Market study:
Wind energy in Brazil

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Executive summary

Brazil has one of the cleanest energy matrices in the world, mainly hydro power. Brazil can be considered the most promising market for wind energy in Latin America, with an estimated wind potential of 300GW and energy demand expected to increase by 2GW per year until 2020. Moreover, wind conditions are characterized as strong and stable. The government supports the development of the wind energy sector and has introduced renewable energy auctions in 2009, which have been leading to the development of a large number (142) onshore wind farms. The focus in the Brazilian wind energy sector is onshore, due to lower cost and land availability. Sector specialists do not foresee a future for offshore wind energy in Brazil within the next 10 to 20 years.

The Brazilian government is strongly in favour of clean energy sources and a keen supporter of wind energy. It has set a clear regulatory framework with favourable tax incentives for both local and international players. Regular auctions for new capacity offer mid- and long-term contracts ahead of delivery. The state owned development bank BNDES is the biggest contributor to the financing of wind farms and offers favourable credits. In order to apply for these credits, parties do need to meet strict local content requirements. To protect Brazil's local market, the government is obligating turbine manufactures to increasingly source, produce or assemble components locally. These obligations have accelerated the market entrance of foreign players, either by setting up a local facility, strategic alliance, joint venture or via acquisitions. Currently, players from all over the world are active and a competitive market is developing.

While favourable conditions exist, Brazil also faces challenges in the wind energy sector; the country's supply chain is not yet optimized, there is a poor infrastructure (grid connection and logistical issues), lack of qualified and trained labour and overall high project costs. Brazil's onshore wind energy sector is still in an early phase of development and in need of expertise in the field of operation and maintenance of wind farms (big and small), an improved energy infrastructure (connection to the grid), a variety of turbines (big and smaller ones for rural areas) and overall technical knowledge (R&D) in each market area.

The Netherlands has the experience, knowledge and technology to assist Brazil in developing their wind energy industry. The biggest opportunities for Dutch parties in Brazil lie in the field of R&D, Design & Engineering and Operation & Maintenance. For Dutch players, who have competitive advantages due to specific technologies and knowledge in these fields, Brazil could be of interest. Unfortunately the Dutch wind sector has more to offer for offshore wind which is not yet applicable for Brazil.

Players who would like to enter the market should be aware of protectionism, bureaucracy and a complex regulatory framework. Besides, a thought through market entry strategy should be applied. The Dutch government could assist via economic diplomacy and has a variety of instruments (subsidies) available for Brazil.

1. Introduction

On behalf of the Ministry of Economic Affairs of The Netherlands, represented by RVO, Larive International has executed this market study together with Transfer Latin Consultancy.

This market study explores the possibilities of collaboration between The Netherlands and Brazil with regards to the areas of both onshore and offshore wind energy. Concrete recommendations will be given to exploit the identified opportunities and to advise how the Dutch government can be involved to support the industry.

Brazil has one of the cleanest energy matrices in the world: approximately 45% of the overall energy production originates from renewable sources, mainly hydropower. During the past five years the government has shifted its focus towards three other renewable resources for large scale electricity generation: wind power, small hydro and biomass. Wind power is the fastest growing source of power generation in Brazil, with a market potential of 300GW. Since 2009, when the government took a series of incentive measures to introduce wind power into the energy matrix, the energy auctions have already contracted about 6.7GW of installed power. Moreover, energy demand is expected to increase by 2GW per year until 2020.

Since the 1980s, The Netherlands, Denmark and Germany were the European frontrunners in technical development of wind energy. These countries have been working together for decades within the framework of national and European programs, which has resulted in a successful manufacturing industry in both Denmark and Germany. The Netherlands is no longer a world leading manufacturer of wind energy equipment, but Dutch parties still have extensive knowledge in the field of wind energy.

This market research comprises the following:

- Relevant developments in Brazil in the field of wind energy, including policy developments;
- Description of strengths and weaknesses of the wind energy sector in both Brazil and The Netherlands;
- A detailed overview of relevant stakeholders and companies in Brazil;
- Opportunities and threats, in general terms, for bilateral cooperation with Brazil;
- Business needs in Brazil and related opportunities for Dutch parties;
- Advice for the Dutch government regarding their role as a facilitator.

Desk and field research have been conducted in both The Netherlands and Brazil, but the main part of the research was conducted in Brazil. Interviews have been held with representatives of companies and branch organizations as well as with government officials, an overview of the interviewees in Brazil can be found in appendix A.

2. Wind energy sector in Brazil

2.1 Market overview

Renewable energy

Brazil has one of the cleanest energy matrices in the world; approximately 45% of the overall energy production originates from renewable sources, compared to the worldwide average of 19%. The success of renewable energy in Brazil can be mainly attributed to the development of hydroelectric plants, geographical advantage and to foreign dependency avoidance (especially by the military government from 1964 to 1980) and as a response to the oil crisis of 1979. The subsequent governments have increased the country's independence in energy as a sovereignty asset, which recently achieved its peak with vast oil reserves discovered off the coast of Rio de Janeiro and São Paulo.

More than 80% of the electricity generation installed capacity in the country is linked to sustainable sources. With 158 hydro plants operating in the country, the fundamental energy model of Brazil has long been based around hydroelectric power. Today, 70% of Brazil's renewable electricity still comes from hydro sources, such as the Itaipu Dam, a hydroelectric dam on the Paraná River.

The development of new hydro plants can be difficult due to geographical circumstances and strict environmental regulations, therefore the government has shifted its focus towards three other renewable resources for electricity generation: wind power, small hydro and biomass (PWC, 2013). Moreover, there are various environmental concerns about the preservation of the Amazon forest and the dislocation of communities associated with hydropower. In this way, Brazil tries to diversify electricity production away from hydropower.

The Brazilian government plays an important role in the stimulation and development of renewable energy. In 2004, PROINFA was launched, a program to stimulate the development of renewable sources. In the summer of 2013, during protests, the government again emphasized the importance of the energy sector and promised to increase the role of renewable energy sources significantly over the next seven years. The first objective is to produce nearly 70% of its energy from renewable sources by 2020. The second objective is to reach 16GW of installed wind capacity by 2021 (approximately 9% of the national electricity demand), to be generated by onshore wind farms.

Wind energy

Brazil is the second fastest growing wind market in the world, driven by favourable wind resources, a governmental auction (tender) system and sound financing schemes by BNDES, the Brazilian state owned development bank

(Americas Quarterly, 2013). Behind Brazil follow Mexico, Argentina and Chile. A comparison is presented in figure 2.1.

Within Latin America, Brazil can be considered the most promising market for wind energy in terms of regulations and experiences with an estimated potential of 300GW onshore.

Figure 2.1. Total MW wind capacity including pipeline projects
Source: Windpower Intelligence (2013)

As mentioned the start of the Brazilian wind energy market was originated by PROINFA (2004), a subsidy driven incentive, which resulted in approximately 1GW of onshore wind farms (mostly along the coast). In 2009, contract auctions became part of the renewable energy policy, which increased competition and developed the sector.

Regular auctions offer mid- and long-term contracts ahead of delivery, in an exclusive tender for new capacity. These auctions are focused on renewable energy (wind, hydro or biomass), and they present demand for a certain amount of energy in certain areas of the country. The auctions are divided by the period in which the wind farm must be able to generate electricity, which can be either 3 or 5 years, hence the auctions are called A-3 or A-5. Prior to this date, no Dutch player has acquired a major role in any of the auctions.

The motives for the introduction of auctions are price disclosure, efficiency in the procurement process and reduction of asymmetric information. The auction system has introduced transparency, and strict screening of both the projects and the auction participants, combined with completion guarantees. This has led to a larger number of new projects to be carried out and constructed. For energy contracts to be awarded to wind projects at the auction, the requirements are becoming increasingly demanding, especially in terms of the quality of wind measurements equipment (such as MEASNET calibrated ISO First Class anemometers) and high data recovery rates. These requirements are made in order to improve bankability and reduce the risks of underperformance of future wind farms.

Currently, wind energy constitutes approximately 1.7% of the total electricity production capacity of the country. The large majority of Brazil's 142 wind farms are located in the coastal area in the northeast (Rio Grande do Norte,

Paraíba, Ceará), on the coast of Bahia, and in the southern state of Rio Grande do Sul. There are also other states where wind energy projects are being developed, such as Espírito Santo, Minas Gerais and Rio de Janeiro. An overview of the current number of wind farms per state can be found in figure 2.2 (next page).
Currently, the number of wind turbines and size of wind farms is small compared to international standards. But as the market is concentrating around established developers both turbines and farm size are expected to increase.

The swift development of the wind energy sector created a competitive environment with both local players, such as Renova Energia, as well as international players, such as Alstom (France) and Impsa (Argentina). Most of the international companies active in Brazil have a production facility in order to meet local content requirements (see paragraph 2.2). These facilities currently only produce minimally to meet the requirements, and act mostly as assembly plants. In this way, they are able to rapidly develop their production in the future in response to changing local content legislation.

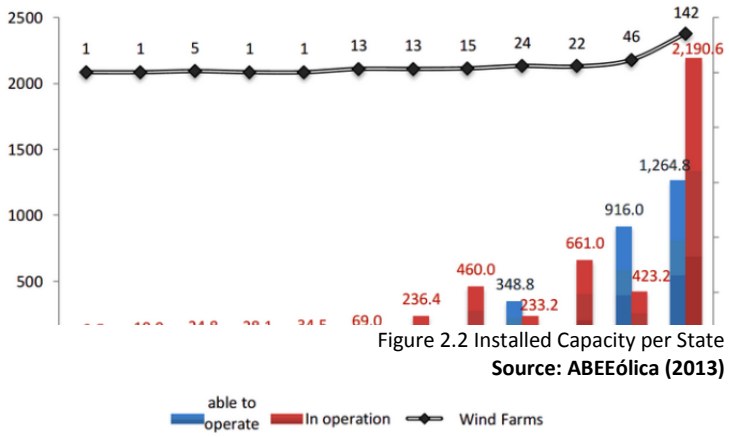

Figure 2.2 Installed Capacity per State
Source: ABEEólica (2013)

Offshore wind energy

In 2008, the first study on offshore wind energy was conducted. The results showed that the south eastern region (more or less from Rio de Janeiro to Porto Alegre) is a promising location for offshore wind energy. There are also several other promising areas for offshore developments. Camargo-Schubert, a leading wind energy consultant, explains however that, as their company has evaluated the offshore resources of Espírito Santo, Bahia and Rio Grande do Sul: “there is simply no reason for Brazil to opt for the more expensive energy soon. Actually, I do not foresee any bright future for offshore wind energy in Brazil in the next 10 to 20 years”. This was indicated, amongst the other interviewees, by Renova Energia. As there are still opportunities for onshore wind through within the supply chain, the remaining part of this report focuses on onshore wind in Brazil.

