

# HedeDanmark

## Analysis of potential activity increase on the German Energy Market

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**Author:** Jacob Egholm Lyngsoe

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**Supervisor:** Steen Ehlers

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## 1. Executive summary

This thesis is developed to assist the Danish company Hededanmark (HD) and their German subsidiary Heidegesellschaft (HDG) in preparing for an author-suggested activity increase in the German energy industry. The main problem, which ultimately captures the essential purpose of this report, is;

***“How is the German market potential for HDG likely to develop in the years to come, and which factors will be key drivers of this development? And how can HD & HDG improve their approach to developing strategies to ensure profitability in their foreign subsidiaries?”***

The report has prioritized to analyze the macro environmental factors that are believed to have the largest impact on the future development of the German energy industry. These macro factors include; the Political & Legal-, Economic-, Social & Cultural- and Technical environment.

The findings from this analysis will then be applied onto an impact and probability analysis, as this offers HD & HDG an easy overview of which uncertainties to prioritize making contingent strategies for.

Next, the thesis moves on to a market and competitive analysis of the two submarkets electricity and heat generation. The market analysis includes historic data and forecasts on future development, also weighing in the previously revealed uncertainty scenarios from the above macro analysis.

Included in the market analysis is a comprehensive discussion on the competitive environment that HDG can expect to face, if they decide to go ahead with the suggested activity increase. At the end of this chapter, the author has enclosed a high-growth market risk assessment, which also assists in limiting the risk of unforeseen scenarios surprising HDG, should they choose to enter this market.

The final sub-analysis will initially focus on a micro level analysis of HD's current assets and competences, in an attempt to reveal competitive advantages, which should be thought into the development of a market specific strategy for this proposed activity increase. Once this final piece in the puzzle has been unveiled, the report moves onto the actual recommendation of strategic options available, and which of that is considered most advantageous for the potential task at hand in HDG.

## 2. Introduction

The purpose of this report is to offer a comprehensive analysis of an author-based recommendation, for HedeDanmark (short: HD) and more specifically their German subsidiary; Heidegesellschaft (Short: HDG), to consider increasing their biomass energy business efforts on the German Energy Market. The report will make use of a wide variety of acclaimed business theories as well as a great deal of updated secondary data and finally empirical primary data, retrieved from interviews with leading managerial employees of HedeDanmark.

## 3. Criteria for choice of empirical project

Apart from adhering to the formal requirements for this final thesis, and due to the comprehensive scope of International Business theory, the author of this report initially narrowed down the purpose of this report and defined the following criteria:

- The report should be: Relevantly based on a current opportunity of new market entry or expansion of activities in an International market.
- The data in the report should, apart from updated secondary data, contain primary empirical data, with offset in empirical interviews with key managerial positions in HD & HDG.
- The report should contain: Practically applicable conclusions, based on theoretical analysis and empirical knowledge.
- The report should contain Multi level research; Industry & Country analysis (Macro), Market & competition analysis (Meso) as well as an analysis of performance enhancing or reducing strategies or the lack hereof (Micro)

Though the author of this report is currently working in a completely different field of business, the opportunity for a more objective analysis with no prejudiced thoughts on the planned investment, as well as a highly relevant case that would tick all of the above purpose definitions, and finally a

personal interest in the subject of future energy industries and the trade within these, lead to a choice of HD & HDG as the target companies.<sup>1</sup>

#### 4. Context analysis

After a final vote in May 2011 a decision was made to shut down the remaining nuclear power stations in Germany over the course of the next ten years.<sup>2</sup>

Apart from the no-nuclear policy, Germany has also politically committed to several energy reforms such as the “Energiewende” from the early 2000’s and the “Renewable Energy reform Act” (EEG) from 1990, where some of the primary targets are a reduction of greenhouse gas emissions with 40 % in 2020 and by 80 percent in 2050. (Compared to 1990 levels)<sup>3</sup>

As Germany are the first and only European country to implement a “no nuclear” energy policy, and with Germany being the front runners on promoting renewable energy sources since the early 90’s, this development arguably means that the demand for alternative sources of energy will increase relatively more over the coming years in Germany compared to other European countries.

This (perceived) high-growth development has sparked the recommendation, from the author of this report, for HDG to increase their activities on the German market for biomass energy.

Since Biomass is far from the only alternative energy source to nuclear energy and fossil fuels in general, it is currently unknown to the author exactly how this German energy market has, is and will develop in the years to come as well as which macro level factors that are the key drivers of this development.

During the process of writing this report, the author will also keep a close eye on the developments in the Ukraine – Russia crisis, which has highlighted the disadvantage of EU and particularly Germany’s dependency on Russia for gas based energy.<sup>4</sup>

Through interviewing various managerial people within, as well as previously employed at, HD/HDG<sup>5</sup>, the author believed to have revealed a potential lack of suitable market specific

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<sup>1</sup> Researcher Bias - <https://explorable.com/research-bias>

<sup>2</sup> <http://www.information.dk/269844> - Troels Heeger, 31st May 2011

<sup>3</sup> <http://www.dw.de/what-exactly-is-germanys-energiewende/a-16540762>

<sup>4</sup> <http://energytransition.de/2014/03/closer-look-at-german-energy-dependence-on-russia/>

strategies and this consequently called for the micro level analysis to be focusing mainly on existing competences in HD & HDG's organization and from this, offer recommendations for future market specific strategies, based on the findings in the macro & meso level analyses as well, naturally.

Though nuclear energy is/was solely used for the generation of electricity<sup>6</sup>, the report will not approach the analysis with a limitation of analyzing only this industry, as the nuclear phase out is only one of many factors expected to affect the German energy market in the years to come and the link between the electricity and heating sector is believed to be highly interconnected.

## 5. Company Profile – Hedeselskabet<sup>7</sup>

HD is part of the cooperate group; Hedeselskabet, which is a business driven association with various subsidiary companies. All of these subsidiary companies are operated under the group name “DalgasGroup”, which are tasked with all commercial ends of the association.

All of these subsidiaries are working within nature-related and environmental sectors.

Hedeselskabet is also a research and knowledge promoter within the “green” industries such as forestry, energy and environment. Appendix 1 shows the cooperate structure of Hedeselskabet and a later sub-analysis will describe these partnering subsidiaries in more detail.

### **Vision:**

*“DDH's vision is to be the leader in the group's business areas.*

*Through development, the company will continue to supply better products and optimum services to the customers - and thereby make a significant contribution to the development within nature and the environment both in Denmark and abroad.”*

### 5.1.HedeDanmark (HD)<sup>8</sup>

HD's Danish organization is the largest supplier of wood chips to the Danish heating and electricity plants with a total market share of approximately 33 % of the total consumption of this energy

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<sup>5</sup> See appendix 14 – interview with Erik Joergensen, previous Director for Heidegesellschaft.

<sup>6</sup>[https://www.destatis.de/EN/FactsFigures/EconomicSectors/Energy/Production/Tables/ElectricityProduction\\_CHP\\_Monthly.html](https://www.destatis.de/EN/FactsFigures/EconomicSectors/Energy/Production/Tables/ElectricityProduction_CHP_Monthly.html)

<sup>7</sup> [www.hedeselskabet.com](http://www.hedeselskabet.com)

<sup>8</sup> [www.hededanmark.dk](http://www.hededanmark.dk)



source (biomass) in Denmark. Their operation in Denmark is based on a well-renowned complete supply chain project based service, ranging from the planting of future forests, the distribution of the wood chips from forests to plants, customer stock planning, machinery maintenance and so forth.<sup>9</sup>

HD currently only offers this full supply chain service in Denmark, but they are represented in wide variety of countries with various trade offices & agencies around the globe. Their main International subsidiaries are located in Sweden, Germany & UAE.

HD is made up from 4 main business units (SBU's); Green Services, Landscape, Forest and Trade. This report will only operate within the Forest division, as both the Danish and German biomass energy operations are contained within this SBU. However, the author critically acknowledges that the other SBU's and partnering subsidiaries might offer valuable experience or knowledge; hence this will also be considered where relevant.

**Vision:**

*“Our vision in HedeDanmark is to become a leading, innovative company with service-minded employees in the green area.”*

**Mission:**

*“HedeDanmark's mission is to develop natural amenities and natural resources in both Denmark and abroad by adhering to a high level of professionalism and ethics in our dealings with nature.”*

## 5.2.Heidegesellschaft<sup>10</sup> (HDG)

HDG was founded in 1989 and currently has 15 employees that generate a turnover of €15-20 million this year. The company is generating approx. 80 % of their turnover from trading of round logs for countless purposes, ranging from ice lolly sticks to wood pallets. The remaining 20% of the turnover is generated from biomass energy related business. The majority of the traded wood products are exported out of Germany, with a particular focus on the existing Danish customer base in Southern Jutland.

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<sup>9</sup> Interview with Carsten Mortensen, Driftsleder, Flis at HD (DK) – see appendix 17

<sup>10</sup> [www.heidegesellschaft.com](http://www.heidegesellschaft.com)

The company is managed by Niels Joergen Pedersen from Denmark, but with Carsten Boedicker as the regional manager with the responsibility of the daily management of HDG.

Apart from Carsten, there is another regional manager for the round timber division; Mario Stabenow. The organization also consists of two “buying agents” for round timber trading, and 10 different roles within logistic, IT and administrative assistance. From the looks of the organization chart, there are no specific personnel allocated to the trade of biomass energy in Germany.<sup>11</sup>

**Vision:**

*“Heidegesellschaft is a strategic partner and wants to be the market's most credible supplier of German and foreign wood resources from forests and the open land.”*

**Mission:**

*“With high professional and ethical competence in service, procurement, logistics and finance, Heidegesellschaft wants to contribute to security of supply and optimisation of the supply chain at wood-consuming companies in Germany and abroad.”*

## 6. Problem identification

The main spark for the author of this report to recommend an activity increase was the recent political decision in Germany to out-phase all nuclear energy supply within the end of 2022. When this decision was made in May 2011, the market share of Nuclear power in Germany was at 17.6 %.

Seeing that this, relative to other energy supply forms, large market share will have to be covered by other energy supply sources within the next 8 years; this inarguably has a massive effect on the market for energy in Germany.

Apart from the no-nuclear policy, Germany has as mentioned also committed to several renewable energy reforms such since the 1990's, and more of these incentive programmes are added continuously.

The below chart illustrates the total contribution of renewable energy sources compared to the total consumption of electricity and heat in Germany from 1990 to 2012.

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<sup>11</sup> <http://www.heidegesellschaft.de/Contact.6447.aspx>

## Renewable energy shares of energy supply in Germany, 1990 and 2000 to 2012

	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
	[%]	[%]												
Electricity supply (based on total gross electricity consumption)	3.4	6.2	6.6	7.7	7.6	9.3	10.2	11.6	14.2	15.1	16.3	17.0	20.4	23.5
Heat supply (based on total heat consumption)	2.1	3.9	4.2	4.3	5.2	5.5	5.9	6.1	7.5	6.7	8.2	9.3	9.9	10.2

Table 1 - Source: "Renewable energy sources in figures" by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

This table is sourced from a publication made by the Federal Ministry for the environment, Nature Conservation, building and nuclear safety, hence the official profile of the authors of this report, makes it highly reliable.

The above data has in appendix 2 & 3 been placed in an easy-to-compare table to illustrate how the development in Germany compares to other EU countries. For the electricity sector, Germany has since 2004 been growing their renewable share at a faster pace than all other European countries except for Estonia and Ireland. The heating and cooling industry has not seen a similar rapid growth pattern, but relative positive growth compared to the EU average is evident.

These superficial data does indicate a high-growth market for renewable energy suppliers in Germany, and with the ambitious plans of continuously increasing these shares, the potential for high growth in the German energy sector, in the coming years is also apparent.

However, these data does also invite several important problematic questions which have fuelled the prioritization of content within this report:

1. Why did the nuclear phase out decision in 2011 not result in a spike (negative growth rate compared to 2010-11) in the renewable energy share with the immediate closure of 7 reactors? (Are other macro environmental factors affecting the market negatively?)
2. Though the data indicates high growth potential for renewable energy supplier, will this growth be equally distributed on the individual shares of competing renewable energy sources? (Market & competitive risks analysis with above macro findings in mind)

The first problem/question above contradicts the perception that the anti-nuclear decision will be an exclusively positive thing for the renewable energy sector, and leads the author to question just how much other events in HDG's macro environment are affecting the development within the German energy industry. A probability & impact analysis is also considered highly relevant to conduct, so that the market specific strategy recommendations can weigh the importance and likeliness of the various uncertainties that are potentially revealed.

The second questions raise the need for a comprehensive market analysis that is expected to establish where the market potential actually lies for HDG in Germany and how large this potential is and potentially will be in the years to come. Once the market potential has been identified and estimated, the report will look in-depth at the partly macro-, partly meso-level, Competitive environment which HD can expect to face if stepping up their interests in this volatile German Energy market.

Statements from official sources such as; "It's all about the wind and solar (photovoltaic - PV) power supply"<sup>12</sup> as well as the note from interview with current regional manager for HDG; Carsten Boedicker in appendix 21:

*"The Political situation changed after May 2011, but the government preferred subsidies for Solar & Wind Energy."*

Leads the author to believe that the preference from various important stakeholders might be biased and not in favour of the Biomass sector. The role of potential interest/lobby groups should also be analyzed within this section of the report.

As a build-on from the market analysis and the probability analysis in the macro analysis, the author believes a risk-analysis, of the factors that typically affect the profitability of the competing companies, within a high-growth market, should be conducted.

Not related to the data above, but instead, data stemming from interviewing various managerial people within, as well as previously employed at, HD/HDG<sup>13</sup>, has led the author to believe a lack of

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<sup>12</sup> [http://www.agora-energiawende.org/fileadmin/downloads/publikationen/Impulse/12\\_Thesen/Agora\\_12\\_Insights\\_on\\_Germanys\\_Energiewende\\_web.pdf](http://www.agora-energiawende.org/fileadmin/downloads/publikationen/Impulse/12_Thesen/Agora_12_Insights_on_Germanys_Energiewende_web.pdf)

<sup>13</sup> See appendix 14 – interview with Erik Joergensen, previous Director for Heidegesellschaft.

suitable market specific strategies is reducing the performance of HD's international subsidiaries and this is subsequently calling for a micro level analysis where emphasis should be placed on valuating the internal competences in HD & HDG's organization and from this, offer recommendations for future market specific strategies. This analysis should naturally also consider the previous findings in the other sections of the report.

With the above prioritization of content, the overall problem-based purpose of this report can be boiled down to answering the following problem(s) for HD/HDG:

## 7. Formulation of Problem

**“How is the German market potential for HDG likely to develop in the years to come, and which factors will be key drivers of this development? And how can HD & HDG improve their approach to developing strategies to ensure profitability in their foreign subsidiaries?”**

To ensure the above main problem can be resolved to an utilizable outcome, the report will look at the following subsidiary questions:

- How has macro environmental factors affected the Germany energy industry since the inception of their energy reforms in 1990 and how will these be likely to affect this industry in the years to come?  
*(PESTLE tool as checklist for macro factor inclusions + probability matrix analysis for prioritization of uncertainties)*
- How has the Germany energy market and the competitive environment within this market, reacted to the changes in the macro environmental factors, and what is the outlook for this market in the years to come?  
*(Mainly quantitative data- and empirically based historic overview & forecasting, Porter's 5 forces model to analyze macro/meso level competitive environment & finally a risk assessment model for a perceived high growth market)*
- How is HD/HDG currently managing their international subsidiaries from a strategic perspective, and are there any competitive advantages within the organization that could be exploited to a higher degree?  
*(Analysis of HD/HDG's potential competitive advantages as well as strategic abilities to manage the growth of their international subsidiaries)*

## 8. Limitations

As stated in the problem identification chapter above, the author has found relevance in including all macro environmental factors that are included in the PESTLE framework. A couple of macro-level factors has however been excluded (which are all coincidentally not part of the typical PESTLE framework) and one of these is the demographic development in Germany. The author does not believe that changes in the matters such as ethnicity, age group development or gender spread is relevant in a report offering advice to increase the chances of a successful venture for HD in Germany.

Another excluded factor is the media environment. This environment typically holds a great deal of power in most modern countries<sup>14</sup>, but to offer a deep insight into the potential bias of this sector would not be within the scope of this report. However since a lot of the data for this report has been collected through various media outlets, the author will continually offer a critical assessment of these sources and their potential bias. (this is also included in the bibliography chapter)

In the authors work with the prioritized macro level factors, the author has deliberately chosen to combine certain synergetic environments and hence selected the following factors to analyze:

The **Political & Legal**, the **Economic**, the **Ecological & Social/Cultural** & finally the **Technical/Scientific** environments.

As it can be seen above, the author has not included the competitive environment in the macro-level factor analysis, though theoreticians such as Kottler<sup>15</sup> include this in their so-called PESTLE-C framework. This deliberate separation has been done, as the author argues that the competitive environment should not be considered a factor which HD cannot affect by their actions, hence it is not exclusively a macro environment that should only be adapted to. The macro analysis will also include an impact analysis, that will help to visualize the probability as well as consequences that the acknowledged uncertainties represents for HD/HDG.

The meso level market analysis will be based on quantitative historic data and forecasts, and once the market potential of the sub-markets has been established, the above mentioned analysis of the

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<sup>14</sup> Statement made by the author based on general knowledge on internet based media outlets such as blogs, opinionated news sites etc.

<sup>15</sup> Marketing Management by Kottler et.al. 2<sup>nd</sup> edition 2012.

competitive environment will follow through the usage of an author amended version of Porter Five Forces model. Finally a risk assessment of the risks HDG is likely to phase, when potentially entering a high growth market will be conducted.

The micro-level introverted analysis of HD and their organization has been turned towards a strategic and competence perspective, due to some of the responses in the enclosed interviews with managerial personnel at HD/HDG.

Though the report evaluates the competitive advantages of HD/HDG, it will not include a full scale value chain analysis, partly due to space restriction and prioritization of other matters, but also because of the comprehensive data needed for this type of analysis has not been available. The exclusion of this is however not valued to reduce the validity of the conclusions within the report, but performing such an exercise, could result in HD/HDG potentially finding even more competitive advantages in their organization to exploit in foreign markets.

By prioritizing the above 3 subsidiary analyses, the author has naturally neglected countless alternative International Business approaches to this case. Below is a list of most relevant exclusions and the reasons for not prioritizing these:

#### **In-depth analysis of interregional trading in EU**

Though partly contained in the report, in the discussion on Germany's import/export of energy for power supply, a thorough analysis of this would be too comprehensive to be contained within this report. The author does however believe the brief discussion of this subject that is contained in the report, offers enough relevant insight to not affect the validity of the conclusions made in this report.

The author has however prioritized a discussion of the potential, but immediate, threat from the Russian president Vladimir Putin on potentially cutting back on the supply of Biogas for Europe due to the Ukraine crisis.

#### **Customer loyalty and satisfaction survey (incl. competitor comparison)**

Although being highlighted in several chapters as being a highly advisable for HD & HDG to conduct, this survey has not been deemed possible for the author to create. This is partly due to a prioritization of other content, but also because the customer data needed to conduct such as survey, has not been made available to the author.

## 9. Methodology

Throughout, the report will document and summarize conclusions through a SWOT framework<sup>16</sup>. The use of this framework as summary tool will first and foremost enable HD's management to rapidly utilize this report's conclusions to plan their next move. It will also offer the general reader of this report a visual overview of conclusions. The below chapter clarifies in detail how this report will approach the research as well as offer details on the data & theory used within this report:

### 9.1.Scale of research

The author has, in an attempt to offer a wide spanning yet still specific and relevant conclusion for HD to act upon, chosen to include all 3 research scale levels in this report. Firstly a macro level analysis, of the environmental factors which HD can expect to face, when they potentially increase their activities in Germany. This analysis represents the factors which HD are unable to directly affect with their actions, hence they must adapt to the findings in this analysis.

Secondly a meso level market research and competitive environment analysis will be conducted, to ensure HD knows the historic development of the market but also the realistic outlook for this. The majority of findings in these meso level analyses can be directly or indirectly affected by the future actions of HD, and their strategies in their marketing mix. Particularly the power of interest groups will be explored in-depth in this chapter of the report.

Finally the analysis of HD's internal competences and seeming lack of market strategies will be conducted on a micro level. On a micro level, HD will be able and responsible for making potential necessary changes, which can increase their chances for a successful venture.

### 9.2.Different angles of approach (deductive vs. inductive)

This problem based report is initially met with a deductive approach; since it was already in the context analysis concluded that the business environment and market development in the German Energy Sector is changing due to recent changes on the political scene. This creates a problem/potential for this report to analyze, as the perception from the management is clear in their interview answers; that these political changes will not affect the potential for their biomass energy business in Germany.

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<sup>16</sup> See appendix 10



Since the market potential for the various sub-markets in the German energy industry is unknown at this point, the author will follow an inductive approach to hopefully reveal where the biggest and easiest accessible market potential actually lies for HD/HDG.

The final sub-analysis will also make use of a more inductive approach, as this analysis is based on the retrieval/discovery of empiric data, which indicates the management of HD might not be achieving maximum output from their subsidiaries due to disadvantageous strategic management practices.

### 9.3.Data-analysis form(s)

The first sub-analysis will look at historic data for the macro environmental factors prioritized in the problem identification section of this report. By basing the conclusions, on the past developments as well as the current situation for the factors affecting this market, on historic data, this data analysis form can be labelled as descriptive. As Bickman and Bog writes in their “*Handbook of Applied Social Science Research Methods*”<sup>17</sup>, descriptive research is the preferred data form to explain “what is” and “what was”. From this descriptive level, the author makes use of scientific business theories and industry expert opinions, to offer a more explorative approach which provides HD with new knowledge on the expected outlook for these factors through the impact & probability analysis.

This is the same recipe for the second sub-analysis, where historic market data will be used to descriptively explain the “what is” and “what was” situation of the German Energy market, and a more explorative research approach will then be applied for the forecasting of the future market outlook, both in terms of size and competitive environment. The high-growth market risk analysis will also make use of this explorative approach, as this is a forecasting tool.

The final sub-analysis exclusively uses a experimental/explorative approach, where the author’s argument of HD not being sufficiently strategically geared to manage this International business expanding project, is argued through various management and strategy theories.

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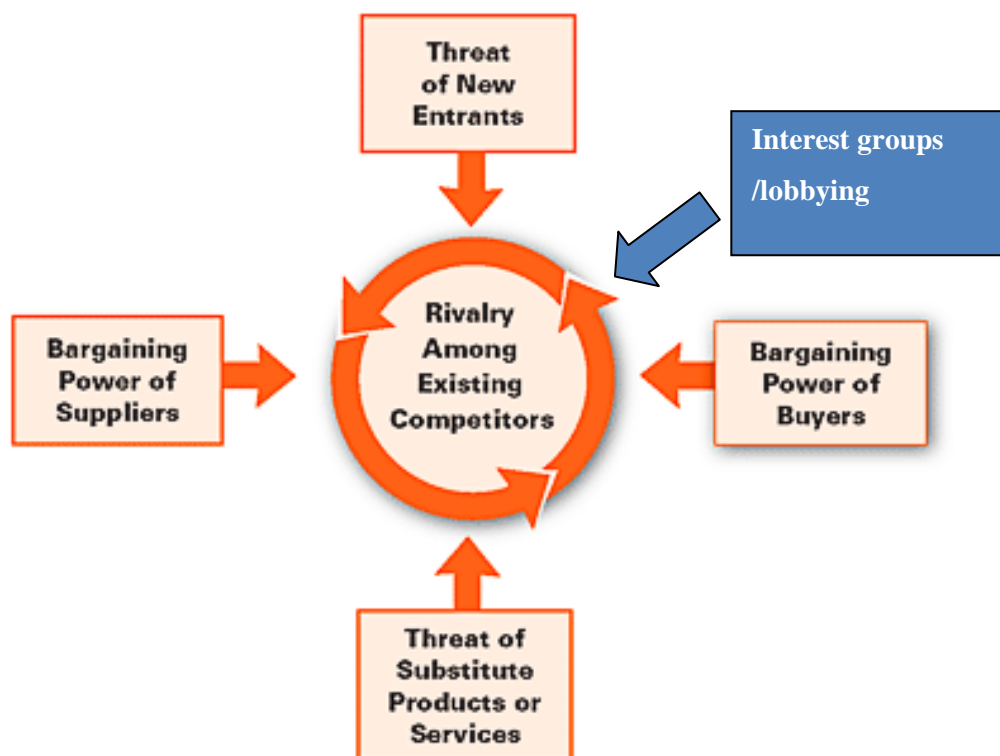
<sup>17</sup> ‘Designing a qualitative study’, in L. Bickman & D.J. Rog (Eds.), *Handbook of Applied Social Science Research Methods*. Thousand Oaks, CA: Sage

#### 9.4.Theories and Models used in the report

The first sub-analysis makes use of a PESTLE framework, which is more of a checklist than an actual analytical model. This framework covers the macro environmental factors of; Political, Economic, Social, Technical, Legal and Ecological. The PESTLE's frameworks origin is believed to be from a paper by Francis J. Aguilar from 1967, which discusses ETPS (economical, technical, political and social sectors).<sup>18</sup> This chapter of the report will also contain an impact and probability analysis developed by David A Aker & Damien McLoughlin in their book "Strategic Market Management" European Edition, from 2007.

The competitive environment analysis will make use of an author amended version of Michael E. Porters 5 forces model (P5F), which argues that any competitive environment and the level of rivalry within this environment is relying on 5 forces/factors. See the author amended version below:

#### The Five Forces That Shape Industry Competition



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<sup>18</sup> <http://rapidbi.com/history-of-pest-analysis/>

*Figure 1 - Source: "How competitive forces shape strategy" by Michael E. Porter, published by Harvard Business Review from 1979*

*HBR is believed to be a highly reliable source of IB related papers and articles.*

The reason for adding the 6<sup>th</sup> element, is the authors critical acknowledgement of the P5F model having certain limitations in describing more complex markets, where a.e. strategic alliances, with would-be competitors are lobbying against a common enemy, exist. This build-on will help clarify for HDG, just how the presence of these interest/lobby groups can assist and oppose HD in succeeding in a market where a high level of political interference is thought to be present.

The market analysis will apart from the findings in the PESTLE framework & the impact and probability analysis, also make use of a tool that illustrates the risks of entering a high growth market. This model is presented in the book Strategic Market Management by David A. Aaker and Damien Mccloughlin from 2007 and can be seen in the chapter relating to this analysis.

The final sub-analysis makes use of the concept of strategic market management, which is developed in the same book as the high-risk analysis above. This theory explains how an organization, such as HD/HDG can, benefit from creating strategies with offset in the individual market and not just the vision and mission of the organization.

This type of strategic approach, does not only consider internal competences and potential sustainable competitive advantages, but it is also highly dependent on factual market figures and realistic environmental forecasts, which due to the other content of this report, raises the validity and reliability of the conclusions within this chapter and the report in general.

### 9.5. Empirical knowledge & data within the report

The report will make use of interviews with the following key personnel at HD:

**Niels Joergen Pedersen** – Manager of HDs raw-wood division, which includes the current trade office in Germany.

**Erik Roi Joergensen** – Previous director of Heidegesellschaft. (Referenced to by his previous superior manager, Niels Joergen Pedersen as well as previous colleague Carsten Mortensen)

**Carsten Boedicker** – Regional manager of Heidegesellschaft

**Carsten Mortensen** – Daily Operation manager of wood chip division in Denmark.

### 9.5.1. Critique of qualitative interviews<sup>1920</sup>

Throughout the report these interviews has been used to explain matters such as technical industry related matters, practical market insight and finally the author has analyzed the responses for use in the final micro-level analysis of HD and HDG. The interviews has been conducted on an explorative basis where the author of this report attempted to set up semi-structured open questions for the interviewee to elaborate freely on, as the author believed this would result in more utilizable answers that could be used for specific answering of certain doubts the author might have had to the business of HD & HDG in general, but also work as a platform for a discussion on the internal capabilities of HD. Finally the interviews were also designed to potentially offer insight into some prejudiced expectations these key stakeholders might have had to the potential activity increase on the German market for Energy. The author deliberately informed the interviewed managers that the purpose of the report was to identify and analyze unreleased potential on the Germany energy market, before they responded, which was thought to provoke a defensive stance against the authors challenge of the company not taking full advantage of a potential market opportunity.

The author was critically aware that these responses might have contained biased opinions. a.e. the German Regional manager might be more inclined to have positive prejudices about the potential in Germany, whereas the Danish operations manager might be more inclined to spend the resources building on the current set-up in Denmark. This would however prove not to be the case, with the current regional manager in Germany; Carsten Boedicker clearly expressing that he does not believe there is any unspent potential for HDG on the German market for biomass energy.

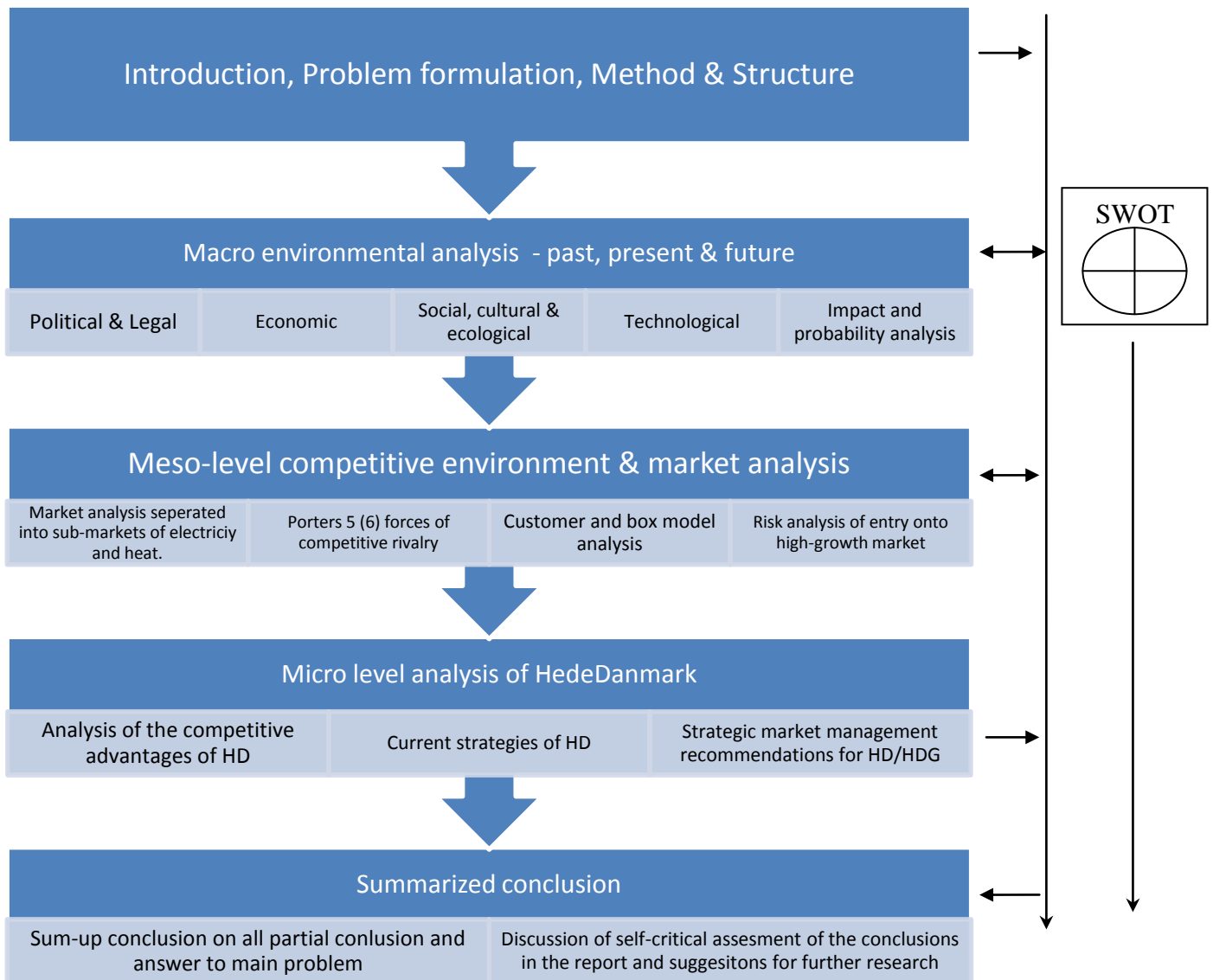
The superior manager of Carsten Boedicker; Niels Joergen Pedersen as well as the daily operations manager Carsten Mortensen, did however also refer to a recent previous director for HDG; Erik Roi Joergensen. Erik he offered some interesting insight into areas such as scarce resource constraints (indirect competition), managerial shortcomings and historic efforts (or lack hereof). The author of this report naturally acknowledges that being a previous employee, Erik might have biased opinions on certain matters, however, since it was current managers that referred to Erik, the author does not believe any reasons for Erik to be biased against HD/HDG exist.

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<sup>19</sup> [http://samfnu.systime.dk/fileadmin/filer/Tekster/Emne1/k\\_jbn\\_samfviden\\_under.pdf](http://samfnu.systime.dk/fileadmin/filer/Tekster/Emne1/k_jbn_samfviden_under.pdf)

<sup>20</sup> Marketing Management by Kotler et.al. chapter 6, 2<sup>nd</sup> edition 2012.

### 9.6. Structure of the report



### 9.7. List of abbreviations

HD	=	HedeDanmark
HDG	=	Heidegesellschaft
PV	=	Photovoltaic (Solar)
KSF	=	Key Success Factors
SCA	=	Sustainable Competitive Advantages
IB	=	International Business

CHP = Combined Heat and Power (plant)

DH = Direct heating (plant)

## 10. Sub-analysis 1 – Macro Environmental Factors

The political decision to phase out all nuclear based energy in Germany before 2022, is a prime example on certain changes in a company's macro environment that can have a direct ripple effect into the performance of the organization, or indirect through the effect a certain decision has on the organization's customers and/or suppliers. Typically an organization is unable to affect the changes happening in their macro environment, and the management therefore often needs to adapt actively to certain threats or opportunities created here from.

