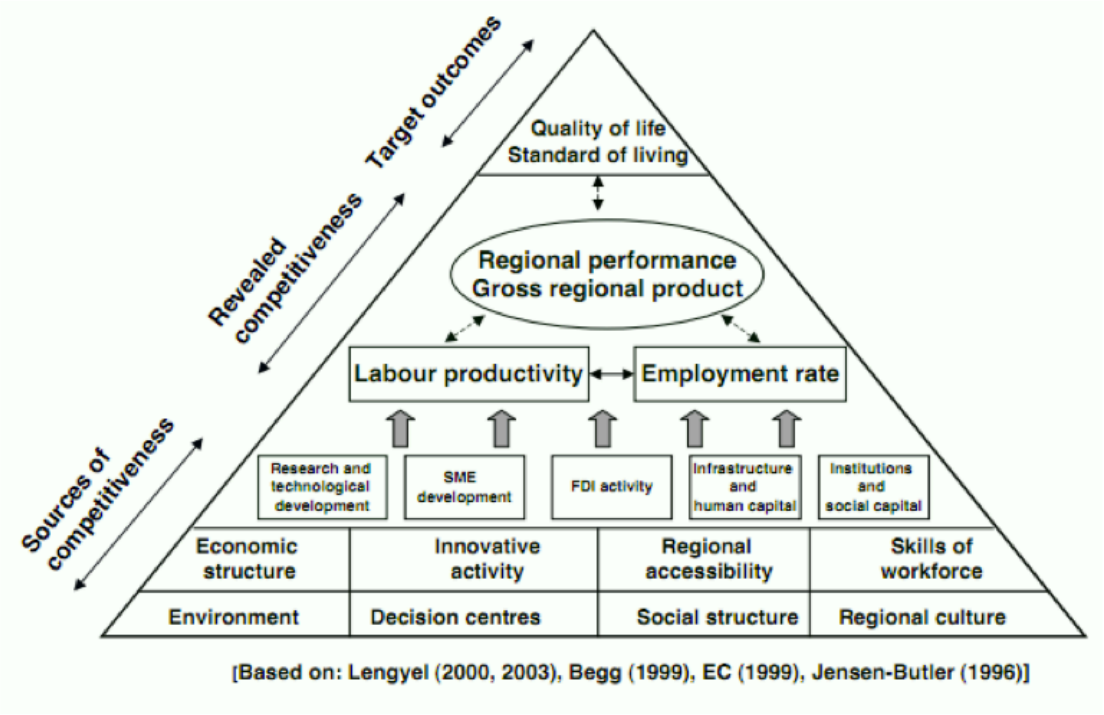
Nonetheless, how can one examine how places, regions or countries that compete with each other? And how can one assert that a certain place is more competitive than another? Krugman (1996) and Porter (2003) state that competitiveness is measurable by studying the *productivity* of a certain location. If competitiveness does have any meaning, it is just another way of defining productivity. In the end, regional or national growth is eventually determined by productivity growth (Krugman, 1996).

Porter also asserts that competitiveness is being measured by productivity. In order to understand the concept, it is necessary to study the wealth of a region or nation. Living standards of an area are determined by the productivity of its economy, which is measured by the value of its goods and services, produced per unit of human, natural and capital resources. This productivity is subject to the cost of products and services in an open market and the efficiency in which they are produced. Thus:

> True competitiveness, then, is measured by productivity. Productivity allows a nation to support high wages, a strong currency and attractive returns to capital, and with them a high standard of living (Porter & Ketels, 2003 in Gardiner, Martin & Tyler, 2004, p.4)

To conclude, one could say that competition can be measured by productivity, which functions as the main driver behind the performance and wealth of a region or nation. Gardiner *et al.* (2004, p.4) illustrates the relationship between the wealth, productivity and its underlying drivers in Figure 2.2.

Figure 2.2 The Pyramid of Regional competitiveness by Gardiner et al. (2004)



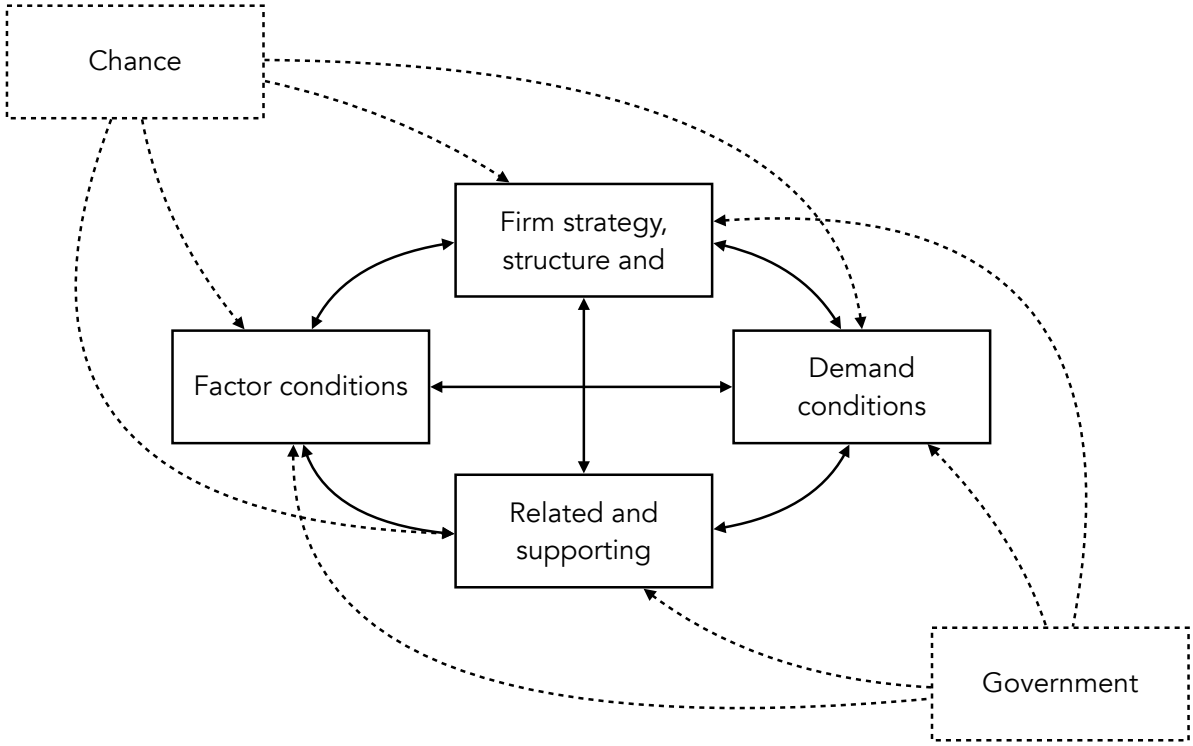
High regional competitiveness comes with a high productivity rate and a low unemployment rate. These are determined by sources, such as economic structure, the availability of skilled labor, innovative activities, and regional accessibility. But also the region's environment and the availability of certain (natural) resources, the social structure, and regional culture can play a role. On top of that, the decision centers, the place where regional policies are being made, e.g. on education or trade and investment promotion, have an impact on activities, which increase competitiveness. Having a higher availability of skilled labor, for instance, generates a competitive advantage, which in itself attracts new foreign direct investment, and other forms of capital.

In order to analyze why some nations are relatively more competitive than others, Porter (1998a) devised a theory that explains why particular clusters of industries have become successful in particular places, and why some industry clusters have a competitive advantage

over others. Cluster-based thinking can have several benefits, such as investment promotion. As Porter (2000, p.16) states: 'Clusters are a driving force in increasing exports and are magnets for attracting foreign investment.'

The model that he developed to analyze a nation's competitive advantage has become known as *Porter's Diamond*, and is shown in figure 2.3. He argues that the environment in which a firm is located, plays an important role in shaping the extent to which it is likely to achieve advantage on a global scale. Moreover, it allows analysis between the relative competitiveness of nations, by four determining factors: 1) factor conditions, 2) firm strategy, structure and rivalry, 3) demand conditions and 4) related and supporting industries. Two other factors, government (policy) and chance also influence the comparative advantage of a nation. We will elaborate on this model below, by discussing the different determinants in the diamond.

Figure 2.3 Porter's Diamond model for National Competitiveness



Factor conditions

Factor conditions basically entail the availability and quality of certain production factors in a country. It involves the factors, such as skilled labor or infrastructure, which are relevant for competition in particular industries. Traditionally, economic theory mentions the following factors for comparative advantage of *regions* or countries: land, location, natural resources, labor and local population size. These are endowed factors and can hardly be influenced. Therefore it fits in a more passive view of economic development. Besides they do not explain why countries, such as Switzerland, which is surrounded by land, poor in natural resources and has a small population, became one of the wealthiest nations in Europe and globally. The same

holds for Singapore, which encountered huge economic growth, while having limited (natural) resources.

Porter (1998a) believes that the factors that eventually determine competitive advantage are *created*, and not *inherited*. On the contrary, these factors may develop and change. For instance, technological progress, policies or socio-cultural change may influence these conditions. These specialized, or advanced factors include skilled labor, capital and infrastructure. Moreover, they may include factors like the quality and intensity of research on universities, the deregulation of labor markets or availability of venture capital. These factors are harder to duplicate and therefore create higher productivity, higher competitiveness and thus a higher competitive advantage over other nations. Each country has its own particular set of factor conditions. As a result, each country will develop those industries for which the particular set of factor conditions is optimal. As Porter (1998b, p.172) states: 'Nations succeed in industries where they are particularly good at factor creation. Competitive advantage results from the presence of world-class institutions that first create specialized factors and then continually work to upgrade them.'

Demand conditions

These conditions describe the state of home demand for products and services produced in a country. In other words, it measures the size or growth of the domestic market for a certain product or service. As the different factors within Porter's Diamond influence each other, demand conditions influence the shaping of particular factor conditions. Demand conditions also have impact on the pace and direction of innovation and product development: the more demanding the customers in the economy, the greater the pressure that firms face in enhancing their competitiveness. They can enhance their products or services through innovation, quality improvement, and so on. As stated by Porter (1998a), domestic demand is determined by three major attributes: First, the mix of customer's needs and wants. Second,

the scope and growth rate. Third, the processes that transmit national preferences to foreign markets. A country can achieve these national advantages in a market segment, if home demand provides clearer and earlier signals of market trends to domestic suppliers than to foreign competitors.

Related and Supporting Industries

This factor identifies the presence of (internationally) competitive supplying and supporting industries. The existence of an internationally successful industry may cause advantages in other related, or supporting industries. Within the value system, competitive supplying industries will strengthen innovation and internationalization in industries. Next to suppliers, related industries are relevant: These industries can use and coordinate particular operations in the value chain together, or are concerned with complementary products. E.g. hardware and software, or advanced plastics, offshore industries, and wind turbines. Porter asserts that governments can foster such advantages by e.g. stimulating exchange of ideas and innovations, or activating vertical cooperation between suppliers and buyers nationally.

Firm Strategy, Structure, and Rivalry

These entail the national conditions that control how firms are established, are organized and are managed. Moreover it entails which conditions determine the characteristics of domestic competition. Cultural aspects play an important role. Factors such as management structures and hierarchies, working ethos, or interactions between companies are formed differently. This will provide benefits and downsides for particular industries. Firm strategies, organizational structures and domestic competition also determine productivity and innovation (Porter, 1998a).

Government & Chance

Porter (1998a) defines the role of government to encourage firms by raising their performance, through imposing policies in one of the four factors in the diamond. For example, governments can do this by applying strict product standards. It could also stimulate early demand for advanced products, e.g. by setting regulations or applying certain subsidies or incentives. Furthermore, governments should focus on specialized factor creation, e.g. via investments in higher technical education, investing in mainports or infrastructure. As Porter (1998b, p.184-185) defines, governments' role is not to create competitive industries, since it is not able to do so. It can, however, function as a catalyst for increasing competitiveness:

> Government's proper role is as a *catalyst* and *challenger*; it is to encourage – or even push – companies to raise their aspirations and move to higher levels of competitive performance, even though this process may be inherently unpleasant and difficult. Government cannot create competitive industries; only companies can do that. Government plays a role that is inherently partial, that succeeds only when working in tandem with favorable underlying conditions in the diamond.

As visible in Figure 2.3, the Diamond functions as a system where the effect of one factor, relies on the others. For instance, there may be advanced factor conditions, such as the availability of high-skilled engineers and the availability of renowned research universities. However, when there is little firm rivalry, the lack of competition won't necessarily spur innovation, despite the advantageous factor conditions.

Even though government can impose policy on each of the four factors in the diamond, it still has limited control over their performance, let alone the relative competitive advantage of the nation. The factor *Chance* entails the developments outside the control of firms and governments. Eventually, these developments allow in new players who exploit opportunities

arising from the reshaped industry structure. Think of fundamental, disruptive innovations by a company, political instability, revolutions, and etcetera.

To sum up, Porter's Diamond model may be used to identify the extent to which nations can build on domestic advantages to create competitive advantage. It helps to understand the dynamic interaction between the corporate strategy of the enterprise and the competitive advantages of the country, the environment in which it operates. One of the major issues that the model explains, is why a large natural resources base is not sufficient to encourage economic growth, high levels of productivity, and thus create wealth. For governments it can be useful to evaluate policies, or as a guidance to build a new policy framework for a given industry. This enables industries in the country to develop a strong competitive position internationally.