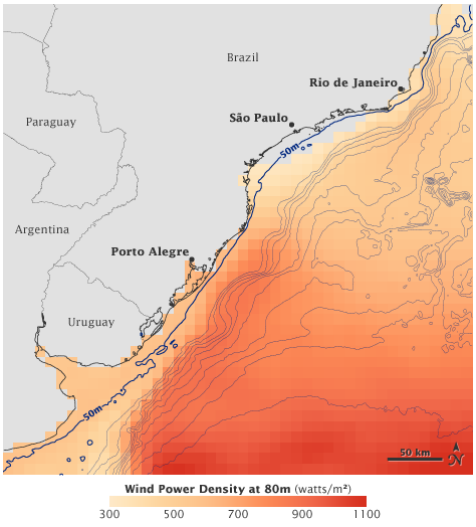

Figure 2.3. The analysis of offshore wind potential by Felipe Pimenta
Source: NASA (2013)

Brazilian Offshore Developments: Asa Branca Maritima

The northeast of Brazil is a promising place for offshore wind energy: it has steady winds, shallow waters without big waves, and a growing electricity demand, mainly from the coastal population. Despite perfect conditions, no offshore installed capacity has been built in Brazilian waters, and developer, Eólica Brasil, is waiting for the final environmental license for its ambitious offshore project, called Asa Branca Marítima. According to Marcello torrer, CEO of Eólica Brasil, there is simply a lack of interest in offshore projects: "A major obstacle standing in the way of Asa Branca Marítima is the Brazilian government's and other onshore wind developers' lack of interest in offshore options, despite its potential to be a much bigger business than anything onshore". Eólica Brasil formed a joint venture with Offshore Wind Power Systems of Texas to install an offshore platform from which it will collect accurate meteorological readings to demonstrate the project's financial viability to potential investors. Storrer is convinced that with the introduction of larger, more productive turbines, offshore wind will become competitive in Brazil. Currently, Storrer expects construction of the first phase of Asa Branca Marítima to start by 2016: "The finance plan is being developed, and we have enough offers to cover all our needs, and we have supplier's commitments to fulfill our (turbines and foundations) needs. However, for this project, we will need installation barges and general port infrastructure. We have all the basics in Brazil, but we lack the cables and all other electric equipment for large (5-6 MW) turbines."

2.2 Government policy

The Brazilian government is strongly in favour of clean energy sources and is a keen supporter of wind energy. Therefore, the regulatory framework for, amongst others, the wind sector is in place and is being promoted to achieve the energy goals set by the government. Programs that are developed to stimulate the use of renewable energy sources, such as wind energy, are (APEX, 2014):

- The Alternative Energy Source Incentive Program, PROINFA, was created in 2004 and was aimed at stimulating the development of wind, biomass and small hydro plant projects in Brazil. It subsidized the higher cost of alternative energy through a levy on consumer electricity bills;
- The Electricity Development for States and Municipalities, called PRODEEM, and the Luz para Todos ("Electricity for All") federal government initiatives encourage the development of alternative energy systems in rural and isolated parts of Brazil;
- Electricity regulator ANEEL has changed the rules to allow independent and individual producers to use renewable generation to connect to the national grid and a net metering Power Compensation System has been introduced to offer credits on energy bills;
- Several credit options from the Brazilian Development Bank (BNDES) are available for companies operating in the renewable energy sector.

Favourable credit is provided by the BNDES and used amongst various parties in the wind industry, such as wind farm developers, and also by third parties to finance machinery and equipment. In order to apply for financing from BNDES, one needs to meet the following requirements (BNDES, 2013):

- Up to date fiscal, tax and social obligations;
- Satisfactory registration;
- Capacity to make payments;
- Enough guarantees to cover the risk of the operation;
- Client cannot be undergoing credit recovery;
- Comply with environmental legislation;
- Comply with legislation related to imports in case of financing imported machinery and equipment.

The last point is a critical issue in the Brazilian wind sector. As mentioned in the previous section, parties need to comply with local content requirements. This forces companies to source most of the components in their turbines locally. From January 2014 onwards, gearbox, generator and DFIG panel applied in turbine models that include a gearbox must be produced locally. For models without a gearbox, at least three of the four main wind turbine elements (towers, blades, nacelles and hubs) must be produced or assembled in Brazil (Cleantech Investor, 2013). These requirements should not be taken lightly; although BNDES created a phased move to local production up to 2016 (appendix E), they stopped offering financing last June (2013) to developers that bought turbines from five companies that were not meeting the requirements, hindering the suppliers' ability to conduct business. The companies who did not comply with these regulations were Acciona, Fuhrlander, Siemens, Suzlon and Vestas. Fuhrlander filed for insolvency in September, and the other companies are catching-up in order to meet the requirements as soon as possible (Bloomberg, 2013).

Apart from the BNDES financing, there are some tax incentives for wind energy firms that are related to import and national taxes. Some regional state governments, such as Rio Grande do Sul, Bahia, Pernambuco, Rio Grande do Norte, Ceará and Piauí, have also developed local tax incentives for investors in wind energy. According to Camargo-Schubert, these incentives are not considered decisive factors for investors. In general, taxes are a cumbersome part of the process for foreign companies entering the Brazilian market, especially regarding the import of goods and services. These tariffs are highly variable though, and as a guideline an overview of taxes, and how they are calculated can be found in appendix F.

Brazil's environmental legislation is an important element for wind energy developers to take into account. It is one of the most complete in the world and is governed by The National Environment System (SISNAMA), which includes local, state and government environment agencies, the National Environment Council (CONAMA) and the Brazilian

Institute of Environment and Renewable Natural Resources (IBAMA). Obtaining environmental licenses in Brazil is a burdensome and complicated process. The Ministry of the Environment is currently in the process of reducing the complexity of environmental licensing proceedings at federal level. Deadlines have been introduced for the Brazilian Institute of Environment and Renewable Natural Resources (the institution in charge of the distribution of environmental licenses) to issue environmental licenses, and there is a time limit to request additional information and/or studies from entrepreneurs in order to complement the environmental licensing proceedings (APEX, 2014).

2.3 Relevant stakeholders

The activities taking place in the Brazilian wind energy stakeholders can generally be divided into ten segments. Each of these segments are facing different challenges, as different parties are involved. Below we will elaborate on each of the segments and present the most important players.

Wind farm development

Energy generation consists of all activities related to the acquisition, design and construction of the actual wind farms.

Main Developers	Origin
CPFL Renovaveis	Brazil
Eletrobras	Brazil
Renova Energia	Brazil
Casa dos Ventos	Brazil
Contour Global	United States

Parts and non-technical components

With the exception of blades, Brazil specializes in supplying low technology components such as towers, castings, transmitters and general electric components to the large international wind turbine manufacturers. A number of parties supplying parts and low technology components are listed below.

Low technology component manufacturers	Country
ABB	Switzerland
Algolix	Brazil
Engebasa	Brazil
PEVEDUTO	Brazil
V & M do Brasil	France

Tower manufacturers

The tower, bearings, and casting have a relevant volume/weight and low technological content, and are thus less technologically sophisticated and can easily be produced locally. Competition in this segment is based on costs, some of the companies supply parts and other non-technological components such as towers. Additionally, some of the international turbine manufacturers manufacture the towers themselves, such as Wobben (Brazilian subsidiary of German company Enercon) and Impsa (Argentina). Note that local content requirements (appendix E) related to towers are very specific. It needs to be built in Brazil and by 2016 at least 60% of the forged materials has to be sourced within the country.

Tower manufacturing plants	Country
Engebasa	Brazil
Intecnial	Brazil
Iraeta	Spain
Piratininga	Brazil
RM Eólica	Spain
Tecnomaq	Brazil

Blades

Brazil mostly produces its own blades, the market is being dominated by a Brazilian company called Tecsis. Tecsis inherited its technological capacity from a previous insertion in the aeronautics sector, as Brazil's EMBRAER is the third largest manufacturer of airplanes. Another Brazilian blade manufacturer is Aeris Energy, which was established by former Tecsis' employees. As it only started operations in 2012, it is a relatively new market player.

Blade Manufacturers	Country
Aeris Energy	Brazil
Tecsis	Brazil

Technologically advanced components

The most technologically advanced parts of the wind turbine are the rotor and blades, gearboxes, electronics controls and generators. Apart from the blades (which are mostly supplied by Tecsis) the large, international turbine manufacturers are producing the majority of these parts themselves. In order to comply with the local content requirements, most of these international companies have established operations in Brazil, so that these parts are produced or assembled locally.

Wind turbine manufacturers

As mentioned before, the large potential of the Brazilian wind energy industry has attracted many international suppliers of wind turbines. A list of large scale turbine manufacturers can be found on the next page.

