MASTER THESIS – COPENHAGEN BUSINESS SCHOOL

NAVIGATING THE RENEWABLE ENERGY SPACE

AN EMPIRICAL STUDY AND COMPARISON OF PROFITABILITY AND CAPITAL STRUCTURE IN ENERGY COMPANIES WITH KEY CONSIDERATIONS FOR STATOIL NEW ENERGY SOLUTIONS

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EXECUTIVE SUMMARY / ABSTRACT

As 97% of climate scientist believe in global warming, there exist overwhelming consensus that the global energy mix needs to change in order for future generations to survive. Renewable energy investments have however suffered from lack of financial returns leading reluctance to tunnel sufficient capital into the sector. This thesis explores the intersection between pure financial analysis and analysis of the renewable energy space. With this as the backdrop, the authors sought deeper understanding of the actual performance of renewable energy companies, its drivers, trends and opportunities lying ahead in order to provide valuable input for Statoil New Energy Solutions.

This thesis analyse renewable energy from numerous angles with several financial tools. To answer the problem statement, annual market data and financial statements for 32 companies have been gathered, some as far back as 1997 until 2016. The extensive data material is structured and analysed through financial statement analysis, which resulted in key metrics, on firm and sector level. To complement the analysis of company accounts authors have explored relevant theory on capital structure and performed an industry analysis of the wind and solar market. Further, a multiple analysis is performed to understand pricing mechanisms and especially to explore investor sentiment towards financing- and capital structure. Finally, corporate finance elements are explored with a qualitative approach in order to reach potential recommendations for Statoil New Energy Solutions.

The profitability analysis suggests that renewable energy companies reflect underlying projects with high gross margins, but also that divestments of non-core assets have depressed results lately. Pure renewable companies have more steady margins and earnings due to contracted revenues, and are thus less affected by commodity prices relative to oil & gas and utilities. Leverage is consistently high among firms with high exposure towards renewable energy assets reflecting underlying projects with high debt capacity. YieldCos perfectly mirrors the underlying business as described above, and have been trading at impressing premiums due to lofty growth expectations, which led to the dramatic crash in 2015. The analysis further suggests that the transparency and asset/revenue visibility of pure play renewable firms has been greeted by investors leading to high valuations. Inferior quality and time perspective in financial data on pure play renewable firms generally reduces value of analysis.

Finally, we find that staging strategies and capital recycling has been crucial for the strong project IRRs of firms such as Dong Energy and EDPR. Project financing is more utilized in renewable energy projects as banks become comfortable with the risk picture. The choice between project financing and balance sheet financing is however still based on overall company specifics rather than any consensus rules. Understanding the YieldCo model and history could prove valuable for Statoil NES.

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1. INTRODUCTION

With the recent Paris Agreement, there is an accord that we need to fundamentally change how we produce and consume energy (REN, 2017). A decade ago, the future of renewable energy looked very different from what it does today. Political forces and advancements in technologies have led to a stark increase in investments that more than fivefolded from 2004 to 2010 and peaked in 2015 amassing $312 billion. Investments last year fell by 23% to $241.6 billion, which is in fact the biggest decline in that sequence. Still, the installed capacity increased from 127.5GW in 2015 to a record high 138.5GW in 2016 due to reduction in capital costs on solar photovoltaics, offshore- and onshore wind. Renewables accounted for 55.3% of the total new power generation, whereas solar power added 75GW, more than any other power source and became the leading technology for the first time (BNEF, 2017).

Due to the increased competitiveness, oil majors have caught interest in the renewable energy market, albeit investments are still marginal. Meanwhile, utilities are continuing to invest, capturing added value in renewable projects. The current attractiveness of renewables combined with a deprived fixed-income market also led to the fruition of YieldCos. The financial vehicle model was first observed in 2013 when NRG spun off their operating renewable assets into NRG Yield. Based on fixed-purchase pricing the YieldCo model would seemingly provide investors with steady growing dividend yields. The YieldCo market peaked in 2015, raising substantial capital and gaining widespread acceptance, but growth expectations inflated stock prices that ultimately led to a crash in the market later that year. Trial and tribulations has been part of the learning process for the renewable market that still possesses substantial opportunities.

In comparison to the oil and gas industry, the renewable energy sector is still an emerging market. While most oil majors are structured financially uniformly, renewable companies apply a number of different approaches. Sharing similarities with infrastructure projects, project finance has proved a suitable option. Still, balance sheet financing is also common and there is no apparent consensus as to which is preferable.

1.1 RESEARCH TOPIC

1.1.1 PROBLEM STATEMENT

The thesis seeks to analyse and uncover financial trends across three specified sectors, with the ultimate goal of proposing important considerations for the future of Statoil New Energy Solutions. The project was initiated through a common interest between Statoil ASA and the authors to scope out the opportunities of Statoils renewable business unit, with focus on corporate structuring, capital structure and financing decisions. This has been made possible through an extensive financial analysis of 30+ companies using both company accounts and market data to detract patterns between profitability, capital structure decisions, exposure and corporate structures leading to the following main problem statement:

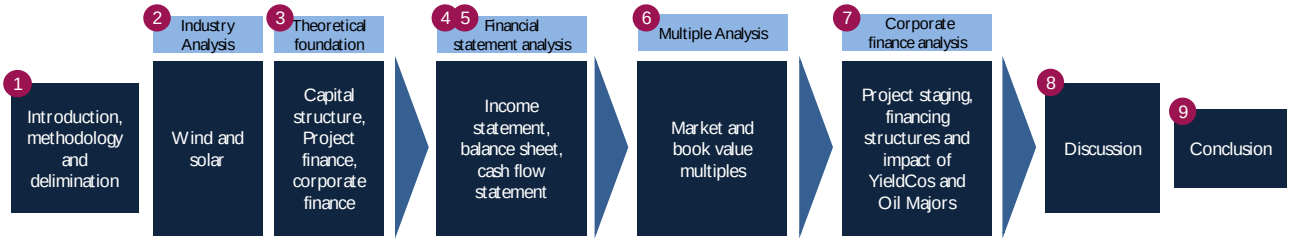
"An empirical study of profitability and capital structure considerations in renewable energy companies. What are the main drivers and determinants of profitability, capital structure and corporate structuring and how does this compare to oil majors? Based on the analysis, what are key considerations for Statoil NES going forward?"

As the thesis scope is complex and unprecedented, a breakdown of the problem statement is provided to improve the structure. As will be elaborated, combinations of a practical and theoretical approach, qualitative and quantitative research, and primary and secondary data characterize the thesis. In addition, the analysis stretches over several industries. The following sub-problem statements are investigated:

- *What are the main value drivers of profitability within oil and gas, renewable corporations and YieldCos - and what are the best practice cases observed?*
- *How has debt financing trends developed over time and across industries, and what are the underlying drivers and policies governing capital structure?*
- *What main attributes are detected within sources of funds and capital allocation policy, across time and industry?*
- *What are interesting company specific cases and what patterns can be linked to the analysis of the income statement and balance sheet?*
- *In retrospect, what can be learned from the YieldCo vehicles when developing Statoil NES?*
- *What are the take on renewable energy among the oil majors?*

The objective of the extensive sub-research questions is to create an overview in a somewhat complex thesis structure. As mentioned, the main goal is to uncover trends through a financial analysis and propose key factors for Statoil to consider in the continuing development of the renewable business unit.

1.1.2 THESIS STRUCTURE



After the presentation of methodology and theoretical framework, the thesis introduces the focal company, Statoil ASA and its renewable energy business unit, New Energy Solutions. This is followed by an analysis of the solar and wind industry, with a focus on economics, technology, value chain and support schemes. Because the renewable industries are still immature, it is imperative to gain a solid understanding of the sector before conducting the financial analysis. The financial statement analysis (5) represents the majority of the analysis, both in terms of research and output. The companies are divided into three peer groups: oil and gas, renewable corporations and YieldCos. The firms are analysed on a number of financial metrics, whereas each peer group and financial metric is presented separately. The approach is primarily based on the DuPont framework and is on a superior level divided into income statement, balance sheet and cash flow statement. While DuPont is a common method to analyse single companies, this thesis deploy DuPont on a subset of companies, which enables analysis both on industry and company level. The authors believe this adds substantial value to the project. The financial statement analysis is followed by a relative valuation analysis (6) that seeks to understand the pricing of companies, adding the market perspective to the analysis and thus, additional insight. The last part of the analysis (7) is different in nature to the preceding analysis. While the analysis clearly has quantitative elements, it uses qualitative data sources and is not directly related to the market data or financial statements, which is central in part 5 and 6. Certain factors, such as staging and financing structures are not easily analysed through financial statements and require a deep-dive into the business model and strategy of each company. Despite being time consuming, it is of great importance for the profitability and capital structure of a company. As this information is derived from press releases and annual reports, it entails certain synergies with the financial analysis. Part 7 also includes analysis of the YieldCo model and the initiatives by Oil Majors within the green sphere. This part has a material effect on both the quality of the financial analysis and the proposals to Statoil NES. The thesis ends with a discussion of main findings and potential perspectives of the thesis, before a conclusion is presented.

1.2 METHODOLOGY

1.2.1 RESEARCH APPROACH

In order to create a foundation for the answer to the problem statement, it is of importance to consider the methodology and scientific approach that will define the thesis. The methodology is often defined as the approach to build well-founded answers to the problem statement and this can be characterized as scientific knowledge (Bjerg 2006). The research philosophy, which defines the nature of knowledge, deemed valuable and acceptable for the analysis. Generally, the thesis has its foothold in the philosophy of pragmatism. The ontology of pragmatism provides multiple- and external views, which align with the research question in the most optimal way (Saunders et al, 2012). Epistemologically, in the pragmatist view both observable phenomenon and subjective gained knowledge are acceptable assumptions for generating new knowledge, allowing for both quantitative and qualitative data. Pragmatism also allows unbiased information in research, allowing for both objective and subjective points of views, which proved valuable in analysing Statoil NES structural opportunities. We could however also have adopted the constructive paradigm, which takes a relativistic view and recognizes reality as several mental constructions by humans. It generally relies on qualitative data, but sometimes also a mixed method approach (Guba, 1990). Some questions will be answered from the paradigm of constructivism in cases where one single reality does not exist. An example of this is the choice of financing (recourse vs non-recourse) where different stakeholders have different perceptions of the choice and thus, the questions needs to be analysed subjectively to understand the mental constructions and different data sources.

The thesis entails a descriptive research objective, as the overall objective is to identify current practises in the renewable energy industry and assess decisions regarding financing- and corporate structures (Olsen & Pedersen, 2008). It also employs an application-oriented research approach where it is the target group that asses the quality of the research (Møller 1990). This is combined with critical reflection towards the methodology throughout the process. Further, as we investigate Statoil NES opportunities based on a general financial analysis of 30+ companies, we move from the general to the specific and are adopting a deductive approach to our problem. We have chosen to apply a mixed research method, which entails both qualitative and quantitative data, limiting the disadvantages of mono method research. To strengthen the legitimacy of the thesis, a triangulation design is used. This entails that we view quantitative and qualitative methods as complementary, rather than conflicting to each other (Saunders et al, 2012).

1.2.2 PRIMARY DATA

While the thesis relies heavily on secondary data, primary data is collected to add complexity, depth and triangulation of the results. First and foremost, data is sourced from the company supervisors within Statoil, Mr. Wærn and Mr. Serck-Hanssen through extensive interviews and workshop sessions throughout the research period. Through the discussions, we have collected data on strategy and rationale for Statoil on current practices within renewables, but also theoretical considerations within financial theory. The discussions have been semi-structured to less structured in its nature. Further, in order to understand Statoil's positioning in the value chain and staging preferences (part 7), Marius Sandnes at Statoil Investor Relations provided useful insight through a semi-structured telephone interview. In order to gain knowledge of company events beyond what is achievable through financial statements, press releases or annual reports, several companies have been contacted over e-mail and phone for specific questions. Examples of this are Dong Energy on financing strategy or Innogy regarding its preferences towards project finance. Finally, 20+ equity analysts were contacted, of which 5 answers were received in writing and 4 telephone interviews conducted, discussing the topic of Statoil NES positioning today and going forward. The analysts cover Statoil and are among the most reputable in the Nordic market. Interviews were semi-structured and little information on purpose or context was disclosed in advance to keep the interviewees unbiased. The rationale of the interviews were not as to dilute the importance of our analysis, but were conducted at the end of the project in order to strengthen and confirm our views and suggestions.

1.2.3 SECONDARY DATA

Secondary data form the most important part of the analysis where a string of sources will be accounted for. This includes company accounts through Thomson Reuters, annual reports, academic financial literature, press releases, presentation material, news articles, a wide range of research papers, market reports and market data on share prices and commodity prices. As other researchers and institutions produce secondary data, the authors continuously review these sources and evaluate the purpose the data has been created for. This is imperative for the validity of the research which is the extent to which data methods accurately measure intended purpose of the problem statement (Saunders et al, 2012). Therefore, we constantly review validity of data. Secondary data constitutes the majority of data throughout the analysis, particularly in the financial statement analysis, which solely relies on company accounts and accompanying notes and comments. This part is based on 19 years of financial data for 32 companies within three different sectors.

1.3 LITTERATURE REVIEW

General literature and contribution to literature

Despite the practical approach, the thesis relies on a wide range of research papers and a literature review is therefore deemed to be of relevance.

The aspects of existing literature on these topics are twofold. First, to our knowledge there exists no prior research on renewable energy companies with the sample size, sample composition or financial metrics as in this thesis. Research is often made on one or two companies within renewable energy with a limited set of financial metrics. Alternatively, reports are made on one or two financial metrics (such as capex or leverage) for a solid amount of renewable companies, but even this is seldom. Further, little research compares the financial performance of renewable corporations and oil majors on an industry and company level. Secondly, no research actually analyse the financing decision between project finance and corporate finance for a company within the renewable energy space (and little research in general). While there exists excessive literature on the theoretical financial disciplines and certain project specific research reports on renewable financing, the high level considerations seem to be forgotten.

Understandably, there exist extensive equity and credit research on each company, but this is seldom lifted to a higher industry level. Much of existing market reports are distorted by companies within the manufacturing space rather than focusing solely on developers. Further, the authors have found several market reports of different depth, quality, age and sector focus. Based on the above, this thesis contributes significantly to existing literature by providing a holistic overview of the renewable energy industry based on a detailed financial analysis. It also gathers financing trends and investment stage preferences within the sample creating significant value for Statoil NES and unprecedented to the knowledge of the authors.

1.1 THEORETICAL FRAMEWORK

Generally, in order to identify current practices and trends within an industry, the thesis is practical in nature and independent of any fixed frameworks and theories. However, the financial statement analysis is partly based on the DuPont framework for analysing profitability. Relevant metrics are calculated and structured to be analysed between companies and industries. When it comes to reformulating financial statements, common financial and accounting rules applies to achieve appropriate numbers. Theory on capital structure, project finance and corporate finance are analysed and utilized in a practical manner when scoping out structuring and financing practices within the peer groups. Finally, as this thesis is a master dissertation, it relies on theories and aspects from most disciplines within the economic and financial discipline, ranging from organisations, microeconomics,

macroeconomics, statistics and several financial topics. It therefore is a result of 5 years of theoretical and practical achieved knowledge from university and off-campus activities, and a semester of deep dive into a certain topic.

1.4 DELIMITATIONS AND SOURCE CRITICISM

The problem statement naturally delimitate us to investigate the exploration and production oil and gas, renewable and YieldCo sector. Moreover, the analysis is restricted to the chosen years of data and carefully picked companies in the peer groups. However, at certain points other companies are included if interest case in points exists. Those companies are often excluded in the full analysis due to lack of data, quality of data, portfolio exposure, domicile or similar traits. Further, the analysis is restricted to the chosen multiples. The multiples universe is substantial, but the chosen multiples are the most commonly applied and considered representative as they represent both market and book values. In the financial statements, certain data quality weaknesses were detected in the process, lowering the flexibility of the cash flow analysis. Throughout the analysis, the authors reserve the right to present only a subset of data due to the waste amount of information.

The phrases industry and sectors are used interchangeably to describe the three different peer groups. While oil majors are relative homogenous representatives of the oil and gas industry, the companies within the renewable group are more diversified across several industries and to some extent, parts of the value chain. Further, YieldCos are more correctly described as a corporate structure rather than an industry as the underlying assets are similar to the interesting assets within the renewable corporation group. However, due to the widespread use of YieldCos and importance in capital markets, it could also be considered an industry. As such, the authors justify the use of industry and sectors interchangeably across the three peer groups. However, the most dramatic limitation of this research relates to the dilution of renewable energy in the renewable corporation peer group. Due to the immaturity of the industry, there are few pure players, so data material often reflects other businesses such as utility, networks, coal, retail, trading and nuclear. Optimally, we would carve out data for the renewable operations of each company, but this is close to impossible due to lack of data caused by lack of disclosure, asymmetric disclosure, few data points and weak availability of data. This and other delimitations will be discussed on an ongoing basis throughout the thesis.

2. INDUSTRY ANALYSIS

2.1 INTRODUCTION TO STATOIL ASA

Statoil ASA is a Norwegian multinational integrated energy company, founded in 1972 and partially listed in 2001 at Oslo Stock Exchange, OSE and New York Stock Exchange, NYSE. The company has operations in 35 countries, 20 500 employees and are the world's largest offshore operator within oil and gas.

Figure: 2.1.1: Organizational overview Statoil ASA

Source: Statoil ASA/Own Contribution

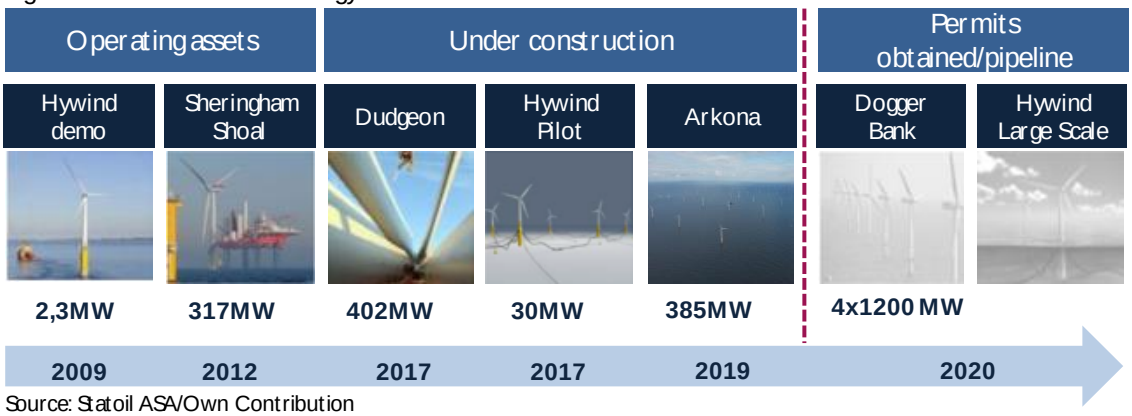
Historically, Statoil was incorporated as "Det Norske Stats Oljeselskap A/S" in Norway, a fully state owned company with the political motivation to accelerate the domestic petroleum industry and build up Norwegian competency within the field. Statoil has since inception expanded its upstream operations within exploration and production (E&P) oil and gas and has become a significant player, particularly on the Norwegian continental shelf. The company decided to become fully integrated in the 1980s, subsequently creating a downstream retail brand with presence in the Nordic countries, Ireland, and Eastern Europe. The Norwegian Government sold 18.3% of its shares in the 2001 IPO, with further sales to a 70.9% ownership by 2005. Today, the government owns 67%, while other large shareholders consist of reputable institutional investors such as BlackRock, Lazard, Fidelity and Vanguard. In the new century, Statoil has taken several strategical measures to accommodate the changing global energy markets. In 2007, the company merged with the oil and gas division of aluminium giant Norsk Hydro, while the $2bn. downstream marketing (fuel & retail) activities were spun off in an IPO in 2010. Since 2008, Statoil has gained heavy involvement in the booming shale gas industry in the US through several ventures. Today, Statoil has $60bn in assets, revenues of $45bn, delivered an EBITDA of $12bn and had a market capitalization of $58bn. As a result of high fossil fuel exposure, Statoil was hit hard by the recent oil price slump. Management quickly decided to cut spending to sustain cash flow generation, and even issue debt in order to maintain dividend policy. In recent years Statoil has grown a renewable business unit with assets within offshore wind and carbon

capture storage. Statoil has stated that by 2030, 15-20% of total annual investments will flow to renewable activities (Statoil Capital Markets Day, 2017). In 2016, Statoil Energy Ventures were created. The venture fund has $200m capital with mandate to invest in renewable energy growth companies. The renewable energy business unit, New Energy Solutions (NES), is currently one of eight business areas in Statoil.

2.1.1 STATOIL NEW ENERGY SOLUTIONS

In 2015, Statoil New Energy Solutions, NES was established as a separate unit to take part of the growing renewable energy business and utilize the vast offshore capabilities of the organization. It was initiated with a mandate to invest in profitable renewables energy projects and develop new lower-carbon business opportunities for Statoil's core products (Irene Rummelhoff, Pareto Power and Renewable Energy Conference, 2016). The underpinning rationale for the strategy is a belief in a changing energy industry and a need for diversification. Recently, CEO Eldar Sætre forecasted at the annual Oil and Money conference in London that the world will reach peak oil demand in the 2020s due to the growing electric car market (Climate Home, 2016).

Figure: 2.1.2: Statoil New Energy Solution asset overwiew



Source: Statoil ASA/Own Contribution

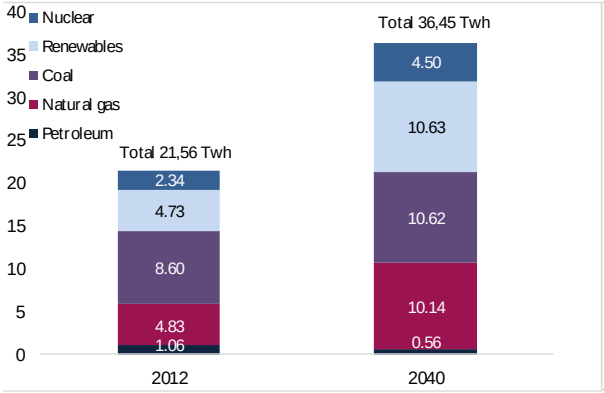
Despite long history of carbon storage solutions, the renewable activities took off after a While installed capacity currently approximates to 10GW, Statoil NES believes that this will grow to 100GW within 2030. As the world's biggest (subsea) developer, Statoil's rationale was to utilize its management of complex projects and its E&P experience offshore. As a consequence, Statoil NES sees their role as a utility scale player, potentially also in emerging markets due to their track record of handling similar risks and history with potential stakeholders (Irene Rummelhoff, CSIS presentation, 2016). Going forward, Statoil has expressed they plan to expand NES and believe that in order to grow profitably the next decade, solar, geothermal and onshore wind should also be targeted. The portfolio and project pipeline of Statoil New Energy Solutions consists of several large offshore wind projects.

- Hywind: a project of floating wind turbines offshore, potentially a game changer if successful. In 2009, Statoil installed a one-turbine demo off the coast in Norway. In 2015, Statoil made the final investment decision of developing the world's first floating wind farm. The project of 30MW represents a 60-70% cost reduction relative to the demo, requires investments of NOK 2bn and will start production in late 2017. The rationale for floating turbines are accessibility to windy deep water areas and potential economies of scale of the design. If successful, the plan is to utilize the technology to build large scale wind farms in the future.
- Sheringham Shoal: A 317MW wind park in the UK that went operational in 2011 and powers approximately 220.000 households. The park consists of 88 turbines of 3,6MW each, primarily owned by Statoil, but Statkraft and UK Green Investment Bank are brought in as partners.
- Dudgeon: 402MW project under construction in UK with expected production start in 2017. Statoil initially partnered up with Statkraft and later sold half of its shares to Masdar of Abu Dhabi, a large and growing renewable investor
- Arkona: A 385MW German wind farm in the Baltic Sea. The project requires an investment of EUR 1,2bn and is a 50% partnership with E.ON, where E.ON is developer. Operations is expected to start in 2019 and the park consists of 60 turbines of 6MW each.
- Dogger Bank: An offshore wind consent of total 4,8GW (4x1200MW) off the east coast of the UK. As Dogger Bank is still early stage, further details and Statoil's share of the project is uncertain.

2.2 INDUSTRY – RENEWABLE ENERGY

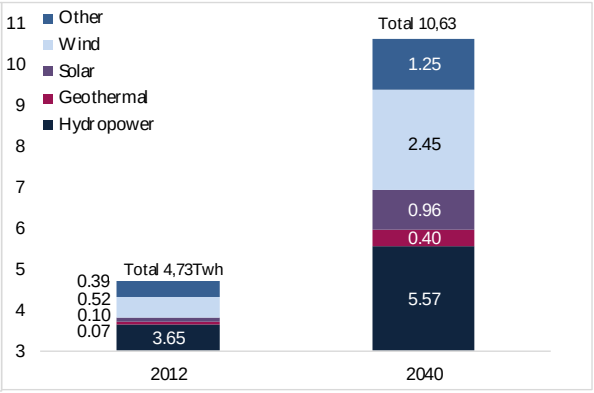
Energy generation separates between renewable and non-renewable sources. Energy resources that cannot be easily replenished are non-renewable, such as coal, natural gas, hydrocarbon gas, nuclear and crude oil. These resources are major contributors to the emission of greenhouse gases, which leads to global warming. While conventional sources supply the majority of the world's energy demand today, renewable energy resources have gained traction in recent years. The five energy resources that can be easily replenished are solar, geothermal, biomass, hydropower and wind energy. The following seeks to provide an overview of the industries of the companies being analysed, and what solutions Statoil NES is targeting.

Figure: 2.2.1: World electricity generation by fuel, Twh



Source: EIA, Outlooks/Own Contribution

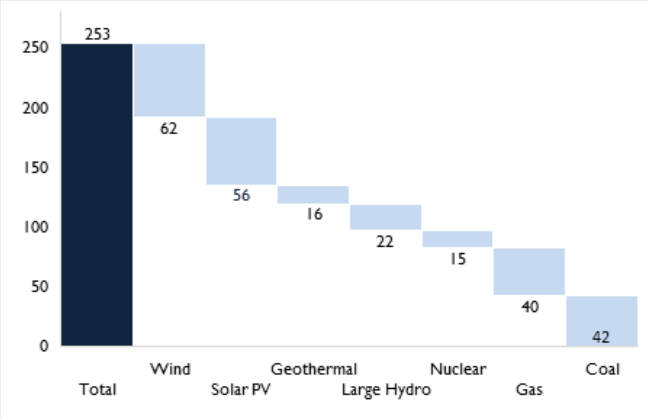
Figure: 2.2.2: World electricity generation from renewable power, Twh



Source: EIA, Outlooks/Own Contribution

The figures above depict current and expected electricity generation by conventional- (left) and renewable sources (right). Counterintuitive to many, the petroleum industry contributes little to the generation of electricity. Further, these forecasts on renewable sources may be conservative, as most former projections have been too low. When considering the total energy consumption, the story is different. In line with globalization and industrial development, demand for energy has been steadily growing. The majority of this demand has been supplied by fossil energy sources. In 1973, oil, coal and natural gas supplied 94% of the consumption in the global energy mix. This number was down to 88% at the end of 2015 (An Energy Primer, 2015). Historically, developed countries has sought to diversify the energy mix for several reasons. First, the price of oil fluctuates greatly due to demand and supply mechanisms. The most recent price-shock occurred in 2014 when the shale gas technology increased the supply, causing the price of brent oil to decline from $110 to less than $30 within a year, whereas prices are now stabilized at around $50/barrel. Secondly, efforts by government-s to reduce greenhouse gas emissions has amplified the attractiveness of renewable technologies. As the renewable industry has developed, technology improvements has reduced costs, further pushing renewable solutions into the global energy mix. The European Union has a goal of reaching 20% energy production from renewables by 2020 and Chinas latest five-year plan targets 15% renewables and 100 GW solar by 2020. India, Morocco and Saudi Arabia all have GW targets on renewables and US investments has accelerated, incentivised by subsidisation and increased efficiency (Engie Investor Presentation 2017).

Figure: 2.3: Generation capacity added in 2015, GW



Source: Bloomberg New Energy Finance 2016/Own Contribution

Renewable electricity generation represented 23% of power output in 2015, and by 2021 wind is expected to double and solar PV to triple. In 2016, investments in renewables exceeded fossil

investments for the first time, and renewables accounted for half of total installed capacity globally (IEA, 2016). IEA estimates that solar PV and wind will make up 37% of electricity generation by 2040, partly driven by greater policy support.

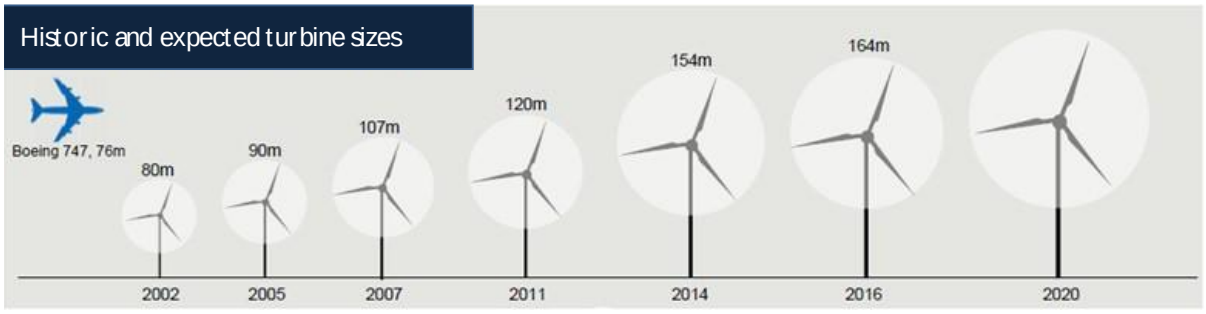
Early stage renewable energy technologies (clean tech) is highly risky and difficult to finance. Renewable energy projects are characterized by being capital intensive, yet providing stable, low-risk cash flows as power offtake are secured through long term contracts. Operating costs are marginal compared to fossil alternatives, meaning that marginal cost of producing electricity is close to zero. Further, renewable energy is an intermittent energy source, being dependent on the wind to blow or the sun to shine. Finally, as a step towards a lower carbon society, there are extensive policy schemes available in many markets increasing the economic viability of projects.

2.2.1 WIND ENERGY

2.2.1.1 Background and overview

Wind power is essential in battling climate change, ultimately reaching the goal of limiting global warming to 2 degrees centigrade compared to pre-industrial levels. The resource is fully renewable, clean to harvest and abundant in most parts of the planet. On land, global available energy base is estimated to about 1 million GW. The potential for offshore wind energy is enormous compared to current installed wind capacity (487 GW) as of 2016 (A primer on wind, 2017). As an illustration, resources within 30km off the coast of Europe is sufficient to supply the entire European electricity consumption.

Figure: 2.2.4: Turbine size development



Source: Dong Energy Investor Presentation 2017/Own Contribution

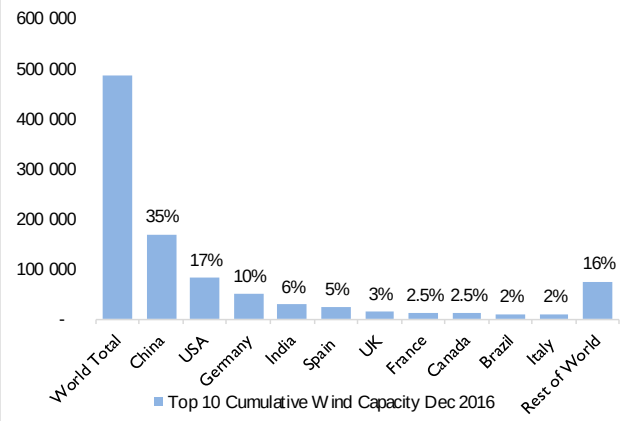
The kinetic power of wind has been used by humans since the first sail was introduced, several thousand years ago. In the Middle Ages, windmills were used to drive water pumps and assist in food production. For electricity generation, the first windmill was developed in Scotland in 1887. Utility scale production expanded in Europe and USA pre and post the second world war, but the industry was largely overshadowed by the rise of the fossil fuel industry. The rise of wind power roots back to the

1970s in Denmark, due to the energy crisis and rising worry of nuclear power consequences. In the new century, wind power competitiveness has been fuelled by technology advancements and political will from rising climate worries. As projects proved economically and technologically feasible, political interest and money poured into the industry.

Over time, turbine size has increased steadily in line with industry growth and expansion in the global energy mix. To achieve economies of scale, turbines are bundled together into wind farms either onshore or offshore at relatively shallow waters (<60m). Alternatively, and as displayed in Statoil's Hywind project, floating turbines are to an increasing degree utilized in deeper waters.

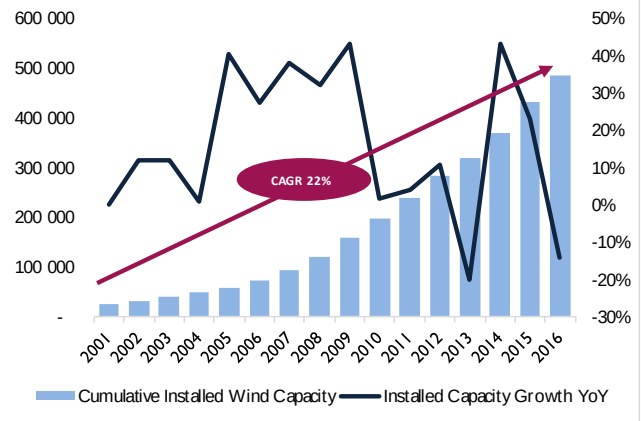
Today, wind is one of the fastest growing energy sectors with investments of more than $109bn in 2015, and has achieved a cumulative average growth rate, CAGR in investments of 17% since 2004 (BNEF, Investment Trends 2016). Installed capacity has more than four-folded since 1990 with current total number of wind turbines reaching 314 000 by end of 2015. Growth in recent years are boosted by development in Asian countries, with China representing almost 50% of global installations in 2016.

Figure: 2.2.5: Cumulative Capacity in MW by Country, Dec 2016



Source: GWEC/Own Contribution

Figure: 2.2.6: Cumulative installed capacity of onshore and offshore wind, MW



Source: GWEC/Own Contribution

The rise of wind power does not only benefit the climate, it brings huge social and economic repercussions. By the end of 2015 more than 1.1m worked within the industry and 550.000 additional jobs are expected to be created by 2020 in EU alone (GWEC, 2015). Current issues with wind power is its intermittency and grid integration challenges. Reliance on support schemes and subsidies also pose as a drawback, but an increasing degree of onshore (and offshore) projects are becoming economically sustainable.

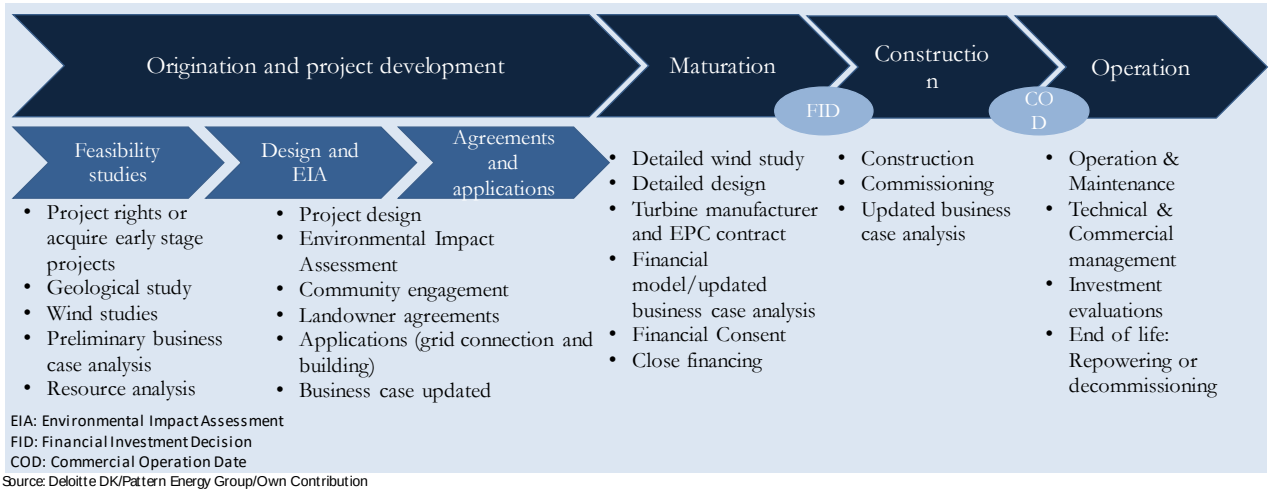
2.2.1.2 Technology, Value Chain and Logistics

The phenomenon of wind is caused by rotation of the earth (Coriolis effect) or irregularities of the suns heating and earth's surface. The profile of turbine blades enables energy generation by converting wind energy into low speed rotational energy. The physics are similar to an airplane wing, where the blade

rotates due to an increase and decrease in air pressure above and below the blade. As a rule of thumb, 5 meters per second (m/s) is the minimum operating wind speed, while winds exceeding 20 m/s often leads to a temporary shutdown of the turbine.

Each turbine has over 8000 parts, which needs to be sourced and produced. Offshore, site, including wildlife impact, bottom assessment, maritime logistics and foundation construction needs to be handled. In onshore projects roads must be built, land rights negotiated and wildlife impact assessed. The figure below describes the main processes and milestones in a typical wind project.

Figure: 2.2.7: Typical project lifecycle of an onshore wind project



Source: Deloitte DK/Pattern Energy Group/Own Contribution

Despite operational improvements recent years, the immature industry still experiences several constraints. Costs are decreasing rapidly, but there is potential for optimization as market participants are gain experience. Examples of inefficiencies are supply chain bottle necks, lack of people with the right skills, issues of obtaining consents, access and capacity of grids and the time dependent balance of risk (Deloitte- Establishing the wind investment case, 2014). Further, balancing of risk is an essential question in the viability of wind power development and has been a challenge due to the asymmetric need for capital with project risks frontloaded and financial returns back ended. The essence is the wide variety of early stage risks related to construction, technology, volume and price volatility that no party is willing to cover. This leads to a "financing gap", where projects lack sufficient funding. The risk aversion is due to lack of experience in crucial phases but as will be analysed later, some companies have adjusted its business models to exploit and harvest these potential risky returns.

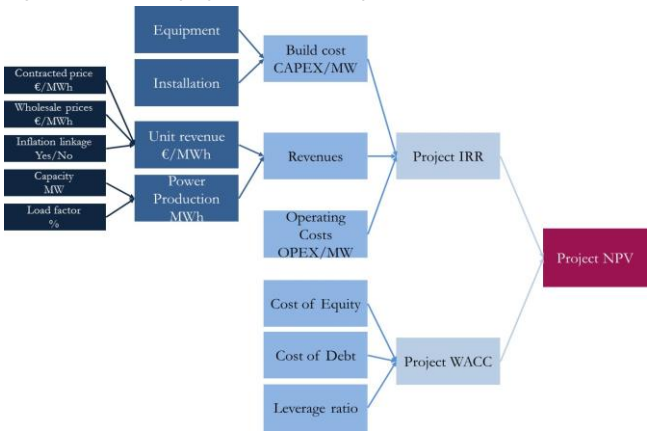
Despite challenges, supply chain and project management improvements have driven the industry towards a more competitive position. The entire value chain has developed in line with increased investments into the sector, from supply vessels and turbine parts to consultancies and advisors. The importance of infrastructure development is underlined by Lars Thaaning Pedersen in the Danish fund

Copenhagen Infrastructure Partners: "*The industry is still new and developing in the United States. There will not be a long-term market for offshore wind if we do not establish a supply chain"* (U.S.News, 2017)

2.2.1.3 Economics

Overall, the profitability of a wind project depends on the levelized cost of producing electricity and the revenues generated over the operational lifetime. Revenues are a function of produced output and power prices, where expected production depends on wind speeds, directions, air density, temperature, humidity and how these factors match with the chosen turbine type. Expected production can be modelled in detail through wind studies over 2-5 years and additionally incorporating expected losses from wake effects, electrical losses and down time due to maintenance (Deloitte- Establishing the wind investment case, 2014). Revenues are often contracted prior to construction through offtake agreements with fixed or semi-fixed electricity prices. Counterparties for these power purchase agreements (PPAs) can be governments, utilities, military, regional public institutions or other large consumers. Parks may also operate without long term contracts, applying floating prices, but this increases price volatility which increases cost of capital leading to lower returns. Incentives have been an essential part of wind profitability. Project NPV is dissected in figure 2.2.8.

Figure: 2.2.8: Wind project economics explained

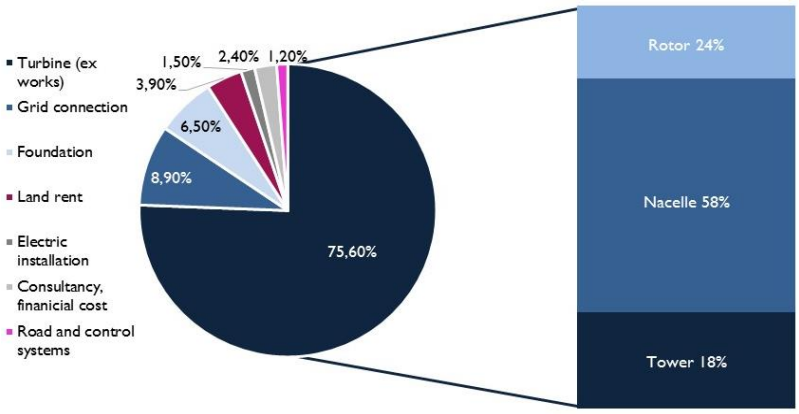


Source: HSBC, Dong Energy AS/Own Contribution

Levelized cost of electricity (LCOE) is a measure that enables investors and producers to compare the profitability of different energy projects. The metric represents the all-in cost of generating each MWh of electricity and includes all costs i.e. project development, fuel, construction, financing and O&M over the lifetime of the project. As mentioned, wind projects are characterized by large upfront investments and low operating costs, leading to a low marginal cost. The cost breakdown changes in line with the rapidly changing industry. However, a rule of thumb is that 75% of total costs are related to upfront capital investments. In comparison, fossil fuelled technologies as e.g. a natural gas plant have 40-70% of costs related to O&M and fuel (AWEA, Economics of Wind 2009). Turbines alone compromise approximately 75% of capital investment, while remaining costs relate to grid connection, foundation and land rent. In the turbine, the nacelle (housing all generating elements) is the most expensive component. Because the variable costs are so small, wind projects often yield EBITDA margins around. 60-90%. Several operating costs such as land lease, insurance, management costs and maintenance can be fixed amounts, but may also

vary with production. Service and spare parts (O&M) makes up 26% of total OPEX for onshore and 53% for offshore according to Deloitte. These costs are often covered by service contracts with turbine suppliers and are somewhat higher for offshore due more tear and more complex and expensive logistics. A typical breakdown of the investment costs is presented in figure 2.2.9.

Figure: 2.2.9: Cost structure of a typical onshore wind project



Source: NREL/Own Contribution

Onshore and offshore wind differs greatly when it comes to cost, maturity and operations. Capital cost in offshore wind is often 2-3 times higher than onshore, yet investments and focus offshore increase relative to onshore. This is partly due to scale advantages, but also lower visual impact and higher and more reliable wind speeds as farms move further offshore. Thus, the higher cost is offset by higher total electricity production (AWEA, Economics of wind 2009). Cost differences between offshore and onshore boils down to the complexity of the project. The Balance of Plant, i.e. foundation, grid connection and construction are generally costlier offshore, while turbine costs makes up less of total cost. Additionally, larger depths and greater distance from shore have negative impact on project economics (Deloitte- Establishing the wind investment case, 2014).

Looking ahead, larger turbines are expected to drive cost efficiency in the industry. Turbines in the 1990s was as small as 150kW, while Siemens and Vestas currently are working on 10MW turbines. Increases from today's sizes are also a prerequisite for success of projects that are auctioned today and built in the coming years. An example of this was the recent German auction where auction bids were subsidy free and expected turbine capacity was 13-15 MW by operation in 2024 (Offshorewind.biz, Dong Energy 2017). Ceteris paribus, larger turbines mean fewer turbines, fewer foundations and less construction work needed. Increase in park sizes yielding scale advantages and clustering of new parks around existing parks are expected to lower cost of O&M and CAPEX (transmission cables and substations). Further, increased competition in the supply chain are expected to contribute to cost cutting in areas such as construction vessel size, consultancy providers and cable capacity. Onshore wind has experienced an almost unprecedented cost reduction in recent years, and could be used as benchmarking to predict offshore cost development. Onshore has reached grid parity[1] several places,

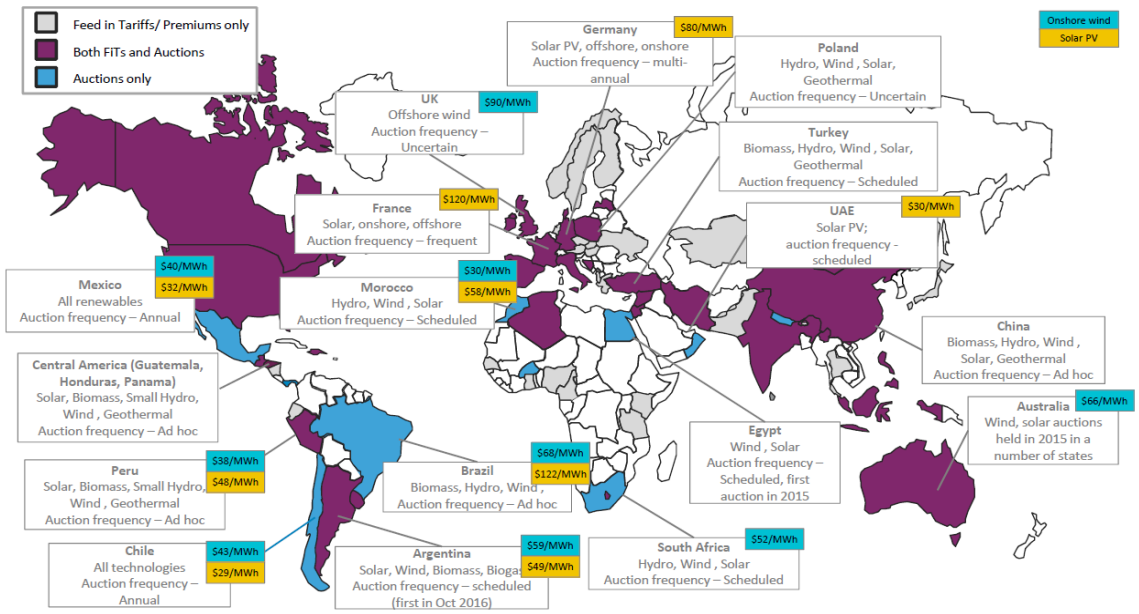
[1] Grid parity: LCOE competitive with other energy sources without subsidy support

with the lowest LCOE in US at EUR 47/MWh (SEB, Dong Energy 2016). In light of future subsidy regimes, for offshore wind to be competitive, it needs to reach full grid parity in the 2020s.

2.2.1.4 Policy design considerations

Support policies has contributed to the worldwide renewable energy expansion in recent years, industrializing and creating learning effects. Support policies aim to address market failures, help grow the industry, job creation and secure energy diversification. Each market has unique policies that seeks to encourage private investments. Support schemes are common for most energy sources, and currently fossil fuels receive 6-7 USD for each USD going to renewables (IEA, WEO 2016). Projections on subsidy dependency varies, but as cost comes down the general consensus is that onshore wind is profitable without support in several markets and offshore in the 2020s at the earliest, yet as shown in Germany recently, this may be accelerated.

Figure: 2.2.10: Selection of recent global auction results - global overview



Source: Baringa Analysis/IRENA

Incentive schemes are structured differently for each country, but the common goal is for it to be market based by incentivize capacity additions and operational improvements. The three main invectives are Feed-In-Tariff (FiT), Renewable Obligations (RO) and Tax credits. FiT is a constant tariff paid either for power produced in addition to the market price or a fixed payment. Further, it may be capped if sum of subsidy payment and power price reaches certain levels, partly limiting upside for developer. ROs are general obligations on power utilities requiring them to source part of the consumption from renewable energy. It can also come in the form of certificates that are traded on a secondary market. Tax credits may be income tax credits where a capital cost to a certain degree is

deductible from future income streams. This works as a rebate on payroll taxes. Production based tax credits (PTC) is a well-known example of tax credits. Worldwide, the FiT are most used, while in large markets such as US and China, all schemes are provided (Deloitte - Establishing the wind investment case, 2014). However, policies are changing fast and most markets are moving towards market based mechanisms instead of state-determined payments for every KWh fed into the system. These demand- or reversed auctions involves a tender where only selected renewable generators benefit from the support tariff based on prices from bids in the initial auction (IRENA 2013).

It is crucial to emphasize the importance of stability in these regimes, as a change would have severe impact on project economics. Investors are risk adverse, making stable framework conditions imperative. Examples of this are Spain where no capacity were added in 2015 for the first year since 1980 due to policy changes, or UK where changes impacted onshore wind development. The tender process structure has led to record low project costs. In 2016, Vattenfall won the tender auction on Kriegers Flak, Denmark with only EUR 49,90/MW, which was 30% lower than Borssele, The Netherlands, the same year. It is also notable that Kriegers Flak is half the price of the 400MW park Horns Rev from February 2015, which initially received headlines for its low bids (Vattenfall wins Kriegers Flak, 2016). Tender auctions in Denmark and Netherlands has showed 50% decrease in offshore compared to prices in former Contract for Difference (CfD) schemes in 2014 in UK. Further, recent auctions and deployment plans suggest onshore wind can be built for USD 60-80/MWh and in the near future markets with good resources and favourable financing could see onshore wind at USD 45-65/MWh (IEA 2016).

2.2.2 SOLAR ENERGY

2.2.2.1 Background and overview

The solar industry enables electricity generation from energy created by the sun, extracted through solar panels. The panels are made of photovoltaic (PV) cells which convert sunlight into direct current electricity. Unlike the wind industry, a large part of the solar market is household applications where panels are installed on the roof. Currently, new additions are split between approximately 60% utility scale, 25% commercial segment and 15% residential segment. However, utility scale will be in focus as this reflects the positioning of Statoil and the companies analysed.

Total new investments in clean energy were $242bn in 2016, 23% lower than in 2015. The decline in investments is partially due to cheaper fossil fuels, but mainly because of decreasing costs in solar PV, which had a solid effect as 40% of total investments went to solar. In addition, solar PV is expected to lead renewable capacity growth going forward, with additions of over 300 GW (BNEF, 2016). The

contrasts are stark to the very beginning, when Alexandre Becquerel observed the photovoltaic effect in 1839. Research on the physics of utilizing solar power to generate electricity continued throughout 19th century and 20th century, but the focus remained on personal applicability and off grid solutions. The focus has later turned towards utility scale production, attracting large institutions, financial players and corporations to acquire and develop projects. Since 2005 the industry has experienced unprecedented growth, whereas global capacity increased from 4.5GW to 225 GW by the end of 2016 (McKinsey, Darkest Before Dawn 2016). In the 1990s subsidies made PV economically attractive, which sparked a surge in demand, increase in new entrants and acceleration of innovation. As the Chinese caught interest, large-scale and low cost manufacturing became the tone-setter. Prices dropped, demand grew quickly, but margins were squeezed and the downward spiral has since continued as the cost deflation runs its course.

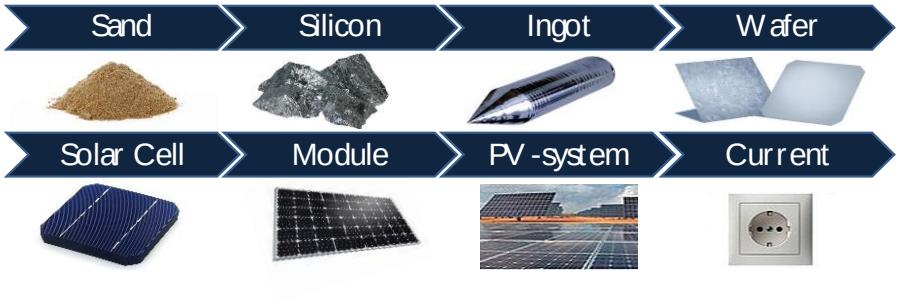
Despite media coverage and promising industry trends, companies within the industry has experienced volatile and challenging years. Both public and private companies have seen falling margins and increased competition. Most solar tracking Exchange Traded Funds (ETF) and indexes has declined over the last 1-5 years. Further, as with wind, an essential issue is the intermittency of the energy source, which has incentivized increased research into storage technology.

2.2.2.2 Technology and Value Chain

Technology and value chain improvements are the main drivers behind the cost improvements characterizing the solar industry. The consequences of the cost declines have to a varying degree affected the market participants, dependent on the positioning in the value chain. Ceteris Paribus, one would assume that the declining costs would have a positive effect on developers as cost of materials is cheaper. It is therefore important to differentiate the solar PV value chain. Even though the focus of this dissertation remains at developer level, understanding the entire value chain is imperative.

Solar cells come in many shapes and sizes. Early development stems from space exploration as on site power was needed for space crafts. Today, the panels used in solar projects are made of solar cells which use semiconductor materials of which silicon wafer is the most dominant technology. Even though the technology itself is straight forward, the abundance of materials and alternative technologies complicate the situation. Sunlight can be considered a flux of photons, and these photons are converted into electric energy. The efficiency of the energy conversion depends partly on the absorption capabilities, and is crucial to create effective solar panels, and harvest the energy from sunlight in an optimal way (Solar Primer, 2011)

Figure: 2.2.11: Solar PV Value Chain



Source: Own Contribution

With no moving parts, solar technology is robust and requires little maintenance compared to other conventional sources. As can be seen from figure 2.2.11, panels consist of several layers of materials which is sourced from different raw materials. A waste number of companies are included in the process of electricity production, often with strong degree of competition. In light of the rapid cost declines recent years, the industry has seen and will continue to see large structural changes. Thus, there has been and is expected to be consolidations vertically among manufacturers. For project developers, the competition has two effects; the deteriorating market environment threatens investments and entries into solar which could hurt the long term potential of the industry. On the other hand, it improves project economies. For end consumers, the low electricity price environment has been favourable. McKinsey believes the industry matures and will experience a more stable and expansive growth going forward. The consultancy emphasizes the focus on cost cutting in addition to innovation in order to succeed in the future. Further, McKinsey advises companies to learn from more mature industries to optimize practices within procurement, supply chain management and manufacturing.

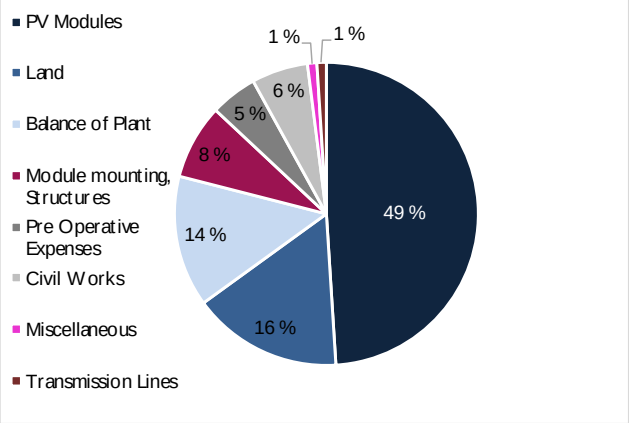
2.2.2.3 Economics

Solar PV deployment is an unparalleled story of growth going from zero to a substantial player, leading the renewable energy expansion. According to IEA 2016, Solar PV cumulative capacity is expected to double from 225GW in 2015 to 547GW in 2021. This represents 16% growth annually and is primarily driven by cost reduction expectations and improved policy environment. The FiT regime in China and Investment Tax Credit (ITC) in US are expected to continue drive investments in utility scale solar. Emerging markets are showing promising tendencies with investments exceeding those in the developed world for the first time in 2015 (BNEF, 2016). As with wind, solar PV is an intermittent energy source that only produces electricity when the conditions are right (when the sun shines). Thus, load profile, efficiency and grid capacity are important assessment factors.

A projects profitability depends on LCOE and revenues generated. The predetermined sales price, electricity quantity and subsidy scheme are often bundled in an offtake agreement between developer and customer, called a Power Purchase Agreement (PPA). While the developer is the investor or seller of electricity, the customer may be the government, local authorities or any institution buying the

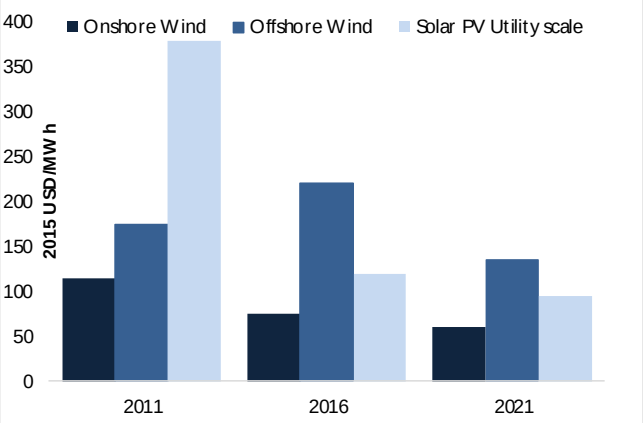
electricity over long term contracts and providing it to end customers. For developers, cost improvements lead to lower cost of solar panels and higher margins. However, governments anticipate this development and adjust support mechanisms towards market based auctions and subsequent lower bid prices. Recent Power Purchase Agreements from growth markets has indicated bid prices in tenders as low as USD 30-45/MWh going forward (IEA, 2016). The competitive auctions environment force developers to optimize operations and financing in order for projects to remain economically attractive. Part of this optimization may reduce margins in the supply chain for balance of system cost, ie. for all PV component manufacturers. As the industry matures, risk factors may be addressed leading to lower cost of capital. Furthermore, developers expand globally, gaining experience and cutting out cost inefficiencies in several countries. To sum up, there are substantial investments flowing into solar PV, leading to expected capacity increase. However, revenue is affected by lower realized prices due to competitive tender auctions.