However as Gary Hamel and C.K. Prahalad writes in their 1992 article "competing for the future" for Harvard Business Review, a post-modern organization can achieve competitive advantages through having a clear and shared understanding in how their industry will look in 10 years time. By having proactive management strategies, an organization can ensure quick adaptation and in certain cases even have an effect on changes in their macro environment before they become a reality.<sup>21</sup>

### 10.1. The political & Legal environment – then till now

On the 11<sup>th</sup> March 2011, a 15 metre high Tsunami disabled the power supply for the cooling systems for 3 reactors at the Fukushima plant some hundreds of kilometres north of Tokyo. The actual nuclear meltdown has not caused a single death case, and there has been no sign of any radiation sickness, but it is estimated that the evacuation of more than 100.000 Japanese civilians has resulted in more than 1000 deaths due to bad living conditions etc.<sup>22</sup> The financial costs for the Japanese economy are beyond count still, but it is actually the effect that this tsunami had on a country's energy politics more than 5.000 miles away, that this report will place emphasis on exploring; more specifically Germany.

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<sup>21</sup> Strategic Market Management, European Edition by David A. Aker & Damein McLoughlin – John Wiley & Sons Ltd. 2007

<sup>22</sup> <http://www.world-nuclear.org/info/safety-and-security/safety-of-plants/fukushima-accident/>

Already in 1980's, Germany started to draw up plans for an "Energiewende" which targets significantly reduced CO<sub>2</sub> emissions from energy manufacturing. This Energiewende was made official policy in early 2000's, with the coalition of the Social Democrats and the environmentalist party "Greens", and the targets for this reform was a reduction of CO<sub>2</sub> emission, from 1990's figures, of 40 % by 2020 and 80 % by 2050.

When Angela Merkel took over as Chancellor of Germany in 2005, she had previously been the German Federal minister for Environment, Nature Conservation and nuclear safety for 4 years between 1994 and 1998 under Chancellor Helmut Kohl before becoming the leader of the Christian Democratic Union (CDU)<sup>23</sup>. When she entered office, she publicly supported the usage of nuclear energy, as the only realistic way to reach the targets set out in the Energiewende, without there being an enormous bill to pay for the German public.<sup>24</sup>

However due to the public voters mounting massive pressure on Angela Merkel in the aftermath of the 2011 disaster in Japan, she therefore made a U-turn and ordered the immediate closure of seven reactors and reaffirmed that the previous targets in the Energiewende would still be standing, however these should now be achieved without the CO<sub>2</sub> neutral nuclear electricity production.<sup>25</sup>

#### **10.1.1. Feed in tariffs (Short: F.I.T)**

In the early 1990's the Germans introduced a Renewable Energy Act (EEG), which is a law that ensures that electricity created from renewable energy sources have priority on the power grid, and by this legislation force the utility companies to pay the supplying power companies, or in most cases individuals or energy "co-operatives" a F.I.T. This tariff is calculated in a fairly simple way:

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<sup>23</sup> [http://en.wikipedia.org/wiki/Angela\\_Merkel](http://en.wikipedia.org/wiki/Angela_Merkel)

<sup>24</sup> <http://www.dw.de/what-exactly-is-germanys-energiewende/a-16540762>

<sup>25</sup> <http://www.economist.com/node/21559667>

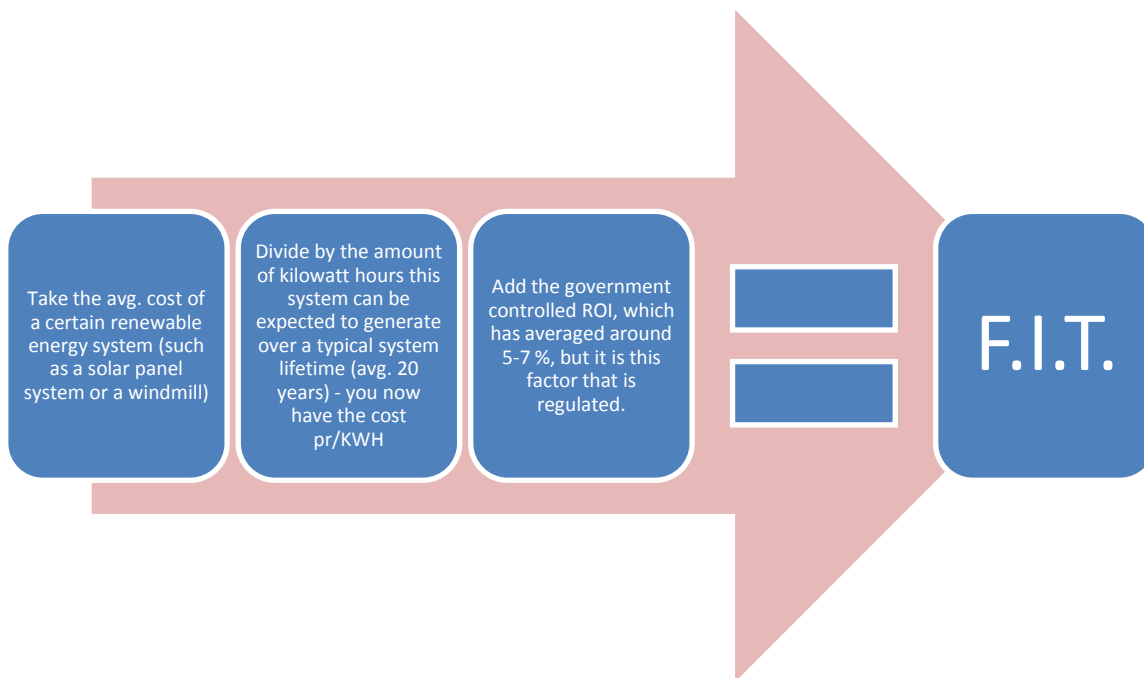


Figure 2 - Source: Authors own creation, based on the data in the following article on a German energy blog that offers details on how the FIT is calculated: [http://www.germanenergyblog.de/?page\\_id=28](http://www.germanenergyblog.de/?page_id=28)

*This source is believed to be a factual website that offers an easy-to-understand interpretation of the many energy subsidy laws etc. The majority of material on this site is directly linking to paragraphs within the german energy laws, hence the reliability is valued to be high.*

Although it would seem simple for the German government to simply adjust the single factor of the offered ROI, on the renewable energy plant investments, the real challenge is adapting to the rapidly declining costs of a.e. PV panels, as these cheaper panels naturally results in the suppliers that use these are getting paid a lot more in tariffs, compared to suppliers with older generation panels that were far more expensive.<sup>26</sup>

This FIT system, which more than 100 different countries has copied in some way, has resulted in many positives for the German Energiewende and from several perspectives also for the German economy in general. The FIT is the key driver behind almost 25 % of all electricity production

<sup>26</sup> [http://www.germanenergyblog.de/?page\\_id=283](http://www.germanenergyblog.de/?page_id=283)



being from Renewable energy sources in 2013, an estimate of 370.000 jobs in the energy sector and significantly higher regional & community revenue from these energy co-operatives.<sup>27</sup>

However, since the FIT is being billed directly back to German consumers of electricity in a “renewable energy surcharge” that in 2013 peaked at €0.067 per Kwh, from €0.036 in 2012, this increase of more than 86 % sparked a public dissatisfaction, particularly from the previously mentioned consumers not engaged in green energy investments, on the rising electricity bills which were already the most expensive in Europe. This development combined with the fact that the largest of electricity consumers, such as large industrial plants in Germany’s top grossing industries, being completely exempt from this surcharge, a demand for a change was obvious.

The FIT system is not only supporting the electricity suppliers, but also the main potential customers of HDG, the combined heat and power plants (CHP), can receive a similar financial support from efficient co-generation of heat and electricity using renewable energy sources.<sup>28</sup>

#### **10.1.2. The market incentive programme (MAP) & the Renewable Energy Heat Act<sup>29, 30</sup>**

The MAP programme was introduced in the year 2000, and consists of two forms of governmental support for the use of renewable energy usage in heat generation:

1. The Federal Office of Economics and Export Control (BAFA) provides investment grants for smaller investments which are mostly carried out by private investors in one and two-family homes.
2. The state-owned KfW development bank provides loans at reduced rates with additional repayment grants for larger investments which are mostly effected by commercial enterprises and municipalities.

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<sup>27</sup> <http://www.renewableenergyworld.com/rea/blog/post/print/2014/04/german-renewable-energy-act-reform-is-not-a-feed-in-tariff-2-0>

<sup>28</sup> [http://www.german-irish.ie/fileadmin/ahk\\_irland/New\\_Website\\_2011/Events/Upcoming\\_Events/Bioenergy\\_Conference\\_2013/01\\_Tatjana\\_Tupy.pdf](http://www.german-irish.ie/fileadmin/ahk_irland/New_Website_2011/Events/Upcoming_Events/Bioenergy_Conference_2013/01_Tatjana_Tupy.pdf)

<sup>29</sup> <http://energytransition.de/2012/10/renewable-energy-heating-act-and-market-incentive-program-map/>

<sup>30</sup> <http://www.germanenergyblog.de/?p=5759>

The investment grants offered between 2000 and 2012 508 million EUR in support to the construction of more than 304.000 small-scale biomass plants. (Typically wood chips/pellet heating systems for private households etc.)

The KfW bank has since 1999 offered more than 13.600 reduced interest loans, totalling more than 2.5 billion EUR, which has helped construct many large thermal PV installations or large-scale biomass CHP plants.

The renewable energy heat act was introduced in 2009 and this stipulates that owners of new buildings (construction notification after 1<sup>st</sup> January 2009), are required to receive a percentage of their heat supply from renewable energy sources. The percentage varies depending on the type of renewable energy used.

This act was introduced to increase the share of renewable energies in the heating industry from 8.2 % in 2009 to 14 % in 2020. (Latest figure known to the author is 10.2 % in 2012 – see earlier chart)

### **10.1.3. The search for energy efficiency<sup>31</sup>**

One of the most recent political support programmes that have been introduced in Germany is the combined heat and power act (KWKG). This programme allocates more than 750 million EUR in subsidizing funds, for the expansion of the contribution to the total energy supply by combined heat and power plants (CHP) from 14.5% in 2009 when this act was introduced, to 25 % in 2020.

The latest amendment to this act in 2012, means the current subsidy amount are as follows:

1. less than 50 kW of electric output: 5.41 cents per kilowatt-hour
2. 50 to 250 kW (a new size category): 4 cents per kilowatt-hour
3. up to two MW: 2.4 cents per kilowatt-hour
4. above two MW: 1.8 cents per kilowatt hour-hour

A later technical environment analysis will explain further on the CHP plant development, and the market and customer analysis will include an outlook for this type of potential customer for HDG.

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<sup>31</sup> <http://energytransition.de/2012/10/240/>

#### 10.1.4. The Putin effect and US shale gas project

When Russia officially decided to adopt, the peninsula of Crimea from the fallen Ukrainian government, into Russian ownership and control, most parts of the western world condemned these actions and has sanctioned leading Russian officials involved in this aggressive move ever since.

It is not within the scope of this report to thoroughly analyze this diplomatic crisis, but important notes about the EU, German & Russian interdependency is however highly relevant for the future of the German energy industry and not the least the potential for HDG in this market.

Stories have arisen, in the press, on potential counter sanctions from Russia against leading European countries, and particularly a cut-off on energy supply seems to be the most serious threat yet.

Germany currently imports 38 % of their natural gas, 35 % of crude oil and 27 % of their fossil coal fuels from Russia. 40 % of the total energy import from Russia is being transported through Ukraine at the moment.<sup>32</sup>

This is a similar picture across Europe, and with the other countries and their existing nuclear based electricity being dependant on approximately 30 % of the Uranium used in manufacturing of electricity, is currently being imported from Russia<sup>33</sup>. This was also why Barack Obama in his speech at the EU-US summit in Brussels on the 26<sup>th</sup> March brought attention to and advised the European Union in finding ways of decreasing this dependency to Russia to avoid being held hostage in these unfortunate diplomatic situations that seems to appear consistently between Russia and the Western World.<sup>34</sup>

The author critically acknowledges that the proposed, and to some extent opportunistic “plan B” from the US officials, on exporting natural gasses known as Shale gas from the USA to Europe, is met with significant doubts as more and more energy multinationals such as Shell & BP has completely left the shale gas industry due to the process of extracting the gas from the underground

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<sup>32</sup> <http://www.euractiv.com/sections/energy/eu-warms-shale-gas-wake-crimea-crisis-301142>

<sup>33</sup> <http://www.theglobalist.com/to-deal-with-russia-germany-needs-renewables/>

<sup>34</sup> <http://energytransition.de/2014/04/russia-and-the-energie-wende-is-there-a-connection/>

(known as fracking) is both high in CO<sub>2</sub> pollution, and up until now, not rentable from a financial perspective according to these energy companies.<sup>35, 36</sup>

The author of this report does however believe this development could spring a change to the current German Energiewende, which has previously mainly concerned itself about the out phasing of nuclear electricity generation. Now with the uncertainty related to the imported supply of natural gas and coal for the heat generating industry and the relatively highly successful Energiewende for electricity (measured from Germany being in front of their own target with 25 % of electricity coming from renewable energy sources in 2013 + a worldwide copying of the German tariff system), a direction of more locally sourced renewable energy could very well be a realistic outcome for the heating industry as well!<sup>37</sup>

Angela Merkel spoke on the 20<sup>th</sup> March 2014 of the Russian/Ukrainian crisis has sparked the need for, quote:

*"There will be a new look at energy policy as a whole"*

Since then, Angela Merkel and Barack Obama has met on the 2<sup>nd</sup> May, to discuss, amongst others, the increasing tension in Ukraine and how this might spark an urgent need for alternative energy supply, than the gas being distributed through Ukraine currently.

#### **10.1.5. The outlook for the political environment**

In the autumn of 2013, Angela Merkel's party CDU entered into a political coalition with the (currently) biggest political party in Germany; SPD (Sozialdemokratische Partei Deutschlands), in what has since become famous under the name "Große Koalition". This coalition has meant the appointment of Sigmar Gabriel, the leader of SPD, as the new economic and energy minister.

The above mentioned mounting public pressure on the government to reconsider their FIT strategy due to the repercussions it had on retail electricity prices, resulted in a 2014 Energy reform orchestrated by Sigmar Gabriel, which was approved in the German Cabinet on the 1<sup>st</sup> April 2014.

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<sup>35</sup> <http://www.globalresearch.ca/replacing-russian-gas-deliveries-with-us-shale-gas-washington-lies-to-the-eu/5377358>

<sup>36</sup> <http://royaldutchshellplc.com/2014/03/20/shell-writes-down-value-of-its-u-s-shale-gas-and-liquids-rich-assets-by-2-5-billion/>

<sup>37</sup> Conclusion based on authors own perception of matching empirical knowledge about the combined advantages of creating electricity and heating simultaneously from renewable sources in Danish power plants.

This reform has resulted in some significant changes on the subsidy system for the renewable electricity industry in particular;<sup>38</sup>

1. More risk for investors in the PV and wind systems, with lower FIT subsidies and more accountability for poorly performing systems. (private and cooperate)
2. Upper capacity limit of 2.5GW for how much PV and on-shore wind energy generating systems that can be installed (more than 4 GW of PV systems was installed in 2013).
3. Off-shore wind projects are given more incentive with allowance for 6.5GW.
4. **The focus for Biomass energy (for electricity production) in the years to come, will be on waste and residue plants, and annual installed systems are not expected to exceed 100MW (0.1GW)**
5. The 2100 companies that have previously been exempt from the renewable energy surcharge have been reduced to 1600 companies.

As it can be seen from the above headlines, it is clear that electricity generated from Biomass sources are not expected to gallop out of control in the years to come, as there has not been made a capped upper limit on the expansion of this source of electricity.

With the above energy reform in place and agreed upon, it is clear that Germany can no longer afford to simply expand their share of renewable in the electricity sector at an uncontrollable pace, as this has too high costs for the private consumers. The quote from Sigmar Gabriel confirms this change in pace<sup>39</sup>:

*"A shift to a more sustainable energy supply means not only ensuring the swift expansion of the use of renewables, but also expanding transmission networks, agreeing on a design for the electricity market, and connecting European states across national borders,"*

The exemption of the largest of the German industries is currently being monitored by the European Commission for claims of unfair subsidizing, but experts believe that the claimed 800.000 jobs at stake within these industries will be enough to "scare" the European Commission away from taking any action.<sup>40</sup>

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<sup>38</sup> <http://www.reuters.com/article/2014/04/08/us-germany-energy-idUSBREA3716I20140408>

<sup>39</sup> <http://www.bundesregierung.de/Content/EN/Artikel/2014/04/2014-04-08-eeg-reform-kabinett.html>

<sup>40</sup> <http://econews.com.au/news-to-sustain-our-world/germany-adopts-flagship-renewable-energy-reform/>

With the historically many different subsidy programmes in place to help expanding the share of renewable energy sources, a newer approach to ensuring sustainable energy supply is the governmental focus on the efficiency of the plants producing electricity and heat. With the committed target of getting 25 % of the total energy production in Germany in 2020 from high-efficient CHP plants, it is the authors belief that more incentive programmes will be put in place to push for this to become reality.

Due to the uncertainty surrounding the Russian/Ukrainian crisis, it is not yet possible for the author of this report, to make qualified estimations on what this might entail for the Germany energy industry, but from the earlier mentioned quote from Angela Merkel and her fellow politicians, it would seem a significant change from the current dependency on Russian energy supply will be the focus in the years to come. Should Germany decide on introducing more subsidizing programmes more specifically for the heating industry, the market potential for HDG will certainly increase, as the heating industry is generally more inclined to be sourcing solid biomass energy sources, such as wood chips. This will be further explored in the later market analysis.

The below chapter will look at the economic macro environment in the German energy industry and will enter into a more in-depth discussion of the economic pro's and con's of the FIT system and the effects this has on the electricity prices in Germany and not the least if this has had or with the announced changes, can be expected to affect the market potential for HDG's biomass supply to the German electricity sector.

## **10.2. The Economic environment – Past, Present & Future**

### **10.2.1. The FIT effect on electricity prices (retail & wholesale)**

To understand why the German government have been pushed by the public to change their existing Renewable Energy Act (EEG) into a 2.0 version, a look into the development of the electricity prices in Germany is needed.

The enclosed tables in appendix 4 & 5, illustrates the development of the electricity prices for household and industrial consumers. In solitary and from a 10 year development perspective, these two tables does not indicate an unfair bias of either wholesale nor electricity prices with both increasing at a similar pace, but when you start to compare where the German level for wholesale & retail electricity prices lie, compared to their European neighbouring countries, it is quite clear that

the wholesale prices are, relatively, a lot lower than the EU avg. As it can be seen the electricity retail prices are about 9 % more expensive than the EU28 average, where the whole sale prices are 9.5 % cheaper than the same EU28 avg.

This relatively large gap between retail and wholesale prices are created due to the FIT and the consequential renewable energy surcharge, which is billed back to the consumers that are not feeding electricity into the grid. Combine this surcharge with the fact that the largest industrial consumers are exempt for paying this surcharge, which naturally means that the utility companies has offered relatively lower wholesale prices with the rapidly increasing surcharges for private consumers of electricity.

With the new reform in place, almost a fourth of previously supported industrial high-intensive electricity consumers will need to be liable for paying part of this renewable energy surcharge.

These initiatives that have been agreed upon in April 2014 are therefore expected to help equalize the electricity prices for retail and wholesale consumers over time.<sup>41</sup>

### **10.2.2. Import and export of energy**

As mentioned previously, Germany currently imports a large share of their fossil fuels for both the heating and electricity industry from Russia. They are as appendix 6 shows, the largest importer of energy related fuels in Europe.

Though this does not directly relate to HDG and their biomass energy business in Germany, it would be highly thinkable that the German energy industry will start to look at more locally sourced energy, also for the heating industry, to avoid the dependency to foreign supply of more polluting sources.<sup>42</sup>

If Germany decided to aim for an increasing Energiewende in their heating energy sector, as well as their electricity sector, it is highly likely that HDG will have an increased potential for supplying solid biomass fuel, such as wood chips for German heating plants, as these solid biofuels are mainly

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<sup>41</sup> Ibid.

<sup>42</sup> Postulation made by author

used in the heating industry, where gas and waste biomass energy is the preferred option for electricity production.<sup>43</sup>

This statement is backed by the fact that Germany is one of the largest exporters of electricity in Europe (only second to France's strong nuclear industry<sup>44</sup>), as it can be seen from the table in appendix 7.

This high level of export is also directly linked with the subsidy systems for renewable energy, which is resulting in production of renewable energy, particularly from PV systems, in quantities over the needs of German consumption at peak hours. Also the dual effect the renewable energy surcharge has on driving down the wholesale prices, has a direct effect on the whole sales export prices Germany can offer neighbouring countries.<sup>45</sup>

Another factor that would indicate a current and future preference for domestically sourced renewable energy is the "Green Electricity Privilege" (§39 of the EEG-Act), which allows for utility businesses to receive a reduced EEG surcharge if they source a minimum of 50 % of their electricity consumption from domestically created renewable energy. This legislation is however currently under review by the European Commission for discriminatory taxation.<sup>46</sup>

### **10.2.3. Outlook for the economic environment**

With the very recent changes to the German EEG act, listed above, it can be expected that the economic environment surrounding the German energy market will see some noticeable changes in the years to come. If the plans of Sigmar Gabriel and Angela Merkel succeed, this will result in lower retail electricity prices & higher wholesale prices. Considering this fact as well as the capped installation allowances, a deliberate slowdown of the rapid expansion of solar and on-shore wind farms is a certainty. This will also likely cause a slight stagnation or reduction of the German export of electricity, with the higher wholesale prices in mind.

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<sup>43</sup> See later break down of contribution in the market analysis

<sup>44</sup> <http://www.renewablesinternational.net/german-power-exports-up-by-62-percent/150/537/68613/>

<sup>45</sup> <http://www.renewableenergyworld.com/rea/news/article/2011/09/germany-continues-exporting-electricity-renewables-driving-down-prices-despite-closing-reactors>

<sup>46</sup> [http://europa.eu/rapid/press-release\\_IP-13-1283\\_en.htm](http://europa.eu/rapid/press-release_IP-13-1283_en.htm)



The future of the economy in the energy industry will surely also depend on the outcome of the Russian/Ukrainian crisis, which could spark an even more panic infused change of German and European Energy policies, than even the nuclear phase out has represented!<sup>47</sup>

Finally HDG should keep a close eye on the developments in the EEG subsidies, as these are likely to constantly be amended to ensure as much level and fair competition in the industry over the next 5-10 years.

### **10.3. The social, cultural & ecological environment<sup>48</sup>**

On Saturday the 22<sup>nd</sup> of March, more than 30,000 Germans demonstrated on the streets of the largest German cities, and another large protest is planned for the 10<sup>th</sup> May 2014 in Berlin. However these are not protests against the rising electricity prices for the poorest of consumers, but instead a pro-Energiewende demonstration that is planned to oppose the government's plans on deliberately slowing down the expansion of renewable energy sources.<sup>49</sup>

The German association for Energy and Water Industries publishes a survey twice a year, which measures the public support for the Energiewende. In the early part of 2014 this survey was once again published, and the result is relatively conclusive; More than 89 % of the German population believes the Energiewende is "important" or "very important", and just as interesting 56 % believes the progress is not happening quickly enough. 40 % of these 89 % does however believe the implementation hereof is too costly on their energy bill.<sup>50</sup>

It would seem that the German government's decision to regulate the FIT and EEG surcharge for the sake of the poorest consumers and the disadvantage of certain industries is conducted to convince these 40 %, that their voices are also being heard.

An important reason for the widely spread public support for renewable energy in Germany, can be found in the foundation of the Green party (Grüne Bundestag/Bündnis 90) in 1980 in West Germany. The party has been a governing part of Germany since the late 1990's and the party was thought to be the primary driver behind the original and later scrapped nuclear phase out plans from

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<sup>47</sup> Conclusion made by the author, based on the high dependency level from EU – Russia combined with authors perception of the situation in Ukraine being more serious than simply a minor diplomatic matter.

<sup>48</sup> <http://www.globalchange.umd.edu/energytrends/germany/3/>

<sup>49</sup> <http://www.renewablesinternational.net/energiewende-demonstrations/150/537/77771/>

<sup>50</sup> <http://www.germanenergyblog.de/?p=15281>

the early 2000's. In October 2011 the party received more than 20 % of all votes in certain parts of Germany, and ended 4<sup>th</sup> in the Bundestag (regional) with 8.4 % off all votes.<sup>51</sup>

### The opposition for Biomass energy suppliers

An often read negative phrase about solid biomass fuel (generated from forestry), is the fact that opposed to the Sun and Wind, the forest sources are not limitless in its capacity and resources available. It therefore takes strict management of this energy source, to ensure that sustainable forest growth is not endangered by the use of solid biomass energy sources.<sup>52</sup>

However the official governing party; The German Federal Ministry for the Environment, Nature conservation and Nuclear safety does point out the following:<sup>53</sup>

*"Model calculations carried out by the Federal Research Centre for Forestry and Forest Products, have shown that there are reserves to expand the use of wood without impairing sustainable forestry."*

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*"Theoretically speaking, national resources for bio energy would suffice to reach the targets and double the share of bio energy in Germany by 2020"*

The above ministry does however also underline the importance of Germany tapping into the relatively unspent potential of residual biogenic substances and biogenic wastes:<sup>54</sup>

*"In the future special attention must be given to the tapping of this still largely unused potential. Energy production from biogenic residues and waste helps to avoid or mitigate potentially conflicting uses between biomass for energy purposes or as production material"*

This last sentence corresponds closely with what the interviewed personnel from HD & HDG explained about the continuous issue in getting a decent supply of quality wood for the energy sector, with manufacturing industries such as the MDF panel board and cellulose (paper) having priority and being able to pay a premium price.<sup>55</sup>

This is likely to be the reason why the government, in their April 2014 reformed EEG 2.0, has outlined their support for the biomass industry, in the electricity sector, predominantly will be by

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<sup>51</sup> <http://www.gruene-bundestag.de/>

<sup>52</sup> <http://energytransition.de/2012/09/e-biomass/>

<sup>53</sup> <http://www.erneuerbare-energien.de/en/topics/biomass/general-information/?cHash=816f8cc23fe06c8f81ed0897140ba585>

<sup>54</sup> Ibid.

<sup>55</sup> See interviews in appendix XXXX

backing electricity generated from biogenic residue and waste. (The author refers to the chapter on “outlook for economic environment” above)

## 10.4. Technical/Scientific environment

### 10.4.1. CHP plants (Combined heat & power plants)

According to the interviewed managers from HD & HDG, a key reason for the big difference in market potential from Denmark to Germany is the fact that almost all Danish power in HD's customer portfolio, are CHP plants. Carsten Boedicker & Erik Joergensen both explained, in their respective interviews, how the focus in the 1970's were on these CHP plants and district heating in Denmark, whereas Germany was more drawn in a direction of gas heated houses and separate production of power & heat.

CHP plants are, all else being equal, a lot more efficient than comparative heat/power only plants. The below illustration helps to understand why, as the separate heat and power solution clearly results in a lot more wasted energy.

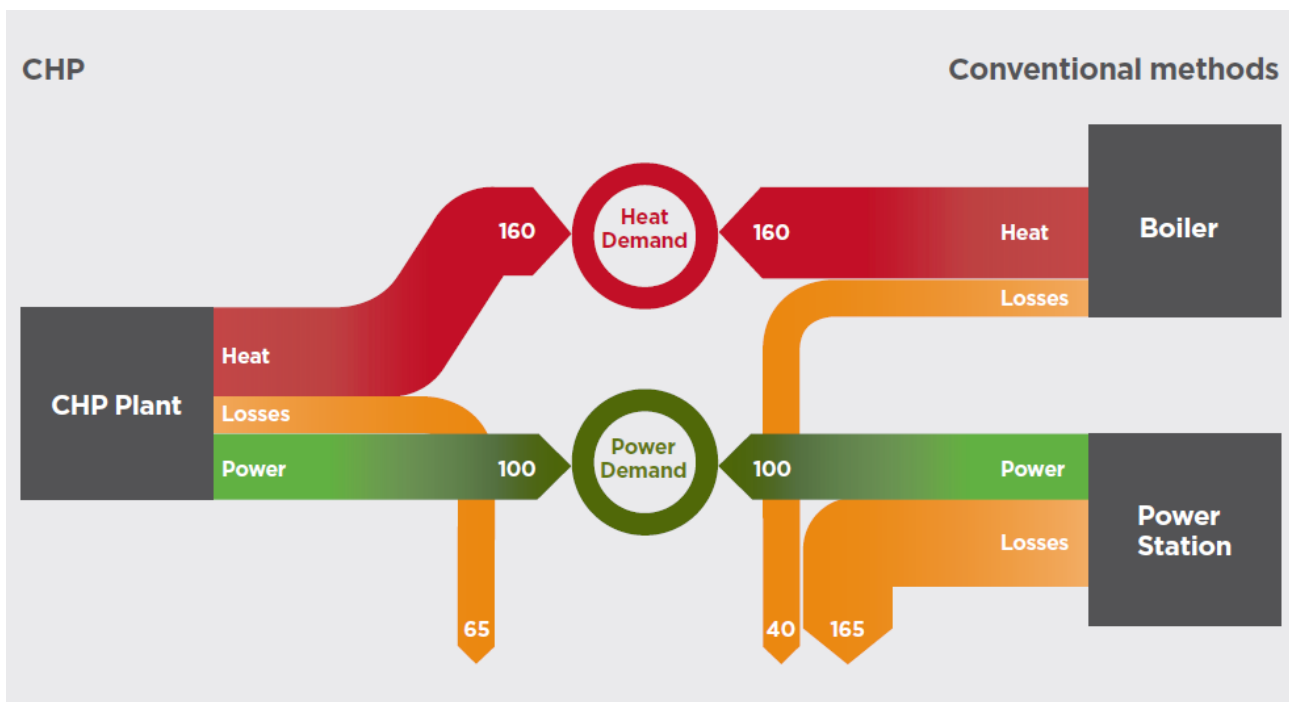


Figure 3 - Source: Combined Heat and Power association. [http://www.chpa.co.uk/what-is-chp\\_15.html](http://www.chpa.co.uk/what-is-chp_15.html)

The above illustration has been retrieved from the CHPA's (combined heat and power association) website. The author critically acknowledges this sources' potential bias, and the author has therefore cross checked the content of this illustration from other source for reliability, but chose the above for its simplicity and easy-to-understand build-up.

Appendix 8 shows how much of the total electricity generation that the CHP plants in the different EU countries account for. Is it somewhat clear why Carsten Boedicker & Erik Joergensen would indicate, in their interview, that the potential for HedeDanmark to supply solid bio fuels to these CHP plants in Germany is limited compared to Denmark, when comparing the percentages in this table.

However, the author believes this large difference in percentages should be closely compared to the total market size for energy, before a proper assessment of the market potential can be established. This will be conducted in the later market analysis.

Important to note however, is the

#### 10.4.2. Private CHP plants

In Denmark, there are currently 665 CHP plants with the below separation;

##### NUMBER OF CHP AND DH PLANTS IN DENMARK

###### Public-heat supply (cities):

- 16 centralised CHP
- 285 decentralised CHP
- 130 decentralised DH plants

###### Private heat supply (enterprises, institutions):

- 380 CHP
- 100 DH plants

###### In all:

- 665 CHP
- 230 DH plants

Table 2 - Source: Danish Energy Agency - <http://www.ens.dk/en/supply/heat-supply-denmark/large-small-scale-district-heating-plants>

*This agency is a government funded association that is responsible for Denmark reaching their budgeted CO2 emission targets and the author believes this source should be considered highly reliable considering their close link with the Danish Climate and Energy ministry*

The author has sadly not been able to find a similar complete overview of the CHP plants in Germany, but with more than 900 of these local CHP plants in Germany and 60 % of them

operating on renewable energy as their primary source, there is surely also a noticeable market potential from these small-scale typically municipality owned plants.<sup>56</sup> Apart from these CHP plants, also the earlier revealed more than 300.000 private household biomass heating plants, which were created through the government sponsored MAP programme, might offer a significant market potential for HDG.

A case study made public by the European Commission (CS 315 IZES GMBH Germany)<sup>57</sup>, explains how a combined privately founded and regionally subsidised project of establishing a self-sufficient CHP plant for school heating in the Saarland district in Germany proved to be highly rentable after only a couple of years, compared to oil or gas heating boiler systems.

Both the centralized utility-company owned CHP plants as well as the potential from private small-scale CHP plants will be explored more in-depth in the later market analysis.

### **10.5. Impact and probability analysis**

Before concluding on the findings in the environmental analysis, the author believes it is of upmost importance that the uncertainties unveiled in this analysis is weighed in regards to their likeliness of becoming reality, the consequences if they become reality and when these scenarios are likely to occur (if ever). This process is similar to that of managing an international project, where stakeholders are clustered into certain groups, so that the project manager can plan his strategies on how to approach and potentially fend off these stakeholders.<sup>58</sup>

Therefore the author will now attempt to cluster these uncertainties into logical groups which can then be managed, and in some cases, offset, through strategic preparations. The report will also conduct a scenario analysis on a few prioritized uncertainties.

The below model will work as reference point for this analysis;

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<sup>56</sup> Ibid.

<sup>57</sup> <http://www.managenergy.net/download/nr315.pdf>

<sup>58</sup> "Managing Stakeholders" By McElroy B. & Mills C. In Handbook of Project Management 3rd Edition 2000

		Immediacy	
		LOW	HIGH
Impact	HIGH	Monitor and analyse; contingent strategies considered (scenario analysis)	Analyze in-depth and develop strategy ready for immediate implementation
	LOW	Monitor; but using only low amount of resources	Monitor and analyze through scenario analysis. Focus on resource spending is also important here

Figure 4 - Source; Author's own creation, based on figure 6.2 in chapter 6 in "Strategic Market Management" by David A. Aaker & Damien McLoughlin, European Edition, John Wiley and sons 2007.

In appendix 9, the author has listed and weighed the uncertainties that have been uncovered in the environmental analysis, in a similar manner to the earlier mentioned stakeholder matrix model from project management theory.

From this stakeholder-inspired matrix, it can be seen, that particularly the Ukraine crisis is believed to have a possible high impact as well as having a high level of immediacy. It is therefore of utmost importance that HDG monitor the development of this political situation closely, and already now begin to prepare contingent strategies that can be implemented as soon as the immediate consequence, as well as future possible repercussions of this crisis, is known.

A key uncertainty for HDG to monitor and analyze as well, is the development of the incentive programmes in the heat industry, as the political focus is currently very much on ensuring efficient co-generation through CHP plants. The later market analysis will attempt to shed some light on the current CHP market potential for HDG, but this potential is believed to be significantly improved

through these incentive programmes, such as MAP, renewable energy heat act & combined heat and power act.