Turbine Manufacturers	Country
Acciona	Spain
Alstom	France
Gamesa	Spain
Goldwind	China
GE Energy	United States
IMPSA Wind	Argentine
Siemens	Germany
Suzlon Energia Eólica do Brasil	India
Vestas do Brasil Energia Eólica	Denmark
WEG Equipamentos Elétricos	Brazil
Wobben Windpower Indústria e Comércio Ltda.	Germany

Engineering, procurement and construction (EPC)

Construction of wind farms is often done by large construction companies. There are also a few companies of Dutch origin, such as DNV-GL and Mammoet. However, the design and planning is often in the hands of engineering and consultancy companies, offering their services to assure that the farms are well designed and architecturally adequate. The largest construction companies can be found below and an extensive list, including engineering companies, can be found in appendix D.

Construction and Engineering companies	Country
Arteche	Spain
Camargo-Schubert	Brazil
DNV-GL	The Netherlands
Grupo Encalso	Brazil
Mammoet	The Netherlands
Nótus Renováveis	Brazil

Transmission

Brazil plans to extend its local transmission network by an additional 40,000km, a 35% increase in comparison to the current length of the system. The main company participating in the ANEEL auctions regarding transmission expansion is Eletrobrás, the largest local utilities company. Via its subsidiaries, the company is involved in several transmission expansion projects and controls about 70% of all transmission lines.

Transmission companies	Country
Electrosul, Furnas, Electronorte, Chesf (all owned by Eletrobrás)	Brazil
COPEL (Owned by the state of Parana)	Brazil
CEMIG (Owned by the state of Minas Gerais)	Brazil
CTEEP	Brazil
Terna Participacoes	Brazil

Distribution

Public service electricity distribution contracts are granted by tender and define clauses relating to tariffs, regularity, continuity, safety, updating and the quality of the services and supply provided to consumers and network users. Distribution can be arranged through the regulated market (ACR) or through the free market (ACL). In the regulated market distribution companies buy energy for captive consumers through public auctions regulated by ANEEL. Under the free market, electricity is traded between generation concessionaires, independent energy producers, self-producers, trading agents, importers of energy and large consumers (factories, mining sites). Most of the distribution companies are state owned and the most important ones are listed below.

Distribution companies	Country
Cemig (Minas Gerais)	Brazil
Cia Energetica do Rio Grande do Norte (Rio Grande do Norte)	Brazil
Eletropaulo (City of Sao Paulo)	Brazil
CPFL (State of Sao Paulo)	Brazil
Light (Rio de Janeiro)	Brazil

Regulation

The MME (Ministério de Minas e Energia) is the Brazilian government's primary regulator of the power industry, acting as the granting authority on behalf of the Brazilian government. MME is empowered with policymaking, regulatory and supervisory capacity through the National Agency of Electric Energy (ANEEL). ANEEL's primary responsibility has been to regulate and supervise the power industry in Brazil, pursuant to the policies adopted by the MME. Several other institutions are involved in the supply of wind power of which the most important ones are listed below. Regulation in Brazil is notably extensive, however wind energy regulation is less complicated as it focuses on the supply of equipment. For example the local content requirements are very specific about the turbine elements that must be produced in Brazil.

Institutions
ABEEólica (Brazilian Wind Energy Association)
ANEEL (Brazilian Electricity Regulation Agency)
Apine (Brazilian Association for Independent Electric Energy Producers)
BNDES (Brazil's state-owned development bank)
EPE (Brazilian federal energy planning company)

2.4 Remarkable developments

Recent energy auctions

On November 18 2013, an A-3 auction for new power capacity was held. All of the contracts went to wind energy projects, as 39 wind projects were approved, totalling 867MW of capacity with an average price of R$124/MWH. Nearly half of them will be

State	Wind Farms	Capacity (MW)
BA	4	83
CE	4	98
PE	4	120
PI	8	240
RS	19	326.6

Table 2.1. Wind contracts A-3 auction Nov 2013
Source: ABEEólica

located in the southern state of Rio Grande do Sul. Two third of the financing was backed by Electrobras subsidiaries Electrosul and Furnas. The A-3 auction projects need to be established within 3 years (2016) (ABEEólica, 2014).

State	Wind farms	Capacity (MW)
BA	41	1000,8
RN	25	684,7
CE	10	212,6
PI	7	168
RS	10	152
PE	4	120

Table 2.2. Wind contracts A-5 auction Dec 2013
Source: ABEEólica

The 2013 A-5 auction was held approximately a month later, on the 13th of December. The projects under this auction need to be established within 5 years and completed by 2018. Brazilian wind farm developers won contracts to sell energy from 97 planned power projects with 2.3GW, the most ever of any generating technology in a government organized auction (Bloomberg, 2013). The auction ended with an average price of R$109 per MWh.

The strict completion guarantees, combined with sanctions in case of delays, assures that all of these projects will be carried out. In addition, all of the projects are expected to obtain financing from BNDES. The next A-3 energy auction will be held on June 6th, 2014. An overview of all auctions can be found in appendix E

.

Changing government policies/local content requirements

In December 2013, Brazil's development bank increased the local content requirements for wind turbine manufacturers in order to spur its domestic industry. Companies must source a progressively increasing amount of components for their turbines locally, as described in detail in appendix E. From January 2014 onwards, turbine models that incorporate a gearbox must assure that the gearbox, generator and DFIG panel are produced locally. For models without a gearbox, at least three of the four main wind-farm elements (towers, blades, nacelles and hubs) must be produced or assembled in Brazil (Melo, 2013). By 2016 more than 70% of the turbine needs to be produced in Brazil.

According to Steve Sawyer from the Global Wind Energy council, "local content requirements generally drive costs up, interfere with the development of an efficient global supply chain, and often create non-competitive situations in countries where you might only have one or two manufacturers able to supply a critical component needed to meet local content requirements" (EWEA, 2013). This was confirmed in an interview with Camargo-Schubert, who stated that: "the requirements for domestic content are creating bottlenecks in the supply side at this moment, but I strongly believe they will contribute to a more sustainable, established domestic market in the near future."

Increased competition

The auction system has improved transparency in the energy sector, and it also has led to the entrance of new players. The downside of this system is the fact that competition led to commercialization of the energy price below cost price, while the cost price is actually increasing due to bottlenecks in the wind energy supply side. According to data from the National Electric Energy Agency, the sale price of wind energy electricity in Brazil reached R$99.54/MWh in auctions in 2011, 67% below the 2009 price which was around R$148.39/MWh. This price drop reflects the growth in confidence and knowledge around the development and exploitation of wind farms, as they must be developed to respond exclusively to market forces when tendering to auctions, they still need to be financially feasible. Declining prices are favourable for big investors and developers, because they are able to offer lower prices due to economies of scale and hence compete with other electricity generating technologies. During the most recent auctions, prices were on average R$124 and R$109.

Technological developments

Most of Brazil's wind farms are supplied with wind turbines ranging from 1.6MW to 2.0MW; however, the capacity of wind turbines is increasing. In January 2014, Acciona received a large order to supply, operate and maintain 31 wind turbines with a capacity of 3.0MW (Acciona, 2014). The towers are becoming higher, as current heights vary from 80 to 120 meters and rotor diameters range from 48 to 125 meters (The Windpower, 2014).

Grid connection is a technological challenge for Brazil. The cooperation related to planning and connection to the grid between wind farm developers and grid operators should be improved. According to the executive director of APINE, Régis Augusto Vieira Martins, "the separation of the construction of the wind farm and the grid connection has been a very bad unforeseen development that now makes most of the installed wind turbines not a profitable venture". The connection of the wind farms to the grid used to be carried out by large public companies who suffered from bureaucracy. Currently many wind farms are not delivering any power as they are not connected to the grid.

3. Market potential assessment

3.1 SWOT

Strengths

The strength of the Brazilian wind energy sector lies partially in the government's motivation to make wind energy a success. Former Minister of Energy and current president Dilma Rousseff has placed renewable energy high on Brazil's government agenda. The total investment to be made in renewables up to 2020 is estimated at US$ 118.1 billion.

Brazil's wind resources are favourable for power generation and there is sufficient land available. According to Camargo-Schubert, winds as measured in Brazil are ideal for wind turbines; not too strong, not too turbulent, coming from one direction, and blowing at the right height. These winds blow at the coastal areas of Brazil, and with vast canyons that help accelerate these winds to constant 10-12m/s, there is a huge potential for onshore wind energy. These rich wind areas are fortuitously close to energy consumption and favourable grid connection to establish large scale projects. Furthermore, an auction system is in place, which has increased transparency and efficiency within the sector and it has enabled foreign companies to enter the market.

Weaknesses

Although the Brazilian wind energy industry is quite developed, it does have weaknesses. The equipment supply chain is not mature. According to Elbia Melo, Executive Director of ABEEólica: "The industry grows, and so must the supply chain. Unfortunately, this has not followed the fast pace of development, and now the industry has opportunity for suppliers of everything related to these wind generators; from wood, fibers, resins and steel to installation services and control equipment, services and accessories; everything will be needed."

Brazil lacks specialized, qualified, and trained employees in the sector. Members of the Brazilian wind energy association ABEEólica have been in discussion with the government to set up a nationwide training program (Windpower Monthly, 2013). Technical knowledge is currently brought in via the international turbine manufacturers. The local content requirements make sure that in the years to come, Brazil will have (part of) the necessary technical knowledge.

The country's poor infrastructure sometimes makes it difficult to connect to the grid (especially in rural areas), and can also make the transportation of blades and other big components a hurdle. According to the CEO of Tecsis, "It takes 12 days to take blades from São Paulo to Bahia in the north-east (a distance just under 2000km). Last year we developed a new truck to carry two blades at a time, and we are now trying to develop one that carries three" (Windpower Monthly, 2013).

The costs for wind energy projects are still high, as 75% of the cost of a wind energy project comes from investments in equipment. The average investment value in Brazil, including the turbines and the infrastructure, was estimated at R$4.2 million per installed MW in 2011 (Garbe, Mello, Tomaselli, 2011). Grid connection difficulties also have a negative influence on costs (according to APINE).

Opportunities

New onshore wind projects (big and small in size) in Brazil will continue to be developed in order to fulfil the growing energy demand. With a growing energy demand of 2GW per year until 2020 and a potential of 300GW there is a lot to be developed.