Figure: 2.2.12: Cost structure of a typical PV Project



Source: NREL/Own Contribution

Figure: 2.2.13: Global weighted average LCOE for each industry



Source: IEA 2016/Own Contribution

On the cost side there are massive changes that have repercussions throughout the supply chain, receiving the majority of headlines. From 2010-2015 module prices declined by approximately 70% globally, with regional variations depending on demand-and-supply dynamics, trade measures and support schemes. As part of the supply side, global manufacturing capacity increased by 30% in 2015, overflowing the market and pressing down costs. More than half of manufacturing capacity is now situated in China, and Chinese companies are investing in capacity in other Asian countries (IEA, 2016). According to research by IEA 2016, PV capital costs will continue to decline due to global learning in module production and improvements in Balance of System costs. Further, improvements in technology will lead to more efficient processes for wafers manufacturers- and cells manufacturing and better capacity factors. In figures 2.12-2.13, LCOE and project cost breakdown are displayed. It should be noted that LCOE is a weighted average, and ranges. Projects economics are still positive due to cost slumps, but developers would favour increased long term prices or less competitive auction.

Certain low contracts may reflect different market-specific factors such as price escalations, special low-cost financing, exceptional capacity factors and additional subsidies for land and grid connection. This makes comparisons among different markets (or even different projects within the same market) difficult. In addition, delivered project costs may differ from those reported at the time of the auction or the signing of the PPA.

2.2.2.4 Policy design considerations

As with other renewables, the growth of solar PV the last decade is partly led by increased support schemes. In 2014, IEA expected subsidies in 2035 to amount to USD 240 Bn, up from a previous estimate of USD 90 Bn. As experienced in wind, countries cut costs by changing subsidy structures towards more favourable mechanism for governments. Research shows that countries can achieve 30% savings the first years after changing from awarded fixed prices (Feed-in-Tariff) towards reversed auctions where developers are forced to bid prices for developing a certain amount of capacity (Wilson, 2016).

Even though the specifics of the support schemes differ from wind to solar, the main mechanisms have similar characteristics. Government generally deploy three different support programs to incentivize investments: feed-in-tariff, tradable green certificates and tax incentives. The tax exemption scheme is used to spur solar deployment and may apply to capex, production, increased depreciation or lower income tax and differs dependent on local authorities. The main tax credit is the Solar Investment Tax Credit that has been successfully deployed in the US, providing 30% tax credit on investment against tax liabilities. This has provided market certainty and facilitated long term investments into the industry (Solar Investment Tax Credit). Feed-in-tariff is a support scheme that ensures developers a fixed power price for a certain period, removing price exposure risk and improving project economics. A common system is the Contract for Difference (CfD), where price is based on the difference between strike price for full production volume and market prices. As mentioned previously, governments are moving from CfD to competitive tender auctions. The recent deployment of auction practices has led to record low bid prices as developers must compete for projects on several financial and non-financial indicators. The more interest in a given project, the lower the awarded price and thus, the smaller is the deadweight loss.

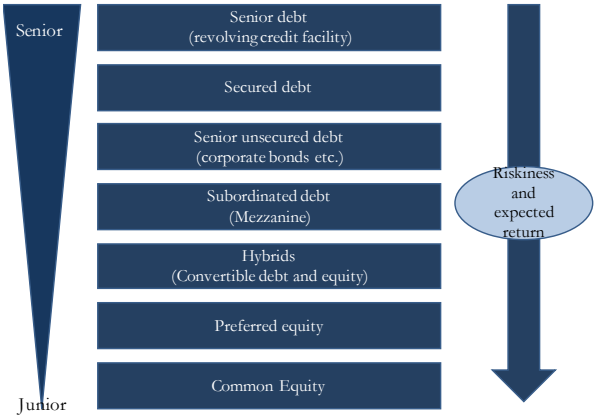
In China, the FiT should continue driving growth, while the US ITC is expected to maintain its important role in utility-scale deployment looking ahead. Aside from these two countries, policy-driven and government-administrated auctions should spur the majority of new additions, especially in Latin America, the Middle East and Africa (IEA, 2016).

3 FINANCIAL LITERATURE REVIEW

In deciding upon the optimal capital structure for a certain project or enterprise, one must carefully evaluate the pros and cons of various sources of financing. Furthermore, financing can be separated between the two main approaches, corporate finance and project finance. Both terms are loosely used by academics, investment bankers and asset managers to describe a range of financing arrangements. The next section seeks to describe capital structure theory and compare the two financing approaches.

3.1 CAPITAL STRUCTURE THEORY

Figure: 3.1.1: Characteristics of seniority in the capital structure



Source: Own contribution

Before turning to corporate finance and project finance, it is essential to understand the underlying factors impacting capital structure decisions. Despite its obvious importance, capital structure appears to be a key financial decision still not completely understood. Finance professionals worldwide have published a vast amount of papers on how debt and equity can be combined to maximize firm value, without providing definite answers. This part will briefly go through the main theories and describe crucial decision points in capital structure decisions that will prove valuable in later analysis.

Companies can choose from a wide range of instruments, from common equity, bank debt and bonds to more exotic versions such as hybrids or convertible instruments of debt or equity. Conventional rules of thumb compare the tax benefits of debt against the increased risk of financial distress. In other words, companies should seek to minimize the cost of capital, thus maximizing company value. The main theories of capital structure are currently grouped into three categories: taxes, contracting costs and information costs.

Taxes: The most obvious benefit of debt financing is reduced taxes as interest payments are tax deductible. Thus, replacing equity with debt reduces taxable income and increases value of firm. It does not propose that 100% debt is optimal because investor taxation should also be considered, whereas income tax is often higher than capital gains tax. This theory is also known as Miller-Modigliani Proposition 1 with taxes. However, the argument is that a company that pays more taxes by not using its debt capacity is leaving free cash on the table (Barclay & Smith, 1999) As an extension, Miller Modigliani's targets the above from a theoretical point of view. The second theorem without corporate

taxes propose that increased leverage leads to a higher required return on equity as equity becomes riskier. The theorem with corporate taxes argues that increased leverage should lead to a lower WACC as a result of the interest tax deduction (Berk & DeMarzo, 2014).

Contracting Costs: Conventional theory regards the opposing powers of increased debt on interest tax shield and financial distress cost. The financial distress costs regard both the actual direct costs associated with a bankruptcy process, but also the underinvestment problem that can be substantial and threaten future value generation of a company. The rationale is that highly leveraged companies may forgo investment opportunities and reduce R&D budgets, because remaining cash flow goes to debt service. They may also loose employees, suppliers and other connections because of counterparty risk and risk of financial distress. Another aspect of the underinvestment problem is the cost of investor conflict, namely the different incentives of debt holders, managers and shareholders. Shareholders in a highly distressed company may want to invest in cash, because any value creating investments would primarily benefit debt holders. The same argument limits the possibility of infusion of equity to investments, at favourable terms for the company.

On the other hand, according to the free-cash-flow hypothesis, debt can discipline managers to avoid spending on perks or negative NPV opportunities. The reduction of overinvestment is particularly important in companies with strong cash flow, few growth opportunities and dispersed ownership (Koller, Goedhart et al, 2010). Disciplining through leverage is also widely used in Private Equity transactions. These balancing powers of leverage are much quoted by academics and practitioners. Mature companies often have higher leverage, as the underinvestment problem is most severe for growth companies, while mature companies are most exposed to the overinvestment problem. This is due to the strength of cash flow of mature companies, as opposed to the intangible investment opportunities, or growth options of growth companies (Barclay & Smith, 1999).

Information Costs: As corporate executives or managers have inside information there exist information asymmetry between managers and investors. *Signaling* and *pecking order theory* has emerged in the wake of the information disparity phenomenon, and provides contrasting views to the above theories. Information cost theorems regards how companies raise capital rather than finding an optimal weight between debt and equity. Nevertheless, the type of capital raised has a great impact on actual capital structure.

With **signalling**, managers in undervalued firm can increase share price by communicating information to the market, but it only succeeds if the signalling is credible. Economic theory states that information disclosed by managers is only credible if the cost of lying is large enough to force managers to signal the truth. Therefore, companies should issue debt because it signals higher future cash flows that is

used to service debt. In other words, it clearly displays confidence for the company. Further, as bondholders receive fixed payments and shareholders the residual, the share price is more sensitive to positive undisclosed news than bond prices. Management of undervalued companies should generally issue debt, and only use equity as a last chance. Opposite, if management believes the company is overvalued, it is likely to issue equity, which would be negatively welcomed by investors, as they understand the signalling of overvaluation. In equity issues, share prices decline on average 3%, but this also reflects the mechanical dilution of the existing shareholders (Barclay & Smith, 1999). **Pecking order theory** continues on the rationale of signaling, stating that information costs are so dominating that it trumps all other considerations. Pecking order thus propose that companies maximize value by meeting investment needs by first using internal funds (retained earnings), then issuing debt, and as a last resort, issue equity. The theory believes investors draws the conclusion that financing method is a direct result of management belief in future prospects. Pecking order theory could therefore be called a more extreme version of the theory of signalling. Because investors view equity issue as a message of overvalued stock price, management tries to avoid this outcome (Koller, Goedhart et al, 2010). What can be concluded from this view is that more mature and profitable companies use internal funds, and thus have lower leverage. Growth companies are typically higher leveraged, in stark contrast to the theory of tax and contracting costs. As described, there are opposing views on capital structure. The structure often depends on market conditions and company specific factors. This will be described more neatly in the end of this section and when discussing the optimal structuring of Statoil NES in the discussion part.

3.2 CORPORATE FINANCE

Corporate finance is a term that covers a vast majority of tasks relating to running a business from a financial point of view. In general, corporate finance is primarily concerned with maximizing shareholder value through implementation of various financial activities. One of these activities is capital investment decisions. Making solid capital investment decisions are pivotal for a firm that seeks to maximize shareholder value. However, there are many things to consider whenever a capital investment decision is made. One of these subjects is the capital financing. As the name implies, corporate finance considers the financing decisions relating to running a corporation. Corporations raise their capital through debt, retained earnings or equity i.e. they fund their project off of their balance sheets (Corporate Finance Explained, 2017). A company may borrow money from commercial banks, financial intermediaries and issue debt securities through investment banks. A corporation can also raise money through issuing new stock or selling existing stock to equity investors. One of the aspects where corporations differ from projects or other enterprises is that they are most often

considered as a going concern. This entails that corporations are operated in such a way that the timespan of operations is indefinite (Going Concern, 2017). In turn, this affects how a corporation is financed.

3.3 PROJECT FINANCE

Project finance is often portrayed as a new financing technique, but the first traces of project finance dates back to at least 1299 A.D. The English crown financed exploration and development of Devon silver mines by repaying the Florentine merchant bank with output from the mines. The bankers held a one-year lease and mining concession i.e. they were entitled to as much silver as they could mine during the lease agreement. This was one of the earliest examples of applying a projects output and assets to secure financing. Another example is the ship voyages until the 17th century that were financed by investors whom shared the proceeds from the voyages. The projects were carried out on a voyage-by-voyage basis that allowed the investors to continue investing in the next voyage or allocate their capital otherwise. This form of financing emphasizes another trait of project finance, which is the finite life of a project or enterprise. In corporate finance terms, this predetermined liquidation of a project can be thought of as a fixed dividend policy. In those scenarios, the managers of the enterprise are not concerned with the option of reinvesting earnings.

Given the complexity surrounding project finance, the term has not yet established a singular definition. Larry Wynant (1980) defined it an article in Harvard Business Review as "a financing of a major independent capital investment that the sponsoring company has segregated from its assets and general purpose obligations". Nevitt and Fabozzi (2000) later defined it as "a financing of a particular economic unit in which a lender is satisfied to look initially to the cash flow and earnings of that economic unit as the source of funds from which a loan will be repaid and to the assets of the economic unit as collateral for the loan". The World Bank, which is one of the most significant contributors in financing infrastructure projects in developing countries, defines it as the "use of non-recourse or limited-recourse financing" (Comer, 1996). The bank further defines the terms as "a project is said to be nonrecourse when lenders are repaid only from the cash flow generated by the project, or in the event of complete failure, from the value of the project´s assets. Lenders may also have limited recourse to the assets of a parent company sponsoring a project" (World Bank, 1994).

Based on the examples and definitions provided it is becoming clearer what corporate and project finance entails although the terms still need further investigation. This next section will compare the approaches with regard to a list of characteristics to distinctly present the differences in the financing approaches.

When a new project is created the sponsor can choose to finance the venture using two alternatives:

- The project is financed through the balance sheet i.e. corporate financing.
- The project is incorporated into a separated economic entity, a special-purpose-vehicle (SPV) and financed off balance sheet, being project financing (Gatti, 2008).

The first alternative entail that the sponsor can use all assets and cash flows from the existing firm to guarantee the added credit provided by lenders. If the project is unsuccessful, the lenders can often claim repayment from all the remaining assets and both new and old cash flows. The second alternative suggests instead that the sponsor and the newly created economic entity live two separate lives in terms of financial dependency. In other words, the lenders have no (or very limited) claim on the sponsoring firm's assets or cash flow. Repayment occurs in the form of cash flow generated from the SPV or an eventual seize of the assets if the project proves unsuccessful. Furthermore, while corporate financed projects raise debt based on credit quality and profitability of the sponsor, project finance raise debt based on expected future cash flow generated by the particular project. Project financed ventures also tend to be higher leveraged, which may be explained by the nature of the project and why project finance is chosen in the first place. Intuitively, high leverage is favourable in large, capital intensive projects with stable long term cash flows. Debt to equity ratios is often between 60% and 90%, and in some cases between 90% and 100% (Pikiel. M, 2015)

However, one major disadvantage of project finance is that structuring and organizing such a deal is much costlier than financing the project on the balance sheet (Pikiel. M, 2015). The technical, legal and insurance advisors of the sponsors and the loan provider need a huge amount of time to evaluate, negotiate and process the contract terms of the deal. Furthermore, the project is costly to monitor and loan providers demand a higher rate of return because of the added risk (Ibid). At the same time, there are several advantages from applying project finance. Firstly, it allows for a high level of risk allocation. This enables the project to apply a leverage that would otherwise not be achieved. Consequently, the return on equity (ROE) or internal rate of return (IRR) increases based on the assumptions that ROE exceeds the required rate of return on debt. Secondly, as mentioned before the projects are financed through non-recourse or limited recourse loans where the loan only holds collateral through assets from the SPV. This enables the sponsors to apply their existing assets as collateral for recourse if additional funding is needed. Thirdly, since the project company is an independent economic entity, the equity investors of the sponsoring company have limited the repercussions if the project fails (Pikiel. M, 2015).See Appendix 5 for chart that summarizes the key differences between the two types of financing.

3.4 EQUITY INVESTORS IN THE WIND ENERGY SECTOR

The capital structure of wind projects differs with project specific risks, available capital, process stage and whether it is onshore or offshore. Offshore projects tend to deploy a 3:1 ratio of debt to equity with a higher degree of leverage as the project reaches operation. While debt is sourced from commercial banks, state banks, multi-laterals (EIB) and export credit agencies, the equity universe are wider, with different players preferring each phase (EWEA, Where´s the money coming from?). The equity investors can be classified as follows:

- **Power producers:** They have provided around 70% of equity historically and are characterized by strong balance sheets and strategic rationale in vertical integration. Dong, Vattenfall, E.ON, RWE, SSE and Statkraft are among the main offshore participants, but post 2008 global financial crisis, credit downgrades has led to increased use of partnerships and JVs.
- **Oil and Gas:** Strong synergies in construction and offshore capabilities, in addition to extensive experience with capital-intensive projects. Recent downturn in oil price has put constraints on their balance sheets.
- **EPCI/O&M:** Main provider of Engineering, Procurement and Construction (EPC) or Operations and Maintenance (O&M) often participate in risk sharing with smaller investments or performance guarantees. The contractor is recognized by operational excellence and equity participation amplifies incentives for the contractor.
- **Corporate investors:** Corporates like Lego, Google, Yahoo and Walmart achieves security of energy supply and a positive branding impact by investing in wind. Further, it creates long term price stability in their budgeting process, while being a relatively small component of total operating expenditures.
- **Institutional investors:** Pension funds etc. Large capital pools and long term perspective which aligns well with wind attributes. Further, low interest climate has increased the attractiveness of wind as an investment segment. However, lack of experience and risk appetite often leads institutions to require construction risk guarantees.
- **Infrastructure funds:** Management funds with infrastructure or sector expertize that may take on construction risk and be involved at early stages.
- **Sovereign wealth funds**: Many similarities with institutional investors – often late stage investors.
- **Independent developers**: Lacks the balance sheet strength of corporates and power producers.

3.5 THE YIELDCO STRUCTURE

Since the early 1980's, in Canada and the US, master limited partnerships (MLPs) have long been a popular option for yield-seeking investors and has been used to finance infrastructure investments in the mid-stream oil and gas sector (Varadarajan et al. 2016). There are more than 120 MLPs in today's market, amounting to more than $600 billion in market capitalization. A new and similar asset class, the YieldCo meaning "yield company", has evolved over time and was first seen in its current iteration in 2013 (EY - The YieldCo structure, 2015). A YieldCo is a publicly traded corporation that much like a MLP produces steady and growing dividends to investors through expected cash flow. However, MLPs are limited on the types of income they can produce i.e. at least 90% of gross income must be regarded as "qualifying income", such as revenue from discovering, producing, transporting, storing, processing etc. related to certain minerals and natural resources (Ibid). YieldCos on the other hand, have no technical limitations on assets or income sources other than expectations of flow. As a result, YieldCos can be created for purposes that are beyond the scope of a MLP i.e. YieldCos can be applied for renewable energy projects. Similar to MLPs that were designed for the US and Canadian market, YieldCos has primarily been adopted in the US. The section will therefore look at US YieldCos first and foremost.

In most cases, a YieldCo structure is created when an independent power producer (IPP) or a project developer spins off their renewable energy assets that are already producing stable cash flows into a separate entity. The parent company i.e. the sponsor tends to keep the majority stake, while they sell a minority stake to shareholders at an initial public offering (IPO). The YieldCo subsequently owns a number of subsidiaries that contain several projects. The cash flows of these projects moves up the corporate structure to the YieldCo. The YieldCo thereafter distribute the majority of their cash to their shareholders. This arrangement is often referred to as cash available for distribution (CAFD) and typically a high percentage of free cash flow is distributed to investors (Jacobs, 2016). To ensure continuing growth the YieldCo is also given a ROFO (right of first offer) agreement that guarantees access to a pipeline of future assets. Furthermore, in order to avoid conflicts of interest between the sponsor and its YieldCo, the YieldCo presents its own independent board of directors.

3.5.1 THE UNDERLYING DRIVERS OF YIELDCOS

There were many underlying forces that drove the demand for the YieldCo-type structure:

- Lower interest rates over a longer period, made essential segments of the US financial markets look for low-risk, liquid investments that presented higher yields than the typical fixed income investment.

- Renewable energy project with long-term fixed-price contracts were considered a low-risk high yield investment. This matched well with the investor preferences and became a substitute for fixed income investments and a strong alternative to sub-investment-grade corporate bonds.
- Participants within the renewable energy sector were sitting on large pipelines of current and future projects whose value would be enhanced from inserting the assets into a YieldCo-type financial vehicle (Varadarajan et al. 2016).

The creative financial vehicle was initially warmly welcomed by the US financial markets. The YieldCo structure presented several advantages and opened the market of renewable energy investments to more investors:

- Investing in real assets like wind farms or solar PV parks would require an investment team for each individual projects. The transaction cost for each project could seriously eat into the return of the projects unless the investor directly invested in several projects simultaneously. Only the largest institutional investors could afford such investments, hence smaller investors would face high transaction costs.
- These major renewable energy projects were also highly illiquid. If an investor would be in need of cash, they would most likely struggle to find a buyer in the short-term. Furthermore, selling the assets would require internal resources and transaction costs. Even though most investors plan to keep their investments long-term this limitation still added risk to the projects. Consequently, illiquid projects are typically priced at a discount.
- As mentioned, few investors have the capacity to invest in more than one renewable project simultaneously. The unsystematic risk[2] that follow from investing in a single project would increase the cost of capital assuming incomplete or not fully competitive financial markets in equity and debt of YieldCos (Ibid).

For the reasons mentioned, the base of direct investors into renewable energy projects was relatively small. This entailed that developers had little leverage at the negotiation table in comparison to other types of projects. The few big investors that were able to partake in these investments gained high returns relative to the risk. The YieldCo structure would tackle all of these issues and create an exchange-traded security that would provide a low-risk and diversified product. Analysts at the Rockefeller Foundation estimated that a YieldCo structure in its purest form could reduce the financing cost of renewable projects with 20% (Ibid).

[2] Unsystematic risk refers to company or industry specific risk that is inherent in each investment. This type of risk can be reduced through diversification (Unsystematic Risk, 2017).

3.5.2 THE TRAITS OF THE YIELDCO STRUCTURE

YieldCos were initially designed and offered to the general public in close cooperation with financial intermediaries, most often investment banks. Their overall objective was to create a financial vehicle that focused on growing dividends, recycle sponsor capital and maximize sponsor short-term earnings, while allowing financial intermediaries to capitalize on renewable growth opportunities. The designers of the first YieldCos recognized this opportunity, although they realized the financing vehicle could do even more. The YieldCos would seemingly serve a number of objectives for their sponsors:

- Exchange high of cost capital with lower cost of capital. Capital intensive investments such as renewable energy projects have most of their risk related to the construction period. This entails that after the commercial operation date (COD), the risk is much lower due to fixed contract pricing. The cost of capital during construction is therefore much higher. The YieldCos consists primarily of assets that are under operation. Hence the cost of capital is reduced due to the reduction in risk.
- Creating a YieldCo and thereafter selling a part of the equity at IPO will help recover parts of the capital applied for the underlying assets. Furthermore, due to the liquidity, diversification, low risk and lower transaction costs the assets would be sold at a premium. In short, the lower cost of capital would increase the present value of cash flows for the cash flow generating units (CFGU).
- YieldCos usually have a long pipeline of undeveloped assets. This increases the expectation of a growing yield which raises the current value of the assets/firm as it is priced into the market value.
- Having a dedicated company that the sponsor has a majority interest in is advantageous compared to selling their assets to third parties. The sponsor can decide the terms and also sell the assets to a price that is beneficial for the sponsor. Although the YieldCo is said to have an independent board of directors, several instances have indicated otherwise.
- Since the YieldCo is independent from the sponsors riskier assets and obligations and as it continues to grow its assets base, it will eventually be able to refinance through corporate bonds. Increasing the leverage will ultimately increase the return on equity.
- As mentioned before, creating an exchange traded fund with a diversified portfolio opens the pool of potential investors. Due to lower operational risk and lower beta, the investors demand a lower cost of capital (Ibid).
- Renewable energy assets are capital-intensive and often subject to subsidization through tax reforms to encourage sustainable investments. This allows the YieldCos to aggressively

depreciate the asset base with the purpose of paying minimal corporate tax. In that way, the structure negates the taxation that would otherwise take place both in the YieldCo, as well as in the sponsor company as dividends moves up the corporate structure.

3.5.3 THE PROBLEM OF TOO MUCH GROWTH

The abovementioned features and objectives made the YieldCo structure a very attractive investment case. But at the same time, the objectives also made the vehicle very reliant on growth. The US YieldCos were already a growth-oriented vehicle, however the initial yields were modest. The problem became that the valuation of YieldCos were largely based on expectations of dividend growth. Most YieldCos had dividend growth targets the first three years between 12-15% on average. Some YieldCos even had targets as high as 20-25%. Maintaining such a high growth rate implied a steady flow of assets from the sponsor. The YieldCos also distributed between 80-90% of available cash to investors. This entailed that only a minor amount of the earnings was retained in the company and available for reinvestment in new assets. Consequently, the YieldCos needed to raise new capital to continue growing. Several sponsors also implemented incentive distribution rights (IDRs)[3]. This incentivized the sponsors to grow dividends even more. In theory, the YieldCos were sold on the premise of possessing high-quality cash-generating assets that would produce growing dividends over time. Investors were willing to pay a premium for this opportunity. The sale of equity at IPOs gave the YieldCos capital to invest in additional assets that the ROFO provided and they could much faster achieve their IDRs goals. This would increase both earnings and the financial health of the sponsor company, which allowed it to raise additional capital. This approach had been previously seen in MLP's. However, the problem became that YieldCos typically had much more aggressive growth targets. This spiral of events made the YieldCo structure very dependent on a growing dividend. At the same time, many factors were threatening the growth of the firms. If a project were postponed or hindered, growth would slow. If the managers did a bad investment, growth would slow. Furthermore, if interest rates were to increase, then the present value of future cash flow would decrease, hence the expected dividend growth would decline. Along with a high payout ratio, the YieldCos were dependent on raising capital to continue growing. The troubles that arose from the too lofty growth expectations will be further elaborated upon in part 7.3.

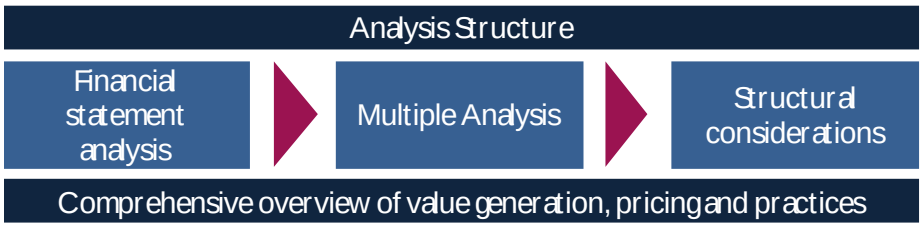
[3] IDRs is an arrangement that incentivizes the sponsor to increase their dividend growth as much as possible. The rights are decided before the implementation of the YieldCo and it decides how the dividends should be shared between the sponsor and common investors (Gue, 2012).

4. FINANCIAL ANALYSIS OVERVIEW

4.1 INTRODUCTION TO THE FINANCIAL ANALYSIS

The objective of this dissertation is to gain both a detailed as well as a holistic understanding of the performance of companies building, operating and investing in renewable projects. This requires a deep understanding of the industry and each company including its typical drivers. Financial statement analysis of the accounts and economic prospects of a firm will be complemented through a business analysis identifying the challenges for Statoil New Energy Solutions. This will be followed by a discussion and proposal of potential solutions.

Figure: 4.1.1: Structure of financial analysis



Source: Own contribution

The financial analysis is structured into three parts. After a review of method and adjustments of financial statements, the financial statement analysis will be conducted. This part will dig into the essential parts of the companies financials, analyzing income statement, balance sheet and cash flow statements thoroughly. Secondly, the multiples analysis is concerned with how the companies are trading on the stock market and thus how they are perceived by investors, relative to the results in the financial accounts. The last part deals with project related trends and structural consideration regarding business and financing models. This part will be based on both the financial analysis and secondary research where annual reports, press releases and other data will build a solid foundation for the conclusions drawn. Each financial measure will be analyzed in light of each of the three peer groups, Oil & Gas, Renewable Corporations and YieldCos.

The rationale of segmenting the analysis into three sub-analyses is to keep an agile and flexible approach, while at the same time being able to deep dive into specific fields of interest. It is also organized with the purpose of depicting important elements for the future development and structure of Statoil's renewable activities.

4.1.1 FINANCIAL STATEMENT ANALYSIS

Considering the analysis of company accounts, the authors has chosen to focus the research around two key measures, Return on Equity (ROE) and Return on Invested Capital (ROIC). ROE reveals how

much profit a company can generate on equity and is useful to compare profitability of firms in the same industry. It also describes the impact of financial leverage on profitability and is therefore complementing Return on Invested Capital. ROIC on the other hand reveals how much cash is generated by the capital investments. Both measures are indispensable in the analysis as the thesis seeks to reveal patterns within profitability, capital utilization and leverage in the peer group. In order to retain a sense of structure and hierarchy, the financial statement analysis first targets the income statements top down, before moving on to balance sheet aspects and tying it together in the ROE and ROIC. The analysis is conducted with a build-up approach of ROIC and ROE, rather than a decomposition, which is perhaps more common. The argument for this is that the authors seek to identify drivers and trends in the sub-components separately without excessive repetition of findings. Secondly, the end outputs of ROE and ROIC may lack clear patterns and thus be more easily interpreted after a solid analysis of its components. The lack of consistency may in rough terms be attributable to the immaturity and high rate of change in the industries, as well as limited sample size. The income statements gross margin and profit margin are analyzed and compared. In the balance sheet assessment, the focus is kept on asset turnover rate, leverage, borrowing costs and the ability to service debt. A detailed analysis on subcomponents is included for the sake of truly understanding how a renewable energy balance sheet is developing over time.

4.1.2 MULTIPLES ANALYSIS

The second part constitutes the multiples approach that is divided in two segments, enterprise based (EV/EBITDA, EV/IC) and equity based multiples (P/E, P/B, P/S). Multiples are applied as it simplistically compares company valuations. However, it is also quite informative on underlying fundamentals and growth prospects, if conducted in a proper sense with a well-founded peer group. The analysis seeks to understand trends in multiples compared to the oil and gas industry, in addition to detect underlying drivers, and finally, back up and complement the preceding financial statement analysis. EV/EBITDA is the most used multiple for comparing companies as it measures return on investments for a company and normalizes for differences in capital structure. EV/IC expresses the multiple accorded by investors to each amount of capital invested in the company and is a good complement to P/B. A characteristic of equity multiples is that they are distorted by capital structure. Price Earnings (P/E) is also affected by non-operating posts, but is a useful measure for investors as it expresses how much they must pay for one dollar of earnings. As many renewable firms are asset heavy, Price to Book ratio (P/B) is also included to reflect how much one must pay for the company compared to its book value of equity. Finally, Price to Sales is included, as sales growth has shown to be imperative to many firms operating in the industry.

4.1.3 CORPORATE FINANCE ELEMENTS AND STRUCTURAL CONSIDERATIONS

The third part of the analysis to some extent builds on the two previous parts. It seeks to detect patterns in structuring of projects and companies, understand financing trends and what companies tend to emphasize when setting financial strategy. In wider terms, the objective is to analyze corporate financial decisions by utilizing secondary data, such as annual reports, presentations and public domain articles. This part is less structured and more creative in its nature, as the required research is less mechanic involving various sources. Of the same reason, its value may be substantial as data gathering of this nature to this extent is less conventional than commonly performed in the market. In other words, most investors view financial statements, but fewer investors analyze and structure the more qualitative and less easily obtainable data. The first sub-section regards staging and positioning in the value chain, followed by a section on financing structures; the choice between corporate finance and project finance. This is an essential question in the renewable energy community, whereas Statoil mostly has financed projects using its balance sheet. Next, the section will analyze the YieldCo rollercoaster and opportunities going forward.

As mentioned throughout, the analysis seeks to provide a multidimensional perspective on the financial performance and trends within the peer group. It seeks to reveal what characterizes companies within the three main company groups and find differences between oil companies, renewable corporations and YieldCos. Finally, the analysis is instrumental in discussing the future structure of Statoil New Energy Solution and its potential within wind and solar.

4.2 REFORMULATION OF FINANCIAL STATEMENTS

It has been important to adjust the financial statements that were initially provided to ensure that the analysis produced metrics and results that were appropriate and significant for the financial breakdown of the industries chosen. Both the income statement and balance sheet has therefore been reformulated from the US GAAP or IRFS accounting standards to a more analytical approach that divides the operational and financial aspects of a firm. At the same time, it has also been imperative that the financial analysis produced results that made the firms stand on equal footing. In other words, the financial analysis is based on a generic approach that reformulates the income statements and balance sheets for all firms equally. It therefore became essential that the approach was encompassing and applicable for all firms and financial statements. Additionally, the financial analysis also reformulated the cash flow statement for all firms. The main reason for reformulating the cash flow was to create an overview of the firm's sources and uses of funds i.e. how did the firms finance their business and allocate their capital. Lastly, the analysis applied data on market capitalization for all the firms to create

the multiple analysis. The data was collected for a maximum of 20 years and collected from the dates that matched with the dates of the annual financial statements. Consequently, the financial analysis would comprise of the three parts mentioned above. Even though the overall analysis applied additional data and information, a proper reformulation and construction around the financial statements became crucial for the analysis. In the end, the financial analysis managed to extract valuable information across all firms and industries.

4.2.1 THE REFORMULATION OF THE BALANCE SHEET AND INCOME STATEMENT

The balance sheet and income statement sheds light on details that makes it possible to determine the drivers of profitability and growth for a company. The value of a company is often seen as the firm's business operations because they are unique to the firm. It therefore makes sense to separate the operational and financial aspects of the balance sheet and income statement. However, since financial statements are based on approved accounting standards this notion is overlooked. Hence the statements need to be adjusted so the proper financial metrics can be extracted (Penman, 2013).

4.2.1.1 Balance Sheet Reformulation

The typical balance sheet which is based on accounting standards such as US GAAP (in the US) or IFRS (in Europe and elsewhere) separates between current and non-current assets and liabilities. For assets the division is decided based on liquidity while liabilities are separated based on their maturity. The intention is to give the reader a notion of the firm's ability to meet creditors claim on cash. While this might be very useful for an analyst who is solely examining a firm's credit rating, it gives little value to an analyst who seeks to determine the value and profitability of the firm. All the balance sheets applied in the analysis are collected from Thomson Reuters and are categorized as utility balance sheets. They are built on the premise above, although they are specialized for the utility sector. Even though not every company is a utility, the template still allows for all the firms to have their booked values in assets/liability classes that accords with the annual reports and as originally stated. The Thomson Reuters utility balance sheet consists of approximately 90 different elements, where the reported assets and liabilities can be posted/classified. This entails that for many of the firms, less than half the elements are actually applied for the reported numbers. As an example, every firm have reported numbers in the asset class called "Cash and Equivalents". Contrary, only a small amount of the firms has reported numbers in the asset class which is referred to as "Deferred Gas Cost". Nonetheless, it has been necessary to include all the 90 or so different elements into the adjusted balance sheet, although many of the elements, which amounts to small values are combined into one asset/liability class in the adjusted balance sheet.

After the balance sheets are collected from Thomson Reuters they have been adjusted with the intention of separating operating assets and liabilities from financial assets and liabilities. They are still divided based of maturity i.e. they are divided between non-current and current assets and liabilities. This approach allows the balance sheet to extract working capital, which consist of current assets less current liabilities. It also allows for calculating fixed capital that comprise of non-current intangible and tangible assets less the non-current operating liabilities (Ibid). The working capital and fixed capital combined represent the net operating assets, often referred to as invested capital. As the name implies, net operating assets comprise all the assets less all the liabilities that relates to the operations of the firm. Operating assets refers to all the assets that is relevant in running the operations such as property, plant and equipment (PP&E). Similarly, operating liabilities refers to liabilities that arise from operations such as accounts payable. To balance assets and liabilities, the financing is divided into interest bearing debt (i.e. financial liabilities), equity and financial assets. Financial assets refer to assets that often carry interest or are considered as financial investments. In general, interest-bearing debt is liabilities that carry interest. Interest-bearing debt less financial assets is referred to as net interest bearing debt (NIBD). Lastly, net operating assets (invested capital) equals net interest bearing debt and equity.

It cannot be stressed enough the importance of constructing an encompassing approach that correctly adjusts all the balance sheets, income- and cash flow statements. The authors have consequently spent a significant amount of time determining how to classify the assets and liabilities as part of operations/financials. While Penman (2013) contributes with examples regarding classes such as minority interest or capital leases, more specific cases has demanded additional research. The Reuters fundamental glossary report (2009) is a report comprising more than 600 pages describing each class for both the balance-, income and cash flow statement specifically for the utility template. The table below illustrates some of the examples that needed further specification:

Restricted Cash - Current	Current Assets: Cash that bears some kind of restriction, and may not be available for operational use by the company, but it still gained from operations.
Other Current Assets	Current Assets: Includes advance payments to employees, assets held for sale, deferred costs, deferred revenue and more.
Security Deposits	Current Liability: Security deposits represents deposits received for the purpose of offsetting potential losses due to damage of either physical or intellectual nature.
Other Current Liabilities	Current Liability: includes acquisition-related expenses accrued, merger-related expenses and integration expenses.

Pension Benefits - Overfunded	Non-Current Tangible Asset: Includes prepaid pension costs and pension assets. The asset arises when funded pension contribution generate gains such that the fair market value of plan assets exceeds the accumulated benefit obligation.
Pensions Benefits - Underfunded	Non-Current Operating Liability: Includes severance liabilities, minimum pension liabilities, directors' retirement plans and more. The liability occurs when there are insufficient funds to support expected liabilities.
Reserves	Non-Current Operating Liability: Includes reserves for business closure, claims and losses on self-operated insurance policies, restructuring expenses, litigation losses and more. The liability represents an estimate of liabilities that have a good probability of arising.
Minority Interest	Non-Current Operating Liability: Consistent with Penman (2013), is not an obligation like debt. It is rather an equity sharing in the results of the consolidated operations.
Capital Leases Obligations	Interest-Bearing Debt: Consistent with Penman (2013) capital leases are "in-substance" purchases granting the firm the right to use if for most of its life-time. Accordingly, if an asset satisfies in-substance purchase criteria, then it is treated similar to PP&E. Since the lease is treated as if the firm had purchased the asset, then the lease obligation is effectively a loan.
Deferred Charges	Financial Asset: The asset represents prepaid expenses other than for operations. This includes deferred financing costs, deferred debt issuance costs, deferred loan expenses. This may be deferred as assets and amortized during the life of the related debt instrument.
Restricted Cash – Long Term	Financial Asset: Includes cash held in escrow, cash pledged as collateral, restricted investment. The asset represents cash or equivalents that are prepared for specific purposes and is subject to long-term restrictions (Thomson Reuters Fundamentals, 2009).

The analytical balance sheet has been adjusted based on the abovementioned information and can be found in Appendix 1. To reduce the amount of appendix, the adjusted financial statements will only include one example/one firm from each sector (see attached USB-stick for all excel calculations).

4.2.1.2 Income Statement Reformulation

Like the balance sheets, the data on income statements are retrieved from Thomson Reuters as utility income statements. The template should allow all reported numbers to occur as originally stated in the annual reports. While the reformulated balance sheets look quite different from the originally reported utility balance sheet, less adjustments were needed to create the reformulated income statement. Nonetheless, adjustments were made to create the analytical income statement and derive at the desired metrics. Similar to the template for balance sheet, the utility income statement included several classifications for both revenues and costs. As an example, the income statement originally reported revenue from seven different sources such as water operations, gas operations, electric operations and more. The authors experienced that even though the template comprised a variety of classifications both for revenue and cost elements, not all of the classifications were applied in the reporting of numbers. As a result, to simplify the adjusted statement, some elements were added together. For instance, revenue was divided into different classes, however, only the bottom-line called "revenue" contained reported numbers. Therefore, the adjusted income statement comprised all the revenue classes into one element and classified it as revenue/total revenue.

Correspondingly with the adjusted balance sheet, the income statement must be adjusted to allow a separation of operational and financial activities. As a result, all financial income/expenses has been separated from operational income/expenses. This separation enables the adjusted income statement to calculate the operating profit. The operating profit measures exclusively the profitability of the operations in the firm, thus excluding all financial matters. The financial income/expenses is added after the operating profit to ultimately calculate the net profit. This metric shows how profitable a firm is after accounting for the cost of financing. This is important to separate because firms that generate similar net profits could potentially produce vastly different operating profits. In such a scenario, the firm that is more profitable at the operational level, would have much more financial expenses i.e. more expensive loan terms (Penman, 2013). While this is arguably the most important adjustment in the reformulated income statement, there are still other metrics that have been implemented. Starting at the top, the adjusted statement derives the gross profit, which is the revenue less the cost of goods sold (COGS). Thereafter, the operating costs are included and operating profit before special items is derived. This measure is also referred to as operating income from sales (before tax). This measure is useful because it separates the income and costs from sales from other income/expenses i.e. unusual income/expenses such as impairments, restructuring charges and more. After adding other income/expenses the statement derives at the earnings before interest, taxes, depreciation and amortization (EBITDA). As seen throughout the analysis, this measure will be heavily applied as it

captures the firm's ability to generate cash more or less. Moving on, the depreciation and amortization is subtracted giving the earnings before interest and taxes (EBIT). Thereafter, the tax is accounted for giving the net operating profit after tax (NOPAT). It should be mentioned that since most taxation regimes allows for deduction of interest expense in the calculation of taxable income, the tax line item is a function of debt level of the company, consequently making the NOPAT metric difficult to interpret. After that, financial expenses are subtracted and net income is calculated. The adjusted statement further divides into net income before and after minority interest to separate the income/expenses from subsidiaries from income relating exclusively to the parent company.

For all intents and purposes, the adjusted income statement seeks to break down each income/cost segment to properly analyze the profitability of the firms. However, the authors have decided not to apply a marginal tax rate, which is the conventional approach in a typical reformulated income statement. Most firms (depending on country) are usually taxed on a schedule of tax rates, depending on the size of the income. This tax rate is referred to as the marginal tax rate (Penman, 2013). This is useful because it allows the analyst to separate taxes on operations from taxes on financial income/expenses. In most cases, firms receive a tax shield from interest expenses, hence the tax on operating profit is usually higher than the total tax reported. Because the analysis examines income statements for 32 companies going back as far as 20 years, it would demand an incredible amount of resources and time to extract all the marginal tax rates. Consequently, the analysis applies an efficient tax rate, which is the tax expense divided by net income (Penman, 2013). Based on the efficient tax rate, the income statement separates the tax into operating income tax and tax shield on financial expenses. This provides a picture of how taxes would be divided between operations and financials. However, deferred taxes or tax receivables affects the taxes in a given year, hence the effective tax rate can vary substantially year-over-year, which is the case for several firms in the sample.

It was mentioned initially that the Thomson Reuters utility income statement should allow all the numbers to occur as they were initially reported. However, the authors detected a significant weakness in the reporting made by Thomson Reuters. Interest expenses were not reported consistently across firms and often not even consistently within a single firm year-over-year. The reporting of interest occurred through several classifications of interest income/expenses both operating and non-operating. What became evident after a thorough analysis of the reporting was that interest income/expenses was ultimately reported in three classifications:

Interest Expense (Income) – Net Operating	This represents the net interest expense (income) reported in the operating section by the company, when the company does not delineate between interest expense and interest income incurred. It is also used to report interest income

	and expense for the standardized financial view when the company reports interest income/expense separately.
Interest Expense, Non-Operating	This represents interest expense on financing costs, bank charges, amortization of debt discounts/premiums and debt issuance expenses.
Investment Income, Non-Operating	This represents income, other than interest, from investment securities. Such income may include dividend income, gain/loss of investment securities, equity earnings in affiliates, unconsolidated subsidiaries or joint ventures (before taxes) or any other investment income.

Initially, the net operating interest expenses were reported as expenses pertaining to the operations of the firm as seen in the adjusted income statement. Thereafter, even though the template had several classifications for "non-operating interest income/expenses", they were all being reported in either "interest expense non-operating" or "investment income non-operating" (all described above). Furthermore, the element referred to as "investment income non-operating" in the Reuters Fundamentals Glossary (2009), were named "interest/investment income, non-operating" in the utility income statement while still being the same element. Since there were no other places "interest income non-operating" were being reported, one would assume that interest income in general would derive from this element as well.

Given that the numbers were correctly reported in the three classes, it would be manageable to separate operating and non-operating interests as well as separating interest income from interest expenses in the non-operating section. Unfortunately, in several firms and within a single firm year-over-year, the interest expenses would either only be reported in the "interest expense (income) net operating" element, or in the two remaining elements as non-operating. This made the calculation of financial income/expenses very distorted. The adjusted income statement performed several checks to ensure that numbers were correctly adjusted. The authors also performed random tests to ensure that the Thomson Reuters utility income statements were correctly reported. This was always the case for elements such as revenue, COGS, depreciation, net income, earnings per share, dividends per share etc. However, seeing that the template divided interest's income/expenses the way it did, made it impossible to consistently calculate the actual financial expenses for the firms. Be that as it may, the adjusted income statement still provided very valuable information. With regards to financial expenses, they are only discussed to a minor degree in the opening phases of the analysis i.e. financial statement analysis. They will be qualitatively analyzed through investor presentations and annual reports in later

sections of the analysis i.e. capital allocation and financing policies. See Appendix 2 for calculations of the adjusted income statement.

4.2.2 CASH FLOW REFORMULATION

So far, the reformulation of the balance sheet and income statement have served the purpose of shedding light on metrics that highlight growth and profitability of the firms. The purpose of reformulating the cash flow statement however, are many. The cash flow statement is essential for an analyst who applies discounted cash flow analysis. Even though the financial analysis does not apply fundamental valuation of the firms, metrics such as free cash flow are still interesting to look at. This is especially important for the YieldCos, where management often have incentives to boost EBITDA or other metrics to achieve the IDRs (See 3.5 YieldCos for further explanation). A difference between the accrual accounting earnings and the operating income cash flow is often seen as a "red flag" that could indicate manipulation (Penman, 2013). This falls under the umbrella of liquidity analysis that is well covered by the cash flow statement. Still, what is even more interesting is the use of cash flow statement to determine financial planning and capital allocation of the firms. By looking at sources and uses of funds, the analysis will gain substantial information that are vital to understanding the capital allocation strategies.

The way that cash flow statements are originally reported should correspond with the accounting standards for balance sheets and income statements. However, even credit analysts or treasurers who focuses on the firm's ability to meet creditor's claim on cash, have to adjust the cash flow statement. The main problem with the original reporting is that operating cash flows are often confused with financing cash flow (Ibid).

The approach in this financial analysis is neither a theoretical correct reformulation, nor is it just a duplicate of the originally stated numbers. To obtain the desired metrics the cash flow statement was adjusted based of what was interpreted as sources of funds and uses of funds. There were several reasons for this approach. Firstly, it became impossible to correctly reformulate all the cash flows for the firms because the data applied was incomplete. The cash flow statements were collected from Thomson Reuters as utility cash flow statement applying the same approach as for the income statement and balance sheet. In nearly all cases, the operating cash flow activities and financing cash flow activates were reported correctly. The problem occurred in the financing cash flow where the reported activities showed lack of consistency throughout the period of the time interval (max 20 years). Not only were the reporting inconsistent across firms, it was also inconsistent within firms from one year to the next. Consequently, the adjusted statement of cash flows was not able to separate the issuing of new shares from share repurchasing for either common or preferred equity. Furthermore, the

analysis could not separate long term debt from short term debt nor could it separate issuing of debt from debt repayment. In other words, both debt and equity was shown in net figures. This is surely a limitation for the financial analysis, however, it is still able to present how much debt and equity is reduced or increased on a year-to-year basis. The second reason that the adjustment of the cash flow statement has taken a more practical approach is due to the goal of the analysis. Most theory covering analysis and reformulation of financial statement are focused around valuation purposes and forecasting. In this case, the cash flow statement is first and foremost applied for detecting capital allocation policies. Ultimately, the cash flow statement has divided each of the three parts: operating-, financing- and investing cash flow activities, where all three are further divided into sources of funds and uses of funds. To provide some examples, the operating income and depreciation is considered sources of funds from operations while an increase in working capital is regarded a use of funds from operations. Similarly, sale of assets is viewed as sources of funds from investing activities, while capital expenditure is reflecting uses of funds from investing activities. Lastly, issuing of debt is considered a financial source of fund, while repurchasing of debt is regarded as a financial use of funds. See Appendix 3 for calculation of adjusted cash flow statement.

5. FINANCIAL STATEMENT ANALYSIS

5.1 INCOME STATEMENT ANALYSIS

5.1.1 GROSS MARGIN

Revenue is the result of prices achieved and quantity sold and quantity sold. Gross margin is revenues less Cost of Goods Sold (COGS) and describes the sales remaining after the direct costs associated with producing the goods or services are deducted per USD of revenues.

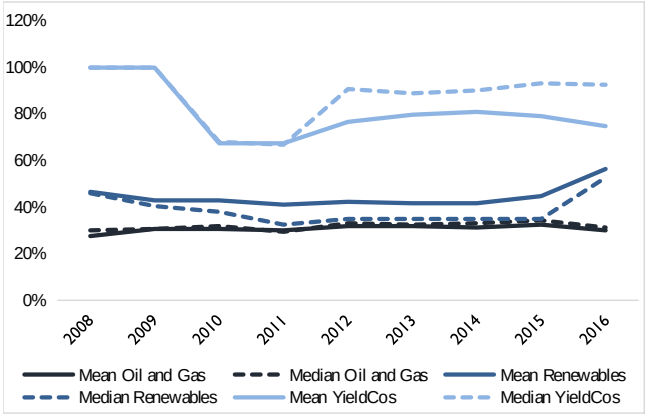
$$Gross\ margin\ \% = \frac{Revenue - Cost\ of\ goods\ sold}{Revenue}$$

Gross margin is a pure operational metric. This is due to its ignorance of other operating costs, depreciation, taxes and financial costs. Despite the limited use in a holistic company analysis, it is a useful starting point in evaluating companies and the characteristics of specific industries. The topline is an important measure for the temperature in a market and may describe the long term trends that characterize the companies within those markets. The figure to the left reflects calculated revenue CAGR[4] for the three industry groups analyzed. Adverse trends are observed.

[4] CAGR = Compounded Annual Growth Rate

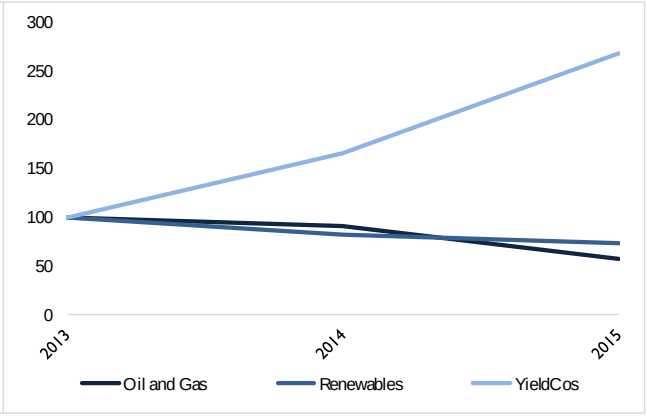
As can be viewed in figure 5.1.1 there are visible sector specific differences, with YieldCos displaying high margins caused by limited direct costs. Further, renewable corporations exhibit a positive trend, with a couple percentage premium to oil and gas companies the last decade.

Figure: 5.1.1: Gross Margin Medians and Averages



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.1.2: Indexed Revenues by Industry Group



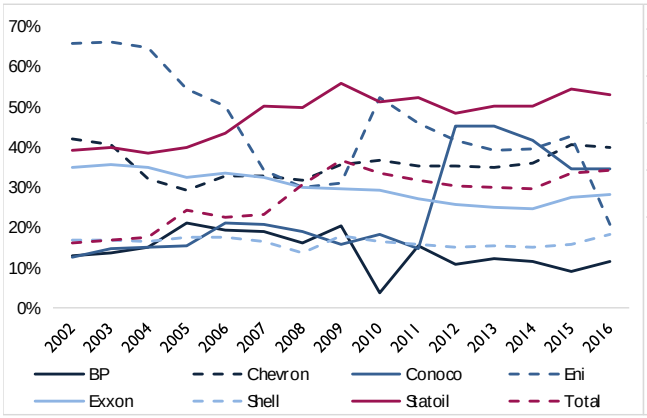
Source: Thomson Reuters Eikon / Own Contribution

Despite company variations, using industry averages on this metric is valuable as it clusters the data in a more practical fashion. Both average and median values are included as to better smooth for outliers. Indexation are to a certain extent used to reveal industry trends as other measures such as nominal sales values will be practically impossible to display graphically. For YieldCos, data quality before 2012 is rather weak as the company structure partly is a response to the recent low interest rate environment. From 2010-2016, Oil & Gas has achieved a CAGR of -8.3%, Renewables 3% and YieldCos 53%. To better seize the trends, the peer groups and components of the metric will be analyzed subsequently.

5.1.1.1 Oil and Gas

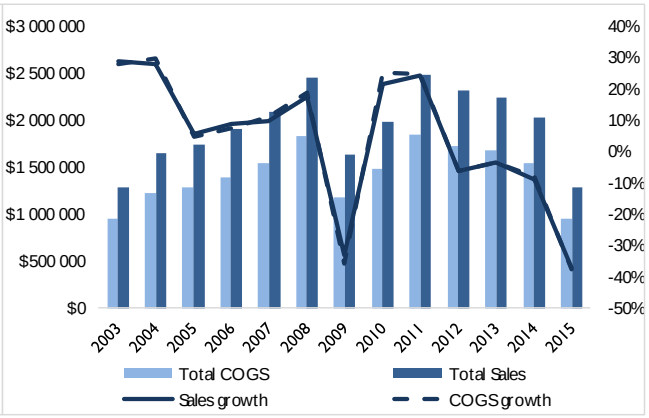
The integrated oil companies receive a large portion of revenues from sale of oil and gas. In our peer group, gross margins have remained stable around 30% in recent years, despite drop in oil price from $100 in July 2014, to the low 30s January 2016. Since 2013, half of peer group revenues have diminished, without hurting gross margins emphasizing surprisingly great cost flexibility. While CAGR for revenues negative -8.28% since 2010, COGS has a CAGR of negative -8.35%, a sign of dynamic cost management. This is surprising as oil and gas represents capital intensive, long term projects with limited flexibility in downscaling production on a company basis. Decommissioning costs and cost of cold or warm stacking equipment often leads companies to continue operation below break-even levels in oil price. Therefore, one would not expect direct costs to track revenues as closely as is the case.

Figure: 5.1.3: Oil & Gass Gross Margin



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.1.4: Peer Group Revenue, Cost and Growth (numbers in millions)

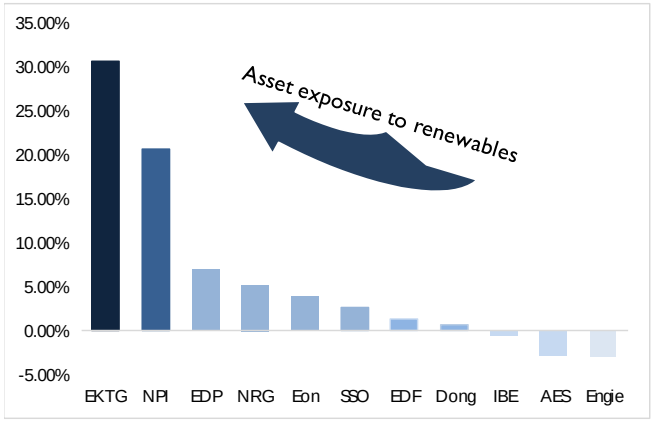


Source: Thomson Reuters Eikon / Own Contribution

The Brent price decline also has strong repercussions in labor costs, other OPEX, R&D and CAPEX, and thus not reflected in gross margins. This underlines the limited value of gross margin analysis. The full profit picture will be discussed later. As can be seen, there are substantial variations within the group which can be caused by accounting practices and excellence in operations and adopting to changing market environment. Further, market exposure and business model may have an impact as profit structure varies with activities upstream or downstream. It is visible that adjusting cost to price development has been crucial the last three years. However, some of the effect may be mechanical as offtake prices on liquids (oil and gas) have naturally declined, as is part of the case for f.ex Statoil (Annual Report, Statoil 2016, p.54). From the figure 5.1.4, it can be concluded that change or growth in sales and cost has moved close to identically, exhibiting negative growth since 2010/2011. The grey band that decreases towards 2016 graphically describes the reduction in gross margins among the peers.