Criticism

Although Porter's Diamond has been acclaimed by various scholars in the past decades, and is still one of the widely known frameworks for measuring competitiveness within business studies, economics and geography, it is also subject to various criticisms. First of all, even though the model tries to give a holistic approach, it is not extensive. In other words, there always remain a variety of factors which are not included, despite the factor *Chance* taking up the remainder of non-explainable components. Secondly, scholars, such as Rugman & D'Cruz (1993) argue that the diamond emphasizes the national markets, while in small, open economies, international markets are possibly more important demand conditions. Thirdly, Porter does not provide a set of indicators that are able to measure each of the given determinants. The various studies that have used Porter's diamond, each use different indicators to measure factor conditions, demand conditions, etcetera. (Beije & Nuys, 1995; Atzema, 2002). Thirdly, the model does not take in account large differences among countries, with respect to their population and/or geographical size. When comparing the Netherlands

versus Germany, or Canada versus the United States, one should take in account the large differences in population size, despite their geographical proximity (both Canada - US and Netherlands - Germany) or comparable landmass (in the case of Canada & US). Finally, the original framework is based on 10 case studies of developed countries, and did not take developing countries in account, which might have led to different results.

The Diamond of Dutch Competitiveness

For the sake of this study, it is interesting to briefly provide an example of the application of Porter's Diamond to the Dutch economy. From the perspective of this model, the national competitiveness of the Dutch economy is strong on particular aspects. According to Jacobs, Boekholt & Zegveld (1990), who first conducted an analysis on Dutch competitiveness by using Porter's Diamond, and Atzema et al (2002, p.165-166), perhaps most important asset of Dutch competitiveness is the favorable geographical position of the Netherlands. Although a lot has changed since 1990 and 1998 respectively, when it comes to global economic development, it still remains one of the most important factor conditions of the Dutch economy. Its central location, within the heart of Europe's blue banana, locked between the major economies United Kingdom, Germany and France, creates a very suitable business environment for business. This has been verified more recently by recent benchmark reports, including KPMG's *Competitive Alternatives* (2012) DHL's *Global Connectedness Index* (2012), and a recent ranking performed by Bloomberg on *Best Countries for Business* (2012). Yet, seen from the perspective of international business, the revealed competitive position of a country is determined by the value a firm gives to a certain place, or area.

As one would expect, and already discussed in Section 2.1, motives differ per business, and type of activity: A European headquarters requires different factor conditions than a distribution center, or R&D plant. Basically, each type of activity requires its own set of motives and demands (Atzema et al. 2002). The Netherlands has been very successful in attracting

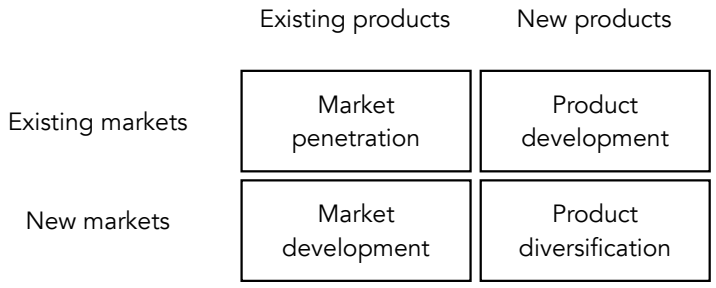
logistical operations (NFIA, 2011). This seems reasonable. When taking in regard the earlier mentioned factor condition, and define it as *Geographical location*, the Netherlands gains a competitive advantage over other (European) countries.

It is helpful to learn more about how and why multinational firms grow and evolve over time and space. This will give us more understanding of their strategies behind the establishment of subsidiaries, joint ventures or other types of overseas activities. We will discuss this in the following section.

2.4 The locational behavior of multinational firms

Strategic management entails that corporations continuously try to be ahead of changes within the markets in which they operate. They continuously try to adapt to the behavior of competitors and consumers. Businesses are continuously working on assessing their own strengths and weaknesses, and oversee threats and opportunities within their environment. Therefore, strategic management often starts with a SWOT analysis. Based on this analysis, the corporation can choose from different strategies. According to the *Product/Market matrix* by Ansoff (1965), there are four possible strategic options. These are shown in Figure 2.4 below:

Figure 2.4: The Product/Market Matrix by Ansoff (1965)



Market penetration

In this strategy, there is a focus on trading the same products or services in current markets. Within this strategy, businesses often aim at vending the same product at a larger scale, through efficiency improvements in manufacturing, distribution, and binding clients through customer relationship management.

Market development

This entails concentrating on serving new markets, with use of the existing products. One could think of directing at a new target audience, e.g. younger customers. Another strategy is expanding to new geographical markets, by starting sales activities overseas.

Product development

This involves serving existing markets and target audiences, while innovating in the product, in order to keep ahead of competitors. Instead of innovating new products, firms could introduce add-ons or accessories.

Diversification

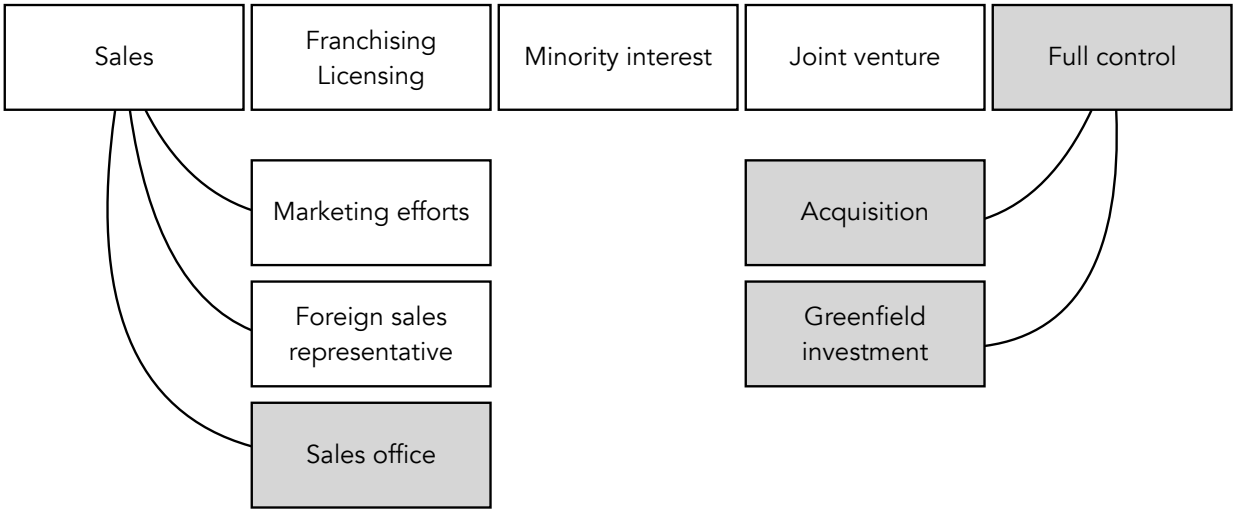
This strategy aims at developing new products or markets that are related to the existing product range or existing markets. The first option is *concentric diversification*, where a company can leverage its know-how in a certain market to gain advantage in new markets. For instance, a company that builds certain appliances for business-to-business use, now tries to introduce a comparable product for consumer markets. The second option is *horizontal diversification*: A company may introduce new products, which are not directly related to their existing range, but that may appeal to the current target audience. A famous example of horizontal diversification is the successful introduction of the iPhone by Apple Computer Inc. Apple penetrated the cell phone industry by offering a new product range, which appealed to consumers that already made use of e.g. Apple computers or the iPod music players. The third

option, *vertical diversification*, is practiced when the company starts with vertical integration: For example, the company could take over operations of their suppliers, or a distributor starts retail activities. The final option, *conglomerate diversification*, is the type of diversification where a firm enters an entirely different market, which has little or no direct relationship to its core business or technology.

A certain corporate strategy may lead to the decision of setting up an operation abroad. Basically, this decision can be either *cost-oriented*, or *market-oriented*. For instance, a company can decide to penetrate new (geographical) markets with its existing, or new product range. It could also decide to increase efficiency in production within its supply chain. For instance, by setting up manufacturing in a region or country with lower employment costs, or setting up logistical operations in order to serve customers faster, thus more efficiently. The choice for a particular location is dependent on the *comparative advantage* the business can obtain with setting up an operation in the area (Porter, 1998a).

Figure 2.5 below, based on Atzema et al (2002, p.97) shows different examples of overseas activities a firm could engage in. The focus of this study is on attracting new foreign direct investments. The shaded boxes display different examples where the business sets up a new, physical, presence in another country. This could range from a foreign sales office, in order to penetrate new markets more effectively. Another example is the acquisition of a (foreign) firm abroad. A company could use this strategy to reach out to new markets by buying a competitor, or it could be a strategy to increase vertical integration. A *greenfield investment* is a form of FDI where a parent company starts a subsidiary in abroad. This could be a new operational facility, such as a factory, warehouse, shared services center, or R&D facility.

Figure 2.5 Examples of activities abroad, based on Atzema et al. (2002). The shaded boxes indicate a physical presence.



Different studies touched upon the strategies of multinational corporations, behind the geographical expansion of their ventures. For instance, Håkanson's (1979) model for the spatial organization of firms, the product life cycle by Vernon (1966), the OLI-Model by Dunning (1973), the case study on the international expansion of Sony Corporation by Chang & Rosenzweig (1998), and the study on the evolution of foreign-owned subsidiary companies by Birkinshaw & Hood (1998). We will expand on the OLI-Model, as it provides a very comprehensive theory on the determinants, which make a firm decide whether it will decide to expand its operations abroad.

The OLI-Model, or *Eclectic paradigm,* is a theory in economics, which is originally devised by Dunning (1973). In response to economic globalization, the model evolved and has been extended by different scholars, such as Eden & Dai (2010). In essence, the model tries to explain the origin, level, pattern and growth of offshore activities by MNC's. The model consists of three elements, which are *Ownership specific advantages* (O), *Location specific*

factors (L) and *internalization of Internalization advantages* (I). We will discuss these different elements below:

Ownership-specific advantages

These involve firm-specific advantages that are usually intangible and are transferable within the enterprise with low transaction costs. For instance, brand value, patents or technological expertise. These advantages can balance out additional the costs of operating at a distance in location overseas.

Location-specific factors

These factors cover the specific benefits of the production environment within a region, or a country. These benefits can be advantageous from both the cost-efficient as market perspective. Economic advantages include the quality of the production factors, or the size of the (foreign) market. Political advantages include the government policies on FDI inflows and trade. Social-cultural advantages involve cultural and language barriers or the openness of society towards foreigners. Interestingly, there is a noticeable resemblance with Porter's Diamond, which has been discussed in section 2.3. Porter's *Factor* & *Demand conditions* are aligned with economic advantages, political advantages is loosely aligned with the factor Government in Porter's Diamond, and Social-cultural advantages are comparable to *Firm strategy, structure and rivalry*.

Internalization advantages

These are the advantages that are created when business operations are internalized, instead of outsourced, conducted via partnership arrangements, or joint ventures. A firm can have certain strong core competences, e.g. in production, or sales. It wants to explore new markets,

or sees benefits in moving production overseas. The greater the net benefits of internalizing these operations, the more likely the firm will invest in activities abroad.

Basically, the OLI-Model asserts that it is only interesting for a business to invest abroad when the (foreign) market has a distinct advantage, when the production factors are right, and/or when there is a net benefit of conducting these activities themselves. Nonetheless, next to considerations on production factors or markets, other *behavioral* elements also play a role in the decision-making process. Atzema et al. (2002) refers to a study by Blackbourn (1972) which looked into the decision-making process behind location choice of American and German firms, which both established subsidiaries in Ireland. The benefits of the investment climate of Ireland were the same for both American and German subsidiaries, since they both carried similar characteristics. Yet, they had radically different perceptions of desirable locations. According to Blackbourn, it appeared to be that entrepreneurs not always give the same value to a certain location factor.

2.5 Towards a conceptual model

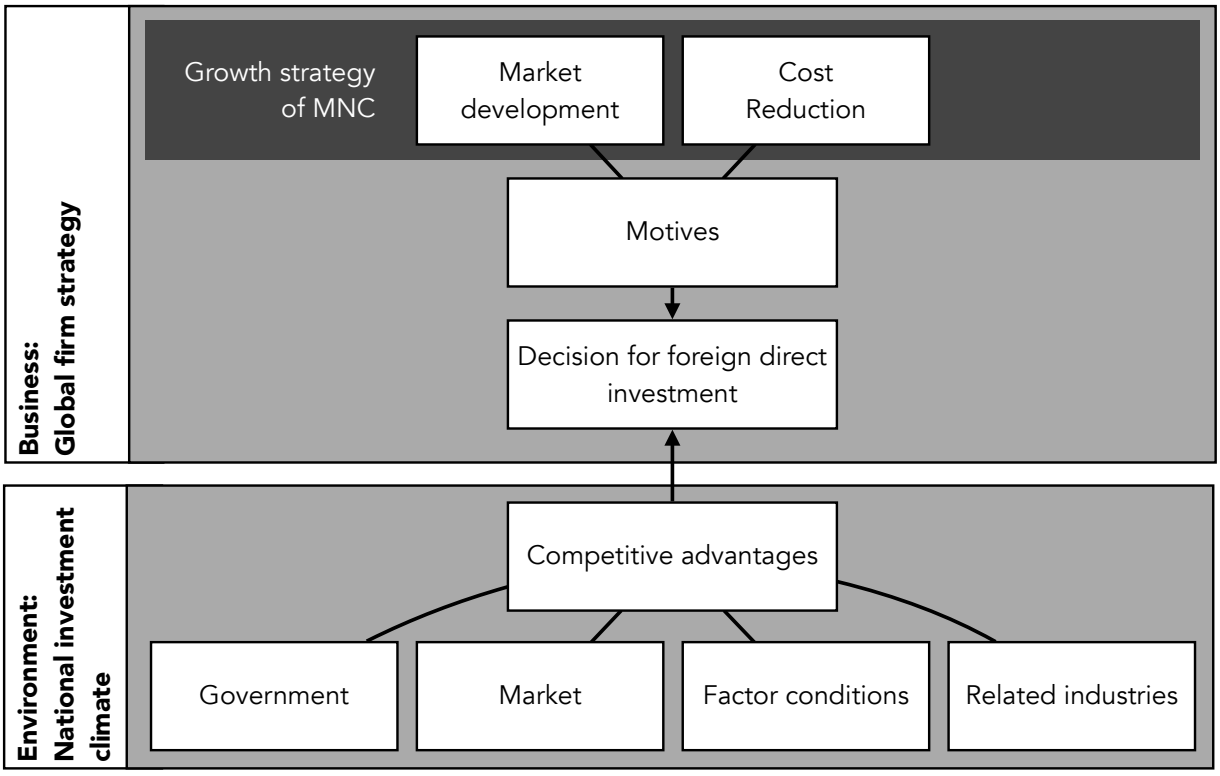
The previous sections touched upon several topics around the growth of multinational firms, its locational behavior and the environment that they are embedded in. Firstly, we discussed the interplay between business and regional and national environments. After this, we explored the environment level, by addressing concepts of regional and national competitiveness. Then we zoomed in on the micro level: we discussed motives behind corporate growth strategies, types of overseas activities businesses can undertake, and its motives behind the preference for establishing an activity at a certain location.