As Brazil has a lack of knowledge and research and development regarding wind energy in the country this offers opportunities for international players. The government's motivation to make wind energy a success, and the favourable governmental project finance (via BNDES) makes it an interesting market.

Threats

The auction system, which is labelled as a strength can also be seen as a threat, as the prices of wind energy in Brazil have been forced down (below the cost price) due to competition.

Poor coordination and communication of wind farm developers and grid operators slows down projects. In order to solve these problems, new projects will be responsible for their own transmission connection, which is expected to drive up the overall cost by approximately 10 per cent (Americas Quarterly, 2013).

The local content requirements pose a threat, as they make it harder for companies to comply with the BNDES financing requirements. However, as was indicated by Camargo-Schubert, "the requirements for national content are a weakness at this phase but will probably become a strength when the supply chain is fully established".
At last, regulations and obtaining environmental licences can be complex and are subject to change.

Strengths	**Weaknesses**
✓ Wind energy as an important sector for the government ✓ Good onshore wind resources and sufficient land available ✓ Transparent auction system	✓ Supply chain not yet optimized ✓ Poor infrastructure ✓ Lack of qualified, specialized and trained people ✓ Project costs
Opportunities	**Threats**
✓ Estimated wind potential (300GW) ✓ Development of small and big projects ✓ Need for R&D ✓ Favourable governmental project financing	✓ Auction system increases competition ✓ Poor coordination and communication between wind energy developers and grid operators ✓ Local content requirements ✓ Regulation and obtaining environmental licences

3.2 Business needs in Brazil

Following previous chapters, it can be concluded that (international) developers, manufacturers and service providers have been keen to explore the opportunities in the Brazilian wind energy market. However, as can be deducted from the SWOT analysis, most of the sector can still be improved and challenges need to be dealt with in order to spur the industry in Brazil. To identify and verify the needs of the Brazilian onshore wind energy industry, several interviews have been conducted.

Due to the financial crisis in Europe and North America international players started to explore Brazil. As sales volumes and profits in the northern hemisphere declined, turbine manufacturers shifted their focus to emerging markets such as Brazil, which gave Brazil the opportunity to quickly develop its initial wind energy potential.

The biggest opportunities are as follows:

Operation and Maintenance

as wind farms are definitely not experimental anymore and are becoming larger, the main challenge is to run them as smoothly as possible in order to produce the energy at the price level of the A-3 and A-5 auctions. This will require trained management and staff and new technologies.

Infrastructure

Transmission and connection to the (smart) grid. The most recent auction has changed regulations as developers are now also responsible for connection to the grid. There will be a need for knowledge and experience.

Wind turbine design

Both turbines specifically developed for the stable and windy Brazilian climate, as well as smaller turbines for rural areas, are expected to be in demand in the near future.

Supply of equipment

As the wind energy market will grow tremendously there will be a need for equipment supply.

According to the majority of the interviewed parties, the most important opportunity concerns the operation and maintenance (O&M) of wind farms. It was pointed out that the knowledge and technical expertise related to operational aspects of wind farms are not available locally – a large number of experienced staff is needed within the next couple of years. Specifically experience with operation and maintenance, condition monitoring, wind turbine and wind farm performance is needed, claims Camargo-Schubert. This was also confirmed by ABEEólica, who stated that, “Brazil’s biggest challenge will be the operation and maintenance of wind farms”.

The overall need to improve the energy infrastructure through technological innovation is a second opportunity. An example is the connection of the wind farms to the grid. Grid connection used to be done separately by public companies that suffered from bureaucracy, but now instead need to be taken care of by the wind farm developers. According to APINE, this is a good development for the wind energy sector in Brazil.

There is a particular need for the development of systems and equipment specifically designed for the Brazilian climate, which is characterized by stronger (not too strong) and more stable winds. These systems and equipment include cost-effective blades, turbines and metal parts. This was confirmed by Talvani Nolasco from CPFL: “We do not have the best technology in the world. Apart from a few exceptions, most of the available equipment is second to the last generation that has been adapted.” This, in turn, leads to an industry needing more high technology components, such as generators, automation and monitoring systems, as well as high tech inverters and converters.

Together with the introduction of the net metering system in April 2012 (which offers credits on electricity bills for micro and small plants and individual use), several small companies are investing in services and technology for micro wind farms, operated by small businesses and farmers at isolated locations. Smaller, less expensive systems will be required, together with lead and nickel batteries to support these systems.

Moreover, Renova Energia indicated that there is a lack of knowledge and research and development regarding wind energy in the country. This statement is supported by Sergio Souza from General Electrics – with more data available and new technology required, he considers this an opportunity: “We are currently building one of our largest R&D facilities in the world in Rio de Janeiro. It is meant for all our core areas and includes wind energy as well. We are putting high hopes in Brazil for wind energy development.”

4. Wind energy sector in The Netherlands

4.1 Market overview

Onshore market

Since the 1970s several national research programs for the development of wind energy in The Netherlands were executed with funds of the Ministry of Economic Affairs. The emphasis of these programs was on research and the goal to support R&D of wind energy and (large) turbines. Later on the Dutch government also stimulated turbine buyers in the form of investment subsidies and a more practical oriented program called TWIN (1996).

The main focus in The Netherlands was still on research and development of large, cost efficient turbines. Looking back it turns out that Dutch policy on wind energy was not very successful in realizing its capacity targets and building a strong international competitive position in the wind turbine industry. The Dutch wind energy policy was dominated by large R&D subsidies to research institutes and large turbine manufactures. Attention for (potential) buyers (e.g. electricity companies, but also private owners) and market introductions was limited. For many years electricity companies were not interested in wind energy and very skeptical about the potential of wind energy for fossil fuels.

The last couple of years the Dutch government changed its policy to increase the share of renewable energy in The Netherlands. According to the latest objectives of the National Energy Agreement 16% of Dutch energy needs should be generated sustainably by 2023. Based on the latest estimates this will be about 6GW of onshore generated wind energy.

Offshore market

Currently The Netherlands has two offshore wind farms, called wind farm Egmond aan Zee (108MW) and wind farm Prinses Amalia in IJmuiden (120MW). In addition, there are three wind farms under construction: wind farm Luchterduinen (Noordwijk - 129MW), Buitengaats and Zee-energie. The latter two constitute the Gemini Wind farm, which is located about 80km off the coast of Schiermonnikoog (600MW). Funding of the Gemini project (EUR 2.8 billion) recently has been completed, and they start to build in the beginning of 2015. After completion of these three projects the total capacity of Dutch offshore wind farms will be around 1GW.

As mentioned, the latest objectives of the National Energy Agreement state that 16% of Dutch energy needs should be generated sustainably by 2023, and 3.2% should come from offshore wind farms. Based on the latest expectations this 3.2% will be about 4.5GW. In the next 10 years the government plans to launch several new wind farms with a total production capacity of 3.5GW. The first tender will be in 2015. Besides the GW target, the Dutch State formulated the following offshore wind energy goals to be realized in 2020:

- 40% reduction of the Cost of Energy;
- EUR 6 billion turnover;
- 12,500 FTE Employment.

Compared to their European counterparts The Netherlands is in fifth place, based on installed MW capacity. The UK has the largest amount of installed offshore wind capacity in Europe (3,681MW), which is 56% of all installations. Denmark follows with 1,271MW (19%). With 571MW (8.7% of total European installations), Belgium is third, followed by Germany (520MW: 8%), The Netherlands (247MW: 3.8%), Sweden (212MW: 3.22%), Finland (26MW: 0.4%), Ireland (25MW), Norway (2.3MW), Spain (5MW) and Portugal (2MW).

Country	BE	DE	DK	ES	FI	IE	NL	NO	PT	SE	UK	Total
No. of farms	5	13	12	1	2	1	4	1	1	6	23	69
No. of turbines	135	116	513	1	9	7	124	1	1	91	1,082	2,080
Capacity installed (MW)	571	520	1,271	5	26	25	247	2	2	212	3,681	6,562

Figure 4.1 European Offshore Wind Installation
Source: EWEA 2014

The consented projects for 2014 and 2015 in Europe show that The Netherlands will expand their market share in offshore wind energy in the coming two years; 13% of approximately 22GW of consented offshore wind capacity will be generated by Dutch wind farms.

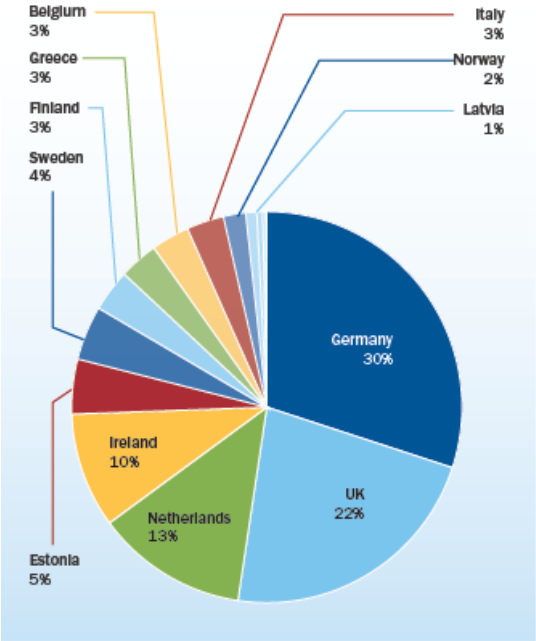

Figure 4.2 Share of consented offshore capacity per country (MW) in 2014 & 2015
Source: EWEA 2014

Worldwide the US and Japan are, with their European counterparts, the frontrunners in offshore wind energy. The offshore wind resource of the US is the highest in the world (+/- 4.2GW), and in 2012 the Department of Energy (DOE) announced a further funding of $168 million for seven offshore wind demonstration projects. Japan's offshore wind industry is rather small, but Japan has had more than twenty years of public funded research on deep offshore structures. Moreover, in 2011 the Japanese government shifted its focus to renewables due to the nuclear disaster. Although there are no official targets for offshore wind, it was estimated that around 5 GW to 6 GW of offshore wind farms could be installed by 2030.