To create these contingent strategies, HDG should conduct a strategy-creating scenario analysis. This form of analysis can help HDG to ensure that “no stones are left unturned”, hence when this likely scenario becomes a reality, there will be no organizational panic in adapting to these new market conditions.

If HD needs more of an incentive to invest in these types of uncertainty analyses, quick look at the cultural mapping tool of Geert Hofstede, which measures national and organizational culture from (originally) 4 different dimensions; Power Distance, Individualism vs. Collectivism, Masculinity vs. femininity & Uncertainty avoidance, should again be considered relevant.

The report will not prioritize to fully analyze the expected differences between HD’s Danish and HDG’s German organization. However in this discussion of the allocation of resources for uncertainty analysis and strategy enhancing exercises, the one dimension that is highly relevant to consider, is the German’s noticeably different attitude towards uncertainty avoidance:

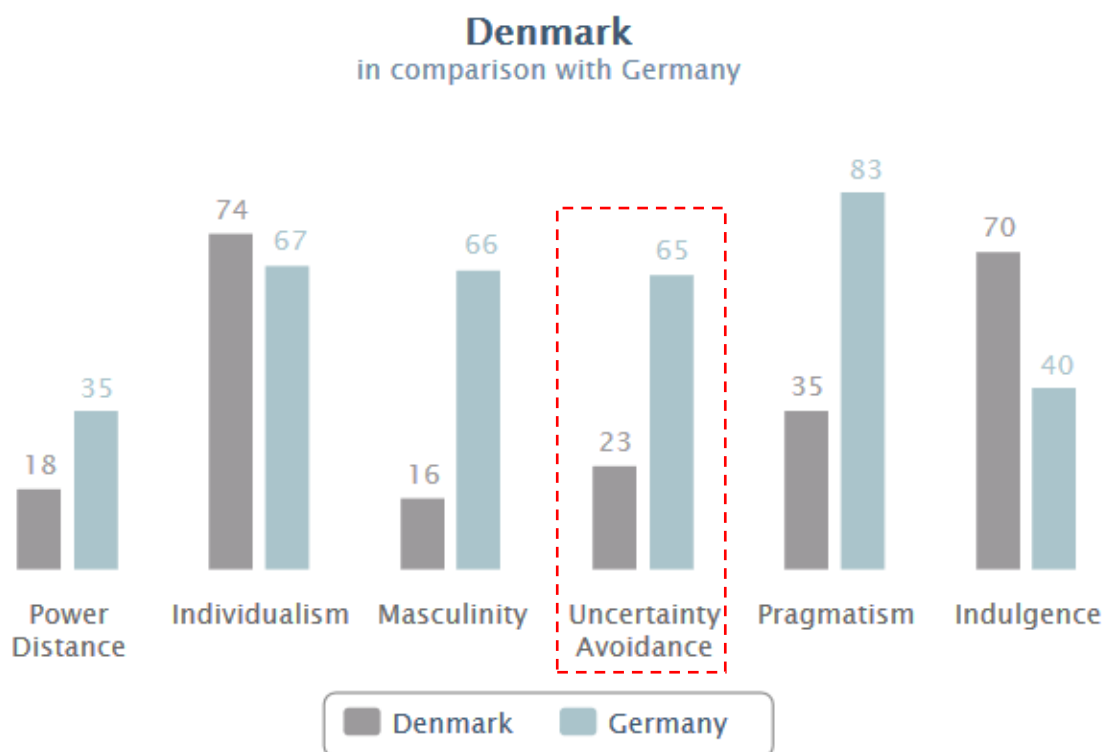


Figure 5 - Source: The Hofstede centre “country comparison tool”; <http://geert-hofstede.com/denmark.html>

*Gert Hofstede's cultural mapping tool is a very commonly used tool in explaining cultural differences in IB economy theories, and the reliability is therefore valued to be high. The validity of the usage of this model, is deemed highly valid, with the below conclusion in mind.*

Translated into the concept of impact and scenario analysis, it is quite obvious that Germans in general, do not operate very well in a highly volatile market, with no directional strategies in place to off-set the environmental shocks that are estimated to be likely to occur.

#### **10.6. Part conclusion on environmental analysis**

The energy-political scene has been dominated by subsidy programmes since the inception of the renewable energy act in the early 1990's. The most well-known programme is the electricity Feed-In Tariff system, which success has resulted in it being copied on a global level. The heating sector has only recently been supported by expansion incentive programmes, but ambitious targets of reaching a minimum of 14 % renewable energy share in 2020, from approx. 10.2 % in 2012, does indicate a much increased political focus on this sector in recent years.

The current political crisis between the EU and Russia, is believed to be a key factor in deciding the future outlook of this environment. No matter the outcome of this crisis, it is believed that Germany as well as the rest of Europe, will attempt to lower their energy dependence on Russia, as an abrupt halt to the supply of gas from Russia would have massive implications on the European energy industries and economies in general.

The economic environment placed emphasis on explaining the relationship between these subsidies and the consumer energy prices. With the very recent adjustment of the FIT system, the German politicians are attempting to ensure the consumer electricity prices does not spiral out of control, as the public support for the Energiewende might otherwise dwindle.

The public support was briefly discussed in the social/cultural environment analysis, and it was concluded that even with the relatively high consumer electricity prices in Germany, the public support remains high at 89 % describing the Energiewende as being important and 56 % actually believes that this energy transition is not happening quickly enough.

The final technical environment analysis placed emphasis on unveiling the increasingly important role of CHP plants in Germany, which with the increased political focus on energy efficiency, is targeted to supply 25 % of the total energy consumption in 2020, from approximately 15 % today.



The findings in the above analyses and the constructed impact and probability analysis have been added to the SWOT model in appendix 10, and marked with a blue font.

## **11. Analysis of the market potential and the competitive environment**

### **11.1. Market analysis of Electricity sector – development and forecast**

With the political decision to phase out nuclear energy from Germany's electricity supply in the coming 8 years, with the nuclear supply at that point in time, accounting for 16.7 % of the total electricity generation, the market for electricity in Germany is expected to experience considerably changed characteristics in the years to come!<sup>59</sup>

However since German politicians already back in the early 1990's declared their targets and commitment of reducing their CO2 emissions through the renewable energy act (EEG), and from that developed the current Feed-In tariff (FIT) system in the Energiewende from the early 2000's, the perceived drastic market changes needs to be looked at in a greater perspective.

The below chart shows how the renewable energy share in the generation of electricity has changed since 1990.

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<sup>59</sup> Postulation made by author from collated information from the various enclosed appendixes.

**Electricity supply from renewable energies in Germany since 1990**

	Hydro-power <sup>1)</sup>	Wind energy on land	Wind energy at sea	Biomass <sup>2)</sup>	Photo-voltaics	Geothermal energy	Total electricity generation	Share of gross electricity consumption
	[GWh]						[GWh]	[%]
1990	17,426	71	0	1,434	1	0	18,932	3.4
1991	14,891	100	0	1,471	1	0	16,463	3.1
1992	17,397	275	0	1,558	4	0	19,234	3.6
1993	17,878	600	0	1,636	3	0	20,117	3.8
1994	19,930	909	0	1,875	7	0	22,721	4.3
1995	21,780	1,500	0	2,013	7	0	25,300	4.7
1996	21,957	2,032	0	2,102	12	0	26,103	4.8
1997	17,357	2,966	0	2,277	18	0	22,618	4.1
1998	17,216	4,489	0	3,260	35	0	25,000	4.5
1999	19,647	5,528	0	3,589	30	0	28,794	5.2
2000	21,732	9,513	0	4,737	60	0	36,042	6.2
2001	22,733	10,509	0	5,207	76	0	38,525	6.6
2002	23,124	15,786	0	6,038	162	0	45,110	7.7
2003	17,722	18,713	0	8,841	313	0	45,589	7.6
2004	20,095	25,509	0	10,471	557	0.2	56,632	9.3
2005	19,638	27,229	0	14,354	1,282	0.2	62,503	10.2
2006	20,008	30,710	0	18,700	2,220	0.4	71,638	11.6
2007	21,170	39,713	0	24,363	3,075	0.4	88,321	14.2
2008	20,443	40,574	0	27,792	4,420	17.6	93,247	15.1
2009	19,031	38,610	38	30,578	6,583	18.8	94,858	16.3
2010	20,953	37,619	174	34,307	11,729	27.7	104,810	17.0
2011	17,671	48,315	568	37,603	19,599	18.8	123,775	20.4
2012	21,793	49,948	722	43,550	26,380	25.4	142,418	23.5

Table 3- Source: "Renewable energy sources in figures – national and international development" - [http://www.erneuerbare-energien.de/en/topics/data-service/renewable-energy-in-figures/artikel/renewable-energy-sources-in-figures/?tx\\_ttnews\[backPid\]=115](http://www.erneuerbare-energien.de/en/topics/data-service/renewable-energy-in-figures/artikel/renewable-energy-sources-in-figures/?tx_ttnews[backPid]=115)

*This table is sourced from a publication made by the Federal Ministry for the environment, Nature Conservation, building and nuclear safety, hence the official profile of the authors of this report makes it highly reliable. It does also correspond with the earlier enclosed figures from "Destatis"*

If this chart is not indication enough, on the effect of the renewable energy supportive programs, the table in appendix 11 offers a good overview of the development, including key dates for the inception of these various programmes. Though biomass contributes to more than 30 % of the total electricity generation from renewable energy sources, the breakdown of this contribution in

appendix 12 clearly shows how biogas is the primary contributor with 4.1 %, with solid biofuels such, as wood chips “only” contributes with 1.9 %.

Referring back to appendix 2, which shows the historic development of electricity generated from renewable resources in Germany compared to the rest of the EU in the last 10 years. The author has attempted to clarify just how big a change the German market for electricity has seen compared to other EU countries. As it can be seen from the index calculations, only Estonia and Iceland have managed to increase their share percentages of; electricity generated from renewable energy sources, more than Germany since 2004.

As the above chart showed, particularly PV energy has seen soaring growth figures. From only contributing to less than 1 % of the total electricity generation in 2004, this figure had changed to 18.5 % in 8 years.

An easier visual overview of the rapid development of particularly PV energy is offered by the below graphic from the same source – note that this is not contribution, but the installed plant capacity.

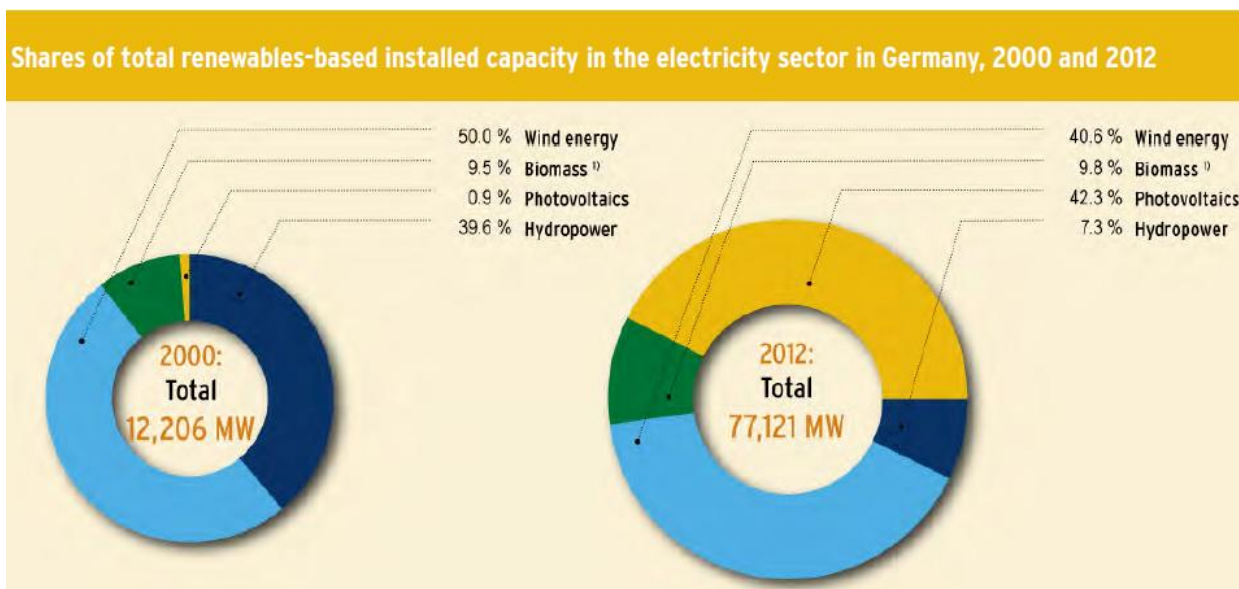


Figure 6 - Source: “Renewable energy sources in figures – national and international development” - [http://www.erneuerbare-energien.de/en/topics/data-service/renewable-energy-in-figures/artikel/renewable-energy-sources-in-figures/?tx\\_ttnews\[backPid\]=115](http://www.erneuerbare-energien.de/en/topics/data-service/renewable-energy-in-figures/artikel/renewable-energy-sources-in-figures/?tx_ttnews[backPid]=115)

*This table is sourced from a publication made by the Federal Ministry for the environment, Nature Conservation, building and nuclear safety, hence the official profile of the authors of this report makes it highly reliable. It does also correspond with the earlier enclosed figures from “Destatis”*

The wind energy industry has not seen as rapid a development as the PV industry, but from almost being non-existent in 1990 with 0.38 % contribution to total electricity generation, this industry is today the biggest contributor with more than 35 % of the total share of renewable energy.

As it can be seen, the majority of the contribution from the wind industry is coming from on-shore turbines. These on-shore turbines are often owned by small-midsized companies or private investors, which has allowed for this rapid development to take place due to attractive and “safe” ROI’s offered through the FIT system. The power generated from on-shore turbines are thought to be 2-3 times cheaper than the off-shore turbine generation, which would make one wonder why the German government are so keen on expanding the off-shore wind industry instead of a.e. focusing on replacing old and relatively in-efficient on-shore turbines to more modern turbines which in some cases can mean a ten-fold increase in output? <sup>60</sup>

The German governments push for more off-shore wind, is considered by the green vision think-tank “The Heinrich Böll Stiftung” to be a way for Angela Merkel and her government to ensure continuous support from the large energy conglomerates, that currently operates the to-be-closed nuclear plants. These companies are naturally wanting to get “a piece of the cake” from the change to renewable energy sources, with private investors and small-midsized companies currently being the main benefitters through their ownership of smaller on-shore turbines and private PV panels. <sup>61</sup>

#### **11.1.1. Transmission grid/distribution of electricity & Storage options<sup>62</sup>**

For Germany to be able to take a further leapfrog step in expanding their share of electricity generated from renewable sources, and in particularly increase the share of off-shore wind energy, an expansion of the transmission grids and high voltage lines needs to be introduced.

From previously having the majority of coal plants and nuclear plants located in the central industrial areas such as the Ruhr district in East and Leipzig in West, close to the industries that are

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<sup>60</sup> Question raised by author based on data from “Energie Transition – the German energiewende” by The Heinrich Böll Stiftung from November 2012.

<sup>61</sup> Ibid.

<sup>62</sup> ”Energy Transition” – The German Energiewende by Heinrich Böll Stiftung 2012

the main consumers of power, a change is needed for the distribution of the renewable sources and more specifically wind and solar energy. With the government pushing for increasing the share of off-shore wind projects, completely new lines are needed to extract this power from the North Sea and into the various transmission grids covering central Germany. The same scenario is a reality in the distribution of solar energy, which is geographically biased towards the south of Germany where more daily hours of sun exist.<sup>63</sup>

The difficulties for the German government now exist in pushing for more renewable electricity from off-shore wind, but with the consequent grid expansion costs as a result hereof. The same goes for potentially subsidizing decentralized solar plant installations, with a lack of efficient output from less sunny hours being the downside of this option.

After the reform made in April 2014 an industry consultation period between the government and the four transmission grid operators will end on the 28th May 2014.<sup>64</sup> Until then, it is still unknown to the author of this report (and everybody else) how the grid expansion plans will conclude. HDG should keep a close eye out for the development of this, as potential grid expansion will inarguably have a large effect in shaping the future of the electricity industry in Germany. Considering the earlier made impact and scenario analysis, this uncertainty should be considered one with low impact, since the electricity sector is not the primary target industry for HDG, but a high level of immediacy. Hence contingent strategies should be considered to adapt to this market change.

The biomass industry and particularly the solid bio fuels which HD/HDG currently trades are clearly not a key ingredient in the German electricity market currently and with the German governments focus on waste and residue biomass energy, in the electricity sector, in the years to come (see political environment analysis), this is not thought to be different in the years to come.

It is however important to underline the importance of considering the electricity and heating industries as closely interconnected markets, and particularly because of the push for more usage of CHP plants in the generation of energy in Germany.

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<sup>63</sup> [http://ec.europa.eu/competition/state\\_aid/modernisation/groebel\\_en.pdf](http://ec.europa.eu/competition/state_aid/modernisation/groebel_en.pdf)

<sup>64</sup> [http://www.bundesnetzagentur.de/cln\\_1412/DE/Sachgebiete/ElektrizitaetundGas/Unternehmen\\_Institutionen/NetzentwicklungundSmartGrid/Gas/NEP\\_Gas2014/Netzentwicklungsplan\\_Gas\\_2014\\_node.html](http://www.bundesnetzagentur.de/cln_1412/DE/Sachgebiete/ElektrizitaetundGas/Unternehmen_Institutionen/NetzentwicklungundSmartGrid/Gas/NEP_Gas2014/Netzentwicklungsplan_Gas_2014_node.html)

The report will therefore now turn its attention to the heating sector in Germany, as some interesting observations has been made in the previous analyses in this report, that would indicate this industry might offer more potential for HDG.

## 11.2. Market analysis of heating sector – developments and forecast

As the below table clearly shows, the dominating share of renewable energy in the heating sector, is coming from biomass energy with 95.6 %. More than 91% of this energy is coming from wood/waste products.

### Renewables-based heat supply in the EU-27

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
	Final energy [TWh]											
Biomass, of which	536.9	533.9	532.9	556.8	570.1	580.0	597.0	623.2	640.8	646.8	718.1	694.1
Wood/wood waste	529.6	523.5	520.5	548.5	561.5	571.1	588.1	601.4	617.4	630.8	697.0	665.5
Biogas <sup>1)</sup>	4.7	7.0	8.5	3.9	4.0	4.1	4.7	11.7	12.6	10.4	15.1	20.0
Biogenic fraction of waste	2.6	3.5	3.9	4.3	4.5	4.7	4.2	10.1	10.9	5.6	5.9	8.7
Solar thermal energy	4.9	5.4	5.9	6.5	7.2	7.9	9.0	10.9	12.6	14.9	17.3	19.5
Geothermal energy	6.6	6.7	6.9	6.8	6.9	7.4	7.7	7.7	8.3	10.8	10.9	12.2
Total renewables-based heat	548.3	546.0	545.7	570.1	584.2	595.3	613.6	641.8	661.7	672.5	746.3	725.9

1) incl. sewage and landfill gas

Table 4 - Source: "Renewable energy sources in figures" by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

This table is sourced from a publication made by the Federal Ministry for the environment, Nature Conservation, building and nuclear safety, hence the official profile of the authors of this report, makes it highly reliable.

It should be said however, that 62 % of this share is coming from private household's use of wood-chips and pellets in their private heating with the remaining 38 % coming from industrial and CHP plant usage of wood products in their heat & electricity generation.

As the below historic development chart also shows, the renewable energy usage in the heat sector has also been directly affected by the various supportive programs that has been introduced since 1990, with an increase in their share of total heat generation from 2.1% to 10.2% in 2012.

**Heat supply from renewable energies in Germany since 1990**

	Solid biomass <sup>1)</sup>	Other biomass <sup>2)</sup>	Solar thermal energy <sup>3)</sup>	Geoth. energy, ambient heat <sup>4)</sup>	Total heat generation	Share of heat generation
	[Gwh]				[Gwh]	[%]
1990	28,265	2,308	130	1,515	32,218	2.1
1991	28,360	2,308	170	1,517	32,355	2.1
1992	28,362	2,308	220	1,522	32,412	2.1
1993	28,368	2,308	280	1,530	32,486	2.1
1994	28,375	2,308	360	1,537	32,580	2.2
1995	28,387	2,308	440	1,540	32,675	2.1
1996	28,277	2,538	550	1,551	32,916	2.0
1997	45,591	2,290	690	1,569	50,140	3.2
1998	48,402	4,743	830	1,604	55,579	3.6
1999	49,593	4,939	1,090	1,645	57,267	3.8
2000	50,056	4,911	1,290	1,694	57,951	3.9
2001	56,857	4,784	1,620	1,765	65,026	4.2
2002	55,756	4,781	1,910	1,855	64,302	4.3
2003	65,974	7,964	2,520	1,956	78,414	5.2
2004	70,651	8,553	2,560	2,086	83,850	5.5
2005	72,849	10,339	3,030	2,294	88,512	5.9
2006	74,137	12,225	3,550	2,762	92,674	6.1
2007	75,174	17,180	3,940	3,415	99,709	7.5
2008	72,992	13,123	4,490	4,168	94,773	6.7
2009	83,232	15,355	5,280	4,931	108,798	8.2
2010	106,101	18,658	5,630	5,585	135,974	9.3
2011	95,230	20,457	6,440	6,297	128,424	9.9
2012	102,700	23,900	6,700	7,070	140,370	10.2

Table 5 - Source: "Renewable energy sources in figures" by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

This table is sourced from a publication made by the Federal Ministry for the environment, Nature Conservation, building and nuclear safety, hence the official profile of the authors of this report, makes it highly reliable.

### 11.2.1. The importance of CHP plants

Looking from an objective efficiency perspective, it is not difficult to understand why solid bio fuels are mainly thought of as a source of raw material for combined heat and power generation purposes. A biomass power plant that solely produces electricity can only offer 30 % energy efficiency, where CHP plants exploits as much as 85 % of the primary energy in solid biomass.



Primary energy to final energy		
Scenario	Current	
	Electricity	Heating and Cooling
Solid Biomass	30%	85%
Biogas	26%	67%

Figure 7 - Source: Eurelectric – [http://www.eurelectric.org/media/26720/resap\\_biomass\\_2020\\_8-11-11\\_prefinal-2011-113-0004-01-e.pdf](http://www.eurelectric.org/media/26720/resap_biomass_2020_8-11-11_prefinal-2011-113-0004-01-e.pdf)

*The official Pan-European electrics interest association counts all of the largest European energy companies in their membership portfolio. As they are not believed to be unreasonably biased towards renewable energy, but instead profit focused, the source is believed to be reliable for the usage of the above model*

Carsten Boedicker from HDG mentions in his interview that the German infrastructure model for residential and industrial heating has mainly been based on gas supply, whereas Denmark has focused on district heating.

Referring back to appendix 8, which clearly shows how Denmark is generating a significantly larger share of their total energy (46.2 %) from CHP plants that supplies the district heating infrastructure, with Germany “only” accumulating 13.1 % from the same plants. Before making any conclusions to back the statement from Carsten Boedicker & Erik Joergensen, the author finds it relevant to look at how much consolidated energy the different percentages actually represent, as this will allow for a more factual market potential perspective than simply looking at the percentage shares.

Appendix 13 shows the total energy generation as an EU comparison. As it can be seen, no other European country produces more energy than Germany, and when looking from a Denmark vs. Germany perspective, this total energy generated in Germany is more than 6.5 times of what Denmark can muster. When merging appendix 8 & 13, an interesting observation can be made, by comparing the share of energy created from CHP plants to total market size.



Denmark: 46.2 % of 18881.5      = 8,723.25 (tons of oil equivalent)

Germany: 13.1 % of 123536.7      = 16,183.31 (tons of oil equivalent)

So in actual terms, Germany's total market potential for supplying CHP plants is close to double the size of that in Denmark! Add to that a public spoken target of CHP plants representing a minimum of 25 % of Germany's energy generation in 2020, and the difference would almost be quadrupled.<sup>65</sup>

The CHP plants in Germany are distributed in a similar way as in Denmark, where the main CHP plants are operated by the largest energy consortiums and focusing on nationwide distribution of electricity and heat through the existing grid and district heating infrastructure. These large CHP plants are typically located in the industry heavy areas, for easy distribution to neighbouring industrial areas. Germany's largest consortiums and consequently biggest potential customers for HDG are: EON, RWE, EnBW and Vattenfall – more on these later on.<sup>66</sup>

More local supply of district heating and electricity is often coming from municipal utility companies, which are typically owned by the local community for which it supplies energy to. There are currently more than 900 of these local CHP plants and 60 % of them are operating on renewable energy as their primary source.<sup>67</sup>

Apart from the combined CHP plants, a massive market potential is also present in the supply of wood chips & pellets to the more than 305.000 small scale biomass heating installations, which the MAP incentive programme has supported the construction of since the year 2000.

The author has sadly not been able to conduct an in-depth analysis on where the private owners of these small-scale biomass heating plants, as well as the municipality-owned small-scale CHP plants are currently getting their supply of wood chips and pellets from, but this information would be highly advisable for HDG to retrieve, as a major market potential might just be unveiled.

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<sup>65</sup> <http://www.iea.org/media/files/chp/profiles/germany.pdf> - quote from BMU, Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety





<sup>66</sup> <http://energytransition.de/2013/09/local-decentralized-innovative-why-germanys-municipal-utilities-are-right-for-the-energiewende/>

<sup>67</sup> Ibid.

### 11.3. Customer analysis

#### 11.3.1. The big four overview<sup>68</sup>

As earlier mentioned, the four largest utility companies in Germany are EON, RWE, EnBW and Vattenfall. Below are a few selected facts for each of these potential customers for HDG:

	Total turnover Germany: €20,5 bill. Biomass CHP in Germany: 9 (all waste biomass)
	Total turnover Germany: €9,3 bill. Biomass CHP plants in Germany: 3 (total MWh = 1,372,000)
	Total turnover Germany: € 36,8 bill. Biomass CHP plants in Germany: 0 (20 fossil fuel plants)
	Total turnover Germany: €25,7 bill. Biomass CHP plants in Germany: 1 (total MWh = 100,000)

Although the above facts can only be considered highly basic, they clearly indicate the most business potential for HDG can be found in approaching Vattenfall and RWE<sup>69</sup>, as neither EnBW or EON are operating any solid fuel biomass plants (according to their respective companies annual reports)

A deeper insight into these potential customers has not been prioritized to be included within the contents of this report, but since all of the above listed companies are publicly listed in the stock exchange markets, detailed information can be found via their annual reports and investor relations departments.

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<sup>68</sup> [www.eon.com](http://www.eon.com), [www.rwe.com](http://www.rwe.com), [www.vattenfall.com](http://www.vattenfall.com), [www.enbw.com](http://www.enbw.com) (Most information acquired from the respective companies' annual reports – can be found through “investor relations” on their website)

<sup>69</sup> Conclusion based on the fact that EnBW does not support solid bio fuels in their plants and EON is focused mainly on fossil fuels in Germany.

Instead of prioritizing the individual customer analyses, the author believes the response from Erik Joergensen to question 3, in his interview in appendix 14, calls for a more emergent focus area; HDG's inability to get the attention of the key stakeholders in their largest potential customer's organization.

### 11.3.2. B2B Purchasing analysis through the "Box" model<sup>70</sup>

First and foremost, is it relevant to figure out, who are the key stakeholders or in other words the "buying centre" of the target customers? Erik Joergensen describes, in his interview, that the key stakeholders in Vattenfall is located on the director level. HDG has so far, not been able to successfully reach the key buying centre in their potential customers organizations. Therefore most sales meeting has been with lower-level purchasers, that has mainly, if not only, had price as a comparative factor in mind.

The below illustration is an author-amended/translated organizational decision-group model, inspired by an educational paper by Steen Ehlers, made on the background of Orla Nielsen's box model:

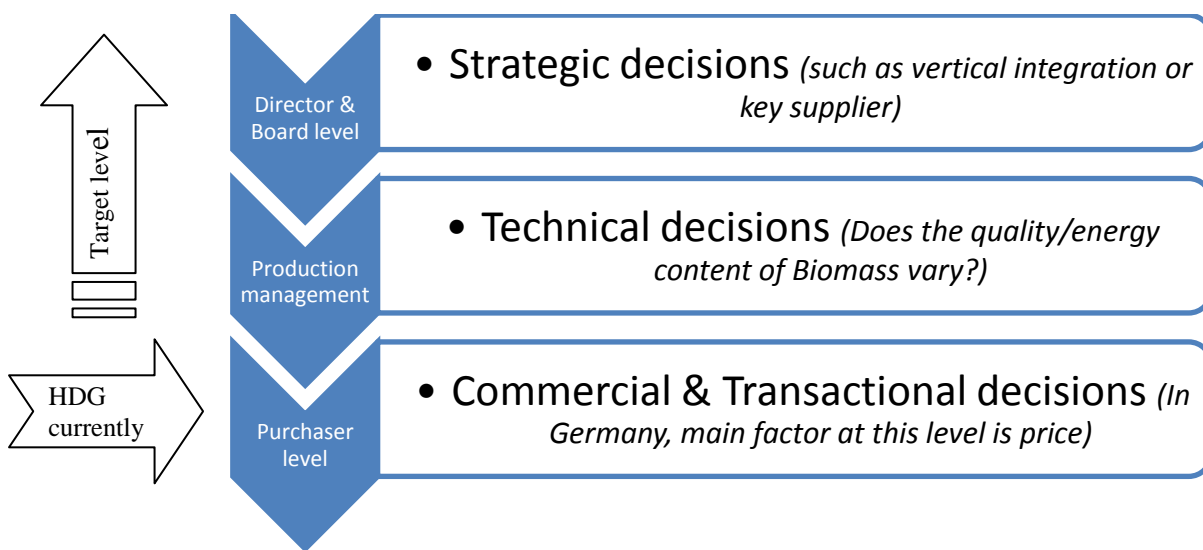


Figure 8 - Source: "Efterspoergselsmodeller" by Steen Ehlers, CBS – based mainly on the work of Orla Nielsen and his box model.

<sup>70</sup> The "Box" model of B2B customer analysis is created by Orla Nielsen and used in his book "Organisationers koebesadfærd i grundtræk" written in collaboration with Ricky Wilkes. (Material from this has been sourced via an educational presentation from Steen Ehlers CBS)

*With Steen Ehlers being a lecturer at CBS and consultant for the author in writing this report, this source is deemed to be highly reliable.*

HDG's lack of ability in reaching the required decision level in Germany is believed to be a key contributor to the fact that HDG are currently only operating with export to their existing Danish customer base in their biomass energy division.<sup>71</sup>

The later introverted micro level analysis of HD/HDG and their strategic market management capabilities will highlight further how this trend can be reverted. However as a complimentary note on the above model, the author acknowledges a clear link to the statement by Niels Joergen Pedersen in appendix 15, as he describes HDG's international ventures' growth ability, as typically being short-lived due to the market "saturating" from customers excluding HDG in their supply chain or integrating vertically. Again the author believes that by engaging with the correct strategic level of their customers organization, HDG/HD are less likely to be replaced in their customers supply chain.

If HDG can manage to reach the strategic and technical decision level, and convince these key stakeholders of the value that HDG can offer, will benefit their business, the below author-amended/translated model visually explains how the complexity of repeat and routine purchases will be reduced and hence the sales efforts will be reduced accordingly:

	<b>First time purchases</b>	<b>Repeat purchases</b>	<b>Routine purchases</b>
<b>Strategic decision</b>	New activity budgeting	Adhere to budget	Adhere to budget
<b>Technical decision</b>	Product specifications from budgeting	Boundaries of product specifications	Given/known product specifications
<b>Commercial decision</b>	Offer comparison & negotiation according to given product specifications		Choice between existing suppliers
<b>Transactional decision</b>	Contract and order execution		Repeat order supply

*Table 6 - Source: "ibid. to above used model from Steen Ehlers*

It has not been within the scope of this report to conduct a.e. qualitative interviews with key stakeholders in Vattenfall or RWE, but the author would advice for HD/HDG to draw on their

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<sup>71</sup> Postulation made by author, considering that earlier efforts have been made to reach this decision level, sadly without any luck so far.

extensive experience with similar customers, such as DONG Energy in Denmark if no such data can be retrieved.

A final factor HD & HDG needs to appreciate in their attempts to reach a higher decision tier in their potential customer's organization is the type of personality they will be faced with. This naturally varies from person to person, but the earlier used cultural mapping tool, created by Geert Hofstede, can help shed some light on the typical national and organizational culture that dominates the German customers compared to their Danish counterparts:

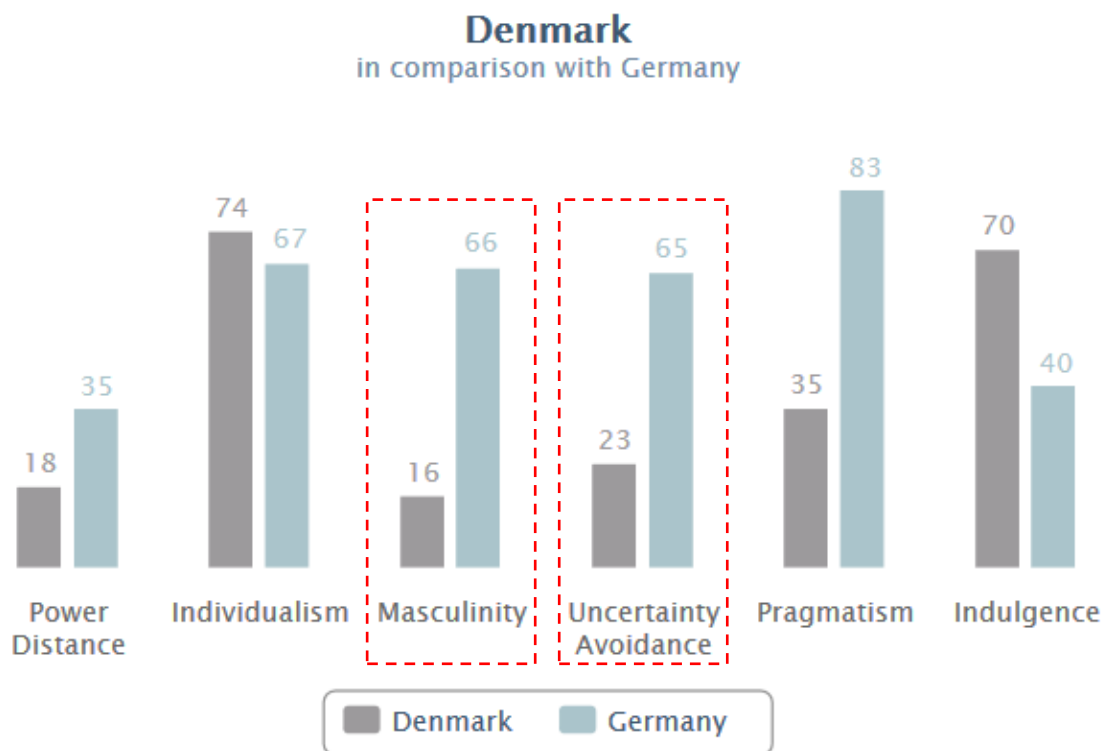


Figure 9 - Source: The Hofstede centre "country comparison tool"; <http://geert-hofstede.com/denmark.html>

*Gert Hofstede's cultural mapping tool is a very commonly used tool in explaining cultural differences in IB economy theories, and the reliability is therefore valued to be high. The validity of the usage of this model, is deemed highly valid, with the below conclusion in mind.*

Apart from the earlier explained difference in uncertainty avoidance, which in a case of communicating with German customers, might reveal itself in the classic prejudiced quote on German culture:

*“Ordnung muss sein”<sup>72</sup>*

By relating to this quote, the author is attempting to get across the message that HDG must ensure that all parts of their service is clearly illustrated and explained in a sales meeting, so that no doubts to the responsibilities of the various processes are left coincidental.