5.1.1.2 Renewables

Figure: 5.1.7: Renewables revenue CAGR 2010-2015

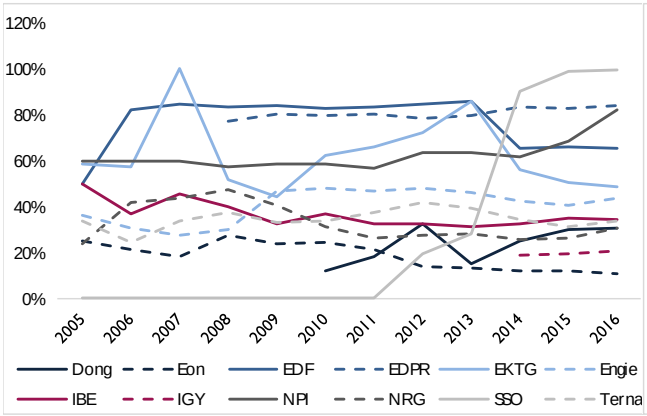


Source: Thomson Reuters Eikon / Own Contribution

Economically, where renewable sources differentiate from fossil fuels is in the operational phase. While fossil fuels entail solid direct costs in extraction, operations and input prices, renewables are in essence close to free throughout its lifetime. Thus, in theory the renewable peers should provide outstanding gross margins compared to oil and gas as most incremental revenues flow to EBITDA (Dong Energy 2016, SEB). As described earlier, the renewable peers have a certain degree of diversification in their operations and assets, even though most firms move towards all-renewable models. This evolution is also a function of time, meaning that

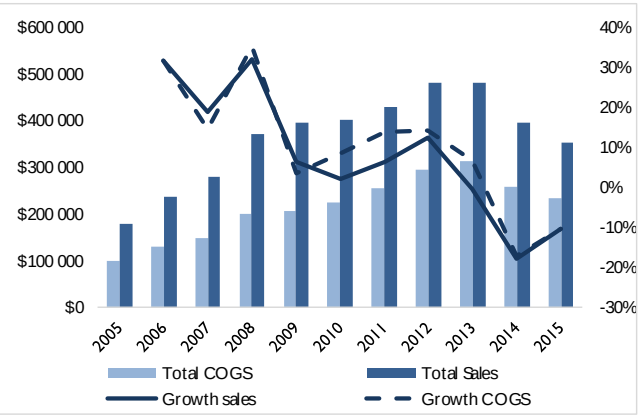
more recent data reflects higher percentage renewable assets in business portfolios. As a consequence of the

Figure: 5.1.5: Renewable Gross Margin



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.1.6: Peer Group Revenue, Cost and Growth (in millions)



Source: Thomson Reuters Eikon / Own Contribution

above, revenue drivers have also rotated over time. An example of this trend is Dong Energy, the former Danish E&P and electricity utility that were exchange listed in 2016 marketed as a wind power company. Currently 40% of its revenues are derived from wind operations but over 75% of invested capital is in green energy. E.on, Engie, Iberdrola and the majority of the peer group are in the same process, but at different stages since some hold on to certain segments, such as regulated utility business. Despite certain stickiness of old business areas, the rate of change observed in the peer group is unparalleled in most other industries. Contrary to the above, 100% renewable companies such as Energiekontor, EDPR and Scatec Solar depend solely on revenues where the majority is fixed prices through PPAs signed with respective counterparties.

The two figures above provide messy, yet valuable information. Peer group sales has increased the last decade, but growth rates have slowed down somewhat. As with oil and gas, cost of sales naturally tracks sales closely. At first it may seem surprising that the majority of companies lies in the 20-50% gross margin band. First, the low average gross margins are a result of diversified portfolios with business in sectors with more direct costs relative to sales. This is visualized in outlying high margins in pure plays like Scatec Solar (solar) and EDPR(wind). Some companies do not support this thesis, such as SunEdison, Abengoa and Dong Energy. The weak revenue trend in the first two is due to balance sheet problems and their distress situations will be elaborated later. Dong Energy is in the middle of a massive strategic turnaround, with divestments depressing group revenues and oil and gas division lowering gross margins. If considering wind segments only, Dong would be in the top in the table above. Scatec Solar, which had its IPO in 2014 has achieved 100% gross margin due to COGS only consists of capitalized payroll, travel –and external expenses that are directly attributable to project rights in project companies. As Scatec uses project finance structure, revenue and costs are recognized at group level upon transfer of title (Scatec Solar 2016, Annual Report). The groups revenue growth is

primarily derived from capacity expansion from solar parks, not achieved prices. The same trend is visible in EDP Renovables, the renewable spinoff of EDP which delivers gross margins almost equal to its EBITDA. EDPR is one the peer groups pure plays and has posted strong top line growth, primarily driven by capacity additions. Finally, E.on achieves mid-range gross margins due to its portfolio composition. Despite 10 years of experience within renewables, 2016 was a transition year as it spun off conventional energy into Uniper. The group has a CAGR of -11% since 2010, partly driven by discontinued operations within fossils. As with Dong, what is interesting is its financial composition. While renewable revenue makes up 3% of total revenue, renewable EBITDA contribute to 16% of total EBITDA (direct cost efficiency of renewables). In addition, renewable CAPEX (primarily growth) stands for 33% of total CAPEX in 2016, and the trend is expected to continue (CMD 2016, E.on).

In absolute numbers, revenues have come down substantially since 2014 and this can be explained by peer group selection. First, firms are selected based on renewable merits, but as several of the companies has diversified portfolios, their revenues are affected by falling commodity prices such as coal, oil and electricity prices. Secondly, a company's strategic portfolio is not changed instantly, and this restructuring process hits revenues hard as assets within utility, networks and fossils are divested. E.on, Engie, Iberdrola and Edf are examples of this. Yet, the authors seek to uncover trends within the renewable activities analyzing deeper than at industry level.

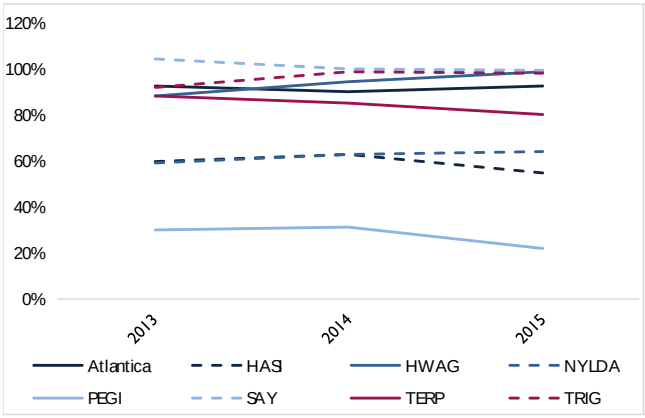
On a more holistic note, core renewable activities have also experienced decreasing growth rates. As explained in the industry analysis, cost of solar components and wind capital costs has declined rapidly as technology and competition increases. Off takers are aware of this and consequently offer less in the tendering/auction process when planning projects. This is translated into lower achieved prices and margin pressures, which only can be compensated by increased volumes/projects in order to maintain revenue growth. As a response to the development, authorities are moving towards auctioning process, which by definition secures positive IRR since no rationale party will bid under their cost of capital. Recent tenders however argue for continued attractiveness in offshore wind despite price declines. Project competition has increased greatly; number of bidders for Horns Rev 3 was four, while Kriegers Flak few months later received seven bidders. The recent tender on Dutch Borsselle I&II attracted 38 bids (Dong Energy 2017, SEB). The same trend has been observed in onshore wind and solar earlier, pointing towards compensation for falling contract prices. If this trend continues in central markets, offshore wind will achieve grid parity and be competitive with other energy sources. In April 2017 Dong Energy won auctions for three German offshore projects of which two was zero bids, meaning that no subsidy will be received on top of wholesale prices (Dong Energy, Investor relations, 2017). This is a breakthrough for offshore wind, and it is noted that solar and onshore wind has accomplished this in certain markets previously (Baringa, April 2017).

5.1.1.3 YieldCos

On the one hand, gross margin is not very relevant in evaluating YieldCos as accounting principles vary and the companies comprise of portfolios of operating assets with limited direct cost of sales. The more substantial costs tend to be presented further down in the income statement as other opex, depreciation and interest expenses and will be investigated further in the net income part. On the other hand, gross margin is essential in understanding the idea of YieldCos and how they differ from other energy companies. Further, by depicting gross margin one will analyze revenue drivers, and thus understand how and why the YieldCo structure has evolved. Based on the abovementioned, cost of sales will receive limited focus in the analysis.

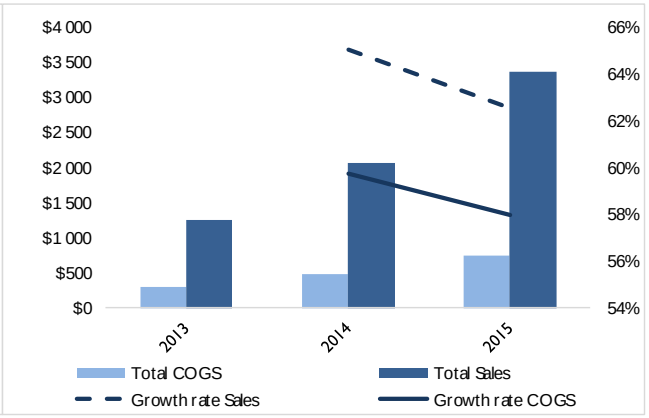
The revenue drivers of YieldCos are more straightforward than the other peer groups. As a consequence of the focus on dividend growth in YieldCos, revenue growth is an obvious prerequisite that needs to be sustained. Therefore, the YieldCos is characterized by a very high investment rate, adding several projects each year. In addition, in order to sustain a high CAFD[5], companies are focused on cost reductions and tax efficiency. YieldCos are constructed to attract yield hungry investors requiring stable and high dividend yields at limited risk. This aligns well with the underlying operating assets of YieldCos. As the structure in this form is a relatively new invention, there is limited historic data accessible for analysis. However, as displayed in figure 5.1.9 the industry has experienced rapid revenue growth recent years.

Figure: 5.1.8: YieldCo Gross Margin



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.1.9: Peer Group Revenue, Cost and Growth (in millions)



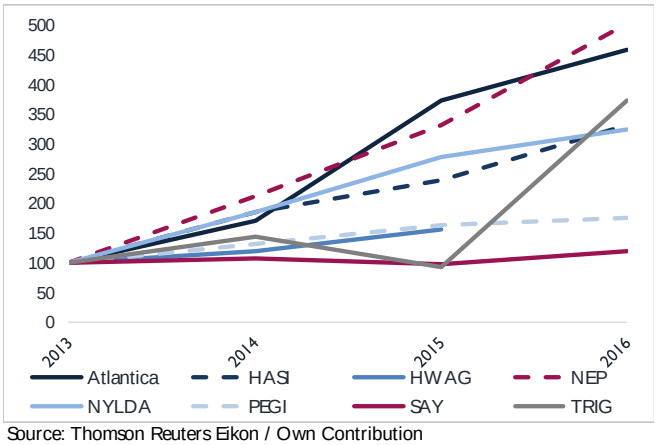
Source: Thomson Reuters Eikon / Own Contribution

YieldCos generally offers high gross margins due to a mixture of corporate structure and operating- and organizational efficiency. However, the trend over time is of less importance for two reasons. First, direct costs are initially very small, meaning that a small change in cost reporting or increase in direct cost will have a substantial effect on gross margins, exemplified by Hannon Armstrong and Pattern. It

[5] Cash Available for Distribution

will however not has a substantial effect on the growth of the company. In addition, accounting changes and data quality from Reuters may be unreliable in regards to how costs are classified. Secondly, comparability from year to year may be difficult as companies make several acquisitions each year. In contrast to the other peer groups, YieldCos achieves increasing sales relative to COGS, a 1% increase in sales gives a less than 1% increase in COGS, as displayed in figure 5.1.9. Peer group sales has more than tripled from $1,5Bn to more than $4Bn over four years.

Figure: 5.1.10: YieldCo Indexed Revenues



Source: Thomson Reuters Eikon / Own Contribution

Deep dives in annual reports reveals consistently similar revenue drivers across the field. As YieldCos need constant growth, capacity additions are the main driver behind revenue growth. An additional factor is capacity increase as projects enter into more stable maximum output production. Exchange rates may have an impact, but often immaterial due to hedging. Revenues may also be impacted by lower than expected outputs caused by lower utilization rates (ex. wind speeds below long term averages).

The indexed sales overview below reveals abnormal sales growth on company level. Together with the renewable corporations, YieldCos have experienced lower realized prices. As an illustration, Pattern Energy had average realized prices per MWh of $80 in 2014, and $62 in 2015, a 22,5% decrease. The decline is attributable to a large amount of new projects acquired or which commenced commercial operation in 2015 at PPA prices about 50% lower on average than the year before. The 22,5% decrease is a combination of a strong decline in prices and large capacity increases which yields a strong impact on the realized prices of the entire portfolio (Pattern Energy, Annual Report 2015). However, Pattern posted a strong sales growth meaning that despite lower revenue per MW, capacity additions by far outweighed lower realized prices. This is also due to the fixed price setup, which secures that price declines only materializes in new projects. A large part of the peer group output is contracted on fixed prices, and the remaining floating prices are hedged, so electricity price fluctuations have limited effect on realized revenues. Most companies emphasize the limited commodity risk as one of the main points in the investment thesis, alongside long term visibility in contracted sales to solid off takers, whereas 90%+ is investment grade. An average CAGR of nearly 50% industry wide over the last five years is uncommon in most industries. However, top line growth does not reveal the entire story, as discussed later.

5.1.2 PROFIT MARGIN

Profit margin is the corner stone in the DuPont model, which multiplied with leverage and asset turnover gives the Return on Equity. The profit margin is often referred to as net margin and is expressed below.

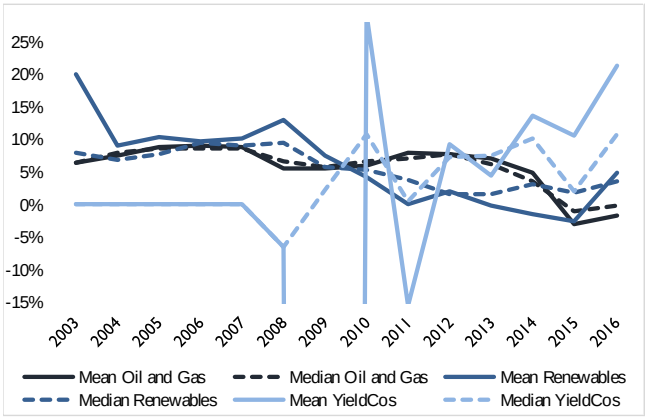
$$Profit\ margin\ \% = \frac{Net\ income}{Revenue}$$

Profit margin describes the residual income to shareholders after debt holders have received their fixed return. While Net Income expresses the net earnings of the business at the end of the year and is commonly cited as metric to whether a company creates wealth, it is not without flaws. Net income may be distorted by manipulative or creative accounting by ex. non-cash items, one-offs and does not describe the actual cash flow generated by a company. On the contrary, profit margin is essential in the DuPont setup, and utterly valuable when each component is broken down and analyzed with care. As will be discussed, the industries have experienced several shocks and upheavals which has had an effect on operating costs and impairment charges. Further, differences in capital intensity and capital structure may be visible in depreciation and interest expenses, respectively. Interpreting the profit margin is fundamental is identifying the structure and performance of renewable corporations.

As profit margin is composed of revenue and net income, and the former is explained in the last part on gross margin, earnings will be the main focus area. Further, in order to depict trends and drivers, the main cost elements will be analyzed systematically. However, the authors reserve the right to present preferred findings due to the vast amount of results.

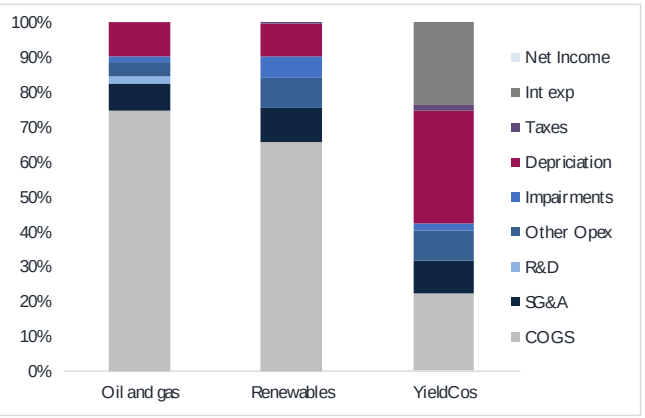
Earnings per share (EPS) is a commonly used equivalent to net income, expressing the portion of the company's net income allocated to each share. EPS is a widely stated metric describing value creation, both by management and in the investment society. David Bianco of Deutsche Bank broke down S&P 500 EPS growth drivers back to 1967 into sales growth, margin expansion and share count shrink. The last factor has had little, and mostly negative impact due to secondary offerings. However, since 2011 buyback programs has increased as cash piled up in balance sheets, which have contributed a moderate 1,4% to EPS growth. Before 1980, sales growth was the main driver, while recent years reveals a more balanced view between sales growth and margin contribution. Bust years 2001 and 2008 was characterized by extreme margin shrinking, while 2010 (post financial crisis) experienced margin expansion which contributed three times more than revenue growth (Breakdown EPS growth, Business Insider 2015). The research emphasizes the importance of market environment impacting revenues and company focus on margin excellence.

Figure: 5.1.11: Profit Margin Medians and Averages



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.1.12: Income statement structure, %of revenue, 2015



Source: Thomson Reuters Eikon / Own Contribution

The graph to the left confirms common perceptions in the sense that falling oil prices has affected oil and gas profit margins badly. Further, especially within Yieldcos mean and median differs greatly, pointing towards a limited number of companies in the sample and outliers. To the right, absolute financial data is collected at company level, aggregated and broken down as a percentage of sales. The three columns essentially summarize relative income statement structures and characteristics as of 2015. As observed in gross margin, sales in oil and gas entails higher direct costs, which partly contributes to a low aggregated industry net income. YieldCos have low COGS, but solid depreciation and high interest expenses. This is essential in the corporate structure and will be elaborated.

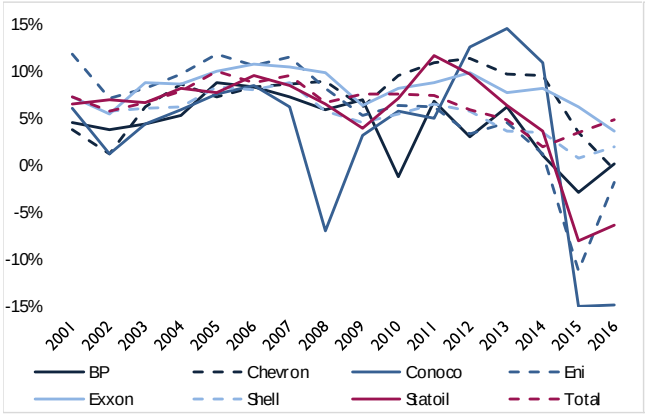
5.1.2.1 Oil and Gas

As mentioned, differences in accounting standards, practices and creativity may occur between the industries, distort results and lower the value of benchmarking. This is particularly relevant in expenses treatment within oil companies and tax items for Yieldcos. As seen in the company overview below, profit margins have historically followed the oil price trend. Further, it is a certain visual company correlation observed up until the 2014 price decline, where margins detached. This may be a sign of the current downturn being more dramatic than previous price drops. From the data material it is a varying presence of write offs within the sample, which could partly explain the spread in recent years. On a general note, a declining profit margin would mean that decreasing sales are surpassed by a relative higher decline in net income.

From the expense component breakdown, it is visible that earnings have vanished last two years despite a wide range of actions by management to rescue margins. We know from gross margin analysis that COGS tracks revenue declines quite closely. However, aggregated net income declined 93% from 2014 to 2015. An additional observation is the remarkable increase in impairments in 2014 and 2015, followed by a 50% decline in R&D investments in 2016. SG&A and labor are cut by 48% since 2012, while taxes are close to zero the last two years, driven by low and negative taxable incomes. Interest

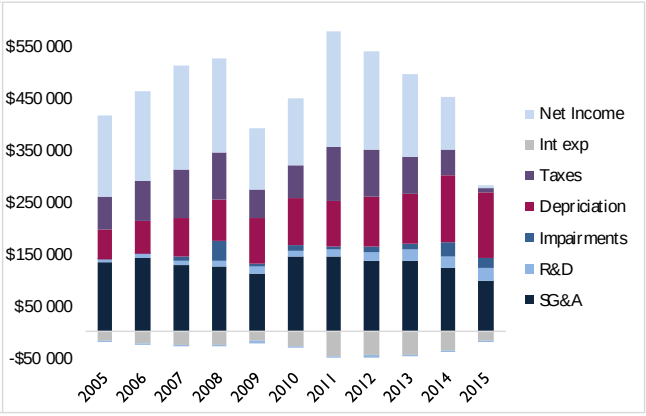
expenses has historically been positive (income) due to low leverage and strong cash balances. This effect has however diminished the last three years. First, interest income has come down as a result of less cash from operations and a general withdrawal. Secondly, an increase in gearing has led to higher interest expenses across the industry.

Figure: 5.1.13: Oil & Gass Profit Margin



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.1.14: Oil Gas Income statement structure, Excl. COGS (m)



Source: Thomson Reuters Eikon / Own Contribution

Generally, oil and gas income statements varies with the degree of exposure upstream and downstream due to varying risk profiles and tax- and accounting standards. As the exploration phase is costly and risky, and the production is characterized by high margins, the oil industry is regulated by government intervention. Tax schemes may impact efficient tax rates and accounting approaches such as "successful efforts" and "full cost" method affects margins. This is because exploration costs may be capitalized at varying degrees and hedging activities treated individually. In addition, our peer group is international

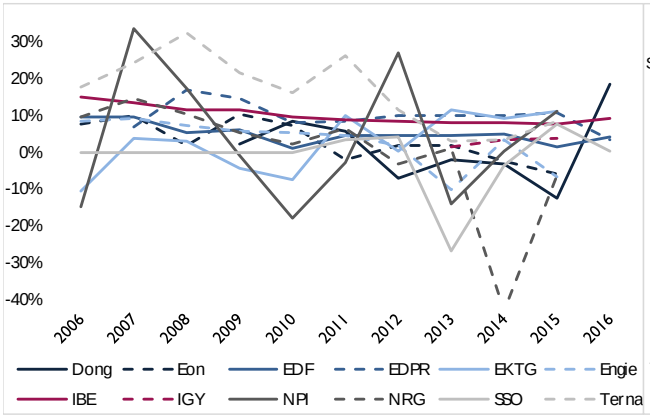
Research by valuation guru Aswath Damodaran at NYC Stern proposes net margins for integrated oil and gas companies at 0.56%, somewhat lower than our analysis (Damodaran, NYU Stern 2017). For P&E, the margin is -85.74%, with a sample of 330 companies which aligns well with the risk profile and capital requirements described above. The peer group net margin averaged 6% since 2000 and 5% since the financial crisis, while 2015 and 2016 resulted in -3% and -2% respectively. In addition to an industry wide decline, Conoco delivered net margins of -15% both years.

5.1.2.2 Renewables

Renewable corporations has experienced a somewhat similar declining trend post the 2008 financial crisis and up until 2014. Adverse to oil and gas, renewables increasingly created positive earnings the last two years, but the mean-median spread is substantial, pointing towards outlier values. It seems that oil price does not have a material effect on net earnings in the renewable peer group, although there obviously may be several indirect effects of oil price volatility. A more indisputable phenomenon, is the

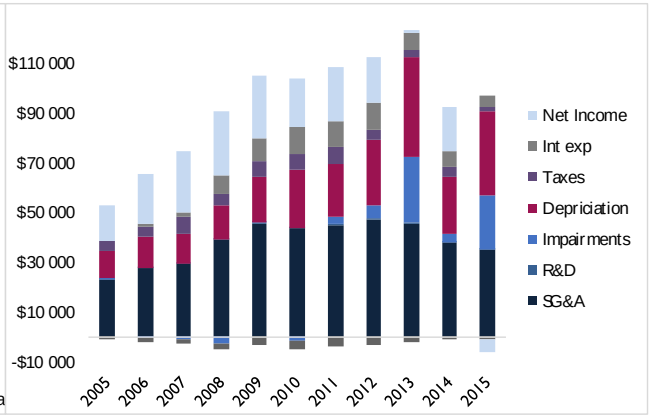
increase in competitiveness and preference relative to other energy sources in case of increasing oil prices. As this is best described with market data, it will be elaborated in the multiple analysis.

Figure: 5.1.15: Renewable Profit Margin



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.1.16: Renewable Income statement structure, Excl. COGS (m)



Source: Thomson Reuters Eikon / Own Contribution

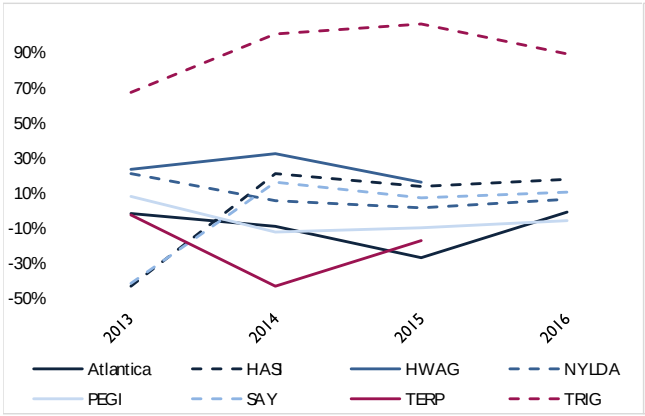
Naturally, management seeks to adjust operations and costs to the market environment to protect margins and value creation. Thus, profit margins have stayed relatively stable at average 5% with most companies just below 10% and some companies with volatile and negative earnings. NRG Yield´s sponsor, NRG posted non-cash impairment charges of $5Bn in 2015 due to a distressed coal plant in Texas and falling gas prices. This triggered a profit margin of -43% that year and illustrates the effect of both non-recurring events and the fossil exposure in the data material. An interesting finding is the apparent negative relationship between renewable exposure in portfolios and impairment levels. Low levels of write downs seem to contribute to stable profit margins in companies with high degrees of renewables assets. Figure 5.1.16 illustrates solid impairments in 2013 and 2015. This is driven by mentioned NRG, but also write downs Engie of $20Bn in 2013, in addition to smaller charges in Dong and EDF, mostly fossil related. In Engie, issues with gas storage and thermal generation led to net income deterioration, yet it had no real cash flow effect (Engie, press release 2013). On a general note, SG&A and labor costs has been cut by approximately 20% across the table, while interest expenses have remained stable and depreciation has taken a larger piece of the cake. On a final note, the distress cases with following restructurings in Abengoa and SunEdison has had a depressing effect on sample net margin development in recent year.

For pure play renewables, net income has remained stable but in some cases, like EDPR, earnings have been lowered by one offs and from 2015 to 2016, a generally lower wind resources.

Aswath Damodaran at proposes the following net margins; 4.01 in Power sector (68 firms), 9.41% in Utility (18 firms) and -9.57% in Green & Renewable Energy (25 firms) (Damodaran, NYU Stern 2017.) Our results are somewhat in the middle of the estimates, nicely reflected by the actual business exposure among the sample firms.

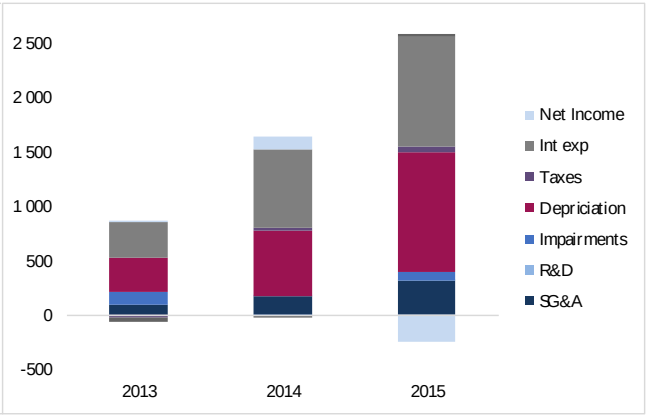
5.1.2.3 YieldCos

Figure: 5.1.17: YieldCo Profit Margin



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.1.18: YieldCo Income statement structure, Excl. COGS (m)



Source: Thomson Reuters Eikon / Own Contribution

Profit margins are of less importance for YieldCo investors due to the nature of the business model. YieldCos measure performance in Cash Available for Distribution (CAFD) as actual cash flows generated is what is of interest. Further, the YieldCos normally pay out 80-90% of CAFD which leaves little cash for internal cash flow financing and created a dependence on capital markets. The corporations have separate subsidiaries for each asset where operations endure and non-recourse debt is self-amortizing. Based on the above, net income at YieldCo level may be of less importance and clarity, but will be analyzed nevertheless. Yieldcos are intriguing as the cash generating business model is intuitively easy to understand, yet the tax- and accounting implications are rather complicated. In many ways, the nuances between cash flow and net income caused by non-cash items are crystalized through the YieldCo model.

YieldCos should be tax efficient by construction, as elaborated in the theoretical part. Therefore, authors did not expect substantial profit margins among the analyzed companies. Similar to REITs and MLPs, YieldCos are structured to avoid double taxation at corporate and shareholder level. This is achieved by matching strong positive cash flow with the characteristically high depreciation and expenses in renewable projects. These net operating losses (NOLs) should lower or even eliminate taxes and be sustained by continued asset growth through dropdowns. This is in theory, but not fully reflected in the analysis. Excluding TRIG which reports less detailed numbers, profit margins wake around 10%, but have historically been volatile. While COGS tends to make up less than 25% of revenues, SG&A and labor costs stands for under 10%, but has been increasing. Renewable projects are often highly leveraged, which means that YieldCos depend on a wide range of debt instruments on corporate level. The majority of this is self-amortizing project debt, but the companies also raise corporate level debt. The geared business model entails high interest expenses, as reflected by above 30% of revenues in the figure to the right. As proposed in the beginning, YieldCos also have large

depreciation charges annually, displayed by the burgundy area to the right. To sum it up, YieldCos tend to seek low profit margins as a consequence of tax efficiency because investors care about the cash flow generating ability of the corporations. That said, operating margins are far from irrelevant as control over COGS and SG&A is essential for cash distributions. However, items such as financial costs and depreciation are to a larger extent subject to financial engineering. As an example of the corporate structuring of YieldCos, studies of NRG Yield (NYLDA) annual report 2016, shows negative tax expenses of $1 million and reported net income of negative $15 million. After adding net income of Drop Down Assets and income attributable to minorities, net income attributable to NRG Yield shareholders are $57 million.

According to Aswath Damodarans sample of 238 firms, R.E.I.Ts achieves average profit margins at 22,43%. Since the sample size of this thesis is smaller (nine YieldCos), and the structure is young, one should expect outlier values to affect sample averages. However, the margin results are in the ball park area of the comparable R.E.I.T structure. Furthermore, it is imperative in YieldCo analysis to consider also the growth in earnings, and subsequently growth in dividend. The dividend growth requires an abnormal topline growth fueled by asset additions financed by large amounts of debt and equity issuances. From gross margin analysis, it is clear that revenues growth has translated into EPS growth and been sustained in most corporations. Further, guiding on expected EPS is aggressive and for the most part double digits. This expectation treadmill has already claimed its first victims, and so whether the earnings expectations are sustainable is an interesting area for research.

5.2 BALANCE SHEET ANALYSIS

5.2.1 ASSET TURNOVER

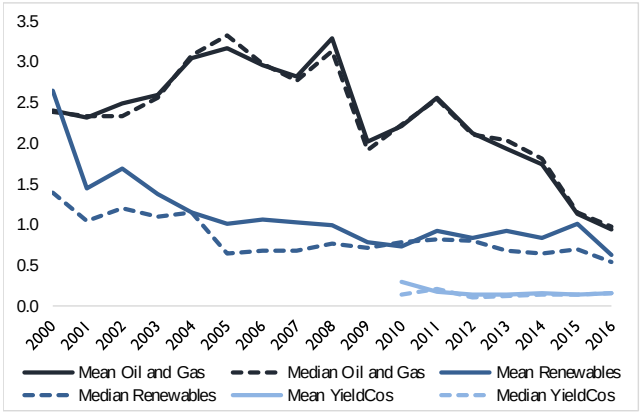
The asset turnover is a commonly applied metric and combines information from both the balance sheet and the income statement. It is an efficiency ratio that measures a firm's ability to generate sales from its invested capital. A firm that has an asset turnover of 2 generates $2 of revenue per $1 of invested capital, hence a ratio of 0,5 means that a firm only generates 50 cents of revenue per $1 of invested capital.

$$Asset\ Turnover = \frac{Total\ Revenues}{Invested\ Capital}$$

The metric typically varies across industries, where industries that are capital intensive often deliver low asset turnovers. The reason is fairly self-explanatory as industries that are dependent on massive capital investments creates less sales per dollar invested. Industries that are less contingent on assets, but more driven by strong market brands such as clothing designer industry will be driven by high asset

turnovers. A common rule in the simple DuPont breakdown is that companies with low asset turnover have higher profit margins and vice versa. However, as seen from the profit margin analysis every case is different.

Figure: 5.2.1: Asset Turnover Medians and Averages

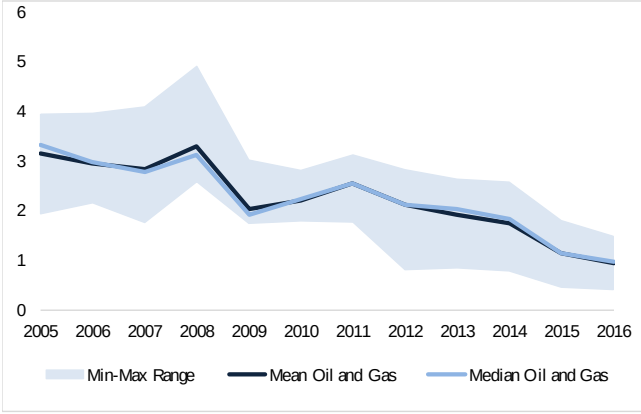


Source: Thomson Reuters Eikon / Own Contribution

Figure 5.2.1 illustrates how each industry have experienced very similar medians and averages the last two decades. This is consistent with the company-specific results that show a clear trend across the firms within their industry. Initially, the graph exhibits a much higher asset turnover for oil and gas compared to renewables. YieldCos is on the completely other end of the scale with extremely low asset turnovers.

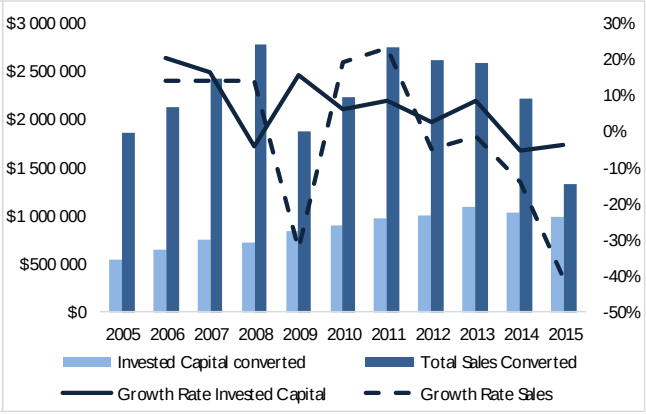
5.2.1.1 Oil and Gas

Figure: 5.2.2: Oil and Gas Asset Turnover Mean, Median & Min-Max Range



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.2.3: Peer Group Revenue, Cost and Growth (numbers in mill.)



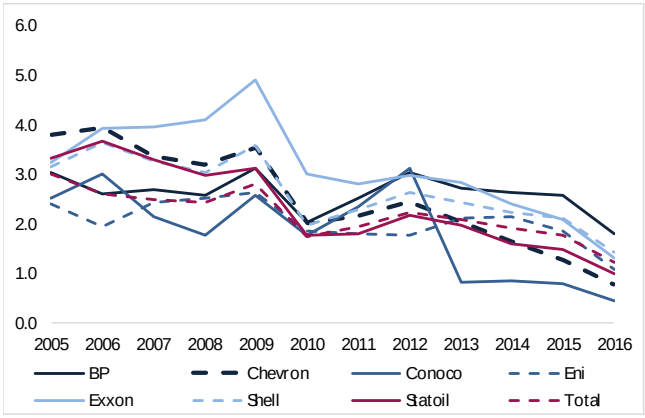
Source: Thomson Reuters Eikon / Own Contribution

Looking at the oil and gas industry as a whole from figure 5.2.2, the industry shows a steady decrease in asset turnover. This is driven by both decline in sales growth and total sales, while invested capital has slowly increased during the same period. Total invested capital has actually more than doubled since 2003, however the growth has been decreasing and was turned negative in 2015. While invested capital has been at fairly steady levels year-over-year, revenues on the other hand, shows a much more volatile development due to its strong correlation with the oil price.

Relative to invested capital, the revenue declines after the financial crash and never recovers to its former levels. However, a driver just as important as the decline in revenues is the growth in invested capital. Figure 5.2.5 display the development in the crude Brent oil price from 2003-2016. As expected, the revenues and oil price move fairly similar. A more surprising scenario is that even though revenues and oil prices have sharply declined in recent years, the invested capital remains at steady levels. After

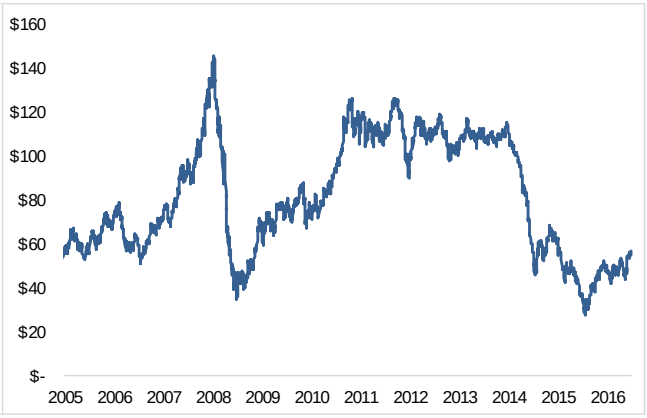
investigating the balance sheets and cash flow statements it is found that almost every analyzed oil and gas firm keep Property, Plant and Equipment (PP&E) at steady levels or even increase their holdings from 2014-2016. This is somewhat surprising as it would be natural to assume that capital expenditure decreases during periods when the attractiveness of investments is greatly reduced. Furthermore, fixed assets are sometimes booked as cash-generating-units (CGUs) where the current market value is valued as present value of future cash flow. When future cash flow is significantly diminished due to lower prices, impairments should be made to correct the value of assets. Statoil has written down more than NOK 130 ($14-16) billion worth of assets since 2013 (Nedskrivninger, Hegnar.no, 2017). This is transparent with their PP&E that peaked in 2013 with more than $80 billion. In 2016, this number was reduced to just below $60 billion. Chevron on the other hand, increased their PP&E in the same timespan from $164 billion to $182 billion.

Figure: 5.2.4: Oil and Gas Turnover Rate



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.2.5: Crude Oil-Brent Price 2005-2016



Source: Thomson Reuters Datastream / Own Contribution

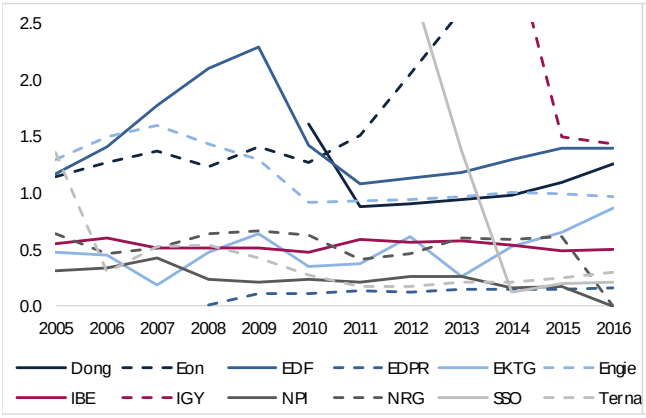
By looking at the company specific ratios in figure 5.2.4. , ConocoPhillips is the least efficient participant. ConocoPhillips bought Burlington Resources in 2005-2006 in a $35.6 billion transaction (ConocoPhillips History, 2017). In 2006, the company had a booked goodwill of more than $30 billion, which accounted for more than a quarter of the invested capital. A company can only increase their goodwill from buying assets or acquiring firms where the purchase price is higher than the market value of the assets. Hence to balance the assets with debt and equity, goodwill is used as an equalizer. Especially with regards to the energy industry, PP&E often have a direct link to revenue. Goodwill on the other hand, might be more loosely linked to revenue and is often regarded as assets that will boost synergies in the long term. Acquisitions has often failed to increase the effectiveness of a firm and in this instance, the asset turnover ratio is able to support that observation.

5.2.1.2 Renewables

The figures below depict the renewable industry to have a fairly consistent ratio between growth in invested capital and revenue. Both metrics move with the same trend and spikes at the same time

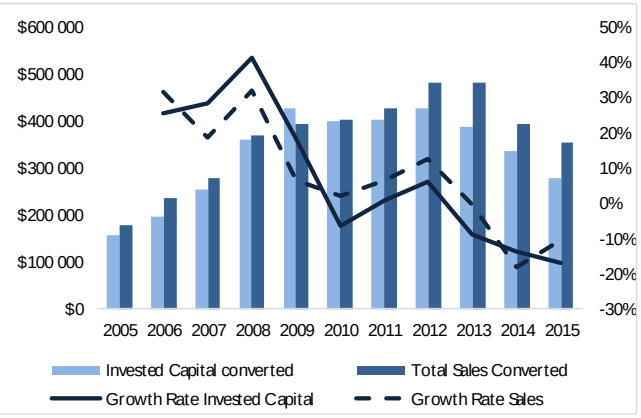
periods i.e. 2008 and 2012. In contrast to the oil and gas industry, the renewables industry has had a corresponding decline in revenue and invested capital the last couple of years. Nonetheless, the sample applied has a legitimate spread between the firms being the most and least efficient in terms of revenue per dollar invested. This could imply that looking at the industry as a whole might not be a very precise method of analysis. On the other hand, oil and gas revenue has a strong correlation with the oil price that has been prone to change both rapidly and drastically.

Figure: 5.2.6: Renewables Turnover Rate



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.2.7: Peer Group Revenue, Cost and Growrth (numbers in mill.)



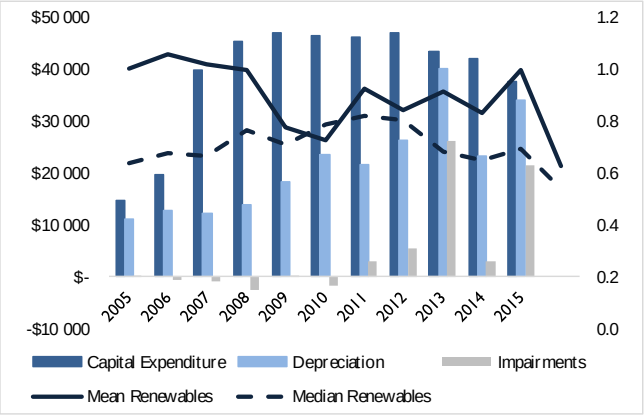
Source: Thomson Reuters Eikon / Own Contribution

The renewable energy industry whose sole foundation is based on fixed price contracting are less affected by fluctuating power prices, because the majority of the revenue stems from already determined power prices. The concern is that only few of the sampled renewable corporations are IPPs or pure-play renewable firms. Firms with a larger exposure towards natural gas or utility networks (which regards several participants) should also be more affected by fluctuating commodity prices.

At the firm-specific level E.ON looks to be the only firm with a clear upward trend in asset turnover (ranges between 2 and 5 in 2013-2015). The utility company had approximately 13% of its adjusted 2016 EBIT from renewables while the other core business areas, energy networks and customer solutions comprised 55% and 26% respectively. This makes it hard to determine whether operational excellence in development and financing of renewable energy projects is the underlying driver for the increased efficiency in asset turnover. What is evident is that a large portion of the revenues is sourced from long-term contracts and hedged merchant prices (E.ON Roadshow 2017). The firm has also initiated an efficiency program securing sustainable competitiveness and focuses on disciplined capital allocation, whereas CAPEX spending reduction has been the main goal. Furthermore, renewables as a core business area has increased year-over-year compared to the other mentioned operations. Still, only 13% of EBIT is from renewables. In fact, the pure-play renewable firms and IPP's seem to have amongst the lowest asset turnover levels in the sample. Both Scatec, NPI, EDPR and Terna are all pure-play green power and IPP's. They are all among the five firms with the lowest asset turnover level.

The reasoning to why IPPs seem to have lower asset turnovers will be discussed in further detail in the Yieldco section below.

Figure: 5.2.8: Renewables Asset Turnover and breakdown PP&E (numbers in mill.)



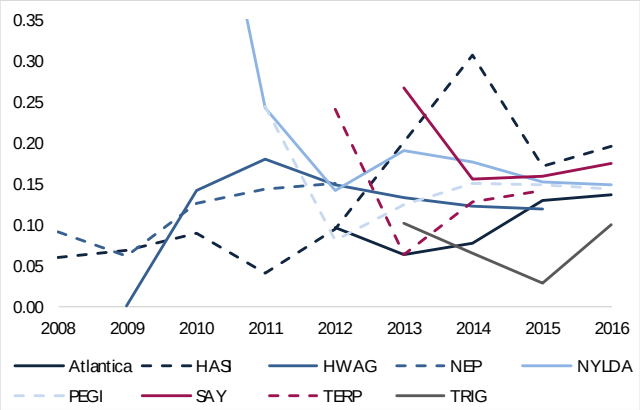
Source: Thomson Reuters Eikon / Own Contribution

Circling back to the industry as a whole, the CAPEX and asset turnover seem to move quite uniformly, although asset turnover takes a significant dive in 2016 where lack of data prohibits the CAPEX number from showing the same effect. This could indicate that the industry is not becoming more efficient with their newly acquired assets; instead the new assets could potentially be generating revenue with the same efficiency as existing assets. However, adding the fact that power prices have declined in recent years, indicates that new assets are actually becoming more efficient on a general basis. At the same time, PP&E do not amount to all the invested capital applied in the asset turnover ratio. Furthermore, impairments are among the additional factors that should be taken into account. Still, it could be interesting to separately examine whether new assets generate revenue more efficiently than old ones.

5.2.1.3 YieldCos

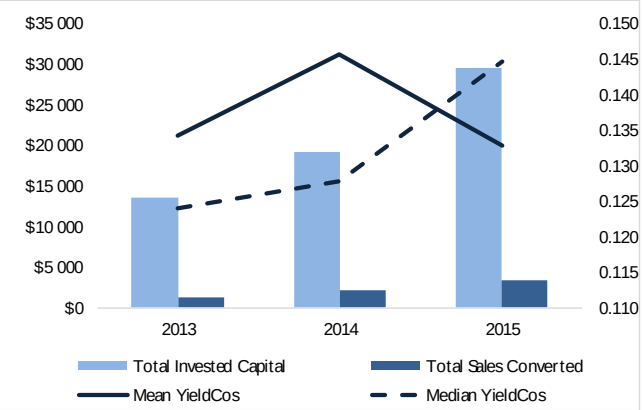
Yieldcos have a significantly lower asset turnover than the renewable energy industry in general. This is as anticipated since the financial vehicles are constructed to own capital-heavy assets that is expected to generate revenues for the next 25+ years. For the sample as a whole, the PP&E have comprised 96%, 101% and 102% of invested capital the last three years respectively. Hence the turnover rate of the PP&E is driving most of the net operating asset turnover. Given that the assets are built to generate long term revenues it makes sense that the turnover rate is lower than for other asset classes where the life expectancy is significantly shorter. Additionally, many of the firms in the renewable corporation sample are complete utility companies where customer solutions amount to a large part of the revenues as with E.ON for instance. That business area is very asset-light compared to investments in power plants. Another factor driving the low asset turnover is that sponsors have historically sold assets at high prices to their YieldCos. For instance, NRG Yield acquired in November a 75% interest in NRG Wind TE Holdco, a portfolio of 814 net MWs of power generation capacity. NRG Yield recorded the drop down at a net asset historical cost of $369 million rather than the fair value of $207 million (NRG Yield Q4 Financial Results). This ultimately resulted in a non-cash impairment, hence the net operating assets were ultimately reduced. However, it still amplifies the impression that assets are sometimes dropped down at unreasonably high prices.

Figure: 5.2.9: YieldCos Turnover Rate



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.2.10: Peer Group Revenue, Cost and Growth (numbers in mill.)



Source: Thomson Reuters Eikon / Own Contribution

A cautionary note that should be regarded when analyzing the YieldCo structure is that they are financially constructed in a manner that differ from a standard corporation. Hence metrics such as asset turnover might not give the same informational value, or at least, should be analyzed with a different framework/approach compared to other financial vehicles. As mentioned several times, the asset turnover is considered an efficiency ratio, but it characterizes YieldCos in an especially poor manner. Without properly breaking down the assets on the balance sheets or the cash flow to investors it is hard to justify an asset turnover ratio of 0,1 or 0,15. Understanding the YieldCo strategy is imperative to understanding results of the analysis. Revenue for instance, might not be the most interesting metric to compare to assets when YieldCos are regarded. What might be more interesting is looking at either EBITDA of CAFD that represents the cash flow to investors. While the corporate structure in general have a higher asset turnover ratio compared to YieldCos, they also tend to have much higher operational expenses. Comparing EBITDA with invested capital could be a more applicable metric to compare YieldCos with renewable corporations. Nonetheless, it will still not be a comparison of apples with apples as most corporations comprise of several business areas, while YieldCos in general are more pure-play.

5.2.2 LEVERAGE

Capital structure has long been a debated theme amongst academics, financial analysts, CFO's and investors. As described theoretically in section 3.1, determining the optimal capital structure and leverage of a firm is a complex matter as several options pose both advantages and disadvantages. The capital structure strategy for one firm, might not be the best solution for competitors. However, firms within the same industry often have similarities in capital structure. Looking at the industry-level, one industry might be favorably disposed to apply an aggressive capital structure strategy, while other industries are more reliant on equity and conservative funding practices.

This part of the analysis will apply three different metrics to examine the leverage and capital structure of the firms. The first metric looks to examine the ratio between interest-bearing debt and equity, which are the sources of financing that are based on purely financial decisions and also sources of capital that demands a return. The first metric is referred to as the debt leverage:

$$Debt\ Leverage = \frac{Total\ Debt}{Total\ Equity + Total\ Debt}$$

The second metric is similar to the first, however, it subtracts financial assets from debt, hence it looks at the net interest-bearing debt to equity. It is referred to as net debt leverage:

$$Net\ Debt\ Leverage = \frac{Net\ Debt}{Total\ Equity + Net\ Debt}$$

The purpose of this metric is to illustrate the use of and positioning in financial assets. The idea behind net debt is that it tells how much debt is left on the balance sheet if all existing cash and equivalents are used to pay its debt obligations. It should be mentioned that while the majority of financial assets are cash and equivalents, it still contains some minor and more illiquid financials as explained in section 4.2. Finally, the analysis seeks to examine the total leverage measured at booked values. It looks to determine how total assets are financed through equity, debt and liabilities. By "liabilities" the authors is referring to the obligations that arise from running a business operation such as accounts payable, deferred revenue, accrued expenses etc. The purpose is to investigate how the firms not only apply debt and equity, but also how they use liabilities as a source of financing. It is referred to as total leverage and calculated as follows:

$$Total\ leverage = \frac{Total\ debt\ \&\ liabilities}{Total\ assets}$$

Based on the metrics above, net debt leverage could indicate a 1:1 ratio between net debt and equity, while total debt and liabilities to equity could indicate 90% leverage. In such a scenario, the firm would largely finance itself from liabilities. If a firm is able to get credit from its suppliers or in some cases its customers with no explicit interest, this will reduce the investment in net operating assets. This is favorable because the available capital can be allocated elsewhere. However, such credit comes with a price. To compensate suppliers for not applying interest rate, they often charge higher prices for the goods and services they provide or require rebates on the product purchased or other advantages (Penman, 2013).

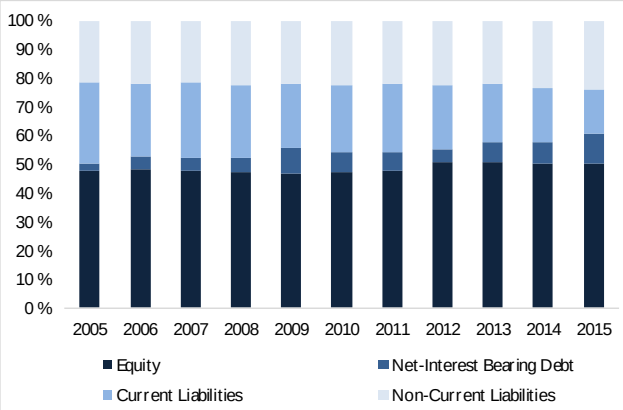
It is more common to apply debt/equity or net debt/equity then the debt "ratios" calculated above. The reason they are applied is that some firms had extraordinary high or low leverages, making it hard to present and compare company-specific metrics. The purpose was to create ratios that ranged

between 0-100% (0 and 1), even though the debt/equity ratio for the same firms could range between 0 and 10. Furthermore, industry averages were also being greatly affected by outliers, whereas median remained more intact. The reader should bear this in mind as it entails that a net debt leverage of 50% equals a net debt/equity of 1. However, a net debt leverage of approximately 91% equals a net debt/equity of 10. In other words, the percentages do not translate into a linear relationship between debt and equity.

5.2.2.1 Oil & Gas

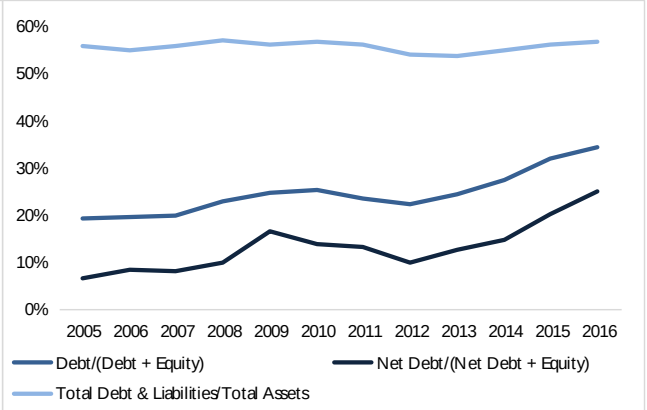
Figure 3.4.2.1 illustrates how to the oil and gas companies have financed their invested capital for the last 11 years. The bar is presented in percentage points with the purpose of depicting the ratio between the different sources of financing. The application of relative numbers loses the advantage of showing the absolute increase/decrease in specific segments; however, absolute numbers for invested capital are already presented in the asset turnover section. The figure only includes net interest bearing debt, hence it does not separate interest bearing debt and financial assets. To illustrate the difference, the second graph display the three abovementioned leverage ratios. The difference between the debt leverage and net debt leverage display the impact of financial assets on net debt.

Figure: 5.2.11: Oil and Gas Sources of Financing as a % of Invested Capital



Source: Thomson Reuters Eikon / Own Contribution

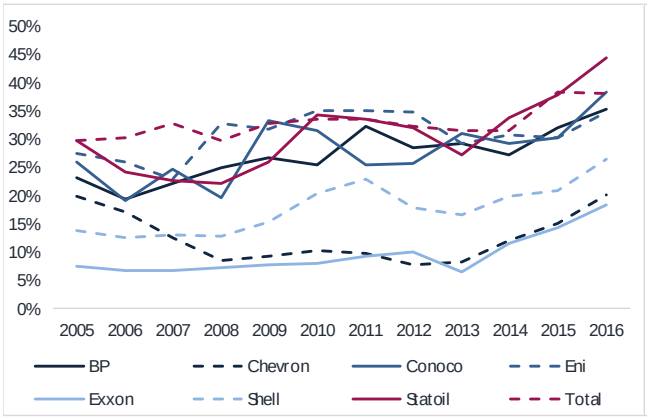
Figure: 5.2.12: Oil and Gas Leverage and Debt-to-Equity Ratios



Source: Thomson Reuters Eikon / Own Contribution

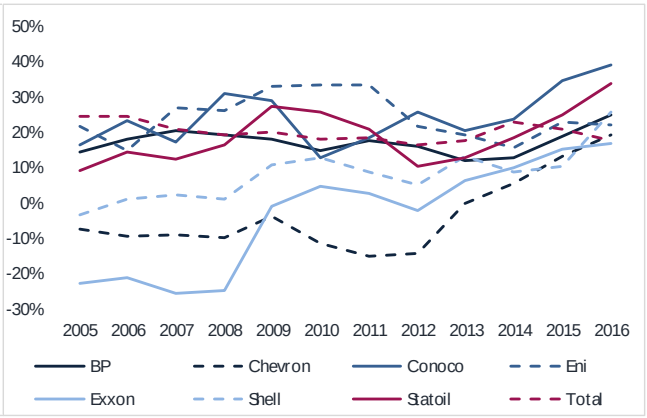
The oil and gas industry have had a fairly stable and constant total leverage. Although the figures above only depict the industry back until 2005, the data shows an almost equally stable and constant leverage for the last 20 years (se appendix 4). What has changed to some degree is that the industry as a whole has increased interest bearing debt. This is illustrated in figure 5.2.11, where NIBD increased from amounting to less than 5% of invested capital to comprise a total of more than 10%. Still, the NIBD is small compared to both equity and liabilities. While non-current liabilities have remained fairly constant, the rise in NIBD has mostly led to a decrease in non-current liabilities. This development is visible in figure 5.2.11 and also evident in figure 5.2.12 whereas both debt leverage and net debt leverage increase while total leverage remain constant.

Figure: 5.2.13: Oil and Gas Debt/(Debt + Equity)



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.2.14: Oil and Gas Net Debt/(Net Debt + Equity)



Source: Thomson Reuters Eikon / Own Contribution

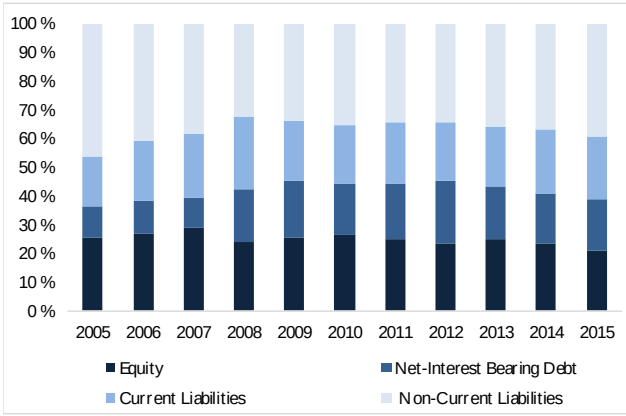
The trend-analysis of the firm-specific ratios shows that debt leverage and particularly the net debt leverage are consistent among all firms i.e. all firms have increased interest bearing debt in recent years. Although the spread in the debt leverage across the firms are apparent the trend is undeniable. Arguably more important, the net debt leverage shows a smaller spread between the firms in recent years. This implies that for the firms with low debt leverage such as Exxon and Chevron are also the firms with the lowest amounts of financial assets relative to their invested capital.