4.2 What Dutch parties can offer

Since the 1980s The Netherlands, together with Denmark and Germany, is a European frontrunner in technical development of wind turbines. These countries have been working together for years within the framework of National and European programs, which resulted in a successful manufacturing industry in Denmark and Germany. The Dutch wind turbine industry developed in the 1980s, as in Denmark, with building successful relatively small wind turbines. When wind turbines became bigger The Netherlands lost its position. Manufacturers merged and went bankrupt, nowadays there are no producers of large wind turbines anymore. Nevertheless Dutch parties still have extensive knowledge in the field of wind energy. Companies such as Lagerweij, Mecal, Darwind and many other small companies are still in the lead as specific knowledge is highly in demand.

In addition, there is a lot of interesting expertise for manufacturers to improve their products or to solve their design problems. The Netherlands can be seen as an idea factory with institutes such as TU Delft, MARIN, ECN, TNO and IMARES. The Netherlands has many experienced project developers and financial facilitators. Designers and relatively small companies such as WES, EWT and Lagerweij focus on small projects specifically for onshore wind.

The Dutch offshore wind energy sector is not as mature as onshore, but The Netherlands still outperforms most of the world. Dutch companies distinguish themselves particularly in the field of foundations, installation and maintenance of offshore wind farms. The wind turbines itself are mostly produced by large organisations such as Siemens and Vestas. In R&D, Imares, ECN and Marin are a few of the leading Dutch parties. In project development the Dutch have Deltares and MECAL, and in the construction field companies such as Seaway Heavy Lifting, Van Oord, Smulders Projects, Ampelmann Operations, Royal HaskoningDHV and Fugro are groundbreaking. The Netherlands also has extensive knowledge on O&M with companies such as Ascent Safety, Ballast Nedam and Damen. Offshore, the Dutch wind energy sector has a lot to offer due to experience gained in the past 10 years.

An overview of Dutch expertise on wind energy (onshore and offshore) is as following:

- Wind energy R&D (Deltares, Imares);
- Wind turbine design and blades (WES/Lagerweij Wind, MECAL, EWT, We4Ce);
- Design & engineering (ECN, TenneT);
- Construction & installation (IHC Merwede, Smulders Projects);
- Operation & maintenance (Van Oord, VSMC);
- Wind farm development & exploitation (Ampelmann, Ascent safety, Z-technologies).

4.3 Opportunities for Dutch parties in Brazil

A thriving new industry of wind energy is being developed in Brazil, fuelled by the country's development bank (BNDES) and its growing need for alternative sources of energy. Brazil has a high demand for wind energy aiming at 2GW/year growth. To fulfil this demand, a large number of relatively small, and yet to be developed onshore wind farms are consented. The deliverables of these projects will result in substantial growth for the sector onshore. The opportunities for Dutch parties in the onshore wind sector are visually displayed below.

Onshore opportunities for Dutch wind energy parties in Brazil

Opportunity level based on experiences and views of Dutch wind energy companies:

Brazil's onshore wind market is in an early phase of development, therefore there are opportunities throughout the value chain. The biggest opportunities for Dutch parties in Brazil lie the field of R&D, Design & Engineering and Operation & Maintenance. The market for wind turbines is dominated by producers such as Siemens and Vestas who have local presence in Brazil.

Design, construction and production of blades

The Dutch have innovative technologies as it comes to design and construction of blades, and as the Brazilian wind energy sector will increase rapidly, these components will be highly in demand. So far there is only one company in Brazil able to produce and deliver reliably (TECSIS), and a second one is being formed (AERIS). A Dutch company that is able to set up operations, or help speed up AERIS' growth, can step into a promising market segment.

O&M and Asset Management strategies

As occurs in most of the emerging wind countries, the main focus is primarily on wind turbines. After installation of the wind farms, O&M and Asset Management strategies will be required, in which The Netherlands is years ahead compared to local parties. Especially as the wind farms become larger, this will be Brazil's biggest challenge. Wind turbine manufacturers are offering service packages but the management of the wind farm as a whole, and the optimization of high electricity generation will be the first priority to developers. Dutch companies can deliver management services, as well as knowledge to operate wind farms.

Design of wind farms

Until recently, wind farm design and grid connection used to be done separately. Although the Brazilian government decided to include grid integration in their projects, Brazil is still years behind compared to international standards. This is a challenge that requires thoughtful and strategic planning in which the Dutch have invaluable hands-on experience. The Netherlands can help Brazil make profitable choices from the very beginning, even before the project physically develops.

Grid Integration & Smart-Grids

In rural areas where energy demand is low and difficulties towards connection to the grid exist, The Netherlands has the knowledge and technology to assist (grid Integration and smart-grids). The specific planning related to transmission, is a new challenge for Brazilian developers to be able to bid with low prices at the auctions. Dutch expertise can help not only with planning, but also engineering and installation of transmission lines, servicing both the developers as the transmission and distribution companies.

Design of wind turbines

There is also a demand for smaller wind turbines in Brazil, and here lies an opportunity for Dutch companies. The winds in Brazil are stable, strong and blow from one direction. Wind turbines will not have to withstand earthquakes, cold winters or hurricanes either. This fortunate climate calls for the proven designs available in The Netherlands, that can be simplified and produced with lower costs. The Dutch (for example former Lagerweij technology) have (technical) knowledge for the development of maller wind farms.

Research & Development

As mentioned by the interviewees, up till now Brazil plays a minor role within the research community. Dutch research and knowledge institutes could play a role via for example knowledge to knowledge (K2K) projects (knowledge transfer between countries). Dutch research institutions such as ECN have done some projects in Brazil (opportunity driven).

Financial engineering and insurance

Currently, the Brazilian government directly or indirectly finances most projects. When the market becomes more mature funding is more likely to come from private parties, which could be interesting for companies such as Green Giraffe but also for (foreign) banks (Rabobank). And as the local content rules tighten, financing from other sources than the Brazilian development bank (BNDES), that do not specify such content rules, can become interesting.

5. Improving commercial involvement

5.1 Bilateral cooperation

In general, Brazil has enormous business potential. The most important opportunities country wide can be listed as follows (PWC, 2013):

- Huge internal growth potential;
- Diversified economy;
- Fast-changing business conditions;
- Inflation is under control;
- Abundance of semiskilled and unskilled labour;
- Tax incentives are negotiable in some locations;
- Experienced industrial modernization during the last decade.

Brazil and The Netherlands maintain a long lasting business relationship which dates back centuries. Compared to other BRICs, Brazil holds the closest culture to Western countries, with easy communication and abundant treaties. Some of the industries that have profited from Dutch knowledge and equipment include: Maritime, Offshore, Aerospace, Machinery, Agriculture, Livestock, Milk, Sports and Media.

The Brazilian industries that are of interest to The Netherlands in Brazil are continuously stimulated to seek partnerships. For example, the Oil & Gas operators in the recently discovered pre-salt fields off the coast of Rio de Janeiro have close cooperation agreements with Dutch suppliers that are guaranteed by the Dutch government. During 2012's largest trade mission, an agreement between Petrobras and the Dutch government was signed that guaranteed €1 billion financing for the Brazilian company to source equipment in The Netherlands.

Local policy and regulations play an important role in the attractiveness of Brazil. Many regulations are directly imported from the European Union's regulations and guidelines. For example, in the design of office buildings, the state of São Paulo demands some of the exact same standards as The Netherlands, making it a less cumbersome step for the manufacturers of, for example, safety equipment, to export to this state.

Although Brazil is a very promising country market entrants need to keep in mind the challenges to successfully conduct business. Successful Dutch SME's have in common: tackling many barriers by setting up a local entity and using the services of expert firms to assist them in their efforts in Brazil. Most common entrance barriers are listed in the "Ease of doing business ranking", a ranking produced annually by the World Bank, where Brazil only ranks 116 of 189 in 2014. The most important reasons are:

- Business activities are generally regulated;
- Considerable documentation and bureaucracy are involved in day-to-day operations: in the wind energy sector, these include inefficiency of public distribution companies and the long and elaborate process to obtain environmental licenses;
- Multiple taxes, high taxation and payroll rates;
- There are no special federal tax incentives to attract foreign investors;
- Foreign ownership of rural land is restricted.

5.2 Market entry strategy

There are a various ways to enter the Brazilian market namely: greenfield, acquisition, joint venture, strategic alliance, and export through an agent. The best entry strategy will be dependent on the Dutch company's structure and strategy, and the market situation in regards to available companies; setting up a greenfield operation, forming a joint venture, or acquiring a Brazilian company are equally attractive. This is due to the benefit of being in Brazil (bypassing import taxation and cumbersome procedures), being far more advantageous than working through an agent. In this section, each of these market entry strategies will be discussed briefly.

Greenfield

The strategy entails a newly created entity as a subsidiary of a Dutch company. This is an attractive strategy, as it provides Dutch companies with freedom to start operations in a timely manner. It allows the company to fulfill the local content regulations, to avoid the cumbersome import procedures and high taxation rates. When setting up a corporate entity in Brazil, you have the choice between establishing a limitada (comparable with Dutch BV) or an S/A (comparable with Dutch NV). At a high level, the limitada usually provides trading flexibility and allows for easier implementation. For more complex operations and limited liability, the S/A is the best option.

A benefit of having a greenfield operation is complete ownership and control. However, taking into account Brazil's bureaucracy, the establishment of the entity can be a cumbersome process (at least 3 months), and to obtain forms and licenses can be complex. It requires great commitment in capital and managerial effort, and the entity needs a native legal representative.