In order to relate these theoretical concepts to the focus of this research, the elements that relate to the problem definition, are tied together, simplified and used as building blocks for the conceptual model in Figure 2.6. Essentially, the model distinguishes two levels: a) the firm level (relating to the global firm strategy) and b) and the environment (relating to the national

investment climate for FDI. The model implies that the decision of a company to invest in a certain location, is influenced by the company's motives. These flow out of the growth strategy of the firm (relates to Ansoff Product/Market matrix), and can be either cost-oriented (e.g. increasing efficiency in the supply chain by opening an European distribution center) or market oriented (e.g. the company wants to penetrate new markets overseas, and seeks a location close to large markets). Also, investing in the destination country must yield a net benefit, compared to the alternatives, such as outsourcing these activities (relates to OLI-paradigm). Based on this, the country should meet certain factor conditions (e.g. accessibility to high-skilled labor, a favorable fiscal climate, or the presence of logistic facilities, such as a seaport and/or inland waterways), a qualified market (e.g. a large consumer market), the quality of government regulations (i.e. the ease of obtaining permits, tax rulings or incentives), and the presence of related industries, which can be of use as a supplier (e.g. the availability of a strong IT cluster, or well-developed offshore industry). These different factors, relate to Porter's Diamond, and thus influence the attractiveness of the location for the foreign firm.

When the firm decides to invest abroad, it seeks a location that offers the best competitive advantages. In other words, the location that provides the largest benefit for the company, or has the best investment climate, which meets the company's motives behind its investment decision (relates to the OLI Paradigm). The competitive advantages of the Dutch Energy Key sector, which defines its investment climate will be discussed in Chapter 4. The motives of firms behind their decision to expand their activities abroad, will be analyzed in Chapter 5. The operationalization of this research will be discussed next, in Chapter 3: Research methodology.

Figure 2.6 Conceptual model



3 RESEARCH METHODOLOGY

3.1 Why use mixed methods?

As mentioned in the first chapter, this research contains different sub questions. These sub questions are very distinct in nature, and thus require a different approach in answering them (see Table 3.1 for an overview). The first sub question has a very open nature, and can best be answered through a qualitative research strategy. Qualitative research allows obtaining very deep, rich data, and carries an inductive approach. For answering the second sub question, we want to look for significant causalities between motives and the investment decision, with help of a large project database (see section 3.2). Getting such observations from a large set of data requires a quantitative strategy. In order to combine these different strategies in our research design, we will apply a mixed methods approach: a research that integrates quantitative and qualitative research within a single project, which combines research methods that cross the two research strategies (Bryman, 2012, p.628).

3.1 Applying a mixed methods research approach

Bryman (2012) asserts that it is difficult to say what an exemplary or model mixed methods research looks like. To a certain degree, it uses conventions associated with both qualitative and quantitative research. He refers to the former editors of the *Journal of Mixed Methods Research*, Creswell and Tashakkori (2007, p. 108). They specified that a mixed methods article should a) be well-developed in both quantitative and qualitative components, and b) it should be more than reporting two distinct 'strands' of quantitative and qualitative research. These studies must also integrate, link, or connect these 'strands' in some way.

Bryman extends these statements by explaining that the quantitative and qualitative components of a mixed methods research design should both be adequately executed. Mixed

methods research should conform to both quantitative and qualitative research criteria. This means that it should be clear what the research questions were, how data was gathered and analyzed. Moreover, it should be taken into consideration that quantitative and qualitative research carry conflicting ontological assumptions. Qualitative research has a subjective, constructionist nature, whereas quantitative research is based on objectivism (Layder, 1993; Bryman, 2012). Next to that, using mixed methods research should give added value. It should be more than the sum of its (quantitative and qualitative) parts. It can be beneficial if the two sets of findings are linked, in order to gain a maximum return from the study.

This research is conducted according to these guiding principles in mixed methods research. As mentioned in the previous section, our sub questions (see Table 3.1 below) require different research methods. Sub question 1 uses qualitative research in order to conduct the SWOT analysis of the Dutch investment climate. Sub question 2 will use quantitative analysis in order to analyze patterns behind the motives of businesses, and their decision to invest in the Netherlands, with use of a database with past investment projects. Sub question three will link the results from question 1 and 2: It will analyze how the motives that companies define when they consider investing in the Netherlands, correspond with the strengths of the Dutch investment climate. In addition, it will give policy recommendations, based on these findings.

Table 3.1 Problem definition: Research questions

Main research question	*Which strengths and opportunities can be defined for the investment climate of the Dutch Energy sector, and how could these be used to attract FDI from the renewable energy sector in the United States?*
Sub question 1	*Which strengths, weaknesses, opportunities and threats can be identified within the current investment climate of the Dutch energy sector?*
Sub question 2	*Based on which motives do American firms in the energy sector invest in the Netherlands, when it comes to an expansion of their operations to*

	Europe?
Sub question 3	*How can the Dutch government effectively attract new renewable energy investments from the US?*

Nonetheless, why should a mixed methods approach be applied to this research? There are different arguments to defend this choice. As mentioned before, the different sub questions, each require different methods of research in order to gather data. The first part of this research will focus on acquiring a detailed insight in the investment climate of the Dutch Energy sector. This will require deep, rich information that describes certain assets, trends, projects, initiatives and so on, which all characterize this climate. In order to gather this information, a qualitative research strategy is beneficial, as it is a more open-ended research strategy that allows to explore the research matter in great detail.

Secondly, the second sub question will analyze American firms that have established activities in Europe. The question is if there are any correlations between the locational choices, in relation to their motives. Quantitative analysis gives an opportunity to analyze if there are any general trends in these location choices. The second reason for applying a quantitative research strategy for this question is of a more practical nature. The process of FDI decision-making may have a very delicate nature, as companies want to keep their decision-making confidential. Also regarding past investment projects, businesses are not eager to share much information. Therefore, the Netherlands Foreign Investment Agency, the source from which the data for this research comes from, instructs to keep the data anonymous. This confidentiality agreement has several reasons, for instance the relations of firms with different stakeholders, such as investors or shareholders. They do not want any commotion regarding potential expansion plans. Therefore, using a database with past investment projects, whereby the cases will be treated anonymously, is a suitable choice for this part of the research.

The third sub question in this research will compare the findings of the previous chapters and aims to draw conclusions from them. It will explore to what extent the strengths of the Dutch investment climate correspond with the motives businesses had when they decided for the Netherlands, or another European country as the location for their investments. Based on these findings, policy recommendations for the Dutch Energy Key Sector policy will be made.

How the research is designed and how data will be gathered will be discussed in the following section.

3.2 Research design

This section will discuss the research design. It will discuss the different sub questions, where it will deal with how the question will be operationalized and how data will be gathered.

Sub Question 1: Which strengths, weaknesses, opportunities and threats can be identified within the current investment climate of the Dutch energy sector?

In order to answer this question, we made use of extensive literature review on trends in the Dutch Energy sector, with a strong emphasis on the renewable energy. Renewable energy is operationalized by limiting it to the largest domains within the Dutch renewable energy cluster, as defined by Topteam Energy (2012) and ECORYS (2010). These are a) solar, b) wind, c) bioenergy, and d) smart grid technology. In addition, 14 semi-structured expert interviews are conducted with different key opinion leaders in these fields. These involve government officials, consultants, and professionals. Based on these findings, we conducted a SWOT analysis, which define the most significant strengths, weaknesses, opportunities and threats of the Dutch investment climate. The interviews focus on important location factors, the market, related industries and notable projects within the sector. Please view Appendixes I-IV for interview reports, interview transcripts and the interview guide.

Sub question 2: Based on which motives do American firms in the energy sector invest in the Netherlands, when it comes to an expansion of their operations to Europe?

Through quantitative analysis, it is possible to examine which motives have been decisive for investing in the Netherlands, or another European country. In order to undertake this analysis, use has been made of the CRM (Customer Relationship Management) database of the Netherlands Foreign Investment Agency. This database contains a wide variety of information on current and past investment projects of foreign companies that received support from the NFIA. It contains projects that eventually resulted in a landing of an investment in the Netherlands, but it also includes projects that were 'lost' by the Netherlands and eventually landed in another European country. Table 3.2 below provides an overview of the company information in the database.

When a query is executed with a) all investors from the USA, within b) the Energy sector, c) in which NFIA provided support in the investment decision-process, and d) have taken place between 2007-2012, there are 129 projects, which could be used for statistical analysis.

Table 3.2 NFIA CRM Database: Company information of current and past projects

Variables	**Values**
Type of Activity	Assembly/Value Added Logistics, Data Center, Distribution Center, Finance/Holding, Headquarters, Marketing & Sales, Manufacturing, Research & Development, Representative Office, Service Center, Shared Services Center, Supply Chain, Technical Center/Engineering, Other, Unknown
Type of Establishment	Initial, Outsourced, Expansion, Addition, Relocation, Retention, Merger/Acquisition
Industry - within Energy	Energy - General, Oil Gas and Coal, Bioenergy, Solar Energy, Wind Energy, Smart Grid, Energy Efficiency, Energy Storage, Other Sustainable Energy
Project Status	Active, Prospect, On Hold, Decided, Completed, Confirmed, Cancelled,

	Lost, Missed, Not Involved
Lead Source	Desk Research, Investor Development abroad, Investor Development in NL, Mailing, Advertisement, Media Coverage, NFIA Publication, Website, Networking events, Roadshow, Seminar/workshop, Trade show
Intake year	Between 2002 - 2012
Competition	Austria, Belgium, Denmark, Eastern Europe, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Norway, Portugal, Spain, Sweden, Switzerland, UK, Other
Project History	Intake logs, e-mail correspondence log, press releases

Aside from general company information, such as type of activity, industry, or project status, the database provides historical data of the investment project. This includes information that is logged during intake sessions, e-mail correspondence, but also press releases. During intake sessions, business officials convey their wishes for their investment project. In other words, what are their requirements for their investment project, and what qualities do they wish in the potential investment location? From this data, we can deduce the motives of a company, when they consider expansion in the Netherlands. Based on the database, these motives are operationalized and grouped in Table 3.3 below. (See Appendix V for an overview of the dataset).

Table 3.3 Motives

Motive	**Description**
Business costs & Taxation	The costs of doing business and fiscal rulings, such as corporate taxes and tax rulings for expatriates.
Incentives	The availability and quality of subsidies and other incentives for energy related businesses, such as a feed-in tariff subsidy scheme for energy generation.

Knowledge & Expertise	The availability of research institutes and institutes of higher education, for knowledge sharing and as a resource for innovation and R&D.
Market	The availability and size of a domestic consumer and/or business-to-business market.
Labor pool	The availability and quality of labour, such as the availability of skilled engineers.
Infrastructure & Logistics	The availability and quality of infrastructure, including roads, rail, waterways and digital infrastructure. It also includes the availability of air- and seaports, as logistic hubs.

Sub Question 3: How can the Dutch government effectively attract new renewable energy investments from the US?

Based on the principles of Bryman (2012) on mixed methods research, we will use the results from sub questions 1 and 2 to compare which factors determine the strengths of the Dutch investment climate of the Energy sector, and which motives businesses have in the decision-making process. If sub question 2 delivers significant results, different outcomes can be very useful for answering the problem definition: When it turns out that the motives of businesses to invest in the Netherlands do not with the defined strengths of the investment climate, this could be of good use for making policy recommendations for increasing the success of the investment promotion strategy.

3.3 Limitations

Aside from the assumptions that need to be met to conduct mixed methods research, there are several limitations with this study when it comes to research design and data availability:

- Regarding the internal validity of the research, we could question if assessing the investment climate of the Dutch Energy Key sector is valid when contrasting this with US investors' motives. Within the dataset, American businesses within the renewable energy field are broadly defined: a manufacturer of wind turbine blades that considers a distribution center might have different motives when it comes to expansion, compared to a software company that develops energy management solutions for the transmission of electricity from renewable energy sources. It would perhaps be valid as well contrasting the latter to the investment climate, defined by the High Tech & IT Key sectors, instead of the Energy Key sector.
- Although the NFIA Achilles database delivers a rich source of information on investment projects, we only use a limited amount of variables, namely those that define motives behind the investment decision. Other factors might have played a much bigger role. However, this data is not available in the NFIA dataset.
- The motives that have been distilled from the available project information are distilled from logs from intakes with investors and e-mail correspondence. Nonetheless, these do not convey other, latent, motives that firms may have, but are not communicated with the Dutch government.
- When it comes to external validity, we could raise the question to what extent FDI projects where NFIA played a role are representative for *all* foreign direct investments that have been conducted in the Netherlands. NFIA provides support on greenfield investments, and the expansion of existing, physical operations of foreign companies. The dataset does not include mergers and acquisitions, e.g. the acquisition of a Dutch firm that operates in the renewable energy field, by an US firm.
- The available database contains projects between 1976 and 2012. It is plausible that the investment climate has changed in the past decade. Therefore, this study might give more valid results when only more recent projects are included in statistical research. For this

reason, we will only include the cases between 2007-2012. Nonetheless, this decreases the total number of cases to 129.

