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Valuation of Vestas Wind System A/S

- A study serving for strategic purpose

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Abstract

The report is designed to evaluate the strategy appropriation of Vestas Wind System A/S. Vestas Wind System A/S, as one of the biggest international wind turbines manufacturer, has faced serious business fluctuation during the past five years. Even though the business has been recovering over time recently, but whether they have adopted an appropriate strategy remained to be a question.

From the financial statements of Vestas Wind System A/S, one can see that both invested capital and cash and cash equivalence have abnormal change in the recent years. The invested capital has been shrinking sharply and the cash and cash equivalence has been accumulating over time. This may indicate an inefficient use of internal fund and incapable of catching the potential business opportunities. Wind energy as an industry with huge potential, the fast growth rate is expected at least for the next decade. Standstill will not be a smart strategy in the wind energy business.

As it is revealed in the report, the biggest market potential worldwide both for the past and future decade are in the Chinese market. This doesn't seem to be in accordance with the strategy of Vestas Wind System A/S. The financial statements show that the revenue source weighted in the Asia Pacific market is much lower than the actual market importance. From year 2014 to year 2015, the revenue generated from Asia Pacific surprisingly decreased while all the other markets get a positive outcome during the time. This makes it a problem that whether the strategy of Vestas Wind System A/S in China is appropriate or not.

In order to discuss this issue, the report is divided into three main parts. The first part is to make a valuation of Vestas Wind System A/S to find what is the company's value under the assumptions of historical performance and current strategy. The second part of the report will be a strategic analysis at macro level, industry level and micro level respectively to see that what kind of competitive position that Vestas Wind System A/S is in and what is the best combination of the competitive strength for the company. The third part will be the other valuation based on the discussion of the strategic analysis from the second part of the report. The comparison of the results between two valuations will be discussed for the strategy appropriation issue.

In the first valuation, the report firstly conducted an accounting policy clarification. A profitability analysis is made after the reformulation of the financial statements. This analysis will provide information about the historical and current performance of the company. In the assumption, the report seizes the issue of cash and net interest-bearing debt in order to reflect the problem that is discovered before. The valuation outcome is not too deviated from the market price at the end of year 2015, but a little lower than average. This may indicate that there is a good prospect that is generated by the recent turning-around performance for Vestas Wind System A/S.

In the second part of the report, a PEEST model (D. Jobber 2010) is firstly adopted for analyzing what kind of macro environment that Vestas Wind System A/S is in. A Porter's Five Forces model (M.E. Porter 2008) is followed to analyze at the industry level to figure out the competitive position of the company. A resource-based view (J. Barney 1991) is utilized to deem the company as a bundle of resources and capabilities. Among the resources and capabilities, the advantages and the sustainable advantages are identified according to the criteria called VRIN model (R.M. Robert 1991). These resources in the end will from the core competence which help the company to obtain a better competition position in the future development.

The second valuation is conducted in the second part. As the purpose of the report is not to focus on an accurate forecast of the company value, but to compare the benefit obtained before and after the strategy adjustment, the forecast on tax, financial instruments and so on are not forecasted in too much details. Though it is a limitation of the report, the compromise regarding the purpose will be regarded as acceptable. The final valuation result is calculated in the end. Comparing to the two outcomes, there is almost a 60% of increase in the company value after the strategy is adjusted. This shows how important the strategy in Chinese market is and the urgency to put endeavor in the Chinese market becomes strong.

Table of Content

Introduction of Vestas Wind System A/S

Vestas Wind System A/S (Hereby, refer to as Vestas Group) is the largest wind turbines manufacture, seller, installer and servicer in the world. The company entered the wind turbine industry in 1971. And since then, it started its rapid growth for a decade and expanded the business all over the world.

The first wind turbine is manufactured in 1979 with a capacity of 30 KW, and quickly enough, they started their massive production just one year later. In 1981, they were able to take control of quality and start producing their own fiberglass components that enable them to achieve a success in the US market[1]. In 1986, Vestas Group has a huge crisis and went into suspension of payment on Oct. 3rd, 1986. But later, Vestas Group decided to focus exclusively on wind turbine business and both technology and operating improvement for Vestas Group after then are quiet impressive[2].

Vestas was the first wind turbines business penetrator in Chinese market as well[3], but the business is not all with satisfaction. With huge technological advantages, Vestas didn't achieve enough market shares in China. In the end of 2014, the market share of the foreign companies has been strike down to 2% and the market for Vestas goes down to 1.13%[4]. The reason can be deducted as partly related to the National policies that support the local companies' development, but the underestimation of the Chinese wind turbines market development is also considered as a misjudgment from the company. In 2015, Goldwind Science & Technology Co., Ltd has surpassed Vestas Group with an annual installation capacity of 7.8 GW to make them the second place in the world[5].

Problem formulation

As it is mentioned in the introduction, the development of Vestas Wind System A/S has been a legend

[1] https://www.vestas.com/en/about/profile#!from-1971-1986

[2] http://en.openei.org/wiki/Vestas

[3] http://toutiao.com/i6242565343861015041/

[4] http://news.cb.com.cn/html/money_10_24552_1.html

[5] http://business.sohu.com/20160401/n443028013.shtml

and the fast development lead the company to the world number one wind system manufacture. Due to the fact that the clean and renewable power is still an apparent trend for the world energy source development, the prospect of this wind system business is very much positive for the following decade at least.

The Chinese market is with the biggest potential for the forward years, and the development of the wind system market for China is also the fastest. These facts have indicated that it is super important to seize the opportunity in the Chinese market as the growth of the wind turbines demand is foreseeably enormous.

From 1986 when Vestas just install the first wind turbine in China without any possible competitors[6], until it enters 2010 and after when a large number of local competitors emerged[7], the changing competing environment had brought a great challenge to the company's development. As it is known that Vestas has lost 166 million Euro (Vestas Group, 2011), the deficit was enlarged in 2012 to 963 million Euro (Vestas Group, 2012). Meanwhile, local companies such as Goldwind Science & Technology Co., Ltd, Guodian Union Power Technology (Baoding) Ltd and so on has caught the fabulous wind turbines market opportunity and incurred a fast development. It is doubtful about whether Vestas has correctly forecast the world wind turbines business development trend and the consequence was lead to as that Vestas has keeping losing the market share in China though with a huge technological advantage. Even though Vestas was retrieving Chinese business in 2014 and 2015, the installation capacity was surpassed by the local company called Goldwind Science and Technology Co., Ltd. the foreign companies who are with technological advantages are keeping losing the Chinese market share. This would indicate to some extent that Vestas still didn't do enough and their efforts in developing the Chinese market are yet insufficient.

Due to the facts above, it is interesting to figure out how the business in China could influence the valuation of Vestas and how will the strategy adjustment maximize the valuation of the company.

[6] http://www.eeo.com.cn/2014/1022/267654.shtml

[7] http://info.machine.hc360.com/2011/01/251625323547.shtml

Thus, the problem is formulated as below:

What is the valuation of Vestas Wind System A/S, and how could Vestas Wind System A/S adjust their strategy to improve the valuation result?

Sub-questions:

What is the valuation of Vestas Wind System A/S under the current strategy?

What can be the potential factors that influence the business of Vestas Group and where should Vestas should focus on to improve the competence both geographically and technically?

What is the valuation of Vestas Wind System A/S after the adjustment of company's strategy?

The three sub-questions will be in accordance with the three part of the report that are the valuation under the current strategy, the strategic analysis, and the valuation under the adjusted valuation. The questions will be answered in the sub-conclusions and the final conclusion.

Methodology

The philosophy of the report is ontology (P. Eriksson & A. Kovalainen 2008). The report is taken from an objective aspect, which means the social world has existence, independent of people and their actions and activities. The results provided by financial statement analyzing skills are considering as independent from the knowers and thus providing objectivity to the report.

The research approach is abduction (Esterberg & G. Kristin 2002). The general idea is to compare the valuation of Vestas Group based on two different strategies. But when doing the strategic analysis, the information obtained by utilizing public documents, organizational documents, and so on are analyzed inductively.

The research is based on not only quantitative approach, but also qualitative approach. In order to figure out what the value Vestas Group is, the valuation process based on the firm financial statements and historical record are used quantitatively. The information obtained for the analysis in this paper will be secondary data (A. Bryman & E. Bell, Documents as Sources of Data 2007) contains public

documents, organizational documents, and so forth will be analyzed qualitatively. The analysis will be cross-sectional. This means that the analysis will be data from independent time point as financial reports of Vestas is only collected annually. Longitudinal valuation will not be possible in this case.

Reliability and validity (A. Bryman & E. Bell, 2007) are important to the report. As the report is carried out mainly based on a quantitative approach and it is one-member research, two criteria are discussed here, which are credibility, and confirmability.

The credibility is guaranteed due to the fact that the research can be fully replicated. The financial reports of Vestas Group and all the relevant documents are all available to the public and there are no difficulties for the researcher to conduct same research with relevant skills. The relevant calculation processes for valuation are disclosed in the Appendix 1-8. Relevant information sources are outline to show that no personal values or theoretical inclinations manifestly to sway the conduct of the research and findings deriving from it. This has helped to proof the confirmability of the report.

Theories

The theories used in the report are related in two categories. The first category is to be used in order to analyzed the company's profitability situation, making assumptions based on the historical and current performance as well as forecast, valuation and sensitivity testing of valuations. These are overall financial statement analysis skills (C.V. Petersen & T. Plenborg 2012)

The second category involves different strategic analysis skills. The primary step to do the strategic analysis is to put the company in the macro level in order to see how does the macro environment influence the business of Vestas Group. In this sense, a PEEST analysis (D. Jobber 2010) is adopted for the analysis. The model analysis the company from Political, environmental, economic, social and technological perspectives to showed the general macro environment to the wind energy business.

In order to see what kind of business position that Vestas Group is in within the business context, a Porter's Five Forces model (M.E. Porter 2008) is adopted. The model analyzes the industry

situation from five aspects that are barrier of entrance, bargaining power of buyer, bargaining power of supplier, substitutes, and intensity of competitive rivalry.

When come to the micro level analysis, namely the analysis at the firm level, a resource-based view (R.M. Robert 1991) is used for detailed analysis to show what kind of resources and capabilities that the firm possesses. The resources are categorized in four kinds, which are tangible resources, human resources, organizational resources and financial resources (H. Dahlgren 2012). In order to find the kind of resources or capabilities are advantages or sustainable advantages that Vestas Group can use in their competitive position, another model called VRIN model (J. Barney 1991) is used by using the criteria of whether the resources or capabilities are valuable, rare, inimitable, and non-substitutable. Only the resources or capabilities fulfill all criteria will be qualified for being sustainable competitive advantages. A core competence analysis follows (C.K. Prahalad & G. Hamel 1990) to combine different resources and capabilities above, to form a strategic strength for Vestas Group to compete in the future.

Literature Review

There is a bundle of literatures which are found relevant and used in the report. The literatures are relevant from different aspects. The first set of literatures is the annual reports from Vestas Group from year 2011 to year 2015 (Vestas Group, 2011-2015). These reports are not only necessary to provide the financial statements information, but also inform about their historical performance, the internal view of the business, the strategic making as well as the internal prospects in the future. Financial Statement Analysis (C.V. Petersen & T. Plenborg 2012) is the primary tool for the valuation process.

To make the strategic analysis of the company, a set of literatures regarding different models are processed. Firstly, a PEEST model (D. Jobber 2010) from Principle and Practice of Marketing provides the tool from macro level to analyze the business situation of Vestas Group. Secondly, the analysis from the industry level, a Porter's Five Forces (M.E. Porter 2008) model provides good angles to figure out what kind of competitive position that Vestas Group is in. And finally, a

resource-based view (R.M. Robert 1991) is used. It is to deem the company as a bundle of resources and capabilities and the criteria of judging that which of them can be sustainable advantages (J. Barney 1991) can provide the combination of the core competence (C.K. Prahalad & G. Hamel 1990) of the firm.

There are also public documents and reports need to be referred in this report. To obtain the information of world wind energy developing status quo and future prospect, reports includes Wind Power Business in the Middle East and North Africa (M.K. Halou 2012), Africa 2030: Roadmap for a Renewable Energy Future (IRENA 2015), Wind Energy Scenario for 2030 (EWEA 2015) and Market Forecast for 2015 - 2019 (GWEC 2014) are read and utilized. For Chinese market specifically, An Integrated Assessment of China's Wind Energy Potential (D. Zhang, M. Davidson, B. Gunturu, X. Zhang & V.J. Karplus 2014) gives further information about the market potential in China. On top of these, Taxes and Incentives for Renewable Energy (KPMG 2015) provides further information about the political support towards the renewable energy sector to indicate the macro environment of the wind business.

Last but not least, the world economic situation is also very important to almost all industries. In order to be richer in economic knowledge, two reports World Economic Situation and Prospects (United Nations 2016) and Global Economic Prospects (World Bank 2016) are very useful for provide the world economic situation and the development trend.

Research Limitations

There are some limitations to this report. One limitation is caused by the accounting policy of Vestas Group. The depreciation of the company in included in different costs and not possible to utilized the EBITDA margin. The cost is not clearly traced back to different geographical markets, which makes it impossible to provide the accurate forecast of cost development. The compromise of this issue is that the report adopted EBIT margin as general tool to evaluate the ability for Vestas group to convert revenue to operating profit.

Another limitation is that there is no clear financial information of the Chinese market. As in the

second valuation, the main issue is to adjust the strategy in China to achieve a better prospect, lacking this information can be a vital issue. But as it can be seen in the financial statements, the Chinese market is included in the Asia Pacific market, and the overall weight of the Asia Pacific market is very low compare to the other markets. It is regarded that the Asia Pacific market is not fully developed, thus the general trend of the Chinese market is included in the Asia Pacific region.

The next limitation is about the forecast. In the forecast stage, the transforming feature of tax, financial instruments and items like are not taken into consideration due to lack of knowledge. Under different strategies, the possible influences of these issues are not discussed, as it is not possible to provide an accurate and object outcome. As the report is not aiming to provide accurate number of how much Vestas Group values, but to compare the prospects under different strategies in order to provide the company more options in the future business development, the detailed forecasts of these issues are not tightly pursued.

Accounting Policies

The parent company of Vestas Wind Systems A/S has prepared the financial statements in accordance with the provisions of the Danish Financial Statements Act (DK GAAP) applying to entities of reporting class D as well as the requirements laid down by NASDAQ Copenhagen in respect of the financial reporting of companies listed on the stock exchange. Though the functional currency is Danish kroner (DKK), due to the international relations of the Group, the financial statements are presented in Euro.

The consolidated financial statements have been prepared in accordance with the International Financial Reporting Standards (IFRS) due to the fact that it is adopted by the European Union and the necessity for fulfilling the additional Danish disclosure requirements for listed companies.

Note that the depreciation and amortization of the company is included before EBIT and hided in different costs. These include the production cost, administration cost and so on. As the amount of total depreciation in the account and the source of depreciation are not very clearly stated, due to the complexity of tracing the source of depreciation, the EBITDA number is not discussed in this

financial statement.

Reformulation of the Financial Statements

The original financial statement is prepared in a standard way that reflects the general performance of the company. In order to analyze the information behind the numbers, it would be crucial to calculate the Net Operating Profit after Tax (NOPAT) and Invested capital (IC) in income statement and balance sheet. Due to this reason, a set of analytical financial statement will be made and in order to do it, whether different items are financial activity or operating activity need to be accurately decided. The reformulated income statement is in Appendix 4.

Reformulation of Income Statement

There are two items in Income Statement needed to be clearly defined. They are Special Item, and Income/(Loss) from Investments Accounted for Using the Equity Method. In Note 1.6, the Special Item is explained as that it comprises costs and income of a special or non-recurring nature in relating to the main activities of the Vestas Group, which make the author believe that it has a nature of being operating item. As for Income/(Loss) from Investments Accounted for Using the Equity Method, according to Note 3.4, it recognizes the interest of Joint Venture. Under the equity method, when the Group's share of losses in a Joint Venture equals or exceeds its interests in the Joint Venture, the Group does not recognize further loss. Due to this nature, this item can be categorized as financing activity.

When calculating NOPAT, it should be dealt with by removing operating tax from EBIT while keeping the tax from financing activities. This generates an amount of tax shield that is calculated by using the effective tax rate times the net financing expenses.

Reformulation of Balance Sheet

There are two ways to calculate the invested capital in balance sheet. From the assets side, interest-bearing assets first needed to be moved away. Cash and cash equivalents is considered

interest bearing assets. For non-current assets held for sale, according to note 6.7, it is classified as those non-current assets whose carrying amount will be recovered principally through a sale transaction rather than through continuing use. The assets are expected to be sold within one year from the reporting days which make the assets has nothing to do with operating use. The number calculated deduces the total non-interest bearing liabilities will be invested capital.

On the other side, the invested capital can be calculated by adding total equity and net interest-bearing debt (NIBD). The financing debt for current and non-current feature is clearly stated in the balance sheet. In 2013, there is an item called Liabilities Directly Associated with Current and Non-Current Assets Held for sale. According to the Note 21 in annual report 2013 (Vestas Group, 2013), it is classified into interest-bearing debt. The NIBD equals total interest-bearing debt subtracts total interest-bearing assets.

Profitability Analysis

The profitability analysis will analyze Vestas Group's historical performance for the recent 5- 6 years. The result of the analysis will be used for forecasting and valuation in the following parts of the paper. But as valuation is not the only purpose of the paper, a brief discussion of the reasons behind the good and bad period of performances is also made along the way.

Profit Margin & Assets Turnover

One insight of Profit Margin is that it reflects the ability for the company to convert the revenue into real profit. The calculation of Profit Margin is:

$$\text{Profit Margin} = \frac{NOPAT}{Revenue}$$

The revenue generation trend is shown below.

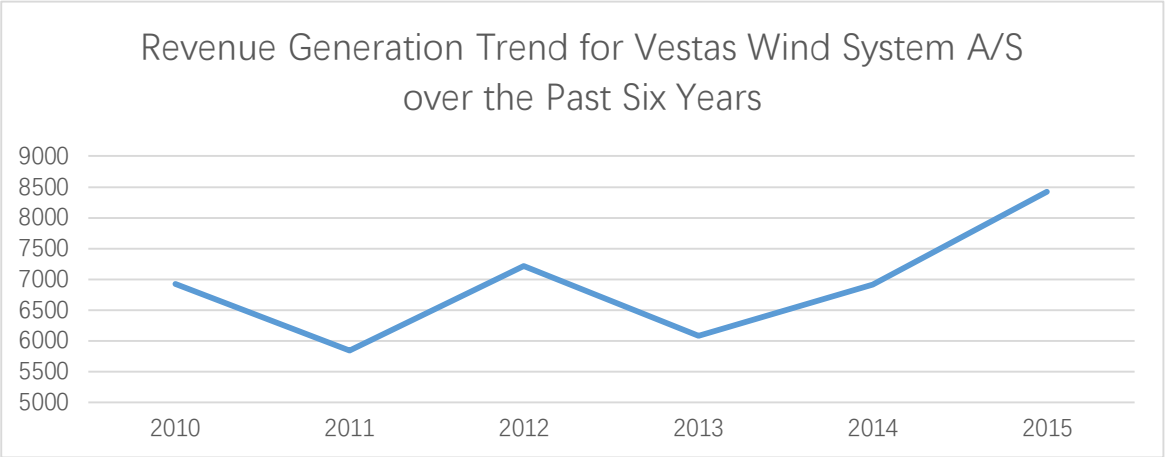

Figure 1, Source: Produced by author

As it can be observed, the revenue for Vestas Group had experienced a fluctuation, but it generally can be perceived as that Vestas has periodical good and bad time for business, and it starts to obtain a continuous growth in recent two years. But this conclusion is not that accurate when taking the profit margin into consideration. As the trend is shown in the chart below.