According to the Bank for International Settlements, the oil and gas industry's debts almost tripled from $1.1 trillion to $3 trillion from 2006 to 2014. It was particularly smaller firms and state-controlled groups in emerging markets that were enthusiastic gearing up. Nonetheless, most participants increased their debt holdings. This was partly driven by the post-crisis monetary policies. Low rates of interest drew investors to riskier assets and into oil and gas equity- and debt investments (Crooks, 2016). After the oil price declined in the summer of 2014, many of the big firms issued additional debt to finance their investment programs and dividends payments. Among the firms taking on debt to pay dividends were Statoil as evident from both figures above (Dahl, 2015). Chevron is the firm with the most aggressive net debt/equity increase since 2012, with more than a 30% increase. Chevron is also among the companies increasing invested capital heavily the last couple of years.

The oil and gas industry had initially lowered the industry debt/equity in the mid-2000s on the promise of rising oil prices. High profit margins allowed the firms to pay off debt and be less dependent on external financing. But as the oil prices dropped dramatically in 2008 and 2009 the firms saw their profit margin plummeting.

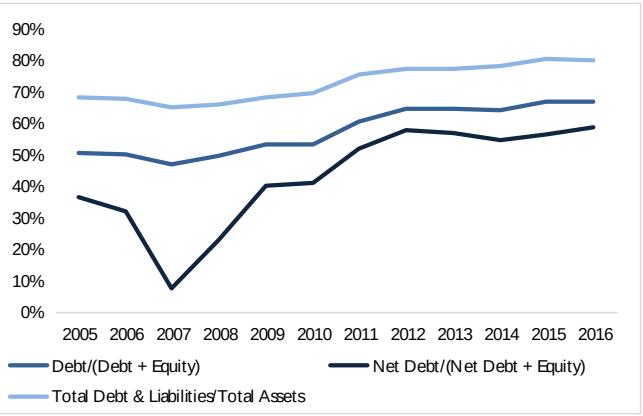
5.2.2.2 Renewables

Figure: 5.2.15: Renewables Sources of Financing as a % of Invested Capital



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.2.16: Renewables Leverage and Debt-to-Equity Ratios



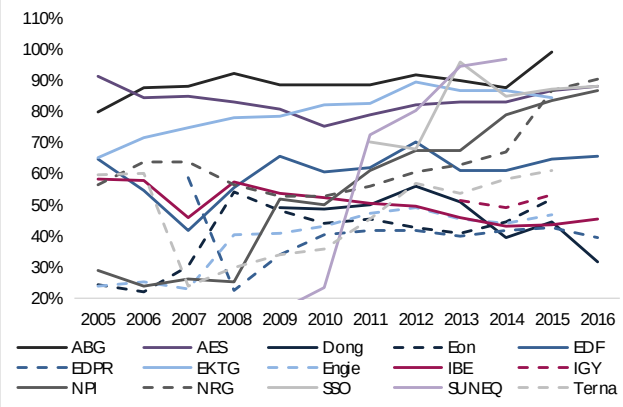
Source: Thomson Reuters Eikon / Own Contribution

Figure 5.2.15 illustrates an industry where the mix between sources of financing have been mostly stable for the last 11 years. Liabilities have increased somewhat in recent years while equity has decreased marginally. Interestingly, liabilities comprise more than half of the total sources of financing every year. The authors find that current liabilities mostly consist of accounts payable, other payables and other current liabilities. Furthermore, non-current liabilities mostly consist of deferred income tax, reserves, pension benefits and other long term liabilities. However, the size of the different liabilities varies across the firms, making it difficult to determine any clear patterns. Still, renewable corporations are able to apply payables and deferred income taxes as a means of financing operations. Figure 5.2.15 illustrate that firms increased their debt-to-equity from 2007-2012/13 quite significantly. On the other hand, total leverage has only modestly increased. From a theoretical standpoint, this would imply that debt is increasing more than liabilities, relative to invested capital. Figure 5.2.15 is biased towards the bigger firms because the numbers are calculated in absolute figures. To check whether the figures are corresponding and building on each other, one can look at the equity as a percentage of total invested capital against the total leverage. The residual in the total leverage is the equity part, hence if total leverage in a given year is 70% then equity should be 30%. In this regard, the figures look to correspond pretty well.

The firm specific ratios show a huge spread in both debt leverage and net debt leverage. If the graphs below are compared with the results from the oil and gas industry, then it looks as though there is little consistency or consensus in the industry. However, the sample of firms consist of not only pure-play renewable corporations, but also utility companies and similar. For this particular metric, it is especially interesting to consider the leverage of the pure-play renewable corporations. Looking at the wind power industry specifically, Deloitte reported that the industry-average had a leverage between 50-70% on wind projects. They also reported that onshore wind power projects were mostly in the upper range,

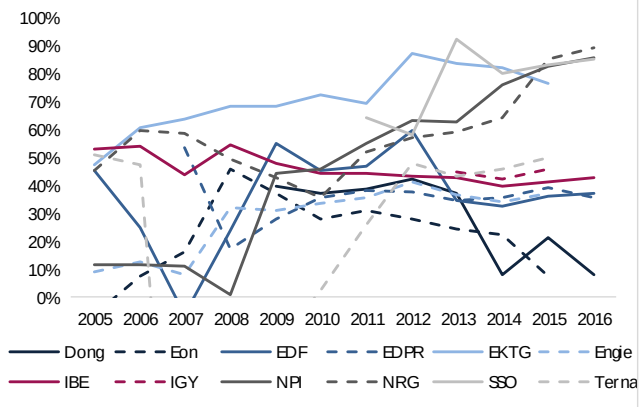
while offshore projects were in the lower range. This is due to the increased riskiness of offshore projects, hence they demand a higher equity-capital requirement (Deloitte – Establishing the investment case Wind Case, 2014). EKTG is one of the few pure-play companies and largely dominated by wind power investments (wind energy equals 711 MW of a total 738.5 MW installed capacity as of 2017) and among the highest leveraged firms. It also shows a consistent and stable debt leverage and net debt leverage over the course of the interval. The firm has had a total leverage between 87%-91% from 2012-2015. This by far exceeds the industry average as reported from Deloitte. Scatec is another pure-play renewable firm whose leverage is among the highest in the sample. Both debt leverage, net debt leverage and total leverage has been between 80%-90% the last four years. This implies that Scatec applies much more debt financing compared to its peers. Furthermore, Northland

Figure: 5.2.17: Renewable Debt/(Debt + Equity)



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.2.18: Renewables Net Debt/(Net Debt + Equity)



Source: Thomson Reuters Eikon / Own Contribution

Power Inc, is also among the highest leveraged firms with increasing leverage in past years. The authors note an apparent relationship between leverage on company level and degree of exposure to fixed, solid cash flows from renewables at project level. It is intuitive to assume that less risky cash flows facilitate higher geared companies, which yields higher ROE, in theory.

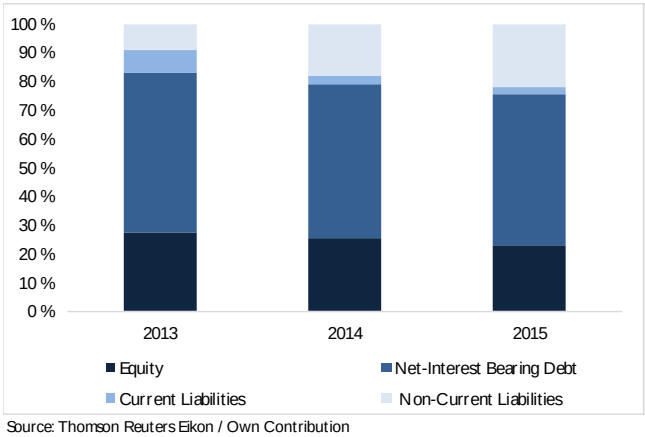
Dong has been consistently decreasing leverage the last 4-5 years and delivered a net debt leverage at approximately 8% in 2016. The company argues that the conservative capital structure is due to their desire of keeping a BBB+ credit rating (Dong Annual Report, 2016). However, Scatec, a company that is much more leveraged is considered to have a BBB rating (Nordea Shadow Rating). Northland Power Inc. also hold a BBB rating (Northland Power Inc. Annual Report 2016). An interesting consideration is that Scatec and NPI almost entirely apply project finance and non-recourse debt, while Dong apply corporate finance and full recourse debt. If Dong turns out to make a bad investment/project, the lenders can essentially go after all the assets in the entire firm to reclaim their collateral. Contradictory, if Scatec were to fail in one of their projects, they would only lose their assets pertaining that project, since the loan is only secured in the assets of the same project. This makes Scatec able to achieve sensible loans terms even though they are highly levered i.e. the required return on debt is lower than

required return on equity. As an overall finding, the authors believe the utility companies to have a significantly lower leverage than the pure-play renewable IPP's as seen from both figures above. Both utilities and IPP's are capital heavy, however, utilities are more often stately owned or backed by governments and is in general bigger firms. This makes utilities attractive to big pension and investment funds, that do not consider smaller firms such as Scatec or NPI attractive (Maverick, 2015). As a consequence, they often pool more equity-investors. Additionally, the authors believe it is the structure surrounding the revenue-stream of the assets pertaining IPP's that makes it affordable for IPP's to be highly leveraged. Because they rely on fixed-price contracts they are able to create security and hedge against fluctuating commodity prices, ultimately decreasing liquidity risk for debt lenders.

What makes the Scatec company structure very interesting is that it allows stakeholders to invest in a single project, with a risk and reward picture that is tailored to the specific project. Some co-investors have joined Scatec in constructing solar parks in the US, which is considered a safe investment environment. Since project finance is applied, the lenders will demand a return based of the risk of the project, which in that case is pretty low. Oppositely, other investors have chosen to join Scatec in constructing solar parks in Africa. This is in general, a much riskier investment, hence the lenders demand a higher return. Still, due to the involvement of local investors and stakeholders, Scatec is able to reduce risk significantly. An IPP in general have assets and a business model that enables fixed and predictable cash flows for the coming 20+ years. Added the company structure of Scatec enables the company to achieve affordable debt even though they are highly leveraged. This matter will be discussed in the capital allocation policy section in more detail.

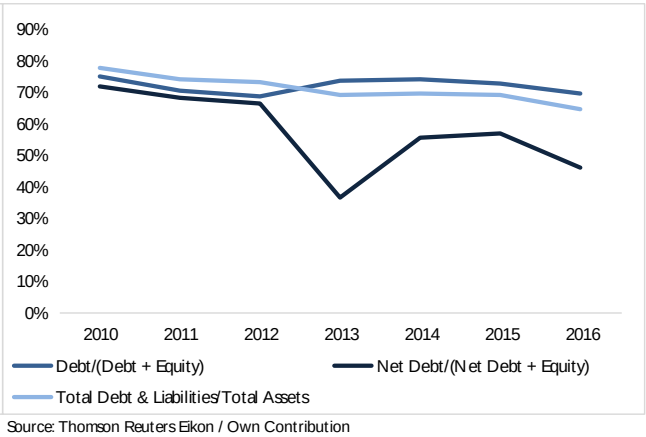
5.2.2.3 YieldCos

Figure: 5.2.19: YieldCos Sources of Financing as a % of Invested Capital



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.2.20: YieldCos Leverage and Debt-to-Equity Ratios

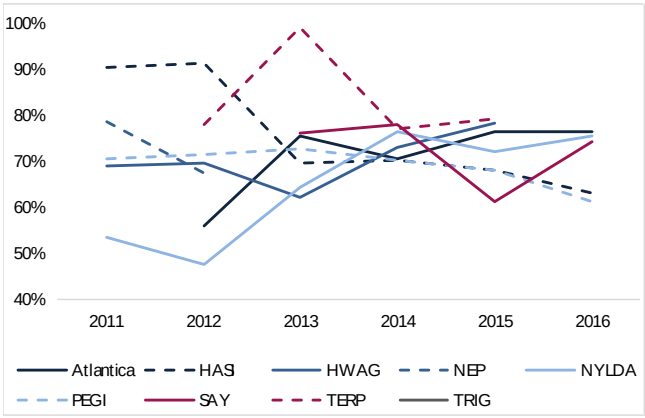


Source: Thomson Reuters Eikon / Own Contribution

The yieldco industry have experienced a decrease in both equity and net-interest bearing debt compared to operating liabilities from 2013-2015 as illustrated by figure 5.2.19. The trend is only minor and not especially consistent with figure 5.3.20 that depict an industry with gradually decreasing debt leverage

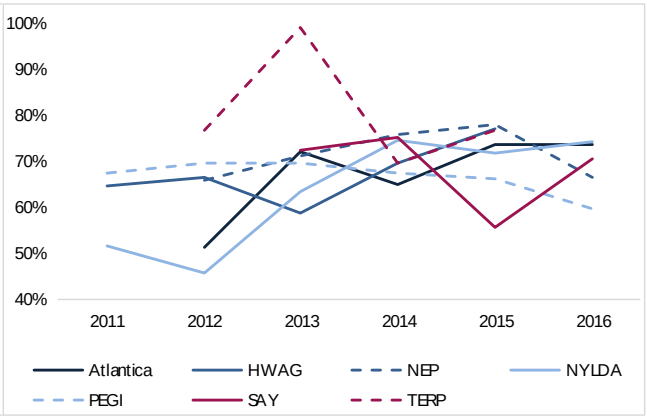
and total leverage. The net debt leverage is the only metric that expresses significant volatility in recent years. The fluctuations are not huge, but it goes to show that financial assets and primarily cash holdings vary year-over-year. Similar to many of the pure-play IPP's previously mentioned, the Yieldcos

Figure: 5.2.21: YieldCos Debt/(Debt + Equity)



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.2.22: YieldCos Net Debt/(Net Debt + Equity)



Source: Thomson Reuters Eikon / Own Contribution

have in general a rather high leverage with a debt ratio at 70% i.e. debt/equity equals 2.3 in 2016. This is consistent with the belief that it is the underlying assets that drive the leverage ratio for IPP's. Yieldcos are equity-financed at the corporate level in the sense that they issue equity to finance dividends payments and fund projects. However, as they build up the balance sheet, they are slowly able to build up their leverage, which they do. Furthermore, Yieldcos often apply non-recourse debt and project finance in many of the subsidiary or project companies to finance projects. As a capital structure they are much alike the structure of Scatec, thus it makes sense for the firms to have fairly equal leverage.

As expected, the YieldCos have in general quite similar capital structures. This co-aligns with the discovery of similar asset turnover across the industry. Compared to the renewables sample it makes sense that the firms have more corresponding results since they are deliberately constructed more similarly.

5.3 RETURN ON EQUITY AND INVESTED CAPITAL

The purpose of this section is to elaborate return on investment metrics. Conventional profitability analysis usually starts at the top, describing and breaking down return on invested capital (ROIC) and return on equity (ROE) before approaching the specific sub-metrics they consist of. The authors felt it was necessary in this case, to go the other way around. This is mainly due to the fact that the ROE results presented in the analysis is not based directly on the metrics in the advanced DuPont analysis due to lack of data. Furthermore, ROIC and ROE had varying and not especially presentable results. The sub-metrics on the other hand, had much more consistent data year-over-year both within and

between firms. Therefore, the metrics do not provide much value before knowing the underlying drivers and what has impacted these drivers.

The decomposition of profitability is known as DuPont analysis. Herein lies both the advanced and the simple DuPont analysis. The main purpose is that they both end up with the ROE. Due to lack of data, it has been hard to compute a significant and justifiable net borrowing cost (NBC)[6].

To explain ROE, one should to initially look at the ROIC. The ROIC describes the profitability of the net operating assets, which means it only looks at the operational aspect of the firm. In the reformulation of annual statements, it has been stressed that operational and financial assets and liabilities should be divided. That coincides with the reasoning behind the DuPont analysis. The ROIC can be calculated as:

$$ROIC = Operating\ Profit\ Margin * Asset\ Turnover$$

Both metrics have been previously dissected and analyzed, the first a profitability measure, the second an efficiency measure. The two measures combined, ultimately illustrates a firm's ability to generate return on its invested capital/net operating assets. Still, it should be mentioned that the operating profit margin refers to the NOPAT margin. This entails that the metric does not include interest expenses because they are not related to the operational aspect of the firm. The profit margin presented in the income statement includes financial costs. However, all costs in the income statement has been dissected, hence operating profit margin is simply the net profit margin added the financial costs. Moving on, the ROE is an extension of ROIC and includes capital structure i.e. the impact of leverage:

$$ROE = ROIC * Financial\ Leverage * (ROIC - NBC)$$

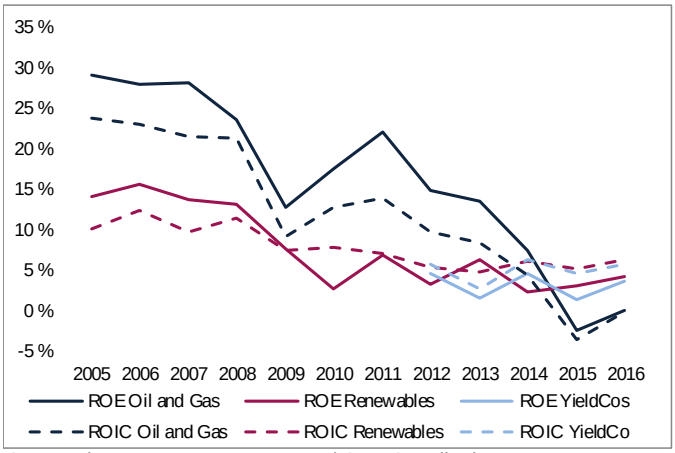
In the equation above, financial leverage/gearing is calculated as net interest bearing debt/equity, which is the foundation for the net debt leverage applied in the leverage analysis. Furthermore, the net borrowing cost is calculated as the net financial expense (net interest cost) divided by net-interest bearing debt (Penman, 2013). The equation ultimately expresses how the spread between return on assets and cost of debt either encourages or discourages the option of applying leverage to increase shareholder return/ROE. As mentioned, the analysis was not able to extract a believable and thus useful NBC, hence the ROE had to be calculated otherwise. The simple DuPont analysis calculates ROE as:

$$ROE = Profit\ Margin * Asset\ Turnover * Equity\ Multiplier \quad \rightarrow \quad Equity\ Multiplier = \frac{Total\ Assets}{Total\ Equity}$$

[6] Net borrowing cost is calculated in the DuPont analysis as: interest expenses/net interest bearing debt

This is a simpler approach, but still captures the leverage effect, ultimately giving the same results. While the advanced DuPont applies operating asset turnover as sales/net operating assets, this equation computes total asset turnover as sales/total assets (Pinsent, 2017). This should eliminate differences in results from one analyst to another as net operating assets is based on an adjusted balance sheet, while total assets are never a subject of speculation. While the advanced DuPont model yielded varying results, the simple DuPont model yielded the same results as the standard calculation for ROE: net income/average equity. However, since the elements in the simple DuPont, except profit margin, are not discussed or analyzed in the income statement analysis, nor in the balance sheet analysis, the ROE was simply calculated as net income/average equity.

Figure: 5.3.1: Industry Medians Return on Equity & Return on Invested Capital



Source: Thomson Reuters Datastream / Own Contribution

Figure 5.3.1 illustrates the industry medians for ROIC and ROE the last 11 years. The oil and gas industry shows a development consistent with the previous analyses. It shows how both the financial crisis and especially 2014 and onwards have been tough years for the industry. It also depicts how even though years such as the financial crisis strained the industry, the last couple of years has been much tougher and could be an indication of more struggles going forward due to low oil prices. Furthermore, the development between ROIC and ROE illustrates that the oil and gas companies are able to apply leverage to increase ROE. This makes sense because the industry applies low levels of debt, hence they should be able to acquire fairly cheap loan capital.

The renewable industry depicts a quite stable, slowly decreasing development in ROIC the last 10+ years. This corresponds well with both downward trending profit- and turnover margins. The fact that the ROIC shows a stable development overall also corresponds to previous findings where fixed-price contracts drives the robustness and low-risk environment in the industry. Still, the figure applies medians due to large outliers, while the figures presented elsewhere is mostly as averages. Hence the development in ROIC illustrated above is not completely parallel with previously presented measures. The ROE tend to more volatile and to a large extent lies beyond the ROIC. This would suggest that the sample at least is not applying financial leverage effectively to increase ROE. This could be an indication of expensive loan capital. However, it could also derive from the recent development seen in several firms where divesting has taken a toll on the profit margin and capital allocation to equity.

Lastly, the YieldCos presents a uniform trend between ROIC and ROE, but the industry seems to unsuccessfully apply leverage as a source of increasing shareholder return. Still, as discussed in the profit margin analysis, the profit margin is of less importance for the YieldCo structure. This affects both the ROIC and the ROE in this regard, but the ROE is arguably the least relevant metric, because it does not necessarily give a precise picture of the cash distribution to shareholders.

5.3.1 OIL AND GAS

Figure 5.3.2: Oil and Gas Return on Invested Capital & Return on equity

	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016	
	ROIC	ROE	ROIC	ROE	ROIC	ROE	ROIC	ROE	ROIC	ROE	ROIC	ROE	ROIC	ROE	ROIC	ROE	ROIC	ROE	ROIC	ROE
BP	14 %	23 %	15 %	23 %	9 %	17 %	-12 %	-4 %	13 %	25 %	0 %	10 %	5 %	19 %	0 %	3 %	-6 %	-6 %	0 %	0 %
Chevron	22 %	26 %	25 %	29 %	9 %	12 %	15 %	19 %	20 %	24 %	17 %	20 %	10 %	15 %	7 %	13 %	0 %	3 %	-1 %	0 %
Conoco	7 %	14 %	-22 %	-24 %	4 %	8 %	11 %	17 %	12 %	19 %	9 %	13 %	10 %	16 %	6 %	11 %	-7 %	-10 %	-4 %	-10 %
Eni	28 %	37 %	22 %	29 %	12 %	14 %	13 %	17 %	11 %	17 %	6 %	10 %	0 %	12 %	3 %	3 %	-9 %	-15 %	0 %	-2 %
Exxon	28 %	34 %	30 %	39 %	11 %	17 %	14 %	24 %	15 %	27 %	16 %	28 %	9 %	19 %	8 %	19 %	4 %	9 %	1 %	5 %
Shell	26 %	27 %	21 %	21 %	8 %	9 %	11 %	14 %	10 %	19 %	7 %	15 %	5 %	9 %	3 %	8 %	-2 %	1 %	0 %	3 %
Statoil	20 %	29 %	29 %	24 %	9 %	9 %	13 %	18 %	25 %	33 %	19 %	23 %	15 %	12 %	5 %	6 %	-6 %	-10 %	-5 %	-8 %
Total	21 %	30 %	16 %	23 %	11 %	16 %	13 %	18 %	15 %	20 %	11 %	15 %	8 %	11 %	2 %	4 %	3 %	5 %	4 %	6 %
Median	22 %	28 %	21 %	24 %	9 %	13 %	13 %	17 %	14 %	22 %	10 %	15 %	8 %	14 %	4 %	7 %	-4 %	-3 %	0 %	0 %
Average	21 %	28 %	17 %	21 %	9 %	13 %	10 %	15 %	15 %	23 %	11 %	17 %	8 %	14 %	4 %	8 %	-3 %	-3 %	-1 %	-1 %
Min	7 %	14 %	-22 %	-24 %	4 %	8 %	-12 %	-4 %	10 %	17 %	0 %	10 %	0 %	9 %	0 %	3 %	-9 %	-15 %	-5 %	-10 %
2 Quartile	22 %	28 %	21 %	24 %	9 %	13 %	13 %	17 %	14 %	22 %	10 %	15 %	8 %	14 %	4 %	7 %	-4 %	-3 %	0 %	0 %
3 Quartile	26 %	31 %	26 %	29 %	11 %	17 %	13 %	18 %	16 %	25 %	16 %	21 %	10 %	17 %	6 %	11 %	1 %	4 %	0 %	3 %
Max	28 %	37 %	30 %	39 %	12 %	17 %	15 %	24 %	25 %	33 %	19 %	28 %	15 %	19 %	8 %	19 %	4 %	9 %	4 %	6 %

Source: Thomson Reuters Datastream / Own Contribution

The table above shows how the firms are hit fairly equally and across the entire peer group by the oil price decline in 2014. Both average and median ROIC and ROE are approximately sliced in half from 2013-2014 before going into negative territories in 2015 where the firms felt the full effect of low oil prices. Statoil, Conoco and Eni had the lowest return in 2015, but ENI managed to deliver better returns in 2016, while Statoil and Conoco still lagged behind. In the case of Statoil, that is partially due to its large impairments. Conoco on the other hand, has been the firm with the lowest profit margin and turnover rate in recent years. The company acknowledged in a February 2016 press release that they have struggled with cost-cutting (DePersio, 2016).

5.3.2 RENEWABLES

In comparison to the oil and gas industry, the renewable sample shows a broader spread in returns. Still, the returns across the sample coincides with previous findings i.e. they are company-specific to a larger degree. Abengoa, AES and Sunedison are all included although they have previously been excluded due to their large outliers in values. AES was excluded because they comprised of several business areas, whereas renewables only amounted to a minor part of it. SunEdison on the contrary were a pure-play IPP and the biggest developer of solar parks in the US. Abengoa was more diversified,

but they mostly comprised of utility and renewable energy projects. SunEdison went bankrupt in 2015, while Abengoa filed for chapter 11 last year i.e. they filed for a restructuring of debts. SunEdison has been the biggest bankruptcy in any non-financial sector in US history. Similarly, Abengoa was among Spain's largest firms before they filed for chapter 11. Looking at the numbers, it is evident that SunEdison performed poorly for several years and a comparison between ROIC and ROE depicts the

Table 3.5.3: Renewables Return on Invested Capital & Return on equity

	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016	
	ROIC	ROE	ROIC	ROE	ROIC	ROE	ROIC	ROE	ROIC	ROE	ROIC	ROE	ROIC	ROE	ROIC	ROE	ROIC	ROE	ROIC	ROE
ABG	10 %	24 %	12 %	27 %	8 %	28 %	10 %	21 %	12 %	13 %	10 %	10 %	9 %	9 %	11 %	11 %	-4 %	-159 %		
AES	6 %	16 %	11 %	36 %	9 %	17 %	4 %	-2 %	7 %	7 %	-1 %	-17 %	4 %	6 %	6 %	18 %	3 %	8 %	2 %	0 %
Dong	0 %		0 %		8 %	6 %	8 %	12 %	7 %	9 %	-5 %	-11 %	3 %	-4 %	0 %	-5 %	-12 %	-19 %	20 %	22 %
Eon	15 %	14 %	7 %	3 %	18 %	23 %	15 %	16 %	1 %	-6 %	8 %	6 %	9 %	6 %	-3 %	-10 %	-21 %	-34 %		
EDF	29 %	22 %	23 %	14 %	18 %	15 %	9 %	2 %	12 %	10 %	11 %	12 %	11 %	12 %	12 %	11 %	7 %	3 %	11 %	8 %
EDPR	0 %	0 %	3 %	3 %	3 %	2 %	3 %	2 %	4 %	2 %	5 %	2 %	5 %	2 %	5 %	2 %	6 %	3 %	5 %	1 %
EKTG	2 %	5 %	7 %	6 %	5 %	-5 %	4 %	-10 %	13 %	22 %	6 %	0 %	12 %	42 %	14 %	35 %	18 %	46 %		
Engie	14 %	14 %	13 %	13 %	7 %	8 %	8 %	8 %	8 %	6 %	5 %	3 %	-8 %	-17 %	7 %	5 %	-5 %	-10 %		
IBE	9 %	13 %	7 %	12 %	7 %	11 %	8 %	10 %	7 %	9 %	7 %	9 %	6 %	8 %	5 %	7 %	5 %	7 %	6 %	7 %
IGY	0 %		0 %		0 %		0 %		0 %		0 %		8 %	8 %	6 %	9 %	6 %	10 %		
NPI	-5 %	-6 %	14 %	15 %	5 %	6 %	8 %	0 %	8 %	-9 %	3 %	-1 %	5 %	19 %	8 %	-12 %	5 %	0 %	7 %	13 %
NRG	9 %	12 %	12 %	18 %	10 %	13 %	8 %	6 %	6 %	2 %	6 %	6 %	2 %	-4 %	4 %	1 %	-22 %	-98 %	1 %	-31 %
SSO	0 %		0 %		0 %		0 %		18 %	26 %	15 %	14 %	-10 %	-21 %	8 %	-5 %	11 %	9 %	11 %	0 %
SUNEQ	83 %	52 %	76 %	19 %	-6 %	-3 %	4 %	2 %	-65 %	-103 %	0 %	-23 %	-14 %	-145 %	-10 %	-508 %				
Terna	14 %	7 %	8 %	7 %	5 %	4 %	2 %	3 %	5 %	5 %	5 %	4 %	5 %	1 %	6 %	2 %	8 %	5 %		
Median	10 %	14 %	11 %	13 %	7 %	8 %	8 %	3 %	7 %	7 %	5 %	3 %	5 %	6 %	6 %	2 %	5 %	3 %	6 %	4 %
Average	16 %	14 %	16 %	14 %	7 %	10 %	7 %	5 %	3 %	0 %	5 %	1 %	3 %	-5 %	5 %	-29 %	0 %	-16 %	8 %	3 %
Min	-5 %	-6 %	0 %	3 %	-6 %	-5 %	0 %	-10 %	-65 %	-103 %	-5 %	-23 %	-14 %	-145 %	-10 %	-508 %	-22 %	-159 %	1 %	-31 %
25th percentile	9 %	14 %	8 %	13 %	7 %	8 %	8 %	3 %	7 %	7 %	5 %	3 %	5 %	6 %	6 %	2 %	5 %	3 %	6 %	4 %
75th percentile	14 %	18 %	12 %	18 %	9 %	15 %	8 %	10 %	10 %	10 %	7 %	8 %	9 %	9 %	8 %	10 %	7 %	8 %	11 %	9 %
Max	83 %	52 %	76 %	36 %	18 %	28 %	15 %	21 %	18 %	26 %	15 %	14 %	12 %	42 %	14 %	35 %	18 %	46 %	20 %	22 %

Source: Thomson Reuters Datastream / Own Contribution

company as highly levered. Abengoa on the other hand, delivered strong results until 2015, which could be considered as odd. However, it has later come to light that Abengoa manipulated earnings, where negative profits were being converted into positives (Burgen, 2015). Dong Energy, Eon and NRG also posted negative results in 2015 and NRG continued the trend last year. As mentioned in the profit margin analysis, DONG had large impairments. NRG also had a $5 billion impairment in 2015 and an additional $1.1 billion last year. E.on did not perform any write-offs, however, they increased depreciation from approximately $5 billion in 2013 to $8.6 billion and $11.9 billion in 2014 and 2015 respectively. All three firms have been quite aggressively divesting from fossil fuels and investing in renewable energy sources. The similarity between the firms is that they have all publicly expressed their desire to invest in renewable energy and become less dependent on fossil fuel, ultimately less exposed towards fluctuating energy commodity prices. While the firms have performed write-offs, a partial reason for the low returns is their exposure towards commodity prices on gas, which have been low in recent years. It seems as though the firms are cutting losses now to secure long-term returns. Contrary to many of the large utilities, almost all the pure-play renewable firms show fairly consistent returns year-over-year. Scatec and NPI have had some disappointing years, but they have both reversed that

trend the last two years. EKTG, EDPR and Terna have continuously performed and delivered strong results. Especially EKTG has delivered exceptional results and is the top performer in both ROIC and ROE from 2013-2015. The German-based company that almost solely invests in wind, and primarily on-shore wind has a strong track record. They are also the highest levered firms as mentioned in the leverage analysis. The IPP's relies almost entirely on fixed-purchase pricing and combined with effective operations, results in strong returns. Still, the firm has only installed around 800 MW.

5.3.3 YIELDCOS

Figure 5.3.4: YieldCo Return on Invested Capital & Return on equity

	2011		2012		2013		2014		2015		2016	
	ROIC	ROE	ROIC	ROE	ROIC	ROE	ROIC	ROE	ROIC	ROE	ROIC	ROE
Atlantica	0 %	0 %	6 %	0 %	4 %	0 %	4 %	-2 %	5 %	-12 %	6 %	0 %
HASI	-3 %	-26 %	2 %	21 %	-10 %	-13 %	7 %	5 %	2 %	2 %	4 %	3 %
HWAG	5 %	-1 %	7 %	8 %	7 %	8 %	8 %	12 %	6 %	8 %		
NEP	0 %	0 %	6 %	5 %	2 %	2 %	6 %	5 %	6 %	1 %	9 %	17 %
NYLDA	3 %	2 %	2 %	2 %	7 %	9 %	7 %	4 %	4 %	1 %	3 %	4 %
PEGI	10 %	5 %	2 %	-1 %	3 %	3 %	3 %	-6 %	1 %	-4 %	0 %	-2 %
SAY	0 %	0 %	0 %	0 %	-2 %	-40 %	7 %	10 %	7 %	3 %	6 %	5 %
TERP	0 %	0 %	10 %	5 %	2 %	-3 %	2 %	-23 %	0 %	-9 %		
TRIG	0 %	0 %	0 %	0 %	7 %	7 %	6 %	6 %	3 %	3 %	10 %	9 %
Median	4 %	0 %	6 %	5 %	3 %	2 %	6 %	5 %	4 %	1 %	6 %	4 %
Average	4 %	-5 %	5 %	6 %	2 %	-3 %	5 %	1 %	4 %	-1 %	5 %	5 %
Min	-3 %	-26 %	0 %	-1 %	-10 %	-40 %	2 %	-23 %	0 %	-12 %	0 %	-2 %
25th percentile	0 %	0 %	2 %	2 %	3 %	2 %	6 %	5 %	4 %	1 %	6 %	4 %
75th percentile	3 %	0 %	6 %	5 %	7 %	7 %	7 %	6 %	6 %	3 %	7 %	7 %
Max	10 %	5 %	10 %	21 %	7 %	9 %	8 %	12 %	7 %	8 %	10 %	17 %

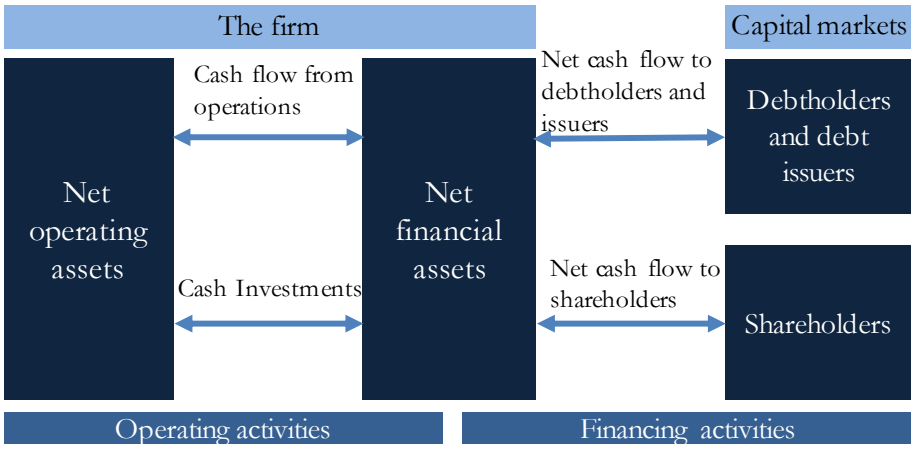
Source: Thomson Reuters Datastream / Own Contribution

Similar to the oil and gas industry and consistent with the previous analysis, the YieldCos have had quite stable returns in recent years. At the same time, the results are not especially uplifting. The YieldCo structure, which was praised for its financial creativity, could to the naked eye seem as a big disappointment based on the table above. Still, it has been mentioned several times that ROE are not particularly good measure for determining the shareholder return of YieldCos as the structure floats cash to investors in creative ways. The ROIC consists of profit margin and turnover that mirrors the profitability and efficiency of the operations. The authors have argued earlier that EBITDA rather than profit margin is the better measure for profitability regarding YieldCos. NextEra Energy Partners is the strongest performer last year with a 17% ROE. The firm have almost 2,8 GW installed capacity with approximately 80% in wind and the remaining in solar, and they have more than doubled sales in two years from $301 million in 2014 to $715 million last year. This was partially due to an unusual income in revaluation of consideration instruments. This entails that they have received additional earnings on sale of assets through "earn-outs" (NEP Annual Report 2016 & SRR - Contingent Consideration, 2017).

5.4 ANALYZING SOURCES AND USES OF FUNDS

Comprehensive understanding of a company's income statement and balance sheets is crucial when analyzing its performance. To understand the story behind the company's operations and how the different activities affect the financial statement one should analyze the cash flow statement. It basically records all cash and cash equivalents entering and leaving the company by separating between operating, investing and financing activities. As argued in the income statement analysis, what is often of interest for investors is the actual cash generated by a company. This is particularly relevant in energy companies since the underlying projects produce strong cash flows, which should translate into high dividends. Further, this thesis put a great effort in understanding financing decisions, balance sheets structures and shareholder value generation of renewable energy companies. As such, the cash flow statement is an imperative part of the financial analysis.

Figure: 5.4.1: Cash flow statement dynamics



Source: Penman, 2016/Own Contribution

Cash flows from operations reflect cash generated by core business operations. Additional to net income, it also includes changes in cash, accounts receivable, accounts payable, depreciation and inventory. Cash flow from investing activities reflects sales of assets or businesses. Financing activities regards the capital structure decisions of a company, i.e. how management decides to finance its activities. The dynamics are visualized in figure 5.4.1

Since the cash flow statement reflects inflows and outflows, it enables research on both financing and capital allocation strategies. The analysis is structured to first inspect sources of funds, followed by uses of funds. Sources of funds are primarily analyzed by examining operating, investing and financing activities across the peer groups. Equity issues is mapped and compared to debt issuances, which is analyzed on debt types and accompanied costs associated with the financing. After this, uses of funds

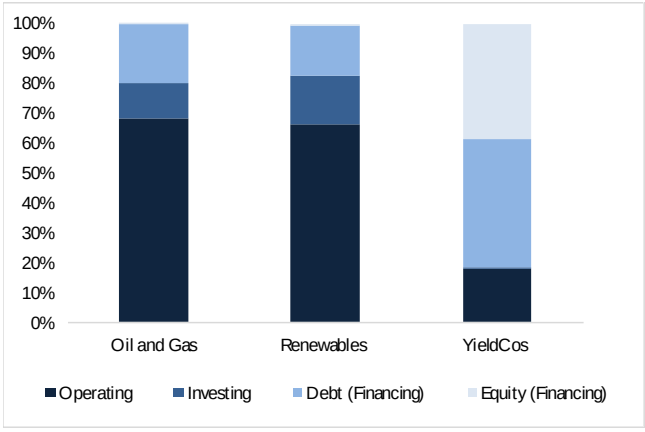
are analyzed with an emphasis on management decisions regarding capital allocation, i.e. the trends in dividends, CAPEX, debt repayments, share buybacks and to some degree the retention rate.

Finally, a note on level of detail and method. Cash flow to and from debtholders are often described as "net debt financing flow" and includes both interest and repayments to debtholders and new debt issuances. Similarly, "net dividend to shareholders" includes dividend payments, share repurchases and new equity raised from capital markets (Penman, 2013). Further, original statements from Reuters unfortunately provides net flows only. While net measurements may simplify results, it does not align well with the purpose of this thesis. The authors sought to analyze performance trends in light of financing decisions and capital allocation by breaking down components and applying additional information. To compensate for this weakness, authors source other data providers to extract data on debt issues, equity issues and buybacks. In addition, debt information and other qualitative data is sourced directly from annual reports.

5.4.1 SOURCES OF FUNDS AND FINANCING DECISIONS

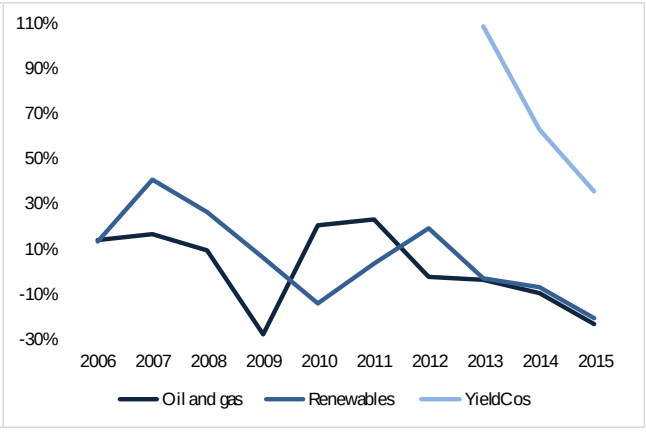
The sources of funds for a company's operations are highly correlated with its core business activities, as visible in figure 5.4.2 below. The cash flow statement enables a confirmation of results found in the income statement and balance sheet across the industries. By analyzing sources of and uses of funds, market participants are able to analyze a firm's financial health and its interaction with capital markets.

Figure: 5.4.2: Sources of Funds, breakdown by sources, % of total



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.4.3: YoY growth in total Sources of Funds, per industry



Source: Thomson Reuters Eikon / Own Contribution

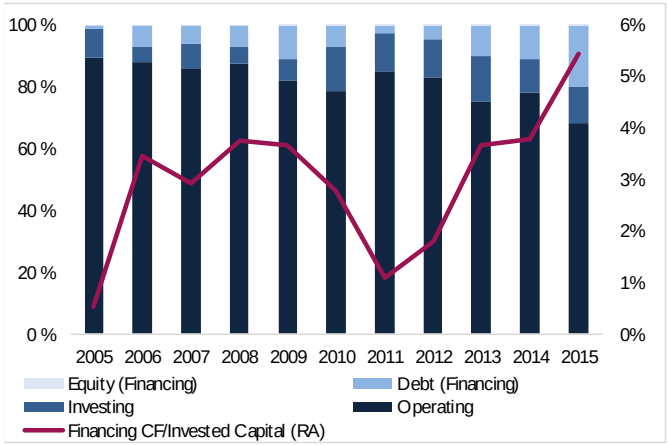
Figure 5.4.3 paints a relatively similar 2015 snapshot of the renewables and oil & gas industries. Operating cash flows represents major parts of company funding, while external financing and sales of assets or business makes up approximately 30% of total sources. As will be elaborated, these seemingly strong cash flows are deemed rather weak in a historic perspective, which aligns well with profitability analysis conducted previously. YieldCos represents a quite different funding structure, where reliance on capital markets has characterized the industry. Total sources of funds have had a negative

development across all industries in recent years, suggesting lower operational performance, but also less use of capital markets.

5.4.1.1 Oil and Gas

The oil and gas sector has experienced lower sources of funds recent years, with current levels of $270 billion not seen since 2009. This is down 37% since record levels in 2011 of $420 billion in the industry sample and mostly driven by lower cash flows from operating activities.

Figure: 5.4.4: Sources of Funds Oil and Gas



Source: Thomson Reuters Eikon / Own Contribution

Industry wide, companies have experienced a lower contribution from operations, from approximately 90% of total sources to mid-60% in 2015. The main source of diminishing cash flows is net income, that historically has made up the majority of operating cash flows, but only 5% in 2015. As visualized in the income statement, oil and gas is a comfortable place to operate if you have support by the oil price development. Oil and gas targets low gearing to retain investment grade ratings, and on the back of buoyant oil prices, they have historically relied on operations as a primary source of funding. However, cash flows are hard to forecast due to external factors, which again emphasize the use of a conservative capital structure (EY, Funding challenges 2014). Adding project cost inflation, operating cash flows have failed to cover capital needs, which have led to increased importance of other funding sources. Shareholders have also increased pressure to limit capital expenditures and outflows in order to sustain cash returns. This will be investigated in 5.4.2 Uses of Funds.

Cash inflows from investing activities, i.e. sale of investments, assets or business has remained a somewhat constant share of the funding mix. Yet, it has declined in absolute terms, some 40% since 2011. The trend seems to be driven by several forces. On one hand, oil price and markets surged up until 2014 with oil prices driving valuations to the skies as cash flow estimates incorporated high input prices. In addition, M&A markets tend to follow bear and bull markets quite closely, amplifying the effect. This drove company and asset values high. When oil price plummeted, operational cash flows and asset valuations decreased. Lack of operational cash created an investment gap that needed to be filled. Thus, management tried to recycle capital through structural changes such as divesting non-core assets and parts of value chains (EY, Funding challenges 2014). However, the increase in divestment activity in the peer group was offset by falling valuations, leading to a net decline in proceeds from

investing activities. We believe that investor/M&A sentiment in the crisis years of 2014 and 2015 further accelerated decrease in asset valuations. We note that operating cash flows has declined since 2011, while cash flows from investing activities reached its peak in 2013.

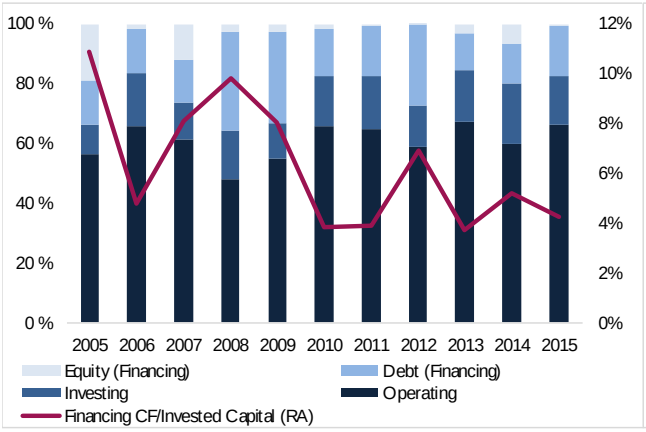
Due to the above, debt financing has played a more prominent role recent years, both in nominal terms and as a share of total sources. While the peer group only issued $9Bn of debt in 2011 on the back of strong cash flows, debt issuances in 2015 amounted to $52Bn. This highlights that capital markets have remained open to the oil majors, contrary to small-cap explorers which suffers from hesitating capital markets due to lack of proven track records or material cash flows. It seems that bank financing has remained a prominent source, while bonds has improved its position in the market. When it comes to equity issuances, we are cautious of potentially distorted data, but note that only Total and Chevron has positive inflows from equity last two years. Conclusively, from our data it may seems that these are the only companies where private placement volumes exceeded share repurchases, but this will be elaborated later.

5.4.1.2 Renewables

As repeated consistently the diversification and history of renewable corporations may have a deteriorating effect on quality in the financial analysis. Total sources of funds are down 30% from the peak in 2012 on the back of deteriorating commodity markets and more concentrated business portfolios. Industry wide there is a trend towards increased funds from sales of assets and businesses. Funds from operations has moved in a band from 55%-65%, but decreased somewhat in nominal values. Capital markets are utilized at a varying pace were most capital is issued in years with low operating profits, such as 2008 and 2012. It may seem counterintuitive to increase external funding when uncertainty is high, however it may also be a window of opportunity.

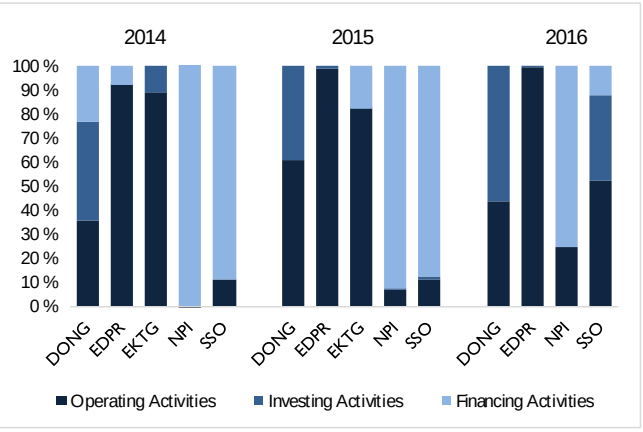
Among former utilities and fossil heavy players, strong operating cash flows remain a dominant source of funds. Due to the diversification of assets in large players like EDF, Engie and E.on it is hard to draw conclusions on the exact characteristics of funds from operations based on underlying businesses. However, the companies have historically sought moderate leverage levels and based funding strategies on operating cash flows. While equity funding was close to nonexistent among oil majors, it has a marginally visible position within renewable corporations. However, the equity issuances on industry level do not follow any specific trend and are company specific, driven by corporate events. Engie, SunEdison, Northland Power and Dong Energy have contributed most with private placements during recent years. SunEdison, the sponsor of YieldCo Terraform (TERP) raised substantial funds in 2013 and 2014 before defaulting in 2015. Dong Energy, which initially has low leverage levels and substantial

Figure: 5.4.5: Sources of Funds Renewables



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.4.6: Sources of Funds Selected Renewables Peer Group



Source: Thomson Reuters Eikon / Own Contribution

funds from operations, raised $2Bn in 2013. Goldman Sachs owns infrastructure funds that bought substantial stakes in a private placement, which helped improve Dongs leverage ratio. Goldmans stake was sold off post-IPO in February 2017 (Reuters, Goldman Sachs invest in Dong 2013). Generally, cash flows from financing have made up a decreasing part of invested capital and equity issuances have only taken place in certain companies. This is illustrated by the red graph in figure 5.4.5 which display cash flow from financing activities as a percentage of invested capital. As seen, cash flow from financing activities fluctuates to some degree, but there is an evident downward trend, going from 10% in 2005 to 4% in 2015. In comparison, Oil and Gas have fluctuated between 1%-4% in the same time interval seen in figure 5.4.4. YieldCos however, have cash flow from financing activities comprising between 25%-30% of invested capital from 2013-2015. This is arguably related to the business model of YieldCos, as well as the growth of the companies seen in those years. The three diversified energy companies and YieldCo sponsors, SunEdison, Abengoa and NRG Energy tells an interesting story. While the two first are distress cases where SunEdison defaulted and Abengoa is in a serious restructuring phase, NRG Energy is performing well and actually bought much of SunEdisons solar assets. SunEdison has negative sources of funds the last years with net earnings losses in the billions several years and depreciation flows of a couple hundred million a year. In 2011-2014, they raised more than $15Bn in debt with the majority raised in 2013 and 2014. Sales of assets were $510m and $324m in 2013 and 2014. The same story is reflected in Abengoa, were debt issuance haves been the main source of funding as operating cash flows have been negative or very small. While both companies have a stated in old presentations goal of funding large portions from operations, recent years described companies in distress. NRG Energy have a more balanced source of funding, but a surprising negative net income of $6,5Bn in 2015 and quite large assets and business sales the last 5 years making up large parts of total sources.

Looking more closely at the renewable pure plays reveals different funding strategies, and highlights the difference from YieldCos (elaborated below). EDPRs operating cash flows to total sources of funds is

above 96% since 2012. EDPR was spun off from EDP in 2008 and has fine-tuned their Self Funding Model where asset rotation is key to decrease reliance to capital markets for growth (EDPR, Annual Report 2017). Scatec Solar relies on a similar model of taking construction risk, capturing the value chain and lowering equity injections. However, the company finances solar parks with solid amounts of non-recourse debt, which makes cash flow from debt the major source. These, and similar models will be discussed in the project focused part. Northland Power has an investing model more focused on capital markets, which explains the share of financing cash flows representing the majority of total sources. Dong Energy on the other hand issues debt non-regularly on corporate level, which explains the lack of trend in financing cash flows. However, in line with a strategy of moving away from fossil and due to listing requirements for its IPO, the company has experienced solid inflows from divestments recent years. It has accounted for 66%, 41%, 39% and 56% of total sources from 2013 to 2016.

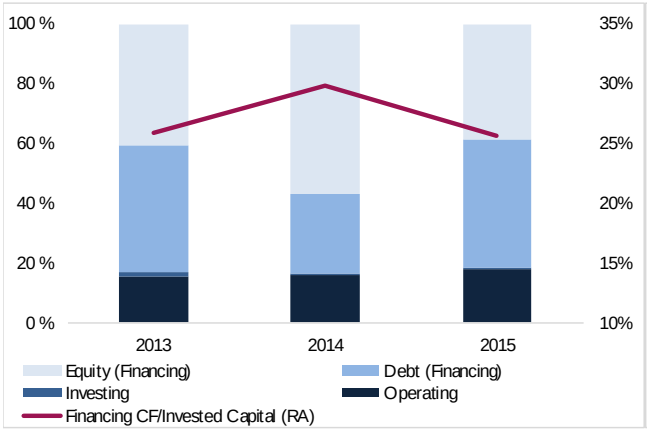
5.4.1.3 YieldCo

Analyzing sources of funds illustrates the essence of the innovative YieldCo structure. The observed differences in sources between YieldCos and the other industries are both expected and natural in light of their business model. The financial vehicles buy operating assets from sponsor after construction and hold them while cash flows are generated and dividends are distributed. Therefore, asset or company sales are rather uncommon in the industry, unless sponsor has been in distress or capital markets has dried up. To support the high and growing dividend yields, equity markets are regularly tapped, in order to invest in new projects. Further, underlying assets are by nature highly leveraged, leading to substantial debt funding

Yield hungry institutions, hedge funds and private investors in the low interest rate environment have warmly welcomed the high dividend regime of YieldCos. Figure 5.4.8 shows that YieldCos on both sides of the Atlantic Ocean has provided more than $14Bn in equity from 2013 to 2015. Worth mentioning is a $688m secondary issue by Terraform Power, $656m issue by Atlantica Yield and a $620m issue by NRG Yield. It however came clear that the YieldCos were dependent on growth in share price to manage to continue its cash distributing growth. As YieldCo stock prices plummeted in 2015, equity raising is still depressed. To describe the magnitude of YieldCos equity raising in the hay days, relevant public markets raised $12,8Bn new equity in 2015, while US and European YieldCos raised $6,2Bn (Bloomberg New Energy Finance, 2016).

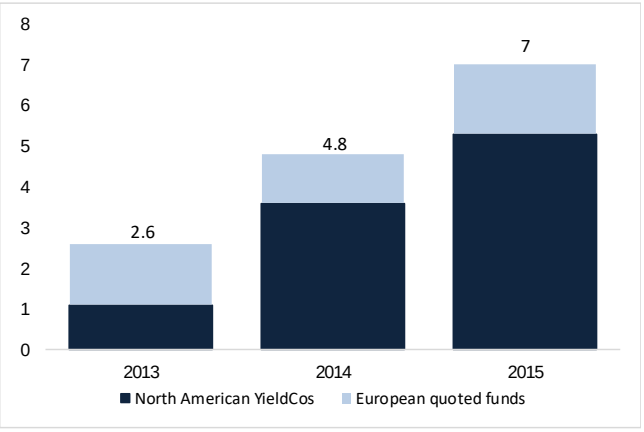
Narrowing in on the peer analysis, YieldCos has posted unparalleled growth, with total sources of funds growing 1400% from 2011, or 360% from 2012 to 2015. This may not be surprising as the industry started from zero, yet it has continued with year-over-year growth of 62% and 35% in 2014

Figure: 5.4.7: Sources of Funds YieldCos



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.4.8: Equity raised by YieldCos, segmented by geography ($Bn)



Source: BNEF 2016/Own Contribution

and 2015, respectively. On the back of growth in assets, depreciation has increased with 325% since 2011, providing tax efficiencies. As described, net income flows are as minimal and actually negative in 2015, caused by Atlantica Yield and TerraForm Power. Most companies have stated that they intend to utilize capital markets. This is illustrated in the figure 5.4.7 where 80% of total sources of funding are debt and equity financing. The actual debt-to-equity split will be researched later with a different data material. However, while the companies rely on equity issues to continue its growth, in 2015 industry debt issues exceeded equity issues based on the peer group. As share prices declined, it was no longer advantageous to raise equity on the low equity multiples. In 2015, SunEdison initiated a trend by fueling growth in its YieldCo Terraform, with debt, something that changed investor sentiment.