- Finally, the research sample is large enough to conduct quantitative research, since N>25. Yet, some results might turn out insignificant. When we filter the cases per activity, or sub industry, the number of cases falls considerably, leaving out the possibility to conduct regression analyses with subsets of data. In the end, when considering these limitations, we should take in account that this study has a rather explorative nature, and that its results should give enough matter for further research.

4 RESULTS: SWOT ANALYSES

4.1 Introduction

This chapter will provide four different SWOT analyses of the different renewable energy subdomains, as they are outlined within the Innovation Contract, the agreement that has been established between government, academia and business within the Energy Key sector (Dutch: *Topsector Energie Innovatiecontract).* The contract highlighted four different areas within the sustainability domain: solar photovoltaic power, wind power, bio-energy and smart grids. Within this analysis, the different SWOTs will outline, per subdomain, the different strengths, weaknesses, opportunities and threats. Per subdomain, important and noteworthy comments or examples will be mentioned. These different key elements will provide a concise overview the Dutch investment climate for renewable energy, and will be summarized in the concluding paragraph. These SWOTs are the product of extensive literature review, and have been triangulated with expert interviews. These interviews have been conducted for the Netherlands Investment Agency with business executives, officials at regional development agencies, commercial managers of port authorities and consultants. These interviews gave interesting, complementing insights on trends, innovations and products within the field. Subsequently, these SWOTs were assessed and reviewed within NFIA and the Ministry of Economic Affairs, Agriculture and Innovation (See Appendices I and II for interview reports and transcripts)

4.2 Solar power

Although the size of the Dutch solar photovoltaics (PV) sector is still relatively small, it has been growing steadily. The most valuable products and services, which define the sector, are intellectual property from R&D activities, materials for PV production, Solar PV components, such as cells and inverters, and related services, such as project development and financial services (Berenschot, 2011).

Nonetheless, Dutch manufacturers of PV cells and modules, have had trouble competing with Asian, mainly Chinese, cell manufacturers, which push their products at very competitive rates on the European market.

Table 4.1 SWOT Analysis of the Dutch Solar PV Industry

S • Strong knowledge & expertise, with renowned research institutions and research collaborations, e.g. Solliance. • Manufacturing technology cluster	**W** • Only a limited number of installations has been installed • Limited size of Solar PV sector • Limited government incentives
O • Large growth of both domestic and international markets • Manufacturing of solar cell production machines • The rise of Building Integrated Photovoltaics (BIPV) concepts and components • The rise of smart grids and smart metering stimulate solar energy generation for residential and commercial use.	**T** • Competition with Chinese panel manufacturers threatens Dutch industry • Increasing growth in neighboring Solar markets

Strengths: Expertise in crystalline silicium and manufacturing technology

Several key strengths define the Dutch solar cluster. First off, there is a strong knowledge base for R&D in manufacturing of photovoltaic cells, mainly coming from research institutes such as

Energy Centre of the Netherlands (ECN), TNO, Holst Centre, and Solliance. In addition, there is a large job market of highly specialized engineers, with a strong background in high-tech systems and materials. Also, the Netherlands has a strong position crystalline silicium R&D and manufacturing (Witte, personal communication, February 22, 2012; Berenschot, 2011).

Moreover, the Dutch solar sector features a cluster of firms, which produces machines for manufacturing. This cluster features firms, such as OTB Solar, that have a market leading position in solar cell production machinery. The Netherlands could become the 'ASML for the PV and thin film industry, according to Deloitte (2012). However, the potential market for such machinery is much smaller than the market for semiconductor manufacturing, which is worth $30 billion (Van der Veen, personal communication, February 29, 2012).

Weaknesses: Limited amount of installed systems and small sector

The Solar sector is still relatively small, having a total revenue, including supporting industries, of $1 billion in 2010 and representing only 2000 jobs in the Netherlands in the same year. Moreover, access to financing for both residential and commercial use is difficult. (Berenschot, 2011)

Opportunities: Growing international markets and Building Integrated PV

In a very quickly, internationally growing market for solar power, which will be reaching grid parity in 2014 (Bloomberg, 2012), there are two major opportunities for Dutch solar. First of all, extending the potential in developing and manufacturing production machines, production processing and production centers. This might attract new foreign investments in the form of suppliers, distributors and services (Witte, personal communication, February 22, 2012; Berenschot, 2011).

In other parts of the solar value chain, the Netherlands could fulfill a position as well. Next to designing and manufacturing production facilities, there are opportunities for extending its

Building Integrated Photovoltaics (BIPV) cluster. The Dutch have a strong legacy, based on its strong position of related sectors in the construction industry and experiences with installing advanced PV systems (Berenschot, 2011). Nonetheless, according to Witte (personal communication, February 22, 2012) the related building and construction industries are locally oriented, and possibly create more opportunities for export, instead of attracting FDI.

Threats: Chinese manufacturers and competing European neighbors

A potential threat for attracting FDI is Germany, which has covered the entire Solar value chain, ranging from large corporations, renowned research institutes. It is also supported by strong governmental support, although this is diminishing. German industries also feel the threat of Asian solar cell manufacturers in their competitive position (Berenschot, 2011).

Dutch manufacturers of PV cells and modules have experienced trouble competing with Asian, mainly Chinese, solar cell manufacturers. Chinese companies push their products at very competitive rates on the European market, leading to several layoffs at Solland Solar and the insolvency of Helianthos and Scheuten Solar in early 2012. (Mikx, personal communication, February 22, 2012; Het Financieele Dagblad, March 10, 2012).

4.3 Wind Power

The wind power industry in the Netherlands has been growing steadily in the past decade. According to ECN (2012b) electricity from wind energy is the only emission-free bulk option that can be implemented on the short term at relatively low societal costs. Wind power has entered the phase of technological maturity. As such, wind energy is a clear option for the energy transition, which is taking place in the Netherlands and elsewhere in the world (Topteam Energie, 2012).

Table 4.2 SWOT Analysis of the Dutch On- and Offshore Wind Industry

S • Knowledge & expertise, with renowned research institutions and test sites • Seaports which are strategically located and provide solutions for offshore wind farms maintenance • Strong offshore industry, with several market leaders • Energy Valley facilitates growth of ecosystem	**W** • Small domestic market, compared to neighboring countries • Costs for offshore wind remain very high • Non competitive feed-in tariff subsidies
O • Location, seaports, knowledge position and strong offshore industry create a large opportunity for offshore wind service & maintenance operations in the North Sea	**T** • Shortage on graduating engineers threatens advantage on available human capital • Strong competition with neighboring countries, Germany, Denmark and United Kingdom, on both market and operating environment.

Strengths: Knowledge, seaports and a competitive offshore industry

The Dutch on- and offshore wind power industry brings a very strong competitive position when it comes to knowledge and expertise. Just as mentioned in the previous paragraph, this is determined through the existence of ECN, TNO and research at the different universities of technology, namely Delft University of Technology. ECN also features different test sites for

wind turbine and blade testing, thereby offering an interesting asset for the Dutch investment climate, when it comes to attracting foreign businesses. (Borgers, personal communication, February 23, 2012). ECN recently established a partnership with the US Department of Energy for Wind power R&D and testing (ECN, 2012a).

German technology giant Siemens decided on locating its R&D facility for Offshore Wind engineering in Delft. According to Molenaar (personal communication, March 2, 2012) Dutch engineers belong to the top of their company and form a necessity to realize innovation to reduce costs in offshore wind development. Siemens will therefore double the amount of engineers in its Offshore Centre of Competence in The Hague in the coming 4 years.

This expertise in offshore engineering within the offshore wind value chain is also displayed with one the one hand, the availability of large seaports at the North Sea, such as Rotterdam, IJmuiden and Eemshaven. On the other hand, there are large marine contractors, such as Ballast Needam, Heerema, Mammoet and Van Oord, which work on the construction of offshore wind farms worldwide and specialize in foundation engineering (Van Dijk, personal communication, February 24, 2012).

Different collaborations, such as Energy Valley, stimulate promotion of the Netherlands as a hub for (offshore) wind construction and development. Also different other initiatives, such as the FLOW offshore wind energy project, a consortium of XEMC Darwind, ECN, TU Delft, RWE, among others, build upon this proposition.

Weaknesses: Small domestic market, high costs and non-competitive subsidies

The market for both on- and offshore wind power is still relatively small. Especially when comparing to neignboring countries Germany, Spain, Denmark and the United Kingdom, the Netherlands falls behind, in terms of market size. Whereas the total amount of wind power in the Netherlands compared with 2000 MW in 2011, Germany exceeded a total of 20.600 MW in

that same year (NWEA, 2011).

Although onshore wind power will reach grid parity within the coming decade, offshore wind is power is still coping with high costs. Generating electricity from offshore wind farms costs approximately 17ct/kWh – which is nearly twice as much as onshore wind power and three times the market tariff of conventional electricity. These higher costs are mainly due to the high costs for installation and transport of offshore wind farms. This makes it hard to compete with other sources of energy.

Opportunities: Facilitate offshore wind service & maintenance in North Sea

Although costs for offshore wind power are high, the European market for offshore wind has been growing steadily in the past decade. The Dutch market for offshore wind equals $1 billion in 2011, which is approximately 25% of the European market (Topteam Energie, 2012; Ministry of Economic Affairs, Agriculture & Innovation (2012b). This steady growth is caused by the European objectives for sustainable energy in 2020. The unique position of the Netherlands, physically, because of its proximity to the North Sea, and economically, due to its position in R&D and offshore engineering, creates opportunities. Dutch seaports could extend its role to facilitating service and maintenance to offshore wind farms. If successful, this could create market-leading position, worth $6 billion and 12.500 FTE employment (Topteam Energie, 2012; Molenaar, March 2, 2012). These conditions provide an interesting opportunity for foreign investors.

Threats: Advancing shortage on human capital, strong competition from neighbors

One of the major threats is the competition with neighboring countries. Whereas the Netherlands has a good starting position within offshore wind power, its market for onshore wind is limited, compared to its neighbors Germany, Denmark, and the United Kingdom. This is mainly due to the active role of their governments, which facilitated competitive subsidy

schemes, in order to spur development. Dutch government policies on wind energy have not been consistent of the past years, thereby leaving out large investments within the wind industry (Van Dijk, personal communication, February 24, 2012; Molenaar, March 2, 2012; NWEA, 2012).

4.4 Bio-Energy

Approximately three-quarters of the renewable energy produced in the Netherlands in 2011 came from biomass (Centraal Bureau voor de Statistiek, 2012). The remainder was produced from sources, such as wind power and solar energy, which are mentioned in the previous sections. Renewable energy from biomass is for the most part produced by waste incineration plants, co-firing in power plants, the use of wood-burning stoves, and from the use of biofuels in the transport sector (Agentschap NL, 2012). Bio-energy, is one of the priority domains within the Energy Key Sector policy. However, Bio-Energy closely tied with the Chemicals Key Sector (*Topsector Chemie*), as it also concerns industries that work with chemical processes, such as biomass catalysis and conversion.

Table 4.3 SWOT Analysis of the Dutch Bio-Energy Industry

S	**W**
• Knowledge and expertise, e.g. ECN, and Wageningen University of Technology. • Leading position on Algae fuel research. • Dutch gas cluster & expertise drives biogas innovation. • Location and facilities of Dutch Seaports in Rotterdam, Amsterdam	• Biomass waste incineration plants are not yielding returns yet. • Feed-for-fuel discussion.

and Eemshaven.	
O • Energy from biomass has the largest and fastest growing share within the renewable energy mix in the Netherlands and Europe. • New technologies, such as torrefaction and bio butanol might encourage growth of the bio-energy industry.	**T** • Insecurity on which biomass technology will become the new standard is holding up large investments. • Investors focus on shipping tonnage, instead of developing greenfield sites.

Strengths: Expertise, seaports as import hubs and strong related industries

The broadly defined bio-energy cluster in the Netherlands has several strengths. First of all, the Netherlands has a decent knowledge position, when it comes to bio-catalysis and conversion. Important institutions that play a role are (as in the previous sections) ECN, and Food Valley, which clusters around Wageningen University. Also several research programs, such as CatchBio are dedicated to biomass conversion. The Netherlands is a frontrunner within R&D is research on biomass conversion from algae, within the AlgaePARC and AlgiCoat collaborations.

Secondly, the Dutch seaports have a strategic location and function as an import hub for the European market. The Port of Rotterdam specializes in biofuels refinery, storage and distribution; the Port of Amsterdam is specialized in the shipping and storage of biomass and

biogas, and already handles 1.5 million tons of biomass annually. The Port of Eemshaven is equipped to distribute biogas (Hallworth, personal communication, February 20, 2012; Van Dijk, personal communication, February 24, 2012). Related to bio-energy, are the strong chemicals and gas industry sectors. On both industries, the Netherlands has an excellent position and market leading firms, of which Royal Dutch Shell and DSM are the most well known examples.

Weaknesses: Biomass plants and biofuels production remains too expensive

Biomass as a source for electricity generation has seen a rapid increase in usage, as it is currently the best method to achieve European guidelines, generating 14% renewable energy by 2020. This is mainly caused by biomass, which is currently co-fired in generic power plants (Agentschap NL, 2012). Power plants, which work solely on CO2 neutral biomass, are not cost-effective. Moreover, the same holds for biofuels. There are currently two of these plants in the Netherlands, Greenmills and Vesta Biofuels, which both aren't cost-effective and aren't working at full speed (Van Stralen, personal communication, February 15, 2012; Hallworth, personal communication, February 20, 2012)

Opportunities: Logistic capacity and new innovations, such as torrefaction

Also within Europe, bioenergy is the major renewable energy source, accounting for almost 70 percent of European renewables, and showing steady growth. According to the 2011 Statistical Report by the European Biomass Association (2011) the total usage of bioenergy, comprising biomass and biofuels for transport, heat and electricity, will rise from 85,3 million tonnes to 138,3 million tonnes in the EU 27. This creates a large market for Dutch seaports, to extent its role as a hub for biomass distribution, blending and distribution of biofuels, and as the European hub for gas distribution (Hallworth, personal communication, February 20, 2012; Van Dijk, personal communication, February 24, 2012).