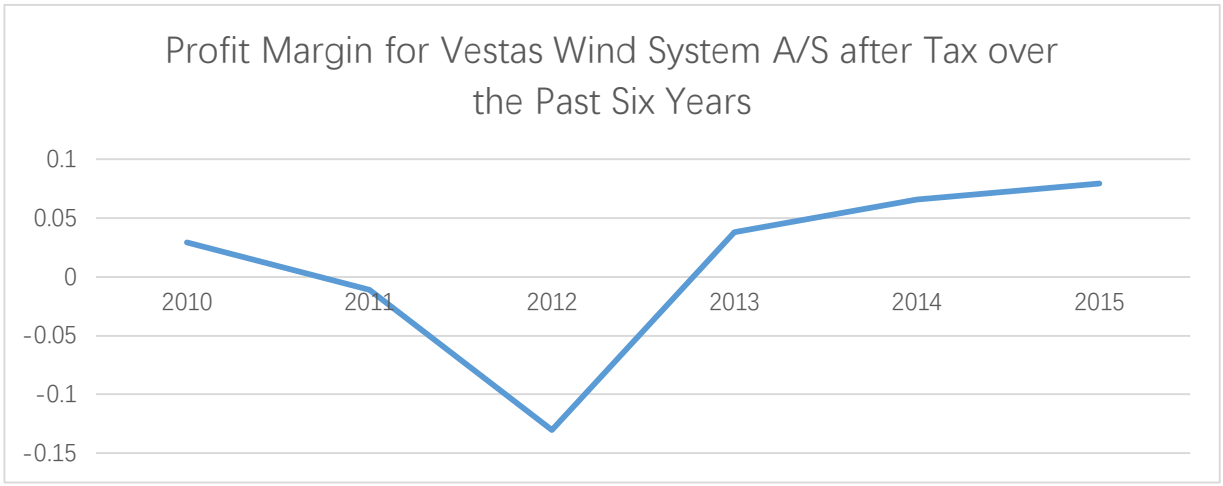

Figure 2, Source: Produced by author

From the chart above, one can see that though Vestas Group is generating satisfactory revenue, but the performance led Vestas Group to losses in year 2011 and 2012. This indicates that Vestas might have faced some kind of business dilemma during that period. This trend reflects fairly about what has happened during those two years. In Statutory report on corporate govenance (Vestas Group, 2012), it reported that Bent Erik Carlsten, Torsten Erik Rasmussen, Freddy Frandsen and Elly Smedegaard

Rex resigned as members of the Board of Directors which was a big news during that time. According to the report from Jyllands-Posten on April 16, 2012, two local Chinese wind turbines magnates Goldwind Science & Technology Co., Ltd. and Sinnovel Wind Group Co., Ltd. started to show their interests of acquiring Vestas Group. This piece of news is even more astonishing. With a huge technological advantage, Vestas Group is showing the outside an impressions that their business is dying out without the support of external finance and the two companies who were intended to acquiring Vestas Group doesn't seems to be competing at the same level with Vestas Group at least during that period of time. This makes people concern that what is really going on with this wind turbine magnate and what has lead the company to this awkward situation. The phenomonon will be further discussed in the strategic analysis of Vestas.

As it entres 2013, though the revenue decreased, but it is the turning point when Vestas Group start to generate positive profit again. This brings hopes to Vestas Group and the turn around of business helped the company to keep the head above water. In the recent three years, the profit margin grows steadily. But according to the record of the growth of other companies which especially includes the Chinese companies it is still in doubt that whether this retrieve was fast enough. According to the report from Bloomberg New Energy Finance, in 2015, China for the first time topped an annual ranking of on shore wind turbines manufacture. Xinjiang Goldwind Science & Technology Co., Ltd. surpassed Vestas with 7.8 GW of capacity commissioned while Vestas Group is the second with 7.3 GW commissioned. This can be concluded that Vestas Group might have turned around the business, but still not turned around the whole market trend now and for the future.

Assets turnover is an important criteria to evaluate the ability for company to generate revenue per unit assets owned. The formula is:

$$\text{Assets Turnover} = \frac{Revenue}{Invested\ \ Capital}$$

Generally speaking, the value of assets turnover should be the larger the better. But in the case of Vestas Group, the situation is in doubt and the essence behind the phenomenon needs to be analyzed. The trend of assets turnover is shown below.

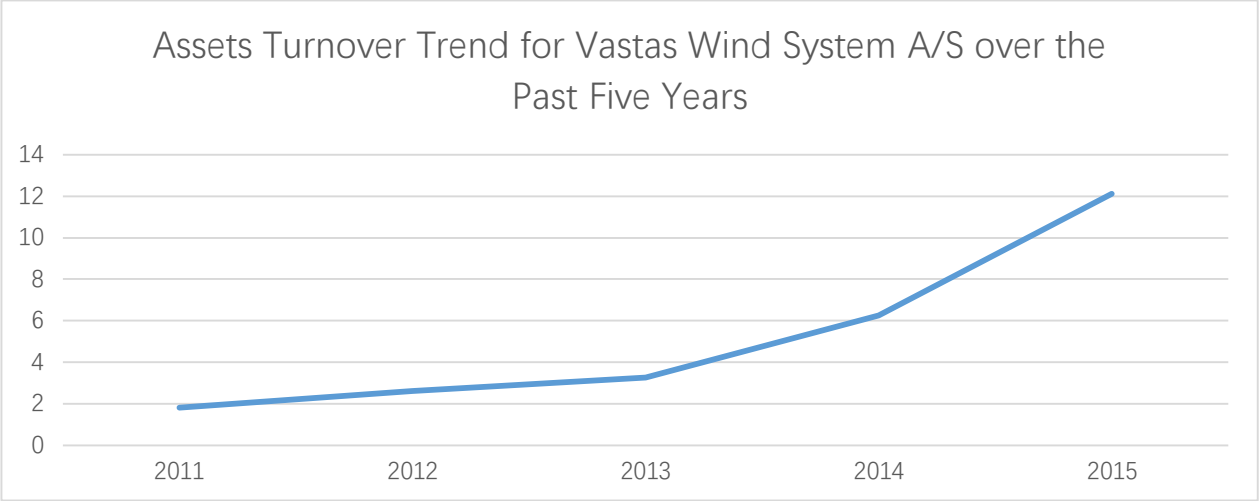

Figure 3, Source: Produced by author

It is clearly shown in the chart that the situation is getting improved continuously. But if looking at what assets turnover is consist of, then one can find not only revenue, but also invested capital. According to the analytical balance sheet presented in Appendix 5, which is prepared by the author, one will find that the invested capital of Vestas Group is in constant decline in the past six years, and the average declining rate is about 30 percent. This is pretty fast declining rate and by the end of 2015, the invested capital shrink by 85% compared with the number in 2010.

The optimistic guess of the reason is that the company can be more concise and more efficient to achieve a better performance by reducing the demand of invested capital. But the assumption should be that the market is close to saturation and business expansion is no longer needed. According to the report from the Renewable Energy called *"Wind Energy Setting Records, Growing Still: The Wind Energy Outlook for 2016"*, though it shows some steady market such as in Europe, but the drastic growth of wind power market in Asian area can not be overlooked. In 2014, the annual global installed wind energy capacity reached 51.4 GW, and among them, China installed 23 GW, which is almost half of the world capacity. As Sawyer predicts China will continue to dominant the world wind energy market in 2016, "China is looking at a market of about 25 GW per year for the next five years

at least"[8]. This raises the question behind this shrink of invested capital that whether this behavior is smart to be more efficient, or insufficient to capture new business opportunities.

Return on Invested Capital (ROIC)

ROIC interpret return from operating activities. The calculation is to use the average invested capital from the current year and one year past rather than only use the current year number. The formula is shown below:

$$\text{ROIC} = \frac{NOPAT}{Avg.Invested\ \ Capital}$$

The ROIC development trend is shown in the chart below.

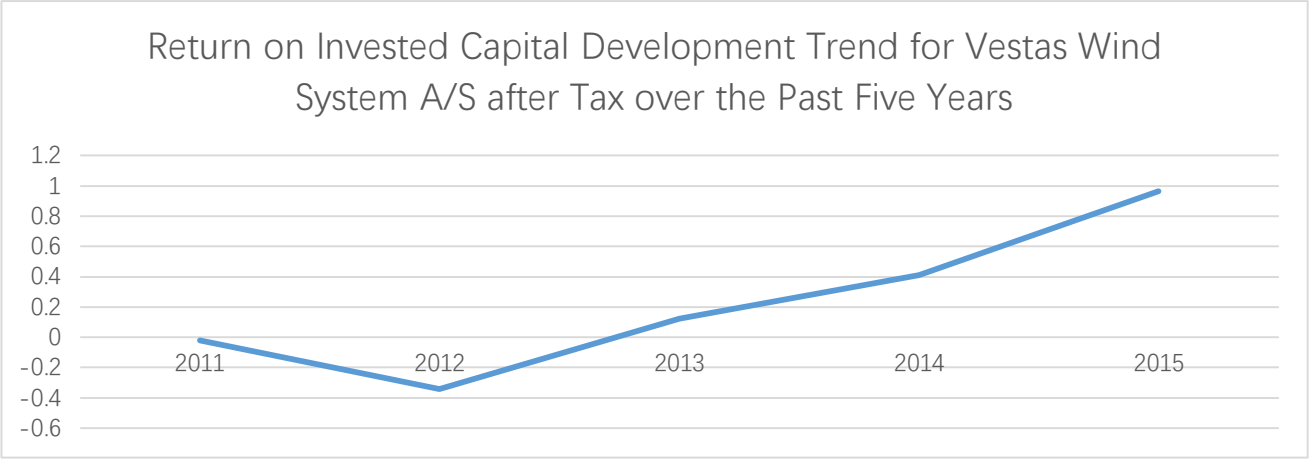

Figure 4, Source: Produced by author

The ROIC development shows a better trend than Profit Margin, as the increase of ROIC is faster than Profit Margin. This trend has shown that the company is becoming more and more efficient in using the invested capital but the same problem occurs to ROIC. As invested capital is decreasing so fast, it is still hard to judge whether Vestas Group can keep this fast improvement after there is no room to

[8] http://www.renewableenergyworld.com/articles/2016/02/wind-energy-setting-records-growing-still-the-wind-energy-outlook-for-2016.html

downsize the invested capital, or it will end up damaging the long-term interest of the company's development.

Financial Leverage & Return on Equity (ROE)

Financial Leverage is also an important indicator of the company's situation. It measures the ratio of Net Interest-Bearing Debt (NIBD) to Equity. In the calculation, both of numbers are using the average amount to make the value more at a fair level. The formula is:

$$\text{Financial Leverage} = \frac{Avg.NIBD}{Avg.Equity}$$

The development of Financial Leverage is shown below.

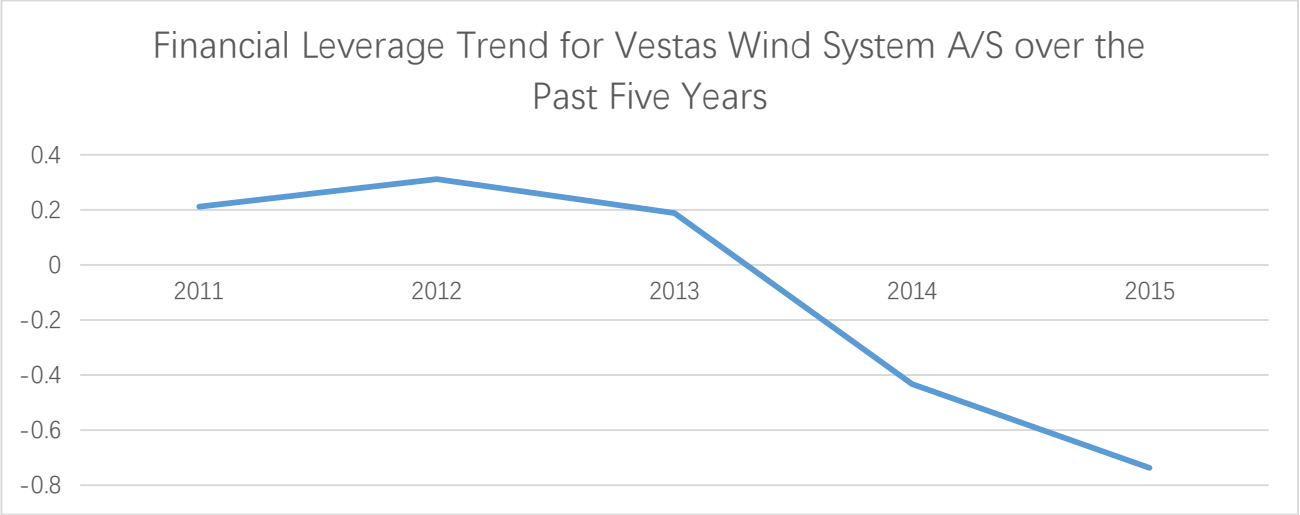

Figure 5, Source: Produced by author

As it can be see that the Financial Leverage is on a trend of decreasing over the recent years, which indicates that the company is using more equity financing rather than debt financing. As a matter of fact, the Financial Leverage is incredibly low and getting far smaller than 0. This makes people wonder what is the reason behind it.

If one looks at the Analytical Balance Sheet that author prepared in Appendix 5, it will be noted that the generation of negative NIBD is due to the fast increase of cash and cash equivalents. Vestas was accumulating cash even in 2012, which was almost the worst year when Vestas Group was

encountering problems. Though the business was turned around in common sense, but cash accumulation was never stopped.

It is interesting to discuss whether Vestas Group has run out business opportunities and satisfied with the cash accumulation, or they let the opportunities slipped and not being able to catch them. As the paper discussed above, there really are some business growing point, while Vestas Group is not only accumulating cash, but also shrinking their invested capital. When this clues come together, strategic consideration of Vestas Group becomes essential for the problem.

The trend of ROE is shown in below.

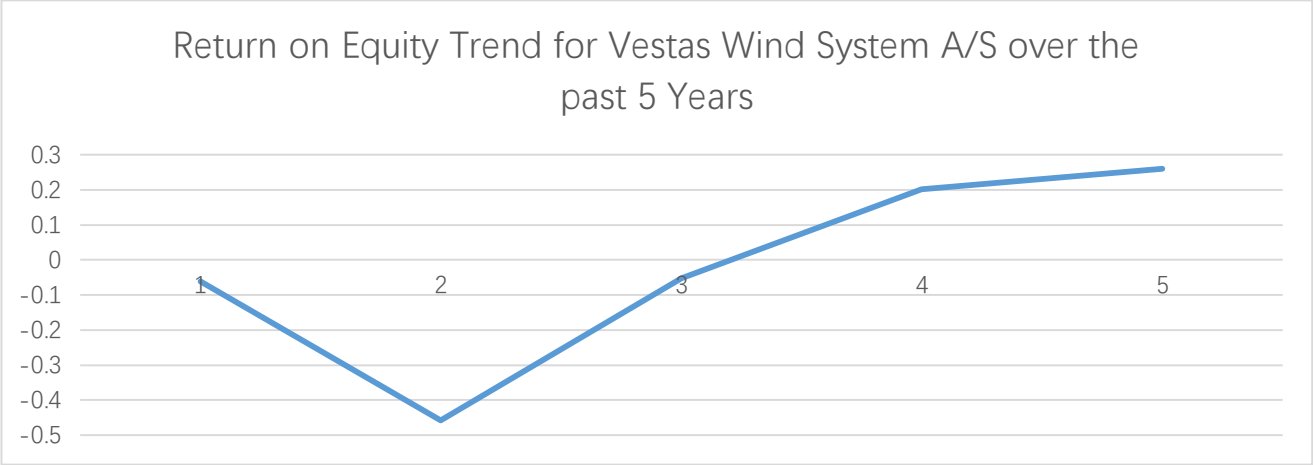

Figure 6, Source: Produced by author

There are two ways of calculating ROE and from which one can derive different insights. The first way to calculate ROE is:

$$\text{ROE} = \frac{NOPAT}{Avg.Equity}$$

From the chart of ROE, one can see that the trend is better reflection of Vestas Group's recent-year performance. From the balance sheet one can observe that unlike invested capital, the amount of total equity is not on the same trend of shrinking but was kept at a reasonable level over time.

And there is another way to computer the value of ROE:

$$\mathrm{ROE} = \mathrm{ROIC} + (\mathrm{ROIC} - \mathrm{NBC}) * \mathrm{Financial\ \ Leverage}$$

This reflect that the difference between ROE and ROIC is due to that the company has used financial leverage. This makes ROE constantly lower than ROIC. When Vestas Group introduced a negative financial leverage, the difference got much bigger. So to some extent, ROE offset some bias disturbance from invest capital disposals and cash accumulation, reflect more fairly that the improvement of Vestas Group's performance is not that optimistic as what ROIC has shown.

Sub-conclusion:

The profitability analysis of Vestas Group has analyzed the historical performance of Vestas Group for the past 5 to 6 years. Vestas Group is in no doubt on that they were in a great business dilemma in 2011 and 2012 and they were even in the danger of being acquired. From the analysis one can see that though Vestas Group has earned a pretty good performance in the recent time, but the problem which happened in 2011 and 2012 which almost led them into a catastrophe is still in doubt about whether it is fully solved.

Though some of the key ratios shows a pretty optimistic turn-around performance, but from concrete analysis, one can observe that the improvements of these key ratios are not fully depend on an outstanding performance. The problems of shrink on invested capital and accumulation of cash is revealed. This doesn't only mean the change of two numbers, but it indicates potential strategic weakness of Vestas and the incapability of capture new business opportunities. In short term, the strategy for Vestas to overturn the business might seem to be effective, but the long-term vision might be damaged presumes that there is no strategic adjustment.

Budgets and Forecasts

According to the problem formulation, the thesis will prepare two sets of forecasts. One is based on the basic recommendation from Vestas Group, and the other is based on the strategic adjustment. While the homepage of Vestas has given some hints of outlook in 2016, the foundation for Vestas Group to present the targets need to be discussed and necessary adjustment will be made for

forecasting use. The forecast will be based on a 10 years' time span.

Income Statement Forecast

In this part of the report, a set of items from income statement will be forecasted. The key items include revenue growth, EBIT margin, tax rate and special items. The forecast will be based on both historical data and the rationality of reality. The forecasted income statement will be shown in Appendix 7.

Revenue Growth Forecast

The first step of forecasting the income statement is to decide the rate of revenue growth. According to the historical data, the average revenue growth rate is about 5.55% for the past five years. This average contains both up and down period of Vestas Group where they had serious problem during 2011 and 2012 as well as where they and rebooted business profitability.

When looking at the outlook data that is made by Vestas Group for 2016, one can see that the sales target is set to minimum 9 billion euro. Regarding this information, one can calculate that the sales growth target is about to be 6.85%. This ratio make sense concerning the recent improving performance of Vestas Group and an enhancement of sales growth rate is within the expectation.

Though the prospect of sales growth can be evaluated to be minimum 6.58%, which means that the number can be even higher, but considering from the long-term perspective, the improvement of growth rate can not rise forever. Due to the great potential of the world wind turbines market for the future years and the efficiency improvement of Vestas Group, the sales growth can be deemed as sustainable. As business will inevitably face some depressing period, the forecasted number shouldn't be too optimistic either. The growth rate target is supposed to be decided based on the current Vestas's strategy. Due to these considerations, a sales growth rate of 6.58 is decided for the forecasted period.