Acquisition

Brazil maintains a liberal posture towards foreign investment, with low restrictions for investments in most industries. Thus, most activities may be freely executed by companies under the control of foreign citizens or foreign entities. The few existing exceptions are expressly determined by law, but the wind energy sector is not restricted. There is no difference in the treatment of foreign companies, from a legal standpoint, in all matters

relating to tax, labor rights, social security, or civil and commercial law. A company incorporated in Brazil is Brazilian regardless of the nationality of its shareholders. However, take into account that local content requirements and import taxes still apply. In general, an acquisition can be a jump-start in the industry, but in fact entails a complicated and lengthy process in Brazil. Also take cultural differences into account.

Joint venture / strategic alliance

By setting up a joint venture with a Brazilian counterpart, bureaucratic hassle (resident legal representative and knowledge on Brazilian laws, regulations and licenses) can be circumvented. Furthermore, risks and rewards can be shared, and technological knowledge can be synergized. The downside of this market entry strategy is twofold. Firstly the company is not wholly owned, and therefore not fully in control of the decision making process. Secondly, the Dutch company is partially liable for operative risks of the joint venture. Two joint ventures in the Brazilian wind energy sector have proven to be successful. WEG/MTOI is a joint venture between WEG, a large Brazilian industrial conglomerate, and MTOI, an Egyptian-owned turbine manufacturer based in Spain. Pacific Hydro/Vale decided to jointly build and operate two wind farms in Brazil's northeast. Joint ventures between companies in The Netherlands and other Dutch companies, that are already present in Brazil, servicing different sectors, can also be a good alternative. For example, in the case of towers for wind turbines, wind specific knowledge from The Netherlands can be combined with the operational advantage of a Dutch ship-builder present in Brazil, in a relatively simple to set-up partnership.

Export through agent

The export through agent market entry strategy is probably least attractive, due to Brazil's protective government. Profits are low (local content requirements and import taxes) and there is little to no control on local operations. On the upside, it is the strategy with the lowest risk and can be operative in a short period of time. For example, when services/products are immediately required due to a recent incident (higher margins).

5.3 Support of the Dutch government

Dutch government presence in Brazil

The Dutch government has a firm diplomatic presence in Brazil who can support with doing business in Brazil. The following governmental bodies are present in Brazil.

- Embassy: The Dutch Embassy located in the capital Brasilia, can provide detailed information and long-term (institutional) support to the wind energy industry. The diplomatic body can also provide political assistance when needed.
- Consulates General: Present in São Paulo and in Rio de Janeiro, can help with procedural necessities and advice related to companies in their jurisdiction. Both consulates count on experienced economic departments and the consulate in São Paulo also counts on an innovation attaché, who has wind-energy as one of his responsibilities.
- NBSOs: Netherlands Business Support Offices are small offices located in strategic areas for foreign business in Brazil. These offices can assist Dutch parties in developing databases and getting in contact with local business and important networks. The NBSOs are undergoing a thorough restructuring in Brazil and are not available at the moment, but are expected to return to activity soon.

Grants and support programs for Dutch parties who are willing to invest in Brazil can be found in appendix G.

Role of the Dutch Government

The bilateral cooperation between the Dutch and Brazil dates back centuries, and Brazil holds a strong relationship with, amongst other EU countries, The Netherlands. As the wind energy sector in Brazil is still an immature market not many Dutch companies and research institutes have experiences operating in Brazil. The Dutch offshore sector is present in Brazil through the oil & gas industry. Those who are active or have done business in Brazil face protective regulations, such as (import) taxes and bureaucratic procedures.

In general Dutch companies and research institutes have expressed their satisfaction about the role the Dutch government plays when doing business in growth markets. Government to government activities are seen as helpful, especially if market players are (partially) government owned. According to the interviewees the Dutch government should have a facilitating role when supporting parties internationally.

In an emerging market such as Brazil economic diplomacy is important. Market and sector studies (especially in immature markets) are a way to inform the sector. Also involvement of the sector in these studies is key as there is a lot of international knowledge and experience available. An economic mission to Brazil with a wind sector focus (broad sector missions have less impact) is advised. The government should set the mission agenda in close cooperation with research institutes and companies, and support matchmaking between Brazilian and Dutch parties (SMEs).

During these missions the Dutch government should promote the whole industry and not only those joining the mission. The goal of the missions should be a win-win situation for the Brazilians and The Netherlands. Express what The Netherlands can give but also take.

Seeing is believing and therefore pilot projects are a way to show what the Dutch onshore sector has to offer. Other EU countries are sometimes more willing to finance large-scale (pilot) wind projects or projects with a higher risk profile. For example Atradius Dutch State Business does not finance projects outside the 12 mile zone, therefore Dutch parties cooperate with German or Danish companies to obtain funding from their governments. Others indicate that public money should be used to support export via credits, bank guarantees, trade agreements etc.

6. Conclusions and advice

Brazil is the second fastest growing wind market in the world, driven by favourable wind resources, a governmental auction system and sound financing schemes by the Brazilian development bank. Since 2009, when the government took a series of incentive measures to introduce wind power into the energy matrix, energy auctions already contracted about 6.7GW of installed power. Its estimated wind potential is 300GW, and energy demand is expected to increase by 2GW per year until 2020. The focus in the Brazilian wind energy sector is onshore, due to lower cost and land availability. Sector specialists do not foresee a future for offshore wind energy in Brazil within the next 10 to 20 years.

The Brazilian government is strongly in favour of clean energy sources and a keen supporter of wind energy. The Brazilian development bank is the biggest contributor to the financing of wind farms and offers favourable credits. In order to apply for these credits, parties need to meet strict local content requirements. These obligations have accelerated the market entrance of foreign players, either by setting up a local facility, strategic alliance, joint venture or via acquisitions. Currently players from all over the world are active but there is still room for new entrants as Brazil is still in need of specific technologies and knowledge.

While favourable conditions exist, Brazil also faces challenges in the wind energy sector; the country's supply chain is not yet optimized, there is a poor infrastructure (grid connection and logistical issues), lack of qualified and trained labour and overall high project costs. The biggest opportunities for Dutch parties in Brazil lie in the field of R&D, Design & Engineering and Operation & Maintenance. For Dutch players, who have competitive advantages due to specific technologies and knowledge in these fields (for example solution for smaller wind farms in rural areas), Brazil could be of interest. Unfortunately the Dutch wind sector has more to offer for offshore wind which is not yet applicable for Brazil.

Advice to the Dutch Government:

- Set-up meetings to inform (especially SME's) about local content requirements, (import/local) taxes and environmental legislation, cultural differences and do's and don'ts in Brazilian business.
- Organize the next economic mission to Brazil with a sector focus on onshore wind and add a mission leader who can represent the sector.
- Know and show (via new media) what the Dutch onshore wind energy sector is all about.
- Set-up a pilot in Brazil to show the Brazilians what the Dutch can offer (think out of the box and not within the existing subsidy instruments and programs).
- Know and understand the incentives, funds, credit facilities (similar as Atradius), programs and subsidies of other European countries and possibly adjust the Dutch instruments in order to improve The Netherlands' competitiveness.

Appendices

Appendix A: Interviewees Brazil

Organization/Company name	Contact Details	Contact person	Description
ABEEólica	Rua do Bosque, 1281, Sala 13 São Paulo - BRAZIL +55 (11) 3660-9792	Elbia Melo *Executive President*	Brazilian Wind Energy Association
APINE	Qd. 06 Ed. Business Center Tower XXI, blc - sala 212 Brasilia – BRAZIL +55 (61) 3224-6731	Régis Martins *Executive Director*	Brazilian Association for Independent Electric Energy Producers
Eólica Brasil (project Asa Branca)	+55 11 3101 2616 marcello@usinaasabranca.com.br	Marcello Storrer *CEO*	Offshore wind developer. The company consists of Marcello Storrer and a group of about 40 people to whom work is outsourced.
Camargo-Schubert	Rua Juvenal Galeno, 55 - Jardim Social Curitiba – PR – BRAZIL +55 (41) 3363-5707	Odilon Camargo *Partner-Director*	Consultancy firm focused on the development of wind farm projects
CPFL Renováveis	Av. Dr. Cardoso de Melo, 1.184, 7º andar São Paulo – BRAZIL +55 (11) 3157-9300	Talvani Nolasco *Superintendent Project Development*	CPFL Renováveis is involved in the development, construction and operation of a portfolio of small (up to 30 MW) and medium (up to 200 MW) scale renewable energy plants, such as PCHs, wind power plants, biomass-fired power plants and solar power plants.
General Electric (GE)	General Electric do Brasil Ltda Rod. Jornalista Francisco Aguirre Proença Campinas / SP – BRAZIL +55 (19) 2104-6900	Sergio Souza *Sales Director Renewables*	General Electrics supplies wind turbines in Brazil. Their Brazilian production facility is located in Campinas- São Paulo and in June 2013, GE launched a Service Center for turbine maintenance in Guanambi – Bahia.
Nótus Renovaveis	Av Washington Soares, 855, Sala 504 Fortaleza – Ceará - BRAZIL	Erick Castro *Principal*	a consulting and independent engineering firm that offers

			specialized services in the development, implementation and operation of power generation systems from renewable sources.
Renova Energia	Avenida Paulo VI 1498, Salvador – Bahia – BRAZIL +55 (71) 3535-0500	Anonymous *Superintendent Strategy Planning*	Renova Energia is a Brazil-based company that operates in the development, implementation and operation of power generation projects from renewable sources, including wind, small hydroelectric power plants (PCHs) and solar, as well as trading of energy and related activities.