Another opportunity for the Dutch industry, is allocating R&D efforts in new trends within biomass conversion, such as pelletization (the densification of biomass) and torrefaction (the roasting of biomass, in order to create higher efficiency per cm2, when combusting). Increasing efficiency creates higher efficiency when shipping and thus creates higher value.

Threats: Foreign investors focus on tonnage, insecurity on breakthrough technology

As both electricity from biomass and biofuels haven't reached maturity, it is unclear which technologies will become standard. For instance, there are different technologies for densifying biomass, to increase efficiency during shipments, such as torrefaction, or generic pelletization. As there hasn't been a clear standard yet, large investments in a certain technology will be postponed (Hallworth, personal communication, February 20, 2012; Van Dijk, personal communication, February 24, 2012; Hurenkamp, February 17, 2012). Moreover, a focus on the logistic capacity of the Netherlands as a biomass and biofuel hub of Europe might attract new investments in the form of extra tonnage, which is pushed into the European hinterland. It might not, however, attract new greenfield investments, and thus e.g. create larger numbers of employment. (Van Stralen, personal communication, February 15, 2012).

4.5 Smart Grids

In order to reach the 2020 renewable energy and sustainability guidelines, governments and utilities are embracing new ways of energy generation, and means to engage in energy efficiency. The energy transition comes with more decentralized power generation and a need for energy efficiency (e.g. through homeowners and businesses that install their own solar panels). This requires a more intelligent energy grid, and opens up new markets.

This new, intelligent energy infrastructure, is called Smart Grid, a term which has been defined by Amin and Wollenberg (2005). This vision includes full modernization and automation of electric power networks. This vision also embraces major elements from advanced metering,

power electronics and information management to renewable and distributed energy resources, and home and electric vehicle energy management.

Next to solar, wind and bio-energy, Smart Grids has been one of the priorities within the Energy Innovation Contract, where it is referred to as a domain with 'uncontrolled, inevitable growth potential' (Topteam Energie, 2012), and thereby creating a lot of potential in growing and attracting new investments and businesses.

Table 4.4 SWOT Analysis of the Smart Grids Industry

S	**W**
• Worldwide renowned knowledge and expertise, with renowned institutes and Universities of Technology. • Powermatching City in Hoogkerk is the world's first real-life smart grid demonstration site. Provides businesses to test smart grid solutions in a real environment. • Various business networks and initiatives, such as KiEMT, Energy Valley and Amsterdam Smart City stimulate smart grid innovation. • Reliable broadband and electricity grid infrastructure • Strong ICT cluster	• There are too little drivers for a solid business case for industry and suppliers • Current electricity grid in the Netherlands does not need to be replaced, which decreases added value of large-scale smart grid.
O	**T**
• A rise of decentral electricity	• Stagnating percentage of renewable

generation requires a new grid infrastructure • Solid business case for storage and battery solutions, to store a possible energy surplus. • The Netherlands could function as a living lab for new products and services for businesses that want to enter the European market.	energy within total energy mix of the Netherlands does not stimulate large investments in grid infrastructure.

Strengths: A wide range of smart grid initiatives and world's first real-life community

As with the previous SWOT analyses, the Smart Grid industry in the Netherlands is also recognized by its strong knowledge and expertise on the matter, which is manifested through different pioneering projects. The most notable example is the research consultancy DNV KEMA, which is dedicated to research in the field, and its Powermatching City project (Van Dijk, personal communication, February 24, 2012; Jun Qing Zhao, personal communication, February 14, 2012). This is a full-scale demonstration project in Hoogkerk, Groningen. This project consists of real homes, outfitted with a range of Smart Grid appliances. All houses are connected to PV panels and are equipped with smart meters. This project forms a major strength for the smart grid investment climate, it is the 'world's first real-life smart grid demonstration' (Reuters, 2012).

Other examples include the Smart Energy Collective, a collaboration of 26 Dutch companies, which plan to design and implement five smart grid demo projects in the Netherlands; the Amsterdam Smart City project, a collaboration Cisco, IBM and the City of Amsterdam, which aim to work on realizing 'a smart, energy efficient city,' through the implementation of 25

projects related to renewable energy generation and energy efficiency; and finally KiEMT, a business networking organization in the Eastern Netherlands, which aims to exchange knowledge on the matter, and supports foreign businesses with rolling out their operations, or expand their markets in the (Eastern) Netherlands (De Kroon, personal communication, February 20, 2012).

The conditions for developing a strong Smart Grids cluster are also set, with the availability of a strong ICT services cluster, mainly centered around Amsterdam and the Province of Utrecht, and fundamental research conducted at Universities of Technology, such as Twente University, which has a dedicated department to ICT & Smart Grids infrastructure. Finally, a reliable broadband and electricity grid infrastructure supports the future implementation of smart grid appliances (Van Dijk, personal communication, February 24, 2012; Van der Meulen, February 14, 2012).

Weaknesses: Volatile market, no solid business case

The market for smart grids is young and remains very volatile. It is not yet sure which technologies will make breakthroughs and which stakeholders will be dominant in this 'uncharted territory', according to Topteam Energie (2012). Also, based on interviews with Siemens (Van der Heijde, personal communication, February 29 2012), it is not yet clear how to develop a clear business case, as there are currently no large drivers for businesses to market new products. Van Der Heijde also asserts that, since the current electricity grid is very reliable, it decreases incentives, for e.g. housing corporations, to invest in large new grid infrastructures, making this a weakness for smart grids investments.

Opportunities: A living lab for the rise of decentralized energy generation

A rise of decentral energy generation comes along with new markets for smart grid infrastructure and appliances. Decentral energy generation requires a two-way grid

infrastructure, along with intelligent metering appliances. Next to that, this requires an ICT infrastructure, which supports managing the supply and demand ratios of electricity generation at home versus centralized power plants. Moreover, this opportunity also opens up a new market for the storage and battery industries, according to Van Dijk (personal communication, February 24, 2012). The Powermatching City project in Hoogkerk (see previous section, *Strengths*) shows interesting product-market combinations, with the integration of electric vehicle infrastructure, vehicle batteries and smart homes. A surplus in energy (e.g. peak energy generated by Solar PV systems on a roof) can be stored via the EV and sent back to the smart grid when demand exceeds surplus.

Another opportunity for the emerging Smart Grids industry cluster in the Netherlands, is profiling the Netherlands as a living lab for foreign investors. Businesses that want to sell services or appliances on the European market could start with testing their products in the Netherlands, in one of the smart energy projects or communities (Van Dijk, personal communication, February 24, 2012).

Threats: Stagnating growth of decentral energy generation

Although the total usage of energy from renewable energy sources has increased over the past years, the production of renewable energy within the Netherlands is stagnating. This indicates that importing energy from abroad has seen an increase. According to a report by Rabobank (2012), 4% of the Dutch energy production is sustainable, which will lead to only 9% in 2020, if current policies do not change. Stagnating investments in renewable energy will also influence the market for smart grids. The more decentralized energy production will get in the coming decade, the faster the market will break open for smart grids.

4.6 Conclusion

The Innovation Contract, the agreement that has been written between government, academia and business within the Energy Key sector, highlighted four different areas within the sustainability domain, solar photovoltaic power, wind power, bio-energy and smart grids. These four domains each represent different industries and different activities within their respective value chains within the Netherlands, but are all concentrated on renewable energy generation and energy efficiency.

Drawing up from the SWOT analyses, similarities can be observed: Within the different domains, we observed that the knowledge and expertise of Dutch research institutes (e.g. Energy Centre of the Netherlands, TNO) institutes of higher education (e.g. Delft University of Technology, Wageningen University and Twente University) and businesses (e.g. DNV KEMA) serve a prominent role, with leading fundamental research, R&D and innovative projects.

Another common denominator appears to be the favorable location of the Netherlands. Its proximity between large players within renewables, Germany and the United Kingdom, gives businesses a large market. This has been made clear with the Dutch offshore industry that serves German and British offshore wind farm developments. Also the size and location of the Dutch seaports (namely the ports of Amsterdam, Rotterdam, Eemshaven and IJmuiden) provide an important factor condition for both the wind power, biomass and biofuels markets.

Moreover, the incentives schemes for renewable energy do not give the Netherlands a competitive advantage, especially when compared to those in Germany of the United Kingdom. Especially concerning the SDE+ subsidy, the feed-in tariff scheme for renewable energy generation, critics express that the many adaptations on the incentive scheme, together with an often changing policy agenda, withheld (foreign) investors in investing in renewable energy, e.g. in the form of wind farms, in the Netherlands. Nonetheless, the 'generic' fiscality and incentives for businesses are still a major pull factor for foreign businesses, and give the

Dutch investment climate a competitive position, when looking at costs for doing business (see KPMG, 2012).

5 RESULTS: MOTIVES OF US INVESTORS

5.1 Introduction

This chapter will provide the results of the second part of the analysis of this study. It will answer the second sub question: *Based on which motives do American firms in the energy sector invest in the Netherlands, when it comes to an expansion of their operations to Europe?* In order to answer this question, we will test if certain motives influence the probability of investing in the Netherlands, by using a dataset with project information of American investors in the Dutch Energy Sector, by which the Dutch government performed a supporting role (See section 3.2 for an extensive guide on the research design). In the following sections we will discuss the composition of the model, and outcomes of the regression analysis. We will also discuss if assumptions for multicollinearity are met, and investigate how the model fits the data, by conducting residual analysis. We will end with some concluding statements, which will be discussed more thoroughly in the following chapter.

5.2 Dataset characteristics

For this regression analysis, we used the NFIA Achilles project database. Eventually, 129 cases have been identified (see section 3.2 for methods and Appendix V for the dataset). These 129 cases are each companies from the US Energy sector that have been in contact with the Dutch government, to discuss the Netherlands as a potential location for their operation. These projects are dated within the past 5 years, thus between 2007-2012. Based on the correspondence and intake sessions with the American firm and the Dutch government, we have distilled several motives, which form the drivers for their investment decision. These motives are the 'wishes', or requirements, that businesses stated, during their intake and other contact with the Dutch government.

The different charts below (Figure 5.1-5.3) provide an overview of the most important characteristics of the variables within the dataset. Figure 5.1 distinguishes the different cases per project activity. These involve headquarter functions (e.g. a *European headquarters*), *Marketing & Sales offices*, activities related to logistics (*Assembly/Value Added Logistics*, or *Distribution Centers*), or others, such as research centers (*Research & Development*). We notice that the largest share of the 129 cases is compromised from *European Headquarters (24%), Distribution Centers* (18%) and *Manufacturing/Production* facilities (23%).

Figure 5.2 shows a division of the cases per Project status. This indicates whether a project, which has received assistance by NFIA, eventually resulted in an investment in the Netherlands, or another European country. We observe that 16% of the cases eventually landed in the Netherlands.

Figure 5.3 shows the frequency of the manifested motives within the total set. We observe that motives related to the quality of Infrastructure & Logistics (34), as well as the availability of Knowledge & Expertise (33) carry the highest frequencies, thus were mentioned the most.