EBIT Margin Forecast

When calculating the EBIT margin for the past five years, the ratio is around 0.02 after the average is

taken. The result reflects both good and bad period and the ratio should be representative for the long run. But if looking at the whole period, under the current strategy, the ratio may not be able to fully reflect the whole picture. As Vestas Group has faced survival problems in 2011 and 2012 mainly, there was a series of strategic adjustments and top management changes being executed.

By looking at the years of performance after the business dilemma for Vestas Group in 2011 and 2012, on can observe that the EBIT margin is gradually improved. This improvement is not considered to be continuing forever. In 2015, the number of EBIT margin of Vestas Group was 0.108. The expectation of the increase of EBIT margin is that it will be slowing down gradually and finally reach a steady point. According to the outlook number in 2016 of Vestas, the EBIT margin is 11%, which is pretty close to the number in 2015. It is reasonable to assume that the room for improve EBIT margin in the future becomes very limited.

As the EBIT margin outlook in 2016 is been decided under certain scenario, namely under the certain strategy, the estimate for future performance is more reliable based on that. Though the long-term number will contain both good and bad time, due to the fact that it will involve strategic adjustment, the assumption for future forecast will be decided as 11%.

Tax Rate

When looking at corporate tax table, the corporate tax rate in Denmark was 25% and decreased a little bit in 2014 and 2015, which were 24.5% and 23.5% respectively[9]. But as Vestas Group is an international company and the business is all across the world, the real effective tax rate will be different from corporate tax rate.

By calculating the long-term tax rate of the past 5 years, the average effective tax rate calculated turns out to be positive. The reason behind this is because that from 2011 to 2013, Vestas Group faced negative profits. As this very unrealistic, so the author decides to take the average of the last two years where Vestas Group started turning around the business and generating positive profits. The result

[9] https://home.kpmg.com/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html

calculated is 25.5% that is decided to be the final estimate of effective tax rate.

Special Items

Special items will be decided as no values in the future forecast. As the objective of the analysis is to forecast the financial statement while not assessing management's performance, the importance of estimates special items is very low. (C.V. Petersen & T. Plenborg 2012) According to what is explained in financial report of Vestas Group, special items comprise costs and income of a special or non-recurring nature in relation to the main activities of the Group (Vestas Group, 2015). Because of this explanation, special items will not be forecast in value in this analysis. But due to the fact that historical special items does have a significant value, one should bear in mind that management performance may have the possibility to make impact on the result of Vestas Group valuation.

Balance Sheet Forecast

The most important issue to verified in the balance sheet forecasting is about Vestas Group's strategic shrinking in invested capital and accumulation in cash. These two things are important because they are probably the reason behind Vestas Group's turning around of business, though it is suspected that the behavior will sacrifice long-term gain by seeking short-term benefits. The forecasted balance sheet will be shown in Appendix 7.

Cash and Cash Equivalents

One highlight of the balance sheet forecast is about cash and cash equivalents. As it was discussed in the previous part of the report, Vestas is very likely to keep on accumulating cash while shrinking on invested capital. This phenomenon needs to be reflected in the balance sheet forecast as part of interest-bearing assets.

Since cash accumulation is only the recent phenomenon after Vestas Group is getting out of business troubles from 2011 to 2013, the forecast will overlook the time period where the company has not adjusted the strategy. Though it can be expected that the cash will be accumulating and fast based on the current strategy, it is not likely to be kept too high for long period of time. Due to this reason, cash

is forecasted based on the average record and the accumulation effect is reflected in the paper as well. Due to the fact that Vestas Group is shrinking in invested capital and saving cash at the same time, cash and cash equivalents is calculated as a percentage of invested capital.

Net Interest-Bearing Debt

The other important part of balance sheet forecast is about the net interest-bearing debt. The effect is triggered by the accumulation of cash, and thus, the net interest-bearing debt becomes negative. As it is showed in the historical financial statements (Appendix 1), Vestas Group started to generate negative net interest-bearing debt from 2013 when the company was still making negative profit (though well better than the past two years), and the situation is not only continued but also enlarged in the following years. This is considered as an important part of indication of strategic adjustment.

The net interest-bearing debt is related to invested capital as cash and cash equivalents due to the same reason behind. The forecasting estimates was using a long-term average due to that the net-interest-bearing debt is getting too unrealistically low. By doing this, the negative trend of net interest-bearing debt will still be reflected.

Invested Capital

The invested capital is calculated by using total equity subtract non-interest-bearing debt and interest-bearing assets. The result shows that the invested capital is expected to come back at a reasonable level. Under all the forecasting assumptions, invested capital wasn't fully corresponding the trend for the latest three years, which indicate that the shrinking in invested capital may just due to the company was in a strategic adjusting period. The invested capital will finally grow and reach a reasonable amount.

Free Cash Flow Forecast

The free cash flow is calculated by using the following formula:

$$\mathrm{FCF} = \mathrm{NOPAT} - \Delta\mathrm{Invested\ \ Capital}$$

Under the current assumption in the forecast, the first year of the free cash flow will be negative due to an increase of invested capital, and the following years will grow steadily. This reflects that the expectation of Vestas will achieve positive performance in the future years, and the good prospect of wind turbines market will back this outcome up.

Cost of Capital

For doing the valuation, there is another parameter that needs to be calculated, namely, the weighted average cost of capital (WACC). This input shows a weighted required rate of return for equity and debt respectively. The formula for WACC calculation is shown below:

$$\text{WACC} = R_e * \frac{Equity}{IC} + R_d * \frac{NIBD}{IC}$$

Where

WACC = Weighted Average Cost of Capital

R_e = Required Rate of Return from Equity

R_d = Required Rate of Return from debt

IC = Invested Capital

NIBD = Net Interest-Bearing Debt

Required Rate of Return from Equity

The required rate of return interprets that the shareholder's demand of return from their investment in the company. The calculation is based on Capital Asset Pricing Model (CAPM) and the formula is shown below:

$$r_e = r_f + \beta * [E(r_m) - r_f]$$

Where

r_e = Required Rate of Return on Equity

r_f = Risk Free Rate

β= Beta of Vestas Group

$E(r_m)$ = Expected Market Return

The CAPM model explains what is the rate of return for a specific investment adding the return without taking any risks. The return for Vestas Group is reflected by the market premium times Beta which indicates the market risk of Vestas Group.

The risk free rate can be estimated by long-term government bond. As Vestas Group is a Danish firm, a 10-year Danish government bonds will be used to estimate the return for not taking the risks. Noted that is not realistic for any kind of investment to not taking any risks. But it is considered as almost risk free for safe bond from the Danish government and a 10-year time span is good enough to do the estimation.

In the Appendix 9, a 10-year Danish government bond historical yield graph is obtained. The graph shows that the value of the bond at the end of year 2015 was about 0.98%. Though the number is at a historical low point, but the yield trend is still on the way down. It is hard to judge what it is going to be in the future and it is also meaningless to take the average of the year in order to pull up the number. So 0.98% will be used directly as risk free rate in the valuation process.

The next step is to calculate Beta value. As the author will be calculating Beta from the raw data, the formula is shown below:

$$\beta = \frac{Cov(r_v, r_m)}{Var(r_m)}$$

In order to do the calculation, historical returns for Vestas and market index will be obtained respectively. As that Vestas Group is a Danish company, the author decides to take 5-year monthly market price starting from 3rd, Jan 2011 until 1st, Dec 2015 for both Vestas and OMX COPENHAGEN 20 CAP. Though that Vestas Group is an international company as well, the Danish market is being considered moving together with the global market, as the power for Danish market to isolate the global influence is weak. The numbers are obtained from Yahoo Finance.

After the market prices were exported, the monthly returns are calculated. Beta value is finally obtained as about 0.7885. This indicates that the share price of Vestas Group is not more violated than the market. Namely, the systematic risk of Vestas Group is not very high.

$E(r_m)$-r_f is known as market risk premium. According to the analysis from Value Walk, the market risk premium in Denmark was 5.5% in 2015 on average[10]. As all inputs are ready for use, the required return for equity is calculated as about 5.3168%.

Required Return from Debt

The required return from the debt is very largely influenced by the ability for the company to borrow money in order to support the business activities. To put it in short, it tells that how to estimate the interest rate on debt. The formula is shown below:

$$r_d = (r_f + r_v) * (1 - t)$$

Where

r_d = Required Rate of Return on Debt

r_f = Risk Free Rate

r_v = Credit Spread (Risk Premium on Debt)

t = Effective Corporate Tax Rate

With regard of what is put in the Vestas's annual report, Vestas Group was able to issue a green corporate Eurobond with a nominal value of 500 million in Euro with an interest rate of 2.75. By using this information, the credit spread will be obtained by using the newly developed interest rate minus the 10-year Danish government bond that is 0.0177.

According to the original formula, the tax rate is settled to be corporate tax rate. By reading the

[10] http://www.valuewalk.com/2015/05/market-risk-premium-risk-free-rate-used-for-41-countries-in-2015/

information published by KPMG, the corporate tax rate in Denmark is 23.5 in 2015[11]. But in this report, the effective corporate tax rate will be used. As Vestas Group is an international company and is facing different corporate tax rate from different countries, corporate tax rate can not accurately evaluate what is the true payment for tax. Since the effective corporate tax rate is a weighted average of the group's different corporate tax rate the effective corporate tax rate that is used in forecast will be carried forward (C.V. Petersen & T. Plenborg 2012).

By taking out tax effect from the real interest that Vestas Group can obtain, the final required rate from debt is about 2.05%. The number will be used together with the required rate of return for WACC calculation.

WACC Calculation

As the report is assumed a consistent strategy, the capital structure will not be changed under the basic idea. But due to the fact that Vestas group is keeping a negative NIBD, the required weighted return from the debt side will turn out to be negative. This means that Vestas is able to use the cash to pay off all interest bearing debt and the surplus of cash will help the company generate positive financial income.

With all numbers variables ready for calculation, the WACC is finally done with a number of 8.93%. Because the capital structure, under the basic assumption, will never be changed, the value of WACC will not fluctuate either in the forecasted period.

Sustainable Growth Rate (g)

The sustainable growth rate is understood as the growth rate which is sustainable for long-term. In this sense, it is not possible to use short period of data to estimate g. Theoretically speaking, g value should contain both good and bad time. By looking at the five-year of historical data, the estimation of g will be more accountable. The formula of g is shown below:

[11] https://home.kpmg.com/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html

$$g = \left[ROIC + (ROIC - NBC) * \frac{NIBD}{E}\right] * Minority \;\; Interest \;\; Share * (1 - PO)$$

Where

g = Sustainable Growth Rate

ROIC = Return on Invested Capital after Tax (based on the beginning of the year balance sheet)

NBC = Net Borrowing Cost after Tax in Percent (based on the beginning of the year balance sheet)

NIBD = Net Interest-Bearing Debt

E = Equity

PO = Payout Ratio (Dividend as a Percentage of Net Profit)

As it can be seen from the formula, the sustainable growth rate is consisting of return on equity (ROE) with a payout ratio.

From the calculation for the past five years according to the formula given above, the value that obtained is about -0.12. This means that for the past five years, Vestas Group has faced a negative growth. This number is questioned, as if Vestas Group keeps this growth rate, it will finally reach bankruptcy in the end. But the result is quite understandable, as Vestas Group has faced a real hard time among the past five years.

Though the business prospect is getting much better, but from a long-term consideration, it is still hard to judge whether there will be a sustainable growth. As it is mentioned that Vestas Group is accumulating cash while shrinking in invested capital, facing decreased revenue situation in Asian market when Asian market is with the biggest potential, it is still hard to say that whether Vestas has striven for short-term turn around while damage the long-term goal. For all consideration above, the g value will temporarily set to 0.

Valuation

In this part of the report, the valuation will finally be conducted. There are two valuation models used

in this section due to different perspective that the company has taken. The two model selected are Discounted Cash Flow (DCF) Model and Economic Value Added (EVA) Model. Though the two models are supposed to generate matching result, but they both have strength and weakness. The valuation is expected to provide a true and fair value for the company and using both models will provide a better view in the process.

Valuation Models

It is important to decide which models to use in the valuation process and the reasons behind it. There are pros and cons for each of them. As DCF model and EVA model are selected in this report, they will be discussed in this section for comparison purpose.

DCF Models VS. EVA Model

It is argued that EVA model is a modified version of a standard DCF formula, within a mathematical structure, which lead those two models provide identical results. The two models are both net present value (NPV) based models, and they both provide concrete estimation of the share price.

The two models are very much depending on the assumption that is made during the forecasting process, and marginal change of the assumptions will have an essential influence upon the final valuation outcome. The two models are very sensitive to the growth rate, discount rate and Beta as well while the impact will be discussed later in the sensitively analysis in the later chapter.

The two models are both depend too much on the terminal value as well but EVA shows much better performance from this regards. In this report, the terminal value of DCF model occupies 78.4% of the total estimated value in the valuation, while EVA models is with the proportion of 33.9%.

As beta value always fluctuate, this makes the models look like ignoring the change of future market conditions. And due the that the models are with a static nature, they lose the flexibility of adjusting the accounting policies changing over time, changing in cash flow structure and so on.

For DCF model specifically, it relies on the actual free cash flow instead of book income. That makes the result more trustworthy and make it possible for investors to track the money left over. By analyze

deeper into the DCF model, one can also identify where does the value of the firm actually generate from.

For EVA model specifically, it can show explicitly that whether the company is trading below or above the book value of the invested capital. When the present value of expected EVAS is positive, the estimated market value of a company will be above the book value, and vice versa (C.V. Petersen & T. Plenborg 2012). This can help better understand what is really happening in the forecast period, namely, whether the company was building up value or destroying value.

Calculation of DCF Model

There are two ways to se DCF Models. One is to use enterprise value approach, and the other I s to use equity value approach. The difference depends on that whether free cash flow to the firm or free cash flow to equity is used. In this report, the enterprise value approach is used.

The DCF model can be specified as a two-stage model that includes the present value from forecasted period plus a terminal value. With this logic, the formula is presented below:

$$MV_0 = \sum_{t=1}^{n} \frac{FCFF_t}{(1+WACC)^t} + \frac{FCFF_{n+1}}{WACC - g} * \frac{1}{(1+WACC)^n} - NIBD_0$$

Where

MV_0 = Market Value of Equity

$FCFF_t$ = Free Cash Flow to the Firm

WACC = Average Cost of Capital

g = Sustained Growth Rate

$NIBD_0$ = Net Interest-Bearing Debt (t=0)

In the first stage of the calculation, the free cash flow to the firm will be discounted to the present value based on the discount factors that are derived from WACC. After the values for forecasted horizon are obtained, the terminal value is calculated based on the second part of the formula. The

enterprise value is calculated as 10656.97 Euro.

As the model is using the enterprise value approach, the net interest-bearing debt needs to be deducted. By taking the average of total number of shares, the final value of market price is 58.15 Euro.

Due to the fact that Vestas is listed on the Copenhagen Stock Exchange market, the number of the market price will be converted into Danish DKK. The exchange rate is taken on 31st, Dec. 2015 which is the last day in 2015 and value obtained is that 1 Euro = 7.46379 DKK[12].

The DCF valuation table is presented below:

DCF Valuation of Vestas Wind System A/S (mEUR)											
Year	*E2016*	*E2017*	*E2018*	*E2019*	*E2020*	*E2021*	*E2022*	*E2023*	*E2024*	*E2025*	*TV*
FCFF	-585.94	645.13	689.32	736.54	787.00	840.91	898.52	960.07	1025.83	1096.11	1399.18
WACC	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Discount factor	0.92	0.84	0.77	0.71	0.65	0.60	0.55	0.50	0.46	0.43	
Present value, FCFF	-537.90	543.68	533.29	523.11	513.11	503.31	493.70	484.26	475.01	465.94	
Present value of FCFF in forecast horizon	3997.52										
Present value of FCFF in terminal period	6659.46										
Estimated enterprise value	10656.97										
Net interest-bearing debt	2373.00										
Estimated market value of equity	13030										
Outstanding shares	224074513										
Market price (in Euro)	58.15										
Market price (in DKK)	434.02										

Table 1, Source: Produced by author

Calculation of EVA Model

The EVA model can be specified as a three-stage model. The model contains the present value of

[12] http://eur.fxexchangerate.com/dkk-2015_12_31-exchange-rates-history.html

EVAs from the forecasted horizon and the present value from terminal period. In addition, the valuation needs to add the invested capital from the last fiscal year. The formula for EVA model is set out below:

$$MV_0 = IC_0 + \sum_{t=1}^{n} \frac{EVA_t}{(1+WACC)^t} + \frac{EVA_{n+1}}{WACC - g} * \frac{1}{(1+WACC)^n} - NIBD_0$$

Where

MV_0 = Market Value of Equity

IC_0 = Invested Capital from the last fiscal year

EVA_t = Economic Value Added

WACC = Average Cost of Capital

g = Sustained Growth Rate

$NIBD_0$ = Net Interest-Bearing Debt (t=0)

The first step to calculate the EVA model is to obtain EVA value for each year. The formula to do EVA is:

$$EVA_t = NOPAT_t - WACC * Invested\ \ Capital_{t-1}$$

After the EVAs are calculated, they will be discounted back to the present value by using the discounted factors derived from WACC as well. The sum of present values of EVA will add terminal value as well as the invested capital from the last year to get the enterprise value that is equal to 10656.97 Euro. The result is identical to what is fetched from DCF model. The table of EVA model is presented below:

EVA Valuation of Vestas Wind System A/S (mEUR)											
Year	*E2016*	*E2017*	*E2018*	*E2019*	*E2020*	*E2021*	*E2022*	*E2023*	*E2024*	*E2025*	*TV*
NOPAT	721.30	770.71	823.51	879.92	940.20	1004.60	1073.42	1146.95	1225.52	1309.48	1399.18
Invested capital, beginning of period	526.00	1833.24	1958.82	2093.00	2236.38	2389.58	2553.27	2728.18	2915.07	3114.76	3328.13
WACC	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Cost of capital	46.98	163.73	174.95	186.93	199.74	213.42	228.04	243.66	260.35	278.19	297.24
EVA	674.32	606.98	648.56	692.99	740.46	791.19	845.38	903.29	965.17	1031.29	1101.94
Discount factor	0.92	0.84	0.77	0.71	0.65	0.60	0.55	0.50	0.46	0.43	
Present value of EVA	619.03	511.53	501.76	492.17	482.77	473.55	464.50	455.63	446.92	438.39	
Invested capital, beginning of period	526.00										
Present value of EVA in forecast horizon	4886.25										
Present value of EVA in terminal period	5244.72										
Estimated enterprise value	10656.97										
Net interest-bearing debt	2373.00										
Estimated market value of equity	13029.97										
Outstanding shares	224074513										
Market price (in Euro)	58.15										
Market price (in DKK)	434.02										

Table 2, Source: Produced by author

Discussion of the Results from DCF and EVA Models

By looking at the historical price for Vestas Group, the share value on 31st, Dec 2015 was 476.78 DKK[13]. This is about 30% higher than the valuation results from the valuation models. But when observe the price half month later, the price drop to 402.97. It is hard to judge whether is there some

[13] http://finance.yahoo.com/q/hp?s=VWS.CO&a=04&b=10&c=2015&d=02&e=31&f=2016&g=d

really value change of Vestas group in this short period of time, but the feature of market price for not being perfect efficient make the absolute value of Vestas Group controversial.