The large difference in masculinity vs. femininity also calls for a non emotional & factually based sales pitch, which keeps focus on technical specifications and potential product superiority from a factual perspective. Therefore reaching the technical decision tier in a target customer's organization is valued to be of utmost importance for HD & HDG when operating in Germany.

#### **11.4. Competitive environment analysis**

As mentioned in the methodology chapter of this report, this analysis will make use of an author-amended version of Michael E. Porters “Five Forces” model to analyse the competitive environment that HDG is/can be expected to face in the heating energy industry in Germany.

##### **11.4.1. Bargaining power of suppliers**

From the responses in the interview with key managers at HD/HDG, it can be established that there are clearly a general strong opinion about the forest owners (suppliers to HDG) having a massive bargaining power, as indirect competitors from the panel board and paper/pulp industry are currently able to offer better terms to these, hence HDG is struggling to get a sufficient supply of quality wood for their biomass energy business.

As it can be seen from the table in appendix 16, Germany is inarguably the leading producer of panel board and paper in Europe, by contributing with more than 24 % of the total European production.

The German company Nova-Institute GMBH, is an organization that specializes in market researches, supply chain & project management consultation for customers that are operating in a bio-based industry. This includes panel board and pulp-, as well as biomass energy companies. The following data and illustrations has been retrieved from a R&D report made for the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety in Germany, hence the

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<sup>72</sup> Unknown origin, although accredited to Paul von Hindenburg, the 2<sup>nd</sup> cancellor of Germany in the 1930's.

material is deemed to be valid for the purpose of this report, as well as reliable, considering it's purpose of promoting nature conservation and not pro-biomass or industrial use.<sup>73</sup>

The below illustration explains the divided use of wood for industrial and energy related use:

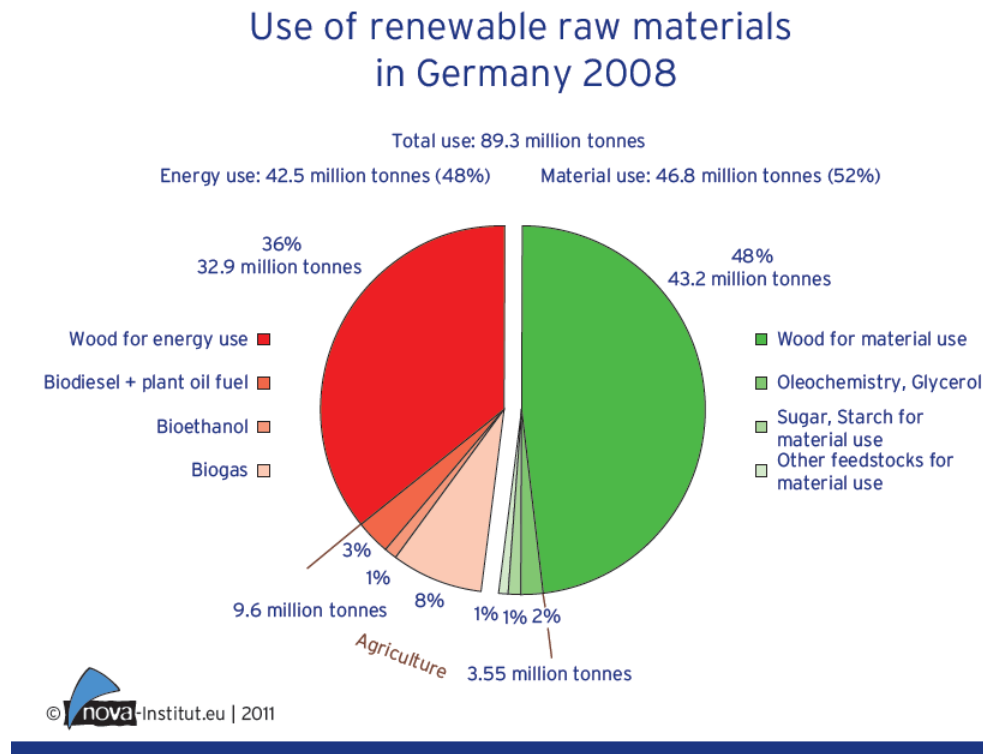


Figure 10 - Source: <http://www.nova-institut.de/bio/index.php?vt=Industrial+material+use+of+biomass&lng=en&lang=&topic=&type=&srt=0&dir=&sid=&tpl=shoplist> – See critique of source above

As it can be seen, 24 % of the total use of wood (not including agricultural gas etc.) is being used for energy purposes and 44 % for industrial purposes. The report does however also report that the majority of wood used directly for energy purposes is coming from forest residues, landscape management and “old growth” low-quality wood, where the majority of material for the industrial sector is round wood and higher quality industrially grown forestry. This is contrasting to the

<sup>73</sup> Postulation made by author upon reading the full R&D paper – link to full report: <http://www.nova-institut.de/bio/index.php?vt=Industrial+material+use+of+biomass&lng=en&lang=&topic=&type=&srt=0&dir=&sid=&tpl=shoplist>

conditions in Denmark, where the demand for industrial wood is much lower; hence the energy consumption in Denmark also includes higher quality wood with higher energy efficiency.<sup>74</sup>

The above findings therefore does conclude that the managers of HD/HDG is correct in their valuation of higher quality wood is predominantly being used for the massive panel board and paper/pulp industry in Germany. Sadly the author has not been able to find a similar study of the division between industrial and energy usage in Denmark. These data could result in more factual comparative figures for HDG, when assessing the real market potential in Germany vs. their Danish biomass division. Again, the earlier made data comparison for CHP plants and the market value this represents should be kept in mind.

For the above tendency to change, Erik Joergensen believes two things needs to happen:<sup>75</sup>

- The demand for Biomass energy in Germany needs to increase through changes in the macro environment.
- A change on the director/technical decision level in the utility companies is needed, as they currently do not separate low/high quality wood in their demand, hence the market is currently dominated by cheap energy-inefficient wood.

#### **11.4.2. Threat of new entrants**

Erik Joergensen explains, in his interview, how HDG is often outbid or deliberately turns away from potential business opportunities as competitors offer their services at a sub-profitable level (according to HDG's calculations). These competitors are therefore, self-destructive and Erik believes that HDG's potential customers are facing frequent supplier changes for this reason.

If this scenario is correct, it would to a large extent, seem like the entry barriers for new organizations are relatively small, hence the threat from new competitors is high. However when considering Erik's response with Niels Joergen Pedersen's explanation of HD's international ventures growth potential often being short-lived, due to a high level of competition on the spot market for round wood, the author wonders whether or not Erik might be referring mainly to the round wood market?

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<sup>74</sup> <http://www.ft.dk/samling/20091/almindel/flf/bilag/89/773861.pdf>

<sup>75</sup> See interview in appendix XX



This postulation is made, as Niels Joergen explains how companies in the Biomass energy sector are responsible for a lot more processes than just sourcing the best price raw materials.

If the demands are similar for HDG's potential German customers, there will be some noticeable entry barriers, which might not only limit the threat of new competitors entering the market, but at least increase the competitiveness of HDG compared to these. When looking at the supply chain and question 9 in Carsten's interview in Appendix 17, it can be established that HD's key competitive advantage in Denmark, is that they are capable of managing the entire supply chain, so that their customers can focus on their own core functions.

Though HDG does not have the same kind of comprehensive organization in place in Germany currently, it must be assumed that valuable experiences on building this type of interdependent organization, lies within the knowledge of HD's Danish organization. More on this in the final sub-analysis.

Apart from this limited threat from newly founded biomass energy supplying competitors, which directly affects the rivalry in the sub-industry of biomass energy, HDG should possibly be more concerned with the entrance of other energy sources such as the earlier mentioned potential entry of US shale gas.

Another threat that is not covered in the classic Porters five forces model, is the highly relevant factor of competing interest groups and/or strategic alliances. This is deemed highly relevant due to the German Government's seemingly continuous favouring of the Wind & Solar industry, which might be due to heavy lobbying from industry interest groups.

#### **11.4.3. Lobby/interest groups and strategic alliances**

As mentioned in the critique of the Five Forces model in the methodology chapter of this report, this model does not fully account for industries with a high level of strategic alliances and lobbying, hence the author has amended the model to include this highly important factor.

It is not within the scope of this report to deeply analyze the specific and individual efforts of these interest groups, although a certain case has been highlighted in a below chapter. A common scenario, according to a study made by Inga Margrete Ydersbond, for the Fridtjof Nansen Institute

(Oct. 2010)<sup>76</sup>, is for these groups to invite broadly recognized international environmental groups such as GreenPeace, WWF etc. to their congresses and meetings, so that pressure on the political stakeholders can be conducted on multiple levels and from multiple sources. Appendix 18 is an outtake from the above mentioned study, and offers the reader of this report a comprehensive insight into the multilevel complexity of the lobbying in the German and European energy market.

Since none of the interviewed managers from HD/HDG seems to have much knowledge about these groups and their activities in Germany/Europe, the author finds it highly relevant to list the most relevant ones for HDG to acknowledge, understand and potentially join.

#### ***11.4.3.1. Fossil energy interest groups***

The major interest group fighting the F.I.T. system in Germany, which inarguably favours the renewable energy sources, is the German Association of Energy and Water Industries or in German; Bundesverband der Energie- und wasserwirtschaft.

This interest group was founded in 2007 when 5 separate interest groups merged into a cooperative interest group. This group currently represents more than 1,800 different companies within the Germany energy industry, which for obvious reasons mainly consist of fossil fuel producers and the major utility companies that are not benefitting from the F.I.T. system, hence they are advocating for a more equal market based subsidy system.<sup>77</sup>

BDEW and their members are particularly hostile towards the Wind and PV industries, as these are the main recipients of the F.I.T. subsidies through the earlier mentioned electricity Energiewende as well as the fact that the wind farms and PV plants are often privately owned, as opposed to being owned and operated by the utility companies themselves. Inga Margrete Ydersbond argues in her above mentioned study that BDEW inarguably has the largest funding base, with “the big four” utility companies being major sponsors to this groups activities.

#### ***11.4.3.2. German Renewable Energy Federation<sup>78</sup>***

German Renewable Energy Federation or in German; Bundesverband Erneuerbare Energie (BEE) is the umbrella organization of the renewable energy industry in Germany and can be considered the

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<sup>76</sup> <http://www.fni.no/doc&pdf/FNI-R1012.pdf>

<sup>77</sup> Postulation made by author on the background that BDEW publicly battles the F.I.T. system.

<sup>78</sup> <http://bee-ev.de/BEE/English.php>

most influential German renewable energy industry interest organization. The organization's main purpose is coordinating other renewable energy interest organizations in Germany and representing their interests to the German government, the EU Commission and the general public. For that reason, BEE is active on all political levels in order to achieve its primary goal; the transition from fossil/non-renewable- to renewable energy sources in Germany. It was established in 1991 and today it consists of 25 member organizations from all ends of the renewable energy industry, including hydropower, wind, biomass, solar and geothermal energy.

BEE currently represents more than 30.000 individual members and companies

Being an umbrella organization, BEE is coordinating activities of a large variety of industry associations and independent companies in the renewable energy. Furthermore, it arranges consultations with political groups & parties, with local authorities, with specialized industry institutes and so forth. BEE also convenes expert hearings, commissions studies, compiles response statements to legislative projects and promotes awareness of renewable energy through various media outlets.

#### *11.4.3.3. Wind energy interest groups<sup>79</sup>*

Though Wind energy is almost exclusively used for electricity generation, except for electricity heated houses, this source of energy is not a direct threat to the competitive environment on the heating market in Germany. It would however be unthinkable not to include BWE in this analysis, partly because it is one of the largest energy interest groups in the world, but more relevantly because BWE has been involved in some major energy cases in Germany since its foundation. It can also be argued that, with more subsidies going to the electricity generating wind energy industry, the less funds is available for HDG and the biomass industry in general.<sup>80</sup>

German Wind Energy Association (Bundesverband WindEnergie - BWE) was established in 1996 and today it counts more than 20,000 members. BWE is attracting members from the wind energy producers and their shareholders, to scholars, engineers and technicians.

BWE has for more than 2 decades been successfully promoting the development of wind energy in Germany. According to Axel Michaelowa from the Hamburg Institute of International Economics,

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<sup>79</sup> <http://www.wind-energie.de/en/association>

<sup>80</sup> Postulation made by the author

the decisive reason for the successful expansion of the wind energy industry, can be found in the early alliances between BWE and regional politicians and farmers unions in the early 90's, which allowed for rapid expansion of the onshore location availability for Wind Farms.<sup>81</sup>

An interesting case for HDG to study, to understand just how much political power a lobbying group such as BWE can represent, was the case of retaining the earlier discussed Feed-In-Tariff in Germany in the late 90's when it was under severe political pressure. This was due to the massive subsidies being paid to the local wind farm owners (farmers), as well as to the wind engineering companies, which was deemed unfair competition from the fossil fuel interest groups such as the previous BDEW group. BWE's response was to attract a very large group of farmers, and union members from the metal industry (producing the windmills) to their cause and arrange a 4000 people large protest March in Bonn in 1997. They argued that more than 10.000 people would risk being without a job, in areas that were already struggling with a high level of unemployment. The protest was successful and the FIT was retained, and has been in place ever since!

#### *11.4.3.4. PV energy interest groups<sup>82,83</sup>*

More relevant for HDG and the competitive environment in the German heating industry, are the two main interest groups for solar/photovoltaic (PV) energy.

German Solar Energy Society or in German; Deutsche Gesellschaft für Sonnenenergie (DGS) was founded in 1975 and they are today a national interest organization with more than 3,000 individual and company members across Germany. It represents the interests of suppliers & consumers in the fields of PV energy. DGS is organized through different technical committees that count all kind of experts, which allows the association to actively participate in discussions and offer a technical position in the PV related industries. DGS strives to improve technical capabilities, research and development, but also the social and legal environment for renewable energies, with a clear emphasis on PV energy.

German Solar Industry Association or in German: Bundesverband Solarwirtschaft (BSW) is a similar style interest group that currently counts 800 members, predominantly industrial companies. The purpose of BSW is similar to that of DGS, and the key political influence comes from BSW &

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<sup>81</sup> <http://www.econstor.eu/bitstream/10419/19268/1/296.pdf>

<sup>82</sup> <http://www.dgs.de/1478.0.html>

<sup>83</sup> <http://www.solarwirtschaft.de/de/start/pressemeldungen.html>

DGS advocating the advantages of the PV industry being more decentralized and publicly available for investments, than Wind & Biomass plants.

The PV industry groups are, just like the Wind interest groups, also on the forefront of promoting investments in the earlier discussed electricity grid expansion in Germany, as no suitable storage options are available for PV electricity. Heat from PV plants can naturally be stored as hot water, similar to a CHP plant.

#### ***11.4.3.5. Bio energy interest groups<sup>84, 85</sup>***

German Bio energy Federation or in German; Bundesverband BioEnergie (BBE) is an umbrella interest group for the entire bio energy industry in Germany. BBE is representing German bio energy industry from a national, regional as well as local level. Their members include companies from biomass production, logistic of Bio energy, machinery and component manufactures to the engineering design and operation of bio energy plants across all biomass energy sectors. BBE was founded in 1998 and the group's purpose was to represent the much diversified nature of the bio energy industry across all forms of technology in the electricity, heat and transport sectors.

BBE currently consists of 158 members of which there are currently 24 associations, 127 companies and 8 research institutes. The group organizes congresses and forums, to promote experience sharing for their members. "The International Conference for Wood Energy" (IHE) as well as an international congress for Biofuels "Fuels For The Future" is according the group's website the place for annual meetings within this industry.

Within the BBE, 4 working groups exist, where at least 3 of these, are of utmost relevant for HDG to consider a membership in, or at the least study for relevant and up to date industry information:

- Working group for electricity relations
- **Working group for heating relations**
- **Working group for CHP plant relations**
- **Working group for wood chips relations**

At a Pan-European level, the European Biomass Association (AEBIOM) represents the biomass energy industry in all European countries. AEBIOM was founded in 1990, and currently counts 30

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<sup>84</sup> [http://www.bioenergie.de/index.php?option=com\\_content&view=article&id=31&Itemid=7](http://www.bioenergie.de/index.php?option=com_content&view=article&id=31&Itemid=7)

<sup>85</sup> [http://www.aebiom.org/blog/about\\_aebiom/](http://www.aebiom.org/blog/about_aebiom/)

national associations and 70 multinational energy companies, which accumulates to more than 4000 members. This interest group has a seat in the European Renewable Energy Council (EREC), which is the official central institution for renewable energy related matters in Europe. AEBIOM organizes “The European Bio Energy Conference” which is next on from the 12<sup>th</sup>-14<sup>th</sup> May 2014 in Fügen in Austria.

Looking at their current membership list, neither HDG, HD nor Hedeselskabet are members of AEBIOM.<sup>86</sup>

#### **11.4.4. Bargaining power of buyers**

The bargaining power of buyers will typically be high if;<sup>87</sup>

- The buyer is accounting for a large share of the suppliers total sales
- If there are a lot of alternative suppliers available
- If the buyer is easily able to integrate vertically in their value chain and “cut” off the supplier in their supply chain.

Considering once again, the reply from Niels Joergen Pedersen in his interview in appendix 15, about HD/HDG often struggling to maintain growth in International Markets due to their customers having too much power or simply integrating their own business into being self-supplying of round wood, the case of high bargaining power of customers is surely not an unknown scenario for HD/HDG.

Although Niels Joergen is referring to the round wood business of HD/HDG, another one of the typical causes for high customer bargaining power is present in the biomass energy division: Erik Joergensen explains how HDG would often decline potential revenue boosting business opportunities, due to calculations showing that the project tender was not profitable, and with competitors of HDG, (knowingly or not) accepting a sub-profitable project, the power of the customers is indeed very high.

Erik Joergensen also elaborates on how their customers do not seem to consider the transaction costs that supplier changes inarguably result in<sup>88</sup>, which to the author of this report, is evidence to

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<sup>86</sup> <http://www.aebiom.org/wp-content/uploads/file/AEBIOM%20member%20guide/AMG-Brochure-for-web.pdf>

<sup>87</sup> ”Strategic Market Management” by David A. Aaker & Damien McLoughlin, European Edition, John Wiley and sons 2007.

the fact that these in/out competitors of HDG have not reached the strategic or technical level of the customers organizations either, and are therefore only operating on the entry level purchaser level as well.

Again HDG can limit the bargaining power of their customers by ensuring that what they deliver in terms of value and complexity is not easily replaceable, without significant cost-benefit considerations from a strategic level at their customers. Again the key is to attract the attention of these key stakeholders in their customer's organization.

#### **11.4.5. Threat of substitute products**

This element is surely of high relevance for all companies operating in the German energy industry, as it can be considered on at least 3 levels, and all with different drivers of the development of this element:

##### ***11.4.5.1. Industry level 1 (all energy sources)***

At this initial market/industry level, all types of fuels are competing for the same total consumption of energy; hence HDG's competitors include coal, natural- & shalegas, wind, PV & many more suppliers. The development of the threat level from other sources and consequently the overall competitive environment on this level is, to a large extent, depending on changes in the macro environment with the Legal & Political scene being the key driver, as mentioned by Niels Joergen and established in the initial macro analysis.

##### ***11.4.5.2. Sub-market level 2 (all renewables)***

Once the threat of substitutional products in the total industry has been clarified, a.e. through the earlier made Macro environment analysis, HDG should look at the threat from substitutional products within the renewable energy sector. This analysis should be carried out similarly to this report's current market analysis, by weighing all previously discovered macro factors that has relevance to this sub-market and analyzing the competitive environment within this sub-market. However, since this sub-market covers both the electricity and heating market, and the author has concluded that the focus for HDG should primarily be on the heating market, a further segmentation, into a third level should be conducted:

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<sup>88</sup> Postulation made by author based on experience in the B2B sector, where establishing terms and conditions, trial runs, testing etc. always has a cost involved for both parties.

#### *11.4.5.3. Sub-market level 3 (heating market)*

Within this sub-market, the threat from certain alternative sources, such as Wind & Nuclear suppliers has been eliminated (as these sources are not used for heat generation) and particularly one fossil fuel source has re-entered the frame; Gas. With the earlier discussed political development between Europe and Russia due to the Ukraine crisis, the dominance of gas powered house heating could see a rapid decline in the years to come.

No matter what happens in regards to the dependency of Russia, the author believes the worldwide acclaimed success of the electricity Energiewende, will mean it is likely spread to the heating industry, which will inarguably lead to more favourable market & competitive conditions for HDG. This is ultimately also backed by the earlier illustrated differences in CO<sub>2</sub> emissions compared to the German, EU & Global targets of increased energy efficiency and reduced CO<sub>2</sub> emissions. Appendix 19 clearly shows how biomass fired heating, only releases 3-8 % of the CO<sub>2</sub> levels of gas fired heating, hence to comply with the requirements of the various earlier mentioned CO<sub>2</sub> reduction targets in Germany, EU and globally, the

The main substitute product threat is therefore from PV & Geothermal powered heating, which as listed earlier in table 5 currently contributes to 4.77 % & 5 % respectively, of the total heating market.

In a meeting between Angela Merkel and Barrack Obama on the 4<sup>th</sup> May 2014, a new Transatlantic Trade and Investment Partnership (T-TIP) was discussed on an advanced level. This agreement is partly created to ensure easy and low-cost export of shale gas from the US to European markets. However as mentioned earlier, Germany is not believed to be interested in exchanging their current fossil fuels with an, albeit more efficient and climate friendly, alternative fossil fuel that is obtained through the criticized method of “Fracking”.<sup>89</sup> Therefore the threat from this energy source is only deemed to become high relevant if the current Ukraine crisis escalates further and results in Russia restricting the gas-based energy supply to Germany.

The threat from substitute products, on the sub-market for heating, is currently deemed to be relatively lower than in the electricity- and overall energy market, and with future expectations of a

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<sup>89</sup> <http://www.whitehouse.gov/the-press-office/2014/05/02/remarks-president-obama-and-german-chancellor-merkel-joint-press-confere>



decline in the market shares of the biggest competing substitute; Natural Gas (no matter the outcome of the Ukraine crisis) this threat should become less and less significant.

### **11.5. Rivalry among existing firms**

This 5<sup>th</sup> (or 6<sup>th</sup> in this author amended version) element of Porters Five Forces is a critical assessment of the actual rivalry that exists between the current biomass energy suppliers in the German energy industry.

Typically the key factor deciding the rivalry in an industry is the number and relative size of the competitors within this industry. A.e. a Monopoly based industry has no real rivalry, as a single dominant company is dictating the industry's development. This is natural the opposite in an oligopoly where many similar sized companies fight over market shares, and in a market with perfect competition, the rivalry is similar high.

Another relevant factor in this element is the increasing rivalry when competitors are offering similar products. This is surely the case for round wood timber, which is also evident in the earlier mentioned fact that this business is almost exclusively price fixated.

For HDG's biomass business, they are expected to be able to differentiate their product offering from competitors from their possession of a unique sustainable competitive advantage, in the shape of value chain synergy. This will be further explored in the later strategic analysis of HD/HDG.

The author has sadly not managed to produce primary or research secondary data, containing information about their competitor's position in the market, and their current product offering to the potential customers. This information would be highly valuable for HDG to obtain, a.e. through a self-conducted customer survey which could offer intimate details on the competition and their strengths and weaknesses etc. An analysis of potential accessible annual reports or other company specific publications are also a possible way of gaining an understanding of how to compete successfully against these.

### **11.6. Risks when entering a high growth market**

As it has now been concluded that the electricity and heating markets for renewable energy in Germany is likely to continue their rapid growth, the author of this report, finds it highly relevant to highlight certain risks for HDG when potentially entering either of these two markets.

The below illustration is from David A. Aaker & Damien McLoughlin's book "Strategic Market Management" which has been used as theoretical reference point throughout this report. The model explains how a company entering a high-growth market must acknowledge, and if possible, plan for certain risk factors;



\*KSF = Key success factors – this can to some degree be translated into competitive advantages and necessities.

Figure 11 - Source: "Strategic Market Management" by David A. Aaker & Damien McLoughlin 2007.

*This book is acclaimed for being a good explanatory tool of the combination of theory with real life case studies, and the author finds the above model highly valid for the purpose of this report. .*

### 11.6.1. Competitive risks

The author is critically aware that the report is, to some extent, contradicting its previous conclusion of the market being one with sub-profitable income levels for the companies engaged; hence fewer companies are expected to enter and/or accept to operate with loss within this sub-market.

However with the forecasted development, of the heating market potentially becoming subject to further Energiewende reforms, which will promote the use of renewable energy in the attempt to raise energy efficiency reduce energy dependency on Russian imports, HDG must consider the heating market from a future perspective to be proactive in their strategic choices. When/if this

increased heat Energiewende becomes a reality, there will inarguably be more biomass energy suppliers entering the market, raising the risks of overcrowding in this market. An example of the consequences of overcrowding in a hyped B2B market is the early 2000's online B2B market. In the year 2000 alone, the number of B2B companies, typically offering exchanges of information between various suppliers and customers, rose from around 280 to an unprecedented high of 1520 companies in one year! 3 years later, a massive shakeout had occurred and less than 200 companies of these previous 1520, were still trading in 2003.<sup>90</sup>

The author acknowledges that the report previously established that certain entry barriers does exist in the biomass energy-supply market, hence the risk of overcrowding is not deemed to be similar to that of the online B2B market in the early 2000's.

Also the risk of superior competitors entering the market will increase, when the market become visibly more attractive. What makes a superior competitor then? Quite often it is a case of a late mover entering the high growth market with a superior products/service, which erases the potential first mover advantages of the early entrants and through this superiority, steals market shares from other players. This potential threat makes it crucial for HDG to take advantage of the experience of their parent company HD, as their full supply-chain solution, which they are offering their Danish customers, could make HDG the superior competitor that smaller niche competitors are struggling to compete with. This is evidenced in the fact that HD is market leaders in Denmark, and the key reason for this being their comprehensive service offering, according to several of the interviewed managers.<sup>91</sup>

### **11.6.2. Market Change risks**

The key success factors (KSFs), are different to competitive advantages, as these only describe the necessities for companies to be able to compete in a certain market. Mastering these KSFs can however be considered a competitive advantage, as the following scenario will highlight.<sup>92</sup>

Currently biomass energy supply to the German heating industry seems to be dominated by price/costs & resource availability. If we hypothetically consider HDG being the market leaders in

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<sup>90</sup> "Shakeouts in Digital Markets": Lessons from B2B exchanges

<sup>91</sup> See interviews in appendix XXX

<sup>92</sup> Chapter 8 in "Strategic Market Management" by David A. Aaker & Damien McLoughlin, European Edition, John Wiley and sons 2007.

cost prices for their product/service and having the most reliable and low-cost supply of wood chips, compared to their competitors, this should leave them in strong position in the market (if they take advantage of these KSFs).

Again hypothetically (but not unrealistically, considering earlier findings), let us say the potential heating industry Energiewende brings along strict requirements to sustainable forestry as well as aiming at lowering the CO<sub>2</sub> emissions from truck-distribution of forested products, the KSFs changes from being only cost and reliable supply driven. Now the best performers in the market need to have a supply from a sustainable forest source, and potentially be directly involved in planning for re-foresting their supply sources. They also need to consider their infrastructure and logging locations, to reduce the logistic distances between the forests and the CPH plants. If HDG does not succeed in this, it is likely that the above discussed superior competitor enters the market with all of these KSFs in hand, and through these “steals” the market shares that HDG enjoyed under the now obsolete KSFs.

The same scenario can be considered with changing technology requirements, which in the case of biomass energy supply could be a change to the fuel for CHP plants, a.e. wood for waste or wood chips for wood pellets etc. Predicting these technological scenarios was part of the earlier conducted technical environment analysis.

Disappointing market growth can also be the outcome of the recently introduced heat and CHP acts, as is often the case with markets that are being hyped by media and politicians alike. The amount of attention to the Germany energy industry, with its status as forerunner for most other economies and home of the feed-in-tariff system, means that not only regional and national media outlets are following the developments on this market. A prime example of this is the fact that Barrack Obama and Angela Merkel had the German energy industry and the interdependence to Russia, on their agenda at their earlier discussed meeting on the 2<sup>nd</sup> May 2014.<sup>93</sup> Disappointing growth can also occur on a market that might live up to the hype in the sense of overall market growth, but due to overcrowding, the capacity of suppliers to this market is exceeding these growth rates.

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<sup>93</sup> <http://www.whitehouse.gov/the-press-office/2014/05/02/remarks-president-obama-and-german-chancellor-merkel-joint-press-confere>

The latter scenario leads us to the final market change risk in this model; Price instability. Once a market is overcrowded, the bargaining power of the customers increases accordingly, which naturally drives down prices and often results in a sub-profitable market for the majority of suppliers.<sup>94</sup>

### 11.6.3. Firm limitations

Just like the overall focus of this report, the high-growth market risk analysis also highlights the importance of not only looking at the external environment and market conditions, but also having an introverted look at HDG/HD and their ability to cope with these demanding conditions. Resource constraints can occur from several levels of the organization, and therefore includes scarce financial resources, limited experience with expansion in a growth market, as well as organizational constraints a.e. in the shape of not having the staff available or trained to operate under these demanding conditions.

Another limiting factor is the availability of distribution of the products, which in HDG's case are logistic companies that specialize in logwood or wood chips distribution. Even if there is high growth to be reaped on the German heat market, and more biomass suppliers enters this market, these companies are still likely to be depending on more distribution channels becoming available for them. Should the German government, as earlier discussed, include an attempt to reduce CO2 emissions through applying governing instruments which apply to the distribution of biomass energy, there might be a drop in logistic companies wishing to supply their services to this sector, as this could involve having to change their fleet of vehicles or alternative costly investments.

The financial resources is a relatively easy matter for HD/HDG's management to conclude on being either sufficient or insufficient, once a budget has been set up for this potential activity increase in Germany. This separate financial analysis is not enclosed in this report.

It is the organizational and strategic constraints that can typically be more difficult to interpret objectively, especially with long-serving managers, which might have adopted a certain managerial approach that lacks the ability to act proactively to forecasted market opportunities or threats.

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<sup>94</sup> "Strategic Market Management" by David A. Aaker & Damien McLoughlin, European Edition, John Wiley and sons 2007.

### **11.7. Part conclusion to market-, and competitive environment, analysis**

Initially the report looked at the market potential for HDG in the German electricity sector and it was established that the dominating contributors to the current and future electricity generation is likely to be the rapidly growing PV industry as well as the off-shore wind industry. In the biomass sector it is mainly agricultural waste and residue that is deemed to be an important contributor in the years to come. It was established, that due to limited political support for the solid biofuels suppliers in this market, the German electricity sector offers only limited potential for HDG. (potential is naturally still there when considering the concept of CHP plants)

Instead, the attention of the report was directed onto the heat industry in Germany, as several findings had indicated that there might be more potential in this sector, than what HDG's regional Manager Carsten Boedicker and previous regional manager Erik Joergesen had estimated in their respective interviews. Though the Nuclear phase-out is not directly contributing to the development the recent add-on of expansion incentive programmes in the heat sector as well as the looming Ukraine crisis, are all very likely to transmit into the heating sector as well and increase the market potential for HDG.

Germany currently offers twice the market size for energy generation from CHP plants, compared to Denmark, and with official targets for the expanding the use of CHP plants in Germany significantly; this difference could be doubled in 2020.

It was established that HDG can segment their target groups into three categories with one being the "Big Four" utility companies. The second group, consists of the local, typically municipality owned, CHP plants and finally the third group is the vast amount of privately owned small-scale biomass heating installations. After a brief discussion on the potential from the "Big Four" utility companies, the report prioritized to turn its attention onto the inability of HDG to reach the sufficient decision level in their target customer's organization.

A slightly amended box model analysis was created, to illustrate how HDG are currently not able to attract the attention of the "right" people in their customer's organization. The characteristics and cultural background of the people HDG are trying to attract the attention of, was revealed and recommendations on how to reach this level was offered.

The competitive environment analysis resulted in the following observations:

**Bargaining power of suppliers:** HIGH

**Threat of new entrants:** MEDIUM

**Threat from competing interest groups:** VERY HIGH

**Bargaining power of customers:** MEDIUM-HIGH

**Threat of substitute products:** LOW-MEDIUM

**Rivalry among existing firms:** UNKNOWN

Finally the high-growth market risk-analysis uncovered some important risk factors for HDG to consider, with emphasis on overcrowding, price instability, superior competitor entry, unforeseen market changes and firm limitations being key factors. The analysis did however also reveal a potential for HDG to become the superior competitor.

To unlock this potential, the report will now draw its attention to an introverted look at HD's ability to strategically manage their international markets.

Firstly though, the author would like to turn the attention of the reader back onto appendix 10, where the summarizing SWOT tool has been updated with the findings from this chapter of the report. These findings are marked with a red font.