Figure 5.1 Cases per activity

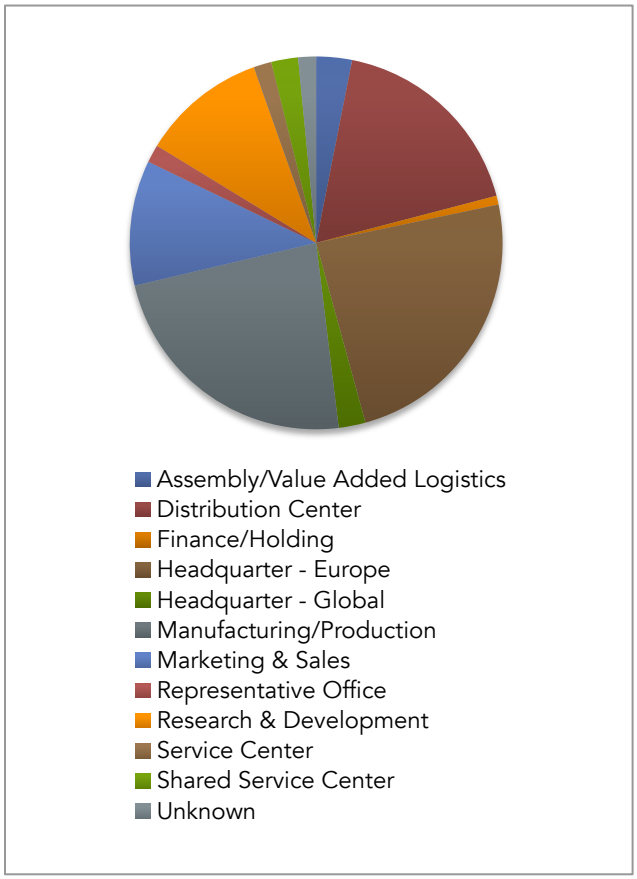


Figure 5.2 Cases per status

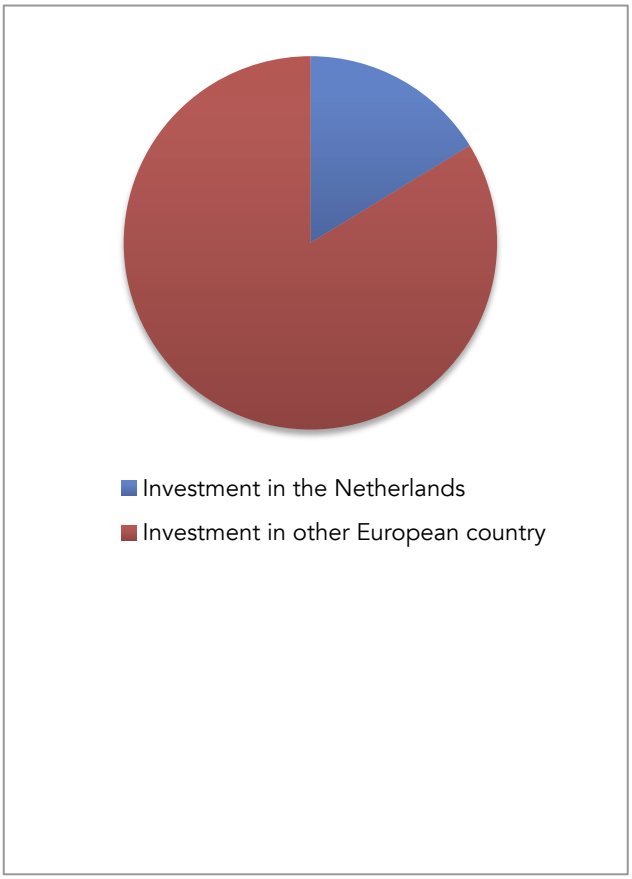
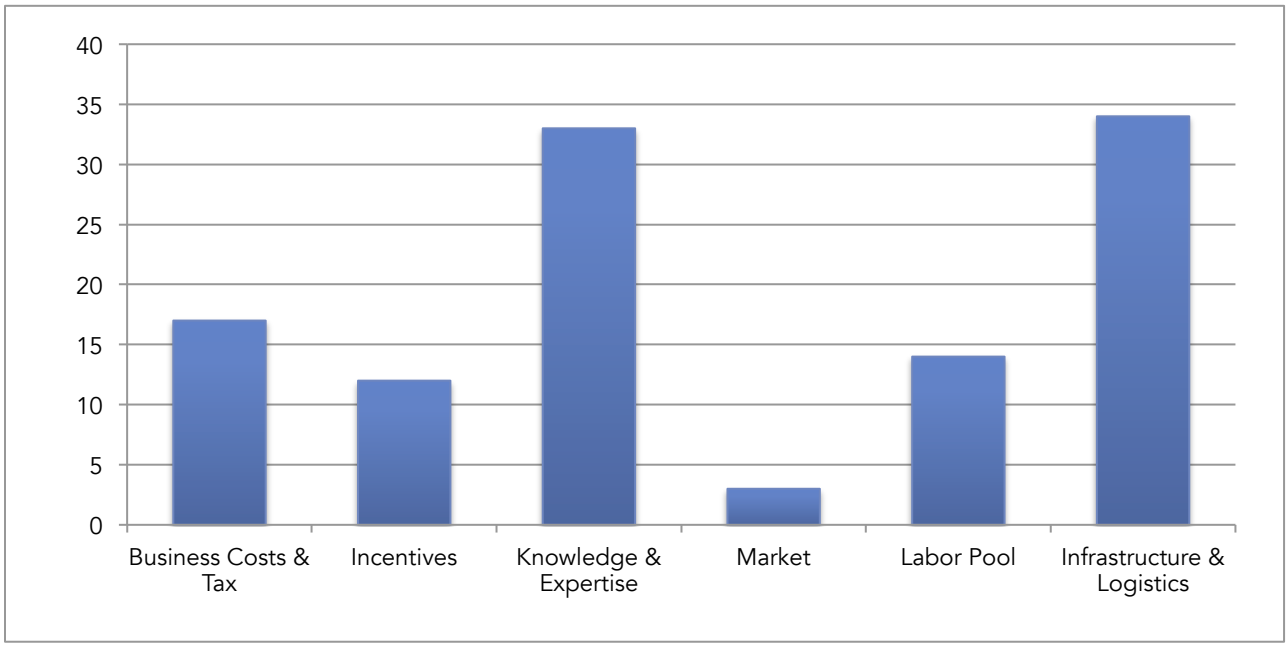


Figure 5.3 Frequency of Motives



5.3 Defining variables and building the model

In order to investigate which motives have a significant influence on the decision of US investors to locate their investment project in the Netherlands, we need to build a model that includes independent predictor variables (the motives) to predict the probability of an outcome (investment in the Netherlands, versus investment in another European country). The outcome variable is categorical, as there are only two options: Option A: The investment project lands in the Netherlands, or Option B: The investment project does not land in the Netherlands (but in another, European, country). Therefore, we will build a binomial logistic regression model.

As Field (2009, p. 265) states, binomial logistic regression is multiple regression but with an outcome variable that is a categorical variable and predictor variables that are continuous or categorical. In its simplest form, this means that we can predict in which of two categories a case is likely to belong to given certain other information.

In order to analyze if certain motives that were assigned to the 129 cases have a significant influence of the probability investing in the Netherlands, we can treat 'motives' as categorical predictor variables. Therefore, these motives have been coded as dummy variables: When the predictor indicates 1, this indicates that a certain motive is attributed to the case. For instance, when an American biomass refinery wants to set up a distribution center for its European activities and specifically demands a location close to a major seaport and railway connections, this case will be attributed the value 1 for [m_InfraLogistics], and the other predictors will be attributed 0.

The regression model tries to find which motives influence the probability that an American firm invests in the Dutch energy sector. This will lead to the following equation:

$$P(\text{Investment in the Netherlands}) = [\text{Constant}] + [\text{m\_BusinessCostsTax}] * x_1 + [\text{m\_Incentives}] * x_2 + [\text{m\_KnowledgeExpertise}] * x_3 + [\text{m\_Market}] * x_4 + [\text{m\_LaborPool}] * x_5 + [\text{m\_InfraLogistics}] * x_6$$

Table 5.1 below gives an overview of the motives as predictor variables that have been distilled from the project data.

Table 5.1 Motives as predictor variables

Motive	**Description**
Business costs & Taxation *[m_BusinessCostsTax]*	The costs of doing business and fiscal rulings, such as corporate taxes and tax rulings for expatriates.
Incentives *[m_Incentives]*	The availability and quality of subsidies and other incentives for energy related businesses, such as a feed-in tariff subsidy scheme for energy generation.
Knowledge & Expertise *[m_KnowledgeExpertise]*	The availability of research institutes and institutes of higher education, for knowledge sharing and as a resource for innovation and R&D.
Market *[m_Market]*	The availability and size of a domestic consumer and/or business-to-business market.
Labor Pool *[m_LaborPool]*	The availability and quality of labour, such as the availability of skilled engineers.
Infrastructure & Logistics *[m_InfraLogistics]*	The availability and quality of infrastructure, including roads, rail, waterways and digital infrastructure. It also includes the availability of air- and seaports, as logistic hubs.

Correlation of predictor variables

In order to assess the quality of the predictor variables, it is necessary to investigate whether they do not correlate too much among each other. A high correlation indicates that another underlying factor might play a role, and that predictors might be rearranged, or merged. Table

5.2 below shows the results of a bivariate correlation analysis. The table below indicates that there are no large, significant, correlations (measured by Pearson's Correlation coefficient) between different predictors. The largest value can be found between *Business Costs & Tax* and *Incentives*, with a significant value of 0.270. This makes sense, as these predictors have similarities, and could both be categorized under i.e. financial motives. Nonetheless, as there are no large (above 0.6) correlations, the current set of predictors will be used in the binomial logistic regression analysis in the following section.

Table 5.2 Bivariate correlation between predictors

		Dummy motive Business Costs & Tax	Dummy motive Incentives	Dummy motive Market	Dummy motive Knowledge & Expertise	Dummy motive Labor Pool	Dummy motive Infrastructure & Logistics
Dummy motive Business Costs & Tax	Pearson Correlation	1	**.270****	**-.176***	-.060	.011	-.129
	Sig. (2-tailed)		**.002**	**.046**	.499	.898	.145
	N	129	129	129	129	129	129
Dummy motive Incentives	Pearson Correlation	**.270****	1	-.065	-.049	-.112	-.131
	Sig. (2-tailed)	**.002**		.461	.578	.207	.139
	N	129	129	129	129	129	129
Dummy motive Market	Pearson Correlation	**-.176***	-.065	1	.027	-.147	**-.270****
	Sig. (2-tailed)	**.046**	.461		.758	.095	**.002**
	N	129	129	129	129	129	129
Dummy motive Knowledge & Expertise	Pearson Correlation	-.060	-.049	.027	1	-.054	-.092
	Sig. (2-tailed)	.499	.578	.758		.545	.298
	N	129	129	129	129	129	129
Dummy motive Labor Pool	Pearson Correlation	.011	-.112	-.147	-.054	1	-.096
	Sig. (2-tailed)	.898	.207	.095	.545		.281
	N	129	129	129	129	129	129
Dummy motive Infrastructure & Logistics	Pearson Correlation	-.129	-.131	**-.270****	-.092	-.096	1
	Sig. (2-tailed)	.145	.139	**.002**	.298	.281	
	N	129	129	129	129	129	129

5.3 Results of the binomial logistic regression analysis

In the regression analysis, we included the 6 dummy predictor variables in a forced entry (Enter) binomial logistic regression model, in order to explain P(Investment in the Netherlands). We will discuss the several steps that have been taken with this analysis below. A summary of this regression model can be found in Table 5.3:

Table 5.3 Case Processing Summary

Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	129	100.0
	Missing Cases	0	.0
	Total	129	100.0
Unselected Cases		0	.0
Total		129	100.0

Table 5.4 Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	107.677[a]	.052	**.089**

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Table 5.3 points out that eventually 129 cases have been used in the logistic regression model. This involves all cases which involve recent projects (between the years 2007-2012) and where values were attributed to one of the 'motive' predictor variables. The Nagelkerke R Square value of 0.089 in Table 5.4 indicates that the model as a whole has a low goodness-of-fit, and is not significant (Sig. 0.326). This indicates other factors play a role when it comes to the investment decision. Nonetheless, in this study we try to investigate if different *underlying motives* of investors have a significant influence in the probability of investing in the Netherlands. It turns out that, within this model, only the motive [m_BusinessCostsTax] turns out to have positive a significant influence, with a confidence interval of 95% (alpha 0.05).

Table 5.5 Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	m_Market	-.011	.672	.000	1	.987	.989
	m_KnowledgeExpertise	1.369	1.282	1.141	1	.285	3.933
	m_Laborpool	-.272	.881	.096	1	.757	.761
	m_InfraLogistics	.823	.577	2.039	1	.153	2.278
	m_BusinessCostsTax	**1.384**	**.691**	**4.012**	**1**	**.045**	**3.993**
	m_Incentives	-1.161	1.146	1.026	1	.311	.313
	Constant	-2.059	.460	20.015	1	.000	.128

5.4 Model diagnostics

In order to test the quality of the model, we will perform several diagnostic tests. We will examine if assumptions for multicollinearity are met, and we will perform several residual analyses.

Testing for multicollinearity

Multicollinearity occurs when two or more independent variables in the model are approximately determined by a linear combination of other independent variables in the model. The degree of multicollinearity can vary and can have different effects on the model. A large degree of multicollinearity can negatively influence the quality of the model. Although we already found out that the predictor variables showed very little correlation among each other, we will perform an additional test on multicollinearity, to be sure that the model fits the data.

We will test if there are any hints for multicollinearity, by builiding a linear regression model, by using the dependent variable and predictor variables of the binomial logistic regression model. A linear regression model gives the opportunity to run diagnostic tests for the Variance Inflation Factor (VIF) and Tolerance statistics.

Field (2009) states that Tolerance values should not be lower than 0.1 and VIF values should not be above 10. This seems logical, since the function for VIF is (1/Tolerance). Table 5.5 indicates that there is no sign for multicollinearity, as no Tolerance values are lower than the critical value 0.1 and, as a consequence, there are no VIF values above the critical value 10.

Table 5.6 Collinearity Statistics

Model	Collinearity Statistics	
	Tolerance	VIF
Dummy motive Business Costs & Tax	.878	1.139
Dummy motive Incentives	.894	1.119
Dummy motive Market	.846	1.183
Dummy motive Knowledge & Expertise	.978	1.022
Dummy motive Labor Pool	.932	1.073
Dummy motive Infrastructure & Logistics	.848	1.179

a. Dependent Variable: Project Status NL Yes/No

When looking at Table 5.6 below, we look for strong condition indexes, which might indicate signs for multicollinearity. If the condition index number has a value above 30, this shows a significant sign for multicollinearity (Field, 2009). Nonetheless, the model does not show any value higher than 30, which also proves that there is no sign for mulitcollinearity.

Table 5.7 Collinaerity Diagnostics

Dimension	Eigenvalue	Condition Index	Variance Proportions						
			(Constant)	Dummy motive Business Costs & Tax	Dummy motive Incentives	Dummy motive Market	Dummy motive Knowledge & Expertise	Dummy motive Labor Pool	Dummy motive Infrastructure & Logistics
1	2.137	1.000	.06	.05	.04	.04	.01	.03	.04
2	1.166	1.354	.01	.20	.23	.07	.11	.01	.03
3	1.058	1.422	.00	.00	.06	.09	.31	.20	.10

4	.932	1.514	.00	.03	.01	.02	.18	.45	.15
5	.884	1.555	.00	.01	.00	.27	.35	.04	.17
6	.620	1.857	.00	.57	.59	.02	.00	.09	.00
7	.203	3.243	.93	.13	.07	.49	.04	.18	.50

Analysis of residuals

In order to examine to which extent certain cases might potentially be large outliers, and thus influence the model too much, several residual analyses have been conducted. In order to see to see how the model fits, we will discuss outliers and their implications of the Standardized Residual values, values for Cook's distance, Leverage values, and values for DfBeta. For each case, these values have been computed. Please see Appendix V to find the different values per case.

First of all, in order to see if there are large outliers, it is useful to analyze standardized residuals ZRE_1]. Out of 129 cases, 9 have a value above 1.96, thus lies outside of the 95% of the area under the normal distribution, that lies within 1.96 standard deviations of the mean. Out of these 9 cases, 8 have values above 2.58 and only one case contains a value higher than 3.29.