5.4.2 USES OF FUNDS AND CAPITAL ALLOCATION POLICY

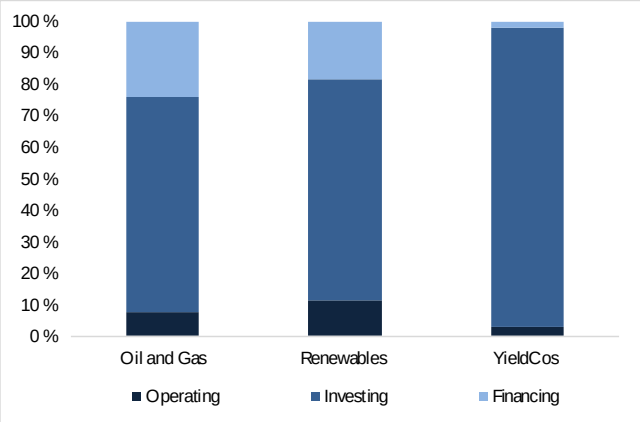
The uses of funds regard an area of direct impact on long-term returns, yet often overlooked by investors. Very simplified, a company sources capital and invest this capital getting a certain amount in return in the future. As such, capital allocation policy should be based on materializing long term strategies while consistently allocating capital that yields the highest return for a given level of risk. Despite its obvious importance for value creation, capital allocation decisions often seem to be sub-optimal and receive less attention. In 1987, Warren Buffet pondered on the capital allocation inefficiency *"the heads of many companies are not skilled in capital allocation, and … it is not surprising because most bosses rise to the top because they have excelled in an area such as marketing, production, engineering, administration or, sometimes, institutional politics" (Marco-Izquierdo, HBR).*

As a rule of thumb, management should choose the use of funds that optimize value creation, but this is seldom a straight forward exercise. Certain companies may have an investor base that emphasizes consistent dividend yields or low risk profiles, thus constraining corporate finance tools of management. Another sub-optimality may come from excess M&A activity fueled by management empire building, rather than return on capital analysis. In the other end of the scale are the companies

that seemingly lack attractive investment opportunities, resulting in piles of cash on balance sheet. As in the case of Apple, this confounds analysts because in theory investors will prefer to receive this cash in dividend and invest elsewhere at potentially higher returns than in a bank deposit. The decisions underlying deployment of funds have a great impact on overall return on capital for a company. Any management decision use of funds should be accompanied by a thorough investment analysis. To underscore the importance, a company with a ROIC of 8% and WACC of 8% will experience an 19% increase in firm value if ROIC improves 1% (Marco-Izquierdo, HBR).

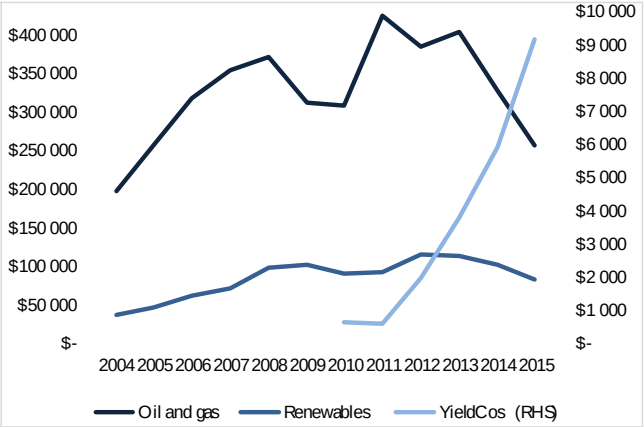
The Uses of Funds analysis depicts cash flow to operating, investing and financing activities. The analysis seeks to understand patterns, priorities and drivers of allocation practices and draw on preceding analysis. Investments consist of Capital Expenditures and Other investing activities, which reflects acquisitions of assets and companies. Financing out flows represents cash dividends, net repayment of debt and net repayment of equity. Similarly, to sources of funds, the net funds to debt repayment and from equity reflects years where debt repayments exceeds debt issuances and where share repurchases exceeds equity issuances. A comparison on payout policy preferences is therefore not achievable with the dataset.

Figure: 5.4.9: Uses of Funds, breakdown by allocation, % of total



Source: Thomson Reuters Datastream / Own Contribution

Figure: 5.4.10: Uses of Funds, per industry, absolute numbers (numbers in mill)



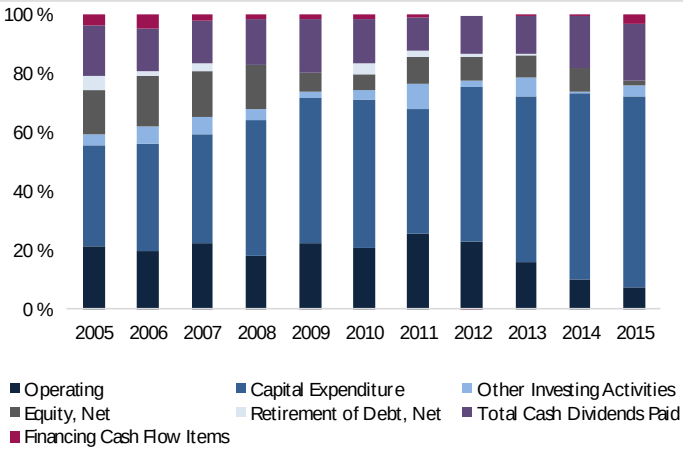
Source: Thomson Reuters Datastream / Own Contribution

On an aggregate sample level, the authors note a remarkable difference between the industries in uses of funds. Funds spent on financing activities make up a greater part of total funds in oil and gas than renewables and YieldCos. This may seem counterintuitive as YieldCos by nature are dividend vehicles. However, the trend is attributable to the high reinvestment rate in YieldCos and maturity of the oil and gas industry. Further, the general development in uses of funds is derived from operating activity and funding activity. The recent years activity sentiment is perfectly described by the graph to the right below. Investments in the YieldCo industry has skyrocketed.

5.4.2.1 Oil and Gas

Management usually adjust uses of funds to the sources available and as mentioned in the preceding analysis, total sources of funds has declined rapidly in recent years. Therefore, when studying graph 5.4.11, one should keep in mind that total uses of funds has declined 40%, from $426Bn in 2011 to $256 in 2015. The patterns within use of funds is nevertheless interesting, with CAPEX taking a larger part of the allocation. Cash required for operating purposes is lowered significantly. This is expected due to the massive and constant focus on operational efficiency, which has led to less cash tied up in net working capital. Other investing activities, a variable reflecting M&A activity has not shown a conclusive trend, except for 2014 as pessimism spread. Dividends are adjusted down somewhat in absolute numbers, but have increased its relative share. This implies that management has been reluctant to cut dividend in the down turn, exemplified by Statoil and other players that issued debt to keep paying dividends. Net equity out flows vanished in 2015, pointing towards cuts in share buyback programs or increased equity issuances that potentially offset effect of buyback programs in the data. Research points towards less buybacks and increased use of equity capital markets. In 2015, only Exxon, Conoco and Shell had outflows from equity transactions. In line with findings in the analysis of leverage and sources of funds, companies have been forced to utilize debt capital markets, consequently focusing less on repayment of debt.

Figure: 5.4.11: Oil and Gas Uses of Funds

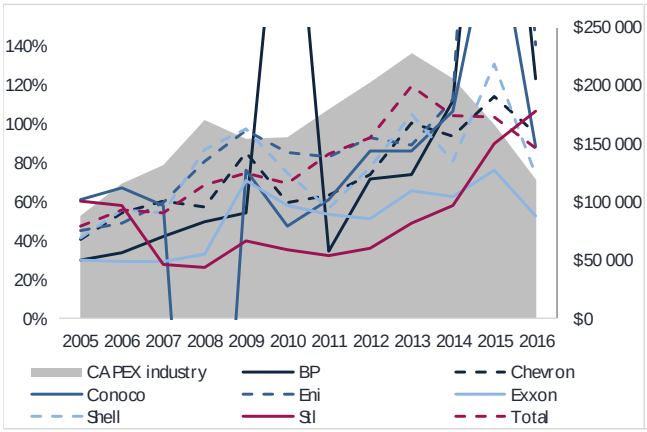


Source: Thomson Reuters Datastream / Own Contribution

Dividend and capital expenditures are displayed on the next page, both as absolute industry numbers and as a percentage of cash flow from operations. This metric is very interesting as it describes how much of CAPEX can be financed through internal cash flow. A general trend in the US reflecting management short-termism has been decreasing CAPEX to operating cash flows, together with increase in payouts. This has partly been funded by increasingly debt issuances. This may be explained by the record low interest rate environment, but is worrisome as it may reflect management seeking to fulfill investor demands rather than building long term values (Tang, 2016). However, our data shows a relative commitment to both CAPEX budgets and payout policies. Most companies have increased CAPEX relative to internal cash flows, but spending topped out in 2013. Up until this point, companies had ratios above 100%, meaning that some companies had to fund investments by cash

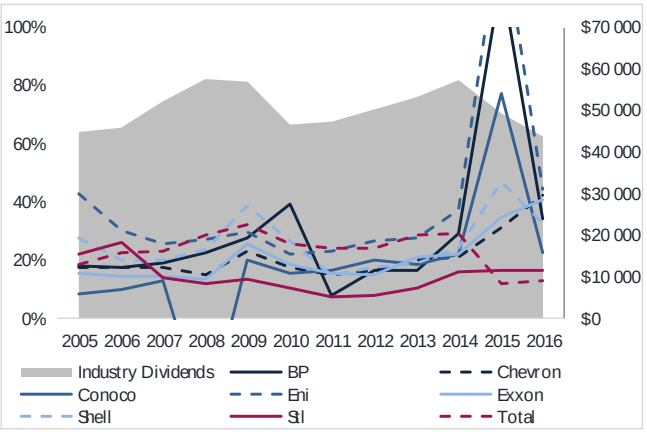
holdings or by tapping capital markets (as observed in the analysis of sources of capital). The spikes in 2015 are caused by weak cash flow generation, even though capex decreased. Aggregated dividend payouts have remained steady, despite moderate declines post financial crisis and oil price decrease. Company wise, dividends has moved in a range of approximately 15-30% of operational cash flows. Conoco, Eni and BP visibly had its operating cash flows heavily impacted in 2015, distorting the metric. This is also reflected in dividend payout as Conoco cut its dividend from$3,6Bn in 2015 to $1,25Bn in 2016. Statoil and Total has cut dividends payout with 65% the last two years and Eni with 37%, while Exxon and Shell actually has increased dividend. It is visible that despite reluctance to cut dividends, most companies adjust to the lower operating performance. There does not seem to be a clear trend between companies cutting dividends and companies cutting capital spending.

Figure: 5.4.12: CAPEX as %of Operating Cash Flow and aggregated CAPEX (m)



Source: Thomson Reuters Datastream / Own Contribution

Figure: 5.4.13: Dividend as %of Operating Cash Flow and aggregated dividends (m)

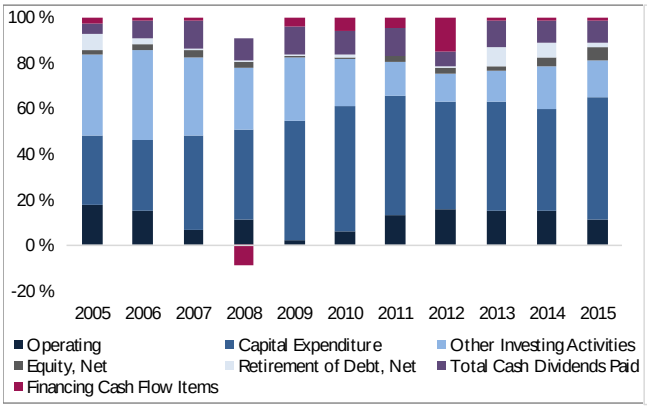


Source: Thomson Reuters Datastream / Own Contribution

5.4.2.2 Renewables

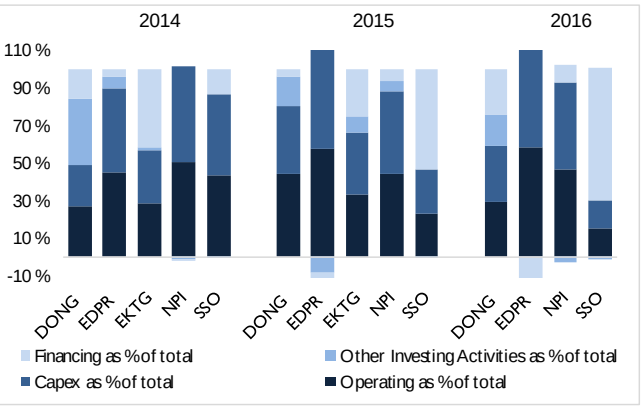
Cash out flows within the renewable sample are less characterized by industry trends and more company specific. As exhaustively mentioned, aggregate activity has decreased recent years due to lower commodity prices and carve outs of non-renewable assets. Total uses of funds have decreased about 27%, from $113Bn to $85Bn in 2015. While capital expenditures increased up until the financial crisis and almost stabilized afterwards, the shopping spree in asset and company acquisitions came to a halt and never recovered. The proposed reason for this lies in the sample selection as most companies are in restructuring processes of becoming purified energy companies. Thus, acquisitions have been reduced and as seen in the analysis of inflows, divestments have increased. This is illustrated in light blue to the left below. Bloomberg New Energy Finance research triangulates our findings. They state that utilities continue to be an essential source of equity at development and pre-construction stage, yet the individual companies show divergent trends. Iberdrola and EDF are among the companies that have invested less recent years (BNEF, 2016).

Figure: 5.4.14: Renewables Uses of Funds



Source: Thomson Reuters Datastream / Own Contribution

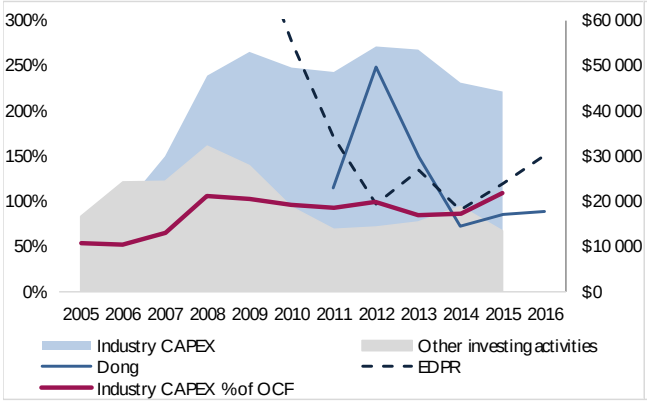
Figure: 5.4.15: Selected Renewable Peers Uses of Funds



Source: Thomson Reuters Datastream / Own Contribution

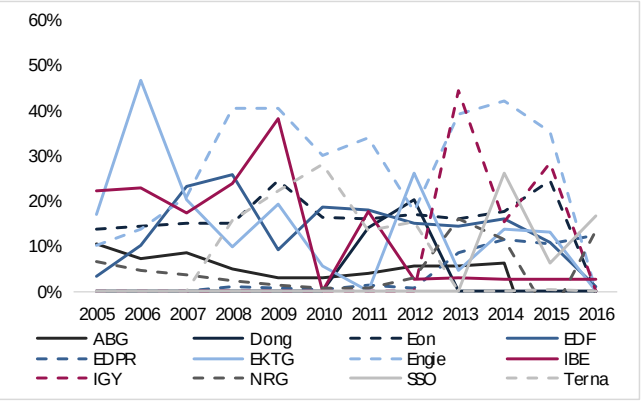
A deep dive in a subset of companies yields some interesting findings, as illustrated above. First, Dong has initiated de-levering efforts recent years, emphasized by stated importance of strong credit rating and illustrated in financing flows as percentage of total funds. This has proved crucial for Dong in order to achieve cheap financing as they rely on a centralized funding structured. Dong expects cash flow from wind farms coming into operations will facilitate dividend to increase with high single digit rates going forward (Dong Annual Report 2016). EDPR is characterized by CAPEX and operating cash representing the majority of cash outflows. Keeping in mind EDPRs low leverage, early stage involvement and self-funding model, the characteristics of the capital allocation makes sense. The company indicated dividends in the range of 25-35% of net income, leaving sufficient funds to support further growth.

Figure: 5.4.16: Aggregated Investing cash flow (m) and CAPEX as % of OCF



Source: Thomson Reuters Datastream / Own Contribution

Figure: 5.4.17: Dividends as % of Operating Cash Flows, selected peer group



Source: Thomson Reuters Datastream / Own Contribution

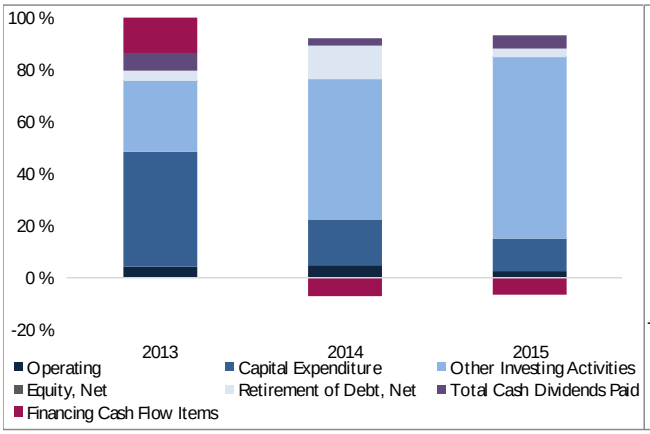
Due to divergent trends in CAPEX among companies, data are best presented at aggregate level in figure 5.4.16. CAPEX as % of Operating Cash Flow (Operating CF) is included for the industry, EDPR and Dong Energy at right hand side axis. In the graph to the right, dividends as % of Operating CF again yield a somewhat varying result, but most payouts lies below 40% of Operating CF. Please note that this metric does not align with the metric that companies guide on, namely dividends/net income. What is remarkable for the renewable companies are the increased CAPEX trend which in

2015 accounts for approximately 100% of Operating CF. To keep current capital spending trend, renewables thus needs to source other funding opportunities. In theory, this strategy is less sustainable in the long run. The authors note the high ratios for Dong Energy and EDPR, which aligns well with their capacity additions and growth expectations recent years. When more assets come into operations, we expect Operating CF to increase relative to capital spending needs, creating a more sustainable long term model. Further, we note that both Iberdrola and Innogy SE is below industry averages, which may be due to a more mature operating portfolio than the abovementioned. Finally, the distress case of Abengoa has caused it to slash spending, dragging down the industry average. NRG, the other distress case in 2013 spent 87% of capital on growth CAPEX and the remaining on return of capital to shareholders. At that time, they expected 2016 capital allocation to consist of 64% of capital to debt reduction and the remaining return of capital to shareholders and maintenance CAPEX. Today, as the company struggles to survive, 78% of capital is allocated to debt repayment, 4% to shareholders and 18% to CAPEX. Industry wide, when it comes to dividend, most observed trends are company specific. We however note that the pure plays are exhibiting increased dividend payments and guides asset portfolio increases.

5.4.2.3 YieldCos

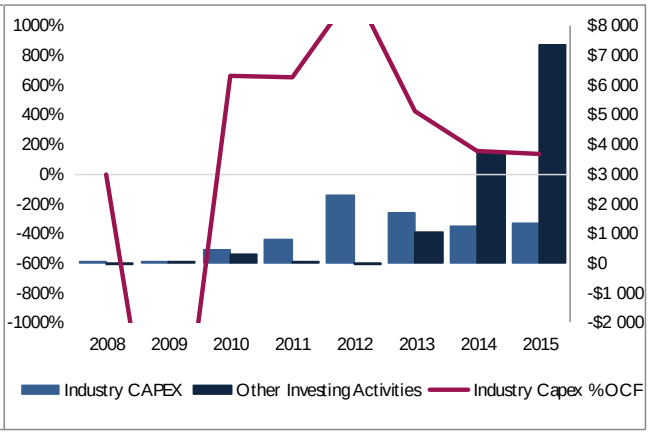
Relative to the more mature industries, YieldCos are characterized with very high reinvestment rates. The companies invest in capital intensive projects and are in theory dependent on constant re-investment for the structure to work. It is visible from the graph below that our results are aligned with the perception of YieldCos growth addiction. While the capital allocation came as no surprise, the difference to pure plays within the renewable group is remarkable. Scatec Solar is the only company exhibiting similar capital allocation trend in 2016, which may also be the reason why several analysts have proposed an implementation of the YieldCo structure as value enhancing.

Figure: 5.4.18: YieldCos Uses of Funds



Source: Thomson Reuters Datastream / Own Contribution

Figure: 5.4.19: YieldCos Uses of Funds - investments breakdown (m)



Source: Thomson Reuters Datastream / Own Contribution

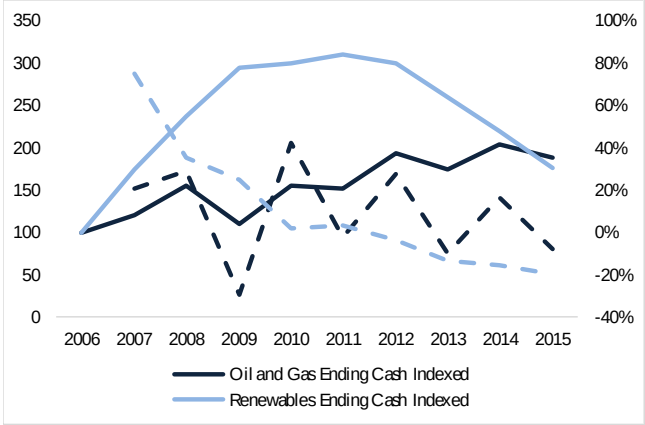
While CAPEX makes up a decreasing part total uses of funds, Other Investing Activities increase

similarly. The financial analysis revealed that drop downs within YieldCos are booked as Acquisition of Assets or Companies which explains why Other Investing Activities attracts the majority of capital. From an investors point of view, dividend yields are very attractive, but this is not reflected in figure 5.4.18 as dividend yield is calculated on net income. This again emphasize the capital intensity of renewable projects and reinvestment rate in YieldCos as dividends are not material compared to growth investments.

Company specific results are not visualized due to lack of analytical value. Even the aggregated industry graph of CAPEX over Operating Cash Flow is highly volatile partly as a result of poor reporting. In 2012, CAPEX was 12x the Operating Cash Flow, a less sustainable trend in the long run. The relationship has converged to reasonable values in 2014-2016. However, as Other Investing Activities has exploded in the same period, the investments over Operating CF metric are increasingly intense. Investments exceeded cash flows from operations 2,5x in 2013, 5x in 2014 and 8x in 2015. If it is sustainable is a question worth asking. It is however made possible through a consistent flow of seasoned offerings, as mentioned previously. Additionally, several players also started tapping debt markets. On the back of debt issuances and YieldCo markets crashing several companies, such as Atlantica, NRG Yield and Pattern Energy initiated debt repayments in 2016. It however attracts a minor portion of annual uses of funds.

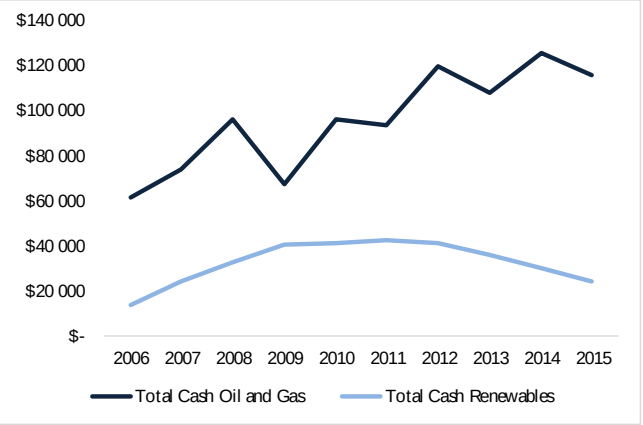
5.4.3 NET CASH DEVELOPMENT

Figure: 5.4.20: Net Cash Development in Renewables and Oil and Gas



Source: Thomson Reuters Eikon / Own Contribution

Figure: 5.4.21: Total Cash Ending Balance (m)



Source: Thomson Reuters Eikon / Own Contribution

The net cash analysis looks at the development in ending cash balance, which changes year-over-year based on the source and uses of funds. A big cash pile makes make sense for companies that operate in an industry where the revenues are based on volatile commodity prices. The decline in oil prices during 2014 stressed the income margins across the industry. Having an abundance of cash at that time give the firm's financial stability. It open doors for cheap asset acquisitions and enables dividend payments without raising additional debt as was the case in Statoil for instance. Figure 5.4.20 illustrates the

development in net cash on an industry-wide level. As for the oil industry, it shows that cash development has been fairly stable going up and down somewhat while gradually increasing. The small dive in 2009 illustrates the effect of a much needed cash reserve as the companies were financially stressed and needed to tap into reserves. The renewable industry increased the cash pile from 2006-2009, ending the latter year with 3x the amount. Correspondingly, sources of funds went from $57 billion in 2006 to $108 billion in 2009. Meanwhile, CAPEX, which dominates uses of funds, increased, although to a lesser extent. The trend in cash development from 2006-2009 is quite stable with respect to firm size- and sales. From 2010, CAPEX has remained at steady levels relative to sources of funds, but the management has increased debt repayments and equity repurchases, which has led some of the decline in cash holdings. However, the biggest driver is the decline in operating cash flow, which declined from $74 billion in 2013 to $53 billion in 2015. As far as YieldCos are concerned, the cash holdings are stable and uniformly increasing from 2013-2015 with firm size and sales.

6. MULTIPLE ANALYSIS

Relative valuation is primarily a valuation tool and in many cases a substitute to fundamental valuation. Financial multiples still serve an important role in the financial analysis because it provides valuable information from the financial markets. A combination of data from capital markets with the already examined financial statement analysis gives the study a broader scope and more information to apply and extract value from. Shedding light on how investors value the oil and gas industry against renewable energy is one of the purposes of this analysis. The renewable industry is steadily increasing its market share in the power industry, while oil and gas have experienced turmoil as of late. Analyzing how growth expectations affect investors' appetite for stocks is among the factors that will be examined. Especially interesting should be the examination of investors pricing surrounding the dividend growth expectations of YieldCos.

The use of relative valuation and multiple analysis is widespread and the majority of equity research reports and acquisition valuations use relative valuation. Multiples are founded on the idea that a firm can be valued by examining the valuation of comparable firms in an industry. The approach is not only simple compared to fundamental valuation, it is also intuitive and palpable for all kinds of investors and stakeholders. Most importantly, multiples reflect the current conditions in the markets. Knowing the investor sentiment towards YieldCos is essential to launch a successful YieldCo, as they are dependent on raising equity at a reasonable valuation.

While multiples present many interesting takeaways they still possess weaknesses. Firstly, since multiples represent the current mood in the markets they could be misleading if the investors are over-

or undervaluing the markets. As mentioned, YieldCos were initially warmly welcomed by the markets, but as investors realized that dividend growth expectations were too lofty, the market experienced a correction. This entails that if an analyst were to examine the multiples in the YieldCo market at its initial stage, they would probably have a very positive upward bias towards the industry. Secondly, a biased analyst can justify almost any value of a firm as long as they pick a multiple that reflects this value. There are vast alternatives of multiples applied and many multiples are industry-specific. Several multiples should therefore be applied to gain a broader view of the pricing of firms (Damodaran, 2012).

6.1 EV/EBITDA

Among all types, earnings multiples are considered the most common measure in relative valuation. They derive their valuation based of a firm's ability to generate earnings or cash flow, which is the ultimate goal from an investor's point of view. The analysis will look at the earnings multiples: price to earnings ratio (P/E) and enterprise value to EBITDA (EV/EBITDA) (Damodaran, 2012).

Unlike the P/E ratio, the EV/EBITDA multiple is a firm value multiple. It has become an increasingly popular multiple over the last two decades and has for several reasons taken some of the spotlight from P/E. Firstly, there are significantly fewer companies posting negative EBITDA compared to earnings. Secondly, differences in depreciations methods and strategies might bias the net income, while EBITDA remains unaffected. As observed earlier, this is often the case for YieldCos. Thirdly, since this is a firm value multiple, capital structure differences are excluded and does not make an impact, which makes it more comparable across firms than other metrics. This is especially crucial in industries where capital structure might differ substantially. Lastly, many believe EBITDA to be a more relevant estimate of a firm's ability to create value compared to net income, because it disregards the elements that are not directly related to the operations of the firm (Damodaran, 2012). For all these reasons, the EV/EBITDA multiple is regarded extra relevant in capital-heavy industries, where EBITDA (a proxy for cash) is king. Hence it corresponds well with the industries covered in the analysis. The multiple is given as follows:

$$\frac{EV}{EBITDA} = \frac{Market\ Capitalization + Net\ Interest\ Bearing\ Debt}{EBITDA}$$

Enterprise value, which equals the market capitalization plus net interest bearing debt essentially equals the market value of the net operating assets. Net operating assets can further be calculated as:

$$EV = \frac{Free\ cash\ flow\ to\ the\ firm}{Weighted\ average\ cost\ of\ capital - growth\ rate}$$

Furthermore, free cash flow (FCF) can be calculated as:

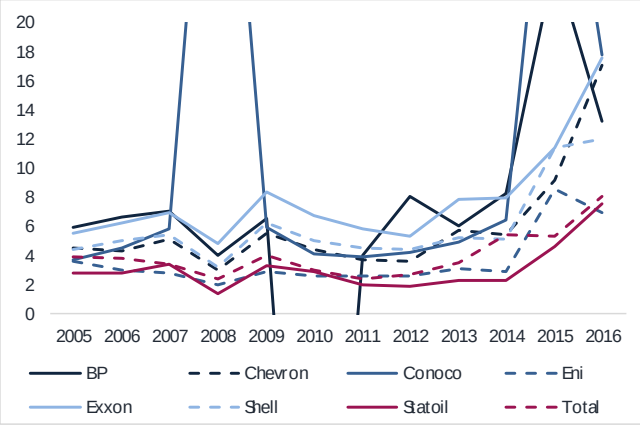
$$FCF = EBIT(1 - tax) + (Depreciation + Amortization) - CAPEX - \Delta NWC$$

Ultimately, the equation above makes the multiple dependent on five determinants:

- Tax rate: Ceteris paribus, when the company tax rate decreases, the firm value to EBITDA increases.
- Depreciation and amortization: Ceteris paribus, when depreciation increases the firm value to EBITDA increases.
- Reinvestment requirements: the greater the portion of EBITDA is spent on reinvestment, the lower the firm value to EBITDA.
- Cost of capital: A higher cost of capital will result in a lower firm value to EBITDA.
- Expected growth: Firms with higher expected growth should trade at a higher firm value to EBITDA (Damodaran, 2013).

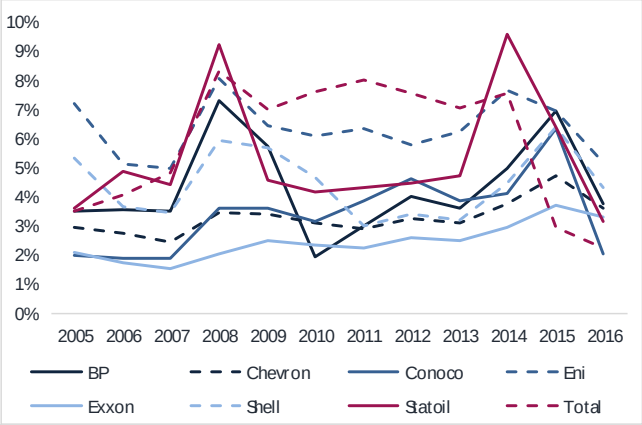
6.1.1 OIL AND GAS

Figure: 6.1.1: Oil and Gas EV/EBITDA



Source: Thomson Reuters Eikon & Datastream / Own Contribution

Figure: 6.1.2: Oil and Gas Dividend Yield



Source: Thomson Reuters Eikon & Datastream / Own Contribution

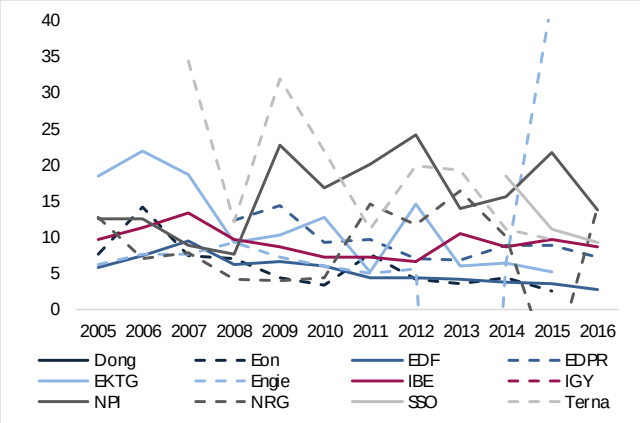
Oil and gas companies present the steadiest development in EV/EBITDA among the three industries. The spread between firms is also fairly small compared to the other industries, although firms are still priced at somewhat different values. As seen in the last three years, multiples start increasing after 2014 with an upward trend the last two years. The current increase in EV/EBITDA is arguably due to the significant decrease in EBITDA compared to losses in market capitalization. This could signify that investors see current EBITDA numbers as non-indicative for future cash flows, or at least that future cash flows should increase from current levels. However, it could indicate that oil majors in general are overvalued at this moment and that investors are not willing to take losses in the market.

Mechanically, there are at least two determinants pulling the multiple upwards. Since the companies have suffered losses the taxes have been greatly diminished. This should decrease the marginal tax rate

(an assumption), which ceteris paribus increases EV. Still, this assumption is somewhat far-fetched. A stronger argument is simply that EBITDA have decreased on an industry-wide level, which increases the multiple. At the same time, increasing reinvestment rates decreases the multiple. Recent years, CAPEX relative to EBITDA have increased, although it has decreased in absolute numbers. Be that as it may, the reduction in EBITDA is the most significant driver for the upward push in the multiple across firms. According to a sample of 330 firms, the oil and gas (production and exploration) industry is priced at an average of 16.61 (Enterprise Multiples – Damodaran, 2017). This corresponds quite well with the current spike and levels illustrated in figure 6.1.1

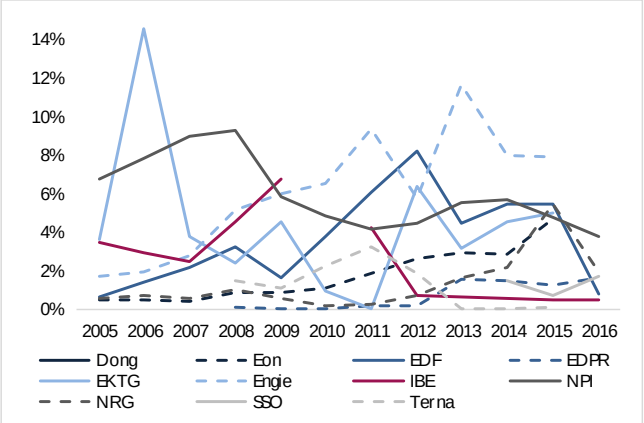
6.1.2 RENEWABLES

Figure: 6.1.3: Renewables EV/EBITDA



Source: Thomson Reuters Eikon & Datastream / Own Contribution

Figure: 6.1.4: Renewables Dividend Yield



Source: Thomson Reuters Eikon & Datastream / Own Contribution

As already stated, the renewable industry is far less stable in EV/EBITDA over the course of the last 11 years, compared to oil and gas. The income statement- and balance sheet analysis has so far found some similarities between IPP's compared to utilities. That does not seem to be the case for the EV/EBITDA multiple. This highlights the notion that firms might look similar strictly off the annual statement, which looks at historical numbers i.e. they are not forward looking. Multiples on the other hand, are forward-looking in the sense that growth expectations play an important role in the valuation of firms. Furthermore, one aspect that has been deliberately removed from the analysis is corporate tax, due to the severity of the subject. The authors still acknowledge that it does have an effect on the multiple. As far as the individuality goes, the strong growth in firms such as NPI should drive the high pricing in the multiple. At the same time, the fact that IPP's have such a high reinvestment rate contradicts the high pricing seen in NPI. However, as seen from figure 6.1.4, the dividend yield[7] is fairly high for the company and investors are often willing to pay a premium for high dividend paying companies. The trend is not consistent across all firms, but for NPI, it can be made a case that there is correlation between high dividend yield and a high EV/EBITDA. EDPR, is more modestly priced. The

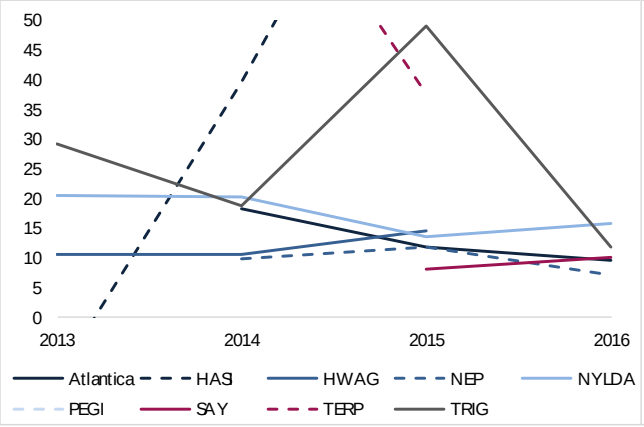
[7] Dividend yield = dividend paid/market capitalization

firm has been trading at an EV/EBITDA between approximately 7-9 from 2012-2016, closing 2016 at a multiple of 7.3. Morgan Stanley stated in a research report recently that the firm is trading at a discount. At the same time, they mentioned several arguments for the low multiples. Firstly, US policy concerns relating to changes in the tax reform and cut in subsidies for renewable energies have driven the share price down. Secondly, the lack of liquidity in trading (traded $2-3 million/day) is a concern for large institutional investors (Morgan Stanley report - EDP Renovables, 2017).

While figure 6.1.3 presents a large spread between values, the median still looks to be quite similar to the average in the utility sector based on a 22-firm sample with an average EV/EBITDA of 11.5 (Enterprise value multiples – Damodaran, 2017)

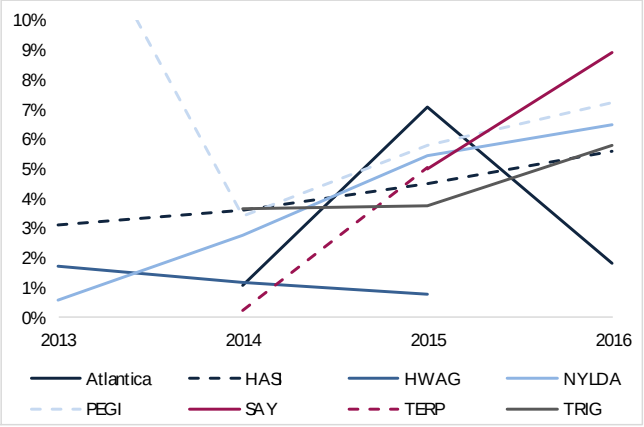
6.1.3 YIELDCOS

Figure: 6.1.5: YieldCos EV/EBITDA



Source: Thomson Reuters Eikon & Datastream / Own Contribution

Figure: 6.1.6: YieldCos Dividend Yield



Source: Thomson Reuters Eikon & Datastream / Own Contribution

As far as YieldCos are concerned, the sample presents itself as quite random at the first glance. This is as expected though, given that the industry is still new and firms although being similar have performed differently both with regard to operations and stock performance. By looking at the current situation, the markets are pricing the YieldCos in the span between 9-16 EV/EBITDA for 5 out of 8 firms in 2016, with the remaining way above (as high as 1000, not applicable). In general, the multiples are quite high, but similar financial structures in real-estate investment trusts are trading at an EV/EBITDA of 20.5, based on a 238-firm sample (Enterprise value multiples – Damodaran, 2017). One would assume that dividend yield and EV/EBITDA would correspond for YieldCos considering that the financial structure is based on the premise of delivering high yields and CAFD[8] above 80% in most instances.

[8] Cash Available for Distribution

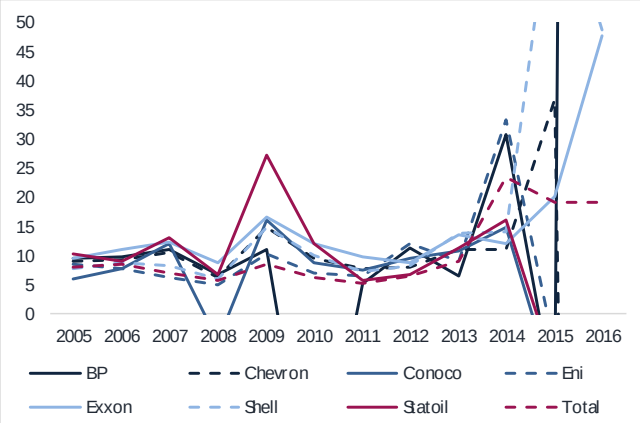
6.2 PRICE-EARNINGS RATIO

$$P/E = \frac{Market\ price\ per\ share}{Earnings\ per\ share}$$

The P/E ratio is by far the most commonly applied investment valuation indicator although it is often misused. It is an equity-based multiple which means that the numerator i.e. price, equals the market value of the shareholder's equity. It does not include the entire value of the firm, consequently ignoring capital structure as a part of the equation. The measure describes how many times a stock is trading its earnings per share. If a firm is trading at 10 times its earnings means that potential investors is paying $10 for every $1 of annual earnings. P/E ratios can be calculated using current earnings, trailing earnings, forward earnings, fully diluted earnings or primary earnings. The analysis will apply current earnings i.e. net income before extraordinary items in the reformulated income statement (See Appendix 2). Being an equity-based multiple P/E can be broken down to three factors that affect the pricing: return on equity, cost of equity and growth. Without going into specifics regarding the calculations (because they are not as relevant in this case), the P/E is said to have a constant relationship with the abovementioned factors. Whenever profit (ROE) increases, the P/E multiple should also increase. If either interest rate or the company's risk increases, then cost of equity increases and P/E decreases. The impact of growth on P/E is dependent on ROE and cost of equity. If ROE exceeds cost of equity then growth will increase P/E and vice versa if ROE is below the cost of equity (Fernandez, 2002).

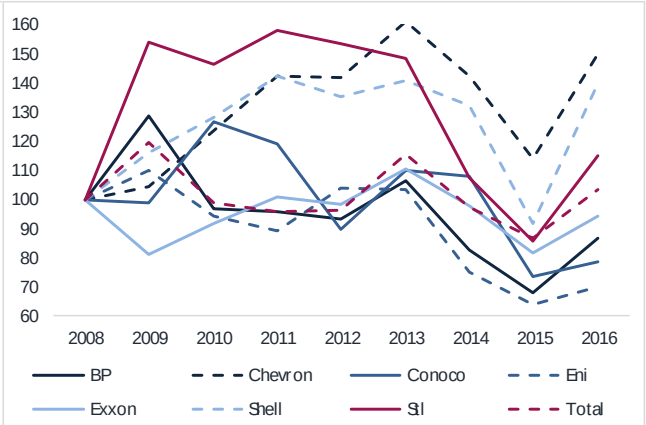
6.2.1 OIL AND GAS

Figure: 6.2.1: Oil and Gas P/E



Source: Thomson Reuters Eikon&Datastream / Own Contribution

Figure: 6.2.2: Oil and Gas Market Capitalization Indexed



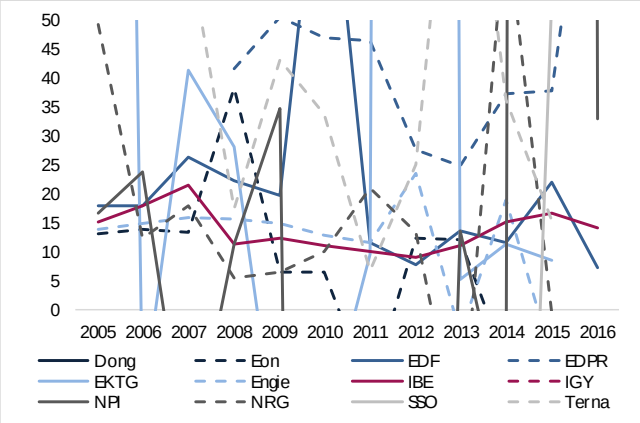
Source: Thomson Reuters Datastream / Own Contribution

The oil and gas companies depict a fairly consistent and close trend between the firms. The development in P/E also corresponds with the trend in EV/EBITDA, although the firms seem to be priced somewhat differently the last two to three years. As seen from figure 6.2.1, the firms traded with minor differences from 2010-2013, before the decline in oil price made an impact on the firms. From

the profit margin analysis, it became clear that firms delivered varying and volatile net profits. Volatility and declines in net profits was partially due to impairments, level of exposure towards change in commodity prices, cost-cutting strategies and more. As seen from previous analysis, Conoco has been among the firms that has handled cost-cutting at the SG&A with the least success. They are priced at a very high multiple today, signifying that they could be overvalued. It could also signal that investors believe the storm is passing through and that companies will be able to cut costs moving forward, ultimately increasing shareholder return. The second figure displays the development in market capitalization indexed since 2008. It shows that even though Conoco is among the poorest performers in the capital market, they are still priced at a high multiple.

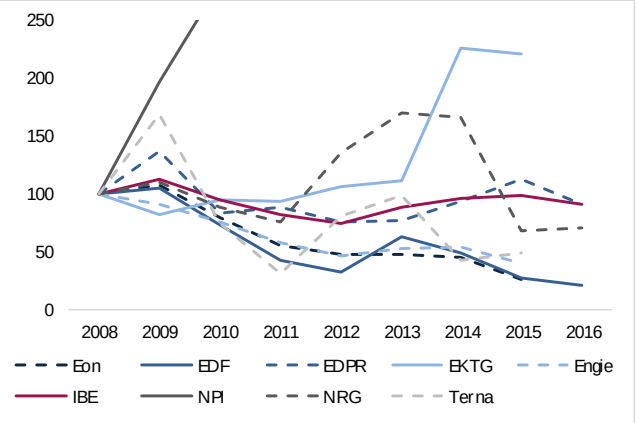
6.2.2 RENEWABLES

Figure: 6.2.3: Renewables P/E



Source: Thomson Reuters Eikon & Datastream / Own Contribution

Figure: 6.2.4: Renewables Market Capitalization Indexed



Source: Thomson Reuters Datastream / Own Contribution

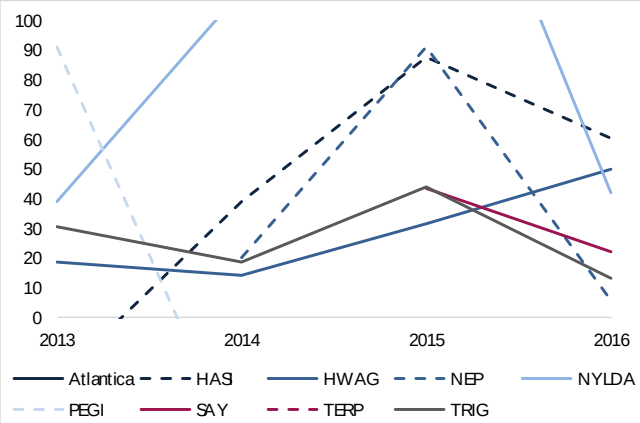
The P/E ratio for the renewable sample is very messy, providing less informational value. The authors considered visualizing the values in a table, however, the numbers still provided little value. Figure 6.2.3 display the result of massive impairments and an industry in constantly change accompanied by a shift from conventional energy to renewable energy sources. Additionally, since the sample comprise of firms with somewhat different profiles in terms of business areas, the P/E ratio, which derives from the bottom-level of the income statement, is bound to have a huge spread. The best performer in the market is by far NPI, which had an indexed market value above 500 in 2015, more than 5 times the value in 2008. IBE and EDF are the only firms trading at consistent levels over the timespan. Apart from NPI and EKTG as of late, few firms have performed well in the capital markets over the time span compared to the very positive development in global indices.

6.2.3 YIELDCOS

Opposite to renewable corporations, the YieldCos present much more comparable results. This is likely due to the fact that firms have a more similar profile. Figure 6.2.6 illustrates the development in share

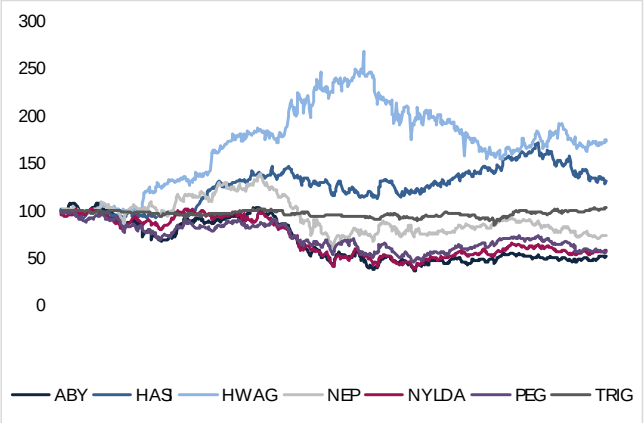
price indexed since end of Q2 2014. Capital Stage and HASI has clearly been outperforming the other YieldCos, and are also the only firms with a clear positive trend over the 2.5-year period. Even though share price has increased for HASI, the P/E is still among the highest and increasing from approximately 40 times earnings to trade around 60 times earnings in 2016. The share price in Capital Stage (HWAG) has been more volatile, but the P/E have aggressively increased and more than doubles from below 20 in 2014 to around 50 times earnings in 2016.

Figure: 6.2.5: YieldCos P/E



Source: Thomson Reuters Eikon & Datastream / Own Contribution

Figure: 6.2.6: YieldCos Share Price Indexed



Source: Thomson Reuters Datastream / Own Contribution

6.3 BOOK VALUE MULTIPLES

While earnings multiples look at the income statement, the book value multiples base their valuation solely on the balance sheet. In general, a stock that is trading below its book value of equity is seen as undervalued. Contradictory, a stock that is trading above its book value could be considered overvalued. The relationship between market and book value of assets have attracted many investors and analysts. Without undermining fundamental analysis, it sometimes presents itself as subjective and complicated, whereas book value multiples are portrayed as logical and practical. Given reasonable consistent accounting standards across an industry, the book value ratios are valuable indicators of determining whether a firm's assets are under- or overvalued. However, this upside can also become a disadvantage as book values are, like earnings, affected by accounting practices on depreciation, amortization and other matters. Different accounting standards across countries could pose a bias in the calculation of book value ratios (Damodaran, 2013).

The most common book value ratio is price-to-book value (P/B), which is also referred to as levered P/B. It is derived from:

$$\frac{P}{B} = \frac{Market\ value\ of\ equity}{Book\ value\ of\ equity} = \frac{Market\ value\ NOA - Market\ value\ NIBD}{Book\ Value\ NOA - Book\ Value\ NIBD}$$

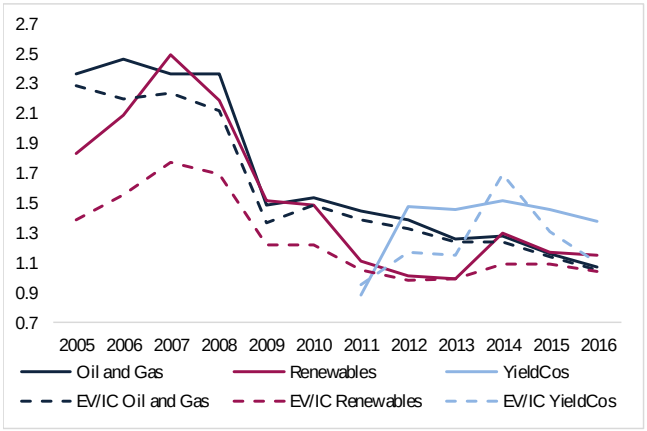
Similar to the P/E ratio, the levered P/B is an equity-based multiple, hence it is mostly affected by the same underlying drivers. Increasing ROE increases P/B, while increasing cost of equity decreases P/B. P/E and P/B holds the same conditions for growth i.e. if ROE > cost of equity then increasing growth increases P/B while increasing growth with the opposite relationship decreases P/B (Petersen & Plenborg, 2012). Although levered P/B is a widely used multiple, it can be made an argument that the unlevered P/B is an even better metric to compare pricing of assets across industries and within industries where capital structure varies. The unlevered P/B is also known as enterprise value/invested capital (EV/IC). The relationship between the multiples is based on the equation above. The equation states that in the adjusted balance sheet, the equity is calculated as the net operating assets less net interest bearing debt. Consequently, the unlevered P/B or simply EV/IC is calculated as:

$$\frac{EV}{IC} = \frac{Market\ Value\ of\ Net\ Operating\ Assets}{Net\ Operating\ Assets} = \frac{Enterprise\ Value}{Invested\ Capital}$$

To explain the relationship even further, the levered P/B can be computed from the EV/IC by only adding the impact of financial leverage:

$$\frac{P}{B} = \frac{EV}{IC} + \frac{NIBD}{Equity} * (\frac{EV}{IC} - 1)$$

Figure: 6.3.1: Median P/B



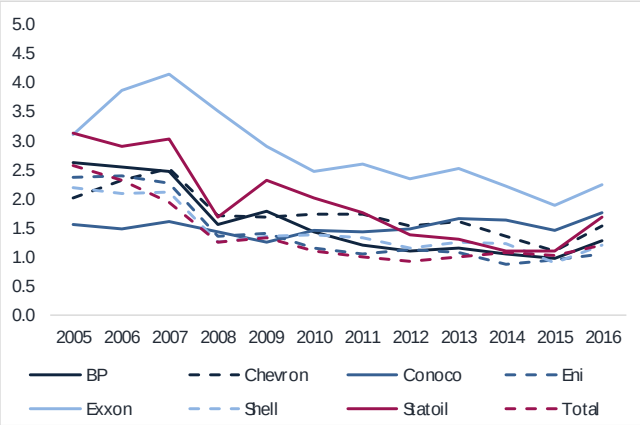
Source: Thomson Reuters Eikon & Datastream / Own Contribution

Assuming the firm is levered, then the equation implies that if EV/IC equals 1 then P/B should also equal 1. If EV/IC is above 1, then P/B should be higher than EV/IC.

Figure 6.3.1 illustrates the medians for P/B and EV/IC across the industries. The difference between P/B and EV/IC within each industry represents the impact of leverage. While P/B should remain either equal or above EV/IC it can sometimes fall below if financial leverage is negative. This entails that the net interest bearing debt is negative i.e. financial assets surpasses the amount of interest bearing debt. The figure depicts the spread between P/B and EV/IC being larger for renewable firms and YieldCos compared to oil and gas. This is consistent with the leverage analysis that showed a much higher leverage in general for renewables and particularly IPP's as well as YieldCos. Furthermore, the figure depicts in general a decline in multiples starting with the financial crisis. Neither industry has so far managed to climb back to previous highs, which could indicate that growth expectations are declining.

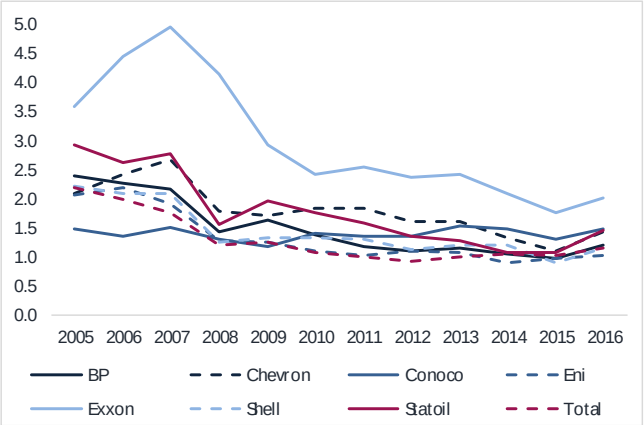
6.3.1 OIL AND GAS

Figure: 6.3.2: Oil and Gas P/B



Source: Thomson Reuters Eikon & Datastream / Own Contribution

Figure: 6.3.3: Oil and Gas EV/IC

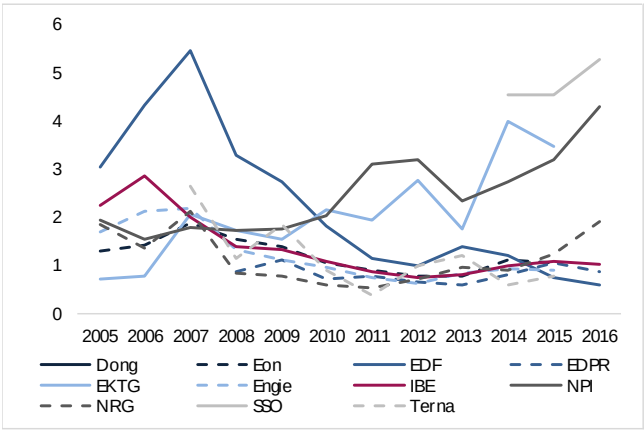


Source: Thomson Reuters Eikon & Datastream / Own Contribution

It comes as no surprise that the industry in general trades at similar multiples considering they have delivered quite similar returns and ratios over the course of the income statement and balance sheet analysis. Most firms lie within the span 1-2 with similar P/B and EV/IC, again indicating the small impact of leverage. The overall trend has been slowly decreasing the last 11 years with most firms trading between 1-1.5 times the value of both equity and enterprise value last year. The only significant outlier is Exxon, which has consistently been trading at a premium to the industry. A strong argument to be made for the apparent premium is that the company has consistently delivered a strong ROIC for several years, significantly above the industry average. The company has paid dividends consistently for the last 30 years and is known to be investor-friendly. Exxon have also relied heavily on equity-finance and have applied little leverage over the course of the last 20+ years. The rock-solid balance sheet made ExxonMobil the last American oil company to see its credit rating cut. Still, the rating slipped from AAA, the highest possible, to AA+, the second to best (Brewer, 2016). Circling back to the industry as a whole, the slight decrease in both multiples seems to correspond with the notion that growth in the industry is slowing down and the return on assets is not as strong as it used to be. While all firms had a small increase from 2015-2016, the industry is still trading in a historically low range. Especially in terms of EV/IC, the oil and gas industry have been trading above the average in the renewable sector for the last 20 years. However, as seen in recent years, the renewable sector has taken up ground, consequently reducing the gap between the pricing of the industries' assets. Furthermore, a better proxy to compare the two industries could arguably be the P/B because leverage has a more advantageous position within the renewable sector, due to the fixed and stable cash flows.