## **12. Developing and managing a market specific strategy**

The concept of Strategic Market Management springs from the idea that; companies operating in a market with rapid changes in their macro and meso level environment cannot depend on a short term static planning cycle to deal with the consequences these rapid and typically influential changes bring with them.

Considering the findings previously in the report, it can inarguably be concluded that the European, and in particular, the German energy industry is one where rapid and highly influential changes occur quite often!

Another clue to the idea of the concept is in the name, as the theory recommends companies within these volatile markets to have a specific strategy for that particular market in place, instead of a globally wide company policy that stems solely from internal orientation.

However, before a strategy for HD/HDG in Germany can be made, the report must turn the attention on the final missing piece from Strategic Market Management overview in appendix 20; The Internal Analysis.

### 12.1. Internal analysis of HD & HDG

The first factor an analyst is likely to consider in a micro-level analysis is the performance of the company, measured from financial ratios such as Return on Assets (ROA) or Shareholder Value. None of these analyses will be conducted within this report, as these ratios are “easily” calculated with the right set of financial data at hand. It is however of monumental importance for HD to understand; that before any market strategy can be developed, this financial performance analysis is compulsory to construct, as these financial findings might indicate that the focus should not be on making strategies for the entry onto new markets but instead divestments of existing sub-profitable assets etc.

The report will instead focus on alternative performance measurement tools for HD.

#### 12.1.1. Measuring performance beyond profitability

All levels of Hedeselskabet, Hededanmark & Heidegesellschaft share the same basic vision of becoming “The Leader” within their respective business areas. To be the leader in a market, a company is depending on a strong following of loyal customers. To attract a following of strong customers HD/HDG needs to have competitive advantages (preferably sustainable) created from their assets and competences.

Looking at the reply from both Carsten Mortensen and Niels Joergen Pedersen in their respective interviews, it would seem that the full supply chain service that HD can offer is their key competitive advantage. This is however an internal opinionated conclusion, and since the vision requires customers to share the same idea, it would be highly relevant to conduct customer satisfaction interviews on their established home market in Denmark, as well as in their international markets.

To measure satisfaction and loyalty of customers and how to improve both on a longer term, HD needs to not only establish the following factors, but monitor the development of these:

- **Which issues can cause customers to consider changing their supplier for biomass energy?** (*valuable information about “what-not-to-do” to existing customers*)



- **Why has a customer moved away from HD and their services in the past?** (*interview with exiting/already exited customers can offer great insight into HD's shortcomings as well as invite to reconsideration of exit if issues are resolved*)
- **Which of HD's customers feel a sense of loyalty to the company, and who are simply dealing with HD as no better option is available or no dissatisfaction is felt?** (*Offers valuable information on which customers might need more attention to create a sense of loyalty – a prime example is Niels Joergen's comments on this issue in foreign markets*)
- **How does the satisfaction and loyalty to HD compare to that of their competitors?** (*Valuable information on competitors strength and weaknesses. This survey should naturally be made according to competitive laws and regulations, but asking their customers for comparison for internal use, is not illegal in any countries, to the knowledge of the author of this report!*)
- **How does HD's product or service (all components) compare to that of competitors?** (*Insight into areas of the value chain where HD might not be offering sufficient value to their products, compared to their competitors*)

As it would seem, from Niels Joergen's response to question 4 in his interview, HD is currently struggling with disloyal customers in their foreign markets and this type of analysis can typically offer the explanation as to why, if there are more reasons than just being unable to compete on price.

By consolidating the responses from the customer satisfaction and loyalty survey, HD should have a highly useful platform, for which to conduct a comprehensive competitor analysis, which can assist HD in mapping their relative cost vs. relative performance in a model such as the below. Similarly to a BCG growth-share matrix, this offers input to developing SBU specific strategies.

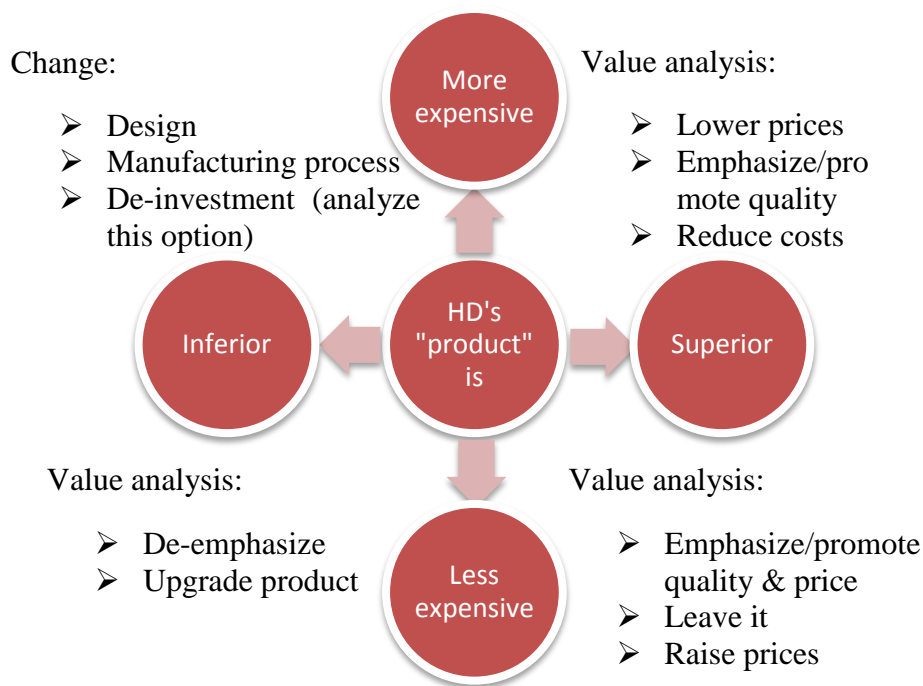


Figure 12 – Source: Own creation based on similar model in chapter 7 in "Strategic Market Management" by David A. Aaker & Damien McLoughlin, European Edition, John Wiley and sons 2007.

However since this report's focus is not on the individual service or product strategies, but instead market specific strategies, these mentioned value analyses will not be explored further.

The final measuring tool for performances is the retrospective look at previous and current strategies and the results that these have created or are creating. An example from the authors current employer, a B2B furniture whole seller, is a failed strategy from 2007-2008 that had the ambitious name of "2 in 12". This title was reference to a target of doubling the turnover from 1 billion DKK to 2 billion over a 5 year period. Now in 2014 the turnover has not even reached 1.5 billion DKK, and although the global recession has had an unforeseen effect on this development, the company has been profitable throughout this period. However, the management was in 2012 left with the disappointment within the organization and from investors, from "only" growing by 50 % during a recession period, where several comparative competitors have seen deflating growth red bottom line figures (!)<sup>95</sup>

Instead of making the same mistake, HD should follow Otto Von Bismarck's saying:

***"Only a fool learns from his own mistakes. The wise man learns from the mistakes of others."***

<sup>95</sup> Case from empirical knowledge from the author in his role as Country Manager for Actona Company.

### 12.1.2. Weaknesses & constraints of HD & HDG's organization

Before any strategic options can be considered, a critical self assessment of the constraints and weaknesses of HD & HDG's organization is obligatory to conduct, as this will ensure a strategy which is not actually implementable, is developed. Again a closer look at potential financial resource constraints has not been included, since the knowledge of these (if any) can be expected to be known already, within the top management of HD as well as their parent company Hedeselskabet.

The first organizational constraint/weakness that springs to the attention of the author is the lack of any dedicated staff members to the biomass energy division in HDG. As described in the company profile section of the report, there are currently several "buying agents" for round timber trading, but none are highlighted as being responsible for the biomass energy trade. No strategy for the biomass division of HDG can be implemented, without any dedicated members of staff responsible of doing so!

The second constraint/weakness lies in the decentralized approach that HD is, to some extent, trying to promote. Although Niels-Joergen Pedersen is listed as the head of Heidegesellschaft, his involvement on a daily basis is very limited and more of an ambassadorial character. A decentralized approach to management carries many advantages, such as;

- Empowered and motivated staff members in foreign subsidiaries
- Quick adaptation to market and environmental changes
- Innovations adapted to market/customer specific opportunities

However, what a decentralized approach also carries; is a cost of not taking advantage of synergies between the parent organization and the foreign subsidiary. The author believes this is evident in the fact that, with HD's dominance in the Danish home market for biomass supply to the heating industry, they have up until now, not been able to gain any grounds on the German market that according to the conducted market potential analysis, currently has double the size of the Danish market with the outlook of further growth.

A third weakness or constraint is a more arguable postulation by the author that HD/HDG should be active members in biomass interest groups, not only in Germany, but also potentially in the Europe wide AEBIOM group. This argument is made, as the power of the political environment has been verified several times throughout the report, and the same goes for the influential power of these

interest groups. Although HD/HDG can potentially reap the benefits from this group's activities, without becoming a paying member that dedicates time and resources to the group's work, it would seem unlikely that the active interest group members do not benefit from firsthand experience sharing, early notifications on market opportunities through mutually sponsored market analyses, technological and innovative progress and so forth.

Gary Hamel and C.K. Prahalad argue that managers operating in markets with rapid changes in their environment and on the market itself need to have a clear understanding of how the relevant industry is likely to look in 10 years time. They should attain this skill by being in front of their competitors, be innovative and finally be proactive in their strategy making process<sup>96</sup>. By not being part of the leading industry interest groups, HD is dependent on retrieving all data and analyzing these themselves, and the author has not come across any persons in the organization that carries this responsibility!

Finally Erik Joergensen's comments on; the lack of cultural understanding from management, the inability to approach a market with another role than being "The Leader", the swearing to duplicate the Danish value chain or alternatively leaving it with the local office to sort out autonomously and other comments, in the reply to question 13 in his interview in appendix 14, has led the author to question if a managerial constraint in HD exists?

Important to underline, is that the author is not criticizing the abilities or intentions of the managerial characters in HD, but instead this potential constraint should spark an internal discussion on who is actually directly responsible for the future growth of HDG and other foreign subsidiaries? And what management structure is necessary to make this happen? (decentralized, centralized or maybe a fusion of the two?)

It is the belief of the author, that if HD manages to think more in the concept of strategic market management, this can help correct the above found constraint of managerial "indifference" and lack of cultural understanding

When looking closer at the above found constraints, these each represent a group in the below model. This model is included in the report, as it helps to visualize the importance of having the

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<sup>96</sup> <http://www.ebooksmagz.com/pdf/competing-for-the-future-by-gary-hamel-and-doctextos-home-203319.pdf>

constraints/weaknesses within these 4 elements, addressed before a new strategy is launched, as performance will otherwise be affected negatively:

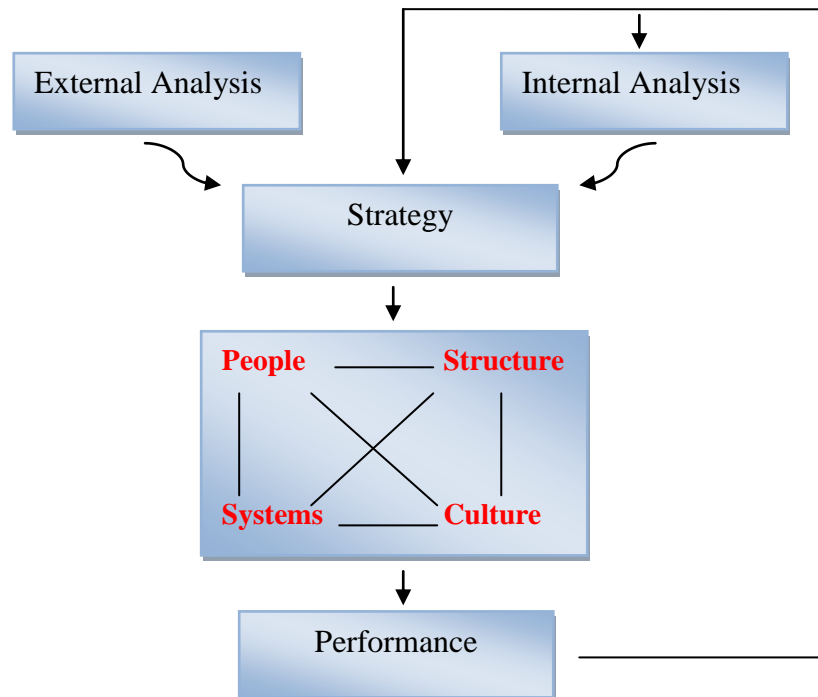


Figure 13 - Source: Own creation based on similar model in chapter 16 in "Strategic Market Management" by David A. Aaker & Damien McLoughlin, European Edition, John Wiley and sons 2007.

### 12.1.3. The Strengths of HD & HDG's organization

Again the report will not offer a detailed look at potential financial strengths, which could come in the shape of having large financial resources available for investment in market opportunities, the ability to generate positive cash flow and the historic ability to make use of optimal gearing of equity and debt. Again these kinds of ratios and data should be readily available to the management of HD & HDG.

Instead this report will attempt to list the organizational assets and competences that are currently contributing or even more interestingly, can be contributing to the development of sustainable competitive advantages (SCA).

The author would like to acknowledge on the SCA criticism by Rita Gunther McGrath, a professor for management at Columbia Business School. She claims that strategies based on obtaining and defending SCA's are obsolete due to the digital and flat transparent structure of today's industries.

Modern organizations should therefore accept that all competitive advantages are transient; hence strategies supporting pro-active development of new transient competitive advantages must be adopted.<sup>97</sup> This is exactly what strategic market management is trying to promote, in the sense that constant monitoring of the external environment and internal performance, must be used to adopt pro-active market specific strategies.

The report will continue to use the term SCA though, as the author does not believe deliberately focusing on competitive advantages being transient instead of sustainable is going to raise the quality of the strategies that are put in place to create more of these advantages in HD. The concept of transient competitive advantages should however serve as a stark reminder for HD to “never rest on the laurels”.

The first and undoubtedly most significant strength of HD is their close bond to an array of supporting synergetic business areas, through the activities of Hedeselskabet/Dalgas-group. As it can be seen from the cooperate organization chart in Appendix 1, these partnering companies include;

- **Orbicon** – Knowledge based company that offers consulting in fields of construction, environmental projects, technological innovation etc.
- **Xergi** - A Company that specializes in the construction of biogas plants for utility companies.
- **Dalgas innovation** – A Company that focuses on research and innovation of projects that is deemed likely to offer profitable returns to Hedeselskabet.
- **Hedeselskabet SP.zo.o** – A Polish subsidiary of Hedeselskabet, that specializes in supply of landfill gas to utility plants in Poland.

The author believes the above mentioned companies and their close tie to HD / HDG is offering a highly unique SCA for HDG in Germany. This is postulated as the author believes that the link between the above companies and HD is the key reason for them being able to offer a market leading full supply-chain solution in Denmark. The focus of these individual companies, offers a synergy that makes HD specialist in a large part of their value chain.

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<sup>97</sup> <http://hbr.org/2013/06/transient-advantage/ar/1>

The advantage is valued as being sustainable as competitors are unable to copy this set-up without having a learning curve to overcome. This advantage could theoretically become transient should a competitor acquire similar companies from a merger or acquisition move, or if Hedeselskabet fails to develop these companies to an extent where they are continuously offering valuable information & innovation.

It would however seem that the effects of this SCA could be significantly improved, considering the fact that Niels-Joergen Pedersen admits to the fact that HD currently employ a sporadic “short term gains” approach to their International ventures. Strategic Market Management should assist in making better use of this, but more on that later...

A second strength is mentioned by Carsten Mortensen in his interview in appendix 17. This is HD's market leading innovation skills, in developing machinery that raises the efficiency and lowers the costs of the process of making wood chips. This equipment also allows for HD to perform tasks that competitors are not able to bid in on, due to a lack of similar capabilities. It can be discussed whether or not innovation can ever become a long-term SCA, as history has plenty of examples of companies were market leading innovators, that were left behind by the competition at key moments. A good example is Nokia, who were the leading mobile phone manufacturer and software developer for these for many years, but by failing to react to the innovative trends of developing smart-phones, the power within this industry changed across to Apple & Samsung in particular. The same can be said for Kodak, who failed to adapt to the digital camera market.<sup>98</sup> This supports Rita Gunther McGrath's argument that resting on obsolete competitive advantages can be highly deteriorating to the profitability or growth potential of an organization.<sup>99</sup>

Based on the reply from Carsten Mortensen in his interview, several other strengths in HD's Danish organization, which are offering competitive advantages to their biomass division in the home market, is exactly what HDG needs to adapt in their strategy for the German biomass market. These advantages include:

- Service superiority with full supply chain solutions
- Large capacity due to position as market leader

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<sup>98</sup> <http://www.radiologybusiness.com/topics/business/sustainable-competitive-advantage-enough>

<sup>99</sup> <http://hbr.org/2013/06/transient-advantage/ar/1>

- Easy access to raw materials
- Positive customer reputation and high level of customer loyalty

## 12.2. From analysis to strategy identification, selection & implementation<sup>100</sup>

With the internal analysis now conducted, the final piece of the puzzle has been unveiled and the report will now move onto recommending a market specific strategy for HDG in Germany as well as offer recommendations to HD on how to approach potential future international ventures, through strategic market management.

### 12.2.1. Identifying & selection strategic option<sup>101</sup>

The strategic market management approach underlines that any strategic decision should consist of 4 elements/problems;

1. Where to invest or divest – is the market in growth or decline?
2. Customer value proposition - what can and should we offer the customer?
3. Assets and competences – How can we beat the competition?
4. Functional strategies and programmes – Which parts of our value chain already have strategies in place to support a main strategy and where are new/revised sub-strategies needed?

The data needed for solving these four problems, has been provided by the analyses within this report, and although a thorough marketing mix analysis, an in-depth competitor analysis and finally a value chain analysis are likely to add even more data to base the strategy-decision on, the author believes sufficient data has been collected to identify certain strategic directions and amongst these chose the most suitable for HD/HDG to follow in Germany. First the author will present some strategic options that are not recommendable for HDG to follow:

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<sup>100</sup> Chapter 7 in "Strategic Market Management" by David A. Aaker & Damien McLoughlin, European Edition, John Wiley and sons 2007.

<sup>101</sup> Ibid.



#### *12.2.1.1. Quality and brand equity<sup>102</sup>*

This particular strategy is all about exploiting positive quality and brand perception from customers within the market. It would seem from the response from Carsten Mortensen that HD, in Denmark, is indeed considered a supplier with a high quality level in the sense of the delivering the right amount, at the right time, in the right quality. They are also well known for the quality of their equipment, which allows for them to tender for tasks, which competitors are not always capable of solving for the customers. Finally their brand equity also seems to be high in Denmark, with Carsten describing HD as being well-renowned within the market.

The earlier recommend customer loyalty and competitor comparison survey can assist HD in further mapping their actual quality and brand equity.

This strategic option is however not deemed realistic and feasible for the German market, as a key factor is countering this strategy; HDG has no current quality and brand equity in Germany, as they are not present in the market yet! This might well be a suitable strategy once HDG has established themselves as a player in the market, but it is surely not the strategy to enter the market with. This failed effect from this strategy is evidenced by the comment by Erik Joergensen, which describes the Danish management's previous attempts to enter the German market, with the market leading mindset that they benefit from in Denmark did not work out very well.<sup>103</sup>

#### *12.2.1.2. Value, focus innovation and customer relationships<sup>104</sup>*

This is not a recommendable strategic option either, as HD only excels in one of the elements in this strategic option; Innovation.

This is because, to follow a strategy of the value option, HD/HDG needs to have a low-cost culture, or at least be cheaper than their closest competitors. There is nothing in the interviews or from the study of HD as an organization that would point in a direction of them being a discounting supplier of biomass energy. On the contrary, by refusing certain projects due to estimation of these profits being too low to be acceptable, and by catering for special requirements through their innovative machine programme, this would indicate a relatively low focus on being the lowest price option in

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<sup>102</sup> Chapter 9 in "Strategic Market Management" by David A. Aaker & Damien McLoughlin, European Edition, John Wiley and sons 2007.

<sup>103</sup> See appendix XX for interview with Erik Joergensen

<sup>104</sup> Chapter 10 in "Strategic Market Management" by David A. Aaker & Damien McLoughlin, European Edition, John Wiley and sons 2007.

the market. Also the concept of Focus does not fit the full-supply chain solution of HD very well. As HD is benefitting from excelling at coordinating several complex processes from forestry to the output of consumable energy, they cannot consider themselves as being particularly focused on a niche area of the supply chain. Finally a customer relations strategy is all well and good in their home market of Denmark, where a customer base is established, but in Germany where HDG is not established yet, this is simply not feasible. Again this might be a strategy to follow once, HDG has established themselves, but again a customer loyalty and satisfaction survey should be conducted to unveil if customers are in fact loyal to HDG for other reasons than them having the best offer on the table for the current project.

#### *12.2.1.3. Global strategy*

This strategy is typically followed by large multinational organizations that are striving for a generalized approach to their markets to benefit from economies of scale and reduce the complexity in their organization.<sup>105</sup> This strategy has in some ways been attempted by HD, as they would approach a new market with the strategy of duplicating their successful value chain from their Danish organization into the new market. This has however failed to have a positive long-term effect on the growth of HD's international ventures and since the author is unable to see what economies of scale advantages this would create, even if successful, the recommendation for a more individual market strategy is believed to be the best option for HD/HDG in Germany.

Moving on from the rejected strategic options, the author will now offer a more in-depth introduction to the recommended strategy direction.

#### *12.2.1.4. Creating advantage and synergies<sup>106</sup>*

This strategic approach is all about taking advantage of potential existing sustainable competitive advantages (SCAs), creating new advantages (in-line with the earlier discussed transient advantage) and finally utilizing these different advantages into a complete synergetic offering, that allows the

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<sup>105</sup> Chapter 11 in "Strategic Market Management" by David A. Aaker & Damien McLoughlin, European Edition, John Wiley and sons 2007.

<sup>106</sup> Previous findings in report coupled with theory from chapter 8 in "Strategic Market Management" by David A. Aaker & Damien McLoughlin, European Edition, John Wiley and sons 2007.

organization to leap in front of competitors and stay in front, which at the end of the day, is the goal of all strategies in the world of business!<sup>107</sup>

As earlier mentioned, HD's key SCA is their ability to deliver a full supply-chain solution, seemingly without suffering from a lack of special knowledge or focus on the various processes. This advantage is believed to be created from the synergy generated by the group of companies that are also part of Hedeselskabet's umbrella organization.

To understand how HD can successfully introduce individual market strategies, while ensuring that information sharing and key sustainable advantages such as this synergy, is being exploited on a global scale, the Tree metaphor created by the earlier quoted Prahalad & Hamel is a suitable illustration:<sup>108</sup>

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<sup>107</sup> Postulation made by author

<sup>108</sup> "The Core competence of the Corporation" by C.K. Prahalad & Gary Hamel from 1990 – Harvard Business Review: <http://hbr.org/1990/05/the-core-competence-of-the-corporation/ar/1>

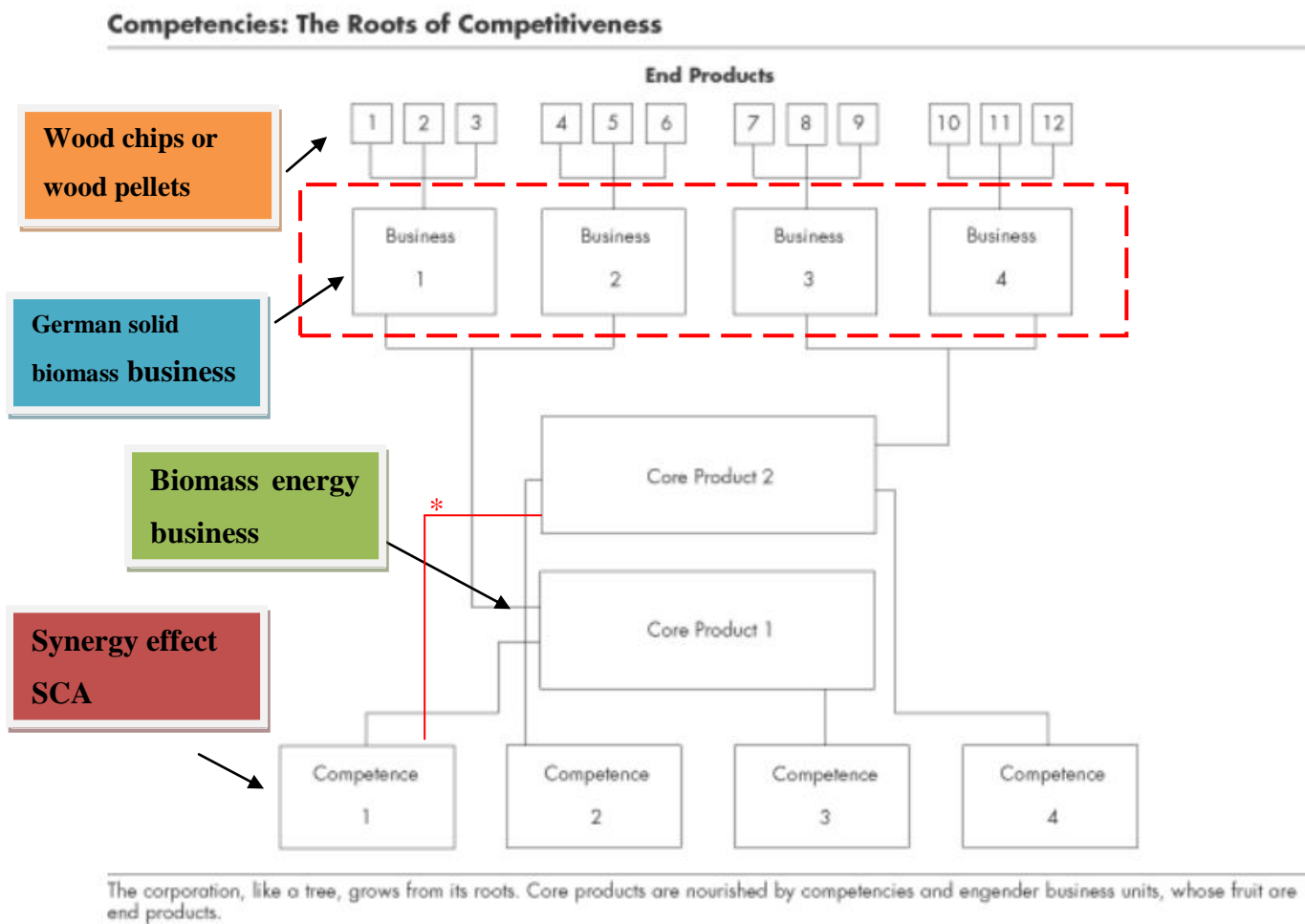


Figure 14 - Source: "The Core competence of the Corporation" by C.K. Prahalad & Gary Hamel from 1990 – Harvard Business Review: <http://hbr.org/1990/05/the-core-competence-of-the-corporation/ar/1>

This paper is believed to be highly reliable and relevant, as it has been published by the acclaimed Harvard Business Review, and is commonly used for explaining the link between competences, business units and end products. \*The author will however offer the slight critique that one competence might offer input to both/all core products.

The illustration is called the TREE model, as it introduces the competences as the roots of any organization in their attempts to compete on any market. These competences gives fuel to the trunk of the organization, which in HD/HDG's case can be translated into the Round timber and Biomass energy divisions. From there, the trunk gives support to the branches that represents the individual market's biomass and round timber divisions. It is at this level (highlighted with a dashed red box) that the author believes it is crucial that HD introduces more market specific strategies, which can ensure growth on both a short as well as long term basis.

Finally the actual leaves represent the end product that is offered to the customers. It is the author belief that by ensuring a clear synergy exists between the SCA's and the final end-product offered to the customers, HDG will also have a much improved possibility of gaining the attention of the higher decision level in their potential customers organization, as discussed in a previous chapter.

For HD to think out these new strategies, there are two basic ways of approaching this; Strategic Vision and Strategic Opportunism.

Strategic Vision is, as the name would indicate, a way of developing long-term strategies.

A way to value the current visionary strategy of HD is to test against the concept of strategic intent or flexibility. The most applicable concept, for an organization like HD/HDG, where a key SCA (synergy) is of upmost importance to uphold and improve when possible, is through strategic intent. Strategic intent consists of 3 key elements, which all needs to have equal focus from management, for the long-term strategy to be successful;

1. The strategy must capture the essence of winning. How do we beat the competition? In HD's case this is easily recognizable in their vision; *"Our vision in HedeDanmark is to become a leading, innovative company with service-minded employees in the green area."*
2. The strategy must contain a target of identifying and developing new SCAs, or/and improve existing SCAs. The above listed visionary strategy does include a target of becoming the market leader, excel in innovation and service towards customers. *(all of these are potential competitive advantages – sustainable or not can be argue)*
3. The strategy must contain a willingness to be innovative; hence it must leave room for exploring alternative way of developing the business. Again the target, in HD's vision, of being a market leading innovator, does strongly indicate that this also covered by the current visionary strategy.

Quite clearly, HD has a strong visionary strategy, which allows the entire organization to all to pull in the same direction with the ultimate goals listed in this.

However, for the visionary approach to be sufficient and feasible for HD to introduce to their foreign subsidiaries, they would need to operate in a market where the future outlook is relatively easy to project, their competitive advantage(s) should already be in place and exploited and the

people in the organization should be following the previous strategies whole heartedly, typically based previous successes from these.

This long-term vision approach is best applied in a centralized organization with a goal of creating economies of scale. In other words, this type of strategy is highly recommendable for HD's existing organization in Denmark, where the market uncertainties are much fewer than in Germany and where they are already taking advantage of being a market leader through their competitive advantage. Considering the visions of Hedeselskabet, HD and HDG, listed in the introduction of the report, it would seem that this long-term vision of being or becoming market leaders in fact is the long-term visionary strategy of these companies.

The risk of this type of approach to strategies is becoming strategically stubborn, by sticking to a vision that is clearly not the right one in the given situation. Again the author would point to the response from question 13 in the interview with Erik Joergensen (translated from interview in appendix 14);

*“When the management, through experience, has concluded that they have not been able to duplicate the Danish value chain or introduce the Danish organizational culture into the foreign subsidiary, they have lost interest in these subsidiaries and let them operate on a much more autonomous level”*

Considering the above characteristics and conclusion, this visionary approach is therefore not deemed sufficient on its own, considering the highly volatile German energy market where swifter reactions to market changes is needed. A completely different approach must be therefore be considered; cue the Strategic Opportunism approach.

This approach is focusing far more on the present moment and the opportunities and threats that are surrounding the organization within the specific market. The opportunism approach allows for HD/HDG to take advantage of emerging business opportunities, which occurs due to changes in their environment. Instead of a focus on economies of scale, this strategic approach supports the idea of economies of scope, which is more in line with what the Tree of SCAs also represents and was earlier concluded as being a suitable structure for HD/HDG to adopt.

Strategic opportunism also supports the continuous development of new SCAs that matches the ever developing KSFs, which the market development calls for, as well as it allows HD/HDG to

quickly adapt to the scenarios highlighted in the earlier made impact and probability analysis, should they become reality.

For this type of strategy development to work, HD must continue their allowance of HDG being run in a decentralized manner, as this allows for far quicker adaptation and innovation in the subsidiary. This should naturally not result in the “branch” being detached from the trunk and the roots of the tree, as this would leave them fighting the expected overcrowded competitive environment without the key SCA as their “weapon”!

The danger for HD in using strategic opportunism as their market specific approach, is the danger of entering a state that is known as; Strategic Drift. Strategic drift typically happens when one or more of the following phenomena occur;

- Short-lived market opportunity, which does not allow for the strategy to be properly implemented before the opportunity has slipped away or been offset by a new different opportunity.
- Short-term profits are mistaken for long term profits, hence the strategy is based on a misconceived future forecast.
- Synergies are lost between the various market specific strategies, and the key SCA of synergized specialty knowledge is lost in a maze of different strategies.

However as long as HDG continuously monitors the industry & market development similarly to what has been analyzed in this paper, as well as keep their contact to the unique knowledge bank in Denmark frequent, it is the authors belief that the risk of entering Strategic Drift is minimal also considering the core business strategy which is still a long-term vision of becoming market leaders in their respective markets.

By combining the two approaches, of having a strong visionary long term business strategy and several more adaptable opportunistic short-term market specific strategies, HD/HDG should in theory be able to exploit the advantages of both of these. However, to allow this to happen, it is important the organization is constantly being reminded of the deliberate separation of the two strategies, and where these should be applied to succeed. Again; creating synergy, this time between opposing strategic alternatives, is a key concept for HD to strive towards!

### **12.3. Part conclusion to strategic market management analysis**

Firstly the author argued why the concept of strategic market management is a perfect fit for HD & HDG with their potential increase of activities in a volatile market such as Germany.

After this argumentation, the focus turned onto an internal analysis of HD & HDG, where recommendations were given on how non-financial performances can be measured and how these surveys can also serve as a dual purpose in the sense of a competitor analysis and a mapping of HD's services in a relative cost vs. relative performance model.

It was also recommended for HD to take a critical look at the successes and failures of previous strategies, as this might ensure that no mistakes are made twice.

The report took a critical view at the organization of HD and established that certain weaknesses and constraints do exist in HD & HDG. These include; Lack of dedicated biomass related staff members, decentralized management that impedes the creation of synergy, no membership in interest groups and managerial constraint in the sense of understanding certain key aspects.

Next the report weighed the strengths in HD & HDG, and several current competitive advantages were unveiled, as well as potential future advantages, which HD currently reaps the benefits from in Denmark. The most imperative SCAs for HD & HDG, is their unique synergy with partnering subsidiaries through the umbrella like cooperation of Hedeselskabet as well as their innovative abilities.

Finally the report offered insight into how the management of HD & HDG can identify, select and implement the most advantageous market specific strategy. A strategy of creating further SCAs and increased synergy within the company was selected and explored in details. Apart from recommending this specific strategy, the report also shed some light on the concept of strategic vision and opportunism, which are the concept of developing a complimentary mix of long-term visionary strategies, and short-term adaptable market strategies.

These findings have all been added into the summarizing SWOT model, and this chapter's additions are all marked with a green font.

## **13. Final conclusion**

The purpose of this report was to answer the following problem(s) for HD & HDG:



*“How is the German market potential for HDG likely to develop in the years to come, and which factors will be key drivers of this development? And how can HD & HDG improve their approach to developing strategies to ensure profitability in their foreign subsidiaries?”*

It is the author's belief that the below findings have served the purpose of the report to a satisfactory degree, yet a self-critical discussion has been added to the end of this final conclusion.