But on average, the market price is still above the price of the valuation results. This indicates that the price of Vestas Group in the market is to some extent overvalued. This may reflect the recent years of positive performance from Vestas Group and this performance is supposed to be consistent for a certain period of time. Market potential can also be a factor to influence this overvaluing issue.

The good prospect of the company has provided positive bonus for the market price of the firm. But it is still the problem that whether this good prospect is correct information. As it is questioned whether the company is on a way of a healthy growth, namely, no to grow by sacrificing the long-term interest, this overvalue issue is very likely to take place in this case.

Sensitivity Analysis

Though the final outcome of valuation is proved not to deviate too much from the actual market value, but the assumptions made during the valuation process is still essential for the accuracy of the result. With this concern, a set of sensitivity analysis is made. In this report, the sensitivity related to g, WACC as well as Beta value would be discussed.

Sensitivity Related to WACC and g

In the valuation of this report, the market price of Vestas Group obtained is 434.02 in Danish DKK with a WACC that is calculated as around 8.93 with a sustainable growth rate assumed as 0. In the sensitivity, the interval of difference for g is set to be 0.5% while it is 1% for WACC. The analysis table is shown below:

		g									
		-2.00%	-1.50%	-1.00%	-0.50%	0.00%	0.50%	1.00%	1.50%	2.00%	2.50%
WACC	4.93%	498.03	520.25	546.22	576.97	613.96	659.29	716.15	789.59	888.08	1027.08
	5.93%	461.99	478.80	498.03	520.25	546.22	576.97	613.96	659.29	716.15	789.59
	6.93%	434.02	447.18	461.99	478.80	498.03	520.25	546.22	576.97	613.96	659.29
	7.93%	411.69	422.26	434.02	447.18	461.99	478.80	498.03	520.25	546.22	576.97
	8.93%	393.44	402.12	411.69	422.26	434.02	447.18	461.99	478.80	498.03	520.25
	9.93%	378.25	385.51	393.44	402.12	411.69	422.26	434.02	447.18	461.99	478.80
	10.93%	365.40	371.57	378.25	385.51	393.44	402.12	411.69	422.26	434.02	447.18
	11.93%	354.41	359.70	365.40	371.57	378.25	385.51	393.44	402.12	411.69	422.26
	12.93%	344.88	349.48	354.41	359.70	365.40	371.57	378.25	385.51	393.44	402.12

Table 3, Source: Produced by author

As it is shown in the result, for 0.5% of change in g presume a current value of WACC, the value of the firm doesn't change by much comparing to the price fluctuation for Vestas Group in a short period of time. The point is that though the sustainable growth is set to be 0, the company may still have a chance to obtain a steady growth rate in the future once the strategy reform was done. The assumption was made base on the historical long-term average, but the sensitivity analysis proves that the error of g will not trigger catastrophic consequence towards the analysis result.

The other variable is about WACC. By looking at the table, 1% change of WACC will lead to higher fluctuation of market price compare to 5% of g. But still that marginal change of WACC will not distort the valuation outcome to an unreasonable range. But as Vestas group process really high amount of negative NIBD, by using the universal interest rate will have a higher risk of being inaccurate due to that the information is lacking about how Vestas Group is dealing with these surplus amount of cash. Since the sensitivity regarding WACC is not very high, and a different judgement may also get the valuation result closer to the really market expectation, the valuation can be deemed as reasonable and accountable.

Sensitivity Related to Beta

The other variable to test the sensitivity is Beta value. Beta reflects the systematic market risk and the

accuracy of Beta estimation will also have apparent impact on the outcome of valuation. The sensitivity table related to Beta is shown below:

		g									
Beta	WACC	-2.00%	-1.50%	-1.00%	-0.50%	0.00%	0.50%	1.00%	1.50%	2.00%	2.50%
0.59	6.78%	437.79	451.40	466.77	484.25	504.31	527.56	554.83	587.26	626.48	674.85
0.64	7.32%	424.78	436.83	450.33	465.56	482.87	502.71	525.70	552.64	584.64	623.28
0.69	7.86%	413.19	423.94	435.89	449.27	464.36	481.50	501.14	523.86	550.47	582.05
0.74	8.39%	402.81	412.44	423.10	434.95	448.22	463.17	480.14	499.58	522.05	548.34
0.79	8.93%	393.44	402.13	411.69	422.26	434.02	447.18	461.99	478.80	498.03	520.26
0.84	9.47%	384.95	392.82	401.45	410.94	421.44	433.10	446.15	460.83	477.47	496.51
0.89	10.01%	377.22	384.39	392.21	400.78	410.20	420.62	432.19	445.12	459.67	476.16
0.94	10.54%	370.15	376.71	383.83	391.60	400.11	409.47	419.80	431.28	444.11	458.52
0.99	11.08%	363.66	369.68	376.20	383.28	391.00	399.45	408.74	419.00	430.39	443.10

Table 4, Source: Produced by author

There is a lot of ways to derive Beta by using different market index. But in this report, as regard Vestas Group to be a Danish firm, the calculation of Beta is decided to be comparing with the Copenhagen Stock Exchange market. Though the calculation has taken fairly long period, but inconsistency will inevitably happen when using another market index as comparison

From the table above, one can see that for 0.05 of change in Beta value, the value in WACC will change about 0.05%. This indicates that the influence of Beta value will not be as strong as WACC. In another word, as WACC will not have too big impact on the valuation when marginal error occurred, if there is not too much value change in evaluation Beta, comparing with different market index will not be too big problem to influence the accuracy of valuation.

Sub-conclusion:

The first valuation made is based on the basic assumption that Vestas Group will have a constant strategy that is analyzed based on the current historical performance. This is the reason that there is no fluctuation in the change of different assumption values. The purpose for doing this is to find how much Vestas Group worth, and comparing the value with the valuation result from the strategy adjusted version, one will see that what can actually be improved at the strategic level, especially for

the long-term interest.

In the valuation, the assumptions are made to the best in order to reflect the trend of Vestas Group's current performance. First of all, revenue growth and EBIT margin forecasting are in accordance with the outlook in 2016 that is made by Vestas Group. The reason for doing it is that the target set is achievable according to the analysis while matching the company's current strategy. Tax rate is decided based on the last two years of performance because Vestas has faced serious loss, and the effective tax rate are complicated to trace from different geographical operating sectors. Cash issue is still very important in this situation, and it lead directly to a negative NIBD. Though invested capital was on a trend shrinking, but it is obvious that they will not shirking at the current rate forever. If do, they will lose all of the invested capital in the short run which is very unrealistic considering the nature of the business.

The value obtained in the end is lower than the value from the last day in 2015. But the fast drop of the price in the following half month makes it questionable that whether the recorded price can reflect the true value of the firm. Even so, the market price is still higher than the valuation result on average, which indicate that the company may have a better prospect due to both market potentials as well as the recent turning-around performance of Vestas.

Finally, two sensitivity analysis related to g, WACC and Beta was made to test the influence of the change in these values. The result shows that though there are some possibilities for obtaining different results for these values, the impact on the valuation result is not too notable. This to some extent brings accountability to the valuation work.

PEEST Analysis

In order to analyze the strategic environment at the macro level, PEEST analysis is introduced in this part of the report. The analysis will be related to Political/Legal, Economic, Environmental, Social and Technological factors. The macro environment will have strong impact on the prospect of Vestas Group, as the industry has a huge dependence on it.

In the analysis, it will not only outline the relevant factor that influence the business of Vestas Group, but will also mention the compatibility of the current strategy of Vestas Group comparing with the macro environment. By doing this, the assumption of the second valuation may be changed by doing the strategic adjustment based on the analysis.

Political/Legal Factors

Political issue is essential to wind turbines business. As wind turbine is a matter of building wind power to a local area, this can be directly affected by some national strategies regarding the clean and renewable power. Base on the fact that political issue is geographically related, in this part of analysis, the discussions will be directly related to geographical markets. According to what Vestas Group has divide different market (Vestas Group, 2015), there are five regions that will be discussed, which are Europe, Middle East, Africa, America, and Asia Pacific.

European Market

In 2014, the European Union set a legally binding target to 2030 of at least 27% renewable energy in final energy consumption at European level. This will be translated as that there will be 46% - 49% of electricity generated by renewable power according to European Commission. Among the target, wind energy is supposed to take the share of at least 21%, which is a pretty big growth potential (EWEA 2015). In year 2015, the wind power capacity increase by 13 GW, which was 44% of all new power[14]. This growth can be sustaining, and it also reflects the support from the political level for all European countries.

Despite the general top-level design from the EU level, European countries hold their own supportive schemes toward wind power. Germany as the typical reprehensive in Europe, a series of KfW supportive schemes are carried out in order to support the developments of renewable energy. Except for indirect energy programs that can benefit wind business such as KfW Renewable Energies Program, KfW Energy Efficiency Program and so forth, a direct supportive program called KfW

[14] http://www.ewea.org/press-releases/detail/2016/02/09/wind-adds-13gw-new-capacity-in-2015-44-percent-of-all-new-power/

Offshore Wind Energy Program is also implemented. All project companies investing in the German EEZ or in the 12 nautical mile zone of the North Sea and the Baltic Sea will have the right to apply for a maximum funding of 5 billion Euro (KPMG 2015).

It is not surprisingly to find that Denmark is on the top rank of the world capacity per capita (REN 21, 2015). After the Danish Parliament adopted a historically broad and ambitious Energy Agreement on the development of the Danish energy supply which targeting to build a wind power supplying system that would fulfill 50% of Danish electricity consumption by 2020, Denmark started to accelerate the process of building more efficient turbines. Denmark was striving to be a leading showcase for new wind turbines technology and the integration of wind power into electricity system[15]. There are some special support schemes from Danish government[16]. According to the memo of support scheme for new electricity producing unites in Denmark, for new wind turbines on land or at sea a price premium of 25 øre/kWh for 22000 full load hours will be provided. There will also be an additional 2.3 øre/kWh in the entire lifetime of the turbine to compensate for the cost of balancing. For household wind turbines, private wind turbines below 25kw, which are connected to the installation in the home of owner, will receive a fixed feed in tariff of 60 øre/kWh. Though they are not the whole picture for the Danish governmental support for wind energy development, the policies carried out must be considered as beneficial and effective.

There is also a lot of European countries carry out rules in order to support renewable energy development, but generally speaking, the situation in Eastern Europe is not as optimistic as it was estimated 5 years ago. Though the Russia market seems promising, but the political situation became worsen as a result of dispute with Ukraine[17]. Though it is commented that Poland market has a good potential, but Eastern Europe has a huge decrease in total installation of EU market from 16% in 2013 to 7.1% in 2014. This is due to retroactive legislative changes in Romania and uncertainty on the impact of the Renewable Energy Sources Act on the support system and renewable market in Poland

[15] http://www.windpower.org/en/policy.html

[16] http://www.ens.dk/en/supply/electricity/conditions-production-plants/subsidies-generation-electricity

[17] http://www.windpowermonthly.com/article/1314228/windenergy-2014-ge-keeps-focus-eastern-europe

(EWEA 2015).

Middle East Market

Middle East is a region with abundant amount of oil and natural gas. But the problem for it is that the resources are unevenly distributed and creates the major oil exporter and importer in the region. The increasing population in Middle East and the increasing demand of natural resources has encouraged the governments to come up with solutions about alternative power resources (M.K. Halou 2012).

The growth in Iran is very promising. In order to improve energy security, reduce internal dependence on hydrocarbons and meet the projected growth in electricity demand, Iranian policymakers have made a lot of endeavors regarding developing renewable energy. Iran boasts a young and educated populace who are not capable of acquiring renewable technology and project financing assistance in a relatively more open channel. In Iran's Sixth Development Plan, it is stipulated that the installed renewable energy shall grow by 5000 MV by 2018 in this five-year government growth policy. In order to fulfill the growing demand of power generation, Iranian government has formulated a plan to pursue the development of nonconventional renewable energy (NCRE) sources. This plan includes increasing the solar and wind capacity in parallel for integration into the electricity grid as well as other energy form[18].

However, the general sign of Middle East wind turbine market is not very optimistic. Talking Saudi Arabia as an example, though they are the minority who announced their interest towards wind energy in 2013[19], but there is little sign of progress entering 2015[20]. Considering that a lot of countries are still in political chaos such as Syria and Iraq, though some big potential can be reflected, but the trigger for these potential to come onto surface remain to be the problem.

[18] http://www.mei.edu/content/article/iran's-renewable-energy-potential

[19] http://www.windpowermonthly.com/article/1172213/saudi-arabia-announces-wind-energy-plans

[20] http://www.windpowermonthly.com/article/1332838/saudi-9gw-renewables-plan-doubt

African Market

There are some key countries in Africa who are in the process of developing the wind energy. They are Egypt, Morocco, South Africa and so forth. They all have some political goal in progressing the wind energy development. Egypt plans to install 7 GW of wind power by 2020 while South Africa will strive for a target of 8.4 GW by 2030. The object for Morocco is 2 GW by 2020 (IRENA 2015). The overall estimate for African market growth is between 75 GW and 86 GW by 2030, which is made by the Global Energy Wind Council (GWEC 2014).

In South Africa, the government has pertinence measure towards wind energy development and a five-year full-size programme, which is called South African Wind Energy Programme (SAWEP), was carried out in order to support the wind energy sector. The programme includes the cooperation with Danish government and it provides huge financing and implementation convenience[21]. This is definitely positive information as Demark is the country where Vestas Group is established.

The other African countries also have supportive policies to different extent, but generally speaking, comparing with the other market, African market for wind turbines is still weak for the foreseeable decade. The political support from the government has to be backup by a strong economic drive. The market is promising in the long run, but it doesn't seem to be possible to generate enough payback for short period of excess investment.

American Market

The two major wind energy consumers in American market are Canada and the US. In the US, wind energy is part of state economic development strategy and was broadly supported in the nation. The wind energy is supposed to provide 20% of the electricity supply by 2030 and will support 500000 jobs for the country.

The energy is regarded as a policy-driven industry. Hard targets are set by a Renewable Electricity

[21] http://www.energy.gov.za/files/sawep_frame.html

Standard (RES) for diversify the electricity supply, facilitate local economic development, reduce pollution, cut water consumption and save consumers money in the short and long run. Different tax policies from each state will have either positive not negative influence to wind energy development. But wind developers have the right to select the best area to build the wind turbines within the nation according to these different policies. The federal Production Tax Credit (PTC) is a typical paper to support the development of wind energy.

More flexibility of electric grid is built to allow integration of wind energy. In addition, AWEA play an active role in supporting the grid operating improvements[22]. AWEA also form a regional network of organizations to promote the growth of the wind industry around the country. Regional partners may work with electric utilities, Regional Transmission Operators (RTOs), Independent System Operators (ISOs), federal power marketing agencies, and others on a broad range of state legislative and regulatory activities in order to support the wind market development and remove market barriers. AWEA plays a role of encouraging companies and organizations to participate with these relevant groups[23]. Meanwhile companies are urged to get involved in AWEA's Policy Committee who are obligated to focus on federal and state legislative and regulatory issues that are important to the wind industry[24].

Canada is also a major market of wind energy. There was only 137 MW of installed wind energy capacity when Canada set the target of 10000 MW. In 2015, they became one of the seven countries that surpassed this threshold. Canadian market keeps a growth rate of 23% for the past five years, which make the wind power the largest source of new electricity generation in Canada[25].

The main organization that can represent the Canadian wind energy market is called Canadian Wind Energy Association (CanWEA). Their mission is to guarantee that Canada will fully realize the

[22] http://www.awea.org/Issues/Content.aspx?ItemNumber=869

[23] http://www.awea.org/Content.aspx?ItemNumber=776

[24] http://www.awea.org/Advocacy/Content.aspx?ItemNumber=4361

[25] http://canwea.ca/wind-energy/national/

abundant wind energy potential on behalf of the members while benefiting the whole population[26]. They provide fair value for the environmental attributes of wind energy, enhance wind energy procurement process, provide incentives to manufactures of wind power equipment, plan and built "wind-friendly" transmission infrastructure, and streaming permitting and approval processes for wind energy projects[27]. These are great support to the wind energy market development in the whole country.

Asia Pacific Market

Asia Pacific becomes the largest wind turbines capacity installed market, and China is the biggest potential among all of them. In this region, there are also some key players such as Australia, India, Japan and so forth.

Japan is a country that requires importing 84% of the energy requirements. Due to this fact, nuclear energy has been a national strategic priority since 1937. Though after 2011's Fukushima accident, the strategy was under review, but it was confirmed afterwards[28]. However, there is still a positive but short-term effect. It is that Japan builds the world's largest floating wind turbine off Fukushima[29] in order to offset the effect the high cost caused by the shutdown of nuclear power plants. This is obviously due to the political decision-making but a decision of increase the oil importation follows afterwards. This information shows little growth opportunity of wind energy growing in the Japanese market.

According to the report from Australia regarding clean energy, renewable energy provides 13.47% of Australia's electricity in 2014. Among these renewable energy, wind power occupies 30.9% of the total among. Australian government positively supports renewable energy. In south Australia, they set an ambitious target of $ 10 billion of investment by 2025, among which $ 5.5 billion has already

[26] http://canwea.ca/about-canwea/visionmission/

[27] http://canwea.ca/wind-energy/national/

[28] http://www.world-nuclear.org/information-library/country-profiles/countries-g-n/japan-nuclear-power.aspx

[29] http://www.nbcnews.com/news/world/japan-builds-worlds-largest-floating-wind-turbine-fukushima-n402871

been secured. In March 2015, the policy changes to shorten the setback distance between house and wind turbines from 2 km to 1 km in line with South Australia. The change is expected to attract new wind projects.

India can be another wind energy growth point in the Asia Pacific region. Developing renewable energy sources is one of the key goals of the Indian government under the Nation Action Plan for Climate Change of 2008. In order to facilitate the wind energy development at par with conventional energy sources, on September 9, 2015 the Union Cabinet gave the approval for the National Offshore Wind Energy Policy, 2015 as well as incentive schemes for development of offshore wind energy in India[30]. The new policy is to promote and streamline the process of implementing offshore energy projects. A nodal agency that is called Ministry of New & Renewable Energy (MNRE) is decided to be in charge of implementing wind energy projects and National Institute of Wind Energy (NIWE) and will be responsible for project sites allocation[31]. The efforts from the government to support wind power development is direct and obvious.

As for the Chinese market, it already became the world largest wind energy producer in 2014. From the current installation capacity of 75 GW, the aim of China is to achieve 200 GW by 2020, which means that there has to be an annual growth of 20 GW, which was really an ambitious plan. This becomes even apparent when comparing with the total plan in Europe whole EU level, which is 90 GW installed wind power capacity[32].

Historical record shows that the ambitious plan from the Chinese top-design was not empty promise. In 2015, new data from Bloomberg New Energy Finance show that China installed just under 29 GW of new wind energy, which well surpass the previous record of roughly 21 GW in 2014[33]. It is well known that China is good at infrastructure establishment, and the fast development of wind power can not go without the political decision-making and effective implementation of policies.