Appendix B: Companies Brazil (short list)

Company Name	Contact Details	From	Production plant located at	Description
Acciona Windpower	Acciona Brasil Rua Joaquim Floriano 1.120 - 6º andar Sao Paulo – BRAZIL +55 (11) 3074-8300	Spain	Bahia	Acciona Windpower is a subsidiary of the ACCIONA Group dedicated to the design, manufacture and sale of wind turbines. The company is one of the most recent entrants of the Brazilian wind market and only signed its first contract for a supply 40 wind turbines in 2013. Shortly after, the company opened its first production facility in Simões Filho – Bahia.
Alstom	Alstom Energia e Transporte Av. Embaixador Macedo Soares 10.001 São Paulo - BRAZIL +55 (11) 3612-7000	France	Bahia and Rio Grande do Sul	Alstom Brazil offers a wide range of products and services in the areas of generation and transmission of energy and rail transport. It has a partnership with renewable energy generator Renova Energia.
Gamesa	Gamesa Brasil Rua Hungria 1240 - 3º andar São Paulo - BRAZIL +55 (11) 3096-4444	Spain	Bahia	Gamesa is a global technology company in the wind energy business and currently has a presence in Brazil, Mexico, Uruguay, Nicaragua and the Dominican Republic. It has a manufacturing plant in Camaçari – Bahía.
GE	General Electric do Brasil Ltda Rod. Jornalista Francisco Aguirre Proença Campinas / SP – BRAZIL +55 (19) 2104-6900	USA	São Paulo and Bahia	General Electrics is an American multinational conglomerate corporation that operates through four divisions: Energy, Technology Infrastructure, Capital Finance and Consumer and Industrial. Their Brazilian production facility is located in Campinas- São Paulo and in June 2013, GE launched a Service Center for turbine maintenance in Guanambi – Bahia.
Impsa	Impsa Wind Av. Tronco Distr. Rod. Norte 1724 Distrito industrial de Suape Cabo de Santo Agostinho, PE - Brasil +55 (81) 3087-9300	Argentina	Pernambuco and Bahia	Impsa is a power equipment group from Argentina with two production facilities in Pernambuco and Bahia. It is a large player in Latin-America with installed wind capacity in Brazil, Uruguay and Argentina.
Siemens	Siemens Ltda Avenida Mutinga, 3800 São Paulo – BRAZIL +55 (11) 3908-2211	Germany	São Paulo	Siemens offers a wide range of solutions and services in the energy, healthcare, industry and infrastructure sectors in Brazil. Its production facility for wind turbines is located in Jundiaí - São Paulo and is also used for maintenance and repair services.
Suzlon	Suzlon Brasil Condomínio Itower Iguatemi, 17º andar. Alameda Xingu, 350.	India	Ceará, Rio Grande do Norte, São Paulo,	Suzlon is a large wind turbine manufacturer headquartered in India that is present in the Brazilian market since 2006. Despite its experience in the market, the company

	São Paulo - BRAZIL		Paraíba	failed an audit of minimum local-content compliance in October 2013.
Vestas	Vestas Brazil Centro Empresarial Nações Unidas Avenida das Nações Unidas 12.901 - Torre Norte - 20 andar Sao Paulo - BRAZIL +55 (11) 2755-8000	Denmark	Ceará	Vestas Wind Systems is a Danish listed manufacturer of wind turbines. The company also provides services such as placing the turbines and maintenance and has a production facility in Sebrae – Ceará. However, the company is losing market share since they recently did not meet Brazil's local-content requirements.
WEG/MTOI	WEG SA Avenida Prefeito Waldemar Grubba, 3300 Jaraguá do Sul Santa Catarina - BRAZIL +55 (47) 3372-4000	Brazil /Spain	Santa Catarina	WEG/MTOI is a joint-venture between WEG, a large Brazilian industrial conglomerate, and MTOI, MTorres Olvega Industrial (MTOI), an Egyptian-owned turbine manufacturer based in Spain. The joint-venture enables the companies to deliver the whole package; from manufacturing, assembling and installation to operation and maintenance services.
Wobben	Wobben Windpower Indústria e Comércio Ltda. Av. Fernando Stecca 100 Sorocaba, SP – Brazil +55 (15) 2101-1700	Germany	São Paulo	Wobben Windpower is a Brazilian subsidiary of the German company Enercon. It has 3 production plants located in Sorocaba – SP, Portuario do Pecém – Ceara and Parazinho - Rio Grande do Norte and is the only Brazilian wind turbine manufacturer so far.

Appendix C: Institutions Brazil (short list)

Name institution	Office Location	Description
ABEEólica	Rua do Bosque, 1281, Sala 13 São Paulo - BRAZIL +55 (11) 3660-9792	ABEEólica is the Brazilian Wind Energy Association. Its members include wind turbine manufacturers, engineering firms, energy companies and other parties involved in the wind energy supply chain. Its goal is to promote wind energy and assure the competitiveness of the sector with a long-term government program.
ANEEL	Setor de Grandes Áreas Isoladas Norte (SGAN), quadra 603, módulo I - J, 1º andar Brasília – BRAZIL +55 (61) 2192-8600	ANEEL is the Brazilian Electricity Regulation Agency and is linked to the Ministry of Mines and Energy. Its mission is "to provide favorable conditions for the electric power market to develop a balance between the agents and the benefit of society".
Apine	Qd. 06 Ed. Business Center Tower XXI, blc - sala 212 Brasilia – BRAZIL +55 (61) 3224-6731	Apine is the Brazilian Association for Independent Electric Energy Producers and acts as a representative body of independent producers. Apine interacts with the executive and legislative powers involved in the Brazilian electric sector.
BNDES	BNDES senior administration Av. República do Chile, 100 Rio de Janeiro – BRAZIL +55 (21) 2172-7447	BNDES is Brazil's state-owned development bank and and financed approx. 130 wind projects over the period 2003 – 2012 (BNDES, 2012). Recently, eligibility for BNDES financing has become more difficult, as the requirements have become stricter.
CEPEL	Av. Horácio de Macedo, 354 Rio de Janeiro – BRAZIL +55 (21) 2598-6386	CEPEL is the Electric Power Research Center of Eletrobras and has over 30 years of research and development (R&D) experience regarding electric power generation, transmission and distribution.
EPE	Avenida Rio Branco, nº 1 – 11º andar Rio de Janeiro – BRAZIL +55 (21) 3512-3165	The Brazilian federal energy planning company EPE was created in 2004 to help the government plan its energy supply. EPE is responsible for projecting energy supply and demand, supporting the government and power regulator Aneel in implementing policies, as well as carrying out studies for new power projects to be offered at government auction.
INEE	Rua da Candelária, 9, sala 908 Rio de Janeiro – BRAZIL +55 (21) 2532-1389	INEE is a private non-profit organization which brings together people and institutions interested in promoting the efficient use of all forms of energy. It seeks to reduce market imperfections by improving the level of available information and supporting the creation of norms and legislation.

Appendix D: Stakeholders Brazil (long list)

Company name	Description
Acciona	Producer of Wind Turbines (large scale)
Alstom	Producer of Wind Turbines (large scale)
Fuhrlander	Producer of Wind Turbines (large scale)
Gamesa	Producer of Wind Turbines (large scale)
Goldwind	Producer of Wind Turbines (large scale)
GE Energy	Producer of Wind Turbines (large scale)
IMPSA Wind	Producer of Wind Turbines (large scale)
Siemens	Producer of Wind Turbines (large scale)
Suzlon Energia Eólica do Brasil	Producer of Wind Turbines (large scale)
Vestas do Brasil Energia Eólica	Producer of Wind Turbines (large scale)
WEG Equipamentos Elétricos S.A	Producer of Wind Turbines (large scale)
Wobben Windpower Indústria e Comércio Ltda.	Producer of Wind Turbines (large scale)
ABB	Producer of Parts and Components
Algolix	Producer of Parts and Components
Bösch Rexroth	Producer of Parts and Components
Engenbasa	Producer of Parts and Components
Gestamp	Producer of Parts and Components
IRAETA	Producer of Parts and Components
Ormazabal do Brasil	Producer of Parts and Components
PEVEDUTO	Producer of Parts and Components
Schneider Energia	Producer of Parts and Components
SEMIKRON Semicondutores	Producer of Parts and Components
V & M do Brasil	Producer of Parts and Components
Aeris Energy	Producer of Blades
Tecsis Tecnologia e Sistemas Avançados	Producer of Blades

Company name	Description
IDNAMIC	Logistics, Assembly and Transportation
Makro Engenharia	Logistics, Assembly and Transportation
Norsul	Logistics, Assembly and Transportation
Saraiva Equipamentos Ltda.	Logistics, Assembly and Transportation
Suape	Logistics, Assembly and Transportation

Company name	Description
Arteche	Engineering, Consulting and Construction
Barlovento Brasil	Engineering, Consulting and Construction
Bio Consultoria	Engineering, Consulting and Construction
Braselco Serviços	Engineering, Consulting and Construction
Camargo Schubert Engenharia Eólica	Engineering, Consulting and Construction
DNV-GL	Engineering, Consulting and Construction (DUTCH)
Encalso	Engineering, Consulting and Construction
Engecorps	Engineering, Consulting and Construction
Engineering SA	Engineering, Consulting and Construction
Eólica Technologica	Engineering, Consulting
Mammoet	Engineering, Consulting and Construction (DUTCH)
Multiempreendimentos Engenharia Consultiva	Engineering, Consulting and Construction

Nótus Renovaveis	Engineering, Consulting
Papyrus Consultoria Ambiental	Engineering, Consulting and Construction
POWERHOUSE ENGENHARIA DE ENERGIA	Engineering, Consulting and Construction
SIMM Empreendimentos	Engineering, Consulting and Construction
Simple Energy	Engineering, Consulting and Construction
Tecnogera	Engineering, Consulting and Construction
Way 2	Engineering, Consulting and Construction
Dois A Engenharia e Tecnologia	Civil Construction