The initial analysis of this report revealed and analyzed the most important macro environmental factors and offered a forecast on the future of the key uncertainties discovered, through an impact and probability analysis. It was established that the energy-political scene was, is and will be the key environmental factor. This is due to the many subsidy programmes that are put in place and almost constantly being adjusted, to reach the various targets from the announced climate, economic and energy goals.

The current political crisis between the EU and Russia, is believed to be a key factor in deciding the future outlook of this environment, and indifferent to how this crisis will end, the reduction of Germany's energy dependency on Russia is high on the political agenda.

The economic environment placed emphasis on explaining the relationship between these subsidies and the consumer energy prices, and the balance act the German government has to overcome by satisfying private consumers demand for stable electricity prices as well as their large industrial sectors demand for low whole sale prices.

The public support was briefly discussed in the social/cultural environment analysis, and it was concluded that the public support for the Energiewende remains very high.

The final technical environment analysis placed emphasis on unveiling the increasingly important role of CHP plants in Germany, which with the increased political focus on energy efficiency, is targeted to supply 25 % of the total energy consumption in 2020, from approximately 15 % today.

The market potential analysis was separated into two sub-markets of electricity and heating. It was quickly concluded that the dominating suppliers to the electricity industry is likely to be the PV and wind industry, with waste and residue biomass products being promoted as the main biomass contributor. The author therefore concluded the German electricity sector offers only limited potential for HDG.

Instead, the attention of the report was directed onto the heat industry in Germany. The Energiewende has, as shown in the problem identification chapter, affected the heat industry at a slower pace compared to the electricity industry. However, with the recent add-on of expansion incentive programmes in the heat sector as well as the looming Ukraine crisis, these factors are all very likely to transmit into the heating sector and increase the market potential for HDG here.

It was established that HDG can segment their target groups into three categories of: “The Big Four” utility companies, the local and typically municipality owned CHP plants and the last group is the vast amount of privately owned small-scale biomass heating installations.

A slightly amended box model analysis was created, to illustrate how HDG are currently not able to attract the attention of the “right” people in their customer’s organization.

The competitive environment analysis resulted in the following observations:

- Bargaining power of suppliers: HIGH
- Threat of new entrants: MEDIUM
- Threat from competing interest groups: VERY HIGH
- Bargaining power of customers: MEDIUM-HIGH
- Threat of substitute products: LOW-MEDIUM

Finally the high-growth market risk-analysis uncovered some important risk factors for HDG to consider, but the analysis did also reveal a potential for HDG to become the superior competitor in the market, by drawing on their extensive synergetic full-supply chain services from their Danish organization.

In the final sub-analysis the author initially argued why the concept of strategic market management is a perfect fit for HD & HDG in Germany.

After this argumentation, the focus turned onto an internal analysis of HD & HDG, where recommendations were given on how non-financial performances can be measured and it was also recommended for HD to take a critical look at the successes and failures of previous strategies.

The report took a critical view at the organization of HD and established that certain weaknesses and constraints do exist in HD & HDG, and these are value to be hindering the performance of the German as well as other international subsidiaries.

Next the report weighed the strengths in HD & HDG, and several current competitive advantages were unveiled, as well as potential future advantages. The most imperative SCAs for HD & HDG, is their unique synergy with partnering subsidiaries through the umbrella like cooperation of Hedeselskabet.

Finally the report offered a concrete and practically applicable recommendation on striving towards a market strategy, which purpose is to create further SCAs and increased synergy within the organization.

### **13.1.1. Discussion**

Though the report has sustained and confirmed the support for the author's perceived notion of Germany being an attractive high growth market for HDG, the author does critically acknowledge that the uncertainties surrounding this market are almost indescribably imperative in the shaping of the future market for energy in Germany.

An argument from an opposing perspective could be, that HDG would be better of in ignoring the German market, till the "Seas have calmed" and the marketplace is no longer dominated by fluctuating subsidy programmes and radical political decisions such as the nuclear phase out are unlikely to happen.

However, while acknowledging the background for this consideration it is the author's strong belief, that if HD & HDG are able to exercise the concept of strategic market management to a high standard, no marketplace is too difficult to navigate within and with their unique synergy SCA, they are quite possibly able to fulfil their overall visionary strategy of becoming market leaders in Germany, just like in Denmark.

To increase the standard of their strategy planning process, it is imperative that HD conducts the recommended comprehensive customer loyalty and satisfaction survey as well as an in-depth analysis of their competitors.

## 14. Bibliography

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- ‘Designing a qualitative study’, in L. Bickman & D.J. Rog (Eds.), *Handbook of Applied Social Science Research Methods*. Thousand Oaks, CA: Sage

### 14.2. Books

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- “Marketing Management” 2<sup>nd</sup> Edition 2012 by Philip Kotler, Kevin Lane Keller, Mairead Brady, Malcolm Goodman & Torben Hansen. (part of curriculum)
- “Transnational Management” 6<sup>th</sup> edition, by Christopher A. Bartlett & Paul W. Beamish (part of curriculum)
- “International Project Management” by Kathrin Köster, 2013 by Sage Publishing (part of curriculum)
- “The International Business Environment” by Ian Brooks, Jamie Weatherston & Graham Wilkinson second edition, Wilkinson hall, 2011 (part of curriculum)

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- [www.hedeselskabet.dk](http://www.hedeselskabet.dk) (Hedeselskabets own website)
- [www.destatis.de](http://www.destatis.de) (Official municipal statistics website for Germany – high reliability, yet not alternative sources has been found for random checks of information used)

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- [www.hbr.org](http://www.hbr.org) (Harvard business review's website – highly reliable articles, journals, paper etc.)
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- [www.energietransition.de](http://www.energietransition.de) (biased website that exclusively places emphasis on the advantages of the German Energiewende – varying reliability has meant a close screening of all usages of this source)
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- [www.economist.com](http://www.economist.com) (official website of the newspaper "The economist" - reliability varies from article to article, but all content thoroughly screened before use)
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- [www.renewableenergyworld.com](http://www.renewableenergyworld.com) (news website solely focusing on renewable energy sources on a global basis – strongly biased towards the promotion of renewable energy, hence all material has been thoroughly screened before use)
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- [www.wind-energie.de](http://www.wind-energie.de) (official website of the largest wind energy interest group in Germany. Highly biased site, but information used from this site has only been describing of the group itself)
- [www.bionergie.de](http://www.bionergie.de) (official website of the largest bio-energy interest group in Germany. Highly biased site, but information used from this site has only been describing of the group itself)
- [www.aebiom.org](http://www.aebiom.org) (official website of the pan-European biomass interest group AEBIOM. Highly biased site, but information used from this site has only been describing of the group itself)

#### 14.4. Empirical

- Interview with: **Niels Joergen Pedersen** – Manager for raw-wood division, which includes the German department and both of the below employees' response areas
- Interview with: **Carsten Boedicker** – Regional Manager for HD's German subsidiary
- Interview with: **Carsten Mortensen** – Daily Operation Manager for wood chips division in Denmark
- Interview with: **Erik Joergensen** – previous director for HDG

## 15. List of appendixes

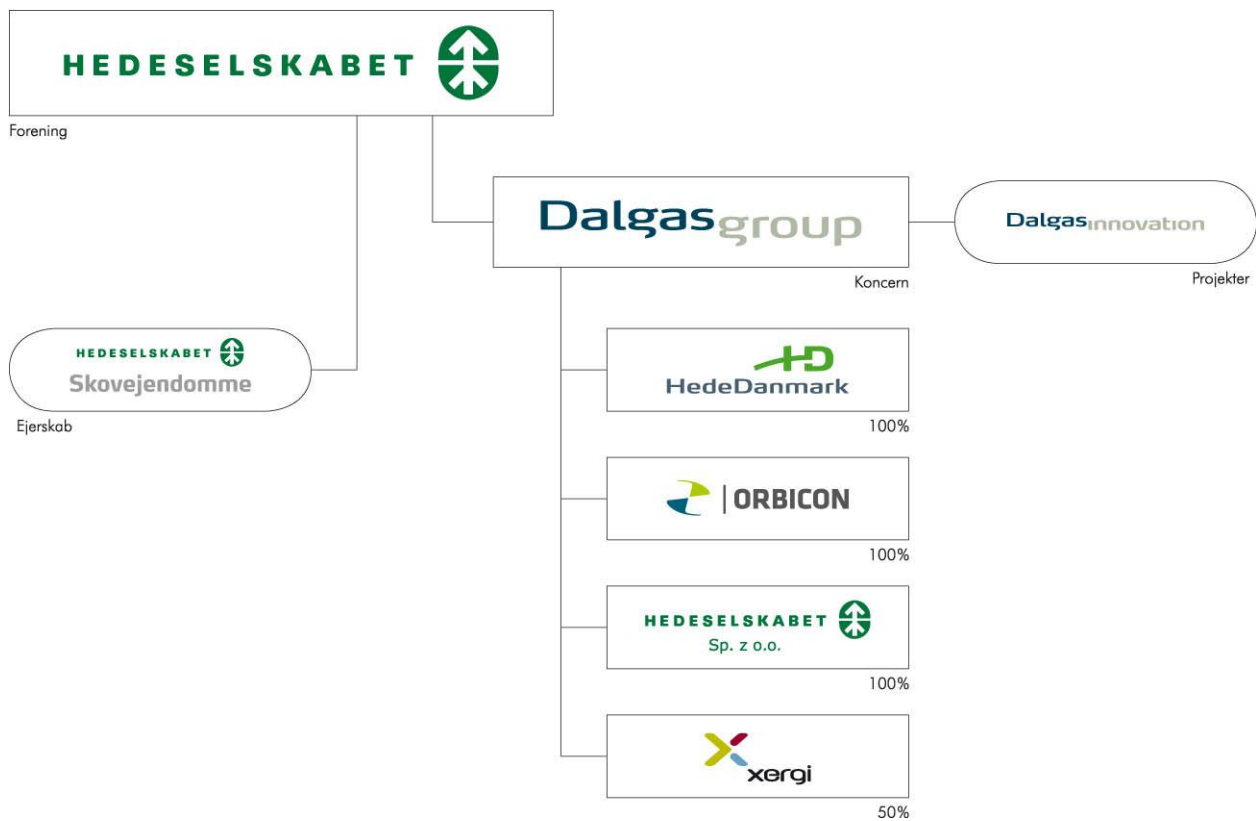
1. Cooperate structure of Hedeselskabet
2. Electricity from renewable energy sources (EU comparison)
3. Heating generation from renewable energu sources (EU comparison)
4. Electricity prices for household consumers (EU comparison)
5. Electricity prices for industrial consumers (EU comparison)
6. Import of energy (EU comparison)
7. Export of energy (EU comparison)
8. Electricity from CHP plants - share compared to total energy generated (EU comparison)
9. Impact and probability analysis (uncertainty matrix)
10. SWOT model for summarized conclusions
11. Renewable electricity share with key subsidy dates visualized
12. Renewable energy share break down
13. Total energy generation (EU comparison)
14. Interview with Erik Joergensen (previous director for HDG)
15. Interview with Niels Joergen Pedersen (Manager for raw wood division incl. HDG)
16. Paper and panel board production (EU comparison)
17. Interview with Carsten Mortensen (daily operations manager for wood chips in DK)
18. Multi level lobbying overview
19. CO2 emissions from biomass vs. fossil fuel sources
20. Strategic market management overview
21. Interview with Carsten Boedicker (regional manager for HDG)



# Appendix 1

## Cooperate structure of Hedeselskabet

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Source: Hededanmark's website: <http://www.hededanmark.com/Ownership-structure.11230.aspx>

## Appendix 2 - Electricity generated from Renewable energy sources (EU comparison)

Source : Eurostat + own creation of comparable index calculations

<http://app.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&code=tsdcc330&plugin=1>

Electricity generated from renewable sources

% of gross electricity consumption

geo/time	2004	Index comparison	2005	2006	2007	2008	2009	2010	2011	2012	Index comparison	Index point difference
EU (28 countries)	14.30	100.00	14.80	15.40	16.00	17.00	19.00	19.70	21.70	23.50	100.00	N/A
Belgium	1.70	11.00	2.40	3.10	3.60	4.00	6.20	7.10	8.00	11.10	47.00	35.00
Bulgaria	9.50	66.00	9.00	9.90	10.00	10.70	12.10	13.70	13.90	17.00	72.00	5.00
Czech Republic	3.60	25.00	3.70	4.00	4.00	5.20	6.40	7.50	10.60	11.60	49.00	24.00
Denmark	23.80	166.00	24.70	24.00	25.00	25.90	28.30	32.00	35.90	38.00	164.00	-1.00
Germany	9.40	65.00	10.50	11.80	13.60	15.10	17.00	18.00	20.90	23.60	100.00	34.00
Estonia	0.60	4.00	1.00	1.50	1.50	2.10	6.10	10.40	12.30	15.80	67.00	63.00
Ireland	6.00	41.00	7.20	8.00	10.10	11.10	13.70	14.90	17.00	19.00	83.00	41.00
Greece	7.90	55.00	8.00	9.00	9.40	9.00	11.10	12.50	13.90	16.50	70.00	14.00
Spain	19.00	132.00	19.00	20.00	21.70	23.70	27.80	29.70	31.60	33.50	142.00	9.00
France	13.80	96.00	13.80	14.10	14.30	14.40	15.10	14.90	16.00	16.00	70.00	-25.00
Croatia	32.50	227.00	32.00	32.00	30.90	30.80	32.60	34.00	34.00	35.50	151.00	-76.00
Italy	16.20	113.00	16.00	16.00	16.00	16.80	19.00	20.20	23.70	27.60	117.00	4.00
Cyprus	0.00	0.00	0.00	0.00	0.10	0.30	0.60	1.40	3.40	4.00	20.00	20.00
Latvia	46.00	321.00	43.00	40.40	38.60	38.00	41.90	42.10	44.70	44.90	191.00	-130.00
Lithuania	3.60	25.00	3.80	4.00	4.70	4.00	5.90	7.40	9.00	10.90	46.00	21.00
Luxembourg	2.80	19.00	3.20	3.20	3.30	3.60	4.00	3.80	4.00	4.00	19.00	-5.00
Hungary	2.00	15.00	4.00	3.50	4.20	5.30	7.00	7.10	6.40	6.10	25.00	10.00
Malta	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.60	1.00	4.00	4.00
Netherlands	4.00	30.00	6.30	6.60	6.00	7.50	9.10	9.00	9.00	10.50	44.00	13.00
Austria	62.00	433.00	62.50	62.50	64.80	64.80	67.00	64.00	65.00	65.50	278.00	-154.00
Poland	2.10	14.00	2.60	3.00	3.40	4.30	5.80	6.60	8.00	10.70	45.00	30.00
Portugal	27.50	192.00	27.70	29.30	32.00	34.10	37.60	40.00	45.90	47.60	202.00	10.00
Romania	28.40	198.00	28.80	28.10	28.10	28.10	30.90	30.40	31.10	33.60	142.00	-55.00
Slovenia	23.30	204.00	28.70	28.20	27.70	30.00	33.00	32.10	30.80	31.40	133.00	-71.00
Slovakia	10.30	72.00	11.60	13.50	14.50	16.00	17.80	17.80	19.30	20.00	85.00	13.00
Finland	26.70	186.00	26.90	26.40	25.50	27.30	27.30	27.60	29.40	29.50	125.00	-61.00
Sweden	51.20	358.00	50.90	51.80	53.20	53.60	58.30	56.00	59.90	60.00	255.00	-102.00
United Kingdom	3.50	24.00	4.00	4.50	4.80	5.50	6.70	7.40	8.00	10.80	45.00	21.00
Iceland	:	N/A	:	:	:	:	:	:	:	:	N/A	N/A
Norway	97.30	680.00	96.80	100.20	98.50	99.60	104.70	97.90	105.50	104.30	443.00	-236.00
Switzerland	:	N/A	:	:	:	:	:	:	:	:	N/A	N/A

<http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&ini=1&language=en&ocode=tsdc330&luin=1>

% of gross heating &amp; cooling consumption

% of gross heating &amp; cooling consumption

GEO/TIME	2004	Index comparison	2005	2006	2007	2008	2009	2010	2011	2012	Index comparison	Index point difference
European Union (28 countries)	9.90	100.00	10.30	10.90	11.80	12.00	13.70	14.20	15.00	15.60	100.00	N/A
Belgium	2.80	28.00	3.40	3.70	3.70	4.00	5.00	5.00	4.70	6.60	42.00	14.00
Bulgaria	14.10	142.00	14.30	14.80	13.90	17.30	21.70	24.40	24.90	27.50	176.00	33.00
Czech Republic	8.40	84.00	9.10	9.60	11.40	11.20	11.90	12.10	12.60	13.60	87.00	2.00
Denmark	19.00	201.00	22.10	23.00	27.00	28.10	29.50	30.70	31.80	33.00	213.00	12.00
Germany	6.30	63.00	6.80	6.90	8.00	7.40	9.00	10.30	10.80	11.10	71.00	7.00
Estonia	33.00	335.00	32.00	30.70	32.00	35.50	41.80	43.30	44.10	43.10	276.00	-59.00
Ireland	2.80	28.00	3.50	3.50	3.80	3.50	4.20	4.30	4.00	5.00	32.00	4.00
Greece	12.80	129.00	12.80	12.40	14.40	14.30	16.00	17.80	19.00	24.40	156.00	27.00
Spain	9.50	95.00	9.40	11.40	11.30	11.70	13.30	12.60	13.60	14.00	89.00	-6.00
France	12.00	121.00	12.20	12.00	12.50	13.30	14.90	16.00	16.00	16.00	108.00	-12.00
Croatia	11.70	118.00	10.80	11.40	10.50	10.40	11.60	13.00	15.60	18.30	117.00	0.00
Italy	4.00	44.00	4.70	6.00	6.10	6.70	9.00	10.70	12.50	12.80	82.00	37.00
Cyprus	9.00	93.00	10.00	10.50	13.10	14.60	16.00	18.30	19.30	21.20	135.00	41.00
Latvia	42.50	429.00	42.70	42.60	42.40	42.90	47.90	43.80	44.80	47.40	303.00	-125.00
Lithuania	30.40	307.00	30.10	29.70	29.80	32.00	34.40	33.00	33.00	35.50	227.00	-79.00
Luxembourg	1.80	18.00	3.60	3.60	4.00	4.00	4.70	4.80	4.80	5.00	32.00	13.00
Hungary	6.50	65.00	6.00	7.50	8.90	8.00	10.50	11.10	12.30	13.60	87.00	21.00
Malta	2.60	26.00	4.70	4.00	5.50	6.00	3.00	4.30	7.80	13.00	83.00	57.00
Netherlands	1.90	19.00	2.00	2.40	2.50	2.60	3.00	2.70	3.30	3.40	21.00	2.00
Austria	20.20	204.00	22.60	23.50	26.20	26.80	29.10	30.70	30.90	32.00	210.00	6.00
Poland	10.40	105.00	10.40	10.40	10.50	11.10	11.80	11.90	13.40	13.70	87.00	-17.00
Portugal	32.00	325.00	31.80	33.90	34.00	37.00	37.90	33.00	35.00	33.00	211.00	-113.00
Romania	17.00	175.00	17.00	17.00	19.50	23.20	26.40	27.20	24.30	25.70	164.00	-11.00
Slovenia	18.00	185.00	18.00	18.50	20.00	19.20	25.10	25.50	28.70	30.60	196.00	10.00
Slovakia	5.00	50.00	5.00	4.00	6.20	6.10	8.10	7.80	9.10	8.00	55.00	5.00
Finland	39.50	398.00	39.00	41.60	42.20	43.40	43.00	44.10	45.70	48.10	308.00	-90.00
Sweden	46.60	470.00	51.80	56.20	58.60	60.90	63.50	60.90	62.50	65.00	420.00	-50.00
United Kingdom	0.80	8.00	0.80	0.90	1.00	1.40	1.60	1.70	2.00	2.00	14.00	6.00
Norway	25.70	259.00	29.00	28.60	29.50	31.10	32.10	32.60	33.90	31.20	200.00	-59.00

## Appendix 4 - Electricity prices for household consumers

Source: Eurostat

<http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=ten00115&plugin=1>

EUR per kWh

geotime	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
EU (28 countries)	:	:	:	:	:	0.12	0.12	0.12	0.13	0.13	0.14
Belgium	0.11	0.11	0.11	0.11	0.12	0.15	0.14	0.14	0.16	0.16	0.16
Bulgaria	:	0.05	0.05	0.06	0.05	0.06	0.07	0.07	0.07	0.07	0.08
Czech Republic	0.07	0.07	0.07	0.08	0.09	0.11	0.11	0.11	0.12	0.12	0.12
Denmark	0.09	0.09	0.09	0.10	0.12	0.12	0.12	0.12	0.13	0.13	0.13
Germany	0.13	0.13	0.13	0.14	0.14	0.13	0.14	0.14	0.14	0.14	0.15
Estonia	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.10
Ireland	0.10	0.11	0.12	0.13	0.15	0.16	0.18	0.16	0.16	0.19	0.20
Greece	0.06	0.06	0.06	0.06	0.07	0.10	0.11	0.10	0.10	0.11	0.12
Spain	0.09	0.09	0.09	0.09	0.10	0.11	0.13	0.14	0.16	0.18	0.18
France	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10	0.10	0.10
Croatia	:	:	0.07	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.11
Italy	0.14	0.14	0.14	0.15	0.17	:	:	:	0.14	0.14	0.15
Cyprus	0.09	0.09	0.09	0.12	0.12	0.15	0.13	0.16	0.17	0.23	0.23
Latvia	:	0.05	0.07	0.07	0.06	0.08	0.10	0.10	0.10	0.11	0.11
Lithuania	:	0.05	0.06	0.06	0.07	0.07	0.08	0.10	0.10	0.10	0.11
Luxembourg	0.12	0.12	0.13	0.14	0.15	0.14	0.16	0.14	0.15	0.15	0.14
Hungary	0.07	0.08	0.09	0.09	0.10	0.13	0.12	0.13	0.13	0.12	0.11
Malta	0.07	0.06	0.07	0.09	0.09	0.09	0.16	0.16	0.16	0.16	0.16
Netherlands	0.10	0.10	0.11	0.12	0.14	0.13	0.15	0.12	0.13	0.13	0.13
Austria	0.09	0.10	0.10	0.09	0.11	0.13	0.14	0.14	0.14	0.14	0.14
Poland	0.08	0.07	0.08	0.09	0.09	0.10	0.09	0.10	0.11	0.11	0.12
Portugal	0.13	0.13	0.13	0.13	0.14	0.11	0.13	0.11	0.10	0.11	0.12
Romania	:	:	0.07	0.08	0.09	0.09	0.08	0.09	0.08	0.08	0.09
Slovenia	0.08	0.08	0.09	0.09	0.09	0.09	0.11	0.11	0.11	0.12	0.12
Slovakia	:	0.10	0.11	0.12	0.13	0.12	0.13	0.13	0.14	0.14	0.14
Finland	0.07	0.08	0.08	0.08	0.09	0.09	0.10	0.10	0.11	0.11	0.11
Sweden	0.08	0.09	0.08	0.09	0.11	0.11	0.10	0.12	0.14	0.13	0.14
United Kingdom	0.10	0.08	0.08	0.10	0.13	0.14	0.14	0.13	0.14	0.16	0.17
Iceland	:	:	:	:	:	:	:	:	:	0.09	0.08
Norway	0.16	0.10	0.11	0.11	0.14	0.12	0.11	0.15	0.16	0.14	0.14
Montenegro	:	:	:	:	:	:	:	:	0.07	0.08	0.08
Former Yugoslav R	:	:	:	:	:	:	:	:	:	:	0.04
Turkey	:	:	:	:	:	0.08	0.09	0.11	0.10	0.10	0.12
Albania	:	:	:	:	:	:	:	:	0.10	0.10	0.10
Bosnia and Herzeg	:	:	:	:	:	:	:	0.06	0.06	0.07	0.07

## Appendix 6 - Electricity prices for industrial consumers

Source: Eurostat											
<a href="http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&amp;init=1&amp;language=en&amp;pcode=ten00114&amp;plugin=1">http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&amp;init=1&amp;language=en&amp;pcode=ten00114&amp;plugin=1</a>											
EUR per kWh											
geo\time	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
EU (28 countries)	:	:	:	:	:	0.09	0.10	0.09	0.09	0.10	0.09
Belgium	0.08	0.08	0.07	0.08	0.09	0.10	0.10	0.09	0.10	0.10	0.09
Bulgaria	:	0.04	0.04	0.05	0.05	0.06	0.06	0.06	0.06	0.07	0.08
Czech Republic	0.05	0.05	0.06	0.07	0.08	0.11	0.11	0.10	0.11	0.10	0.10
Denmark	0.07	0.06	0.06	0.07	0.06	0.08	0.07	0.08	0.09	0.08	0.09
<b>Germany</b>	<b>0.07</b>	<b>0.07</b>	<b>0.08</b>	<b>0.09</b>	<b>0.09</b>	<b>0.09</b>	<b>0.10</b>	<b>0.09</b>	<b>0.09</b>	<b>0.09</b>	<b>0.09</b>
Estonia	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.08
Ireland	0.08	0.08	0.09	0.10	0.11	0.13	0.12	0.11	0.11	0.13	0.13
Greece	0.06	0.06	0.06	0.07	0.07	0.09	0.09	0.09	0.09	0.10	0.10
Spain	0.05	0.05	0.07	0.07	0.08	0.09	0.11	0.11	0.11	0.12	0.12
France	0.05	0.05	0.05	0.05	0.05	0.06	0.07	0.07	0.07	0.08	0.08
Croatia	:	:	0.06	0.06	0.06	0.07	0.09	0.09	0.09	0.09	0.09
Italy	0.08	0.08	0.08	0.09	0.10	:	:	:	0.11	0.12	0.11
Cyprus	0.10	0.08	0.08	0.11	0.10	0.14	0.12	0.15	0.16	0.22	0.20
Latvia	:	0.04	0.04	0.04	0.04	0.07	0.09	0.09	0.10	0.11	0.11
Lithuania	0.06	0.05	0.05	0.05	0.05	0.08	0.09	0.10	0.10	0.11	0.12
Luxembourg	0.07	0.07	0.08	0.08	0.10	0.09	0.11	0.10	0.10	0.10	0.09
Hungary	0.06	0.07	0.07	0.08	0.08	0.11	0.12	0.10	0.10	0.09	0.09
Malta	0.06	0.06	0.07	0.07	0.09	0.12	0.15	0.18	0.18	0.18	0.18
Netherlands	:	:	0.08	0.09	0.09	0.09	0.10	0.09	0.08	0.08	0.08
Austria	:	0.06	0.06	0.07	0.08	0.09	0.10	0.09	0.09	0.09	0.09
Poland	0.06	0.04	0.05	0.05	0.05	0.08	0.09	0.09	0.10	0.09	0.09
Portugal	0.07	0.07	0.07	0.08	0.09	0.08	0.09	0.09	0.09	0.11	0.10
Romania	0.04	0.05	0.08	0.08	0.08	0.09	0.08	0.09	0.08	0.08	0.09
Slovenia	0.06	0.06	0.06	0.07	0.08	0.09	0.10	0.09	0.09	0.09	0.08
Slovakia	:	0.07	0.07	0.08	0.09	0.12	0.14	0.12	0.12	0.13	0.12
Finland	0.06	0.05	0.05	0.05	0.05	0.06	0.07	0.07	0.07	0.07	0.07
Sweden	0.07	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.09	0.08	0.08
United Kingdom	0.05	0.05	0.06	0.08	0.10	0.09	0.11	0.09	0.09	0.11	0.11
Norway	0.06	0.05	0.05	0.05	0.07	0.07	0.07	0.09	0.10	0.08	0.08
Montenegro	:	:	:	:	:	:	:	:	0.06	0.06	0.07
Former Yugoslav Rep	:	:	:	:	:	:	:	:	:	:	0.04
Turkey	:	:	:	:	:	0.07	0.08	0.09	0.08	0.08	0.09
Bosnia and Herzegov	:	:	:	:	:	:	:	0.06	0.06	0.06	0.07

## Appendix 6 - Import of energy - Germany highlighted vs. EU average

<b>Source: Eurostat</b>										
<b>UNIT</b>	<b>Thousand tonnes of oil equivalent (TOE)</b>									
<b>PRODUCT</b>	<b>All products</b>									
<b>GEO/TIME</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
European Union (27 countries)	1,306,287	1,347,758	1,407,713	1,456,804	1,495,516	1,467,536	1,500,246	1,410,976	1,447,343	1,433,053
Belgium	74,142	77,819	80,230	80,527	78,750	77,493	82,628	76,636	81,219	77,583
Bulgaria	11,322	11,410	12,218	12,952	14,122	14,975	15,113	11,940	11,749	11,848
Czech Republic	19,577	19,943	19,857	21,124	21,935	20,925	21,930	21,109	20,516	21,162
Denmark	13,207	14,902	14,352	13,838	14,551	14,148	15,635	14,373	13,991	15,354
<b>Germany</b>	<b>239,351</b>	<b>244,052</b>	<b>252,107</b>	<b>254,816</b>	<b>258,924</b>	<b>246,041</b>	<b>252,928</b>	<b>239,806</b>	<b>241,906</b>	<b>235,920</b>
Estonia	1,882	1,969	2,190	1,987	2,138	2,337	2,138	2,003	1,820	1,822
Ireland	15,157	15,076	15,099	15,038	15,314	15,272	15,479	14,048	14,403	14,039
Greece	27,730	28,844	30,665	29,586	32,147	32,476	33,219	31,693	31,649	29,997
Spain	115,129	117,172	124,967	133,757	135,764	136,602	135,728	124,624	121,473	121,725
France	164,729	168,990	173,499	179,441	177,324	171,332	177,547	165,911	162,941	160,647
Croatia	6,983	7,109	7,589	7,860	7,731	8,139	8,000	7,270	7,094	6,746
Italy	175,616	180,948	186,425	191,305	193,441	191,765	187,546	170,291	180,258	170,719
Cyprus	2,586	2,663	2,422	2,822	2,979	2,878	3,039	2,901	2,914	2,647
Latvia	2,814	3,204	3,936	3,940	3,879	3,759	3,482	3,692	3,100	3,946
Lithuania	9,414	10,528	12,333	12,832	12,492	10,387	13,455	12,131	13,691	14,202
Luxembourg	4,241	4,426	4,897	4,974	4,946	4,756	4,762	4,515	4,810	4,697
Hungary	18,080	19,557	19,034	21,459	21,531	21,016	21,419	17,902	18,821	17,513
Malta	1,555	1,809	1,899	1,626	1,660	1,807	1,874	2,005	2,511	2,563
Netherlands	143,189	143,820	147,976	159,091	168,254	165,923	167,409	172,331	183,322	180,665
Austria	24,595	27,017	28,064	29,539	30,486	29,681	29,526	28,547	30,042	30,658
Poland	31,437	31,982	33,811	36,098	39,962	42,051	44,627	43,092	47,456	49,926
Portugal	24,194	24,355	25,152	27,402	25,535	24,676	24,023	23,202	22,200	22,482
Romania	14,146	14,217	16,689	17,257	17,794	17,626	16,763	11,744	11,711	12,099
Slovenia	3,995	4,298	4,573	4,888	4,922	4,818	5,543	4,864	5,212	4,973
Slovakia	16,527	16,628	17,590	17,613	17,472	17,550	16,809	15,906	15,615	16,257
Finland	24,494	28,702	27,281	24,588	26,852	27,069	27,168	25,906	25,773	27,192
Sweden	30,543	33,995	33,029	32,651	32,072	30,884	33,401	30,800	33,507	32,068
United Kingdom	96,633	99,432	117,418	125,654	140,271	139,288	147,054	139,001	144,735	150,354
Iceland	969	937	1,072	1,063	1,076	:	:	:	:	:
Norway	5,472	6,306	6,563	5,982	6,031	6,378	6,290	6,881	8,205	7,451
Switzerland	18,441	18,245	18,161	19,494	19,345	17,843	18,878	19,042	18,186	:
Former Yugoslav Republic of Macedonia, the	1,301	1,410	1,363	1,566	1,676	1,709	1,768	1,612	1,602	1,809
Turkey	54,674	61,163	63,732	67,705	76,037	82,424	79,857	76,157	81,431	90,802

## Appendix 8 - Export of electricity - Germany highlighted vs. EU average

<b>Source: Eurostat</b>										
<b>UNIT</b>	<b>Gigawatt hour</b>									
<b>PRODUCT</b>	<b>Electrical energy</b>									
<b>GEO/TIME</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
European Union (27 countries)	272,456	293,773	289,011	315,110	307,684	307,671	288,105	271,852	282,737	315,675
Belgium	9,070	8,254	6,790	8,024	8,696	9,037	6,561	11,321	11,844	10,652
Bulgaria	8,335	6,772	6,620	8,380	8,882	7,533	8,441	7,735	9,613	12,110
Czech Republic	20,889	26,299	25,493	24,985	24,097	26,357	19,989	22,230	21,590	27,501
Denmark	11,010	15,568	11,545	11,574	13,702	11,377	11,360	10,874	11,734	10,374
<b>Germany</b>	<b>38,372</b>	<b>52,379</b>	<b>50,808</b>	<b>61,427</b>	<b>65,441</b>	<b>62,508</b>	<b>61,770</b>	<b>54,132</b>	<b>57,917</b>	<b>54,768</b>
Estonia	1,102	1,989	2,141	1,953	1,001	2,765	2,310	2,943	4,354	5,252
Ireland	62	10	0	1	9	82	303	175	290	242
Greece	1,706	2,076	2,034	1,836	1,938	2,057	1,962	3,233	2,811	3,948
Spain	7,175	8,257	11,139	11,555	12,373	14,524	16,920	14,855	13,539	14,023
France	80,739	73,373	68,477	68,390	71,863	67,595	58,736	44,451	50,184	65,914
Croatia	406	586	1,633	3,634	2,691	1,451	1,587	1,899	1,917	1,033
Italy	922	518	791	1,109	1,611	2,648	3,398	2,111	1,827	1,787
Cyprus	0	0	0	0	0	0	0	0	0	0
Latvia	490	38	636	707	302	1,964	2,123	2,605	3,100	2,764
Lithuania	11,018	11,674	11,488	8,607	6,240	7,218	6,606	7,715	2,184	1,347
Luxembourg	2,940	2,799	3,132	3,131	3,267	2,887	2,484	2,604	3,216	2,614
Hungary	8,349	7,138	3,056	9,410	8,186	10,694	8,871	5,459	4,702	8,021
Malta	0	0	0	0	0	0	0	0	0	0
Netherlands	4,488	3,809	5,188	5,398	5,887	5,565	9,116	10,561	12,807	11,531
Austria	14,676	13,389	13,548	17,732	14,407	15,511	14,933	18,762	17,567	16,777
Poland	11,537	15,146	14,605	16,188	15,775	13,109	9,703	9,594	7,664	12,022
Portugal	3,430	3,104	2,131	2,802	3,183	2,153	1,313	2,822	3,191	3,929
Romania	3,290	3,046	3,766	5,224	5,262	3,359	5,169	2,946	3,041	5,316
Slovenia	4,928	5,811	8,189	9,667	7,662	5,877	7,824	10,839	10,717	8,298
Slovakia	10,867	10,878	10,593	11,270	10,921	11,855	8,891	7,682	6,293	10,500
Finland	1,539	7,030	6,797	933	2,717	2,862	3,335	3,375	5,218	3,804
Sweden	14,754	11,457	17,750	21,968	11,497	14,736	14,715	9,080	12,853	19,714
United Kingdom	768	2,959	2,294	2,839	2,765	3,398	1,272	3,748	4,481	2,467
Iceland	0	0	0	0	0	:	:	:	:	:
Norway	15,046	5,548	3,854	15,695	8,947	15,320	17,275	14,634	7,124	14,329
Switzerland	32,308	33,196	27,759	31,996	31,100	36,880	32,736	33,525	32,881	:
Former Yugoslav Republic of Macedonia	0	0	0	0	0	0	0	0	0	0
Turkey	435	588	1,144	1,798	2,236	2,422	1,122	1,546	1,918	3,645