In order to see if there are any influential cases that might have an effect on the model, values for Cook's Distance [COO_1] larger than 1 give an indication. We find that 2 cases have values above 1, thus influence the model.

Another method of investigating the influence of a single case in the total model, is analyzing Leverage values. According to Field (2009) leverage values above 3 times the expected leverage value, indicate a proportionally large influence of one case on the total model. The expected leverage value is calculated by (k+1)/N. For this model, this would be (9+1)/129,

which is 0.077. There are 5 cases that have a value higher than 3 times the expected leverage value, (3*0.077 = 0.231).

Another, final, test for analyzing the influence of single cases, per predictor variable, is the DFBeta statistic. The DFBeta value for a particular observation is the difference between the regression coefficient calculated for all of the data and the regression coefficient calculated with the observation deleted, scaled by the standard error calculated with the observation deleted. An absolute value for DFBeta higher than 1, indicates a large influence. Within the model, there 1 case has a value higher than 1 under [DFB2_1] and one case that has a value higher than 1 above [DFB2_4].

It is wise to add that it can not be justified to remove influential cases, or outliers from the model. According to Field (2009) these should be inspected and reported, and see if it is possbile to find out why these are unusual. Nonetheless, there was not one particular case that showed outliers on different criteria, which made it impractical to find out why certain cases were odd and should have been removed.

5.6 Conclusions

Based on this outcome, we can assert, with a confidence level of 95%, that an underlying motive for low costs for doing business and a favorable tax climate, positively influences the probability of P(Investment in the Netherlands), based on the odds ratio, or Exp(B) of 3.993, with a confidence interval of 95%. Thus, when US investors within the energy sector look for a investment location with favorable tax rulings, which involves low corporate taxes, and low costs of doing business, which involves low costs for real estate, or obtaining permits, this positively affects the probability of investing in the Netherlands, above other European countries. We also discovered that, within the limits of this research, other motives, such as the quality of infrastructure and logistics, a qualified labor pool, the presence of knowledge

institutes, or the domestic market did not pose a significant effect on the probability of investing in the Netherlands. How this relates to the findings in Chapter 4, and how this translates to recommendations for an effective investment promotion strategy, will be discussed in the following chapter.

6 ATTRACTING FOREIGN DIRECT INVESTMENT

6.1 Introduction

The previous chapters focused on identifying strengths, weaknesses, opportunities and threats on the investment climate of the Dutch energy sector, and investigating the motives of American firms when they consider investing in the Netherlands. Although these findings are rather explorative in nature, what do they entail for investment promotion policies by the Dutch government? This chapter will build upon the insights of the results in the previous chapters and will answer the third sub question of this study: *How can the Dutch government effectively attract new renewable energy investments from the United States?*

First, we will define unique selling points (USP's) of the Dutch Energy Key sector for American firms, based on the SWOT analysis in Chapter 4. Secondly, we zoom in to results of Chapter 5, by providing the significant motives of US companies investing in the Netherlands. Thirdly, we will see how these findings contradict or complement each other, and finally we will give recommendations on how to incorporate these results in a successful a investment promotion strategy for the Dutch government, by zooming into the Energy Key sector's internationalization agenda, and the policy framework of Dutch investment promotion agencies, including NFIA.

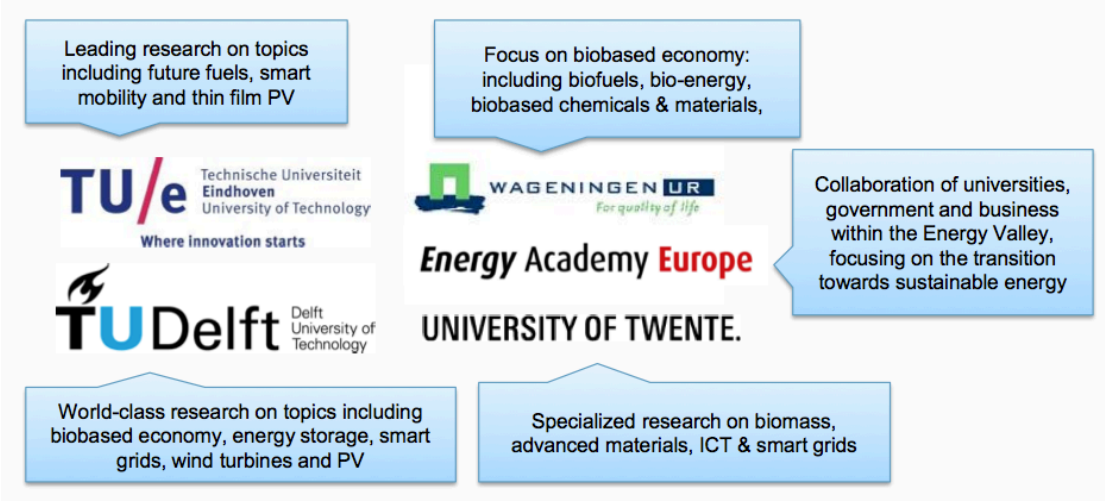
6.2 Learning from the results

Based on the different SWOT analyses that have been made in Chapter 4, we distinguished several strengths within the different renewable energy domains of the Energy sector in the Netherlands, wind, solar power, bio-energy and smart grids technology. Based on these results, which are the most important USP's of the Dutch Energy Key sector?

USP's of the Dutch energy sector: Innovation, location & costs

- We observed that the knowledge and expertise of Dutch research institutes (e.g. Energy Centre of the Netherlands, TNO) institutes of higher education (e.g. Delft University of Technology, Wageningen University and Twente University) and businesses (e.g. DNV KEMA) have a prominent role, with leading fundamental research and R&D.
- When it comes to smart energy innovation, the different Smart Grid projects, form a unique selling point. The Smart City project in Amsterdam, the Powermatching City in Hoogkerk; the Smart Energy Collective, are unique projects and can be used as a unique selling point in investment promotion.

Figure 6.1 Overview of cleantech & renewable energy research topics within different institutes of higher education. Image source: Author

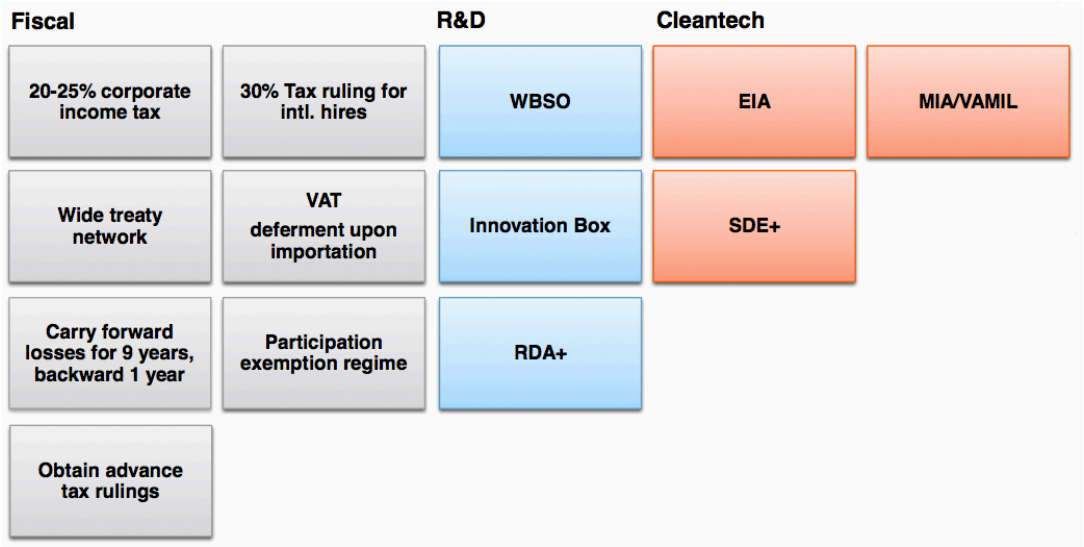


- The favorable location of the Netherlands. Its proximity between large players within renewables, Germany and the United Kingdom, provides businesses a central location

between large markets. This has been made clear with the Dutch offshore industry that serves German and British offshore wind farm developments.

- The size and location of the Dutch seaports (namely the ports of Amsterdam, Rotterdam, Eemshaven and IJmuiden) provide an important factor condition for both the wind power, biomass and biofuels markets.
- Tax rulings for businesses are still a major pull factor for foreign firms, and give the Dutch investment climate a competitive position, when looking at costs for doing business. Figure 6.2 provides an overview of different rulings, such as low corporate tax rates and tax rulings for expatriates. In addition, there are tax deductions for businesses that conduct activities within the realm of energy efficiency and energy generation, such as the EIA and MIA/VAMIL tax deduction. (KPMG, 2012; Bloomberg, 2012; Belastingdienst, 2012).

Figure 6.2 An overview of tax rulings for foreign firms in cleantech & renewable energy. Image source: Author



When looking at the defined USP's, we observe a large emphasis on knowledge, expertise and innovation. This is best manifested through the different research institutes and innovative projects, such as the smart city projects in Hoogkerk and Amsterdam. Also, the central location

of the Netherlands, together with its logistic facilities seem to form a major asset. Finally, last but not least, tax rulings for businesses still form a major, cross-sectorial, asset for the Dutch investment climate.

In order to move towards recommendations for investment promotion strategy, we will find out how these findings relate to the findings for the second part of this study. After making an inventory of the 'supply' side of the Dutch investment climate, based on the perception of literature and experts in the field, we want to see based on which motives American firms choose for the Netherlands as a location for their investment.

Tax rulings provide a significant influence on FDI inflows

In Chapter 5 we analyzed if certain motives of US investors carried significant influence on the decision for investing in the Netherlands, or another European country. By conducting a binomial regression analysis, we came to the following results:

- With a confidence level of 95%, we can assert that when American firms within the Energy sector have tax-driven motives, this positively increases the probability of investing in the Netherlands, over other European countries. In other words, we know that if companies look for a location that has a beneficial tax regime, including low corporate taxes, or other forms of competitive business costs, such as those for obtaining permits, this increased the probability of choosing for the Netherlands.
- Nonetheless, in this research, the other motives *Labor Pool*, *Infrastructure & Logistics*, *Incentives*, *Market* and *Knowledge & Expertise*, did not prove to have a significant influence on the probability of investing in the Netherlands.

Interpretation of the results

IPA's, experts and literature point out that the strength of the Dutch investment climate for renewable energy firms lies in factors, such as the research & innovation, logistic facilities, and

tax & business costs. Remarkably, we discover that in this study, the only significant motive of a US firm for investing in the Netherlands is related to the fiscal tax regime. Other factors, related to e.g. the labor pool, logistic facilities, can also play a significant role for foreign investors. Nonetheless, our regression model does not show a significant influence from these variables. How should we interpret this?

An interesting fact is that scholars argue that investment promotion agencies started focus more on FDI promotion through a more 'qualitative' approach. This is manifested in the shifting focus of investment promotion agencies (IPA's) on after-care and providing assistance to the development of existing MNC subsidiaries, together with fostering human resources, and focusing on policies related to intellectual property, competition, innovation policy, etcetera (Guimón & Filippov, 2012). In a way this *a race to the top*, based on competition in asset creation, as opposed to the classical *race to the bottom*, which is based on lower costs and taxes. (Basinger & Hallerberg, 2004). However, on the contrary, this paper might give a hint towards the fact that favorable taxation and low costs of doing business still form a major driver for foreign businesses in their investment decision. Thus, in order to increase the success rate of attracting new renewable energy investments from the US, the Dutch government should pursue a comprehensive strategy that combines both directions:

1. Continue the *race to the bottom*, by focusing on the continuation of providing favorable tax regimes, and communicating this through promotional activities of the Dutch investment promotion agency: NFIA.
2. In addition, choose for the *race to the top*, by targeted communication of USP's of the Dutch renewable energy sector in investment promotion activities. This may result in drawing FDI projects that carry out high-profile, research-intensive activities, and specifically rely on e.g. the availability of the specialized research institutes, in contrast to businesses that merely focus on a favorable fiscal regime.

Thus, contrary to the popular view that governments need to make a choice between these two directions, policymakers could also integrate these into one comprehensive strategy: Seeing that, we could, instead of juxtaposing these directions (focus on the promotion of favorable tax rulings *or* the promotion of competitive assets,) also view these as being complementary: Promote fiscal, and cost-reducing benefits, as well as relevant, competitive assets. This should form the base of the investment promotion strategy of the Netherlands for the case of US renewable energy firms. How does this translate into concrete policy recommendations? We will discuss this in the following section.

6.3 Policy recommendations

In the case of the Energy Key sector policies and NFIA, which focal points should be addressed in order to achieve successful promotion of the Dutch investment climate towards US renewable energy firms? Based on the outcomes of this study, literature review on the Energy Key sector policies, and enhanced with personal observations at NFIA in The Hague and Boston, policy recommendations are formulated. First, we will discuss recommendations for the Energy Key Sector. Secondly, we will discuss recommendations for investment promotion agencies (IPAs), including NFIA, regional development agencies, and local actors.

Recommendations for the Energy Key Sector

In April 2012, the policymakers from the Energy Key sector formulated a so-called internationalisation offensive (Dutch: *internationaliseringsoffensief*) for the Energy Key sector. This document contained several action points on maximizing the benefits of international trade for the sector. It forms the key document for government plans on internationalisation of this industry, but also for the other actors that are involved in the industrial policy (namely business and research institutes). The main focus of the document lies on technological cooperation (namely for R&D institutes, including ECN) and export (helping Dutch businesses

by working on export regulation to other European member states). Although this is a first start, several key components should be added in the current strategy:

- Include a strategy for FDI promotion for renewable energy sectors in the Energy Key Sector's internationalisation agenda. As the document states: 'strategic acquisition has been documented very little in this internationalisation offensive.' (Topsector Energie, 2012a, p. 28). Only for the bio-energy and offshore wind domains, the national government (namely the Ministry of Economic Affairs) showed targeted efforts towards attracting inward FDI. Nonetheless, the document stresses the added value of establishing a comprehensive strategy for strategic acquisition: 'Since shorter distances between business partners will quicker lead to better innovations, it is desirable that these partners will conduct a part of their activities in the Netherlands. Not only will this increase the position of the Netherlands, it will also enlarge the GDP and possibly generate additional employment' (Topsector Energie, 2012a, p.29). Including a comprehensive FDI promotion strategy is therefore key to attract new investments.