[30] http://www.mondaq.com/india/x/441280/Renewables/National+Offshore+Wind+Energy+Policy+2015

[31] http://cleantechnica.com/2015/09/11/india-approves-offshore-wind-energy-policy/

[32] http://www.bbc.com/news/science-environment-25623400

[33] http://www.scientificamerican.com/article/china-blows-past-the-u-s-in-wind-power/

China's National Renewable Energy Law of 2006 and regulations issued under it have offered subsidies for wind, solar, and biomass deployment; public support for research and development; mandatory grid connection requirements; and a central fund supported by a nationwide electricity surcharge. There are two main supportive incentives from the central government. The first is preferential Value Added Tax (VAT) during the first seven years of a project's life, and a four regional feed-in tariff (D. Zhang, M. Davidson, B. Gunturu, X. Zhang & V.J. Karplus, 2014). The four regional feed-in tariff levels is shown below:

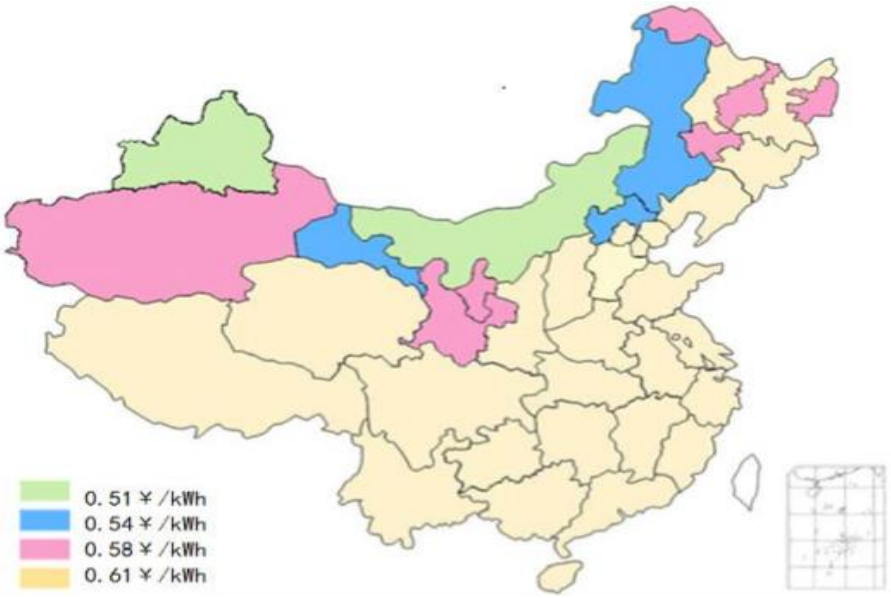

Figure 7, Source: D. Zhang, M. Davidson, B. Gunturu, X. Zhang & V.J. Karplus, 2014

In addition, the well-known Chinese 13th of 5-year plan also clarify the direction of wind power development. The target in the following 5-year of wind energy capacity installed shall not be lower than the past five years. The government will be working on the problem of wind energy abandonment to improve the efficiency of wind power utilization. The policy of providing subsidy will be further perfected. To enhance the technology of wind turbines to lower the price of the development and simplifying the public administration will be extra catalyst to facilitate the Chinese wind energy market to reveal the potential.

Economic Factors

As it mentioned earlier in the discussion of African market, though some policies are showing great will of supporting the wind energy development, but the execution of the strategy will have to be supported by a strong economic drive. From this consideration, economic factor is also a pretty important issue to look into.

According to the number from the report of World Economic Situation and Prospects which is published by the United Nations (UN) in 2016, the world economic growth in 2015 was only 2.4% which was 0.4% lower than the predicted growth rate. The growth of the developing countries is slowing down. Especially under the background of Chinese economy transforming and upgrading, the growth increase rate of developing countries drops to the lowest level after the economic crisis that took place in 2008.

The economic growth in 2016 and 2017 is estimated as 2.9% and 3.2% respectively. This is based on overall assumption of macro-economic environment to have a slowdown of fiscal restraint as well as keeping the monetary policy at a slack level. Meanwhile, the developed economic entities are expected to obtain a growth in 2016 (United Nations 2016).

The global economic downward pressure will definitely have an impact on the real economy and bring negative effect on most of industries. But this is not all with pessimistic prospect. Taking China as an example, as it is known that the Chinese government is trying to transform and upgrade industries, a lot of low class with marginal technological content industries was seriously impacted by this economic downward pressure. But in contrast, a series of innovative industry are emerged and growing. As regard of energy sector, the conventional energy use may still have a negative effect by the economic situation, while the paces of developing clean and renewable energy technology are never stopped.

It is to say that the world economy slowing down is mainly incurred by developing countries. And among them, China is one of the most important countries in this economic impact. While considering the negative influence derived by this economic situation, China’s ambitious

transforming and upgrading plans for industry might provide even more opportunities for clean and renewable energy development such as new wind turbines development. By looking together with the plan of wind power development for Chinese government in the future years, there is no sign of slowing down of the wind power growing while even accelerating. This lead to the conclusion that the global economic will bring negative infect to the world wind energy development is not full accurate, while a lot of potential opportunities are remained to be exploited.

Environmental Factors

Environmental factor is one of the most important issues to support the wind power build-up. Wind turbines can make use of the wind power while reduce the consumption of conventional energy resources. As renewable energy, there is no limit of use while generate no emission of pollution. The wind power farm can same huge amount of fresh water resource and this is especially important to those areas that are in lack of fresh water.

But there is still some negative effect for wind turbines. The most important issue is the noise pollution. But as the sites of most the wind power farm would be carefully selected and will stay far away from where people live, this effect can be minimized. Wind turbines can also generate some electromagnetic radiation, which can be harmful to human bodies. However, this negative effect can be improved through technological improvement to reduce the radiation level, thus minimize the bad influence[34].

Social Factors

As the pollution and global warming problem are getting more and more serious in the world, it is become widely accepted that developing clean and renewable shall be a tendency for world energy upgrade.

According to the survey conducted by Danish Wind Industry Association's survey conducted in 2009,

[34] http://old.hssyxx.com/zhsj/kexue-2/zutiweb/zu42/004.htm

91% of population believes that wind power use shall be expanded. 96% of people believe that Parliament should play a role of support the development of wind power and 62% of the respondents show their attitude that over 50% of Danish electricity production shall be from wind power[35]. In the survey conducted by EU Committee in 2007, among 250000 of respondents, 80% of population support development of solar power, 71% support of developing wind power, and the proportion supporting hydroelectric and ocean power occupy 65% and 60%[36].

Though Danish and EU view can be typical representatives from developed countries, the opinion from developing countries can not be ignored. Still taking China as an example, according to the survey from IPSOS conducted in 2009 from 10 cities, close to 80% of populations confirm the pollution issues and they show their willingness to pay even higher for clean and renewable energy like solar power, wind power and so on. The outcome shows that citizens on average are willing to pay a 19% premium for usage of new and renewable energy. And for younger generation whose ages are between 15-24, the acceptance of price increase achieves 22%[37]. This will definitely show the people even in developing countries have the wish of developing an more completed and effective clean energy system.

Technological Factors:

Technology is the most important driver of facility the development of wind turbines. By improving technology, wind turbines can improve the wind power conversion rate, strengthen wind capture capacity for impellers, and improve the turbines quality and so on[38]. The world wind turbines developing tendency is to improve the unit capacity, to enhance of capacity coefficient and wind speed size, broader adaption for temperature and so on[39].

[35] http://www.windpower.org/en/policy/public_opinion.html

[36] http://www.cnwp.org.cn/news/show.php?itemid=5599

[37] http://news.sohu.com/20090218/n262303692.shtml

[38] http://news.bjx.com.cn/html/20150805/649822.shtml

[39] http://www.fdi.gov.cn/1800000121_21_84715_0_7.html

The technological possessed by Vestas Group is still outstanding. The model that introduced into Chinese market in 2014, which was the latest model at that time, wins the gold prize in the ranking made by Wind Power Monthly[40]. As they claim in their annual report in 2015, the introduction of the V136-3.45MV turbine as well as various other upgrades once again to proves their ability to develop very competitive offering based on the existing production portfolio – and with a time-to-market consistent with customer's needs. The new model represents a performance upgrade in the low wind segment and making it possible to increase annual energy production by more than 10% compared to the existing product V126-3.3MW depending on site-specific conditions (Vestas Group, 2015).

But there are also new companies emerged in wind turbines business and obtained some leading technology of the world. Taking Xinjiang Goldwind Science & Technology Co., Ltd (Hereby is refer to as Goldwind Group). Not mentioning that they have successfully surpass Vestas Group in annual installation capacity in 2015[41], they are planning to build the turbine with the largest unit capacity of 6 MW in China[42]. On top of that, the offshore model with the largest unit capacity of 6.5 MW in the world in develop by Guangdong Mingyang Wind Power Industrial Group Co., Ltd (Hereby is referred to as Mingyang Group)[43] in 2013. But for now, it is still Vestas who has the world largest model established in the world. The introduction of V164 with 8 MW capacity make Vestas Group in the top class of large-size wind turbines manufacture[44]. Though the technological advantage is still there, the sense of crisis should be maintained.

Sub-conclusion:

In the PEEST analysis, it can be seen that the macro-environment for clean and renewable energy development is generally positive. Political support for clean and renewable energy is most of countries' choices but to different degrees. But when looking at different geographical market, the

[40] http://news.bjx.com.cn/html/20160111/700165.shtml

[41] http://www.jiemian.com/article/553845.html

[42] http://www.chinaequip.gov.cn/xnykjzb/2010-09/23/c_13525851.htm

[43] http://www.gzwee.com/shownews.asp?id=232

[44] http://ongreentech.com/10-biggest-wind-turbines/

political support and the effect on the wind power development are not wholly in accordance with each other. For example, though the Middle East and African Market have pretty good policy to facilitate the wind power establishment, the economic weakness makes those counties hard to obtain an excessive progress. The market where the policy is most effective is the Chinese market. By looking at the historical record, Chinese government did not only hit the set target every five years, but also can exceed the target by an exceptional level. This ability of policy execution is outstanding and impressive.

Economic growth is another important factor to be mentioned about. In the context of global economic growth slowing down, the impacts on different industries are foreseeable. Though the European economy is expected to obtain a growth, but it will not offset the negative effect from developing countries. But the economic situation is not all about pessimistic prospect, the transforming and upgrading of economy in developing countries such as China provides extra opportunities for innovative business, which can well include wind turbines business.

As global warming and pollution become more and more serious topic to the whole world, the urgency of improving environmental condition becomes a catalyst for countries to develop clean and renewable energies. Though there are pros and cons to develop wind turbines even for environmental concern, but there is no doubt the benefit to use wind energy is much more environmental friendly than any kind of conventional energy sources.

The environmental problem is not something only to leave to the governments to solve. More and more ordinary people start to pay attention to pollution problem and to make a voice on introducing new energy resorts. In China, people are even willing to pay 19% while 22% for young generation more for clean energy in order to get the environment improved. The social influence is not supposed to be ignored by the government.

Technology factor is crucial to drive Vestas Group to success in their business. Though the company possesses some technological advantages in some domain, the fast development of the companies from some emerging market can not be neglected. As those companies are shortening the technological gap while building their own advantages in wind power business, Vestas Group should

have the crisis awareness. It is known that the Chinese company Goldwind Group has already surpassed Vestas Group in 2015 to achieve the highest annual installation capacity, how can Vestas Group sustain their competitive advantage remain to be a question.

Porter's Five Forces Analysis

After the PEEST analysis is made, the effects of macro environment for wind energy development is becoming clearer. But the analysis only interprets the general influence of macro environment to the business. In order to study concretely that what kind of position that Vestas Group is in, the analysis at industry level will be needed. The Porter's Five Forces model is thus selected to show that the strategic influence towards Vestas Group.

Threat of New Entrants

The first issue to protect the wind business company from the threat of new entrants is the entrance barrier. The most obvious barrier for wind energy sector is about technology. To run a successful wind business company, one should not only have huge amount of start-up capital, but will need to acquire a lot of high technology, establish an integrated R&D group and so on. Among these things, capital might be the easiest to rise, as it is not possible to even buy technology with excessive price from the concern of confidentiality. But this barrier can be reduced by the support of the government due to the fact that the government is on a stronger position in a negotiation especially during the technological introduction process. For example, China introduces the foreign wind technology by requiring joint venture business model in order to provide convenience for local companies to obtain technology transference[45]. Behavior like that can lower the entrance barrier substantially.

There are some other costs for entrance barrier. For new entrants, there will be a natural cost disadvantage independent of size. As it is a new domain for new entrants, the specific knowledge regarding materials, logistics and so forth are lacking thus push up the daily costing. When comparing

[45] http://www.ccchina.gov.cn/Detail.aspx?newsId=29173&TId=63

with exist international companies, the advantages derived by economies of scale become significant issue. Losing this advantage will lead to the consequence of losing price competence with the other companies. And as new entrants, it is unlikely for them to obtain any technological advantages. This put those entrants to a very adverse position.

Product differentiation is another barrier. As big wind energy companies will have a lot of turbine models which fulfill varies needs under different natural conditions, it requires a lot of time for new established companies to catch up with the product's introduction to the market. The distribution channel can be another problem. As distribution are not only responsible for product delivery, but also responsible for after-sale service including product maintenance, upgrading and so forth, the input for building a quality and reliable distribution channel can be a challenge.

The brand of the company is very important. This brand effect needs to be accumulating through long run. Especially for the giant company like Vestas Group, the brand image can immediately provide information of good quality, advanced technology, reliable service and so on. These companies usually have loyal customers. Due to the characteristic of the business, bad quality product can be very harmful to the customers and even for a country's national strategy. The switching cost for customers can not be neglected, either. Because wind turbines are very high-tech products, the cost to learn how to manipulate a new brand can be very high. The labors of manipulating the old model need to learn to use the new ones, which involve a lot of training investment to the employees. This can also increase the risk of operating miss, which might lead to some unavoidable damages to the products. In regard of all these concerns, the wind energy barrier can be concluded as very high to the new entrants.

Threat of Substitute

The substitute for wind power business is a serious issue. The most common substitute for wind power is the conventional energy sources including coal, oil, gas and so on. Though the clean and renewable energy sources are promoted world widely, it is can not be neglected that the traditional energy source still stand a fundamental position in the world energy structure as it is shown in figure

8.

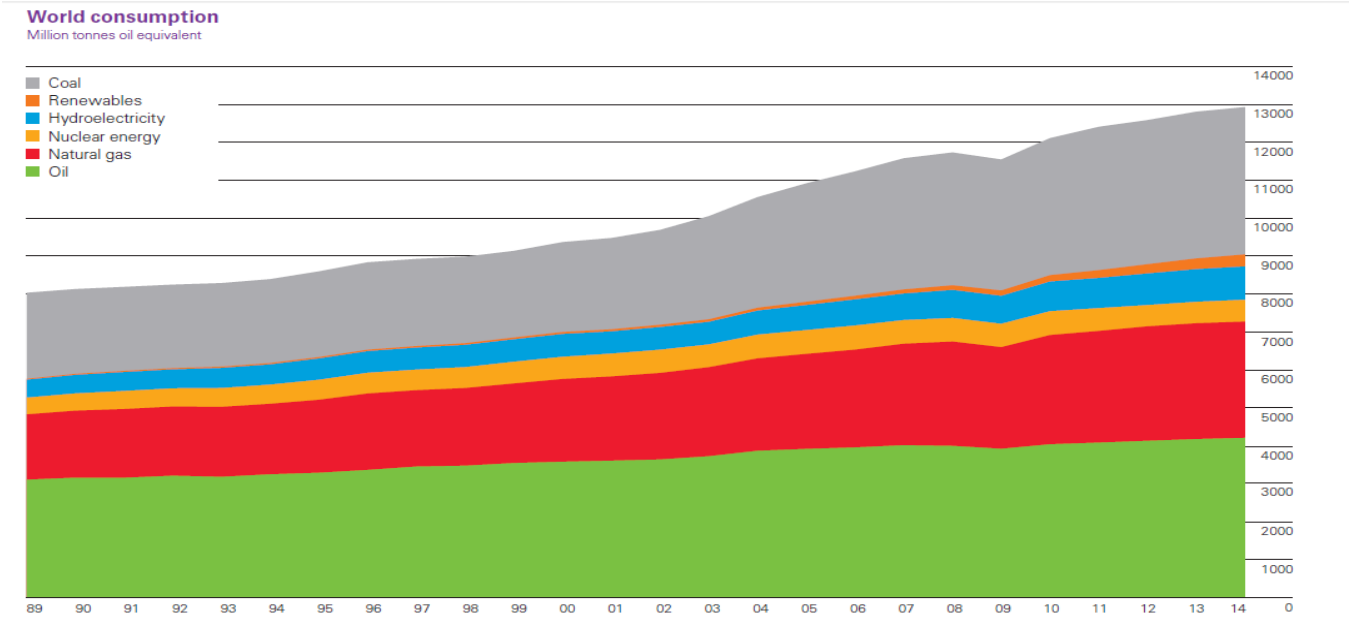

Figure 8, Source: BP, 2015

It was believed that the cost is one of the obstacles of the renewable energy development comparing with traditional sources. But according to the analysis by Bloomberg New Energy Finance (BNEF), wind power is now the cheapest electricity to produce in both Germany and the U.K. after years of development[46]. This indicates that the cost competence of wind power still has the potential to be strengthened and finally gain a cost advantage in the substitutes.

There are still a lot of other kinds of clean and renewable substitution energy sources. These include solar energy, tidal energy, geothermal energy and so on. These can all be direct substitute against wind energy. Some energy will have their regional constraint like tidal energy and geothermal energy which has to be exploited in the certain region where does possess those form of power. But solar power is more like a rival compare to wind power. The electricity converting rate as well as the costs advantages will have to be depended on technological breakthrough from time to time.

[46] http://www.bloomberg.com/news/articles/2015-10-06/solar-wind-reach-a-big-renewables-turning-point-bnef

Bargaining Power from Buyers

The concentration ratio in the wind power market is high. Though the number is not calculated, but according to the report from Wind Power Monthly, ten of the biggest and the best manufactures account for three-quarters of global installed capacity and the capacity is about 270 GW before 2015. These ten companies include, Siemens, GE, Vestas, Goldwind, Enercon, Gamesa, United Power, Ming Yang, Senvion, and Nordex[47]. The high concentration has weakened the bargaining power of the buyer as their selectivity becomes limited.

The switch cost to the consumers is much higher than the switch cost for the company. Though it is much more expensive for Vestas Group for exploit new consumers rather than reserve the old ones, from the consumers' perspective, it takes a lot of efforts in acknowledge new product as well as providing training programme to employees in order to maintain the new turbine types.

It is much easier for Vestas Group to win bargaining leverage as they are in the lead of the newest wind turbine technology. Though the competent for the Chinese competitor to build large-capacity turbines is strong, Vestas Group is still able to retrieve the advantages in the short period. It is apparent that the technology gap is shorten during these year of development, but the incremental technology advantage will provide the market unique choice. The customers are unlikely to bargain in this area against the company.

Since there are a lot of substitutes for wind powers, the price sensitivity comparing to the other energy source is high. Though the market is somewhat influenced by the government policy, but it won't accept too much extra costing comparing to the other resorts. The cost is not only reflected on the wind turbine itself, but also the continuous electricity generation costing and maintenance costing. But due to the fact in the business is that the higher the technology is, the more cost will be saved. This makes it not a too negative impact on the bargaining power of the buyers.

[47] http://www.windpowermonthly.com/article/1352888/ten-biggest-best-manufacturers

Bargaining Power from Suppliers

For the bargaining power of supplier, the strength of it is depended on the technological content of it. Generally speaking, it is not possible for a wind turbine manufacture to assemble and sell wind turbines without acquiring any type of technology. But it is unlikely for one company to own all the copyrights of each part manufacturing technic on a wind turbine. So as a regard of raw materials, the bargaining power of supplier is competed away due to the intensive market competition. But for a part with core technology, the bargaining power can be very high due to the monopoly position of the technology supplier.