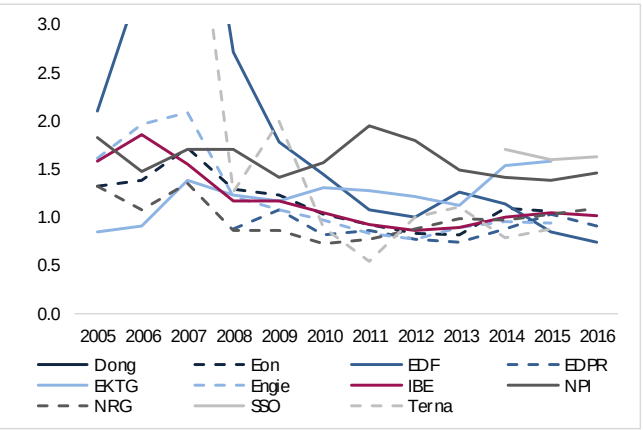
6.3.2 RENEWABLES

Figure: 6.3.4: Renewables P/B



Source: Thomson Reuters Eikon & Datastream / Own Contribution

Figure: 6.3.5: Renewables EV/IC



Source: Thomson Reuters Eikon & Datastream / Own Contribution

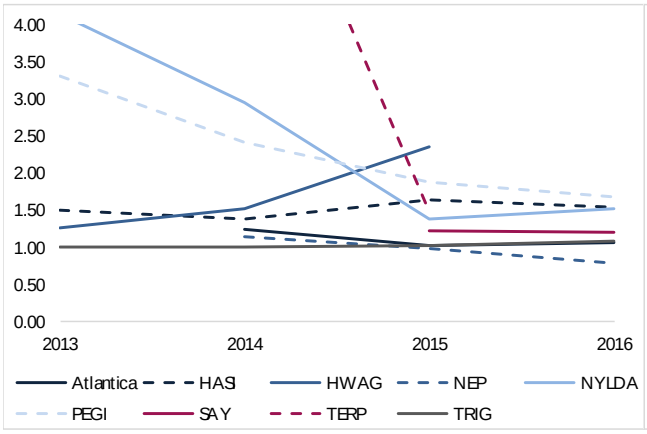
Somewhat surprisingly, the figures above show a fairly consistent multiple across the firms in the industry. Previous analysis has found quite significant differences in returns, turnover and income margins. Hence it would be natural to assume that the markets would price the assets thereafter. Firms such as Dong depicts a strong decline in the pricing of their assets indicating a decline in growth. However, it can also indicate the change in industry from gas to renewable energies. This is transparent with the decline in ROE as a result of the aforementioned, mainly due to heavy divestments and impairments. Another interesting development is that the IPP's NPI, EKTG and Scatec are the firms trading at the highest multiples. This could be an indication of investors sentiment towards future growth. At the same time, the analysis has so far determined the IPP's to have low turnover ratios and being the most capital-heavy firms in the sample. It has also been discussed how IPP's, but especially YieldCos depreciate assets aggressively in order to achieve tax-benefits. This could lead to firm's assets being priced above the booked values because the depreciated asset base is below the tax- and market value of the assets. However, an IPP's assets achieve fixed-price contracts, where the revenue-generation of the assets is determined for the next 15+ years. This makes the value of the assets fairly constant and predictable. Contrary, assets within the oil and gas industry is prone to change with the demand and price of oil. As a result, the book-value multiples should be fairly stable for IPP's compared to oil and gas, although history illustrates the opposite.

6.3.3 YIELDCOS

Without the exception of HASI, all YieldCos seem to be trading at EV/IC close to 1. This coincides with the previous notion that because of the predictability and stable value of the asset base in IPP's, the booked value should be fairly transparent with the market value. It can also be a result of the market correction of Yieldcos that took place in 2015 where investors realized that expected growth

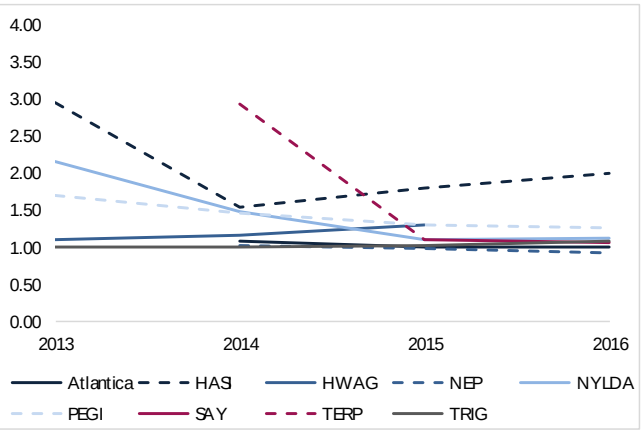
targets would most likely not be met. However, the correction is not especially evident in the figures below, although some slight decrease is detected among the firms.

Figure: 6.3.6: YieldCos P/B



Source: Thomson Reuters Eikon & Datastream / Own Contribution

Figure: 6.3.6: YieldCos EV/IC



Source: Thomson Reuters Eikon & Datastream / Own Contribution

7. CORPORATE FINANCE ELEMENTS AND STRUCTURAL CONSIDERATIONS

7.1 STAGING, PROJECT RISKS AND THE TRUE TIME VALUE OF MONEY

Figure: 7.1.1: YieldCo Process

Source: Own Contribution

In the Venture Capital community, a common issue is funding issues and accompanied risk-return considerations. For many years, the "valley of death"[9] killed the growth of clean tech companies and almost left the industry dying. Investments are about paying cash today in return of receiving a certain amount of cash at a later stage. If the accompanied risk is high, you will be reluctant to invest or require a higher return. This basic idea is the cornerstone of our findings in the financial analysis of pure plays and YieldCos. This part will dig into strategies related to business models, staging and risk allocation practices within the industry and sample. As the industry still is relatively immature, there are several

[9] A phrase used in venture capital to refer to the period of time when a startup firm receives an initial capital contribution to when it begins generating revenues. During the Death Valley curve, additional financing is usually scarce, leaving the firm vulnerable to cash flow requirements (Investopedia – Death Valley Curve, 2017).

innovative business models that seek to handle the early stage risks and grasp returns while reducing risk.

"To the extent there is drama involved in putting together wind farm financing, much of it derives from the efforts of each participant to shift the various risks to others, while retaining the benefits from the transaction that the participant seeks. The project owner seeks to shift the technology risks to the turbine manufacturer and the construction contractor, while preserving for itself as much of the cash flow and appreciation in project value as possible" (Einowski, Edward). The quote above describes the issues relating to risk shifting in renewable projects. On a corporate level there are two broad approaches to address the credit/risk issues, non-recourse (project) financing and full recourse (balance sheet) financing. While these topics will be analyzed in the next part, this section will deal with the analogous, yet more operational decision of when to invest.
A wind project is often structured in a complex fashion with several equity and debt providers with different seniorities and risk profiles. During the life of a project it is not uncommon for stakes shifting hands several times. Due to varying investments mandates and risk preferences, the quote "one man's trash is another man's treasure" is quite illustrative for renewable projects. Research suggests that sponsor/developer fund the development phase, often by including non-sponsor equity or sub-debt. In project construction, availability of debt increases and co-ownerships often occurs with sponsor equity and or sub-debt decreasing equivalently. Gearing in this phase is often either very high or quite limited, reflecting some lenders aversion to construction risk. During project operation, research supports the thesis of the risk picture improving and more interest from lenders and non-sponsor equity (corporates, investment/pension funds). After commissioning, involvement of sponsor equity decreases further, supporting the trend towards equity stake disposals and recycling of capital for sponsors (EWEA, 2013). The authors have sought to analyze this trend among the sample firms.
The industry analysis presented a typical investor universe, ranging from corporates, power producers, Oil & Gas, EPC/O&M providers and different financial investors. EPC/O&M providers, IPPs and utilities have historically taken early stage risk. Corporates and pension funds are more interested in operating assets providing stable cash flows, while infrastructure funds may require a higher return, thus entering earlier. The analysis is primarily limited to oil players, utilities, YieldCos and stand-alone specialized companies. A common strategy observed among developers is that projects are financed 100% on balance sheet in the beginning, before they are refinanced and inviting equity and debt investors into the project. In the US, tax equity often replaces construction debt after commissioning. Capital of the developer is recycled and risk mitigated (BNEF 2016).
A general preference table is displayed below. In theory, one would expect to see early stage risk takers to consistently achieve higher return on invested capital than the players entering projects later. Risk

and returns move together, so the ability to generate alpha is dependent on successful risk management. In practice this is translated into success of projects, which tends to be subject to the operating experience and project management excellence. Accept from YieldCos, most analyzed firms seek excellence in the four categories below. Company specific trends will be further analyzed in section 7.2 on financing strategy.

Figure: 7.1.2: Overview of investor preferences towards project stage and risks

Investor/Stage	Permitting	Development	Construction	Operations	Comments	Project Finance
Utilities	Yes	Yes	Yes	Yes	A proven solution. Dislikes small projects. Control seeking	If Possible
IPP	Yes	Yes	Yes	Yes	Active across value chain. Typically sell all or part of project after developing and financing but prefer operational role	Yes
Corporations	Some	Yes	Yes	No	Invest to hedge power risk and/or for strategic/marketing purposes. Happy (or need) to be minority shareholder behind strategic investor.	Yes
Contractors	No	Maybe	Some	Yes	Taking stakes or providing subordinated loans to secure project pipeline. Often need clear perspective on exit after COD.	Probably
Private Equity	No	Maybe	Some	Yes	Require high returns and typically involved in early development and/or use aggressive long term assumptions. Focus on control and exit.	Not Neccesarily
Municipal Utility	No	No	Maybe	Yes	Small but strong balance sheets, can be part owners. Slow decision process and stringent risk requirements. Low IRR required.	Probably
Sov.wealth fund	No	No	Maybe	Yes	Require simple contracting structure, long term O&M agreements and controlling partner. Some can take more risk.	Not Neccesarily
Infrastructure fund	No	No	Maybe	Yes	A large universe of potentially interested parties. Most still require construction risk mitigation and long term O&M agreements.	Not Neccesarily
Pension funds	No	Maybe	Yes	No	Dislike construction risk but can increasingly do it for onshore wind and solar. Need long term O&M agreements.	Not Neccesarily

Source: Green Giraffe 2017/Own Contribution

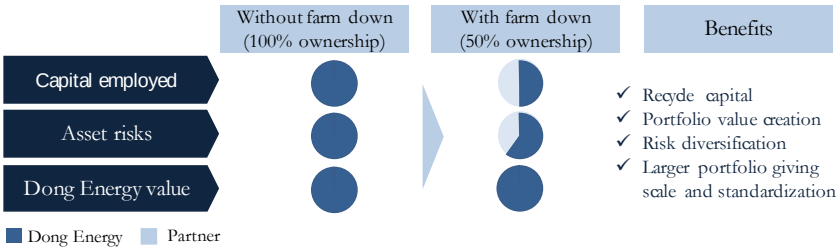
As part of corporate strategies, most companies have expressed their view and preference for project risk. Northland, which market capitalization has increased 500% since 2008, is committed throughout the life cycle of wind projects. E.On are one of the largest offshore wind players are an integrated player focused on strategic partnerships (risk sharing) and monetizing existing assets (recycling capital). The same goes for Iberdrola and its American subsidiary Avangrid, which considers itself a full lifecycle operator. Innogy SE, the carve out of RWE built its first offshore wind project in 2003, stating having achieved significant learning curve. An example of the industry maturity is that average numbers of days for installation per foundation has declined from 8 to 2 from a project with CoD[10] in 2015 to a neighboring project with CoD in 2017. The company is the #3 offshore player, targets lead developer and operator roles and is present throughout the value chain (Innogy, investor presentation 2016). The integrated IPP Scatec Solar uses a self-funding project finance model where high leverage is applied at project level with limited risk exposure at parent level. This is not uncommon. However, by developing, building, owning and operating solar parks, Scatec earns a gross margin in the Development and Construction (D&C) that covers a large part of the company's equity contribution in the project. The model allows for a self-funded capacity of 300-400 MW annually i.e. with limited to no equity

[10] Commercial Operation Date

contribution. Abengoa, the distress case represents an even more asset light structure. In light of the restructuring the company is prohibited from taking debt or equity positions and have therefore moved from an ownership strategy to be a sole service provider. It explicitly states it will not be a financial investor, taking financial risks, earning money through long term investments or owning industrial plants. (Abengoa Investor presentation 2017).

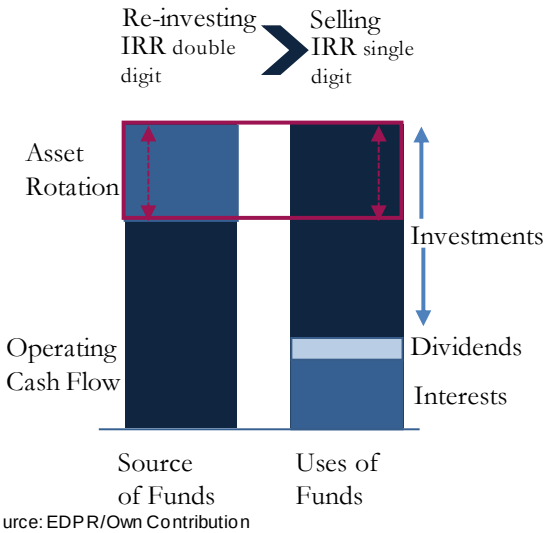
Throughout the thesis, Dong Energy and EDPR are analyzed extensively due to the similar exposure to Statoil NES. Both companies seem to fully leverage the operational experience within wind power to farm down assets and recycle capital around operation start up. Dong Energy, the offshore market leader with 20%+ of offshore market shares, inaugurated the first wind farm in 1991, but the true commitment started in 2007. While competitors have a longer history with wind, Dong is considered to have an operational edge and unparalleled track record developing, building, operating and owning wind power assets. With most partnerships in the industry, Dong has not been reluctant to partner up with corporates, pension funds, infrastructure funds, strategic players and debt institutions (Dong Investor presentation 2017). A central part of value creation comes from farm downs of developed parks where they consistently have divested 50% of assets during the construction phase. In a farm down, Dong sells half the project to a partner 12-24 months after FID while it still is under construction. The partner is usually brought in at around Dongs cost of capital, implying a selling price about 45-50% above cost of development, reflecting construction risk. Analogous to this, research has suggested that construction risk increases required return on debt with 300-400bps (EWEA, 2013). UBS values the NPV of future farm downs to 12% of enterprise value, emphasizing the material values of farm downs (UBS, Initiating Coverage 2016).

Figure: 7.1.3: Dong Energy Farm Down model



Source: Dong Energy/Own Contribution

Figure: 7.1.4: EDPR Asset Rotation, Self funding model



Source: EDPR/Own Contribution

Equivalently to Dong, EDPR seeks to crystalize values at an early stage through an Asset Rotation Strategy, which in principle has made the company self-funded. The main principles and objectives are similar to those of Dong Energy. However, while

Dong seeks to divest even before construction, EDPR have tended to materialize value in mature projects, often already operating. Both companies structure packages with low risk, high visibility cash flows that are attractive to institutional investors. However, while Dong seems to divest assets at IRR around 7,5%, EDPR sells assets at IRR of 6,5%, down 200bps last 2 years. EDPR also explicitly state the self-funding aspect of the strategy, which is not mentioned by Dong. This could be due to Dongs centralized financing structure, other asset areas and higher reinvestment rate requiring a larger funding base.

The combination of industry and financial research in this thesis has provided a solid overview of profitability and prospects of the companies. Despite modest experience (in years) relative to other industries, the analyzed companies are willing to take on developing risks. Further, most companies prefer risk sharing through partnerships. This is particularly illustrated through Innogy, which has changed towards partnerships structures, while they previously preferred independency. Statoil New Energy Solutions are positioned somewhat similarly to the analyzed companies. With decades of offshore experience, 15 years of wind experience and a low turnover among key professionals they believe to have a competitive platform. Projects are so far entered at development stages, with the exception of Arkona where Statoil acquired a 50% stake and simultaneously announced FID[11]. The inclusion of Masdar at project Hywind lowered Statoil´s ownership stake to 75% and a recent acquisition of a 32 miles land lease off the coast of NYC, both share similarities to the sample firms. However, information disclosure is more limited and the company has not officially stated staging preferences, although they believe they have significant development capabilities (Marius Sandnes, Statoil IR). As proposed in the industry analysis, Statoil also emphasize the need for development expertise as auction participants has increased massively. Dong Energy's zero subsidy bid in the Dutch auction illustrates the increased competitive environment. Assessing Statoil's scale and experience relative to incumbents is outside the scope of this thesis, but the authors note the importance of competitive advantages in securing, designing and building wind farms.

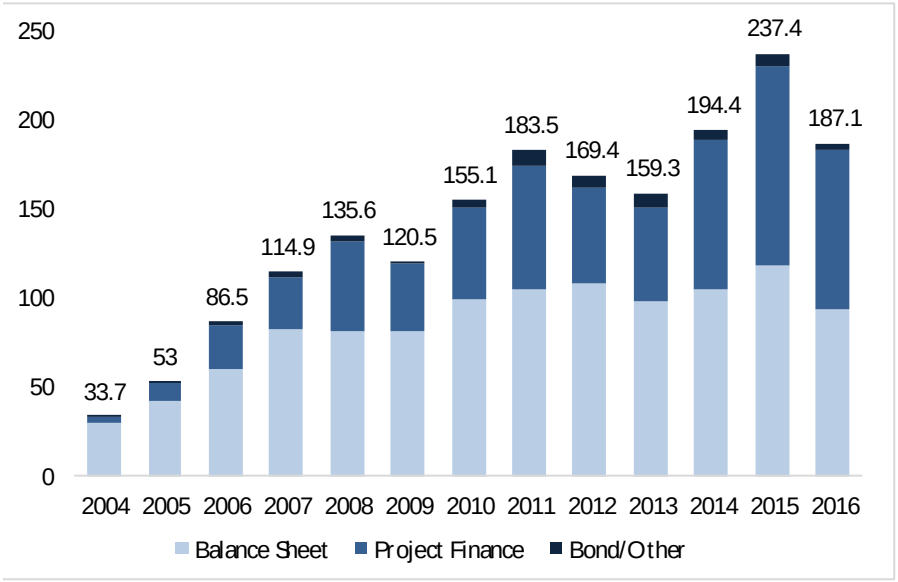
7.2 FINANCING STRATEGY – EVIDENCE FROM INDUSTRY AND CAPITAL MARKETS

A central aspect in the objective of this thesis is to analyse financing structures that can be employed by Statoil NES. While the industry analysis presented the traits of wind and solar, the theoretical part set out to explain the concepts of capital structure, project finance and corporate financing. Risk allocation

[11] Final Investment Decision. The project was thus entered at a later stage.

in projects was analysed from a business model perspective in 7.1, while this part seeks to analyse the perspectives of handling risk through optimized financing strategies. The rationale for the analysis erupts from early scoping and research that revealed no common perception and an apparent lack of consistency in the choice between balance sheet financing and project financing. Despite its imperative importance for firm value and risk, Statoil and other players present no clear stance on this issue. In addition, limited previous research emerged on the topic of financing choices for energy companies within renewables. This was initially hypothesised to be partly due to the immaturity of the industry, and partly as each project is analysed as a separate venture. Statoil has historically utilized balance sheet financing, with the exception of Dudgeon wind farm where a joint venture financed the project through non-recourse debt. This section will include an overview of trends in the market, analysis based on related empirical research and findings regarding funding strategies in the peer group.

Figure 7.2.1: Investments in asset finance by type of security ($Bn)



Source: Bloomberg New Energy Finance 2017/Own Contribution

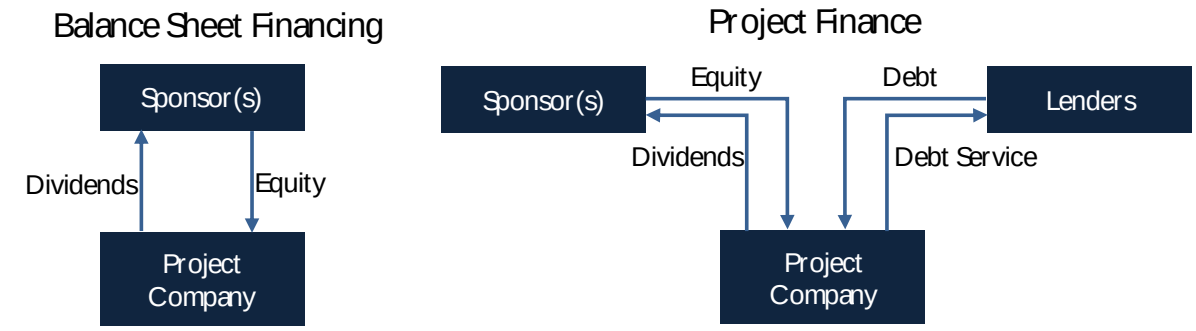
Modigliani & Miller (1958) proposed that corporate financing decisions do not affect firm value. One of the key assumptions backing up the irrelevance proposition was that financing and investment decisions are independent and separable activities. In many ways, the rise of project finance as a discipline provides evidence that dismiss the theory that financing structures does not matter (Esty, 2003). Project finance investments have grown from about $10 billion per year in late the 1980s to over $220 billion in 2001, and today renewables alone constitute almost half of this. As renewable projects share characteristics with infrastructure projects, non-recourse financing has emerged as an increasingly preferred structure in solar, onshore and offshore wind. In more capital-intensive projects, like offshore wind, utilities have historically financed the majority of operating capacity. A hypothesis is that project finance deployment has emerged as a response to credit rating focus and pressure on revenues among utilities, limiting the abundant and cheap financing so far available. The table below displays historical development in use of balance sheet vs project financing. Asset finance covers all capital invested in renewable energy generation projects (excl. large hydro and re-financings), from internal balance sheets, loan or equity capital. Asset

finance constitutes 70-80% of total renewable investments annually, with the rest coming from R&D, VC/PE, public markets and small distributed capacity (BNEF, 2017). Project finance has increased its share gradually but still remains to be larger than balance sheet financing in absolute numbers. In a project finance deal, equity can be sourced from owners directly via equity or shareholder loans, or indirectly via guarantees.

Debt is sourced from banks without recourse to equity investors. Project bonds has emerged as an alternative to bank debt as investors get more comfortable with the risks. This has however often been applied in re-financings post-construction, recycling capital for initial sponsor and opening up for more risk averse long term capital. Bonds often receive investment grade rating and have successfully been applied by Dong Energy among others.

7.2.1 OBSERVATIONS FROM ANALYZED COMPANIES

Figure 7.2.2: Project Finance and Corporate Financing illustrated



Source: Own Contribution

The analysis above provided a market wide depiction of trends in financial structures. In the table below, the authors have mapped actual financing practices among a subset of the selected peer group. Note that some companies, as Engie and Terna are not included in the overview. Terna is a developer and IPP utilizing Tax Equity and Project Finance while Engie is a multinational utility in the middle of a turnaround. It could be an interesting case in point as it both employs project finance structure while having a solid balance sheet.

The table on the next page illustrates the different strategies among renewable players. While the analysed companies are relatively aligned with regards to value chain positioning (early stage/development), there is less consensus in financing strategies. Smaller developers seem to prefer non-recourse structures. An explanation of this may be lack of optionality as they lack the balance sheet strength of the large energy companies. There is also observed high leverage in companies using project finance, which authors believe is a mechanical effect of gearing on underlying assets. The projects using project finance are all pure plays, meaning that corporate leverage will reflect business exposure. In the larger

Figure: 7.2.3: Financing strategies, the choice between project finance (PF) and corporate financing (recourse)

Company	PF	Recourse	Cost of debt	Leverage	Credit Rating	Comments and rationale
Statoil	Once	Yes		66 %	A+(S&P)	So far used internal funds. Dudgeon farm was financed through non-recourse debt.
Dong	No	Yes	4 %	62 %	BBB+	Centralized financing strategy, bank debt, bonds and hybrid bonds a corp. Widespread use of PF considered cost-inefficient. Some projects has PF and project bonds at certain stages
EDPR	Yes	No	4 %	63 %	N/A (EDP BBB-	Self Funding Model excludes increase in corporate debt. Uses external financing - tax equity (US) and PF, which contracts long term debt in local FX (natural hedge). 77% of debt in loan to major shareholder, EDP (strong rating)
Innogy	Yes	Previously		71 %	BBB+	Moved from BS to PF after 2015 - limits capital requirement per project. Increased partnerships. Diversification of projects. Most recent project Galloper IRR 13% at FID.
EKTG	Partly	Partly		87 %	N/A	Finance projects through PF and project bonds. However, main corporate liabilities are LT bank debt and corporate bonds.
NPI	Yes	No	4.9%	89 %	BBB (S&P)	Primarily fixed-rate non-recourse debt in projects (70-80% of total). Emphasize reduced risk profile and added discipline and long term focus.
Scatec Solar	Yes	No		90 %	N/A	Scatec solely uses PF, due to risk mitigation and allocation. Operates high risk markets
Iberdrola	Seldom	Yes	3.5%	65 %	BBB+	Centralized financing strategy. PF 0,6% of total debt. Recently issued €2,7Bn EMTN (91% green bonds) at avg. below 1% Using Tax Equity in the US (subsidiary Avangrid, BBB+)
E.on	No	Yes	2.6%	86 %	BBB (S&P	Centralized funding strategy. Ensure access to capital markets is commensurate with debt levels. Avg. IRR>WACC by 500bps since 2012.
All YieldCos	Yes	No		75 %	N/A	By nature, YieldCos are investment vehicles independent of sponsor without strong funding capabilities. Reliant on external financing

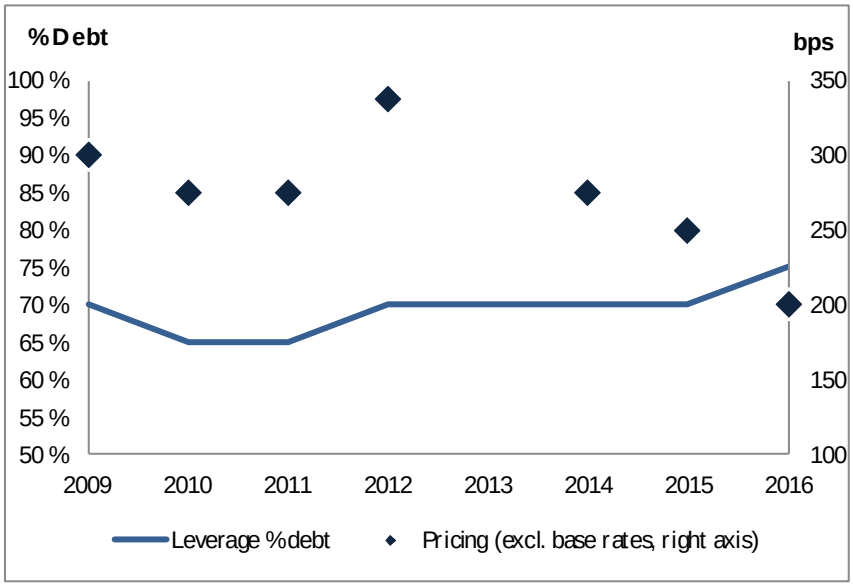
* E.on cost of debt on pretax basis. Aftertax cost of debt 1,8%
** Cost of debt displayed only if disclosed by company. Calculation may be subject to company bias
*** Own calculations used in leverage numbers. Total debt & Liabilities/Total Assets
**** YieldCos average cost of debt and leverage
***** NPI cost of debt based on non-weighted average of all non-recourse loans. Most relevant project (Gemini) of EUR
Source: Annual Report, Company presentations, press releases/Own Contribution

corporations, the effect of a highly leveraged project will be diluted in the corporate leverage due to diversification in asset base. All YieldCos mostly apply project finance, which comes as no surprise as the companies in essence are investment vehicles independent of sponsor without strong funding capabilities. E.On has become a reputable offshore wind player and do not engage in project financing. COO Michael Lewis commented on the direction: *"It is more efficient to take debt from our balance sheet than it is to do project finance. It is also a ratings issue for us. If we finance an offshore wind farm and initially remain the majority shareholder, which we intend to do, the ratings agencies will treat the project finance as if it is E.ON's debt"* (Van Linden, 2013). Dong Energy and EDPR can be considered the closest peers of Statoil NES and use quite different financing strategies. EDPR have transitioned to project finance and rely heavily on operating cash flows, in line with the pecking order theory. However, they have access to cheap financing through major shareholder EDP. Dong fully relies on centralized funding, effectively taking on risk rather than paying a potential lender a premium for providing capital (Interview, Dong Investor Relations 2017). Still, it does not imply lack of innovation in structuring of the project and financing. The company are considered to be the frontrunner in structuring projects to suit institutional investors and mitigate risk, partly by retaining construction risk. It has more than 150 subsidiaries, therefore, concentration of funding through a strong parent rating affords scale and cost efficient financing. In addition to targeting a BBB+ credit, which it is expected to overshoot in few years, the authors observe noteworthy issuances of hybrid bonds. Hybrid bonds are tax deductible quasi capital, supportive to credit ratings, non-dilutive for shareholders and lowers cost of debt relative to proportional amounts of debt and equity. It however comes at a cost, as it is only senior to common equity (Dong Annual Report, 2016).

7.2.2 THEORETICAL AND PRACTICAL CONSIDERATIONS IN FINANCING STRATEGY DECISIONS

Naturally, there are vast amounts of factors affecting financing decisions, both internal and external. One of the most obvious is the return on investment, which depends on the difference between project IRR and cost of capital. In corporate finance the cost of capital describes the weighted required return on debt and equity determined by the market. Thus, rather than taking into account project characteristics, the WACC accounts for the combination of the entire business of the corporate sponsor and is therefore a limited approach in determining projects (Levitt et al. 2011). Project finance use debt and equity from banks that invest on assumptions that applies exclusively for a specific project. These deals therefore provide the best insight into project economics and cost of capital. Due to high gearing in projects, cheap financing is therefore key to success. In project finance parlance debt rates are quoted in terms of the risk free rates and a premium (illustrated below). Due to record low interest rates, all in prices on project finance debt can be issued for less than 3%. Debt structures (ratio, maturity, covenants) has remained fairly consistent since 2007, so commercial negotiations are rarely about specific terms (Levitt et al, 2011). We deem below pricing as competitive with corporate funding rates observed in peer group, bearing in mind the non-recourse aspect. Note that the corporate cost of debt has legacy issues in the sense that it does not reflect the current fixed income environment (Iberdrola issued bonds at <1% recently).

Figure 7.2.4: Offshore Wind Project Finance - Project Leverage (D/E) and Pricing



Source: Green Giraffe 2017/Own Contribution

Maximum underwriting USDm	30-50	50-75	50-75	30-50	100-150	200-300	100-200

Detailed cost of debt analysis requires further market data and comparison of specific terms and is beyond the scope of this thesis. Understanding the trends in terms and the implication of this nevertheless deemed valuable. Offshore debt rates tend to be higher due to higher perceived risk. Market data on project leverage propose a 65:35 D/E ratio in 2011 and a 75:25 ratio in 2016, while

Levitt et al. argues onshore debt to be in the range of 70-80% and offshore 65-80%. Data from Bloomberg New Energy Finance triangulated the findings. They argue that for onshore wind and solar, non-recourse debt constitutes 75%-80% of total installation cost, while in offshore wind and biomass the range is 65%-70%. The residual is covered by equity (BNEF, 2017). Sponsors seek to add as much debt as possible without incurring significant costs of financial distress (Levitt et al, 2011). This represents a finding that aligns with classical theory described earlier. Finally, the results confirm trends in peer group, yet the authors put most emphasize in secondary data from BNEF, Green Giraffe and Levitt et al. due to the size of the sample.

The following sequence seeks to discuss other considerations in applying project finance. A common argument for avoiding project finance structures builds on the Pecking Order Theory and regards the fact that it is generally costlier because security is based on cash flows of the project alone. For it to be rational, the structure must entail larger benefits than the incremental transaction cost and opportunity cost inherit in time. However, costs have declined rapidly and research shows that the risk reduction benefits, often exceeds its costs (Olmsted, 1995). Further, Nevitt and Fabozzi (2000) claim that the structure can be used to improve return on capital, as it allows higher leverage than what is possible through corporate financing. Moving onto signalling effects, while acquisitions tend to provide negative returns for acquirers, announcements of increase in capital expenditure tend to yield positive returns. While acquisitions may signal empire building (negative effect), the decision to use project finance may signal a move away from traditional financing methods and an attempt to reduce financing costs (Esty, 2011). Alternatively, project finance may be viewed as a decision not affecting firm value but lowers value destroying agency conflicts. As projects are capital intensive, decisions are likely to be deliberate and the external capital raised provides a safety net, as banks would not finance a negative NPV project. Convincing bankers with limited upside exposure to finance up to 90% of capital requires well-funded analysis. This is why returns to firms increase proportionally to amount provided by bank debt in announcements of cash tender offers (Bharadwaj and Shivdasani, 2003). A common corporate finance fallacy is agency conflicts leading to overinvestments i.e. investments in negative NPV projects. Project finance may also mitigate effects of leverage and incremental distress costs, which are important sources for underinvestment in positive NPV projects. This is because it allocates project returns to new capital providers in a way that corporate debt cannot replicate. Building on the mentioned agency cost improvement, the governance structure of project companies in many ways resembles leveraged buyouts and achieves several of the same attributes (Jensen 1989, and Kaplan (1989 and 1991). While empirical theories emphasize the advantages of project finance, the structure is costly, requires time and effort in structuring of contracts and may not be optimal for all companies.

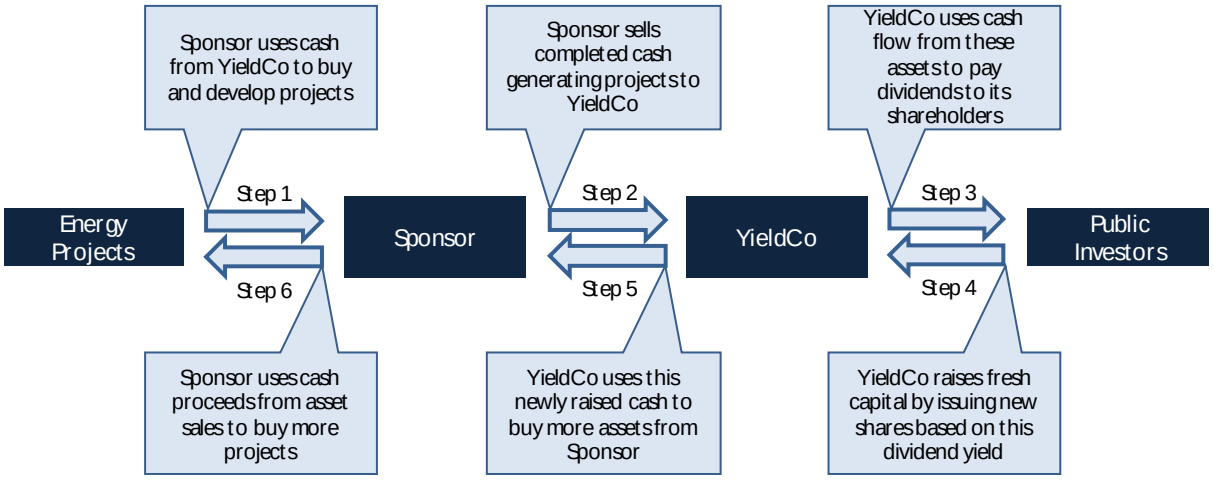
A more practical issue emphasized by COO of E.ON is the negative view of rating agencies on non-recourse debt. Agencies assume utilities will not abandon a strategic project, which in practice makes the non-recourse debt, recourse. Rather than being assessed as a solely positive trait, PPAs are considered providing utilities with a long term liability by rating agencies (Green Giraffe, 2017). Thus, project finance may hurt corporate credit ratings and alter capital market access.

The analysis provided arguments that capital structure and financing decisions do matter in the renewable and offshore wind space. Secondly, financing decision is not necessarily a question of preference, but rather a well-funded cost benefit analysis. While balance sheet financing still is cheapest, it is not for everyone. Equivalently, all developers cannot justify project finance, especially if they are operating in risky markets or the business model is less diversified. As hypothesised, the authors struggle to see evidence on universal rules to determine financing structures. Learning effects reduces risk perception, reducing cost of capital, which is crucial because of the industry wide IRR compression.

7.3 YIELDCOS - IT TENDS TO WORK, UNTIL IT DOESN'T

The demand, the traits and the objectives of the YieldCo structure was shortly described in section 2.3. The analysis touched upon the mechanics and the problems that arose from aggressive dividend growth expectations. The way capital was raised and projects were financed predicated on continuing growth. It worked when stock prices were high and interest rates were low. YieldCos were able to achieve dividend growth by issuing new equity at successively higher rates to produce more capital per share to invest. More capital per share allowed for dividend growth and increase in share price. Each link in the vicious cycle was dependent on the last. When share prices fell, so did the access to cheap capital (Maloney, 2016).

Figure: 7.3.1: The YieldCo Model Explained



Source: Own Contribution

NRG Yield, the first US-based YieldCo, saw its share price more than double from its IPO in 2013 to a peak in January 2015. Meanwhile, several of its peers experienced share price increase of more than 50%. TerraForm Power, TerraForm Global, NRG Yield, AtlanticaYield, Pattern Energy and NextEra Energy partners were among the US YieldCos raising $4.8 billion in the first seven months of 2015. European equivalents raised another $1.4 billion the same year. As more and more Yieldcos drained the market for capital, it became evident that investor appetite was waning. A sudden reassessment by investors of whether YieldCos would meet their growth targets and were truly growth stocks, caused the US YieldCo model to subdue tougher examination from July 2015 and onwards. This was further ignited by the stark sell-off in the related energy market for Master Limited Partnerships. The conditions worsened when sponsor SunEdison announced that they would acquire rooftop solar developer Vivint Solar using $798 million from TerraForm Power as part of the funding. The deal never went through, but it distorted the perception of the YieldCo structure as being an independent entity from the sponsor. Consequently, the market saw a sharp decline in YieldCo share prices across the board in the third quarter of 2015, which reduced the fundraising to less than $300 million the remaining five months of the year. TerraForm Power that was floated in 2014, had earlier peaked at close to $43 per share, but ended 2015 trading below $13 per share. TerraForm Global, another SunEdison-based YieldCo had its IPO in 2015 with a flotation price of $15 per share, though ending the year below $6. UK YieldCos, often referred to as quoted project funds did not suffer nearly as much as the US equivalents. Greencoat UK Wind, the front-runner of UK-based YieldCos saw its share decline 4% in 2015. The spain-based YieldCo Saeta Yield landed in between its UK and US peers, ending the year with an 18% decline from its IPO price (BNEF, 2016).

7.3.1 THE FALL OF SUNEDISON AND THE SQUANDERING OF YIELDCOS

Many investors blame SunEdison as the main driver for the bubble that burst in the YieldCo market. While other YieldCos contributed with timber, SunEdison ultimately provided the spark that caught fire. To understand the sentiment, the fall of SunEdison must be explained. The firm that was once the largest renewable energy developer, filed for bankruptcy in 2016, bringing an end to its ambitious and debt-fueled bid to become a "superpower" in solar and wind energy (Crooks, 2016). The downfall began as the company started a buying frenzy, scooping up assets on every continent except Antarctica, compiling a total $11.7 billion in debt by September 2015 (Ryan & Eckhouse, 2016). The pace of acquisitions rose sharply in 2015 and former employers told "SunEdison went bonkers on the acquisition front", "There was no management around the table to say this does or doesn't make sense financially" and "No one ever touched the brakes. God forbid you hit the brakes." (Feld, 2016). It

peaked with the planned $2.2 billion acquisition of Vivint Solar in July. The deal was priced at a 40% premium to current market capitalization and was questioned from the start.

TerraForm Power and TerraForm Global was diligently used as sources of financing, assisting the rapid growth of their sponsor. Among the joint acquisitions, SunEdison and TerraForm Power bought US wind developer First Wind for $2.4 billion in Janaury 2015 (Ola, 2016). But they did not stop there and continued issuing new shares and raising the share price of TerraForm Power to abide further growth. A major concern became that in contrast to other YieldCos, TerraForm Power and TerraForm Global were heavily influenced by their sponsor. YieldCos should in theory comprise an independent board of directors that seeks to maximize shareholder value i.e. both for the sponsor as well as common shareholders. However, due to the strong influence on its YieldCos, SunEdison could drop-down their assets to just about any price. They were not concerned about overpaying for assets because they knew that their YieldCos or "captive buyer" would be ready with cash in hand to buy the assets at a premium. As for SunEdison, the management incentives were to maximize shareholder value, because like many firms, compensation is stock performance based. However, their bonuses also hinged on two measures, profitability and megawatt completed. Both categories incentivized growth, while the value per share was irrelevant. The incentive scheme was completely ludicrous (Huber, 2016). In October 2015, a lawsuit was filed pertaining securities fraud against TerraForm Global and a handful investors. A month later, both CEOs in the respective YieldCos resigned together with an additional three board members. Still, in December 2015, billionaire hedge-fund manager David Tepper publicly warned investors that recent leadership changes at TerraForm Power would benefit its parent company more than its investor (Ola, 2016). TerraForm Global later sued SunEdison for breach of contract alleging that SunEdison misappropriated $231 million of TerraForm's cash (Hals & Groom, 2016).

7.3.2 WHAT DOES THE FUTURE HOLD?

To put matters in perspective, YieldCos worldwide raised a total of $7.3 billion in 2015, but only $1.9 billion last year. The turmoil surrounding SunEdison and its YieldCos dampered the investing climate and investors worried that the bankruptcy would pull TerraForm Power and TerraForm Global into the sinkhole. As of today, both YieldCos are still operating and share prices have traded at steady levels since the beginning of last year.

The YieldCo debacle made for interesting headlines. Former NRG CEO David Crane proclaimed that the YieldCos are broken, but may be fixable. He said, "There's plenty of opportunity, it's just that those companies are all financially stretched right now" (English, 2016). Alongside other investors, he suggested that YieldCos should be doing some time in private hands. At current levels, YieldCos are trading much more reasonably compared to a year and a half ago, hence they could bode as attractive

investment opportunities for private equity. However, this contradicts the entire idea surrounding the YieldCo model. The use of public markets is cheaper compared to private equity and with a proper business model, this could still bode as an attractive investment model. SunEdison pushed to YieldCo model over the brink as it became unsustainable. Nevertheless, the underlying idea is still an effective way of financing renewable energy and increases the investor pool for renewable energy investments. The key is to manage the investors' expectations. Keeping dividend growth targets at moderate levels and maintaining independency from the parent company supports a sustainable model that could slowly grow and eventually become a substantial contributor in the renewable energy industry. To gain independence, an infrastructure fund or similar could take a controlling interest in the YieldCo. In that way the YieldCo would purchase assets from several sponsors, limiting the risk of being overrun or overpaying for assets.

A disadvantage with the YieldCo model is the dependency on continuous low interest rates. The entire idea came to fruition because of a market deprived of fixed-income instruments with reasonable levels of returns. The US Federal Reserve has raised interest only four times since the financial crisis, but the last three were in December 2016 and March and June 2017 (Fleming, 2017). While the European Central Bank is lagging behind, the American economy is showing signs of a stronger labor market and increase in economic activity indicating the US fixed-income market as a more attractive investment case in coming years (Gensler, 2017). Increasing interest rates will not only increase the cost of equity and debt for YieldCos, it will drive yield-seeking investors to other markets. Especially considering that YieldCos have shown to comprise more risk than what was initially predicted.

While YieldCos primarily compete with the fixed-income market, they were also meant to source capital cheaper than the typical corporation structure. NRG Yield made a case for this assumption when they acquired Alta Wind facility, a 947 MW wind farm, with a significantly lower cost of capital than its parent company NRG. Theoretically, if the two companies were to acquire the same project, the company with the highest equity valuation would gain the lowest cost of equity. In this instance, equity value refers to the share price value. This entail that the firm with the higher share price would issue fewer shares, thus reducing the dilutions of dividends per share. Since the IPO of NRG Yield to the acquisition of Alta Wind in summer 2014, the share price had risen almost 100%. In the same time-span, the NRG stock had not risen nearly as much. NRG Yield was at the time of the acquisition trading at 2x equity value over EBITDA, compared to its parent company. Consequently, NRG Yield enjoyed a lower cost of equity than its sponsor and issued a stock offering for net proceeds of $630 million, whereas $442 million were put aside for the wind project. Furthermore, NRG Yield issued a $500 million in senior unsecured notes due in 2024 with a coupon rate of 5.375%. NRG had three months earlier issued a similar bond with a size if $1 billion and a coupon rate of 6,25%. In the

timespan of the issuances the 10-year treasury bond fell approximately 24 basis points, effectively pricing the NRG Yield bond issue 0,635% lower. Nonetheless, this particular transaction happened long before the correction in the YieldCo market, at a time where investors were flocking for NRG Yield shares (Reynolds, 2015). It is unlikely that YieldCos possess the equally low cost of capital in today's market.

7.4 OIL MAJORS ENTERING THE SPACE

A sub-objective of this thesis is to map renewable activity among oil majors in the peer group. Temperature in recent offshore tender auctions is rising and several utilities and oil companies has caught interest of the renewable energy space. Market intelligence propose that the recent zero subsidy bid by Dong Energy for 240MW OWP West and 240MW Borkum Riffgrund West 2 in Germany can be recognized as a pre-emptive move, displaying experience, relationships in the supply chain and scale. Despite rapid cost deflation, oil majors are sniffing around for opportunities.

There are obvious synergies, scale and learning effects in construction and offshore competency in oil majors. The companies are asset heavy with strong balance sheets that suit infrastructure and similar investments. According to a 2013 survey, oil majors have capacity to invest through balance sheet funding using joint ventures with cost of capital in the range of 10-15%. Research by authors suggest that this number can be adjusted down significantly in light of learning effects, interest rate declines and maturity of the renewable space. Company balance sheet constraints since 2008 may have a cooling effect on investing activities as renewable projects compete with alternative investment opportunities (EWEA, 2013). However, balance sheet strength of oil majors is subject to no discussion. For example, Exxon is three times larger than the top 10 renewable companies combined by market capitalization.

In 2015, oil majors invested 0% to 1.5% of total CAPEX in renewable energy, primarily in solar and wind. In 2016, there have been substantial positioning initiatives, with investments expected to increase towards 2020. Research suggests varying interest in renewables and positioning within the sector. Oil majors seem to have divergent opinions of positioning within renewables, both with regards to the value chain and to the energy source. Most companies have been in (and out) of solar and wind, while also investing in geothermal. Companies like Statoil, Total and Eni expect to increase investments and emphasize the competitiveness as a prerequisite in investment decisions. Further, several majors point out the importance of synergies with core activity and competency as well as the diversification effects. A general overview is provided on the next page.

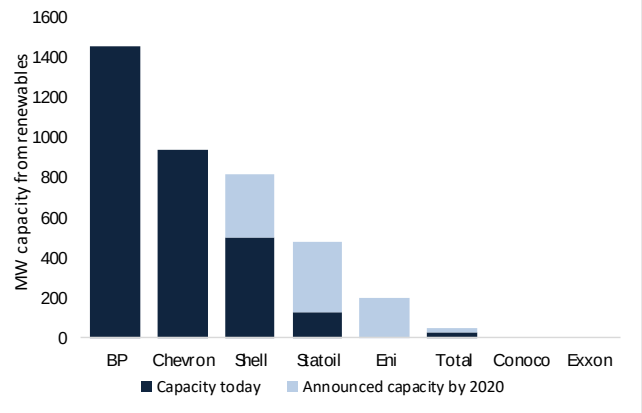
Figure: 7.4.1: Renewable Initiatives Among Oil Majors

	Statoil	Shell	BP	Total	Eni	Chevron	ExxonMobil	ConocoPhillips
Renewable energy focus	Offshore Wind	Onshore/offshore wind and solar	Onshore wind power	Solar power	Solar power	Geothermal energy	Limited focus	Limited focus. Some technology interest
Renewable CAPEX 2015 and alternatively, guidance (USDm)	200. To be increased	200. Expected 1000 annually by end of decade	N/A. Guides re-investment in current portfolio	350	183	N/A	0	0
Renewable CAPEX as share of total, 2015	1,29%	0,77%	N/A	1,39%	1,46%	N/A	0	0
Owned capacity (MW, on equity basis)	129 (pipeline to come into operation 2017 onwards)	500	1452 (1588 in 2015)	34	0	928	0	0

Source: Annual reports, press releases, Swedbank/Own Contribution

Perception of financial attractiveness of renewables varies. According to market intelligence, the management of Total neither understand, nor believe in the viability of the offshore wind positioning of Statoil. A more existential and extreme opinion belongs to US Secretary of State and former CEO of Exxon, Rex Tillerson. In the 2015 annual meeting of Exxon he commented on the positioning towards renewable energy: "We choose not to lose money on purpose" (Swedbank E&P majors in renewables 2016).

Figure: 7.4.2 Renewable capacity among Oil Majors (MW based on equity shares)



Source: Annual reports, press releases, Swedbank/Own Contribution

Analysing specific company efforts, BP stands out as the first mover with public change of position in 1997 and 13 US onshore wind farms, totalling 1452 MW. In 2005 they set out to invest $8 billion by 2015, but no new targets have been set. However, they tried to divest their wind assets to fund the liabilities that rose in the wake of the 2010 oil spills, Macondo, but did not receive "appropriate bids" (BP scraps sale, Reuters). BP however guides re-investments in current portfolio and building a venture arm (BP Annual Report 2016). Chevron early established itself as the world leader in geothermal production, but in 2016 sold off all assets in Indonesia and the Philippines. They seek to raise $5-10bn the next years through divestments of remaining assets. Statoil established New Energy Solutions in 2015 and are with a growing project pipeline becoming a significant player in the offshore wind market. They are currently exploring opportunities in solar and may spend 15-20% of total CAPEX on renewables within 2030. ENI has taken an alternative research focused approach, cooperating with universities for many years, exploring solar power. They set up a new division, Energy Solutions in 2015 and expect to increase investments significantly with projects

announced in Italy, Pakistan and Egypt. In 2017, they also entered into an agreement with GE to develop renewable projects together. This is a result of a stated view of structural headwinds in oil and gas on the back of cheaper electricity from coal and renewables. Shell invested $1.7 Billion in the new division New Energies in 2016, which seeks opportunities in new fuels for transport and integrated energy solutions (wind and solar, partnered with gas to mitigate intermittency of renewables). They currently have 400 MW US wind power, and is part of a consortium that recently won the auction on the 700 MW wind power project Borssele III/IV at a power price of EUR54.50/MWh (WindPower Monthly, 12/16). They expect renewable CAPEX of $1bn by the end of the decade. Shell will focus on areas that share traits with core activities, as they believe to have a competitive advantage compared to renewable pure players. Total has an ambition of becoming a global leader in solar power and increase renewables share of portfolio to 15-20% by 2035. The PV solar power portfolio will be tripled over the next five years. Similar to ENI, they consider the investments as a long term hedge to demand risk of fossil fuels. While establishing a presence throughout the solar value chain, from PV to storage solutions, Total is open to most technologies except nuclear, which they categorically excludes (Swedbank E&P majors in renewables 2016). Exxon and Conoco have no material interests in renewables due to a perception of lack of financial attractiveness relative to core activity.

As discussed, there are varying strategies towards renewable energies, with only two companies not interested in the sector. The authors believe oil majors share characteristics that can be successfully utilized in large scale renewable development. However, the authors deem current efforts for some to be politically motivated, while others are targeting renewables as a fully competitive portfolio alternative. The arguments against converting oil majors into renewable companies are obvious and understandable. Different businesses have different requirements and being good at one thing does not necessarily make them excel at other areas. BP was the largest solar panel manufacturer for a decade and Shell had an adventure into coal, both divested with loss. Secondly, the specific knowledge, equipment and experience required in renewables are not perfectly substitutable with those of oil and gas. This too builds on the argument that oil majors do not have the skills to become a renewable corporation (Worstall, Forbes 2016). On the other hand, very few companies knew how to build large scale wind just a couple years ago, so why should not oil majors be able to learn and adapt?

8. DISCUSSION

Based on the entirety of the analysis, the authors will discuss some ideas that Statoil NES could pursue. However, firstly, some considerations regarding the business unit are presented. Statoil NES has a solid track record and extensive offshore experience based on employee's former experience both within oil

E&P and the renewable energy sector. The business unit has a long term core team with a low employee turnover rate. Statoil NES is generally positive towards partnerships as seen from former deals and their strategy. Shown throughout the analysis, cooperation and joint ventures is often risk mitigating and value enhancing for renewable energy projects. The business unit is currently financing projects off the strong balance sheet of Statoil. This provides the projects with low financing costs and financial flexibility. Tapping of the resources of Statoil as a whole, Statoil NES has a large network in the supply chain, especially offshore, which could grant them a competitive advantage within offshore wind projects. Furthermore, Statoil NES has shown investment decisions on the back of true competition for internal capital, which has been positively received by investors. Lastly, the renewable energy industry is a huge and growing market that is ready to be tapped. The importance of being among the first large companies investing in this market cannot be understated.

As seen from the corporate finance analysis, companies such as DONG and EDPR are applying innovative business models to enhance the value of projects and project IRR. Statoil NES could learn from established players with regard to business models such consistent farm downs and capital recycling. Albeit the fact that Statoil NES is financing off the equity of Statoil, they could also look at how different players are applying financial innovation and capital structures to boost returns and reduce company risk. At the same time, the long term strategy of Statoil NES is essential in determining the corporate structure and should align with how they finance projects. Statoil ASA is often evaluated through a sum-of-the-parts valuation and the consensus among interviewed equity analysts is that NES is likely valued at zero or yields at a discount. At this moment, Statoil NES is garnering vast media coverage and attention in Norway, however, the lack of financial disclosure is limiting the impact of the business unit from an investor's perspective. In order to grow the business unit and its financial impact on Statoil ASA, the firm could consider disclosing financial information to increase transparency and modeling opportunities. The potential to display values for shareholders could enhance the value of Statoil, but it could also hamper development as investors by default are short term focused. Furthermore, many believe that Statoil NES is a political venture that is mainly created in order to gain political goodwill. The authors chose not to analyze the impact of green investments from a social welfare perspective. At the same time, the impact of corporate social responsibility is significant in today's society. Lastly, the analysis has to a large degree included YieldCos, however, the future of the YieldCo model is still uncertain. Due to limitations and lack of market data, the authors cannot suggest any explicit recommendations. Still, the YieldCo model could be an interesting idea to pursue, as it would crystallize values and increase the information and attention towards the renewable energy assets of Statoil ASA. At the same time, the lack of a substantial project pipeline for drop downs and consistent co-investors could garner problems.

9. CONSIDERATIONS AND PERSPECTIVES

Seen throughout the entire thesis, this research paper touches upon several subjects and seeks to analyse and dissect large amounts of data and information with limited space. Because the thesis covers so many areas within finance, several approaches could have been used to examine the collected data. The authors could have chosen to exclusively analyse financial statements, or market data or simply corporate finance considerations. Due to lack in financial data, the analysis was not able to extract a fully comprehensive capital allocation policy analysis. However, given full financial access, the analysis could have looked at the sources and uses of funds analysis more deeply. The analysis could also have looked at more market data and to a larger degree examined how investors perceive renewable energy investments by focusing f.ex on the investment community . A more comprehensive market data analysis could have been complemented by an analysis that seeks to determine the impact of sustainable investments from a social welfare and CSR perspective. Ultimately, the goal could be to uncover whether renewable energy vehicles trades at a premium due to its impact and implications for the climate.

Another interesting consideration is the sample of firms applied in the analysis. Including renewable corporations, oil and gas and YieldCos gave the analysis a sample that could compare firms across industries. However, it can be made a case that the oil and gas companies should have been given less focus or that the YieldCo industry is still too immature to bolster justifiable results. Arguably the biggest concern is that the renewable corporation sample consists of firms with fairly different business operations. This could have been done differently be simply looking at pure-players. However, most pure-players are smaller companies and not especially relatable to Statoil and Statoil NES. To truly analyse the profitability of renewable energy projects, one could have selected certain offshore wind projects and analysed the project economics in detail.

Lastly and arguably one of the most interesting optional approaches would be to exclusively analyse the corporate finance considerations that was tackled in section 7. While much information was analysed and brought forward, more information was still left untouched. This would certainly give the analysis a more qualitative approach, where deep diving into annual reports and investor presentations would have been the primary source of information. Under such a scenario, it probably would have made sense to focus more exclusively on IPPs and pure-players.

10. CONCLUSION

This thesis has analysed the renewable energy sector in collaboration with Statoil ASA and with an extra attention towards how Statoil NES should approach the renewable energy sector going forward. The thesis initially presents the wind- and solar energy industry, which are continuously growing and demanding investor and media attention. Thereafter, the paper briefly submits the theoretical foundation for the thesis as well as introducing the YieldCo model. The next section examines the financial statement analysis. The lack of pure-players within renewable corporations slightly distorts certain financial metrics. The analysis finds that the gross margins reflect the underlying nature of the business operations and there is noticed a high gross margins among renewable pure plays and YieldCos. Profit margins are largely affected by commodity prices, especially for oil and gas, and restructuring and divestments, which are significantly impacting the renewable corporations as they transition from fossil or utility to renewable energy. The analysis also finds that the leverage is consistently higher among IPPs and pure-players compared to the remaining firms in the renewable corporation peer group. YieldCos also apply high leverage while oil and gas companies are relatively more equity-financed. The next section looks at market data and multiples analysis. The analysis show a strong correlation between oil and gas multiples and the development in the Brent oil price. As for YieldCos, the authors find the sector to have fairly stable multiples on an industry-wide level. Furthermore, YieldCos and pure plays seem to trade at a premium compared to remaining renewable corporations. Lastly, the lack of financial data on pure-players also limits the value of the multiple analyses to some extent. The next section seeks to analyse the corporate finance elements with a more qualitative approach. The analysis finds that there is potential for higher returns in early-involvement investments but it also requires significant experience and operational track record. The analysis shows that Dong Energy and EDPR is able to enhance the return on investments by applying capital recycling through farm downs. The authors also find that project financing is becoming more frequently used in renewable energy investments. However, the analysis shows that choice of financing is a result of company specifics rather than a generic rule of thumb. While the cost of project financing has decreased in recent years, there is still no clear consensus as to what is desirable. Additionally, the analysis shortly discusses the future for YieldCos. The YieldCo model could potentially crystallize values for Statoil NES and bolster growth for the business unit. Nonetheless, the YieldCo market is facing on-going challenges and it is outside the scope of this research paper to give a clear recommendation of whether the YieldCo model is favourable for Statoil NES.