- Create a domestic market, by increasing investments by the national government in promising technologies, as a catalyst for market growth. One of the major weaknesses in the SWOT analyses in Chapter 4, was the lack of a domestic market in the Netherlands, which possibly discourages foreign investors. Although the Netherlands has a competitive position on research and innovation for wind power and solar photovoltaics, the markets for these technologies are more competitive in the Germany or the United Kingdom. In order to increase market size, governments should invest in the current technologies for renewable energy generation, in order to decrease price and enlarge their market. However, the Dutch government seems to be betting on the 'newest' technologies, before previous ones have become profitable. This will never create a larger market. Other investors stay out, as the technology has become obsolete too quickly. Hekkert (2012, p.53) sees this as a major pitfall in the solar

industry: 'There will always be a new 'second generation' solar cell that is currently in development, which will cost much less. But because of this argumentation, the introduction of the 'first generation' solar cell has been supported very little, and investments have primarily gone to research for new generations.'

- Increase size and attractiveness of the Dutch market by a renewed focus on climate change policy by the national government. Regain position in national rankings on climate change policy. In the 2012 ranking of the Climate Change Performance Index, the Netherlands ranked 49th, far below Belgium (13th) or Germany (6th) (Germanwatch, 2012, p.6). The report measures efforts national governments undertake in order to contend against climate change. This point complements the previous statement, as an ambitious vision and measures by the national government, also creates a larger market, as seen in Germany.

In the abovementioned recommendations we observe that a large gap can be filled by creating a comprehensive strategy for attracting FDI in renewable energy by policymakers from the Energy Key Sector. Moreover, we observe that one of the observed weaknesses in the SWOT analyses in Chapter 4, the lack of a domestic market, needs to be overcome, in order to successfully draw new investments. Measures that will lead to a larger market, are increasing the market through targeted investments, and an ambitious vision on battling climate change.

Recommendations for NFIA, regional and local IPAs

Image, brand awareness, and perceptions are major factors that influence the location of FDI. Companies make investment location decisions on the basis of their information pool and understanding of an area's location advantages. The role of Investment Promotion Agencies (IPAs), such as NFIA, seems to be essential when it comes to attracting FDI (Loewendahl, 2001). Wells & Wint (2000) found out that the net present value of investment promotion

seemed to be almost $4 for every $1 expended. Investment promotion seems to be specifically effective when overcame information asymmetries, compensated for the imperfect functioning of international markets, and led to product differentiation of the host country as a location for targeted activities. Nonetheless, how do the findings of this study translate into recommendations for effective investment promotion policy for NFIA?

- Build investment promotion strategies, targeted at the US renewable energy sector, upon reasoned objectives. These objectives are set and agreed upon by all the major stakeholders and underpinned by a thorough analysis of the country's competitive position (Loewendahl, 2001). This research aimed to give a first start on this analysis, by presenting SWOT analyses and USPs that define the Dutch investment climate for renewable energy firms. As mentioned in the previous section, these USPs should be both asset-based (competitive position on research and innovation, location and logistic facilities) as cost-based (fiscal rulings).
- Combine lead generation with focused marketing efforts, in order to acquire new investors and establish long-term relationships with target investors in key sectors. These marketing efforts are based on the USP's that are most relevant for the targeted firm.
- Forge effective coordination between industrial policy (the Energy Key sector) and investment promotion, at both national (through the NFIA) and regional levels (regional governments and relevant business organizations, such as Stichting KiEMT, Energy Valley, Brainport Development and Amsterdam Smart City) is essential, in order to maximize efficiency of investment promotion and fence off possible confusion. For instance, when NFIA and regional development authorities target the same sector or businesss, without coordination, this is not efficient and can work out negatively towards the (potential) investor. On the other hand, effective coordination between these actors can create synergetic effects: For instance, US technology firms that

operate in the smart grids sector, can be targeted through promotional activities by NFIA offices in the US, which specifically highlight relevant USPs (e.g. the Amsterdam Smart City project, or the Powermatching City project in Hoogkerk). To obtain additional market intelligence, involve relevant regional actors in the Netherlands (in this case, Amsterdam inbusiness, NOM and Energy Valley), and key players in the private sector (e.g. DNV KEMA).

- Include after-care and investor development activities as major components of invesetment promotion, in order to maximize the long-term benefits from inward investment, including highly skilled employment and trickle-down effects on the (regional) economy.

Consequently, these recommendations also imply that in order to achieve a successful investment promotion strategy, NFIA need to have a significant degree of autonomy and sufficient resources are therefore necessary. It will need to contain good links with local and regional governments, private sector actors and have a direct influence in national policy-making. Moreover, the organization of the relationship between the national IPA (the Netherlands Foreign Investment Agency) and regional IPA's (e.g. NOM, NHN, BOM or OOST NV) needs to be clearly defined. And finally, as mentioned before, NFIA needs to adhere to its coordinating role for promotional efforts, in order to prevent local municipalities or regions to 'compete' amongst each other on the same potential investor. This is especially vital in an environment with increasing competition for FDI inflows, where regional competition may negatively influence information provision and brand awareness of the Dutch investment climate.

Thus, in order to effectively attract FDI from the US in renewable energy, several aspects of the Key sector industrial policy, as well as the approach by IPAs, need to be adjusted. As discussed in this section, efforts need to be made on strengthening the internationalisation agenda for

the Energy Key sector, enlarging the domestic market, as well as establishing a clear strategy for investment promotion agencies. Also, recent reports, including the 2012 results of the Climate Change Performance Index, also proves that the Netherlands seriously lacks behind on serious efforts on renewable energy. This shows a lot needs to be done on this aspect.

7 CONCLUSION & DISCUSSION

The aim of this mixed methods study was to investigate how to attract new investments in renewable energy from the US to the Netherlands. The research was set up in three phases, in order to provide a comprehensive overview of the Dutch investment climate for renewable energy firms in the United States, and how to attract new FDI.

In the first part, a qualitative study was set up, in order to conduct several SWOT analyses of the investment climate of the Dutch Energy Key sector. In this part of the research, we focused on the four major domains within the renewable energy sphere: solar PV, wind power, bio-energy and smart grid. Within this analyses, we observed that the knowledge and expertise of Dutch research institutes, and business have a prominent role, with leading fundamental research, R&D and innovative projects. Another common denominator is the favorable location of the Netherlands. The proximity to large markets (Germany and the United Kingdom) as well as the logistic facilities, namely seaports, are a considerable asset. Finally, we observed within the different sub sectors, that incentives for renewables are not necessarily attractive, but fiscal rulings in general prove to be a real asset.

The second part consisted of a logistic regression analysis. It examined the process of FDI inflows from the firm perspective, by investigating if there were any motives that significantly influenced the probability that the US firm invested in the Netherlands. We used a dataset, which consisted of 129 cases. We discovered that, with a confidence interval of 95%, the underlying motive for favorable costs for doing business and competitive fiscal rulings had a significant positive influence on the probability of investing in the Netherlands. Thus, when US investors within the energy sector look for a investment location with favorable tax rulings, which involves low corporate taxes, and low costs of doing business, which involves low costs for real estate, or obtaining permits, this positively affects the probability of investing in the Netherlands, above other European countries.

In the third part, the results from the SWOT analyses and regression analysis were compared, in order to provide recommendations on how to effectively draw new FDI in renewable energy from the U.S. to the Netherlands. It turned out that there was a gap between the perception of Dutch key opinion leaders, such as RDA managers, and the actual drivers that American businesses were concerned with when they invested in the Netherlands: Whereas Dutch investment promotion for renewable energy was largely focused on the quality of research institutes, labor pool and its logistic facilities, investors seemed to be mainly influenced by financial motives.

Based on these observations, the following policy recommendations are made for industrial policy on the Energy Key sector, as well as for NFIA and other IPA's: First of all, in order to actively promote the competitive advantages of the investment climate of the Energy Key sector, a thorough assessment needs to be made of its assets for U.S. investors. The current internationalization agenda for the sector recognizes the benefits of drawing new FDI, especially investments with high research intensity, but it does yet lack a clear strategy for this 'strategic acquisition.' This study already gave a first start, by providing SWOT analyses for the four primary sub sectors for renewables. These assessments give a clear image of USP's, which can be communicated to potential investors.

Moreover, IPA's have a prominent role in attracting new FDI. They have the role to actively promote, and change perceptions, of the Dutch renewable energy sectors. This works most effectively when IPA's coordinate their efforts effectively, with a leading role for NFIA, and RDA's and municipalities as specialists for the different sub sectors.

Finally, the major weakness of the Dutch investment climate is the lack of a domestic market, especially compared to Germany and the United Kingdom. Government should first and foremost work on enlarging the share of renewables in the Dutch energy mix, in order to attract new firms. Not only does a small market make it more difficult to draw new inward

investments, it also reveals a moral discrepancy: the Dutch government showed too little efforts in actively implementing an ambitious sustainability agenda. Not only is this a missed opportunity for the industry to take a leading role in fighting climate change, and create a larger market, it might also be perceived as an insufficient amount of moral responsibility on securing a solid vision on sustainability and fighting climate change.

Discussion and suggestions for further research

In conclusion, this mixed methods study had an explorative character and provided a comprehensive overview of the Dutch investment climate for U.S. renewables. It provided a unique view on the investment climate of the Energy key sector, by providing both a view of key opinion leaders, as well as a quantitative study on investment decisions by American firms. Nonetheless, it provided only a snapshot on a very broadly defined, dynamic, and complicated subject:

First of all, regarding the general validity of this research, we could question the value of the outcomes, if we consider that the majority of FDI is conducted through mergers and acquisitions by foreign firms. This study, however, only handled greenfield investments, i.e. the establishment of a subsidiary, which might have different underlying motives than the acquisition of a foreign firm. Also, the dataset that has been used contains data that was given to NFIA by potential foreign investors. There is a possibility that other motives have played a role, but that these have not been communicated by the firm to NFIA, or have not been documented properly. Also the projects that were used, in order to obtain sufficient cases, were dated between 2007-2012. Between these years a lot has changed in the global economy, within the renewable energy industry, and on renewable energy policy in the Netherlands, the European Union and the United States. This might have influenced the outcomes too. Finally, the strength of the significant predictors in the logistic regression

model, displayed that other variables played a possibly larger role in the investment decision, but were unable to find in the available dataset.

Secondly, the research subject 'renewable energy sector' was rather broadly defined, as the renewable energy industry covers a wide range of sectors and industries. Although we minimized the focus towards four key industries, they have a very different character, as they are all covered by different firms, suppliers and related industries. Therefore, further research may address what the competitive position is of the individual sectors, such as the growing Dutch offshore wind power industry, or the variety of innovative smart grid projects. This will fill in the gap that policymakers recognize in the Energy Key sector, which is the lack of a detailed assessment of the strengths and assets of the different sub industries for renewables, in order to draw new investments.

Thirdly, this observation also raises a question about the assessment of the Energy Key sector in this research. For American firms that are involved in smart grid, and/or energy management software solutions, an assessment of other Key Sectors, such as High Tech Systems & ICT might be very relevant too. The same holds for bioenergy businesses. For them, a thorough investigation of both the Logistics, and Agrofood sectors is relevant. Further research could focus on a thorough investigation on each of these sectors. They can provide for the possibility to pinpoint true assets of the Dutch investment climate within these sectors, and give new, detailed insights, which can be used effectively for investment promotion for businesses that operate on the verge of renewable energy, e.g. energy management software, or biomass conversion.

Nonetheless, this research aimed to provide a first glimpse on the dynamics between the growing renewable energy industry in the United States and the opportunities it could provide for the Netherlands, within the emerging energy transition towards a sustainable future. ★

GLOSSARY

Bioenergy is renewable energy made available from materials derived from biological sources.

Biofuel is a type of fuel whose energy is derived from biological carbon fixation. Biofuels include fuels derived from biomass conversion, as well as solid biomass, liquid fuels and various biogases.

Biomass is any organic material that has stored sunlight in the form of chemical energy. As a fuel it may include wood, wood waste, straw, manure, sugarcane, and many other byproducts from a variety of agricultural processes.

Foreign direct investment (FDI) is direct investment into production in a country by a company in another country, either by buying a company in the target country or by expanding operations of an existing business in that country.

Investment promotion agency (IPA) is most often a government agency (or occasionally a non-profit organization functioning similar to a chamber of commerce) whose mission is to attract investment to a country, state, region or city.

Key Sectors (Dutch: *Topsectoren*) are industrial sectors, defined by the Dutch government, in which the Netherlands carries a strong market position, and for which specific economic and industrial policies are formulated.

Netherlands Foreign Investment Agency (NFIA) is the Investment promotion agency for the Netherlands. NFIA is an operational unit of the Dutch Ministry of Economic Affairs.

Regional development agency (RDA) is a non-departmental public body established for the purpose of the development, primarily economic, of a city or region.

Solar photovoltaics (PV) is the technology that uses solar panels to convert sunlight into electricity.

Smart Grid is an electrical grid that uses information and communications technology to gather and act on information, such as information about the behaviors of suppliers and consumers, in an automated fashion to improve the efficiency, reliability, economics, and sustainability of the production and distribution of electricity.

Wind Power is the conversion of wind energy into a useful form of energy, such as using wind turbines to make electrical power.

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