Company name	**Description**
Alubar Energia	Developers and Generators/Producers
Atlantic Energias Renováveis	Developers and Generators/Producers
Bioenergy Geradora de Energia	Developers and Generators/Producers
Brasventos	Developers and Generators/Producers
Brennand Energia Eólica	Developers and Generators/Producers
Casa dos Ventos Energias Renováveis Ltda.	Developers and Generators/Producers
CER-Energia	Developers and Generators/Producers
Construtora Andrade Gutierrez S/A	Developers and Generators/Producers
Contour Global	Developers and Generators/Producers
CPFL Renováveis	Developers and Generators/Producers
Desa - Dobrevê Energia S.A.	Developers and Generators/Producers
EDP Renováveis Brasil	Developers and Generators/Producers
Eletrosul	Developers and Generators/Producers
Eletrowind	Developers and Generators/Producers
Enel - Green Power	Developers and Generators/Producers
Enerfin do Brasil Sociedade de Energia	Developers and Generators/Producers
Energimp	Developers and Generators/Producers
Energio	Developers and Generators/Producers
Energisa	Developers and Generators/Producers
ENERPLAN	Developers and Generators/Producers
ENEVA	Developers and Generators/Producers
Furnas	Developers and Generators/Producers
Galvão Energia	Developers and Generators/Producers
Grupo Queiroz Galvão	Developers and Generators/Producers
Honda Energy	Developers and Generators/Producers
Horizonte Energia	Developers and Generators/Producers
Iberdrola Renovables	Developers and Generators/Producers
MS Renováveis	Developers and Generators/Producers
Odebrecht	Developers and Generators/Producers
Omega	Developers and Generators/Producers
Pacific Hydro Energias do Brasil	Developers and Generators/Producers
Petrobras - CENPES	Developers and Generators/Producers
Quifel Energy	Developers and Generators/Producers
Renova Energia	Developers and Generators/Producers
SERVENG	Developers and Generators/Producers
Servtec Energia	Developers and Generators/Producers
SOWITEC do Brasil Energia Alternativas Ltda	Developers and Generators/Producers
Theolia Brasil Energias Alternativas	Developers and Generators/Producers
Ventos Brasil	Developers and Generators/Producers
Voltalia Energia Ltda	Developers and Generators/Producers

Company name	Description
ELETROBRÁS	Energy company southern Brazil
ELETRONORTE	Energy company northern Brazil
LIGHT	Energy company Rio de Janeiro
BTG Pactual	Commercialization of Energy
ECOM Energia	Commercialization of Energy
Lynkx	Commercialization of Energy

Institution name	Description
ABEEOLICA	Brazilian Association for Wind Energy
ABRADEE	Brazilian Association of Electric Energy Distributors
ANEEL	National Agency of Electric Energy
APINE	Brazilian Association for Independent Energy Generation
BNDES	Brazilian Development Bank
CCPE	Coordinating committee for the planning of the extension of the electric system
CEPEL	Research centre for electric energy
EPE	Research institute for energy studies
INEE	National institute for the efficient use of energy

Appendix E: Local content requirements

Phase - with generators delivered from this date	A1 – Initial Step	A2 – July 2013	A3 – January 2014	A4 – July 2014	A5 – January 2015	A6 – January 2016
General rule	To fulfil the requirements for 3 out the 4 turbine parts described below	To fulfil A1 and the requirements described below	To fulfil A2 and the requirements described below	To fulfil A3 and the requirements described below	To fulfil A4 and the requirements described below	To fulfil A5 and the requirements described below
Tower	Should be manufactured in Brazil (in own facility or outsourced), with at least 70% (in weight) of its materials (steel or reinforced concrete) produced in Brazil	Not mentioned	Should be manufactured with 100% Brazilian precedence of internal components (ladders, platforms, cup-holders, electric conductors, screws)	Not mentioned	Should be manufactured in Brazil with at least 60% of quantity of forged components from Brazil	Not mentioned
Blades	Should be manufactured (in own facility or outsourced) in Brazil	Same as A1	A1 with at least 40% of materials (in weight) from Brazil	Same as A3, with 50% instead of 40% of local materials	Same as A4, with 60% instead of 50% of local materials	Not mentioned
Hub	Should be assembled in own facility in Brazil	Same as A1, but in this stage, with at least one component (housing, bearings, pitch control actuator, or pitch control panels) manufactured in Brazil in own facility	Same as A2, with two of the four main components manufactured in Brazil	Same as A3, raising to three of the four components manufactured in Brazil	Should be assembled in Brazil in own facility with all four main components also manufactured in Brazil	Not mentioned
Nacelle	Should be assembled in own facility in Brazil	Same as A1, but requiring more detailed planning	Same as A2, with even more detailed planning and certifications	Same as A3, with again more detailed planning and certifications.	Same as A4, with main structural parts manufactured in Brazil*	Same as A5, with main structural parts manufactured in Brazil*

Appendix F: Taxes

Tax name	Amount	Calculation	Wind Energy specifics
II – Import tax	Varies by NCM*	Calculated over sales price	Doesn't apply for products not available in Brazil (needs official exemption though)
IPI – Tax over industrialized products	Varies by NCM*	Calculated over sales price + shipping + Import tax	No specific treatment
ICMS – Tax over circulation of goods and services	Varies per state (usually 7%-25%)	Same as above + IPI +ICMS	Exempted for wind-energy specific products until Dec 2015
PIS – Social contribution tax	1.65%	Calculated over sales price + shipping + Import tax + ICMS + COFINS + PIS	Has federal stimulus varying per product and doesn't take ICMS under consideration
COFINS	7.6%	Calculated over sales price + shipping + Import tax + ICMS + COFINS + PIS	Has federal stimulus varying per product and doesn't take ICMS under consideration

NCM: Numero Comum Mercosul, product classification system used for import tariff calculation
Simulator: http://www4.receita.fazenda.gov.br/simulador/

Appendix G:

RVO programs

Business partner scan

A business partner scan provides you with an overview of possible partners in Brazil. These can be agents, distributors or production partners. The partner search will be conducted in collaboration with Dutch embassies, consulates and Netherlands Business Support Offices. They know the local market and can cope with language and cultural barriers. After identifying possible partners these companies will be asked if they are interested in potential cooperation. Involved costs: € 500,-.

Website: http://www.rvo.nl/onderwerpen/hoi/netwerkpartners-zoeken/internationale-zakenpartners/zakenpartnerscan (only in Dutch)

Economic missions

RVO regularly organizes economic missions to interesting countries under the guidance of a member of the government. The presence of members of government and the network of diplomats can open doors and provide you with interesting contacts and remove barriers to business. Involved costs: EUR 950,-.

Website: http://www.rvo.nl/onderwerpen/internationaal-ondernemen/exportbegeleiding/missies-en-handelsreizen (only in Dutch)

Finance for International Business (FIB)

The Dutch government provides 35% of the funding amount by loan (co-financing), with a maximum funding amount of € 2.5 million per company per country. No collateral requested. Because the government effectively participates in the financing part, financiers are more willing to fund the investment. In 2013 total budget was € 7.5 million.

Website: http://www.rvo.nl/subsidies-regelingen/finance-for-international-business-fib (only in Dutch)

Starters International Business (SIB)

The Starters International Business facility provides advice and support for companies who wish to develop an internationalization strategy for Brazil. The company can apply for a voucher (max. €2.400). With this voucher the company can hire an advisor from one of the cooperating organizations, who will examine the risks and possibilities and who will develop an plan of action.

Starters International Business is designed for SME entrepreneurs:

- With little or no experience of doing international business e.g. Brazil;
- Who want to embed international business in the structure of their company;
- Who have adequate resources (HR, timing, funding);
- Who are willing to invest time and money to examine and start up business activities in Brazil.

Website: http://www.rvo.nl/subsidies-regelingen/starters-international-business-sib (only in Dutch)

Partners for International Business (PIB)

If clusters of companies and knowledge institutes want to enter Brazil, RVO could support via the Partners for International Business (PIB) program. Through economical diplomacy the government aims to remove business barriers. In 2014 the total budget is about € 6.3 million.

PIB focuses on the Dutch 'Topsectors' (Energy, Life Sciences, Creative Industries, Water, Agro-Food, Horticulture, High Tech Material & Systems, Logistics en Chemicals). The cluster should consist of at least 3 companies. There are 27 focus countries, Brazil is one of them.

Website: http://www.rvo.nl/subsidies-regelingen/partners-international-business-pib (only in Dutch)

Energy in Horizon 2020 (EU)

Horizon 2020 is the biggest EU Research and Innovation program ever with nearly €80 billion of funding available over 7 years (2014 to 2020). € 5.4 billion is assigned to Energy. Any organization that is active in research, technological development and innovation can participate. The European Commission generally requires cooperation with foreign partners.

Website: http://english.rvo.nl/subsidies-programmes/horizon-2020-research-and-innovation

Miscellaneous programs

Exportkredietverzekering (EKV)

Atradius Dutch State Business offers Dutch exporters of capital goods or international construction projects a wide range of insurance and guarantee products when doing business in emerging markets, including Brazil.

Credit insurance on behalf of and for account of the Dutch State usually involves export transactions with credit periods or a completion time in excess of twelve months. These always involve the supply of capital goods such as machinery or equipment.

Through its insurance and guarantee products Atradius can assist you in winning export transactions and increase your financing capacity with your bank.

Website: www.global.atradius.com

Fund for Dutch Enterprises (FOM)

FOM provides medium and long term loans to companies or joint ventures in Brazil that are majority owned or controlled by Dutch enterprises. In many cases, no appropriate commercial financing is available for these joint ventures and subsidiaries for the construction or expansion of a production plant or to buy new equipment. Also, tenors are often too short or excessive security is needed. FMO offers these joint ventures and subsidiaries the opportunity to strengthen their financial structure, by providing often unsecured or subordinated loans. As a result companies are in a better position to attract working capital from local banks.

FOM specifications:

- Financial package is tailored to the specific needs of the local enterprise;
- Financing amounts to a maximum of EUR 10 million;
- Maturity can range from 3 to 12 years.

Conditions:

- Local joint venture/subsidiary must be majority Dutch owned;
- The Dutch company must provide certain guarantees to strengthen the financial structure of the local enterprise;
- FOM will not finance Dutch companies that have entirely or largely transferred to emerging markets.

The costs of FOM-finance - interest and fees- are in line with market conditions and based on the risk-profile of each individual case. FMO is open for companies from all sectors, however the companies must have a focus on: Agribusiness; Water; Energy and Financial institutions.

Website: www.fmo.nl

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