LITTERATURE

ARTICLES & ACADEMIC BOOKS

Penman, S. H., (2013), "Financial Statement Analysis and Security Valuation"

Damodaran (2012), "Investment Valuation"

Fernandez, P., (2002), "Valuation Methods and Shareholder Value Creation"

Petersen & Plenborg (2012), Financial Statement Analysis, Person

Bharadwaj, A., and A. Shivdasani, 2003, Valuation effects of bank financing in acquisitions, Journal of Financial Economics 67, 113-148.

Nevitt, P.K., and F.J. Fabozzi, 2000, Project Financing, 7th edition, Euromoney Books (London, U.K.).

Jensen, M.C., 1989, Eclipse of the Public Corporation, Harvard Business Review, September-October, 61-74.

Kaplan, S.N., 1991, The staying power of leveraged buyouts, Journal of Financial Economics 29, 287-313.

Saunders, Mark & Lewis, Philip & Thornhill, Adrian (2012) Research Methods for Business Students; sixth edition';Pearson Education Limited, Edinburgh Gate, Harlow; Essex CM20 2JE

Oil & Gas (2013) understanding debt markets: E&P funding options remains robust, Societe Generale

UBS Warburg (2001) Valuation Multiples: A Primer

Hull. Robert (1999) Leverage ratios, Industry Norms, and Stock Price Reaction: An Empirical Investigation of Stock-for-Debt Transactions

Talberg. Magnus, Winge. Christian et.al (2008) Capital Structure Across Industries

Sharma. Rachit, Nguyen. Thanh et.al. (2013) Economic and Financial Evaluation of the Dudgeon Offshore Wind Project in the UK

Green Giraffe (2015) Equity for near- and off- shore wind, Kromann Reumert event, Copenhagen

Esty. Benjamin (2002) An Overview of Project Finance

Esty. Benjamin (2003) The Economic Motivations for Using Project Finance

Esty. Benjamin (2004) Why study large projects? An introduction to research on Project Finance, European Financial Management

Prassler. Thomas, Schaechtele. Jan (2012) Comparison of the financial attractiveness among prospective offshore wind parks in selected European countries

Barclay & Smith (1999) The Capital Structure Puzzle, Another Look at the Evidence

Pikiel. M, 2015 Alternative Financing in Infrastructure – The Rise of the New Infrastructure Investor

Bjerg, Ole (2006): De sociologiske metoders epistemologi

Foley. Aoife, Higgins. Paraic (2014) The evolution of offshore wind power in the United Kingdom

Weaver. Tyson (2012) Financial Apprasial of operational offshore wind energy projects, Elsevier

Zhong.Jin, Lee. Cheuk (2014) Financing and risk management of renewable energy projects with a hybrid bond

Fabozzi. Frank, Nevitt. Peter (2000) Project Finance 7th edition

Broome. Greg et.al. (2010) Project Finance primer for renewable energy and clean tech projects

Comer. Bruce (1996) Project Finance Teaching Note, The Wharton School

Gatti. Stefano (2008) Project Finance in Theory and Practice, Academic Press

Guba. Egon (1990) The Paradigm Dialogue

Brealey. Richard (1996) Using Project Finance to Fund Infrastructure Investments, Journal of Corporate Finance, Morgan Stanley

Nelson. David et.al (2016) Beyond YieldCos, Climate Policy Initiative

Latham & Watkins LLP (2014) Comparison of typical MLP and YieldCo Structures

Marathon Capital (2015) The Future of the YieldCo

Sherman & Sterling (2015) Low cost equity gets differing solutions

Rosenbaum. Joshua, Pearl. Joshua (2009) Investment Banking, Wiley Finance

Mitreva. Eliza, Gerogiec. Biser (2015) Determinants of Capital Structure – Evidence from the Global Renewable Energy Sector

Ricciardi. Luis (2016) Understanding Capital Structures for Companies in the Renewable Energy Market

Nevitt. Peter, Fabozzi. Frank (2000) Project Financing, seventh edition.

Berk & DeMarzo (2014), Corporate Finance, Pearson

Corporate Finance Explained, (2017), Investopedia.com

Koller, Goedhart et al, (2010) Valuation: Measuring and Managing the Value of Companies, McKinsey & Company

REPORTS

Financing and Investment Trends (2017) Wind Europe, windeurope.org

IRENA (2013) Renewable energy auctions in developing countries

Global Capital Finance (2015) The European Renewable Investor Landscape

EY (2011-2016) Renewable energy country attractiveness indices (Issue 30, 47 and 48)

EY (2015) the YieldCo structure, Unlocking the value in power generation assets

Wynant. Larry (1980) Essential elements of project financing, Harvard Business Review

REN (2017), Renewables Global Futures Report, Renewable Energy Policy Network for the 21st century

BNEF (2017), Global Trends in Renewable in Renewable Energy Investment 2017, Bloomberg New Energy Finance.

Christensen et al (2014), Establishing the investment case – Wind Power, Deloitte
Northland Power Inc. Annual Report 2016

Engie Investor Presentation 2017 Presentation

Statoil Capital Markets Day 2017 Presentation

Deloitte- Establishing the wind investment case, 2014

AWEA, Economics of Wind

SEB Initiating Coverage Dong Energy 2016

IEA, World Energy Outlook 2016

Global Wind Report (2015), Global Wind Energy Council (GWEC)

Filling the offshore wind financing gap (2010), PWC

Global Trends in Renewable Energy Investments 2016, Bloomberg New Energy Finance (BNEF)

Interview with Rasmus Hærvig, Dong Energy Investor Relations

Green Giraffe, numerous presentations, Retrieved 01.05.2017-15.05.2017

NextEra Energy Partners Annual Report 2016

Levitt. Andrew, Kempton. Willett et.al. (2011) Pricing Offshore Wind Power

Where´s the money coming from? (2013) European Wind Energy Association

Solar primer (2011), National Climate Change Secretariat and National Research Foundation

Annual Report, Statoil 2016

Capital Markets Day E.ON 2016

Baringa Analysis for Scottish Renewables, April 2017

BNEF (2016) Global trends in Renewable Energy Investments

World Energy Outlook 2016, International Energy Agency (IEA)

Darkest Before Dawn (2012), McKinsey & Company

E.ON Roadshow Presentation 2017

EY (2014) Funding Challenges in the oil and gas sector

Abengoa Investor presentation 2017

Swedbank (2016) E&P majors in renewables

REN (2017), Renewables Global Futures Report, Renewable Energy Policy Network for the 21st century

BNEF (2017), Global Trends in Renewable in Renewable Energy Investment 2017, Bloomberg New Energy Finance.

INTERNET SOURCES

ConocoPhillips History, retrieved: 20.04.2017 18:15:
http://www.conocophillips.com/who-we-are/our-legacy/history/Pages/2009-1990.aspx

Impairment Hegnar, retrieved 21.04.2017 10:50:
http://www.hegnar.no/Nyheter/Boers-finans/2017/02/Har-tatt-nedskrivninger-for-130-milliarder

E.ON Roadshow Presentation 04.2017

NRG Yield Fourth Quarter 2016 Financial Results:
http://investor.nrgyield.com/phoenix.zhtml?c=251846&p=irol-newsArticle&ID=2250029

Crooks Ed (2016), Oil and gas: Debt fears flare up, The Financial Times, retrieved 18.01 27.04.2017:
https://www.ft.com/content/d48b1922-eadd-11e5-bb79-2303682345c8

Dahl, Carl A. (2015), Statoil tviholder på milliardutbytte, Aftenposten, retrieved: 18:12 27.04.2017: http://www.aftenposten.no/okonomi/Statoil-tviholder-pa-milliardutbytte-40678b.html

Maverick J.B. (2015), What debt/equity ratio is typical for companies in the utilities sector?, Investopedia, retrieved 02.05.2017 20:17: http://www.investopedia.com/ask/answers/070715/what-debtequity-ratio-typical-companies-utilities-sector.asp

Brewer, Reuben G. (2016), Why investors are paying a premium for Exxon Mobil Corporation, The Motley Fool, retrieved 10:54 07.05.2017: https://www.fool.com/investing/general/2016/05/24/why-investors-are-paying-a-premium-for-exxon-mobil.aspx

Pinsent Wayne (2017), Decoding DuPont Analysis, Investopedia, retrieved: 04.05.2017: http://www.investopedia.com/articles/fundamental-analysis/08/dupont-analysis.asp

DePersio (2016), Analyzing ConocoPhillips' Return on Equity, Investopedia, retrieved 05.05.2017: http://www.investopedia.com/articles/markets/031716/analyzing-conocophillips-return-equity-cop-xom.asp

SRR – Contingent Consideration, SRR, Retrieved: 12:52 06.05.2017: https://www.srr.com/article/contingent-consideration

Reynolds, Lang (2015), A peek into Yieldcos relative cost of capital: An analysis of a recent transaction, National Renewable Energy Laboratory, retrieved 13.05.2017: https://financere.nrel.gov/finance/content/peek-yieldco-s-relative-cost-capital-analysis-recent-transaction

Gensler, Lauren (2017), Fed hikes rate for the third time since financial crisis, sees more in 2017, Forbes, retrieved: 13.05.2017: https://www.forbes.com/sites/laurengensler/2017/03/15/federal-reserve-rate-hike-march-meeting/#605804384831

Maloney, Peter (2016), YieldCo problems: systemic or a speedbump?, Utilitydive, retrieved 12.05.2017: http://www.utilitydive.com/news/yieldco-problems-systemic-or-a-speed-bump/419190/

English, Charleton (2016), YieldCos are broken, but maybe Fixable, says formed NRG CEO, retrieved: 13.05.2017:

http://realmoney.thestreet.com/articles/04/07/2016/yieldcos-broken-maybe-fixable-says-former-nrg-ceo

Crooks, Ed (2016), SunEdinson's ambitions end in bankruptcy protection, Financial Times, retrieved: 12.05.2017
https://www.ft.com/content/fa27a3fa-07cd-11e6-b6d3-746f8e9cdd33

Ryan, Joe & Brian Eckhouse (2016), SunEdison may be the biggest renewable debacle with the least impact, retrieved 12.05.2017:
https://www.bloomberg.com/news/articles/2016-04-05/sunedison-may-be-biggest-renewable-collapse-with-least-impact

Feld, Olivia (2016), How SunEdison went from Wall Street star to bankruptcy, La Times, retrieved: 12.07.2017
http://www.latimes.com/business/la-fi-sunedison-collapse-20160504-story.html

Ola, Danielle (2016), The Rise and fall of SunEdison, PV-Tech, retrieved 12.05.2017
https://www.pv-tech.org/editors-blog/biggest-corporate-implosion-in-us-solar-history-the-rise-and-fall-of-sunedi

Huber, John (2016), Lessons from the Fall of SunEdison, Base Hit Investing, retrieved 12.05.2017:
http://basehitinvesting.com/lessons-from-the-fall-of-sunedison/

Hals, Tom & Nichola Groom, Solar Developer SunEdison in bankruptcy as aggressive growth plan unravels, retrieved: 12.05.2017:
http://www.reuters.com/article/us-sunedison-inc-bankruptcy-idUSKCN0XI1TC

Valley of Death Curve (2017), Investopedia, retrieved: 26.06.2017:
http://www.investopedia.com/terms/d/death-valley-curve.asp

Fleming, Sam (2017), Fed raises rates for second time in 2017, Financial Times, retrieved 29.06.2017:
https://www.ft.com/content/ad34bde6-5121-11e7-bfb8-997009366969?mhq5j=e1

Burgen, Stephen (2015), Spanish energy giant Abengoa's collapse predicted by 17-year-old, The Guardian, retrieved: 27.06.2017:

https://www.theguardian.com/business/2015/dec/14/spain-energy-giant-abengoa-collapse-predicted-by-17-year-old

Einowski. Edward, The Law of Wind – Project Finance for Wind Power Projects, Stoel Rives LLP

https://green-giraffe.eu/publications

Cambridge Cleantech (2013) Rising offshore wind costs to trigger new project finance structures

http://www.cambridgecleantech.org.uk/rising-offshore-wind-costs-to-trigger-new-project-finance-structures

Rummelhoff, Irene (2016), Pareto Power and Renewable Energy Conference presentation

https://www.statoil.com/content/dam/statoil/documents/ir/events-and-presentations/2016-01-Statoil-Pareto-Power-and-Renewable-Energy-conf-Irene-Rummellhoff.pdf

Climate Home (2016), Statoil chief – rise of electric cars will shrink oil industry, Retrieved 04.04.2017

http://www.climatechangenews.com/2016/10/19/statoil-chief-rise-of-electric-cars-will-shrink-oil-industry/

Rummelhoff, Irene (2016), CSIS Presentation, retrieved 04.05.2017:

https://www.csis.org/events/statoil-new-energy-solutions-2016

Newcomer, Cara (2017) Maryland Could Host the Nation's Largest Offshore Wind Farm, U.S News, Retrieved 15.03.2017

https://www.usnews.com/news/best-states/maryland/articles/2017-04-26/maryland-could-host-the-nations-largest-offshore-wind-farm

Offshorewind.biz (2017), Dong explains the thinking behind the zero subsidy bids, retrieved 22.04.2017

http://www.offshorewind.biz/2017/04/14/dong-explains-the-thinking-behind-subsidy-free-bids/

Kaweske. J, (2015), An Energy Primer, Renewable Energy World, Retrieved 14.03.2017

http://www.renewableenergyworld.com/ugc/articles/2015/10/an-energy-primer.html

Energy Explained, EIA, Retrieved 14.03.2017

https://www.eia.gov/energyexplained/index.cfm?page=about_home

Steel. W, Phlebas (2017), A primer on wind, Retrieved 14.03.2017

https://phlebas.co/2014/10/06/a-primer-on-wind-power/

Wind in numbers, (2017) Global Wind Energy Council (GWEC), Retrieved 20.04.2017

http://www.gwec.net/global-figures/wind-in-numbers/

Weston. D (2016), Vattenfall Wins Kriegers Flak, WindPowerOffshore, Retrieved 13.04.2017

http://www.windpoweroffshore.com/article/1414947/vattenfall-wins-kriegers-flak-%E2%82%AC499-mwh-bid

Weston. D (2016), Netherlands plans subsidy free auctions, WindPowerOffshore Retrieved 13.04.2017

http://www.windpoweroffshore.com/article/1418377/netherlands-plans-subsidy-free-auctions-2026

Wilson. I (2016), Peak Renewable Energy Investment Seen Holding Back Climate Fight, Bloomberg Markets, Retrieved 14.04.2017

https://www.bloomberg.com/news/articles/2016-11-02/peak-renewable-energy-investment-seen-holding-back-climate-fight

Solar Investment Tax Credit (ITC), Solar Energy Industries Association

http://www.seia.org/policy/finance-tax/solar-investment-tax-credit

Going Concern, 2017, Investopedia

http://www.investopedia.com/terms/g/goingconcern.asp

Breakdown EPS growth, Business Insider 2015

http://www.businessinsider.com/breakdown-of-sp-500-eps-growth-2015-11?r=US&IR=T&IR=T

Damodaran, Aswath (2017) NYU Stern, Margin analysis overview, Retrieved 05.04.2017

http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/margin.html

Nedskrivninger (2017), Hegnar.no, Retrieved 20.03.2017,

http://www.hegnar.no/Nyheter/Boers-finans/2017/02/Har-tatt-nedskrivninger-for-130-milliarder

History (2017) ConocoPhillips, Retrieved 20.03.2017

http://www.conocophillips.com/who-we-are/our-legacy/history/Pages/2009-1990.aspx

Reuters (2013), Goldman Sachs invest in Dong, Retrieved 29.03.2017

http://www.reuters.com/article/us-dong-investors-idUSBRE9920L120131003

Izquierdo, Marco (2015), CEOs don't care enough about Capital Allocation, Harvard Business Review, Retrieved 29.04.2017

https://hbr.org/2015/04/ceos-dont-care-enough-about-capital-allocation

Tang, K (2016), Buybacks, dividends, capex and long-term value creation, Retrieved 27.04.2017

https://www.indexologyblog.com/2016/04/22/buybacks-dividends-capex-and-long-term-value-creation/

Worstall, Tim (2016), The very Odd Idea, Forbes, retrieved: 12.05.2017

https://www.forbes.com/sites/timworstall/2016/03/28/the-very-odd-idea-that-exxon-should-become-a-renewable-energy-company/#76cfe7e77abf

Reuters (2013), BP scraps sale of U.S wind farm business, Retrieved 10.05.2017

http://www.reuters.com/article/bp-results-wind-idUSL6N0G028J20130730

WindPower Monthly 12/16, (2017), Shell Consortium wind borssele III/IV, Retrieved 11.05.2017

http://www.windpowermonthly.com/article/1418517/shell-consortium-wins-borssele-iii-iv-%E2%82%AC5450-mwh

APPENDIX

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APPENDIX 1: ADJUSTED BALANCE STATEMENT

APPENDIX 1.1: ADJUSTED BALANCE SHEET – EXXON MOBILE EXAMPLE (EQUAL FOR ALL FIRMS)

Numbers in million dollars	31.12.1997	31.12.1998	31.12.1999	31.12.2000	31.12.2001	31.12.2002	31.12.2003	31.12.2004	31.12.2005	31.12.2006	31.12.2007	31.12.2008	31.12.2009	31.12.2010	31.12.2011	31.12.2012	31.12.2013	31.12.2014	31.12.2015	31.12.2016
Current Assets																				
Accounts Receivable - Trade, Gross	8 069	6 711	14 836	17 826	13 876	15 631	17 124	21 044	24 179	25 382	31 033	18 926	22 384	25 591	30 172	28 482	26 105	18 654	13 350	16 108
Provision for Doubtful Accounts	- 101	- 108	- 241	- 306	- 341	- 353	- 396	- 372	- 321	- 306	- 258	- 219	- 198	- 152	- 128	- 109	- 112	- 113	- 107	- 75
Accounts Receivable - Trade, Net	7 968	6 603	14 595	17 520	13 535	15 278	16 728	20 672	23 858	25 076	30 775	18 707	22 186	25 439	30 044	28 373	25 993	18 541	13 243	16 033
Notes Receivable - Short Term	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Receivables - Other	2 734	2 909	4 560	5 476	6 014	5 885	7 581	4 687	3 626	3 866	5 675	5 995	5 459	6 845	8 598	6 614	7 159	9 468	6 632	5 361
Total Receivables, Net	10 702	9 512	19 155	22 996	19 549	21 163	24 309	25 359	27 484	28 942	36 450	24 702	27 645	32 284	38 642	34 987	33 152	28 009	19 875	21 394
Total Inventory	5 487	5 605	8 492	8 304	7 904	8 068	8 957	9 487	9 321	10 714	11 089	11 646	11 553	12 976	15 024	14 542	16 135	16 678	16 245	15 080
Prepaid Expenses	941	1 015	1 733	2 018	1 681	1 831	2 068	2 396	3 262	3 273	3 924	-	-	-	-	-	-	-	-	-
Restricted Cash - Current	-	-	-	-	-	-	-	4 604	4 604	4 604	-	-	-	628	404	341	269	42	-	-
Deferred Income Tax - Current Asset	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unbilled Utility Revenues	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred Gas Cost	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Discontinued Operations - Current Asset	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Current Assets	-	-	-	-	-	-	-	-	-	-	-	3 911	5 175	5 269	6 229	5 008	5 108	3 565	2 798	1 285
Other Current Assets, Total	-	-	-	-	-	-	-	4 604	4 604	4 604	-	3 911	5 175	5 897	6 633	5 349	5 377	3 607	2 798	1 285
Total Current Assets	17 130	16 132	29 380	33 318	29 134	31 062	35 334	41 846	44 671	47 533	51 463	40 259	44 373	51 157	60 299	54 878	54 664	48 294	38 918	37 759
Current Liabilities																				
Accounts Payable	8 246	7 369	13 524	15 357	12 696	13 792	15 334	18 186	22 788	25 084	29 239	21 190	24 236	30 780	33 969	33 789	30 920	25 286	18 074	17 801
Payable / Accrued	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accrued Expenses	5 707	5 671	11 360	10 812	9 534	10 202	11 527	11 706	10 881	11 401	12 480	11 901	12 060	13 804	17 545	10 825	10 578	10 352	9 699	8 644
Dividends Payable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Customer Advances	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Security Deposits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Income Taxes Payable	2 069	1 339	2 671	5 275	3 549	3 896	5 152	7 938	8 416	8 033	10 654	10 057	8 310	9 812	12 727	9 758	7 831	4 938	2 802	2 615
Other Payables	730	785	608	586	632	1 192	1 584	1 871	2 451	2 597	3 556	3 552	4 979	5 450	5 553	6 114	6 587	6 589	4 639	4 748
Deferred Income Tax - Current Liability	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Discontinued Operations - Curr Liability	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Current Liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Current Liabilities	16 752	15 164	28 163	32 030	26 411	29 082	33 597	39 701	44 536	47 115	55 929	46 700	49 585	59 846	69 794	60 486	55 916	47 165	35 214	33 808
Working Capital	378	968	1 217	1 288	2 723	1 980	1 737	2 145	135	418	- 4 466	- 6 441	- 5 212	- 8 689	- 9 495	- 5 608	- 1 252	1 129	3 704	3 951
Non-Current Intangible Assets																				
Goodwill, Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Intangibles, Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred Income Tax - LT Asset	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Current Tangible Assets																				
Property/Plant/Equipment, Total - Net	66 414	65 199	94 043	89 829	89 602	94 940	104 965	108 639	107 010	113 687	120 869	121 346	139 116	199 548	214 664	226 949	243 650	252 668	251 605	244 224
Utility Plant - Gross	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Utility Plant Accumulated Depreciation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Utility Plant, Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exploration And Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accumulated Depletion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Utility Plant, Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LT Investment - Affiliate Companies	-	-	-	-	-	-	-	-	-	-	-	14 458	15 742	17 429	16 968	18 530	19 619	20 017	20 337	20 810
LT Investments - Other	5 205	6 434	12 289	12 618	10 768	12 111	15 535	18 404	20 592	23 237	28 194	6 526	7 254	8 623	7 625	437	115	526	274	154
Long Term Investments	5 205	6 434	12 289	12 618	10 768	12 111	15 535	18 404	20 592	23 237	28 194	20 984	22 996	26 052	24 593	18 967	19 734	20 543	20 611	20 964
Pension Benefits - Overfunded	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Discontinued Operations - LT Asset	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Long Term Assets	3 253	3 404	4 793	6 154	7 123	7 302	7 818	7 836	7 391	6 314	7 056	13 456	15 976	17 926	18 832	17 627	17 998	18 494	17 395	19 015
Other Long Term Assets, Total	3 253	3 404	4 793	6 154	7 123	7 302	7 818	7 836	7 391	6 314	7 056	13 456	15 976	17 926	18 832	17 627	17 998	18 494	17 395	19 015
Total Non-Current Assets	74 872	75 037	111 125	108 601	107 493	114 353	128 318	134 879	134 993	143 238	156 119	155 786	178 088	243 526	258 089	263 543	281 382	291 705	289 611	284 203

Non-Current Operating Liabilities																				
Deferred Income Tax - LT Liability	13 452	13 142	16 251	16 442	16 359	16 484	20 118	21 092	20 878	20 851	22 899	19 726	23 148	35 150	36 618	37 570	40 530	39 230	36 818	34 041
Deferred Investment Tax Credit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reserves	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pension Benefits - Underfunded	-	-	-	-	-	11 202	9 609	10 850	10 220	13 931	13 278	20 729	17 942	19 367	24 994	25 267	20 646	25 802	22 647	20 680
Other Long Term Liabilities	9 877	9 989	13 981	13 100	13 616	7 763	8 112	9 612	9 997	11 123	14 366	13 949	17 651	20 454	21 869	27 231	26 522	27 111	26 582	25 193
Discontinued Operations - Liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minority Interest	2 371	1 807	3 688	3 230	2 825	2 768	3 382	3 952	3 527	3 804	4 282	4 558	4 823	5 840	6 348	5 797	6 492	6 665	5 999	6 505
Total Non-Current Operating Liabilities	25 700	24 938	33 920	32 772	32 800	38 217	41 221	45 506	44 622	49 709	54 825	58 962	63 564	80 811	89 829	95 865	94 190	98 808	92 046	86 419
Fixed Capital	49 172	50 099	77 205	75 829	74 693	76 136	87 097	89 373	90 371	93 529	101 294	96 824	114 524	162 715	168 260	167 678	187 192	192 897	197 565	197 784
Invested Capital (Net Operating Assets)	49 550	51 067	78 422	77 117	77 416	78 116	88 834	91 518	90 506	93 947	96 828	90 383	109 312	154 026	158 765	162 070	185 940	194 026	201 269	201 735
Equity																				
Preferred Stock - Non Redeemable, Net	190	105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Common Stock	2 323	2 323	3 403	3 661	3 789	4 217	4 468	5 067	5 743	4 786	4 933	5 314	5 503	9 371	9 512	9 653	10 077	10 792	11 612	12 157
Limited Partner	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Common Stock, Total	2 323	2 323	3 403	3 661	3 789	4 217	4 468	5 067	5 743	4 786	4 933	5 314	5 503	9 371	9 512	9 653	10 077	10 792	11 612	12 157
Additional Paid-In Capital	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Retained Earnings (Accumulated Deficit)	52 214	54 575	75 055	86 652	95 718	100 961	115 956	134 390	163 335	195 207	228 518	265 680	276 937	298 899	330 939	365 727	387 432	408 384	412 444	407 831
Treasury Stock - Common	- 9 723	- 12 205	- 12 126	- 14 132	- 19 597	- 24 077	- 29 361	- 38 214	- 55 347	- 83 387	- 113 678	- 148 098	- 166 410	- 156 608	- 176 932	- 197 333	- 212 781	- 225 820	- 229 734	- 230 424
ESOP Debt Guarantee	- 225	- 125	- 298	- 235	- 159	- 450	- 634	- 1 014	- 1 266	-	-	-	-	-	-	-	-	-	-	-
Unrealized Gain (Loss)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	-	-
Translation Adjustment	- 1 119	- 641	- 2 300	- 4 862	- 5 947	- 3 015	1 421	3 598	979	3 733	7 972	1 146	4 402	5 011	4 168	2 410	- 846	- 5 952	- 14 170	- 14 501
Other Equity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Pension Liability Adjustment	-	- 282	- 299	- 310	- 535	- 2 960	- 2 446	- 2 499	- 2 258	- 6 495	- 5 983	- 11 077	- 9 863	- 9 889	- 13 291	- 14 594	- 9 879	- 12 945	- 9 341	- 7 738
Other Comprehensive Income	-	-	31	- 17	- 108	- 79	511	428	-	-	-	-	-	55	-	-	-	-	-	-
Other Equity, Total	- 1 119	- 923	- 2 568	- 5 189	- 6 590	- 6 054	- 514	1 527	- 1 279	- 2 762	1 989	- 9 931	- 5 461	- 4 823	- 9 123	- 12 184	- 10 725	- 18 897	- 23 511	- 22 239
Total Equity	43 660	43 750	63 466	70 757	73 161	74 597	89 915	101 756	111 186	113 844	121 762	112 965	110 569	146 839	154 396	165 863	174 003	174 399	170 811	167 325
Interest Bearing Debt																				
Notes Payable/Short Term Debt	2 132	3 752	10 163	5 511	3 364	3 209	2 886	2 672	1 256	1 243	2 065	2 032	2 128	2 442	4 280	2 628	14 774	16 698	18 204	10 870
Current Port. of LT Debt/Capital Leases	770	496	407	650	339	884	1 903	608	515	459	318	368	348	345	3 431	1 025	1 034	770	558	2 960
Long Term Debt	7 050	4 530	8 132	7 028	6 833	6 361	4 386	4 659	6 023	6 425	6 774	6 645	7 129	12 227	9 322	7 928	6 516	11 653	19 925	28 932
Capital Lease Obligations	-	-	270	252	266	294	370	354	197	220	409	380	-	-	-	-	375	-	-	-
Total Interest Bearing Debt	9 952	8 778	18 972	13 441	10 802	10 748	9 545	8 293	7 991	8 347	9 566	9 425	9 605	15 014	17 033	11 581	22 699	29 121	38 687	42 762
Financial Assets																				
Deferred Charges	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash and Equivalents	4 047	1 441	1 688	7 080	6 547	7 229	10 626	18 531	28 671	28 244	33 981	31 437	10 693	7 825	12 664	9 582	4 644	4 616	3 705	3 657
Short Term Investments	15	20	73	1	-	-	-	-	-	-	519	570	169	2	-	-	-	-	-	-
Note Receivable - Long Term	-	-	2 255	-	-	-	-	-	-	-	-	-	-	-	-	5 792	6 118	4 878	4 524	4 695
Restricted Cash - Long Term	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Financial Assets	4 062	1 461	4 016	7 081	6 547	7 229	10 626	18 531	28 671	28 244	34 500	32 007	10 862	7 827	12 664	15 374	10 762	9 494	8 229	8 352
Net Interest Bearing Debt	5 890	7 317	14 956	6 360	4 255	3 519	- 1 081	- 10 238	- 20 680	- 19 897	- 24 934	- 22 582	- 1 257	7 187	4 369	- 3 793	11 937	19 627	30 458	34 410
Net Interest Bearing Debt and Equity	49 550	51 067	78 422	77 117	77 416	78 116	88 834	91 518	90 506	93 947	96 828	90 383	109 312	154 026	158 765	162 070	185 940	194 026	201 269	201 735
Total Debt & Liabilities	52 404	48 880	81 055	78 243	70 013	78 047	84 363	93 500	97 149	105 171	120 320	115 087	122 754	155 671	176 656	167 932	172 805	175 094	165 947	162 989

APPENDIX 1.2: ADJUSTED BALANCE SHEET – IBERDROLA EXAMPLE (EQUAL FOR ALL FIRMS)

Numbers in million dollars	31.12.1997	31.12.1998	31.12.1999	31.12.2000	31.12.2001	31.12.2002	31.12.2003	31.12.2004	31.12.2005	31.12.2006	31.12.2007	31.12.2008	31.12.2009	31.12.2010	31.12.2011	31.12.2012	31.12.2013	31.12.2014	31.12.2015	31.12.2016
Current Assets																				
Accounts Receivable - Trade, Gross	380	345	366	363	783	817	942	1 229	2 461	2 874	4 107	5 408	5 386	6 091	5 649	6 114	-	5 194	5 761	5 629
Provision for Doubtful Accounts	- 45	- 32	- 33	- 36	- 60	- 70	- 72	- 68	- 136	- 84	- 193	- 280	- 284	- 272	- 284	- 428	-	- 375	- 391	- 413
Accounts Receivable - Trade, Net	335	314	333	328	723	747	871	1 161	2 324	2 791	3 914	5 127	5 103	5 819	5 365	5 686	4 611	4 819	5 370	5 216
Notes Receivable - Short Term	13	17	8	25	156	137	263	91	-	-	-	-	-	-	-	-	-	-	-	-
Receivables - Other	307	445	545	1 046	1 930	1 529	1 231	748	420	602	1 918	1 018	1 163	1 158	857	740	1 025	700	678	647
Total Receivables, Net	656	776	886	1 399	2 809	2 413	2 365	1 999	2 744	3 392	5 832	6 145	6 266	6 977	6 222	6 426	5 636	5 519	6 048	5 862
Total Inventory	60	242	209	224	225	768	889	1 142	1 060	1 431	2 071	2 625	2 438	2 251	2 440	2 206	2 438	2 359	2 147	1 956
Prepaid Expenses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Restricted Cash - Current	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred Income Tax - Current Asset	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unbilled Utility Revenues	400	411	404	405	612	559	533	579	-	-	-	-	-	-	-	-	-	-	-	-
Deferred Gas Cost	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Discontinued Operations - Current Asset	-	-	-	-	-	-	-	-	-	-	-	-	-	-	132	216	199	-	44	-
Other Current Assets	87	5	4	4	- 43	4	46	32	15	18	1 202	2 509	1 399	956	759	516	259	512	600	694
Other Current Assets, Total	486	417	408	410	569	563	579	611	15	18	1 202	2 509	1 399	956	890	732	458	512	644	694
Total Current Assets	1 203	1 434	1 503	2 033	3 603	3 744	3 833	3 752	3 819	4 841	9 105	11 279	10 103	10 184	9 552	9 364	8 533	8 391	8 839	8 512
Current Liabilities																				
Accounts Payable	340	437	400	434	1 022	1 027	1 483	1 637	2 920	2 688	3 525	5 045	5 319	6 020	5 667	6 006	4 780	5 473	5 577	5 491
Payable / Accrued	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accrued Expenses	15	132	10	31	24	61	56	81	183	118	5	7	14	9	9	7	21	444	311	284
Dividends Payable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Customer Advances	-	-	-	-	-	-	-	-	-	-	-	360	146	188	377	107	-	-	-	-
Security Deposits	0	0	26	7	-	1	3	7	-	-	-	-	-	-	-	-	-	-	-	-
Income Taxes Payable	251	403	435	369	578	595	611	528	576	635	1 252	477	385	744	818	618	477	419	250	237
Other Payables	589	816	504	508	587	564	606	878	1 028	934	2 083	4 694	2 522	542	462	394	924	996	1 001	914
Deferred Income Tax - Current Liability	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Discontinued Operations - Curr Liability	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84	95	-	-	-
Other Current Liabilities	274	352	195	356	346	323	388	1 018	245	416	1 298	2 194	1 974	4 406	3 178	2 515	1 859	2 334	2 774	2 618
Total Current Liabilities	1 470	2 141	1 571	1 704	2 557	2 571	3 148	4 149	4 951	4 791	8 163	12 777	10 359	11 909	10 511	9 731	8 156	9 666	9 914	9 545
Working Capital	- 267	- 707	- 68	329	1 046	1 173	685	- 397	- 1 132	50	942	- 1 499	- 256	- 1 725	- 959	- 367	377	- 1 275	- 1 075	- 1 032
Non-Current Intangible Assets																				
Goodwill, Net	70	218	540	383	635	463	289	324	50	56	8 064	7 255	7 589	7 831	8 273	8 309	7 804	8 354	9 353	8 711
Intangibles, Net	53	69	158	212	855	613	639	592	799	844	7 174	10 616	10 454	10 392	12 000	11 094	9 373	8 508	11 407	11 223
Deferred Income Tax - LT Asset	-	-	-	-	-	-	-	-	1 356	1 222	1 434	3 243	3 142	3 488	4 545	4 515	6 610	5 837	6 630	6 958
Non-Current Tangible Assets																				
Property/Plant/Equipment, Total - Net	12 385	11 906	11 735	12 016	13 587	15 217	16 982	18 369	19 942	21 067	34 990	43 348	46 630	50 202	52 406	53 423	52 760	55 107	61 789	63 834
Utility Plant - Gross	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Utility Plant Accumulated Depreciation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Utility Plant, Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exploration And Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accumulated Depletion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Utility Plant, Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LT Investment - Affiliate Companies	1 086	2 156	2 423	3 001	2 302	1 584	1 060	1 397	476	761	801	941	636	776	765	438	482	2 295	2 050	2 240
LT Investments - Other	55	169	67	642	179	251	203	213	1 630	2 381	3 388	5 131	1 896	1 757	2 128	2 226	3 566	1 329	1 181	1 217
Long Term Investments	1 141	2 325	2 491	3 643	2 481	1 835	1 263	1 610	2 106	3 143	4 189	6 072	2 532	2 533	2 893	2 664	4 048	3 624	3 231	3 457
Pension Benefits - Overfunded	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Discontinued Operations - LT Asset	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Long Term Assets	666	598	792	1 026	1 211	1 160	739	829	75	80	878	920	542	522	488	403	275	639	960	909
Other Long Term Assets, Total	666	598	792	1 026	1 211	1 160	739	829	75	80	878	920	542	522	488	403	275	639	960	909
Total Non-Current Assets	14 315	15 117	15 716	17 280	18 769	19 288	19 912	21 723	24 328	26 412	56 729	71 454	70 888	74 968	80 605	80 409	80 871	82 069	93 369	95 093

Non-Current Operating Liabilities																				
Deferred Income Tax - LT Liability	-	-	-	-	-	-	-	-	720	605	5 019	7 005	7 881	8 774	9 742	9 093	8 388	9 369	11 896	12 741
Deferred Investment Tax Credit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reserves	724	493	432	369	273	328	328	382	647	892	1 313	2 323	2 206	2 382	2 054	2 026	2 791	2 909	2 772	2 524
Pension Benefits - Underfunded	503	217	297	305	397	370	673	653	733	826	753	1 221	1 256	1 261	1 372	1 902	1 458	1 943	2 233	2 381
Other Long Term Liabilities	1 097	1 129	1 215	1 314	1 105	1 315	1 324	1 498	1 079	1 139	2 828	5 560	5 724	5 893	6 788	7 095	6 659	7 116	7 533	7 745
Discontinued Operations - Liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minority Interest	24	3	29	44	112	81	81	77	147	149	2 294	2 344	2 393	2 584	320	325	225	200	3 246	3 446
Total Non-Current Operating Liabilities	2 348	1 841	1 973	2 032	1 887	2 094	2 406	2 610	3 325	3 611	12 207	18 453	19 460	20 894	20 277	20 441	19 521	21 537	27 681	28 837
Fixed Capital	11 967	13 276	13 743	15 248	16 882	17 194	17 506	19 113	21 003	22 801	44 522	53 001	51 429	54 074	60 328	59 967	61 350	60 532	65 689	66 256
Invested Capital (Net Operating Assets)	11 700	12 569	13 675	15 577	17 928	18 367	18 191	18 716	19 871	22 851	45 463	51 502	51 173	52 349	59 369	59 600	61 727	59 256	64 614	65 224
Equity																				
Preferred Stock - Non Redeemable, Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Common Stock	2 709	2 709	2 705	2 705	2 705	2 705	2 705	2 705	2 705	2 705	3 745	3 752	3 939	4 113	4 412	4 604	4 680	4 791	4 753	4 772
Limited Partner	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Common Stock, Total	2 709	2 709	2 705	2 705	2 705	2 705	2 705	2 705	2 705	2 705	3 745	3 752	3 939	4 113	4 412	4 604	4 680	4 791	4 753	4 772
Additional Paid-In Capital	388	388	388	388	388	388	460	460	460	460	11 829	11 878	-	-	-	-	-	-	-	-
Retained Earnings (Accumulated Deficit)	1 785	2 064	2 378	2 508	2 929	3 162	3 011	3 341	4 477	5 826	10 935	9 896	2 612	2 871	2 805	2 841	3 123	2 878	2 973	3 256
Treasury Stock - Common	5	34	142	257	145	11	17	2	- 2	- 3	- 1 336	- 916	- 233	- 284	- 384	- 500	- 303	- 816	- 639	- 1 083
ESOP Debt Guarantee	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unrealized Gain (Loss)	2 275	2 275	1 389	1 389	1 389	1 389	1 389	1 389	1 389	1 389	1 389	1 389	-	- 360	- 386	- 493	- 297	- 327	- 222	- 149
Translation Adjustment	5	10	- 276	- 258	- 257	- 665	- 827	- 918	153	- 44	- 1 112	- 2 722	- 2 246	- 1 735	- 1 207	- 1 364	- 2 174	- 1 404	- 459	- 1 059
Other Equity	355	299	1 077	754	685	1 056	1 470	1 738	86	86	86	86	22 564	24 475	27 648	28 672	30 108	30 469	31 305	31 506
Minimum Pension Liability Adjustment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Comprehensive Income	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Equity, Total	360	309	801	496	428	391	644	820	239	42	- 1 025	- 2 636	20 318	22 740	26 441	27 308	27 933	29 065	30 846	30 447
Total Equity	7 522	7 778	7 803	7 744	7 984	8 046	8 225	8 717	9 268	10 418	25 537	23 364	26 637	29 079	32 888	33 760	35 136	35 591	37 710	37 241
Interest Bearing Debt																				
Notes Payable/Short Term Debt	397	521	491	509	620	1 177	748	887	-	-	-	-	-	-	-	-	86	101	99	93
Current Port. of LT Debt/Capital Leases	472	212	169	155	761	2 002	1 159	1 417	1 545	1 665	4 450	8 174	4 283	5 902	3 356	4 456	3 687	3 765	4 576	4 437
Long Term Debt	4 580	5 471	6 204	7 526	9 404	7 742	8 747	8 417	11 390	12 575	17 175	22 907	26 435	25 737	29 707	28 353	25 825	23 043	24 617	26 488
Capital Lease Obligations	-	-	-	-	-	-	-	-	-	-	-	162	193	180	165	75	-	67	67	64
Total Interest Bearing Debt	5 449	6 204	6 864	8 191	10 785	10 921	10 654	10 722	12 935	14 241	21 624	31 243	30 912	31 819	33 229	32 884	29 598	26 977	29 360	31 083
Financial Assets																				
Deferred Charges	967	1 039	859	221	172	79	174	175	-	-	-	-	-	-	-	-	-	-	-	-
Cash	-	-	-	-	-	-	-	-	-	-	-	-	-	214	261	302	-	392	904	1 251
Cash and Equivalents	23	34	29	17	55	97	110	106	208	705	981	2 087	1 091	1 888	1 830	2 742	1 709	1 414	249	182
Short Term Investments	102	125	27	15	373	62	78	121	654	270	329	680	4 798	5 968	4 118	3 532	876	1 122	688	781
Note Receivable - Long Term	180	215	77	105	242	361	326	320	1 469	833	389	338	487	479	539	468	422	383	615	887
Restricted Cash - Long Term	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Financial Assets	1 271	1 413	992	358	842	599	688	722	2 331	1 808	1 698	3 104	6 376	8 549	6 747	7 044	3 007	3 311	2 456	3 101
Net Interest Bearing Debt	4 178	4 791	5 873	7 833	9 943	10 322	9 966	9 999	10 604	12 433	19 926	28 139	24 536	23 270	26 481	25 840	26 591	23 666	26 904	27 983
Net Interest Bearing Debt and Equity	11 700	12 569	13 675	15 577	17 927	18 368	18 191	18 716	19 871	22 851	45 463	51 502	51 173	52 349	59 369	59 600	61 727	59 256	64 614	65 224
Total Debt & Liabilities	9 266	10 186	10 408	11 927	15 229	15 586	16 208	17 481	21 211	22 643	41 995	62 473	60 731	64 622	64 017	63 056	57 275	58 181	66 954	69 465

APPENDIX 1.3: ADJUSTED BALANCE SHEET – NRG YIELD EXAMPLE (EQUAL FOR ALL FIRMS)

Numbers in million dollars	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	31.12.2010	31.12.2011	31.12.2012	31.12.2013	31.12.2014	31.12.2015	31.12.2016
Current Assets																				
Accounts Receivable - Trade, Gross	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Provision for Doubtful Accounts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accounts Receivable - Trade, Net	-	-	-	-	-	-	-	-	-	-	-	-	-	41	25	22	41	67	95	91
Notes Receivable - Short Term	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	2	6	7	16
Receivables - Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	-	102	-	-	-
Total Receivables, Net	-	-	-	-	-	-	-	-	-	-	-	-	-	41	50	31	145	73	102	107
Total Inventory	-	-	-	-	-	-	-	-	-	-	-	-	-	4	5	5	14	18	35	39
Prepaid Expenses	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	17	19	22	16
Restricted Cash - Current	-	-	-	-	-	-	-	-	-	-	-	-	-	4	8	21	54	22	48	164
Deferred Income Tax - Current Asset	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	16	-	-
Unbilled Utility Revenues	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred Gas Cost	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Discontinued Operations - Current Asset	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Current Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	2
Other Current Assets, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	4	9	22	55	38	48	166
Total Current Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	50	66	60	231	148	207	328
Current Liabilities																				
Accounts Payable	-	-	-	-	-	-	-	-	-	-	-	-	-	129	99	186	81	63	108	63
Payable / Accrued	-	-	-	-	-	-	-	-	-	-	-	-	-	11	12	20	20	43	68	85
Accrued Expenses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dividends Payable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Customer Advances	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Security Deposits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Income Taxes Payable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Payables	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred Income Tax - Current Liability	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Discontinued Operations - Curr Liability	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Current Liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	3	12	16	23	31	39	29
Total Current Liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	143	123	222	124	137	215	177
Working Capital	-	-	-	-	-	-	-	-	-	-	-	-	-	- 93	- 57	- 162	107	11	- 8	151
Non-Current Intangible Assets																				
Goodwill, Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Intangibles, Net	-	-	-	-	-	-	-	-	-	-	-	-	-	26	38	37	86	1 266	1 362	1 286
Deferred Income Tax - LT Asset	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	146	118	170	216
Non-Current Tangible Assets																				
Property/Plant/Equipment, Total - Net	-	-	-	-	-	-	-	-	-	-	-	-	-	526	863	1 511	1 541	3 487	5 056	5 460
Utility Plant - Gross	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Utility Plant Accumulated Depreciation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Utility Plant, Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exploration And Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accumulated Depletion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Utility Plant, Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LT Investment - Affiliate Companies	-	-	-	-	-	-	-	-	-	-	-	-	-	2	78	220	227	227	798	710
LT Investments - Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Long Term Investments	-	-	-	-	-	-	-	-	-	-	-	-	-	2	78	220	227	227	798	710
Pension Benefits - Overfunded	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Discontinued Operations - LT Asset	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Long Term Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	7	29	42	38	100	61	52
Other Long Term Assets, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	7	29	42	38	100	61	52
Total Non-Current Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	561	1 008	1 810	2 038	5 198	7 447	7 724

Non-Current Operating Liabilities																					
Deferred Income Tax - LT Liability	-	-	-	-	-	-	-	-	-	-	-	-	-	22	11	22	-	-	-	-	
Deferred Investment Tax Credit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Reserves	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Pension Benefits - Underfunded	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other Long Term Liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	8	29	65	45	85	125	128	
Discontinued Operations - Liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other Liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Minority Interest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	382	246	791	520	
Total Non-Current Operating Liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	30	40	87	427	331	916	648	
Fixed Capital	-	-	-	-	-	-	-	-	-	-	-	-	-	531	968	1 723	1 611	4 867	6 531	7 076	
Invested Capital (Net Operating Assets)	-	-	-	-	-	-	-	-	-	-	-	-	-	438	911	1 561	1 718	4 878	6 523	7 227	
Equity																					
Preferred Stock - Non Redeemable, Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Common Stock	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	
Limited Partner	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Common Stock, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	
Additional Paid-In Capital	-	-	-	-	-	-	-	-	-	-	-	-	-	96	434	863	621	1 240	1 855	1 879	
Retained Earnings (Accumulated Deficit)	-	-	-	-	-	-	-	-	-	-	-	-	-	33	28	29	8	3	12	- 2	
Treasury Stock - Common	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ESOP Debt Guarantee	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Unrealized Gain (Loss)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Translation Adjustment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other Equity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Minimum Pension Liability Adjustment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other Comprehensive Income	-	-	-	-	-	-	-	-	-	-	-	-	-	- -	23 -	47	- -	9 -	27 -	28	
Other Equity, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	- -	23 -	47	- -	9 -	27 -	28	
Total Equity	-	-	-	-	-	-	-	-	-	-	-	-	-	129	439	845	629	1 234	1 841	1 850	
Interest Bearing Debt																					
Notes Payable/Short Term Debt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Current Port. of LT Debt/Capital Leases	-	-	-	-	-	-	-	-	-	-	-	-	-	17	33	31	133	160	241	282	
Long Term Debt	-	-	-	-	-	-	-	-	-	-	-	-	-	340	472	736	1 000	3 890	4 562	5 426	
Capital Lease Obligations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Interest Bearing Debt	-	-	-	-	-	-	-	-	-	-	-	-	-	357	505	767	1 133	4 050	4 803	5 708	
Financial Assets																					
Deferred Charges	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cash	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cash and Equivalents	-	-	-	-	-	-	-	-	-	-	-	-	-	32	24	22	36	391	111	317	
Short Term Investments	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Note Receivable - Long Term	-	-	-	-	-	-	-	-	-	-	-	-	-	16	9	29	8	15	10	14	
Restricted Cash - Long Term	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Financial Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	48	33	51	44	406	121	331	
Net Interest Bearing Debt	-	-	-	-	-	-	-	-	-	-	-	-	-	309	472	716	1 089	3 644	4 682	5 377	
Net Interest Bearing Debt and Equity	-	-	-	-	-	-	-	-	-	-	-	-	-	438	911	1 561	1 718	4 878	6 523	7 227	
Total Debt & Liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	530	668	1 076	1 684	4 518	5 934	6 533	

APPENDIX 2: ADJUSTED INCOME STATEMENT

APPENDIX 2.1: ADJUSTED INCOME STATEMENT – EXXON MOBIL EXAMPLE (EQUAL FOR ALL FIRMS)

Numbers in million dollars	31.12.1997	31.12.1998	31.12.1999	31.12.2000	31.12.2001	31.12.2002	31.12.2003	31.12.2004	31.12.2005	31.12.2006	31.12.2007	31.12.2008	31.12.2009	31.12.2010	31.12.2011	31.12.2012	31.12.2013	31.12.2014	31.12.2015	31.12.2016
Revenue																				
Excise Taxes Payments (Revenues)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electric Operations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gas Operations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Operations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Steam Operations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Utility Revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue	135 142	115 417	182 529	228 439	209 417	200 949	237 054	291 252	358 955	365 467	390 328	459 579	301 500	370 125	467 029	453 123	420 836	394 105	259 488	218 608
Other Revenue, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Net Revenue	135 142	115 417	182 529	228 439	209 417	200 949	237 054	291 252	358 955	365 467	390 328	459 579	301 500	370 125	467 029	453 123	420 836	394 105	259 488	218 608
Cost of sales																				
Purchased Power	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fuel Purchased for Resale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cost of Revenue	71 016	56 560	93 817	127 086	110 456	108 781	128 918	162 449	212 038	212 074	231 383	287 359	185 833	233 751	306 802	303 670	284 681	266 831	165 590	136 098
Excise Taxes Payments	14 863	14 720	21 646	22 356	21 907	22 040	23 855	27 263	30 742	30 381	31 728	34 508	25 936	28 547	33 503	32 409	30 589	29 342	22 678	21 090
Total Cost of Sales	85 879	71 280	115 463	149 442	132 363	130 821	152 773	189 712	242 780	242 455	263 111	321 867	211 769	262 298	340 305	336 079	315 270	296 173	188 268	157 188
Gross Profit	49 263	44 137	67 066	78 997	77 054	70 128	84 281	101 540	116 175	123 012	127 217	137 712	89 731	107 827	126 724	117 044	105 566	97 932	71 220	61 420
Fuel Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations & Maintenance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selling/General/Administrative Expense	31 517	30 948	47 899	44 752	46 277	45 928	51 041	54 803	55 956	53 476	55 843	57 592	49 554	50 801	54 956	49 435	46 107	44 884	38 766	36 709
Labor And Related Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Advertising Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Research And Development	753	863	1 246	936	1 175	920	1 010	1 098	964	1 181	1 469	1 451	2 021	2 144	2 081	1 840	1 976	1 669	1 523	1 467
Interest Expense (Income), Net-Operating, Ttl	406	185	145	412	569	209	694	776	799	1 051	1 005	1 647	-	-	-	-	-	-	-	-
Operating Profit before Special Items	16 587	12 141	17 776	32 897	29 033	23 071	31 536	44 863	58 456	67 304	68 900	77 022	38 156	54 882	69 687	65 769	57 483	51 379	30 931	23 244
Purchased R&D Written-Off	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Restructuring Charge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- 6 500	-	-	-	-
Litigation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Impairment - Assets Held for Use	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Impairment - Assets Held for Sale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Unusual Expense (Income)	-	-	625	1 406	748	410	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unusual Expense (Income)	-	-	625	1 406	748	410	-	-	-	-	-	-	-	-	-	- 6 500	-	-	-	-
Property And Other Taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Operating Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Operating Expenses, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EBITDA	16 587	12 141	17 151	31 491	28 285	22 661	31 536	44 863	58 456	67 304	68 900	77 022	38 156	54 882	69 687	72 269	57 483	51 379	30 931	23 244

Depreciation, Operating	5 474	5 340	8 304	8 130	7 944	8 310	9 047	9 767	10 253	11 416	12 250	12 379	11 917	14 760	15 583	15 888	17 182	17 297	18 048	22 308
Amortization of Intangibles, Operating	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amortization of Acquisition Costs, Operating	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Depreciation & Amortization Costs	5 474	5 340	8 304	8 130	7 944	8 310	9 047	9 767	10 253	11 416	12 250	12 379	11 917	14 760	15 583	15 888	17 182	17 297	18 048	22 308
EBIT	11 113	6 801	8 847	23 361	20 341	14 351	22 489	35 096	48 203	55 888	56 650	64 643	26 239	40 122	54 104	56 381	40 301	34 082	12 883	936
Income Tax	3 767	1 965	2 571	9 567	7 602	5 880	9 572	14 243	20 523	25 281	26 262	31 879	12 252	17 320	24 675	25 255	18 412	13 466	3 607	- 184
Tax Shield, Net Financial Expenses	571	651	669	1 524	1 412	619	1 434	1 668	2 779	2 621	3 602	4 651	2 867	4 241	6 376	5 790	5 851	4 549	1 808	- 222
Total Tax	4 338	2 616	3 240	11 091	9 014	6 499	11 006	15 911	23 302	27 902	29 864	36 530	15 119	21 561	31 051	31 045	24 263	18 015	5 415	- 406
Check	4 338	2 616	3 240	11 091	9 014	6 499	11 006	15 911	23 302	27 902	29 864	36 530	15 119	21 561	31 051	31 045	24 263	18 015	5 415	- 406
NOPAT	6 775	4 185	5 607	12 270	11 327	7 852	11 483	19 185	24 901	27 986	26 786	28 113	11 120	18 561	23 053	25 336	16 038	16 067	7 468	1 342
Interest Expense	- 415	- 100	- 695	- 589	- 293	- 398	- 207	- 638	- 496	- 654	- 400	- 673	- 548	- 259	- 247	- 327	- 9	- 286	- 311	- 453
Interest Income	2 100	2 355	2 998	4 309	4 071	2 066	4 373	4 961	7 583	6 985	8 901	11 081	7 143	10 677	15 289	15 010	13 927	13 323	7 644	4 806
Total Expense (Interest)	- 1 685	- 2 255	- 2 303	- 3 720	- 3 778	- 1 668	- 4 166	- 4 323	- 7 087	- 6 331	- 8 501	- 10 408	- 6 595	- 10 418	- 15 042	- 14 683	- 13 918	- 13 037	- 7 333	- 4 353
Gain (Loss) on Sale of Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Allowance for Funds Used During Const.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other, Net - Non-Operating	-	-	-	-	-	1 491	5 311	1 822	4 142	5 183	5 323	6 699	1 943	2 419	4 111	7 662	3 492	4 511	1 750	2 680
Total Financial	1 685	2 255	2 303	3 720	3 778	3 159	9 477	6 145	11 229	11 514	13 824	17 107	8 538	12 837	19 153	22 345	17 410	17 548	9 083	7 033
Net Income Before Minority Interest	8 460	6 440	7 910	15 990	15 105	11 011	20 960	25 330	36 130	39 500	40 610	45 220	19 658	31 398	42 206	47 681	33 448	33 615	16 551	8 375
Minority Interest	-	-	-	-	-	-	-	-	-	-	-	-	- 378	- 938	- 1 146	- 2 801	- 868	- 1 095	- 401	- 535
Equity In Affiliates	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U.S. GAAP Adjustment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Income Before Extraordinary Items	8 460	6 440	7 910	15 990	15 105	11 011	20 960	25 330	36 130	39 500	40 610	45 220	19 280	30 460	41 060	44 880	32 580	32 520	16 150	7 840
Total Extraordinary Items	-	- 70	-	1 730	215	449	550	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Adjustments to Net Income	- 17	- 10	- 36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Income Avail to Cmn Shareholders Incl Extra	8 443	6 360	7 874	17 720	15 320	11 460	21 510	25 330	36 130	39 500	40 610	45 220	19 280	30 460	41 060	44 880	32 580	32 520	16 150	7 840
Income Avail to Cmn Shareholders Excl Extra	8 443	6 430	7 874	15 990	15 105	11 011	20 960	25 330	36 130	39 500	40 610	45 220	19 280	30 460	41 060	44 880	32 580	32 520	16 150	7 840
Basic Weighted Average Shares	5 011	4 880	6 906	6 954	6 868	6 753	6 634	6 482	6 266	5 913	5 517	5 149	4 832	4 885	4 870	4 628	4 419	4 282	4 196	4 177
Diluted Weighted Average Shares	5 952	4 936	7 036	7 033	6 941	6 803	6 662	6 519	6 322	5 970	5 577	5 203	4 848	4 897	4 875	4 628	4 419	4 282	4 196	4 177
Basic EPS Excluding Extraordinary Items	1,69	1,32	1,15	2,30	2,20	1,63	3,16	3,91	5,77	6,68	7,36	8,78	3,99	6,24	8,43	9,70	7,37	7,59	3,85	1,88
Income Avail to Cmn Shareholders Incl Extra	1,69	1,30	1,14	2,55	2,23	1,70	3,24	3,91	5,77	6,68	7,36	8,78	3,99	6,24	8,43	9,70	7,37	7,59	3,85	1,88
Diluted EPS Excluding Extraordinary Items	1,42	1,30	1,12	2,27	2,18	1,62	3,15	3,89	5,71	6,62	7,28	8,69	3,98	6,22	8,42	9,70	7,37	7,59	3,85	1,88
Diluted EPS Including Extraordinary Items	1,42	1,29	1,12	2,52	2,21	1,68	3,23	3,89	5,71	6,62	7,28	8,69	3,98	6,22	8,42	9,70	7,37	7,59	3,85	1,88
DPS - Common Stock Primary Issue	0,81	0,82	0,84	0,88	0,91	0,92	0,98	1,06	1,14	1,28	1,37	1,55	1,66	1,74	1,85	2,18	2,46	2,70	2,88	2,98
Effective Tax Rate/Tax-Shield Rate	34 %	29 %	29 %	41 %	37 %	37 %	34 %	39 %	39 %	41 %	42 %	45 %	43 %	41 %	42 %	39 %	42 %	35 %	25 %	-5 %