But in regard of distribution channel, the bargaining power lost in regarding of technology can be retrieved to some extent. Vestas Group, as the biggest wind turbines manufacture before 2014 (the first place is taken over by Goldwind in 2015) has established strong relation to suppliers while searching for new ones[48]. The continuous improvement of distribution channels lower the negative impact of suppliers' bargaining power.

Intensity of Competitive Rivalry

The competition in respect to Vestas Group is judge to be more and more intensive. As Vestas Group has maintained the world number-one title for years, their lost to Chinese company Goldwind indicated that the competitive environment for Vestas Group is being worsen. Though Vestas Group is able to maintain their competitive advantage in comparison with the traditional market, but the competition from newly emerged market in China strikes them unprepared.

The reasons behind the competent weakening are variance. One is that the political support obtaining by firm from developing countries has the privilege to learn from the other companies who are expecting to enter the new market. The second reason is that as the global wind energy growth focus point has changed into Asia Pacific, the traditional market sustaining effort will not be able to

[48] https://www.vestas.com/en/about/partnering#!our-suppliers

maintain the market position for the Vestas Group. The third reason can be that as more and more new competitor emerge and grow, the R&D function perfection as well as technological progressing of the firm has brought them more and more competences at the global level. By utilizing the advantage of local market potential, the difficulties to compete with them has been increased exponentially.

The most important issue to mention about is the competition in Asia Pacific area. As the fastest wind energy growth region, the achievement in this market will make no doubt influence the international compete wherever the companies are from. Among the whole region, China is still the focusing topic for wind energy development. As it is evaluated that China's wind power growth is expected to triple by 2015 reaching and estimates of 347.2 GW, comparing to the global wind capacity growth by 2025 which is 962.6 GW[49], this means that Chinese wind capacity will reach almost 40% of the global volume. By the end of 2015, the total amount of wind capacity installed in China reaches about 145.4 GW which and increase by 31 GW in 2015 (CWEA, 2016)[50] while the number is 432.4 GW with an increase of 63 GW[51]. It is not hard to get that the current wind installed energy for China is about 34% of the world overall capacity while China will represent almost 40% of the global growth in the following decade. Overlooking this astonishing growth rate for any wind turbine manufacture will be considered as stupid in strategic making.

While obtaining the data from the Chinese market, the strategy of Vestas in China will not be considered as successful. As Vestas turn around the business, the revenue source for Vestas Group from Europe, Middle East, Africa market as well as market of America all had a steady growth which are from 4167 million Euro (hereby referred to as mEuro) to 4357 mEuro and from 2131 mEuro to 3476 mEuro respectively from year 2014 to year 2015. But the situation in Asia Pacific market doesn't look healthy at all. With the background of Chinese booming market, the revenue from Asia Pacific from Vestas Group was not improved, and conversely, it dropped from 612 mEuro to 590 mEuro (Vestas Group, 2015).

[49] http://cleantechnica.com/2015/09/22/chinas-wind-energy-capacity-triple-2020-globaldata/

[50] http://www.cnenergy.org/xny_183/fd/201604/t20160405_276532.html

[51] http://www.gwec.net/global-figures/graphs/

There are a lot of factors that influence the competition intensity in China. Of all those factors, the cost performance of local companies is supposed to be the strongest one to make an impact on the foreign companies. As more and more local companies emerge, the Chinese domestic market becomes more intensive in competition, causing over-capacity problems, which strike the price from about 6500 Yuan (Chinese RMB)/KW in 2008 down to about 3500 Yuan/KW in before 2014. But Vestas persist on the price of around 5000 Yuan/KW, which incurred huge price gap in comparison to the competitors. Though Vestas Group tried to retrieve the market share by providing more incremental services, but the efforts of those didn't reveal to be much effective[52].

Sub-conclusion:

The Porter's Five Forces analysis shows a high entrance barrier to the new players in the wind energy market. The most important elements for running a successful wind energy business are technology, R&D capabilities, and long-term reputation. But there is one factor in particular can diminish the barrier for new entrance, which is the government support from local firms. As they are not only providing economic aid, but also facilitate cooperation between the local and foreign firms in order to enable the local firm to obtain the necessary technology for independent development at political level, it provides huge opportunities to the local competitors, but generate huge threat to the foreign companies such as Vestas Group

Substitutes affect a lot in the competitive environment. Since there are a lot of type of substitutions, which includes both conventional energy sources as well as new energy technologies, substantial competition, are raised outside the pure wind energy industry. Though these different energy forms are competing for shares of electricity supply, there is a notable increase of renewable energies annually. As different energy development will have regional difference such as geothermal energy has to be exploited in the certain region, the potential for wind energy development is still very positive.

[52] http://finance.sina.com.cn/leadership/mroll/20140808/225019958617.shtml

The concentrate level of wind energy business is fairly high. This makes the market close to oligopoly situation, which can increase the bargaining power against consumers. As it is expected to increase cost when switching suppliers for the buyers and the specialty of different firms are not the same, the bargaining power of the buyers are further weaken. Though the buyers can switch to other energy sources, but the reduced price of wind energy development and the expected drop in price in the future technology breakthrough, the price effect will not be too strong to influence the bargaining power of the buyers.

The supplier bargaining power can be weak in low technology supply such as raw materials, while can be very strong for high-tech parts with patent. But due to the fact that Vestas Group has built a stable and robust distribution channel and still are endeavoring to perfect it, the cooperating relationship can offset the negative influence caused by technology barriers.

The competition for Vestas Group is getting more and more intensive. During the analysis, one can be made aware that the new generated competitions are coming from China. As China is the most important market, which can be foreseeable up to a decade, due to the preferable policies for the local companies, the impact of the competitions from the emerging market is huge. Since the cost performance issue become the most important factor for the failure of Vestas Group's China strategy, it will be questioned that whether it is smart to persist using pure incremental service in order to compensate the costing loss in the product itself.

Resource-Based View

After made the external analysis of Vestas Group by using PEEST and Porter's Five Forces models, it is necessary to make analysis of internal environment of the company. In order to do it, a bundle of resources and capabilities are identified for the company. According to the definition of sustainable competitive advantage from VRIN model, the competitive resources and capabilities will be further classified. By integrating the above analysis, the report will make an analysis of core competence of Vestas Group. In the first part of the analysis, four types of resources are clarified, which are tangible resources, human resources, organizational resources, and financial resources.

Tangible resources

Technology is one of the most important tangible resources. As the biggest wind turbine manufacturing before 2015 and the second biggest now, the technology acquired by Vestas Group is still with good advantage. For Vestas Group specifically, they are not only good at the wind turbines for low wind speed design which is made by using the newest technology, but also possess the largest wind turbine manufacture technology in the world. Though the Chinese competitors are shortening the technology difference, but the advantage for Vestas Group is still notable. Besides, the good technology enables Vestas Group to provide exceptional maintenance and incremental service. Though it can not offset the negative influence from the price, but it is relevant to customer satisfaction by overlooking the price issue.

Vestas has the most advanced production facilities that can make sure the consistent quality of the manufactured product without errors. The stream line that Vestas Group established for production are highly standardized to guarantee the efficiency and the flexibility of the whole production process[53].

Human Resources

Human resources are crucial for the success of Vestas Group. For a huge international company like Vestas Group, they need talents from all different perspectives including, technological talents, management talents, decision making talents and so on. In order to guarantee the sustainable development of Vestas Group, a completed recruiting procedure is designed to make sure that different talent will fulfill the needs of different positon.

It should be noted that the system can not prevent the company from all type of wrongdoings. As when Vestas Group faced strategic collapse during 2011 and 2012, a shocking reconstruction of management took place in 2012 when Bent Erik Carlsen, Torsten Erik, Rasmussen, Freddy Frandsen

[53] https://www.vestas.cn/capabilities

and Elly Smedegaard Rex resigned as members of the Board of Directors. Bert Nordberg, Lars Josefsson, Eija Pitkanen and Knud Bjarne Hansen were elected as new members of the Board of Directors (Vestas Group, 2012). This has indicated some potential risks for the human resources maintenance for Vestas Group.

Organizational Resources

Vestas Group is made up of 16000 professionals of 86 nationalities. They possess an eclectic mix of experience and skills, working together to make Vestas's mission a reality. Employees find their working lives changing rapidly. In order to achieve the ambitious and environmental goals, the employees continue their evolution as a high-performance organization. The company strive for – commercially, technically, environmentally – is based on a compassionate and forward-thinking approach, and everyone in the firm benefit from working in a safe, diverse culture where professional development is valued[54].

As Vestas has established a stable and robust supply channels, the formal and informal relation with the channels can be regarded as ponderable resources. The kind of relations will require large amount of time and plenty of resources to build, and the possess of the relation will guarantee the manufacturing process not being constraint by material import.

Financial Resources

Financial resources are something that Vestas Group can really utilize upon. As Vestas Group getting out of the trouble in 2011 and 2012, they were intentionally or unintentionally building large cash reserves. By the end of 2015, the cash amount jumps up by about 298.42% from the number in 2015 (Appendix 2). Due to the fast increase of cash and cash equivalents, the NIBD turned negative from 2013 as well. This means that Vestas Group has the ability to pay off all the debts while reserving surplus amount of cash for investment, paying off dividend or other use. In 2015, the amount of NIBD

[54] https://www.vestas.com/en/career/your_colleagues#!working-in-factory

reaches -2373 mEuro which is really a huge number. The plan of how to use this amount of money will be crucial for the future development of Vestas Group.

Vestas Group also benefits from the financial aids from different countries that support the development of wind energy. As it is mentioned in the Policy part of PEEST analysis, different countries are providing different type of financial supports in order to attract foreign capital, support local industry development and so on. This is what Vestas can take an advantage upon.

Competitor Identification

The analysis is to figure out what can be the sustainable competitive advantages and the core competence that is consisted of competitive advantages will be identified. But for doing all of these works, it is necessary to identify whom is Vestas Group competing with. In this sense, all direct and potential competitors of Vestas Group will be defined in this section.

The first groups of competitors identified of Vestas Group are the wind energy companies in the same industry with Vestas. The world top ten wind turbines maker in capacity installation are Goldwind, Vestas, GE, Siemens, Gamesa, Enercon, Guodian, Ming Yang, Envision and CSIC. The capacity installed is shown in figure 9.

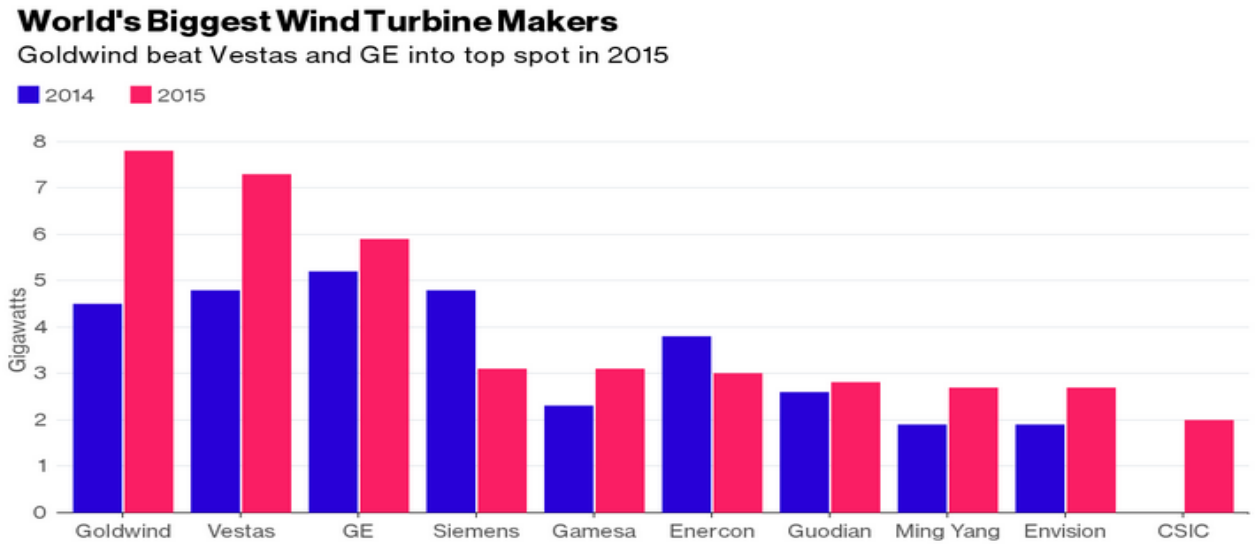

Figure 9, Source: Bloomberg New Energy Finance

In the traditional market in the developed countries, there is no doubt that Vestas is still the most competitive firm in the world. But due to the rise of the Chinese market, five emerging competitors from China went into the world top-ten wind turbine maker club, which are Goldwind, Guodian, Mingyang, Envision and CSIC.

These companies are not only doing the work of enlarging the size of wind turbines, but also approach the newest wind technology in all aspects including the low wind speed domain[55]. The effects from these Chinese competitors are considered to be the strongest.

Except for the direct competitors from wind industry, there are also other competitors coming from both conventional energy sides such as coal, and clean and renewable energy sides such as solar power. They are competing with wind energy in environment protection, cost savings, energy utility efficiency and so on. As global wind power growth at a very high expectation, the necessity to take these impacts into serious consideration is low.

VRIN Model

In order to judge which resources and capabilities can be made up into sustainable competitive advantage, VRIN model has provided good criteria for doing the work. In order to be concluded as sustainable competitive advantage, the capacity or resources should fulfill the requirement of being valuable, rare, inimitable and non-substitutable.

The technology possess by Vestas group is considered as extremely valuable. That's the secret for Vestas Group to be the world largest wind turbine manufacture for years. As for the newest technology, they are rare and hard to imitate. It is possible to find substitution for wind energy, but for technology of wind, it is hard to substitute. For instance, it is only possible for find high wind speed area to establish a wind farm which fulfill the requirements, but it is not only the high wind speed area requires electricity. Thus, the technology can also be deemed as non-substitutable.

[55] http://www.envisioncn.com/newsdetail.aspx?ID=28

The good facilities established for production from Vestas group are also valuable and rare. It might be hard to imitate the whole production procedure, but it is easy to be substitute by researching on other efficient ways. So they can be included as competitive advantage, but may not be sustainable competitive advantage.

The human resource from Vestas Group also fulfills the requirements of valuable and rare. It is not easy to imitate on another company's working style either. But as the main market battlefield for wind business is in China, the international experience of Vestas is not supposed to gain an upper hand against their Chinese fellows in the Chinese market. It will thus be considered as substitutable.

The flexible and dynamic culture from Vestas Group is extremely valuable for their years of development. The efficiency and effectiveness that brought by this culture can be rare in the market and to imitate the same culture requires a lot of conditions. Vestas Group as the largest international wind turbine producer has natural differences from the Chinese domestic producers. It takes long time and many efforts for their competitor to obtain the international experience and form a dynamic and robust organizational culture such as Vestas's.

The supply channels are valuable but not rare. As the China is the world factory, Vestas Group also has to build their manufacturing base there. It becomes much more convenient for Chinese competitors to make procurement for low-tech materials. As for high-tech components, it is also hard for the high-tech firm to bargain on the huge amount of potential generated in Chinese market. But the international supply channel may grow to be an advantage if the Chinese firms start their internationalization and become global competitors. In this sense, it can be concluded as a form of competitive advantage while not sustainable.

The financial savings by Vestas Group can turn to be very valuable if further investment is made for expansion or R&D activities. But they will lose their value if they are only deemed as savings or paid out as dividend. It is not something that could be imitated, but it is substitutable by smarter strategic making and better investment. Accumulation of cash itself indicates the inefficiency of investment to the firm.

The political financial aids can be considered as advantages against the conventional energy sources, but won't be advantages at all against direct Chinese domestic competitors. In contrary, they are the competitive disadvantages as the domestic firms enjoys much more political convenience than foreign firms like Vestas Group. Thus this will not be concluded at all in advantage category.

Core Competence

Core competence can be defined as a complex set of resources and capabilities that binds existing business within a firm. As the competitive advantages and sustainable competitive advantages are identified, the core competence will be induced from the context of the resources and capabilities combination.

As the Chinese government provides a lot of political convenience to the local companies, those companies have a natural upper hand in the competition against foreign companies against Vestas Group. For Vestas Group to improved situation, clear competence will have to be defined. Though it is known that Vestas Group is still in the front of newest wind energy technology, but that didn't help save the market share lost from the Chinese market from the past few years. The problem can be that Vestas Group hasn't fully utilized the resources and capabilities and create synergies with different advantages.

The ultimate goal for Vestas Group in the Chinese market is to win in technology. But though technology is a very good advantage, but Vestas Group can not completely overlook the cost performance effect in Chinese market. This requires the management with courage and insight to have the ability to seize the opportunities incurred by the growing Chinese wind energy market, and make flexible decisions. One of the bad attitudes for Vestas Group is that they didn't face the price issue in China squarely. Vestas Group should be able to quickly adjust the pricing strategy and response to the market. The necessary change can be both derived from a cost saving program or technology improvement. No matter what to do, it is not smart to leave the market like whatever it is going to be without making proper respond to it.

In this sense, the core competence for Vestas Group should be constructed as to properly utilize the

technology combining with the dynamic organizational culture, which facilitates right decision-making. The internal cash accumulation can now be used as source of investment in Chinese market for expansion, promotion, R&D and so on to make sure the success during the next decade of Chinese wind energy market growth.

Sub-conclusion:

In the discussion of resource-based view, the first step is to identify what kind of resources and capabilities that Vestas Group possesses. The resources are divided into four categories that are tangible resource, human resources, organizational resources and financial resources. The tangible resources include technology as well as the facilities build for production and assembly. Human resources are considered as an important factor towards success for the company. The problem took place in 2011 and 2012 leaves the question about how good the quality is to the management of the company. Vestas Group is an old-brand international company with great talent reserves and a dynamic culture. The formal and informal relation regards the supply chain is a crucial organizational resources as well. The financial resources include not only internal cash amount, but also the political funding aid from different countries. All resources and capabilities are taken into evaluate that whether they are advantages or sustainable advantages for Vestas Group.

To serve the comparison purpose, necessary competitors need to be clearly identified. It is analyzed that the main competition challenge for Vestas Group is from China. Though there are also challenges from substitutes such as the conventional energy sector and so on as well as international competitors who are around the world, but those competitions are not strong enough to have big impacts on the competition position that Vestas Group is in.

In order to decide which resources and capabilities are sustainable advantages for the company, criteria of VRIN models is used. The sustainability of advantage needs to fulfill the criteria of being valuable, rare, inimitable, and non-substitutable. The sustainable advantages are analyzed as the advanced technology as well the dynamic international culture that Vestas Group has been nourishing for years.

The competitive advantages can not gain the company a better competitive position alone without right decision making. As the fault which caused by decision-making has brought Vestas Group big loses in 2011 and 2012, the efforts to facilitate right decision making need to be more effective. According to the overall analysis of resource based view, the core competence for Vestas Group is supposed to be constructed as to properly utilize the technology combining with the dynamic organizational culture, which facilitates right decision-making.

Adjustment of Budgets and Forecasts

The fundament of the budgets and forecasts adjust will be based on a general reformulation of the Chinese market strategy. The report assumes no change in the market development trend in European, Middle East, African and American market. The part of the report will not focus on any type of external financial adjustment (including interest rate and so on), taxation issues, and assume all the revenue related balance sheet items with same assumptions as before.

Adjustment of Income Statement Forecast

In this part of the report, two key issues regarding the market strategy will be readjusted which are the revenue growth and the cost. The cost will be reflected based on EBIT margin forecast. The trend of the forecast is based on the current position of the company combining with the market characteristic of the Chinese market.