### Appendix 9 - Uncertainty matrix for impact & propability analysis

Uncertainty/Scenario characteristics	Estimated negative effects for HDG if this scenario becomes a reality?	Estimated positive effects if this scenario becomes a reality?	Impact level	Immediacy	Managing the uncertainty
Continuous lowering of the Feed-In tariff (heat and electricity)	Less financial support to renewable energy source suppliers to control consumer energy prices. Mainly negative for wind & PV suppliers as these feed-in directly to the grid. HD's potential CHP customers will however also be negatively effected.	Less private investments in PV & wind energy plants should mean an increased demand for alternative sources of energy, as solid biomass.	<b>Low</b> <i>(Due to the double-edge sword effect)</i>	<b>High</b>	Monitor and analyze in regards to pricing strategy and customer bargaining power
Increasing subsidies for the heat industry with focus on efficient co-generation plants	No negative effects for HDG	As biomass CHP plants are HD's primary customer type in Denmark, a rapid increase in the amount of these in Germany will inarguably result in a much improved market potential for HDG	<b>High</b>	<b>High</b>	Analyze in-depth and develop strategy, available for immediate implementation
The Ukraine crisis (Abrupt halt of supply of Gas from Russia)	If an abrupt halt to the supply of gas from Russia through Ukraine happens, a larger incentive to consider the use of domestic or US shale gas is likely.	With 40 % of Germany's dominating heat supply source potentially missing abruptly, this will inarguably lead to improved market potential for HDG.	<b>High</b>	<b>High</b>	Analyze in-depth and develop strategy, available for immediate implementation
The Ukraine crisis (incentive to reduce interdependence)	The only negative effect would be the potential introduction of domestic or US shale gas as a replacement for Russian gas	Increased support to local renewable energy supply forms, including solid biomass	<b>High</b>	<b>High</b>	Analyze in-depth and develop strategy, available for immediate implementation
Increased focus on waste and residue biomass plants in the years to come (electricity only)	The market potential for HDG in the electricity sector is significantly reduced due to the political focus on waste & residue	The only derived positive effect is the general increased support for a biomass product, could lead to increased focus on this industry in general	<b>low</b> <i>(considering the later established conclusion of focusing on the heat sector)</i>	<b>High</b>	Analyze in-depth and develop strategy, available for immediate implementation
Cap on forestry made available for biomass energy production due to sustainability issues	This scenario will inarguably mean that HDG will find it even harder to source wood for their potential customers, and prices are as a consequence likely to increase	No positive effects	<b>High</b>	<b>low</b>	Monitor and analyze and ready-make contingent strategies



# Appendix 10

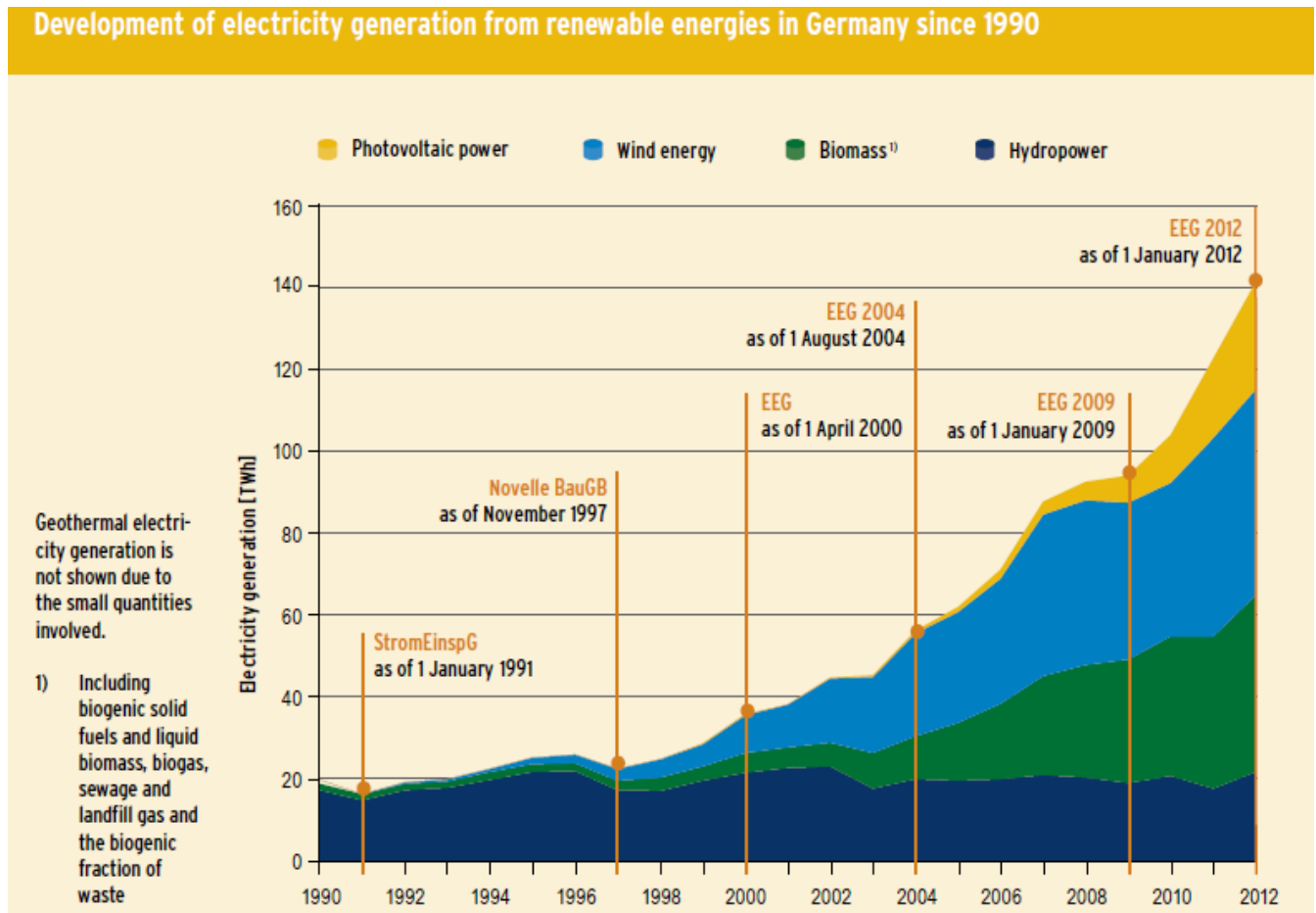
## SWOT model for summarized conclusions

<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• Very strong SCA in the shape of synergy from partnering companies operating in various energy and green-service related sectors.</li> <li>• Highly innovative company, partly also due to the close connection with R&amp;D subsidiaries of Hedeselskabet</li> <li>• Service/product superiority (Denmark)</li> <li>• Large capacity (Denmark)</li> <li>• Easy access to raw materials (Denmark)</li> <li>• Acclaimed customer satisfaction and loyalty (Denmark)</li> <li>• Strong visionary strategy</li> </ul>	<p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• HDG is currently not able to attract the attention of the most important decision levels in their customer's organizations.</li> <li>• No current staff dedicated to the development of the Biomass business in Germany</li> <li>• The highly autonomous and decentralized management of the subsidiaries means synergies from the Danish parent company is lost.</li> <li>• Not a member of the major German or European interest groups</li> <li>• Lack of understanding of; cultural differences, different market positions &amp; the need for a different value chain in some markets, from the management in Denmark.</li> <li>• Lack of short-term market specific strategies</li> <li>•</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Less investments in PV &amp; wind energy due to lowered FIT tariffs could result in leading demand for biomass energy</li> <li>• Increasing subsidies for heat industry with emphasis on CHP plants will lead to an increased market potential for HDG</li> <li>• The Ukraine crisis is likely to result in further incentives for the use of locally created renewable energy sources for the heat industry as an alternative to Russian gas.</li> <li>• Electricity market potential could increase if Germany are unable to allocate the necessary funds to expand the electricity grid, which is needed to expand the use of PV and off-shore wind energy.</li> <li>• Heat market potential is forecasted to be 4 times the size as the home market of Denmark in 2020.</li> <li>• By reaching a higher decision level in their potential customer's organization, HDG can lower the complexity in the repeat sales process.</li> <li>• Even if HDG does not succeed in reaching the above mentioned decision level, market</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• General lowering of subsidies to renewable energy sources due to soaring consumer electricity prices as a consequence.</li> <li>• The potential entry of US shale gas as an alternative to Russian gas</li> <li>• Electricity market potential declining with political focus on waste and residue as biomass energy sources.</li> <li>• Reduced access to wood if caps are put in place to ensure sustainable forestry.</li> <li>• Paper and panel board manufacturing is still a dominating industry in Germany, hence indirect competition from this industry is not likely to lessen.</li> <li>• Electricity market potential declining due to political favouring of the PV &amp; wind industry.</li> <li>• Bargaining power of the supplier (forest owners) is high, hence the possibility of creating profitable returns, is reduced.</li> <li>• Bargaining power of the customers is high, hence the possibility of creating profitable returns, is reduced.</li> <li>• Competing interest groups are strong and well established in the market, and from the</li> </ul>

<p>potential does exist in municipal CHP plants and price biomass heating plants.</p> <ul style="list-style-type: none"><li>• HDG can become the superior competitor entering the heating industry, if they manage to transfer their SCA(s) from their Danish organization.</li></ul>	<p>historic development, it would seem they are relatively more powerful than the biomass sectors' lobbying groups.</p> <ul style="list-style-type: none"><li>• Overcrowding, price instability, superior competitor entry, unforeseen market changes &amp; firm limitations are all potential scenarios in a high growth market such as the heating market in Germany</li><li>• Risk of entering strategic drift, through the recommended adaptation of strategic opportunism for short-term market strategies.</li></ul>
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# Appendix 11

## Renewable energy share in electricity generation including key dates of supportive programmes



Source: "Renewable energy sources in figures" by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

This table is sourced from a publication made by the Federal Ministry for the environment, Nature Conservation, building and nuclear safety, hence the official profile of the authors of this report, makes it highly reliable.

# Appendix 12

## Renewable energy share and co2 emissions in electricity and heat sector in 2012

		Final energy 2012	Renewables-based share		Avoided GHG emissions	Final energy 2011
		[GWh]	[%]		[1,000 t]	[GWh]
Electricity	Hydropower <sup>1)</sup>	21,793	of gross electricity consumption <sup>8)</sup>	3.6	17,911	17,671
	Wind energy	50,670		8.4	39,571	48,883
	on land	49,948		8.2	39,007	48,315
	at sea (offshore)	722		0.1	564	568
	Photovoltaics	26,380		4.4	18,883	19,599
	Biogenic solid fuels	11,600		1.9	9,200	11,296
	Biogenic liquid fuels	400		0.1	199	363
	Biogas	24,800		4.1	9,927	19,281
	Sewage gas	1,300		0.2	1,024	1,280
	Landfill gas	550		0.1	433	628
	Biogenic fraction of waste <sup>2)</sup>	4,900		0.8	3,985	4,755
	Geothermal energy	25.4		0.004	15	18.8
	<b>Total</b>	<b>142,418</b>		<b>23.5</b>	<b>101,148</b>	<b>123,775</b>
Heat	Biogenic solid fuels (households) <sup>3)</sup>	74,400	of FEC for heat <sup>9)</sup>	5.4	22,155	67,500
	Biogenic solid fuels (industry) <sup>4)</sup>	21,800		1.6	6,056	21,942
	Biogenic solid fuels (HP/CHP) <sup>5)</sup>	6,500		0.5	1,448	5,788
	Biogenic liquid fuels	800		0.1	192	722
	Biogas	12,100		0.9	2,455	9,883
	Sewage gas <sup>6)</sup>	1,800		0.1	535	1,770
	Landfill gas	100		0.01	30	113
	Biogenic fraction of waste <sup>2)</sup>	9,100		0.7	2,651	7,969
	Solar thermal energy	6,700		0.5	1,778	6,440
	Deep geothermal energy	340		0.02	90	307
	Near-surface geothermal energy, ambient heat <sup>7)</sup>	6,730		0.5	582	5,990
	<b>Total</b>	<b>140,370</b>		<b>10.2</b>	<b>37,972</b>	<b>128,424</b>

Source: "Renewable energy sources in figures" by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

This table is sourced from a publication made by the Federal Ministry for the environment, Nature Conservation, building and nuclear safety, hence the official profile of the authors of this report, makes it highly reliable.

## Appendix 13 - Total electricity generation (EU comparison)

Source: Eurostat											
<a href="http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&amp;init=1&amp;language=en&amp;pcode=ten00087&amp;plugin=1">http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&amp;init=1&amp;language=en&amp;pcode=ten00087&amp;plugin=1</a>											
Total gross electricity generation											
GWh											
geotime	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
EU (28 countries)	3,143,878	3,234,591	3,303,572	3,325,109	3,369,912	3,383,292	3,386,806	3,221,390	3,364,392	3,294,963	3,294,590
Belgium	82,069	84,630	85,643	87,025	85,617	88,820	84,930	91,225	95,120	90,235	82,874
Bulgaria	42,679	42,600	41,621	44,365	45,843	43,297	45,037	42,964	46,653	50,797	47,329
Czech Republic	76,348	83,227	84,333	82,578	84,361	88,198	83,518	82,250	85,910	87,561	87,573
Denmark	39,287	46,186	40,436	36,246	45,611	39,316	36,616	36,383	38,866	35,232	30,727
Germany	586,694	608,779	617,469	622,579	639,492	640,578	640,406	595,616	632,983	613,068	629,813
Estonia	8,527	10,159	10,304	10,205	9,732	12,190	10,581	8,779	12,964	12,893	11,967
Ireland	25,195	25,219	25,569	25,970	27,480	28,198	30,239	28,313	28,602	27,472	27,592
Greece	54,608	58,471	59,346	60,020	60,789	63,496	63,749	61,365	57,392	59,436	60,959
Spain	244,963	260,727	280,007	294,077	299,454	305,052	313,758	294,620	301,527	293,848	297,559
France	559,194	566,941	574,269	576,204	574,595	569,811	573,896	535,728	569,156	560,233	563,661
Croatia	12,286	12,670	13,321	12,459	12,430	12,245	12,326	12,776	14,105	10,831	10,557
Italy	285,277	293,885	303,347	303,699	314,121	313,888	319,130	292,641	302,064	302,584	299,277
Cyprus	3,785	4,052	4,201	4,377	4,652	4,871	5,079	5,215	5,322	4,929	4,717
Latvia	3,975	3,975	4,689	4,906	4,891	4,771	5,274	5,569	6,627	6,095	6,168
Lithuania	17,721	19,488	19,274	14,784	12,482	14,007	13,913	15,358	5,749	4,822	5,043
Luxembourg	3,697	3,621	4,132	4,132	4,335	4,003	3,559	3,879	4,590	3,718	3,814
Hungary	36,157	34,145	33,708	35,756	35,859	39,960	40,025	35,908	37,371	35,983	34,560
Malta	2,052	2,236	2,216	2,240	2,261	2,296	2,312	2,168	2,115	2,194	2,290
Netherlands	95,942	96,829	102,440	100,219	98,393	105,162	107,645	113,502	118,140	112,968	102,505
Austria	62,499	60,174	64,151	66,409	64,499	64,757	66,877	69,088	71,128	65,811	72,616
Poland	144,126	151,631	154,159	156,936	161,742	159,348	155,305	151,720	157,657	163,548	162,139
Portugal	46,107	46,852	45,105	46,575	49,041	47,253	45,969	50,207	54,090	52,463	46,614
Romania	54,738	55,140	56,499	59,413	62,697	61,673	64,956	58,014	60,979	62,217	59,045
Slovenia	14,598	13,820	15,271	15,117	15,115	15,043	16,399	16,401	16,433	16,057	15,729
Slovakia	32,427	31,178	30,567	31,455	31,418	28,056	28,962	26,155	27,858	28,656	28,664
Finland	74,945	84,312	85,831	70,572	82,301	81,247	77,435	72,062	80,668	73,481	70,399
Sweden	146,735	135,437	151,728	158,436	143,419	148,926	150,036	136,729	148,563	150,376	166,562
United Kingdom	387,247	398,207	393,936	398,355	397,282	396,830	388,874	376,755	381,760	367,455	363,837

## Appendix 14

### Interview w/ Erik Jørgensen– Previous director for Heidegesellschaft

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*Interviewet er foretaget pr telefonsamtale d. 02/04-2014 og nedenstående skriftlige referat er underskrevet af Erik Jørgensen efterfølgende for validering af svar.*

*Note: Erik Jørgensen er ikke længere ansat i HedeDanmark, men kontakt oplysningerne samt anbefalingen om at tale med Erik er kommet fra ledelsen af HD idet man mener Erik's erfaring på markedet samt erfaring med Heidegesellschaft vil tilbyde denne besvarelse en højere reliabilitet end ved blot at interviewe nuværende ansatte.*

1. Kan jeg få dig til at bekræfte din (tidligere) job titel samt dit generelle ansvarsområde i HedeDanmarks tyske datter selskab?

*Direktør for Heidegesellschaft (HDG), som er HedeDanmarks tyske datterselskab, fra 2011-2013.*

*Erik har derudover arbejdet på det tyske marked for træ forsyning siden 1990.*

*HDG var en relativ lille organisation med mellem 6-10 medarbejdere i løbet af denne periode.*

*Min overordnede rolle var daglig ledelse af dette kontor, samt ansvarshavende for beslutninger på et strategisk niveau omkring investeringer samt information og erfaringsdeling med det danske moderselskab.*

*HDG var i høj grad et autonomt kontor, der fungerede under meget decentraliseret beslutningstagning forhold.*

2. Vil du forsøge at beskrive jeres daværende kerne forretningsområder for jeres Tyske afdeling samt hvor stor en del Biomasse energi relateret forretning udgør/udgjorde af jeres total omsætning (hvis nogen)?

*Primært forretningsområde var og er indkøb og salg af rundtræ til savværker til brug til alverdens formål, dog ikke inkluderet energi træ. Denne del af forretningen optager ca. 80 % af omsætningen i HDG. Størstedelen af denne output i HDG bliver faktisk eksporteret fra Tyskland, da der i Nordtyskland historisk set har været en stor kapacitet af kvalitets-træ*

*tilgængelig til brug som rundtræ, hvilket har resulteret i attraktive indkøb og salgspriser herpå.*

*Biomasse energi delen har kun ca. fyldt 20 % af omsætningen i HDG op til nu. Dette har i høj grad været eksport af udtyndings samt rest træ til kraftværker i det sydlige Danmark idet man ikke har været i stand til at etablere sig ordentligt på det tyske marked.*

*Denne biomasse energi omsætning har i flere gange været forsøgt udvidet, men dette har indtil nu ikke kunne lykkedes for Heidegesellschaft, hvilket har flere årsager:*

- 1. Det skyldes de potentielle tyske kunders (indkøberes) manglende forståelse for, at en højere kvalitet af træ kan resultere i en højere energi udvinding heraf. Idet man i Tyskland oftest måler en indkøber på hans evne til at købe billigst muligt ind, (bemærk ikke mest effektivt) vælger de tyske indkøbere oftest at købe fra den billigst mulige kilde, på trods af at de måske godt ved at alternative dyrere kilder i den sidste ende kan tilbyde mere værdi for dem og kraftværket de repræsenterer(!) Erik anerkender at den tyske "maskulinitets" kultur i høj grad spiller ind i disse forhandlinger.*

*Dette betyder at markedsprisen for energi træ ligger ca. 30 % under niveauet i DK, hvilket naturligvis også er med til at gøre det rentabelt at eksportere til DK.*

*Disse low-end leverandører sælger ofte, grundet interne kalkulationsfejl, dette træ med et tab, idet deres manglende erfaring på markedet ikke har givet dem adgang til samme nøjagtige kalkulations faktorer som fx tørretids omkostninger, logistik omk. Træsorter og deres forskellige energi indhold, omregning fra rummeter til KJ energi osv. Disse faktorer er HDG i høj grad i besiddelse af, og der er derfor oftest blevet takket nej til mulig meromsætning grundet vurderet mangel på ROI.*

*Når en konkurrerende leverandør er gået konkurs pga. salg af træ med tab, er der typisk andre optimistiske leverandører der står i kø for at overtage den billige ende af denne forsyning, så denne "onde" cirkel har gjort det umuligt for HD at indtræde på markedet i høj grad, idet kunderne (kraftværkerne) ikke har anerkendt eller vægtet de skifte omkostninger der måtte være ved konstant leverandør skifte.*

- 2. Biomasse leverandører som HDG er også i indirekte hård konkurrence med især spåntræproducenter, som er en enorm stor industri i Tyskland. Dette sker fordi disse producenter skal bruge den samme type træ som man bruger til energi udvinding og disse producenters samlede volumen giver dem en meget større*

*købekraft end enkelt stående biomasse leverandører kan mønstre = de kan tilbyde bedre forhold til skov ejere samt skabe værdi af selv den værste kvalitets grad af træ.*

*Hvis denne omsætning skal udvides for HDG vurderer Erik at der skal ske 2 ting:*

- 1. Efterspørgslen på Biomasse energi skal stige grundet makro økonomiske forhold, idet de relativt få biomasse anlæg i Tyskland har for meget indkøbsmagt, hvilket resulterer i en sub-profit konkurrence situation typisk.*
  - 2. Der skal en holdningsændring til, hos kraftværkernes topledelse, således de fremadrettet kan anerkende at billigst muligt løsning sjældent er den mest kost effektive. (fx 1 rummeter træ er ikke = med samme mængde KJ af energi)*
3. Hvem anser du som værende købscenteret eller ”nøglebærere” for jeres potentielle kunder i Tyskland?
- Købscentret eller ”nøglebærerne” der potentielt kan skabe en holdningsændring hos de enkelte træ indkøbere på de forskellige værker er på direktør niveauet af energi selskaber, som fx Wattenfall (red. Svensk energi organisation ala Dong Energy), som er en stor spiller på biomasse anlæg markedet i Tyskland. Erik kender kun til et enkelt tilfælde hvor det har været muligt at etablere kontakt med direktører på dette niveau, men dette resulterede ikke i et øget samarbejde, idet man ikke lykkedes med at få disse stakeholders overbevist om fordelene ved HDG’s service frem for de billigere alternativer.*

*Erik anbefaler mig i denne sammenhæng at kigge nærmere på hvordan HDG kan skabe værdi for deres kunder (evt. ved at kigge på hvordan dette bliver gjort for de danske kunder) og som resultat deraf skabe værdi for HDG selv, da dette også kan være en del af løsningen på det uudløste potentiale der måtte være på det tyske marked.*

4. I Maj 2011 blev det besluttet i Tyskland at udfase Atom energi som elektricitets kilde inden 2020 grundet katastrofen i Japan. Hvordan (hvis overhovedet) ændrede denne politiske beslutning i Tyskland jeres syn på potentialet på det tyske marked for biomasse energi?
- Hvis potentialet vurderes forøget af denne beslutning vil jeg gerne om du kan uddybe hvad der ligger til baggrund for dette øgede potentiale?
  - Hvis potentialet vurderes til at være uændret eller mindre end før denne beslutning blev lavet, vil jeg gerne om du vil begrunde hvorfor denne beslutning ikke har haft en effekt på jeres markedspotentiale for biomasse energi i Tyskland?



*Uændret.*

*I en forlængelse af ovenstående svar udtaler Erik at uanset om der er atom kraft eller ej I Tyskland, er adgangen til skovdrift og råtræ meget begrænset ift. fx Danmark. Selvom den egentlige fysiske kapacitet i form af et stort skovdække er tilgængeligt er de knappe ressourcer primært grundet den enorme industri for spånplade produktion i Tyskland, som på nuværende tidspunkt har langt større efterspørgsel og derfor har meget mere indkøbsmagt overfor skov ejere end biomasse leverandører.*

*Derudover kommer det faktum at mange af de største spånplade industri værker har egen biomasse anlæg som de selv forsyner via deres indkøb af spånplade træ råvarer. Denne vertikale integration fra disse værker reducerer indirekte potentialet for HD til at levere den samme type energi råvarer til nærliggende kraftværker for at de derefter kan levere denne energi til disse værker. Erik udtaler at muligheden for evt. at varetage dette energi-træ indkøb for disse spånpladeværkers egne biomasse anlæg ikke er undersøgt i dybden tidligere. Men grundet den manglende indkøbsmagt fra biomasse leverandører som HDG, vurderes man ikke til at kunne entrere dette marked med en acceptabel ROI heller, men dette har ikke været undersøgt i dybden hidtil.*

5. Forfatteren af denne rapport er stødt på flere modsigende artikler og journaler der enten beskriver Tyskland som havende rig potentiale for yderligere udnyttelse af skovene til biomasse energi sektoren, men samtidig er der flere kilder der mener at ressourcerne til evt. udvidelse af Biomasse energi sektoren ikke eksisterer og yderligere fældning (udtydning) vil skade miljøet mere end den nedsatte  $\text{CO}_2$  udledning som biomasse energi kan tilbyde. Hvilken af disse modstridende teorier vurderer du til at være korrekt ift. Din erfaring på dette marked?

*Teoretisk set er der kapacitet og potentiale for en større udvidelse af biomasse energi sektoren i Tyskland, men andre aktører, såsom spånplade industrien er indtil nu blevet forfordelt ift. Denne tilgængelige kapacitet.*

*Ift.  $\text{CO}_2$  diskussionen er Erik også stødt på denne i flere af hans tidligere roller i denne industri og han kan ikke tilbyde det definitive svar på denne fortsatte diskussion. Det afhænger naturligvis igen af transportafstanden fra skov  $\rightarrow$  værket,  $\text{CO}_2$  udledningen i tørre processen (dårligere kvalitet af træ skal tørre længere).*

6. Hvilke energikilder ser du som værende de største konkurrenter til biomasse energi leverandører på det tyske marked? List/prioriter gerne såvel indenfor vedvarende energi sektoren samt din vurdering af de største konkurrentmæssige trusler i den total energi sektor

*I vedvarende energi sektoren er det Sol og Vind energi, men Erik vurderer situationen er ikke meget anderledes end I biomasse energi sektoren, idet mange spillere går konkurs grundet regnefejl osv.*

*I den overordnede energi sektor er det stadigvæk kul der er den dominerende spiller på markedet og den største trussel mod de alternative vedvarende energi former.*

7. Havde I på noget tidspunkt tilbage i 2011 eller 2012 haft en intern strategisk diskussion omkring hvad denne politiske beslutning kan tilbyde af muligheder eller hvilke trusler denne evt. måtte skabe for HD?

*Det skabte ikke nogen intern diskussion og der blev derfor ikke diskuteret potentielle strategiske ændringer. En større markedsundersøgelse blev heller ikke diskuteret eller overvejet, da man som nævnt i spm. 3 havde/har en opfattelse af at markedspotentialet for HDG er uændret samt at denne del af forretningen "kun" udgør 20 % af den samlede omsætning i HDG.*

8. Relateret til ovenstående spørgsmål; Hvem i HedeDanmark (DK eller Tyskland) har ansvaret for at indsamle og analysere markedsrelevant information, f.eks. i forbindelse med politiske beslutninger eller andre faktorer i HD's fjernmiljø?

*Det tyske kontor kørte som tidligere nævnt meget autonomt, og det var Erik's ansvar at indsamle og analysere markedsændringer der blev påvirket af HDG's makro miljø.*

*Men fokus har ikke været på energi branchen grundet den relativt lave omsætning vs. Rundtræ forretningen, så Erik udtaler at han ikke har gjort meget aktivt for at indsamle og/eller analysere på eventuelle ændringer i markedet.*

*I den danske organisation har man én senior rådgiver, ved navn Ebbe Leer, som på nationalt niveau rådgiver HD omkring ændringer bl.a. i makro miljøet, som kan skabe muligheder og trusler til driften.*

9. Din tidligere kollega Carsten Mortensen vurderer at logistiske omkostninger, ved levering af flis som energi kilde til kraftværker, udgør ca. 30 % af de samlede omkostninger. Hvordan vil du vurdere at dette regnestykke ser ud i Tyskland?

*Transport omkostningerne er marginalt større I Tyskland grundet lavere max. vægt på lastbilers last samt den geografiske afstand mellem danske kraftværker er væsentlig mindre end i Tyskland, hvilket også påvirker regnestykket negativt.*

10. I Danmark er HD afhængig af fritagelsen for Co2 afgiften på ”grønne” energi kilder såsom flis, er HD (Tyskland) også afhængig af lignende politiske tilskud, hvis ja hvilke?

*Erik mindes der er en lignende ordning i Tyskland, men er ikke i stand til at give yderligere detaljer. Erik henviser til nuværende direktør Carsten Boedicker for denne information.*

11. I den foreløbige analyse, foretaget af forfatteren af denne rapport, er der i flere tilfælde anerkendt en forfordeling af såvel sol som vind energi i Tyskland, er dette noget du også vurderer som værende tilfældet og hvis ja, hvordan kommer det sig til udtryk?

*Erik kender også til flere tilfælde af statslig støttet vind og sol energi projekter, men han har ikke kendskab til hvordan disse er sammensat eller grundlaget for disse.*

12. Deltog du/i som virksomhed i f.eks. en branche interessant gruppe, der har til formål at ”markedsføre” biomasse energi sektoren frem for de alternative energi kilder? Hvis ja, vil du uddybe hvilke aktiviteter i foretager jer? Hvis nej, kender du så til sådanne interessant grupper i energi sektoren i Tyskland?

*Nej HD I Tyskland har ikke gjort meget aktivt herfor. Erik kender ikke til nogle decideret branche foreninger der har til hovedformål at foretage lobbyisme for biomasse sektoren. Han henviser til nuværende direktør Carsten Boedicker for eventuel yderligere info.*

*Det vil have været Erik, i hans rolle som direktør der skulle have initieret denne form for aktivitet, idet man ikke har en senior rådgiver (Ebbe Leer) tilkøbt, som i den danske organisation.*

*Men igen fordi man ikke har vurderet biomasse energi forretningen til at have tilstrækkelig potentiale har dette ikke været tilstræbt.*

13. Hvordan vurderer du at ledelsen i HD prioriterede fokus på jeres tyske afdeling ift. primært den danske men også den Litauiske samt Arabiske organisation? Herunder ønskes der en vurdering af jeres frihedsgrad ift. beslutningstagning på et såvel operationel, som strategisk niveau?

*Erik udtaler at den overordnede ledelse i DK utvivlsomt har primært fokus på den danske organisation og derfor opererer de udenlandske datterselskaber også meget autonomt som en konsekvens heraf.*

*Erik har indtrykket af at ledelsen i HD ikke har formodet at anerkende samt respektere eventuelle kultur samt markedsforskelle fra DK til deres udenlandske markeder. Når ledelsen så igennem erfaring har kunnet konstatere at de ikke været i stand til at duplikere den danske forsynings samt værdikæde og ikke mindst den danske organisationskultur har de gradvist mistet interessen for disse datterselskaber og ladet dem operere mere autonomt!*

*Det samme gør sig gældende ift. måden HD har forsøgt at angribe de udenlandske markeder på, hvor Erik mener at man nok har haft en fejlagtig tildens til at forsøge at operere med baggrund i den markedsleder position man har haft i Danmark, og derved ikke har udvist den ydmyghed som Erik mener, er nødvendig som en ny/lille spiller på det tyske marked.*

*Det var også som en konsekvens Erik der primært måtte budgettere og planlægge investeringer i Tyskland, da initiativer sjældent kom fra Danmark på potentielle muligheder. Og i de tilfælde hvor de kom fra den danske organisation har Erik været nødsaget til at "trække bremsen" da disse forslag ikke har været rentable ift. ROI eller andre vigtige KPI'er.*

*Generelt har holdningen fra DK været meget – "den danske model er den rigtige model" og han mener at HD netop repræsenterer kernen af dansk organisationskultur med kendetegninger såsom "lavt til loftet" samt ærlighed og rene linjer.*

*Den arabiske afdeling har f.eks. lidt under store kultur mæssige forskelle og manglende forståelse af disse forskelle. (Eriks indtryk af situationen)*

*Erik mener at forandringsvilligheden i HD er meget begrænset af ledende medarbejderes lange anciennitet i HD og disses erfaring med den klassiske danske organisations kultur. Erik understreget dog også at dette er et typisk problem, og at denne anciennitet naturligvis også har sine store fordele ift. Ledelse af især den danske organisation.*

*Erik anerkender en forståelse af de ledende personer i HDs prioritering af den danske biomasse energi afdeling, idet dette i høj grad er og har været rentabelt og der her er væsentlig større (kortsigtede) profit muligheder end den hidtidige vurdering af det tyske marked har vist.*

**Off-Topic information fra Erik Jørgensen der ikke er linket til noget listet spm. men kom frem gennem naturlig interesse samtale:**

- 1. Noget der også påvirker de tyske kunders mangel på effektivitet og derved villighed til at betale en højere pris for kvalitets træ er det faktum at mange tyske værker kun produceret elektricitet, i modsætning til danske værker der typisk producerer elektricitet og igennem denne proces også genere fjernvarme. Denne fjernvarme infrastruktur er ikke tilstede i Tyskland og der bliver derfor spildt en masse potentiel energi på de tyske værker da denne varme ikke kan distribueres fra værkerne.*
- 2. Når en investor eller energi firma skal bygge et biomasse elektricitetsværk, vil der være tilskud fra staten hertil idet man bygger til vedvarende energi forsyning. MEN selv om man bygger lokalt til stort skov dække er man nødvendigvis ikke sikker på levering herfra pga. tidligere nævnte andre spillere som f.eks. spåntræindustrien og dennes indkøbsmagt. Dette kan være svært at budgettere sig fra i denne planlægnings fase og der er flere tilfælde af at relativt nye biomasse værker går konkurs pga disse overraskelser. Dette har en naturlig negativ effekt på evt. fremtidige investeringer i biomasse anlæg fra de store energi selskaber.*

## Appendix 15

### Interview w/ Niels Jørgen Pedersen – General Manager of HD's Raw Wood division (All markets)

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*Interviewet er foretaget pr telefonsamtale d. 16/04-2014 og nedenstående skriftlige referat er underskrevet af Niels Jørgen Pedersen efterfølgende for validering af svar.*

14. Kan jeg få dig til at bekræfte din job titel samt dit generelle ansvarsområde i HedeDanmark?

*"Manager raw wood division i DK og andre markeder*

*Geschäftsführer med overordnet ansvar for den globale handel med rundtræ via Heidegesellschafts agenturer (se organisationsstruktur i separat appendix)*

*Danmark – ansvar for rundtræ, kun i Tyskland har også ansvar for biomasse energi."*

15. Hvornår præcis og hvorfor valgte i at etablere en afdeling i Tyskland (var det potentialet for handel med rundtræ mere end biomasse energi fx)?