Sales Growth Adjustment

As it mentioned that there will be no further adjustment in European, Middle East, African and American market, and there is no intent for the new strategy to have a negative impact on those market due to an increasing focus on the Chinese market, the old growth rate will be kept for those markets in the forecast. The reason that Vestas Group do not need to exploit the Chinese market at a cost of the other markets is that they have sufficient internal fund to invest and expand in the booming Chinese market.

It is stated in the strategic analysis part that the Chinese market will represent about 40% of the global wind energy growth and it is expected to reach a total capacity which equals to almost 40% of the global capacity, those information at least gave the hint that the Chinese market in 2025 will eventually grow to the same importance as 40% of the world wind energy market weight.

According to the above discussion, the assumptions are still made conservatively. On one hand, there is no precise forecast of Chinese market as the Chines market is categorized into Asia Pacific market and there is no information about the weight of Chinese market in there. One the other hand, Asia Pacific is considered as the most promising wind energy market in the future years, and it not only include China, but also including the big developing nation such as India as well as the big developed country such as Australia.

Taking all that into consideration, the Asia Pacific market is still too weak in the current Vestas Group's strategy, which is reflected by the historical trend. In 2014, the Asia Pacific market according to the calculation only represent 8.86% of the world's revenue source and it went further down in 2015, which became 7.00%. Comparing to the actual importance of the Chinese market that occupies 40% of the world's wind energy development, there shall be a huge room for Vestas Group to progress in the Chinese market. From all the above consideration, the growth rates for the different markets and the overall sales growth rate are outlined below:

	E2016	E2017	E2018	E2019	E2020	E2021	E2022	E2023	E2024	E2025	TV
Europe, Middle East, and Africa	6.85%	6.85%	6.85%	6.85%	6.85%	6.85%	6.85%	6.85%	6.85%	6.85%	6.85%
Americas	6.85%	6.85%	6.85%	6.85%	6.85%	6.85%	6.85%	6.85%	6.85%	6.85%	6.85%
Asia Pacific	10.00%	20.00%	40.00%	60.00%	60.00%	40.00%	30.00%	30.00%	20.00%	10.00%	10.00%
Sales Growth	7.07%	7.80%	9.51%	12.29%	14.61%	13.60%	12.66%	13.56%	11.21%	7.98%	8.00%

Table 5, Source: Produced by author

According to a general market developing principle, it will take some time to see the outcome from the time when starting the efforts. From this concern, the sales growth will not be driven very fast in the beginning of the forecasted period and the growth rate increase rapidly with time passing by. Though the market growth in China is very high and it is expected to grow for a fairly long period, it

will not be considered that this momentum will last forever. The growth speed is finally neutralized back to an annual growth of 10% for the terminal growth. By readjusting the revenue growth in the Asia Pacific area, the total sales growth is influence to a trend much similar to the it.

Though the Chinese market can not represent the whole picture of the Asia Pacific market, but the importance of Chinese market can not be obliterated. By looking away from the market, the valuation is made more conservatively in order to avoid the overvalued problem to mislead the view of being too optimistic for the Chinese market expanding strategy. For the terminal value, the market revenue from Asia Pacific weighted about 37% of the global revenue source.

EBIT Margin Adjustment

To implementing the strategy to expand the business in China, it is foreseeable that the cost will increase much more than the revenue during the starting period. This lead to a lower EBIT margin according to the calculation formula. But the EBIT margin is expected to grow back to the normal level once the market opportunity is well captured. This lead to the trend shows below:

	E2016	E2017	E2018	E2019	E2020	E2021	E2022	E2023	E2024	E2025	TV
EBIT margin before special item	11.00%	8.00%	6.00%	6.00%	9.00%	12.00%	13.00%	13.00%	12.00%	11.00%	11.00%

Table 6, Source: Produced by author

According to the forecast, the EBIT margin shows a fast decrease in the beginning of the forecasted period and comes back afterwards. After 5 years of the expansion in Chinese market, the EBIT marginal finally reached to a fair level which more or less equal to the current status.

Balance Sheet Adjustment

In the balance sheet adjustment, the items that are revenue related are not being changed. Due to the complexity, tax rate and interest rate adjustments are out of the scope of the discussion of the report. The only items that have impact on the strategy reformulation are the cash amount and NIBD.

Cash and Cash Equivalents Adjustment

The cash amount will be decreased in the beginning period of forecast due to heavy investment. Unlike the other two items in the income statement forecast, the strategy does not assume to accumulate cash again after investment. The cash amount will be remained at a fair level as it is shown below:

	E2016	E2017	E2018	E2019	E2020	E2021	E2022	E2023	E2024	E2025	TV
Cash as % of invested capital	120.00%	80.00%	40.00%	20.00%	5.00%	7.00%	9.00%	10.00%	10.00%	10.00%	10.00%

Table 7, Source: Produced by author

As wind turbine is a high-tech product and the business requires a consistent research and development inputs. A high cash reserve will be considered as negative signal for the company as they are not utilizing the resource to the maximized value. From this consideration, the cash reserves are decided down to 20% for the terminal value.

NIBD Adjustment

Negative NIBD from the past three years, were mainly caused by the large amount of cash which were saved along the time. As the cash and cash equivalents are adjusted, the NIBD level will need to be modified in accordance to the cash level. The forecast rate for NIBD is shown in table 8.

	E2016	E2017	E2018	E2019	E2020	E2021	E2022	E2023	E2024	E2025	TV
Net interest-bearing debt as % of invested capital	-100.00%	-40.00%	10.00%	25.00%	30.00%	27.00%	22.00%	20.00%	20.00%	20.00%	20.00%

Table 8, Source: Produced by author

As it is shown in the table, NIBD as percent of invested capital will quickly increase due to the decrease in cash and cash equivalents in the beginning period and is gradually stabilized in the later years of development. When looking back at what financial leverage that Vestas group has, the numbers obtained on average are about 24%. In this way, a final NIBD as percent of invested capital

of 20% that equals a financial leverage of 25% will be considered as a fair estimate for the terminal forecast.

Free Cash Flow Adjustment

Free cash flow is adjusted based on the adjusted numbers from income statement and balance sheet by using the formula used in the first free cash flow forecast. The trend shows a steady growth of the cash flow over the years and this trend provides further strength for Vestas Group to support their expansion strategy in China.

WACC and g Adjustment

Due to that the capital structure of Vestas Group is adjusted in the second forecast, the WACC value will ultimately deviate from the previous number. By utilizing the same formula from the previous forecast, the WACC for the forecasted period and terminal value are exhibited below:

	E2016	E2017	E2018	E2019	E2020	E2021	E2022	E2023	E2024	E2025	TV
WACC	9.11%	6.83%	4.94%	4.37%	4.18%	4.29%	4.48%	4.56%	4.56%	9.00%	9.00%

Table 9, Source: Produced by author

As it is shown in the table, the WACC keeps decreasing over the forecasted period due to the change of the capital structure. But due to the reason that the valuation model weighted too much on the terminal value, and the WACC evaluate is too low considering the normal level when Vestas Group is profiting, the WACC for the last year is adjusted to 9% which can be a good estimate for the normal level of Vestas Group WACC.

For the sustainable growth rate (g), unlike using the historical way to forecast for the first valuation, it is believed that with endeavor to exploit the Chinese potential market, Vestas Group can actually obtain a growth rate in the terminal period. Though the Chinese economy grows much higher than the global average, the international background of Vestas Group makes the global economic growth as a very good estimate for the sustainable growth rate. According to the report from the World Bank, the global economic growth in 2015 slowed down to 2.4% (World Bank 2016). The sustainable growth

rate for terminal value is finally decided as 2.4%.

Valuation with Adjusted Strategy

The second valuation is based on an adjusted strategy that is considered as superior than the current one. The valuation result will show a direct picture about whether the Chinese market expanding strategy could provide and positive prospect to Vestas Group. By inducing all the adjusted assumption to the valuation, the DCF valuation model is used in this sector.

DCF Valuation

As it has already compared the DCF and EVA model in the first time valuation, for simplistic purpose, only DCF model will be implemented in the second valuation. By utilizing the same method with same calculations, the valuation result from the adjusted strategy is acquired as 703.85 DKK per share. The DCF model calculation is shown below.

DCF Valuation of Vestas Wind System A/S (mEUR)											
Year	*E2016*	*E2017*	*E2018*	*E2019*	*E2020*	*E2021*	*E2022*	*E2023*	*E2024*	*E2025*	*TV*
FCFF	-588.23	635.88	664.89	691.40	742.24	867.63	1003.77	1111.50	1319.88	1556.35	2069.46
WACC	0.09	0.07	0.05	0.04	0.04	0.04	0.04	0.05	0.05	0.09	0.09
Discount factor	0.92	0.88	0.87	0.84	0.81	0.78	0.74	0.70	0.67	0.42	
Present value, FCFF	-539.13	557.14	575.37	582.70	604.82	674.21	738.44	778.08	883.67	657.42	
Present value of FCFF in forecast horizon	5512.73										
Present value of FCFF in terminal period	13244.90										
Estimated enterprise value	18757.63										
Net interest-bearing debt	2373.00										
Estimated market value of equity	21131										
Outstanding shares	224074513										
Market price (in Euro)	94.30										
Market price (in DKK)	703.85										

Table 10, Source: Produced by author

As it can be seen from the second valuation result, the value of the company jumped by about 60% which indicates a huge business opportunity to exploit the Chinese market. The valuation provides a general feeling about that how much the Chinese market is worth working upon, and the value increase is possible considering how much weight Asia Pacific market has occupied now and how much synergy that Chinese market can generate together with other markets. This makes it almost certain that it will be a huge pity if Vestas Group is not able to seize the growth opportunity in the Chinese market for the future decade.

Sensitivity Analysis

The sensitivity analysis regarding the second valuation needs to be conducted again. As what is done in the first time, two variables are taken into consideration which are WACC, g. Beta is taken out of discussion as the terminal WACC is subjectively adjusted to a reasonable level in order to keep the

rationality of the valuation result. The discussion of this will further confirm the accountability of the valuation. The sensitivity table regarding WACC and g is put below:

		g									
		0.40%	0.90%	1.40%	1.90%	2.40%	2.90%	3.40%	3.90%	4.40%	4.90%
WACC	5.00%	895.67	972.86	1071.50	1201.96	1382.59	1649.23	2082.54	2909.75	5115.65	29380.54
	6.00%	782.63	833.61	895.67	972.86	1071.50	1201.96	1382.59	1649.23	2082.54	2909.75
	7.00%	703.85	740.01	782.63	833.61	895.67	972.86	1071.50	1201.96	1382.59	1649.23
	8.00%	645.80	672.78	703.85	740.01	782.63	833.61	895.67	972.86	1071.50	1201.96
	9.00%	601.25	622.15	645.80	672.78	703.85	740.01	782.63	833.61	895.67	972.86
	10.00%	565.98	582.65	601.25	622.15	645.80	672.78	703.85	740.01	782.63	833.61
	11.00%	537.37	550.96	565.98	582.65	601.25	622.15	645.80	672.78	703.85	740.01
	12.00%	513.69	524.99	537.37	550.96	565.98	582.65	601.25	622.15	645.80	672.78
	13.00%	493.76	503.31	513.69	524.99	537.37	550.96	565.98	582.65	601.25	622.15

Table 11, Source: Produced by author

According to what is listed in the table, the final value of the share price is not too sensitive to both WACC and g. By changing 0.5% if g, the valuation outcome will deviate by about 5%. Though there is a huge decrease in g estimate, the value is still well above the estimate from the current strategy. In this sense, the value of g is not violating the valuation too much.

From consideration of WACC, the situation comes more or less the same. There is one thing to be notice about is that if the original WACC is used in the valuation, the result will be around 5 times of the current value to the firm. This doesn't seem to be reasonable at all even with huge success in the Chinese market, and that lead to the subjective adjustment of WACC in the end. Comparing to the original WACC, the adjusted WACC violate much less of the valuation outcome, either.

Sub-conclusion:

The second valuation is based on the adjusted strategy from the second part of the report. It is believed that Vestas Group need to fully utilize their resources and capabilities to exploit the huge Chinese market in order to keep their international competitive position. In order to see whether this judgment is right or not, the second valuation is conducted to reflect how much value improvement will it be if the prospect of the company is changed.

The valuation first adjusts the strategy of the revenue and EBIT margin for the company. The forecast is based on general business development principle as well as hard facts of the local and global market development. The ratios for all other markets are not changed except or Asia Pacific market as there is no intent to change the strategy. The adjustment of China strategy will lead the importance of Chinese market weighted more or less the same as the real market potential.

The valuation secondly focuses on the adjustment on the cash and NIBD issue. It is obvious that the expansion strategy in China will requires a lot of R&D and other investments, the cash level will be decreased and the situation of negative NIBD will be improved. As it is negative signal for a company to accumulate too much cashes while losing huge investment opportunity, it is crucial to change this situation currently in Vestas Group in the new strategy.

After all the other assumptions including WACC and g are forecasted, the final value of the company is calculated by using DCF model. The final value is obtained as 703.85 DKK per share shows almost 60% of the value increase for the company comparing to the old one. Considering how much weight that Chinese market have in the global market and how much synergy that the Chinese market can provide together with other market, this improvement will be considered as reasonable.

When looking at the sensitivity analysis regarding WACC and g, those variables do not violate the valuation result too much. This further provides the accountability of the valuation. One thing to note is that the WACC value is subjectively adjusted to avoid an extraordinary unreasonable increase of value in Vestas Group.

Final discussions and Conclusion

The report is designed to make valuation for Vestas Group based on different strategies. The first strategy is based on historical and current situation that Vestas Group is in. The second strategy is based on the ignored Chinese market that is with the biggest potential in the future decade for Vestas Group. The comparison of the valuation results based on the two strategies will indicates that whether the prospect of the company can really be improved by making adjustment to the current strategy of the company.

In the first valuation, the accounting policy of Vestas Group is briefly discussed in order to back up the quality of the overall valuation as well as providing hints about how to deal with some accounting items such as the usage of EBIT margin. It is necessary to reformulate the financial statements including income statement and balance sheet in order to make preparation for the following assumption making, forecasting and procedures like these afterwards.

The historical statement is analysis by utilizing a profitability analysis in order to reflect that what kind of situation Vestas Group is currently in. Six key ratios are analyzed which are profit margin, assets turnover, return on invested capital, financial leverage and return on equity. There is a general trend that during the period from year 2011 to year 2013 when Vestas Group were having a hard time, the performance for Vestas Group is not very satisfactory, while I the recent two years, the situation is getting improved gradually. But this is not showing positive to all ratios.

Two key finding are clarified in the analysis. One is that though the ROIC is keeping improving over years, but the amount of invested capital drop tremendously especially during the business recovering period. The second is that the financial leverage for Vestas Group has dropped under 0 point and the dropping trend is still getting stronger. The reason behind it is that the amount of cash from Vestas group has been accumulated massively. The quick drop of invested capital together with heavy accumulation of cash make it a question that whether Vestas Group has compensated the long-term interest by pursuing short-term performance. As there are still a lot of huge market opportunities to exploit in, these findings send pretty negative signals to the analyzer.

Bearing these doubts in mind, the forecast based on the historical performance and the company's future outlook based on their strategic plan is made. Two valuation models are made to provide the results of the analysis. The models selected are DCF model and EVA model. Though that the two models have a lot of similarities and provide identical results under consistent assumption making, there are different focus on the two models.

The calculation of DCF model is based on actual free cash flow instead of book income, which makes it possible for investors to track the money left over directly to provide more trustworthy result. For EVA model, it shows clearly that whether the company is trading below or above the book value of

invested capital which means that whether the company is augment the value of the firm or destroying the firm value.

The share price of Vestas is calculated as 434.02 DKK. This price is generally a little bit low than the share price in the market. The price in the market might be pull up due to the positive prospect caused by the recent turning-around performance of Vestas Group. But it is questioned that whether the good prospect is correct as there are some negative signals hidden in the financial statements from Vestas Group.

The strategic analysis provides hinds about what kind of business position that Vestas Group is in and how Vestas Group can prevail in the intensive competition of wind energy sector in the world. The analysis includes a macro environment analysis, namely, PEEST analysis, a Porter's Five Forces analysis to analyze the company at industry level and a resource based view focus on the micro level of the company. The strategic analysis can help the company to underline strategic misbehavior and identify the potential opportunities.

At the macro level, the wind energy sector has received huge political support from different regions of the world. Though that the policies executive power of different countries is not the same, it is a generally a good signal for wind business. The world economy has a trend of slowing down which was not positive to generally all industries. But countries like China provides wind energy market fresh vitality with the huge potentials. Environmental aspect and social concerns are often bond together in clean and renewable energy sector. They give the wind energy business a great opportunity to take advantage of the environmental and social concerns and conquer the market prior to the other conventional energy source. And as for technology part, Vestas Group was always the leading company in the world until it fell behind the Chinese company Xinjiang Goldwind Science & Technology Co., Ltd last year in total capacity installations. The technology ofr Vestas Group is still expectional comparing to the competitors including the biggest Goldwind. They possesss the largest wind turbine manufacturing technology in the world and the technology in low wind speed domain is exceptional. The macro enviroment genrally shows a postive effect on the development of Vestas Group.

At industry level, the entrance barrier for wind energy sector is generally high. But the local support from countries like China will strike the barrier drastically. The bargaining power to the customer is high due to mainly a close to oligopoly wind business situation, and the company has built a pretty strong supplying channel to guarantee a smooth operation of the company. The threat from substitutes not only comes from clean and renewable energy sector, but also from the conventional energy sector. The competition in the market is pretty tight especially after a lot of strong wind energy firms emerged in the Chinese market. The price strategy has been impacted and the political support has inevitably become a disadvantage to Vestas Group. How to utilize their own advantage to compete becomes a crucial question to the firm.

The resources identified in the company are categorized as tangible resources, human resources, organizational resources, and financial resources. There are a lot of competitive advantages identified for the firm. The advantages include, technology, dynamic organizational culture, talent reserves, surplus amount of cash for investment and so forth. Among all of them, the sustainable competitive advantages are identified and they consist of the core competence that to properly utilize the technology combining with the dynamic organizational culture which facilitates right decision-making.

After the strategic analysis is made, it is clear that the opportunities in China will become the key to success for Vestas Group. According to this mindset, the second valuation is made. Since the new strategy is only focusing on the Chinese market, all other markets including Europe, Middle East, Africa, as well as America will be remained using the old forecasting assumptions. The two main issues including the cash and negative NIBD issues are taken care of in the new round of assumptions. g is adjusted to the world economic growth as it is believed that the new strategy implemented in China will generate a sustainable growth. The terminal WACC is adjusted to the level of the normal years, which avoid the exceptional increase of the company value due to too much dependence on terminal value causing by DCF model.

The final value of the share price is calculated as 703.85 DKK. This is about 60% of increase comparing to the old valuation outcome. To looking at the prospect of the Chinese market potential in

the future years, and the weight of the Chinese market among the world, the increasing is not so astonishing presumes that Vestas Group has fully captured the growth opportunities. The valuation only provides an expected outcome by adjusting the strategy, but it definitely shows that how much benefit Vestas Group can obtain by fully utilizing their internal funding resources to exploit the vital market in China.