*"Etableringen af Heidegesellschaft 1992. HD var aktive i Tyskland før dette, men oprettede først datterselskabet dengang grundet stigende potentiale.*

*Dengang blev det åbnet grundet potentialet for at eksportere rundtræ til Danmark/Skandinavien.*

*Biomasse energi i tyskland blev først for alvor inddraget for 4 år siden, med en forventning om at biomasse vil kunne fylde mere i den tyske afdeling også, og denne aktivitet var derudover også udsprunget af en manglende vækst på det danske marked.*

*I Tyskland er det i dag for HDG ren spot handel hvor det kan være svært at budgettere for årets resultater. "*

16. Hvordan har jeres afdeling i Tyskland performet historisk set (f.eks. ift. budgetter og/eller ledelsesmæssige forventninger)? (separer evt. biomasse- og rundtræsforretningen)

*"Samlet set har Heidegesellschaft performet OK ift. at den har været overskudsgivende i alle år siden 1992, på nær enkelte år hvor markedet samt den tyske økonomi har haft problemer.*

*Heidegesellschaft har dog fra et overordnet ledelsesmæssigt forventningsniveau skuffet ift. Forhåbninger omkring yderligere ekspansioner gennem tiderne.*

*Mangel på Biomasse potentiale har været en direkte årsag til manglende udvidelse af engagementet.”*

17. Hvordan vil du vurdere ledelsen i HD's erfaring med international ekspansion samt ledelse af disse datterselskaber? Og relateret hertil, har i haft nogle nævneværdige udfordringer med ledelse af jeres udenlandske afdelinger (Tyskland, Letland, Litauen og U.E.A)

*”Historisk har der primært været en tilfældig tilgang til international ekspansion. Det gælder både Tyskland og Baltikum. Kortsigtede budgetter og forretningskoncepter ud fra et øjeblikspotentiale med højt afkast. Disse har dog lykkedes i de fleste tilfælde, men det har vist sig at disse markeder er blevet modne og væksten er som regel udeblevet efter en periode.”*

*Dette mener NJ der især skyldes at kunderne laver vertikal integration, når det kommer til handel med rundtræ, hvor spot priser/handel gør det svært at skabe en værdi for kunden udover på pris.*

*Ift. Bio energi er rollen som HD optager vigtigere for kunden, ift. Simpel handel med rundtræ idet HD varetager en større del af forsyningskæden for disse kunder.*

18. Hvordan har differencer i såvel national som forretningsrelateret kultur (hvis nogen?) haft en påvirkning af disse afdelingers performance samt kompleksiteten i ledelsen heraf? (kom gerne med konkrete eksempler hvis nogen haves?)

*NJ anerkender kulturforskellene fra DK til udlandet, selv med kort afstand. Derfor lader man også i høj grad de udenlandske datterselskaber kører autonomt med lokale daglige ledere, og kun overordnet ledelse fra Danmark.*

*NJ fortæller at man i Tyskland i høj grad danskere dannede på kontoret i de indledende år, men for at få det til at fungere valgte man over tid at skifte til tyske medarbejdere grundet nemmere samarbejde med leverandører og kunder.*

*NJ er aktiv som overordnet leder af Heidegesellschaft, men det er meget tonet ned og oftest i en ambassadør rolle, idet HD bevidst lader datterselskaberne kører autonomt.*

19. Hvem i HedeDanmark har ansvaret for at lede eventuelle internationale ekspansioner. (som da i enterede Tyskland, Baltikum og U.A.E.)



*"Det overordnede ansvar bliver lavet i form af en forretningsplan der skal igennem ledelsen i HedeDanmark hvis man ønsker at træde ind på et nyt marked. Forslagene til disse forretningsplaner kan komme fra alle afdelinger."*

20. Hvordan(hvis overhovedet) analyserer HD eventuelle markedsændringer i det Internationale marked som kan skabe muligheder for HD som virksomhed, og har i relateret til dette holdt jer opdateret på den netop vedtaget tyske energi reform fra start April?

*"Dette ansvar ligger hos Carsten Boedicker når det er i Tyskland."*

21. Hvordan (hvis overhovedet) politiske anti-atom energi beslutning i Tyskland i Maj 2011 ændret jeres syn på potentialet på det tyske marked for HD's biomasse energi afdeling?

- Hvis potentialet vurderes forøget af denne beslutning vil jeg gerne om du kan uddybe hvad der ligger til baggrund for dette øgede potentiale?
- Hvis potentialet vurderes til at være uændret eller mindre end før denne beslutning blev lavet, vil jeg gerne om du vil begrunde hvorfor denne beslutning ikke har haft en effekt på jeres markedspotentiale for biomasse energi i Tyskland?

*"I tyskland har man en spånplade og cellulose (papir) industri som betyder meget for økonomien. Meget statsstøtte til disse 2 industrier i starten af 90erne. Disse industrier lobbyer meget for at undgå en øgning af biomasse energi."*

*Som tidligere nævnt er statsstøtten gået til sol og vind energi primært.*

*Dette kan mærkes helt i Danmark, idet forhøjede priser på landbrugsjord i det sydlige Jylland, for at bruge disse til sol panel produktion til Tyskland!*

*I Danmark har man i høj grad støttet biomasse energi hvor det ikke er tilfældet i Tyskland.*

*I Danmark har man ikke samme industrier der benytter samme træ varer.*

*Derfor er det typisk kun den ringeste kvalitet man har kunnet få adgang til fra tyske skovejere. Det er også denne type træ der er eksporteret til DK, fx læhegnstræ og ikke rødgran og lignende højkvalitets træsorter"*

22. Hvordan planlægger samt budgetterer HD ift. investeringer (kan være såvel ekspansion samt reduktion) – Bruger HD f.eks. budgetterings værktøjer som såsom PB (Payback Period), NPV (Net Present Value) eller (M)IRR (Modified Internal rate of return ) eller måske helt andre?

*"Ingen budgetterings redskaber som sådan."*

*HD har selv lavet systemer der lister omkostninger vs. ROI på kort og lang sigt.*



*Biomasse branchen er mere speciel end blot handelsbranchen, idet mange faktorer er ukendt for såvel kunder som HD. Der bliver i høj grad estimeret på formodninger i stedet for faktisk data på træet der bliver købt til biomasse, idet man ikke har ressourcerne til at måle alle købte kvantiteter igennem inden handlen er lavet.”*

23. Hvilke faktorer i jeres virksomheds ”fjern” miljø mener du der har den største indvirkning på jeres drift og resultater og hvorfor? (Politiske, makro økonomisk udvikling, økologisk samt social/kulturel udvikling hos slut forbrugere af energi, Tekniske samt videnskabelige fremskridt eller måske lovgivningsmæssige?) prioriter og uddyb gerne hvis muligt.

*Politiske nr. 1*

*Lovgivning nr. 2*

*Kultur nr. 3 (I eks. Tyskland har det ikke været almindeligt at bruge træ til at fyre med)*

*Lobbyisme nr. 4 (fra andre industrier der skal bruge samme træ type)*

24. Ud fra de nedenstående konkurrencemæssige fordele listet af Carsten Mortensen for jeres danske biomasse energi afdeling, hvilke vil du så vurdere er afgørende for HedeDanmarks fremtidige succes på den internationale scene for biomasse handel? (tilføj og prioriter gerne hvis muligt)

- Vi kan varetage hele forsyningskæden, hvilket gør det overskueligt for kraftværkerne samt os selv at varetage de nødvendige opgaver såsom forecast of fordeling af materiel og ressourcer.
- Landsdækkende og velronnemeret virksomhed – velkonsolideret, professionel og pålidelig
- Stor kapacitet – forsyningssikkerhed
- Store mængder i rette kvalitet
- Har været og er stadig markedsleder inden for udvikling af maskinkoncepter, maskinkomponenter og til flisproduktionen som gør os effektive og i stand til at løse opgaver som andre ikke kan

25. Deltager du/i som virksomhed i en branche interessant gruppe, der har til formål at ”markedsføre” biomasse energi sektoren frem for de alternative energi kilder?

- Hvis ja, vil du uddybe hvilke aktiviteter i foretager jer?
- Hvis nej, kender du så til sådanne interessant grupper i energi sektoren i henholdsvis Danmark og Tyskland?

*"Ja i Danmark gør HD dette i høj grad, i samarbejde med deres leverandører i form af skovejerne som har interesse i øget eksponering af denne branche for flere støttemidler.*

*I Tyskland bliver dette ikke vurderet rentabelt ift. Biomasse forretningens størrelse for HDG."*

26. Forfatteren af denne rapport er stødt på flere artikler og journaler fra (på papiret) uafhængige miljø organisationer, der beskriver Biomasse energi (primært træ som kilde) som værende mere skadende for miljøet end ved brug af f.eks. kul eller andre ikke-vedvarende energi kilder! Dette er grundet co2 udslippet ved transporten fra skovene til kraftværkerne, metoderne denne træflis eller rest træ bliver tørret på eller det faktum at man fjerner træer som netop tjener dét formål at rense luften for co2 via fotosyntesen. Hvordan forholder HD sig til denne diskussion ift. at netop denne form for energi forsyning er HD's primære omsætningskilde i jeres danske organisation?

*NJ vurderer ikke at dette spiller en rolle hverken i Danmark eller på andre markeder hvor HD er engageret i biomasse handel.*

### Appendix 16 - paper and panel board industry (EU comparison)

<b>Source: Eurostat</b>											
<b>Total paper and paperboard production</b>											
<b>1 000 t</b>											
<b>geo\time</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
EU (28 countries)	91,262	93,340	97,733	98,426	102,050	101,954	98,427	88,358	95,002	94,470	92,982
Belgium	1,704	1,919	1,957	1,897	1,897	1,931	2,006	1,990	1,974	2,040	2,032
Bulgaria	171	171	326	326	313	367	326	217	248	291	304
Czech Republic	870	920	934	969	1,042	1,023	932	805	769	775	:
Denmark	384	388	402	423	442	417	418	419	435	423	:
<b>Germany</b>	<b>18,526</b>	<b>19,310</b>	<b>20,391</b>	<b>21,679</b>	<b>22,656</b>	<b>23,317</b>	<b>22,828</b>	<b>20,870</b>	<b>23,072</b>	<b>22,706</b>	<b>22,630</b>
Estonia	75	64	66	64	78	78	68	63	76	74	77
Ireland	44	45	45	45	-	49	48	45	45	47	:
Greece	493	493	510	510	412	409	462	522	608	508	:
Spain	5,365	5,437	5,526	5,697	6,898	6,713	6,414	5,700	6,193	6,203	6,177
France	9,809	9,939	10,255	10,332	10,006	9,871	9,404	8,332	8,830	8,527	8,100
Croatia	467	463	464	592	564	545	535	526	560	540	500
Italy	9,317	9,491	9,667	9,999	10,008	10,112	9,467	8,404	9,087	9,130	8,588
Cyprus	-	-	-	-	-	-	-	-	-	-	-
Latvia	33	38	38	39	57	60	52	54	53	54	44
Lithuania	78	92	99	113	119	124	123	86	129	157	127
Luxembourg	-	-	-	-	-	19	31	12	24	21	:
Hungary	517	546	579	571	553	552	424	461	640	696	641
Malta	-	-	-	-	-	-	-	-	-	-	-
Netherlands	3,346	3,339	3,459	3,471	3,367	3,224	2,977	2,609	2,859	2,748	2,761
Austria	4,419	4,565	4,852	4,950	5,213	5,199	5,153	4,606	5,009	4,901	5,004
Poland	2,342	2,461	2,635	2,732	2,857	2,992	3,055	3,275	3,700	3,756	3,822
Portugal	1,537	1,530	1,664	1,570	1,644	1,644	1,662	1,634	1,456	2,180	2,154
Romania	370	443	454	371	432	558	585	250	250	287	295
Slovenia	704	417	497	763	760	762	763	732	750	691	704
Slovakia	710	674	798	858	888	915	921	921	780	748	736
Finland	12,789	13,058	14,036	12,391	14,189	14,334	13,126	10,602	11,758	11,329	10,694
Sweden	10,724	11,061	11,589	11,775	12,066	11,511	11,663	10,932	11,397	11,298	11,417
United Kingdom	6,468	6,476	6,490	6,289	5,588	5,228	4,983	4,293	4,300	4,342	4,416
BLEU	:	:	:	:	:	:	:	:	:	:	:
Iceland	:	:	:	-	-	-	:	:	:	:	2
Liechtenstein	:	:	:	:	-	-	-	-	-	:	:
Norway	2,114	2,186	2,294	2,223	2,109	2,010	1,900	1,577	1,695	1,500	:
Switzerland	1,805	1,818	1,777	1,751	1,526	1,705	1,698	1,524	1,559	1,376	1,249
Montenegro	:	:	:	:	-	-	203	227	227	227	:
Former Yugoslav Repu	19	18	16	20	20	20	23	20	22	22	:
Turkey	1,643	1,643	1,643	1,643	1,643	1,643	4,442	4,442	5,334	5,334	:
Russia	5,978	6,377	6,830	7,126	7,434	7,581	7,700	7,373	7,551	7,549	7,661
Canada	20,073	19,964	20,462	19,498	18,189	17,367	15,789	12,823	12,733	12,057	10,755
United States	81,879	80,712	82,084	83,697	84,317	83,916	80,178	71,355	77,689	76,431	75,533

## Appendix 17

### Interview w/ Carsten Mortensen, Daily Operation Manager – wood ships at HedeDanmark (DK)

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#### Spørgsmål til Carsten Mortesen, driftsleder - flis hos HedeDanmark (DK)

27. Kan jeg få dig til at bekræfte din job titel samt dit generelle ansvarsområde i HedeDanmark?

- Driftsleder i HedeDanmarks afdeling for flis
- Ansvarlig for alle processer i forbindelse med levering af flis til energi industrien i Danmark

28. Hvordan vil du beskrive HedeDanmarks konkurrence mæssige position på det danske marked for flis som en kilde til produktion af energi?

- HedeDanmark står generelt stærkt som leverandør af brændselsflis. Ikke mindst fordi vi er en landsdækkende virksomhed, med et stærkt renommé i branchen. Vi har ressourcer og kapacitet til at levere den rette fliskvalitet til rette tid. Den årligt leverede mængde er stigende år for år i takt med udbygningen af flisfyrede værker. For øjeblikket ligger HedeDanmarks afsætning på ca 1.6 mio rm (rummeter = det der kan være i en kasse på 1x1x1 meter) flis pr. år, svarende til ca 33 % af det danske forbrug. En markedsandel der forsøges bevaret eller udvidet.

29. Hvis muligt, kan du udfylde nedenstående forsyningskæde for flis til EL produktion, og i denne markere hvilke elementer som HedeDanmark i øjeblikket varetager for deres danske kunder? (Tilføj eller fjern evt. trin hvis ønsket)

- HedeDanmark varetager hele værdikæden i forbindelse med håndteringen af flis til El-produktion (og varmeproduktion)



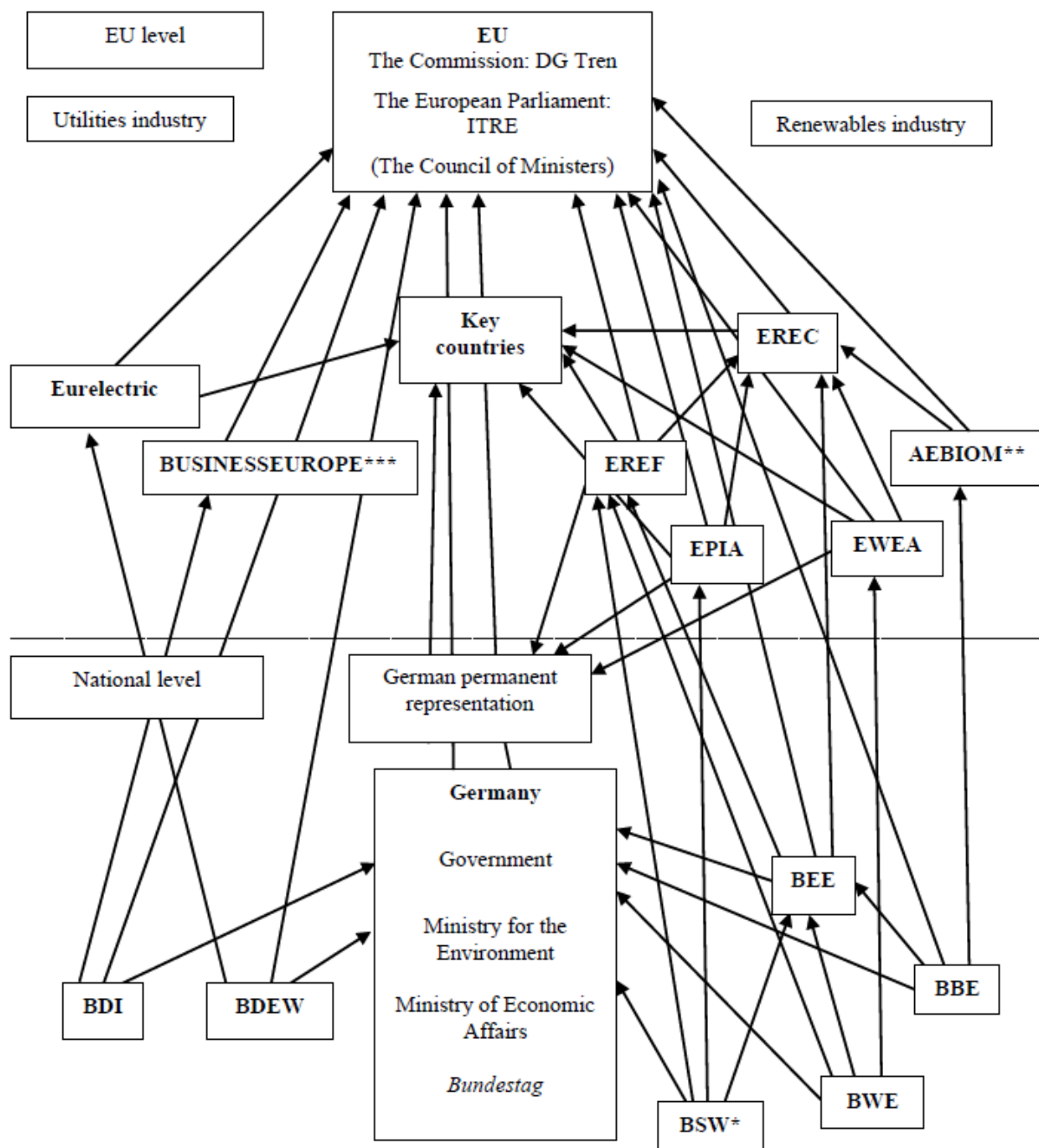
Alternativ kæde:

- Driftsleder opkøber flis hos entreprenør
- Flisen lægges i forsyningsplan
- Afhentning af flisen rekvireres hos vognmand
- Trin 7 – 9 fra skemaet ovenover.

30. Hvor stor en del af den samlede danske skovdrift vil du vurdere der bliver anvendt til energi mæssige formål, og hvordan er kapaciteten for at udvide udnyttelsegraden af denne (forudsat at andre træ relaterede brancher ikke skal opleve et fald i deres forsyning).
- Du får et lidt langt, men godt svar her:  
<http://www.ft.dk/samling/20091/almDEL/flf/bilag/89/773861.pdf>
31. Er der nogle nævneværdige regeringsmæssige (eller EU) tilskud der gør det rentabelt at levere flis som en energi resource, eller for kraftværkerne at anvende dette fremfor f.eks. kul, olie og naturgas som umiddelbart er kendetegnet som billigere alternativer?
- Ja, biobrændsler er fritaget for CO<sub>2</sub>-afgift, hvilket er afgørende. Der kan være detaljer her jeg ikke kender nok til. (Kun Danmark)
32. Har anti-atom beslutningen i Tyskland i Maj 2011 haft nogen former for indflydelse på det Danske marked for HD, f.eks. i form af reguleringer af Co<sub>2</sub> afgifter eller måske øget efterspørgsel på eksport af flis eller andre energi kilder til Tyskland?
- Nej ikke mig bekendt
33. Hvor stor en del af jeres variable omkostninger relaterer til den egentlige distribution af flis? (relative transportomkostninger ift. total omkostninger)
- Ud af de samlede produktions – og transportomkostninger på i alt ca 85 kr/rm udgør transporten ca 25 kr/rm = 29 %. (fældning = 25 + flishugning = 35 + transport = 25)
34. Besidder HedeDanmark nogle ressourcer som er unikke til dem ift. andre danske konkurrenter (og for den sags skyld også udenlandske leverandører af flis til det danske marked), hvis ja kan du prioritere hvilke der betyder mest for HedeDanmarks grad af succes? (Det kan være materielle, organisatoriske, økonomiske, omverdens relaterede eller ledelses mæssige fordele mm.)
- Vi kan varetage hele forsyningskæden, hvilket gør det overskueligt for kraftværkerne samt os selv at varetage de nødvendige opgaver såsom forecast of fordeling af materiel og ressourcer.
  - Landsdækkende og velronnemeret virksomhed – velkonsolideret, professionel og pålidelig
  - Stor kapacitet – forsyningssikkerhed
  - Store mængder i rette kvalitet
  - Har været og er stadig markedsledende inden for udvikling af maskinkoncepter, maskinkomponenter og til flisproduktionen som gør os effektive og istand til at løse opgaver som andre ikke kan.

# Appendix 18

## Lobbying overview for Germany & EU



Source: "Multi Level Lobbying in the EU: The Case of the Renewables Directive and The German energy industry" by Inga Margrete Ydersbond for the Fridtjof Nansens Institute October 2010 - <http://www.fni.no/doc&pdf/FNI-R1012.pdf>

*The above source is deemed highly reliable, as the Fridtjof Nansens institute is renowned independent Research institute that specializes in researching many energy related matters across the globe*



# Appendix 19

## CO2 emission from fossil vs. biomass energy source

Fuel	Net calorific value (MJ/kg)	Carbon content (%)	Approx. life cycle CO <sub>2</sub> emissions (including production) See note 1		Annual kg
			kg/GJ	kg/MWh	
Hard coal	29	75	115	414	8,280
Oil	42	85	87	314	6,280
Natural gas	38	75	63	227	4,540
LPG	46	82	72	259	5,180
Electricity (UK grid - delivered)	-	-	164	590	11,800
Electricity (large scale wood chip combustion)	-	-	16	58	1160
Electricity (large scale wood chip gasification)	-	-	7	25	500
Wood chips (25% MC) Fuel only	14	37.5	2	7	140
Wood chips (25% MC) Including boiler	14	37.5	5	18	360
Wood pellets (10% MC starting from dry wood waste) See note 3	17	45	4	15	300
Wood pellets (10% MC drying from green wood using gas)	17	45	22	80	1,600
Wood pellets (10% MC) Including boiler See note 3	17	45	7	26	520
Wood pellets (10% MC - dried from green using gas) Including boiler	17	45	25	91	1,820
Grasses/straw (15% MC)	14.5	38	1.5 to 4	5.4 to 15	108 to 300

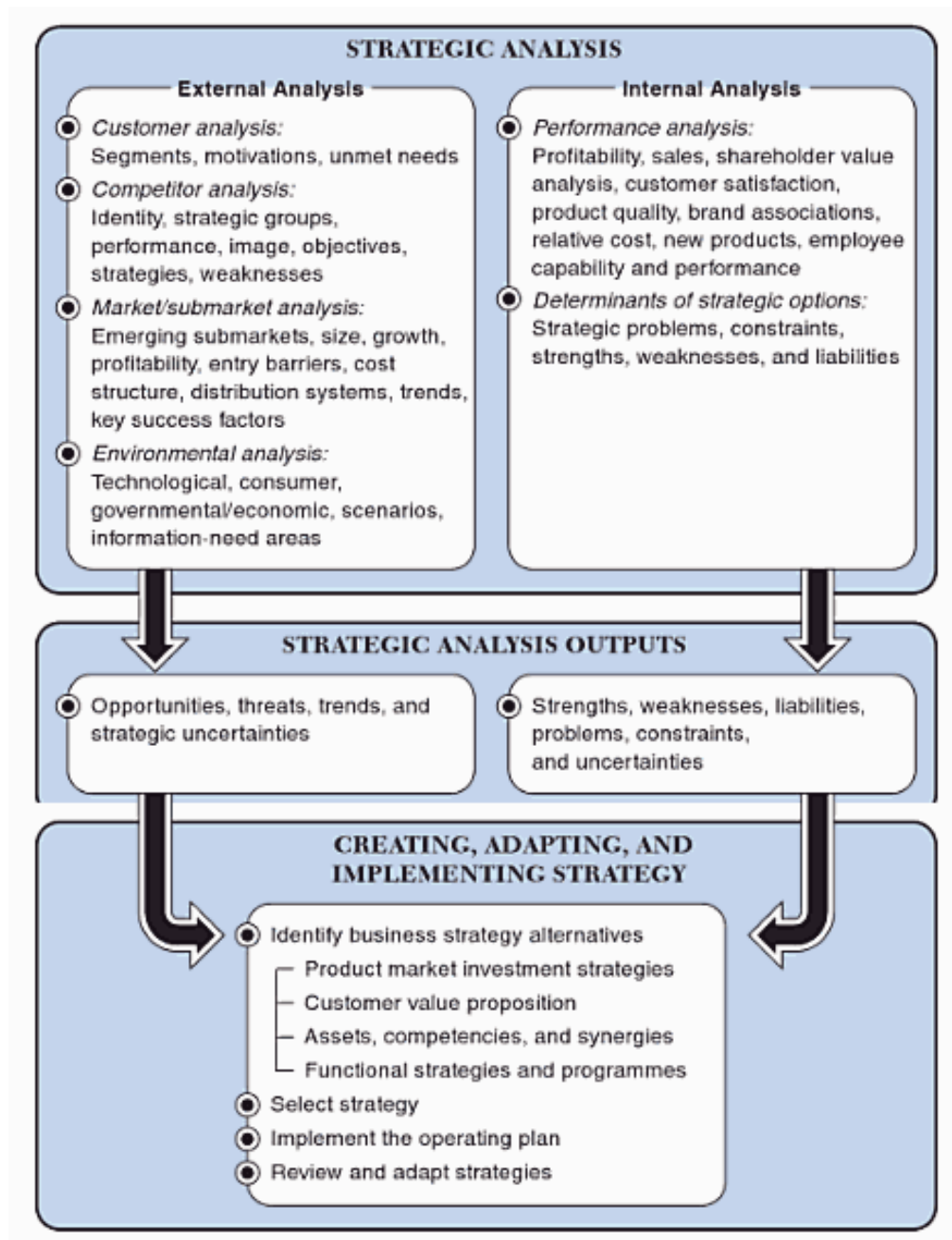
Source: [http://www.biomassenergycentre.org.uk/portal/page?\\_pageid=75,163182&\\_dad=portal&\\_schema=PORTAL](http://www.biomassenergycentre.org.uk/portal/page?_pageid=75,163182&_dad=portal&_schema=PORTAL)

– Though this source is a biomass promoting website, the data in the above table is re-referenced on the above site, to a general survey of co2 emissions by The World Energy Council.

# Appendix 20

## Strategic Market Management overview

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Source: "Strategic Market Management" European Edition by David A. Aaker & Damien McLoughlin – 2007

downloaded from: <http://www.projectguru.in/publications/wp-content/uploads/2012/07/12.png>

*The above book is used throughout the report as reference point, as it compiles a major part of the high acclaimed international business theories into a unique concept of Strategic Market Management. The book is deemed highly valid and reliable for the purpose of this report.*

## Appendix 21

### Interview w/ Carsten Boedicker – Regional Manager for Heidegesellschaft

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*Interviewet er foretaget pr telefonsamtale d. 09/04-2014 og nedenstående skriftlige referat er verificeret af Carsten Boedicker efterfølgende for validering af svar.*

35. Can I kindly ask you to confirm your job title and main areas of responsibility in Heidegesellschaft?

*“Regional manager for Heidegesellschaft*

*Round logs export to Asia*

*Biomass energy (export from Germany to Denmark mainly)”*

36. In Denmark, the biomass energy department is highly dependent on an exemption from a  $\text{CO}_2$  duty on bio fuels. Is there a similar duty in Germany, and is biomass energy also exempt from this in Germany?

*“No there is not a directly similar duty in Germany, but the customers (the electricity plants) have some options when it comes to getting subsidies/support from the government when using renewable energy sources which has an indirect effect. This means the prices for Coal and renewable energy sources such as wood chips cannot be compared equally.”*

37. In May 2011, it was decided in Germany, that all nuclear fuelled electricity production should be removed before 2020 due to the catastrophe in Japan. How did this (if at all?) change your company’s view on the potential of the German market for biomass energy?

- If you value the potential to have been increased, please elaborate on the reasons for this increase?
- If unchanged or less than before, please elaborate why this political decision will not affect the potential biomass business for Heidegesellschaft?

*“The Political situation changed after May 2011, but the government preferred subsidies for Solar & Wind Energy. Most plants for Biomass (that uses wood chips for heat production) were built between 2005-2009. So there was not a reason for us to change our view of the potential of this sector. Carsten only knows of a few biogas plants that are being built in these years.*

*At the moment the biomass plants in Germany are not able to pay the same price for wood as the panel board (MDF) or pulp industry. So almost all wood that is being harvested from the industrial forestry goes to these industries. The biomass plants get their wood chips from landscaping projects, which is typically wood that is not of the same quality as from harvesting through industrial foresting. “*

38. Can you mention any activities or reforms that you have made in Germany in the past 24-36 months, which have been conducted to expand your biomass energy business locally in Germany? (therefore excluding export expanding activities)

*“We react on a higher demand for round logs by delivering a higher quantity to the producers of Fir wood. A market that has multiplied in the last couple of years. Also supplying pellets to the pellet industry has increased over the last couple of years. For wood chips, we have decided to have a focus on exporting the best quality, particularly to Denmark.”*

39. In the research made for this report, the author has in more than one coincidence encountered cases where it would seem that solar- (photovoltaic-) and wind energy has been given preference as renewable energy sources over the likes of Biomass energy. (an example could be the establishment of the large wind farms in the North Sea) – Would you agree that this seems to be the case or do you have similar examples of government supported subsidies for the biomass energy sector?

*“Yes this is correct.” Carsten does not know about any special cases of big governmental support for biomass projects similar to the large wind farm in the North Sea. Carsten believes this is because the source of solar and wind energy is limitless (naturally), whereas the wood chips needed to produce biomass energy is very limited. “There were some projects in the past, e.g. producing fuel from Biomass – but almost all projects failed on grounds of efficiency and cost. The prices for wood increased the last years – in 2005 they even doubled, and so many projects have been stopped.”*

*“Germany has a big negative effect on the cost effectiveness of the power plants as most plants cannot utilize the heat they create when making electricity from wood chips. The biogas plants have a similar inefficiency. Whereas in the 1970's Denmark invested a lot of*

*resources in the “warm water” heat infrastructure for houses, Germany invested in gas heated infrastructure instead. “*

40. Are you as an organisation or individual, involved in any biomass energy interest groups, which purpose is to lobby the advantages of biomass energy compared to other renewable or lignite energy sources?

- If yes, can you elaborate on your activities within this type of interest group?
- If no, do you know of such interest groups who might exist in the renewable energy industry, as example a group of companies that has come together to push for more political and public knowledge of either solar, wind or biomass energy?

*“No we do not participate in this type of political interest group. In Germany we are only a small company and focus our engagement on forestry and the policies related to this.”*

*Carsten recognizes that there are these types of interest groups “out there” but does not know anyone specific or the contact details for these.*

41. What are your personal thoughts on the Danish management’s focus and dedication to your German subsidiary? I am particularly interested in learning how you feel the freedom of making operational and strategic decisions are left with yourself or typically managed from Denmark, and also what level of experience and knowledge sharing that are being offered by your Danish colleagues?

*Although Carsten and his team work very autonomously from the Danish organization, Carsten believes the cooperation between Denmark and Germany is great and that there is no issue in the way the Danish management operates their German subsidiary.*

42. To what extent do you feel that your Danish superiors understand and respect the German business and organizational culture in Heidegesellschaft itself, but also in your potential customer’s organizations?

*Carsten feels that there are no issues related to cultural differences between Denmark and Germany in HedeDanmark/Heidegesellschaft. Quote from Carsten “In our global world the differences are getting smaller and smaller, especially in the European community.”*