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Appendix

Appendix 1

Income Statement of Vestas Wind System A/S						
mEUR	2010	2011	2012	2013	2014	2015
Revenue	6920	5836	7216	6084	6910	8423
Production costs	-5745	-5111	-6420	-5188	-5732	-6918
Gross profit	**1175**	**725**	**796**	**896**	**1178**	**1505**
Research and development co	-150	-203	-255	-246	-213	-211
Distribution costs	-206	-208	-204	-195	-158	-186
Administration costs	-351	-352	-333	-244	-248	-248
Operating profit (EBIT) befor	**468**	**-38**	**4**	**211**	**559**	**860**
Special items	-158	-22	-701	-109	48	46
Operating profit (EBIT)	**310**	**-60**	**-697**	**102**	**607**	**906**
Income/(loss) from investment	0	1	-2	0	-31	34
Financial income	22	26	78	20	50	61
Financial expenses	-94	-120	-92	-158	-103	-76
Profit before tax	**238**	**-153**	**-713**	**-36**	**523**	**925**
Income tax	-82	-13	-250	-46	-131	-240
Profit for the year	**156**	**-166**	**-963**	**-82**	**392**	**685**

Appendix 2

Balance Sheet of Vestas Wind System A/S						
mEUR	2010	2011	2012	2013	2014	2015
Goodwill	320	320	216	215	215	252
Completed development projects	169	577	485	331	274	261
Software	88	90	64	42	32	61
Other intangible assets	0	0	0	0	0	20
Development projects in progress	457	256	251	153	137	93
Total intangible assets	**1034**	**1243**	**1016**	**741**	**658**	**687**
Land and buildings	867	1020	785	803	695	763
Plant and machinery	304	387	220	219	211	219
Other fixtures and fittings, tools and equipment	248	326	218	151	168	191
Plant and machinery in progress	285	165	63	48	58	106
Total property, plant and equipment	**1704**	**1898**	**1286**	**1221**	**1132**	**1279**
Investments accounted for using the equity method	4	4	1	1	188	225
Other investments	0	0	0	0	14	20
Tax receivables	0	0	0	0	0	109
Deferred tax	224	333	146	155	170	149
Other receivables	25	44	32	34	36	39
Total other non-current assets	**253**	**381**	**179**	**190**	**408**	**542**
Total non-current assets	**2991**	**3522**	**2481**	**2152**	**2198**	**2508**
Inventories	2735	2546	2244	1425	1509	1899
Trade receivables	624	663	792	626	598	795
Construction contracts in progress	40	147	21	47	104	15
Tax receivables	64	41	63	57	65	60
Other receivables	277	395	389	307	402	442
Cash and cash equivalents	335	375	851	694	2018	2765
Total current assets	**4075**	**4167**	**4360**	**3156**	**4696**	**5976**
Non-current assets held for sale	0	0	131	332	103	103
Total assets	**7066**	**7689**	**6972**	**5640**	**6997**	**8587**
Share capital	27	27	27	27	30	30
Other reserves	9	7	5	-10	498	138
Retained earnings	2718	2542	1590	1507	1851	2731
Total equity	**2754**	**2576**	**1622**	**1524**	**2379**	**2899**
Provisions	139	145	175	200	231	314
Deferred tax	6	12	17	21	17	20
Financial debts	910	914	1458	604	3	495
Tax payables	0	0	0	0	0	44
other liabilities	2	2	2	2	10	10
Total non-current liabilities	**1057**	**1073**	**1652**	**827**	**261**	**883**
Financial debts	4	6	293	4	604	0
Prepayments from customers	1546	1865	1716	1568	2156	2258
Construction contracts in progress	15	38	77	12	12	17
Trade payables	1120	1563	1008	832	945	1760
Provisions	223	170	159	165	142	124
Tax payables	24	42	33	39	41	147
Other liabilities	323	356	412	426	457	499
Total current liabilities	**3255**	**4040**	**3698**	**3046**	**4357**	**4805**
Liabilities directly associated with current and non-current assets held for sale	0	0	0	243	0	0
Total liabilities	**4312**	**5113**	**5350**	**4116**	**4618**	**5688**
Total equity and liabilities	**7066**	**7689**	**6972**	**5640**	**6997**	**8587**

Appendix 3

Cash Flow Statement of Vestas Wind System A/S						
mEUR	2010	2011	2012	2013	2014	2015
Profit for the year	156	-166	-963	-82	392	685
Adjustments for non-cash transactions	411	366	1345	677	676	603
Financial income received	22	22	38	5	8	14
Financial costs paid	-49	-60	-92	-124	-62	-43
Income tax paid	-131	-69	-97	-57	-148	-184
Cash flow from operating activities before change in net working capital	**409**	**93**	**231**	**419**	**866**	**1075**
Change in net working capital	-353	747	-304	829	260	397
Cash flow from operating activities	**56**	**840**	**-73**	**1248**	**1126**	**1472**
Purchase of intangible assets	-328	-327	-169	-189	-115	-148
Purchase of property, plant and equipment	-458	-406	-167	-73	-163	-220
Purchase of other non-current assets	-12	-19	0	0	-16	-3
Acquisition of subsidiaries, net of cash	-2	-21	0	0	0	-55
Disposal of property, plant and equipment	11	12	45	20	8	1
Disposal of other non-current assets	0	0	5	3	1	0
Cash flow from investing activities	**-789**	**-761**	**-286**	**-239**	**-285**	**-425**
Free cash flow	**-733**	**79**	**-359**	**1009**	**841**	**1047**
Capital increase, net of transaction costs	0	0	0	0	432	0
Acquisition of treasury shares	0	-17	0	-7	-43	-176
Disposal of treasury shares	0	0	0	0	0	40
Dividends paid	0	0	0	0	0	-116
Raising of financial debts	596	4	882	0	0	496
Repayment of financial debts	-28	0	-50	-1143	0	-604
Cash flow from financing activities	**568**	**-13**	**832**	**-1150**	**389**	**-360**
Change in cash at bank and in hand less current portion of bank debt	**-165**	**66**	**473**	**-141**	**1230**	**687**
Cash at bank and in hand less current portion	479	332	370	847	690	2014
Exchange rate adjustments on cash at bank	18	-28	4	-16	94	64
Cash at bank and in hand less current portion of bank at 31 December	**332**	**370**	**847**	**690**	**2014**	**2765**
The balance is specified as follows:						
Total cash at bank and in hand	335	375	851	694	2018	2765
Current portion of bank debt	-3	-5	-4	-4	-4	0

Appendix 4

Analytical Income Statement of Vestas Wind System A/S						
mEUR	2010	2011	2012	2013	2014	2015
Effective tax rate	-0.34	0.08	0.35	1.28	-0.25	-0.26
Revenue	6920	5836	7216	6084	6910	8423
Production costs	-5745	-5111	-6420	-5188	-5732	-6918
Gross profit	**1175**	**725**	**796**	**896**	**1178**	**1505**
Research and development costs	-150	-203	-255	-246	-213	-211
Distribution costs	-206	-208	-204	-195	-158	-186
Administration costs	-351	-352	-333	-244	-248	-248
Operating profit (EBIT) before special items	**468**	**-38**	**4**	**211**	**559**	**860**
Special items	-158	-22	-701	-109	48	46
Operating profit (EBIT)	**310**	**-60**	**-697**	**102**	**607**	**906**
Income tax	-82	-13	-250	-46	-131	-240
Tax on net financial expenses	-25	8	6	176	-21	5
NOPAT	**203**	**-65**	**-941**	**232**	**455**	**671**
Income/(loss) from investments accounted for using the equity method	0	1	-2	0	-31	34
Financial income	22	26	78	20	50	61
Financial expenses	-94	-120	-92	-158	-103	-76
Tax shield	25	-8	-6	-176	21	-5
Net financial expenses	-47	-101	-22	-314	-63	14
Profit for the year	**156**	**-166**	**-963**	**-82**	**392**	**685**

Appendix 5

Analytical Balance Sheet of Vestas Wind System A/S						
mEUR	2010	2011	2012	2013	2014	2015
Total Assets	**7066**	**7689**	**6972**	**5640**	**6997**	**8587**
Cash and cash equivalents	335	375	851	694	2018	2765
Non-current assets held for sale	0	0	131	332	103	103
Total interest-bearing assets	**335**	**375**	**982**	**1026**	**2121**	**2868**
Total non-interest bearing assets	**6731**	**7314**	**5990**	**4614**	**4876**	**5719**
Provisions	139	145	175	200	231	314
Deferred tax	6	12	17	21	17	20
Tax payables	0	0	0	0	0	44
other liabilities	2	2	2	2	10	10
Prepayments from customers	1546	1865	1716	1568	2156	2258
Construction contracts in progress	15	38	77	12	12	17
Trade payables	1120	1563	1008	832	945	1760
Provisions	223	170	159	165	142	124
Tax payables	24	42	33	39	41	147
Other liabilities	323	356	412	426	457	499
Total non-interest bearing liabilities	**3398**	**4193**	**3599**	**3265**	**4011**	**5193**
Invested capital	**3333**	**3121**	**2391**	**1349**	**865**	**526**
Share capital	27	27	27	27	30	30
Other reserves	9	7	5	-10	498	138
Retained earnings	2718	2542	1590	1507	1851	2731
Equity	**2754**	**2576**	**1622**	**1524**	**2379**	**2899**
Financial debts	910	914	1458	604	3	495
Financial debts	4	6	293	4	604	0
Liabilities directly associated with current and non-current assets held for sale	0	0	0	243	0	0
Total interest-bearing debt	**914**	**920**	**1751**	**851**	**607**	**495**
Cash and cash equivalents	335	375	851	694	2018	2765
Non-current assets held for sale	0	0	131	332	103	103
Total interest-bearing assets	**335**	**375**	**982**	**1026**	**2121**	**2868**
Net interest-bearing debt	**579**	**545**	**769**	**-175**	**-1514**	**-2373**
Invested captial	**3333**	**3121**	**2391**	**1349**	**865**	**526**

Appendix 6

Numbers after tax	2010	2011	2012	2013	2014	2015
ROIC		-0.020173	-0.341578	0.1242424	0.4109845	0.9646725
PM	0.0293632	-0.011155	-0.130459	0.0381876	0.0658408	0.0796545
ATO		1.8084909	2.6182874	3.2534759	6.2420958	12.110712
ROIC		-0.020173	-0.341578	0.1242424	0.4109845	0.9646725
ROE		-0.062289	-0.45879	-0.05213	0.2008711	0.259568
NBC		0.1795409	0.0328921	1.0583614	-0.074553	0.0072397
Spread, (ROIC-NBC)		-0.199714	-0.37447	-0.934119	0.4855373	0.9574329
Financial leverage		0.2108818	0.3130062	0.1888112	-0.432744	-0.736453
ROE		-0.062289	-0.45879	-0.05213	0.2008711	0.259568

Appendix 7

Forecasted Income Statement of Vestas Wind System A/S for the First Valuation											
mEUR	E2016	E2017	E2018	E2019	E2020	E2021	E2022	E2023	E2024	E2025	TV
Revenue	9000	9617	10275	10979	11731	12535	13394	14311	15291	16339	17458
Operating profit (EBIT) before special items	**968**	**1034**	**1105**	**1181**	**1262**	**1348**	**1441**	**1539**	**1645**	**1757**	**1878**
Special items	0	0	0	0	0	0	0	0	0	0	0
Operating profit (EBIT)	**968**	**1034**	**1105**	**1181**	**1262**	**1348**	**1441**	**1539**	**1645**	**1757**	**1878**
Income tax	**-250**	**-268**	**-286**	**-305**	**-326**	**-349**	**-373**	**-398**	**-425**	**-455**	**-486**
Tax on net financial expenses	4	4	4	4	5	5	5	6	6	7	7
NOPAT	**721**	**771**	**824**	**880**	**940**	**1005**	**1073**	**1147**	**1226**	**1309**	**1399**
Financial expenses	14	15	16	17	18	19	21	22	24	25	27
Tax shield	-4	-4	-4	-4	-5	-5	-5	-6	-6	-7	-7
Net financial expenses	10	11	12	13	14	14	15	16	18	19	20
Profit for the year	**732**	**782**	**835**	**893**	**954**	**1019**	**1089**	**1163**	**1243**	**1328**	**1419**

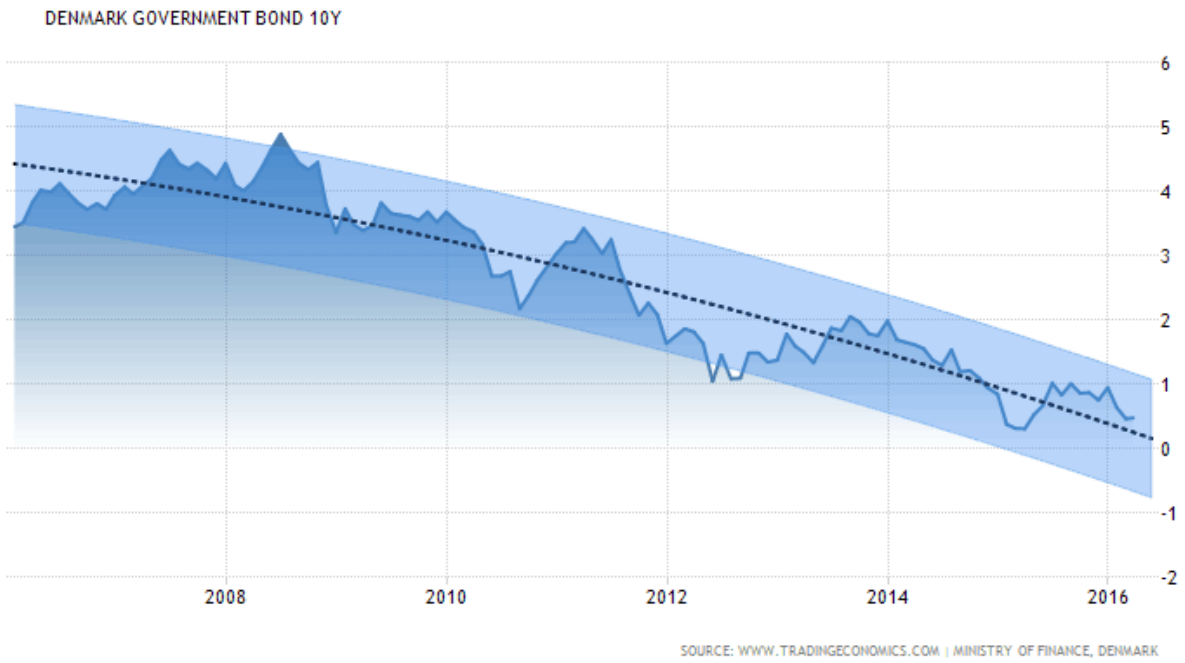
Forecasted Balance Sheet of Vestas Wind System A/S for the First Valuation											
mEUR	E2016	E2017	E2018	E2019	E2020	E2021	E2022	E2023	E2024	E2025	TV
Total intangible and tangible assets	**3010**	**3216**	**3436**	**3672**	**3923**	**4192**	**4479**	**4786**	**5114**	**5464**	**5839**
Inventories	2566	2741	2929	3130	3344	3573	3818	4079	4359	4658	4977
Cash and cash equivalents	2652	2834	3028	3236	3457	3694	3947	4217	4506	4815	5145
Total receivables	**1569**	**1677**	**1792**	**1915**	**2046**	**2186**	**2336**	**2496**	**2666**	**2849**	**3044**
Total assets	**9797**	**10468**	**11185**	**11952**	**12770**	**13645**	**14580**	**15579**	**16646**	**17786**	**19004**
Total equity	**3581**	**3827**	**4089**	**4369**	**4668**	**4988**	**5330**	**5695**	**6085**	**6502**	**6947**
NIBD	**-1748**	**-1868**	**-1996**	**-2133**	**-2279**	**-2435**	**-2602**	**-2780**	**-2970**	**-3174**	**-3391**
Non interest bearnig debt	5312	5675	6064	6480	6923	7398	7905	8446	9025	9643	10303
Interest bearing assets	2652	2834	3028	3236	3457	3694	3947	4217	4506	4815	5145
Total equity and liabilities	**9797**	**10468**	**11185**	**11952**	**12770**	**13645**	**14580**	**15579**	**16646**	**17786**	**19004**
Invested capital	**1833**	**1959**	**2093**	**2236**	**2390**	**2553**	**2728**	**2915**	**3115**	**3328**	**3556**

Appendix 8

Forecasted Income Statement for Vestas Wind System A/S for the Second Valuation											
mEUR	E2016	E2017	E2018	E2019	E2020	E2021	E2022	E2023	E2024	E2025	TV
Revenue	9019	9722	10646	11955	13701	15565	17535	19913	22145	23912	25824
Operating profit (EBIT) before special items	**970**	**1046**	**1145**	**1286**	**1474**	**1674**	**1886**	**2142**	**2382**	**2572**	**2778**
Special items	0	0	0	0	0	0	0	0	0	0	0
Operating profit (EBIT)	**970**	**1046**	**1145**	**1286**	**1474**	**1674**	**1886**	**2142**	**2382**	**2572**	**2778**
Income tax	**-251**	**-268**	**-292**	**-327**	**-374**	**-425**	**-479**	**-544**	**-605**	**-654**	**-706**
Tax on net financial expenses	4	2	0	-1	-2	-2	-2	-2	-2	-2	-2
NOPAT	**723**	**779**	**853**	**958**	**1098**	**1247**	**1405**	**1596**	**1775**	**1916**	**2069**
Financial expenses	15	6	-2	-5	-7	-7	-6	-6	-7	-8	-8
Tax shield	-4	-2	0	1	2	2	2	2	2	2	2
Net financial expenses	11	5	-1	-4	-5	-5	-5	-5	-5	-6	-6
Profit for the year	**734**	**784**	**852**	**954**	**1093**	**1242**	**1401**	**1591**	**1769**	**1910**	**2063**

Forecasted Balance Sheet of Vestas Wind System A/S for the Second Valuation											
mEUR	E2016	E2017	E2018	E2019	E2020	E2021	E2022	E2023	E2024	E2025	TV
Total intangible and tangible assets	**3016**	**3251**	**3560**	**3998**	**4582**	**5205**	**5864**	**6659**	**7406**	**7997**	**8637**
Inventories	2571	2771	3035	3408	3906	4437	4999	5676	6313	6816	7361
Cash and cash equivalents	2204	1584	867	487	140	222	321	406	451	487	526
Total receivables	**1573**	**1695**	**1856**	**2085**	**2389**	**2714**	**3058**	**3472**	**3862**	**4170**	**4503**
Total assets	**9364**	**9302**	**9319**	**9977**	**11016**	**12578**	**14242**	**16214**	**18031**	**19470**	**21027**
Total equity	**3674**	**2772**	**1952**	**1826**	**1954**	**2314**	**2786**	**3245**	**3609**	**3897**	**4208**
NIBD	**-1837**	**-792**	**217**	**609**	**837**	**856**	**786**	**811**	**902**	**974**	**1052**
Non interest bearnig debt	5323	5738	6283	7055	8086	9186	10349	11752	13069	14112	15241
Interest bearing assets	2204	1584	867	487	140	222	321	406	451	487	526
Total equity and liabilities	**9364**	**9302**	**9319**	**9977**	**11016**	**12578**	**14242**	**16214**	**18031**	**19470**	**21027**
Invested capital	**1837**	**1980**	**2168**	**2435**	**2791**	**3170**	**3572**	**4056**	**4511**	**4871**	**5260**

Appendix 9


DENMARK GOVERNMENT BOND 10Y
6
5
4
3
2
1
0
-1
-2
2008
2010
2012
2014
2016
SOURCE: WWW.TRADINGECONOMICS.COM | MINISTRY OF FINANCE, DENMARK