APPENDIX 2.2: ADJUSTED INCOME STATEMENT – IBERDRROLA EXAMPLE (EQUAL FOR ALL FIRMS)

Numbers in million dollars	31.12.1997	31.12.1998	31.12.1999	31.12.2000	31.12.2001	31.12.2002	31.12.2003	31.12.2004	31.12.2005	31.12.2006	31.12.2007	31.12.2008	31.12.2009	31.12.2010	31.12.2011	31.12.2012	31.12.2013	31.12.2014	31.12.2015	31.12.2016
Revenue																				
Excise Taxes Payments (Revenues)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electric Operations	4 869	4 149	6 250	7 048	8 114	9 578	9 452	10 271	11 738	11 017	17 468	25 196	24 559	30 431	31 648	34 201	32 808	30 032	31 419	29 215
Gas Operations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Operations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Steam Operations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Utility Revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue	4 869	4 149	6 250	7 048	8 114	9 578	9 452	10 271	11 738	11 017	17 468	25 196	24 559	30 431	31 648	34 201	32 808	30 032	31 419	29 215
Other Revenue, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Net Revenue	4 869	4 149	6 250	7 048	8 114	9 578	9 452	10 271	11 738	11 017	17 468	25 196	24 559	30 431	31 648	34 201	32 808	30 032	31 419	29 215
Cost of sales																				
Purchased Power	1 641	1 020	2 899	3 406	4 059	4 943	4 457	4 392	6 216	4 224	7 557	-	-	-	-	-	-	-	-	-
Fuel Purchased for Resale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cost of Revenue	463	369	387	438	501	490	585	733	1 183	1 746	2 913	16 986	15 518	20 506	21 389	23 450	22 054	19 555	20 523	17 966
Excise Taxes Payments	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Cost of Sales	2 105	1 390	3 286	3 844	4 560	5 433	5 042	5 125	7 399	5 970	10 470	16 986	15 518	20 506	21 389	23 450	22 054	19 555	20 523	17 966
Gross Profit	2 764	2 759	2 964	3 204	3 554	4 145	4 410	5 146	4 339	5 047	6 998	8 210	9 041	9 925	10 259	10 752	10 754	10 477	10 896	11 249
Fuel Expense	165	222	330	480	418	958	1 025	1 547	81	83	79	-	-	-	-	-	-	-	-	-
Operations & Maintenance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selling/General/Administrative Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labor And Related Expense	663	668	649	658	742	762	772	763	980	1 174	1 455	1 842	2 161	2 159	2 151	2 391	2 386	2 319	2 430	2 517
Advertising Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Research And Development	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest Expense (Income), Net-Operating, Ttl	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	7	8	7
Operating Profit before Special Items	1 937	1 869	1 985	2 066	2 394	2 425	2 614	2 835	3 278	3 791	5 464	6 367	6 880	7 766	8 107	8 361	8 361	8 151	8 458	8 725
Purchased R&D Written-Off	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Restructuring Charge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Litigation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Impairment - Assets Held for Use	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 845	99	279 -	39
Impairment - Assets Held for Sale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Unusual Expense (Income)	- 27	- 30	- 86	- 22	9 -	253	198 -	59	-	-	-	-	-	-	-	-	-	-	-	-
Unusual Expense (Income)	- 27	- 30	- 86	- 22	9 -	253	198 -	59	-	-	-	-	-	-	-	-	1 845	99	279 -	39
Property And Other Taxes	123	121	121	119	116	147	162	181	223	136	401	749	683	908	1 107	1 183	1 577	1 581	1 706	1 537
Other Operating Expense	- 49	- 64	- 48	- 54	- 102	- 80	- 161	- 202	- 190	- 57	- 263	- 672	- 748	- 670	- 650	- 549	- 387	- 350	- 443	- 408
Other Operating Expenses, Total	74	56	73	65	14	67	1 -	21	32	79	138	76 -	65	238	457	634	1 189	1 232	1 263	1 129
EBITDA	1 890	1 843	1 998	2 022	2 371	2 611	2 414	2 915	3 246	3 712	5 326	6 291	6 945	7 528	7 650	7 727	5 327	6 821	6 915	7 634

Depreciation, Operating	716	602	735	776	800	793	789	838	920	1 002	1 437	1 809	2 180	2 698	3 145	3 350	2 458	2 520	2 750	2 636
Amortization of Intangibles, Operating	-	-	-	-	-	-	-	-	64	56	191	220	255	-	-	-	434	360	335	444
Amortization of Acquisition Costs, Operating	1	5	22	18	34	43	21	19	-	-	-	-	-	-	-	-	-	-	-	-
Total Depreciation & Amortization Costs	717	607	757	794	834	836	810	857	984	1 057	1 629	2 030	2 435	2 698	3 145	3 350	2 892	2 880	3 086	3 080
EBIT	1 173	1 235	1 240	1 229	1 537	1 775	1 604	2 059	2 262	2 654	3 697	4 262	4 509	4 830	4 505	4 377	2 435	3 941	3 829	4 554
Income Tax	290	357	366	280	365	442	272	641	504	630	617	836	682	1 184	732	304 -	2 770	1 110	704	1 101
Tax Shield, Net Financial Expenses -	95 -	90 -	63 -	21 -	79 -	138 -	64 -	106	49	65	86	60	37 -	285 -	183 -	97	1 346 -	273 -	177 -	196
Total Tax	194	267	303	259	286	304	207	535	553	695	703	895	719	899	549	207 -	1 424	837	527	905
Check	194	267	303	259	286	304	207	535	553	695	703	895	719	899	549	207 -	1 424	837	527	905
NOPAT	978	969	937	970	1 251	1 471	1 397	1 524	1 709	1 959	2 995	3 366	3 790	3 930	3 956	4 170	3 858	3 104	3 302	3 649
Interest Expense -	443 -	420 -	357 -	462 -	601 -	669 -	651 -	570	-	-	-	-	- -	1 352 -	1 481 -	1 489 -	1 396 -	1 159 -	1 013 -	925
Interest Income	46	106	144	372	272	89	254	221	173	223	380	258	189	135	329	40	270	114	13	112
Total Expense (Interest)	397	314	214	91	329	580	397	349 -	173 -	223 -	380 -	258 -	189	1 218	1 152	1 449	1 125	1 046	1 001	813
Gain (Loss) on Sale of Assets	-	-	-	-	-	-	-	-	117	182	262	555	225	272	46 -	14 -	25	248	125	48
Allowance for Funds Used During Const.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other, Net - Non-Operating	31	10	7 -	23 -	10	79	68	48 -	594 -	673 -	1 240 -	1 210 -	1 266 -	43	55	161 -	95	59	33 -	42
Total Financial -	366 -	303 -	207 -	114 -	339 -	501 -	329 -	301 -	304 -	268 -	599 -	398 -	852 -	989 -	1 051 -	1 302 -	1 245 -	739 -	843 -	807
Net Income Before Minority Interest	612	665	730	856	912	970	1 068	1 223	1 405	1 691	2 396	2 969	2 939	2 942	2 905	2 869	2 614	2 365	2 460	2 843
Minority Interest -	3 -	0 -	0 -	3 -	6 -	6 -	8 -	12 -	23 -	31 -	42 -	108 -	114 -	71 -	101 -	28 -	16 -	17 -	16 -	115
Equity In Affiliates	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U.S. GAAP Adjustment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Income Before Extraordinary Items	610	665	730	852	906	964	1 060	1 211	1 382	1 660	2 354	2 861	2 824	2 871	2 805	2 841	2 598	2 348	2 443	2 728
Total Extraordinary Items	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Adjustments to Net Income	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- -	26 -	21 -	21 -	23
Income Avail to Cmn Shareholders Incl Extra	610	665	730	852	906	964	1 060	1 211	1 382	1 660	2 354	2 861	2 824	2 871	2 805	2 841	2 572	2 327	2 422	2 705
Income Avail to Cmn Shareholders Excl Extra	610	665	730	852	906	964	1 060	1 211	1 382	1 660	2 354	2 861	2 824	2 871	2 805	2 841	2 572	2 327	2 422	2 705
Basic Weighted Average Shares	4 797	4 797	4 797	4 797	4 797	4 791	4 788	4 796	4 794	4 795	5 964	6 512	6 753	6 937	7 334	7 106	7 086	6 747	6 575	6 527
Diluted Weighted Average Shares	4 797	4 797	4 797	4 797	4 797	4 791	4 788	4 796	4 794	4 795	5 964	6 512	6 753	6 937	7 334	7 106	7 086	6 747	6 575	6 527
Basic EPS Excluding Extraordinary Items	0,13	0,14	0,15	0,18	0,19	0,20	0,22	0,25	0,29	0,35	0,39	0,44	0,42	0,41	0,38	0,40	0,37	0,35	0,37	0,42
Income Avail to Cmn Shareholders Incl Extra	0,13	0,14	0,15	0,18	0,19	0,20	0,22	0,25	0,29	0,35	0,39	0,44	0,42	0,41	0,38	0,40	0,36	0,34	0,37	0,41
Diluted EPS Excluding Extraordinary Items	0,13	0,14	0,15	0,18	0,19	0,20	0,22	0,25	0,29	0,35	0,39	0,44	0,42	0,41	0,38	0,40	0,37	0,35	0,37	0,42
Diluted EPS Including Extraordinary Items	0,13	0,14	0,15	0,18	0,19	0,20	0,22	0,25	0,29	0,35	0,39	0,44	0,42	0,41	0,38	0,40	0,36	0,34	0,37	0,41
DPS - Common Stock Primary Issue	0,08	0,09	0,09	0,10	0,09	0,10	0,11	0,12	0,14	0,16	0,17	0,20	0,20	0,21	0,21	0,03	0,03	0,03	0,03	0,03
Effective Tax Rate/Tax-Shield Rate	24 %	29 %	29 %	23 %	24 %	24 %	16 %	30 %	28 %	29 %	23 %	23 %	20 %	23 %	16 %	7 %	-120 %	26 %	18 %	24 %

APPENDIX 2.3: ADJUSTED INCOME STATEMENT – NRG YIELD EXAMPLE (EQUAL FOR ALL FIRMS)

Numbers in million dollars	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	31.12.2010	31.12.2011	31.12.2012	31.12.2013	31.12.2014	31.12.2015	31.12.2016
Revenue																				
Excise Taxes Payments (Revenues)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electric Operations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gas Operations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Operations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Steam Operations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Utility Revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	143	164	175	313	583	869	1 021
Other Revenue, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Net Revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	143	164	175	313	583	869	1 021
Cost of sales																				
Purchased Power	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fuel Purchased for Resale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cost of Revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	97	104	108	127	214	312	306
Excise Taxes Payments	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Cost of Sales	-	-	-	-	-	-	-	-	-	-	-	-	-	97	104	108	127	214	312	306
Gross Profit	-	-	-	-	-	-	-	-	-	-	-	-	-	46	60	67	186	369	557	715
Fuel Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations & Maintenance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selling/General/Administrative Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	10	12	13	7	8	12	16
Labor And Related Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Advertising Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Research And Development	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest Expense (Income), Net-Operating, Ttl	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Profit before Special Items	-	-	-	-	-	-	-	-	-	-	-	-	-	36	48	54	179	361	545	699
Purchased R&D Written-Off	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Restructuring Charge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Litigation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Impairment - Assets Held for Use	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	183
Impairment - Assets Held for Sale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Unusual Expense (Income)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	12	1
Unusual Expense (Income)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	12	184
Property And Other Taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Operating Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Operating Expenses, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EBITDA	-	-	-	-	-	-	-	-	-	-	-	-	-	36	48	54	179	357	533	515

Depreciation, Operating	-	-	-	-	-	-	-	-	-	-	-	-	-	16	22	25	51	136	265	297
Amortization of Intangibles, Operating	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amortization of Acquisition Costs, Operating	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Depreciation & Amortization Costs	-	-	-	-	-	-	-	-	-	-	-	-	-	16	22	25	51	136	265	297
EBIT	-	-	-	-	-	-	-	-	-	-	-	-	-	20	26	29	128	221	268	218
Income Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	8	11	13	9	11	48	14
Tax Shield, Net Financial Expenses	-	-	-	-	-	-	-	-	-	-	-	-	-	- 5	- 7	- 4	- 1	- 7	- 36	- 15
Total Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	3	4	9	8	4	12	- 1
Check	-	-	-	-	-	-	-	-	-	-	-	-	-	3	4	9	8	4	12	- 1
NOPAT	-	-	-	-	-	-	-	-	-	-	-	-	-	17	22	20	120	217	256	219
Interest Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	- 11	- 18	- 28	- 35	- 166	- 238	- 274
Interest Income	-	-	-	-	-	-	-	-	-	-	-	-	-	- 1	1	19	22	27	35	37
Total Expense (Interest)	-	-	-	-	-	-	-	-	-	-	-	-	-	12	17	9	13	139	203	237
Gain (Loss) on Sale of Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Allowance for Funds Used During Const.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other, Net - Non-Operating	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	3	2	3
Total Financial	-	-	-	-	-	-	-	-	-	-	-	-	-	- 12	- 16	- 7	- 11	- 136	- 201	- 234
Net Income Before Minority Interest	-	-	-	-	-	-	-	-	-	-	-	-	-	5	6	13	109	81	55	- 15
Minority Interest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- 42	- 48	- 42	82
Equity In Affiliates	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U.S. GAAP Adjustment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Income Before Extraordinary Items	-	-	-	-	-	-	-	-	-	-	-	-	-	5	6	13	67	33	13	67
Total Extraordinary Items	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Adjustments to Net Income	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- 54	- 17	20	- 10
Income Avail to Cmn Shareholders Incl Extra	-	-	-	-	-	-	-	-	-	-	-	-	-	5	6	13	13	16	33	57
Income Avail to Cmn Shareholders Excl Extra	-	-	-	-	-	-	-	-	-	-	-	-	-	5	6	13	13	16	33	57
Basic Weighted Average Shares	-	-	-	-	-	-	-	-	-	-	-	-	-	33	33	33	23	28	84	98
Diluted Weighted Average Shares	-	-	-	-	-	-	-	-	-	-	-	-	-	33	33	33	23	28	84	98
Basic EPS Excluding Extraordinary Items	-	-	-	-	-	-	-	-	-	-	-	-	-	0,15	0,18	0,39	2,91	1,18	0,15	0,68
Income Avail to Cmn Shareholders Incl Extra	-	-	-	-	-	-	-	-	-	-	-	-	-	0,15	0,18	0,39	0,57	0,57	0,39	0,58
Diluted EPS Excluding Extraordinary Items	-	-	-	-	-	-	-	-	-	-	-	-	-	0,15	0,18	0,39	2,91	1,18	0,15	0,68
Diluted EPS Including Extraordinary Items	-	-	-	-	-	-	-	-	-	-	-	-	-	0,15	0,18	0,39	0,57	0,57	0,39	0,58
DPS - Common Stock Primary Issue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,23	1,42	1,02	0,95
Effective Tax Rate/Tax-Shield Rate	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	38 %	40 %	41 %	7 %	5 %	18 %	6 %

APPENDIX 3: ADJUSTED CASH FLOW STATEMENT

APPENDIX 3.1: ADJUSTED CASH FLOW STATEMENT – EXXON MOBIL EXAMPLE (EQUAL FOR ALL FIRMS)

Numbers in million dollars	31.12.1997	31.12.1998	31.12.1999	31.12.2000	31.12.2001	31.12.2002	31.12.2003	31.12.2004	31.12.2005	31.12.2006	31.12.2007	31.12.2008	31.12.2009	31.12.2010	31.12.2011	31.12.2012	31.12.2013	31.12.2014	31.12.2015	31.12.2016
Cash from Operating Activities																				
Net Income/Starting Line	8 460	6 370	7 910	17 720	15 320	11 460	21 510	25 330	36 130	39 500	40 610	45 220	19 658	31 398	42 206	47 681	33 448	33 615	16 551	8 375
Depreciation / Depletion	5 474	5 340	8 304	8 130	7 944	8 310	9 047	9 767	10 253	11 416	12 250	12 379	11 917	14 760	15 583	15 888	17 182	17 297	18 048	22 308
Amortization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred Taxes (CF)	346	408	- 1 439	10	650	297	1 827	- 1 134	- 429	1 717	124	1 399	-	- 1 135	142	3 142	754	1 540	- 1 832	- 4 386
Non-Cash Items	932	- 8	703	- 2 675	951	915	- 3 723	825	- 1 263	- 3 512	- 2 175	- 1 195	- 1 962	- 137	- 2 722	- 12 847	- 2 100	- 1 581	856	- 2 609
Changes in Working Capital	- 536	- 1 054	- 465	- 248	- 1 976	286	- 163	5 763	3 447	165	1 193	1 922	- 1 175	3 527	136	- 2 306	- 4 370	- 5 755	- 3 279	- 1 606
Total Cash from Operating Activities	14 676	11 056	15 013	22 937	22 889	21 268	28 498	40 551	48 138	49 286	52 002	59 725	28 438	48 413	55 345	56 170	44 914	45 116	30 344	22 082
Cash from Investing Activities																				
Capital Expenditures	- 7 393	- 8 359	- 10 849	- 8 446	- 9 989	- 11 437	- 12 859	- 11 986	- 13 839	- 15 462	- 15 387	- 19 318	- 22 491	- 26 871	- 30 975	- 34 271	- 33 669	- 32 952	- 26 490	- 16 163
Other Investing Cash Flow Items, Total	602	367	- 136	5 148	1 778	1 679	2 017	- 2 924	3 569	1 232	5 659	3 819	72	2 667	8 810	8 670	- 532	5 977	2 666	3 760
Total Cash from Investing Activities	- 6 791	- 7 992	- 10 985	- 3 298	- 8 211	- 9 758	- 10 842	- 14 910	- 10 270	- 14 230	- 9 728	- 15 499	- 22 419	- 24 204	- 22 165	- 25 601	- 34 201	- 26 975	- 23 824	- 12 403
Cash from Financing Activities																				
Financing Cash Flow Items	- 436	- 210	- 419	- 478	- 595	- 330	- 677	- 430	- 974	- 270	- 579	- 461	- 156	- 166	- 62	- 7	- 257	- 133	- 168	- 162
Total Cash Dividends Paid	- 4 038	- 4 012	- 5 872	- 6 123	- 6 254	- 6 217	- 6 515	- 6 896	- 7 185	- 7 628	- 7 621	- 8 058	- 8 023	- 8 498	- 9 020	- 10 092	- 10 875	- 11 568	- 12 090	- 12 453
Common Stock Issued (Retired), Net	- 2 246	- 2 652	- 322	- 1 859	- 5 420	- 4 499	- 5 447	- 8 991	- 17 280	- 28 385	- 30 743	- 34 981	- 18 951	- 12 050	- 21 131	- 20 875	- 15 948	- 13 153	- 4 034	- 971
Preferred Stock Issued (Retired), Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Issuance (Retirement) of Stock, Net, Discrete	- 2 698	- 3 040	- 322	- 1 859	- 5 420	- 4 499	- 5 447	- 8 991	- 17 280	- 28 385	- 30 743	- 34 981	- 18 951	- 12 050	- 21 131	- 20 875	- 15 948	- 13 153	- 4 034	- 971
Short Term Debt Issued (Reduced), Net	- 332	1 244	1 721	- 5 042	- 2 813	- 457	- 1 337	- 1 859	- 1 616	- 212	215	- 414	- 310	- 1 129	1 521	- 3 756	11 272	- 1 304	- 1 253	- 7 773
Long Term Debt Issued (Reduced), Net	340	- 68	113	- 663	41	- 150	- 787	- 92	114	285	- 383	- 113	- 157	- 5 081	436	- 848	332	- 5 662	- 8 002	- 12 066
Total Debt Issued	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Debt Reduction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Issuance (Retirement) of Debt, Net, Discrete	460	- 1 564	- 1 834	- 5 705	- 2 772	- 307	- 2 124	- 1 951	- 1 502	- 73	- 598	- 527	- 153	- 6 210	- 1 957	- 2 908	- 11 604	- 6 966	- 9 255	- 4 293
Total Cash from Financing Activities	- 6 712	- 5 698	- 4 779	- 14 165	- 15 041	- 11 353	- 14 763	- 18 268	- 26 941	- 36 210	- 38 345	- 44 027	- 27 283	- 26 924	- 28 256	- 33 868	- 15 476	- 17 888	- 7 037	- 9 293
Foreign Exchange Effects	- 77	- 28	- 53	- 82	- 170	- 525	- 504	- 532	- 787	- 727	- 1 808	- 2 743	- 520	- 153	- 85	- 217	- 175	- 281	- 394	- 434
Net Change in Cash	1 096	- 2 606	- 698	- 5 392	- 533	- 682	- 3 397	- 7 905	- 10 140	- 427	- 5 737	- 2 544	- 20 744	- 2 868	- 4 839	- 3 082	- 4 938	- 28	- 911	- 48
Net Cash - Beginning Balance	2 951	4 047	2 386	1 688	7 080	6 547	7 229	10 626	18 531	28 671	28 244	33 981	31 437	10 693	7 825	12 664	9 582	4 644	4 616	3 705
Net Cash - Ending Balance	4 047	1 441	1 688	7 080	6 547	7 229	10 626	18 531	28 671	28 244	33 981	31 437	10 693	7 825	12 664	9 582	4 644	4 616	3 705	3 657
Free Cash Flow	4 320	112	2 597	11 706	7 306	5 011	7 508	22 729	24 762	24 105	24 842	23 096	- 629	9 977	7 797	9 259	- 4 819	- 5 343	- 4 253	5 881

APPENDIX 3.2: ADJUSTED CASH FLOW STATEMENT – IBERDROLA EXAMPLE (EQUAL FOR ALL FIRMS)

Numbers in million dollars	31.12.1997	31.12.1998	31.12.1999	31.12.2000	31.12.2001	31.12.2002	31.12.2003	31.12.2004	31.12.2005	31.12.2006	31.12.2007	31.12.2008	31.12.2009	31.12.2010	31.12.2011	31.12.2012	31.12.2013	31.12.2014	31.12.2015	31.12.2016
Cash from Operating Activities																				
Net Income/Starting Line	-	-	-	1 422	1 594	1 439	2 001	2 042	1 958	2 386	3 099	3 864	3 657	3 841	3 454	3 075	1 190	3 202	2 987	3 747
Depreciation / Depletion	-	-	-	-	-	-	-	-	1 351	1 395	1 939	2 318	2 547	2 923	3 260	3 662	5 253	3 448	3 803	3 363
Amortization	-	-	-	- 52	- 88	- 116	- 0	- 62	- 12	29	2 233	-	-	-	-	-	-	-	-	-
Deferred Taxes (CF)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Cash Items	-	-	-	- 329	- 498	26	- 986	- 259	15	0	706	881	303	177	630	917	595	122	150	65
Changes in Working Capital	-	-	-	- 379	- 359	1 980	- 800	1 437	- 1 387	- 675	1 316	665	- 27	978	- 1 232	- 674	- 1 143	28	- 679	- 455
Total Cash from Operating Activities	-	-	-	662	649	3 329	215	3 158	1 926	3 135	9 292	7 728	6 481	7 919	6 112	6 980	5 896	6 800	6 260	6 720
Cash from Investing Activities																				
Capital Expenditures	-	-	-	- 835	- 1 972	- 2 314	- 1 913	- 2 235	- 2 107	- 2 489	- 5 212	- 7 422	- 5 146	- 5 550	- 4 545	- 4 479	- 4 017	- 3 566	- 4 092	- 5 018
Other Investing Cash Flow Items, Total	-	-	-	- 719	- 14	1 053	1 482	45	- 250	- 166	- 11 664	- 5 924	- 233	- 27	342	1 070	889	1 214	- 316	192
Total Cash from Investing Activities	-	-	-	- 1 554	- 1 986	- 1 261	- 432	- 2 191	- 2 357	- 2 655	- 16 876	- 13 346	- 5 379	- 5 578	- 4 203	- 3 409	- 3 128	- 2 352	- 4 408	- 4 826
Cash from Financing Activities																				
Financing Cash Flow Items	-	-	-	32	22	163	1	43	- 506	- 564	- 974	8 026	- 765	- 1 598	- 1 625	- 2 015	- 786	- 918	- 953	- 1 720
Total Cash Dividends Paid	-	-	-	- 454	- 497	- 537	- 573	- 642	- 729	- 873	- 1 264	- 1 469	- 2 367	-	- 1 190	- 178	- 184	- 187	- 187	- 187
Common Stock Issued (Retired), Net	-	-	-	-	-	-	-	-	-	-	7 677	223	- 1 777	- 58	265	- 127	- 370	- 748	- 849	- 1 371
Preferred Stock Issued (Retired), Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Issuance (Retirement) of Stock, Net, Discrete	-	-	-	-	-	-	-	-	-	-	6 344	352	- 1 777	- 58	265	- 127	- 370	- 748	- 849	- 1 371
Short Term Debt Issued (Reduced), Net	-	-	-	-	-	-	-	-	- 932	121	1 593	-	-	-	-	-	-	-	-	-
Long Term Debt Issued (Reduced), Net	-	-	-	1 302	- 1 847	- 1 653	802	- 372	2 666	1 342	1 009	-	- 855	245	654	- 184	- 2 611	- 2 179	- 519	1 601
Total Debt Issued	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Debt Reduction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Issuance (Retirement) of Debt, Net, Discrete	-	-	-	1 302	- 1 847	- 1 653	802	- 372	1 734	1 463	3 936	- 130	- 855	245	654	- 184	- 2 611	- 2 179	- 519	1 601
Total Cash from Financing Activities	-	-	-	880	1 372	- 2 027	229	- 971	499	26	8 041	6 780	- 2 210	- 1 411	- 1 895	- 2 504	- 3 951	- 4 031	- 2 507	- 1 676
Foreign Exchange Effects	-	-	-	-	-	-	-	-	7	- 11	- 181	- 56	112	81	- 25	- 114	- 152	57	3	61
Net Change in Cash	-	-	-	- 12	35	41	13	- 4	74	496	276	1 106	- 996	1 011	- 11	953	- 1 335	474	- 652	279
Net Cash - Beginning Balance	-	-	-	-	-	-	-	-	134	208	705	981	2 087	1 091	2 102	2 091	3 044	1 332	1 806	1 153
Net Cash - Ending Balance	-	-	-	-	-	-	-	-	208	705	981	2 087	1 091	2 102	2 091	3 044	1 709	1 806	1 153	1 433
Free Cash Flow	978	969	937	- 296	- 1 168	1 021	- 1 316	664	- 445	219	3 270	- 1 072	1 165	2 281	1 438	2 679	3 952	3 015	2 334	1 540

APPENDIX 3.3: ADJUSTED CASH FLOW STATEMENT – NRG YIELD EXAMPLE (EQUAL FOR ALL FIRMS)

Numbers in million dollars	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	31.12.2010	31.12.2011	31.12.2012	31.12.2013	31.12.2014	31.12.2015	31.12.2016
Cash from Operating Activities																				
Net Income/Starting Line	-	-	-	-	-	-	-	-	-	-	-	-	-	5	6	13	109	81	55	- 15
Depreciation / Depletion	-	-	-	-	-	-	-	-	-	-	-	-	-	15	22	25	51	136	265	300
Amortization	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	17	54	75
Deferred Taxes (CF)	-	-	-	-	-	-	-	-	-	-	-	-	-	3	4	9	8	4	12	- 1
Non-Cash Items	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	7	- 25	16	9	202
Changes in Working Capital	-	-	-	-	-	-	-	-	-	-	-	-	-	18	- 6	- 5	- 3	- 31	- 22	- 1
Total Cash from Operating Activities	-	-	-	-	-	-	-	-	-	-	-	-	-	42	28	50	141	223	373	560
Cash from Investing Activities																				
Capital Expenditures	-	-	-	-	-	-	-	-	-	-	-	-	-	- 65	- 372	- 558	- 238	- 33	- 29	- 20
Other Investing Cash Flow Items, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	- 119	- 92	- 29	- 150	- 1 035	- 1 089	- 141
Total Cash from Investing Activities	-	-	-	-	-	-	-	-	-	-	-	-	-	- 184	- 464	- 587	- 388	- 1 068	- 1 118	- 161
Cash from Financing Activities																				
Financing Cash Flow Items	-	-	-	-	-	-	-	-	-	-	-	-	-	29	228	- 271	- 541	- 48	- 71	- 115
Total Cash Dividends Paid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- 15	- 101	- 139	- 183
Common Stock Issued (Retired), Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	468	630	599	-
Preferred Stock Issued (Retired), Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Issuance (Retirement) of Stock, Net, Discrete	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	468	630	599	-
Short Term Debt Issued (Reduced), Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Long Term Debt Issued (Reduced), Net	-	-	-	-	-	-	-	-	-	-	-	-	-	185	200	264	349	696	- 104	105
Total Debt Issued	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Debt Reduction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Issuance (Retirement) of Debt, Net, Discrete	-	-	-	-	-	-	-	-	-	-	-	-	-	185	200	264	349	696	- 104	105
Total Cash from Financing Activities	-	-	-	-	-	-	-	-	-	-	-	-	-	156	428	535	261	1 177	427	- 193
Foreign Exchange Effects	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Change in Cash	-	-	-	-	-	-	-	-	-	-	-	-	-	14	- 8	2	14	332	- 318	206
Net Cash - Beginning Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	18	32	24	22	59	429	111
Net Cash - Ending Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	32	24	22	36	391	111	317
Free Cash Flow	-	-	-	-	-	-	-	-	-	-	-	-	-	- 14	- 333	- 517	69	306	524	573

APPENDIX 4: TOTAL LEVERAGE

Total Debt & Liabilities/Total Assets		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Oil and gas	BP	57 %	51 %	52 %	49 %	47 %	56 %	57 %	60 %	61 %	61 %	60 %	60 %	57 %	65 %	62 %	61 %	58 %	61 %	63 %	64 %
	Chevron	51 %	53 %	56 %	52 %	56 %	59 %	55 %	51 %	50 %	48 %	48 %	46 %	44 %	43 %	42 %	41 %	41 %	42 %	43 %	44 %
	Conoco	65 %	70 %	70 %	70 %	59 %	62 %	58 %	54 %	51 %	50 %	50 %	61 %	59 %	56 %	57 %	59 %	56 %	55 %	59 %	61 %
	Eni	66 %	61 %	60 %	60 %	55 %	58 %	58 %	54 %	56 %	56 %	60 %	62 %	61 %	61 %	61 %	58 %	58 %	59 %	62 %	57 %
	Exxon	55 %	53 %	56 %	53 %	49 %	51 %	48 %	48 %	47 %	48 %	50 %	50 %	53 %	51 %	53 %	50 %	50 %	50 %	49 %	49 %
	Shell	0 %	0 %	0 %	0 %	0 %	61 %	57 %	53 %	59 %	55 %	54 %	55 %	53 %	54 %	51 %	48 %	50 %	51 %	52 %	55 %
	Statoil	71 %	72 %	76 %	73 %	77 %	72 %	68 %	66 %	63 %	61 %	63 %	63 %	65 %	66 %	64 %	59 %	60 %	61 %	63 %	66 %
	Total	56 %	55 %	66 %	63 %	61 %	62 %	62 %	63 %	62 %	62 %	60 %	59 %	59 %	58 %	59 %	58 %	58 %	61 %	59 %	57 %
RE Corps	ABG	76 %	81 %	83 %	84 %	85 %	87 %	86 %	86 %	88 %	93 %	92 %	96 %	94 %	93 %	93 %	95 %	94 %	94 %	100 %	0 %
	AES	83 %	83 %	87 %	84 %	85 %	101 %	98 %	97 %	94 %	90 %	91 %	89 %	88 %	84 %	87 %	89 %	89 %	89 %	91 %	92 %
	Dong	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	70 %	71 %	74 %	73 %	69 %	63 %	69 %	62 %
	Eon	73 %	73 %	73 %	74 %	75 %	77 %	73 %	71 %	65 %	62 %	64 %	78 %	74 %	73 %	77 %	75 %	74 %	80 %	86 %	0 %
	EDF	0 %	0 %	0 %	89 %	90 %	90 %	87 %	88 %	89 %	87 %	85 %	88 %	88 %	87 %	87 %	90 %	87 %	87 %	88 %	88 %
	EDPR	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	71 %	46 %	54 %	59 %	59 %	59 %	57 %	60 %	62 %	63 %
	EKTG	0 %	0 %	90 %	57 %	56 %	59 %	50 %	49 %	70 %	74 %	77 %	81 %	81 %	84 %	85 %	91 %	89 %	89 %	87 %	0 %
	Engie	0 %	84 %	82 %	76 %	74 %	68 %	70 %	69 %	68 %	62 %	61 %	65 %	65 %	66 %	71 %	71 %	70 %	70 %	73 %	0 %
	IBE	55 %	57 %	57 %	61 %	66 %	66 %	66 %	67 %	70 %	68 %	62 %	73 %	70 %	69 %	66 %	65 %	62 %	62 %	64 %	65 %
	IGY	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	71 %	70 %	71 %	0 %
	NPI	32 %	4 %	4 %	4 %	4 %	30 %	11 %	36 %	31 %	27 %	38 %	38 %	58 %	57 %	70 %	72 %	71 %	83 %	87 %	89 %
	NRG	0 %	55 %	74 %	76 %	83 %	106 %	74 %	69 %	71 %	73 %	74 %	73 %	66 %	69 %	71 %	71 %	71 %	75 %	91 %	93 %
	SSO	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	77 %	79 %	97 %	87 %	90 %	90 %
	SUNEQ	61 %	78 %	75 %	81 %	104 %	104 %	73 %	56 %	38 %	34 %	30 %	29 %	39 %	51 %	85 %	88 %	97 %	98 %	0 %	0 %
	Terna	0 %	0 %	0 %	0 %	0 %	0 %	0 %	68 %	69 %	74 %	35 %	38 %	42 %	47 %	60 %	69 %	68 %	71 %	72 %	0 %
YieldCo	Atlantica	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	66 %	78 %	78 %	82 %	82 %
	HASI	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	100 %	100 %	88 %	91 %	92 %	74 %	73 %	71 %	67 %
	HWAG	0 %	25 %	73 %	45 %	69 %	73 %	100 %	67 %	3 %	2 %	1 %	1 %	16 %	65 %	72 %	73 %	66 %	76 %	81 %	0 %
	NEP	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	70 %	73 %	80 %	85 %	76 %
	NYLDA	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	80 %	60 %	56 %	73 %	79 %	76 %	78 %
	PEGI	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	74 %	75 %	75 %	78 %	78 %	74 %
	SAY	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	84 %	80 %	65 %	75 %
	TERP	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	81 %	100 %	86 %	86 %	0 %
	TRIG	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Count Oil and Gas		7	7	7	7	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Count Renewables		6	8	9	10	10	10	10	11	11	11	12	12	13	13	14	14	15	15	14	8
Count YieldCos		0	1	1	1	1	1	1	1	1	1	1	2	2	3	4	7	9	9	9	7
Mean Oil and Gas		60 %	59 %	62 %	60 %	58 %	60 %	58 %	56 %	56 %	55 %	56 %	57 %	56 %	57 %	56 %	54 %	54 %	55 %	56 %	57 %
Mean Renewables		63 %	64 %	70 %	68 %	72 %	79 %	69 %	69 %	68 %	68 %	65 %	66 %	68 %	70 %	76 %	78 %	78 %	79 %	81 %	80 %
Mean YieldCos		0 %	25 %	73 %	45 %	69 %	73 %	100 %	67 %	3 %	2 %	1 %	50 %	58 %	78 %	74 %	73 %	69 %	70 %	69 %	65 %
Median Oil and Gas		0 %	55 %	60 %	60 %	56 %	60 %	58 %	54 %	57 %	55 %	57 %	59 %	58 %	57 %	58 %	58 %	57 %	57 %	59 %	57 %
Median Renewables		67 %	75 %	75 %	76 %	79 %	82 %	73 %	69 %	70 %	73 %	67 %	73 %	70 %	69 %	75 %	74 %	71 %	80 %	86 %	88 %
Median YieldCos															80 %	73 %	73 %	74 %	78 %	78 %	75 %
Min Oil and Gas		51 %	51 %	52 %	49 %	47 %	51 %	48 %	48 %	47 %	48 %	48 %	46 %	44 %	43 %	42 %	41 %	41 %	42 %	43 %	44 %
Max Oil and Gas		71 %	72 %	76 %	73 %	77 %	72 %	68 %	66 %	63 %	62 %	63 %	63 %	65 %	66 %	64 %	61 %	60 %	61 %	63 %	66 %
Min Renewables		32 %	4 %	4 %	4 %	4 %	30 %	11 %	36 %	31 %	27 %	30 %	29 %	39 %	47 %	59 %	59 %	57 %	60 %	62 %	62 %
Max Renewables		83 %	84 %	90 %	89 %	104 %	106 %	98 %	97 %	94 %	93 %	92 %	96 %	94 %	93 %	93 %	95 %	97 %	98 %	100 %	93 %
Min YieldCos		0 %	25 %	73 %	45 %	69 %	73 %	100 %	67 %	3 %	2 %	1 %	1 %	16 %	65 %	60 %	56 %	0 %	0 %	0 %	0 %
Max YieldCos		0 %	25 %	73 %	45 %	69 %	73 %	100 %	67 %	3 %	2 %	1 %	100 %	100 %	88 %	91 %	92 %	100 %	86 %	86 %	82 %

APPENDIX 5: KEY DIFFERENCES IN PROJECT FINANCE AND CORPORATE FINANCE

Category	Corporate Finance	Project Finance
Financing Vehicle	Multi-purpose organization	Single-purpose entity
Type of capital	Permanent - indefinite time horizon for equity	Finite - time horizon matches life of the project
Dividend policy and reinvestment decisions	Corporate management makes decision autonomous from investors and creditors	Fixed dividend policy - immdediate payout - generally reinvestment allowed
Capital investment decisions	Opaque to creditors	Highly transparent to creditors
Financial structures	Easily duplicated - common forms	Highly tailored structures which cannot generally be re-applied
Transaction costs for financing	Low costs due to competition from providers, routinized mechanisms and short turnaround time	Relatively higher costs due to documentation and longer gestation period
Cost of capital	Relatively lower	Relatively higher
Basis for credit evaluation	Overall financial health of corporate entity - focus on balance sheet and cashflow	Technical and economic feasibility - focus on project's assets, cash flow and contractual arrangements
Investor/lender pool	Typically broader participation - deep secondary markets	Typically smaller group - limited secondary markets

Source: Comer (1996) / Own Contribution

APPENDIX 6: FIRM SPECIFIC KEY METRICS AND CHARTS

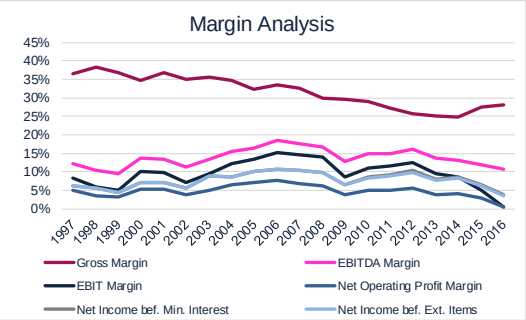
APPENDIX 6.1: FIRM SPECIFIC KEY METRICS – EXXON MOBILE EXAMPLE (EQUAL FOR ALL FIRMS)

Date	31.12.1997	31.12.1998	31.12.1999	31.12.2000	31.12.2001	31.12.2002	31.12.2003	31.12.2004	31.12.2005	31.12.2006	31.12.2007	31.12.2008	31.12.2009	31.12.2010	31.12.2011	31.12.2012	31.12.2013	31.12.2014	31.12.2015	31.12.2016
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Simple DuPont																				
Profit Margin	6,3%	5,6%	4,3%	7,0%	7,2%	5,5%	8,8%	8,7%	10,1%	10,8%	10,4%	9,8%	6,4%	8,2%	8,8%	9,9%	7,7%	8,3%	6,2%	3,6%
Net Operating Asset Turnover		2,3	2,8	2,9	2,7	2,6	2,8	3,2	3,9	4,0	4,1	4,9	3,0	2,8	3,0	2,8	2,4	2,1	1,3	1,1
Equity multiplier		2,1	2,2	2,1	1,9	1,9	1,9	1,8	1,7	1,6	1,7	1,7	1,9	2,0	2,0	2,0	1,9	1,9	1,9	1,9
ROE - DuPont		26,8%	26,4%	43,3%	37,8%	27,0%	47,2%	49,9%	66,4%	70,5%	72,0%	83,1%	36,2%	46,5%	53,4%	55,6%	36,1%	33,2%	15,8%	7,5%
Advanced Dupont																				
Return on Net Operating Assets		8,3%	8,7%	15,8%	14,7%	10,1%	13,8%	21,3%	27,4%	30,3%	28,1%	30,0%	11,1%	14,1%	14,7%	15,8%	9,2%	8,5%	3,8%	0,7%
Net Borrowing Cost		-34,1%	-20,7%	-34,9%	-71,2%	-42,9%	-341,8%	76,4%	45,8%	31,2%	37,9%	43,8%	55,3%	-351,4%	-260,3%	-5098,3%	-341,8%	-82,6%	-29,3%	-13,4%
Spread		42,5%	29,3%	50,7%	85,8%	53,0%	355,5%	-55,1%	-18,5%	-0,9%	-9,8%	-13,8%	-44,2%	365,5%	275,1%	5114,1%	351,0%	91,1%	33,1%	14,1%
ROE - RNOA*Leverage*Spread		97,3%	72,1%	122,4%	180,8%	111,3%	681,7%	-76,6%	-3,6%	28,9%	11,4%	6,3%	-71,6%	748,3%	574,6%	10184,7%	685,2%	185,2%	67,8%	27,8%
Return																				
Return on Equity		14,7%	14,8%	23,8%	21,0%	14,9%	25,5%	26,4%	33,9%	35,1%	34,5%	38,5%	17,3%	23,7%	27,3%	28,0%	19,2%	18,7%	9,4%	4,6%
Return on Invested Capital		8,3%	8,7%	15,8%	14,7%	10,1%	13,8%	21,3%	27,4%	30,3%	28,1%	30,0%	11,1%	14,1%	14,7%	15,8%	9,2%	8,5%	3,8%	0,7%
Margin Analysis																				
Gross Margin	36,5%	38,2%	36,7%	34,6%	36,8%	34,9%	35,6%	34,9%	32,4%	33,7%	32,6%	30,0%	29,8%	29,1%	27,1%	25,8%	25,1%	24,8%	27,4%	28,1%
EBITDA Margin	12,3%	10,5%	9,4%	13,8%	13,5%	11,3%	13,3%	15,4%	16,3%	18,4%	17,7%	16,8%	12,7%	14,8%	14,9%	15,9%	13,7%	13,0%	11,9%	10,6%
EBIT Margin	8,2%	5,9%	4,8%	10,2%	9,7%	7,1%	9,5%	12,1%	13,4%	15,3%	14,5%	14,1%	8,7%	10,8%	11,6%	12,4%	9,6%	8,6%	5,0%	0,4%
Net Operating Profit Margin	5,0%	3,6%	3,1%	5,4%	5,4%	3,9%	4,8%	6,6%	6,9%	7,7%	6,9%	6,1%	3,7%	5,0%	4,9%	5,6%	3,8%	4,1%	2,9%	0,6%
Net Income bef. Min. Interest	6,3%	5,6%	4,3%	7,0%	7,2%	5,5%	8,8%	8,7%	10,1%	10,8%	10,4%	9,8%	6,5%	8,5%	9,0%	10,5%	7,9%	8,5%	6,4%	3,8%
Net Income bef. Ext. Items	6,3%	5,6%	4,3%	7,0%	7,2%	5,5%	8,8%	8,7%	10,1%	10,8%	10,4%	9,8%	6,4%	8,2%	8,8%	9,9%	7,7%	8,3%	6,2%	3,6%
Turnover Analysis																				
Net Operating Asset Turnover		2,3	2,8	2,9	2,7	2,6	2,8	3,2	3,9	4,0	4,1	4,9	3,0	2,8	3,0	2,8	2,4	2,1	1,3	1,1
Net Working Capital turnover		171,5	167,1	182,4	104,4	85,5	127,6	150,1	314,9	1 321,8	-192,8	-84,3	-51,7	-53,3	-51,4	-60,0	-122,7	6 408,2	107,4	57,1
PP&E Turnover		1,8	2,3	2,5	2,3	2,2	2,4	2,7	3,3	3,3	3,3	3,8	2,3	2,2	2,3	2,1	1,8	1,6	1,0	0,9
Ratio Analysis																				
Current Ratio	1,02	1,06	1,04	1,04	1,10	1,07	1,05	1,05	1,00	1,01	0,92	0,86	0,89	0,85	0,86	0,91	0,98	1,02	1,11	1,12
Quick Ratio	0,88	0,72	0,74	0,94	0,99	0,98	1,04	1,11	1,26	1,21	1,26	1,20	0,77	0,67	0,74	0,74	0,68	0,69	0,67	0,74
Cash Burn Rate	1,33	1,61	2,61	1,29	1,28	1,98	1,55	1,25	1,16	1,02	1,24	0,87	1,46	1,00	0,95	0,89	1,09	1,10	2,18	31,78
EBIT Interest Coverage Ratio	-6,60	-3,02	-3,84	-6,28	-5,38	-8,60	-5,40	-8,12	-6,80	-8,83	-6,66	-6,21	-3,98	-3,85	-3,60	-3,84	-2,90	-2,61	-1,76	-0,22
EBITDA Interest Coverage Ratio	-9,84	-5,38	-7,45	-8,47	-7,49	-13,59	-7,57	-10,38	-8,25	-10,63	-8,10	-7,40	-5,79	-5,27	-4,63	-4,92	-4,13	-3,94	-4,22	-5,34

Multiples																				
P/E	17,77	27,57	35,41	18,84	17,72	21,26	12,85	12,95	9,53	11,11	12,42	8,78	16,72	11,95	9,77	8,68	13,47	11,94	20,06	47,75
PEG Ratio	-	335,81	- 256,00	18,43	- 413,66	- 82,97	13,61	55,12	20,25	70,46	123,49	45,38	- 30,82	21,19	27,60	57,36	- 56,17	396,85	- 40,67	- 93,21
P/B	3,44	4,06	4,41	4,26	3,66	3,14	2,99	3,22	3,10	3,86	4,14	3,52	2,92	2,48	2,60	2,35	2,52	2,23	1,90	2,24
P/S	1,11	1,54	1,53	1,32	1,28	1,16	1,14	1,13	0,96	1,20	1,29	0,86	1,07	0,98	0,86	0,86	1,04	0,99	1,25	1,71
EV/EBITDA	9,42	15,23	17,20	9,77	9,61	10,49	8,50	7,09	5,54	6,23	6,96	4,86	8,41	6,76	5,82	5,34	7,84	7,94	11,46	17,59
EV/EBIT	14,06	27,18	33,35	13,17	13,36	16,56	11,93	9,06	6,72	7,50	8,46	5,80	12,24	9,25	7,50	6,84	11,18	11,97	27,51	436,76
EV/IC	3,15	3,62	3,76	3,99	3,51	3,04	3,02	3,47	3,58	4,46	4,95	4,15	2,94	2,41	2,55	2,38	2,42	2,10	1,76	2,03
Payout Ratio DPS/EPS (Total Di	57 %	64 %	75 %	35 %	41 %	55 %	30 %	27 %	20 %	19 %	19 %	18 %	42 %	28 %	22 %	22 %	33 %	36 %	75 %	159 %
Dividend Yield	2,7%	2,3%	2,1%	2,0%	2,3%	2,7%	2,4%	2,1%	2,1%	1,7%	1,5%	2,0%	2,5%	2,3%	2,2%	2,6%	2,5%	3,0%	3,7%	3,3%
Market Capitalization	150 339	177 548	280 118	301 240	267 594	234 098	269 288	328 115	344 491	439 013	504 240	397 234	322 334	364 064	401 254	389 648	438 702	388 382	323 960	374 398
Enterprise Value	156 229	184 865	295 074	307 600	271 849	237 617	268 207	317 877	323 811	419 116	479 306	374 652	321 077	371 251	405 623	385 855	450 639	408 009	354 418	408 808
Company	**30**	**XOM**																		
Growth Analysis																				
Sustainable Growth Rate		5,4%	3,6%	15,5%	12,3%	5,8%	13,3%	17,8%	24,1%	24,6%	24,3%	27,0%	9,2%	16,2%	19,7%	19,4%	11,7%	10,8%	2,2%	-2,0%
Revenue Year over Year		-10,4%	51,9%	17,8%	-2,5%	-9,0%	20,2%	20,5%	14,4%	5,9%	3,4%	8,2%	-34,8%	20,2%	17,5%	-7,6%	-9,8%	-7,2%	-27,3%	-13,8%
Revenue 3 Year Average				19,8%	22,4%	2,1%	2,9%	10,6%	18,4%	13,6%	7,9%	5,9%	-7,7%	-2,1%	1,0%	10,0%	0,0%	-8,2%	-14,8%	-16,1%
Revenue 5 Year Average						9,6%	15,7%	9,4%	8,7%	10,4%	12,9%	10,5%	-0,6%	0,6%	2,9%	0,7%	-2,9%	2,6%	-6,9%	-13,1%
Operating Income Year over Year		-38,2%	34,0%	118,8%	-7,7%	-30,7%	46,2%	67,1%	29,8%	12,4%	-4,3%	5,0%	-60,4%	66,9%	24,2%	9,9%	-36,7%	0,2%	-53,5%	-82,0%
Operating Income 3 Year Average				38,2%	48,4%	26,8%	2,6%	27,5%	47,7%	36,4%	12,6%	4,4%	-19,9%	3,8%	10,2%	33,7%	-0,9%	-8,9%	-30,0%	-45,1%
Operating Income 5 Year Average						15,2%	32,1%	38,8%	20,9%	25,0%	30,2%	22,0%	-3,5%	3,9%	6,3%	9,1%	0,8%	12,9%	-11,2%	-32,4%
Net Income Year over Year		-23,9%	22,8%	102,1%	-5,5%	-27,1%	90,4%	20,8%	42,6%	9,3%	2,8%	11,4%	-57,4%	58,0%	34,8%	9,3%	-27,4%	-0,2%	-50,3%	-51,5%
Net Income 3 Year Average				33,7%	39,8%	23,2%	19,2%	28,0%	51,3%	24,3%	18,3%	7,8%	-14,4%	4,0%	11,8%	34,0%	5,6%	-6,1%	-26,0%	-34,0%
Net Income 5 Year Average						13,7%	36,5%	36,1%	24,2%	27,2%	33,2%	17,4%	1,8%	4,8%	9,9%	11,2%	3,5%	14,9%	-6,8%	-24,0%
EPS Year over Year		-8,2%	-13,8%	102,2%	-4,3%	-25,6%	94,4%	23,5%	47,1%	15,8%	10,1%	19,4%	-54,2%	56,4%	35,4%	15,1%	-24,0%	3,0%	-49,3%	-51,2%
EPS 3 Year Average				26,7%	28,0%	24,1%	21,5%	30,8%	55,0%	28,8%	24,3%	15,1%	-8,3%	7,2%	12,5%	35,7%	8,9%	-1,9%	-23,4%	-32,5%
EPS 5 Year Average						10,1%	30,6%	38,0%	27,0%	31,0%	38,2%	23,2%	7,6%	9,5%	13,4%	14,4%	5,7%	17,2%	-3,9%	-21,3%

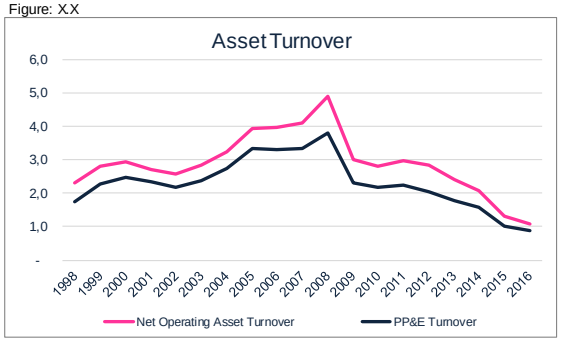
APPENDIX 6.2: FIRM SPECIFIC KEY CHARTS – EXXON MOBILE EXAMPLE (EQUAL FOR ALL FIRMS)

Figure: X.X



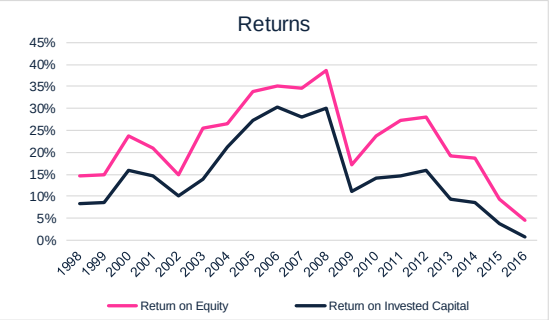
Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



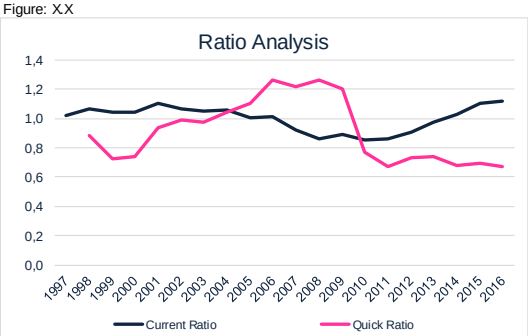
Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



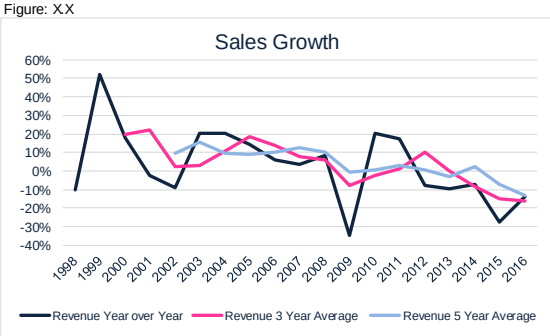
Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



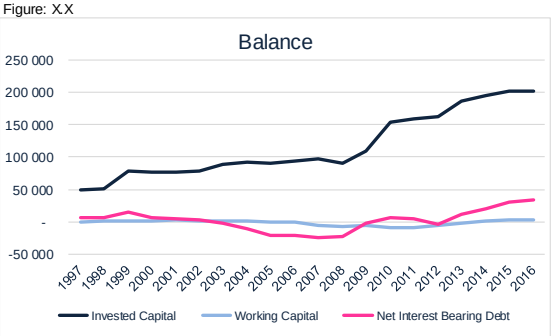
Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



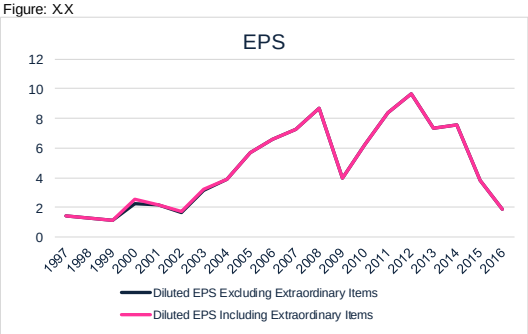
Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



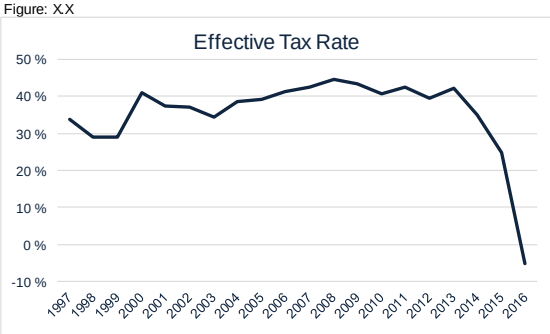
Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



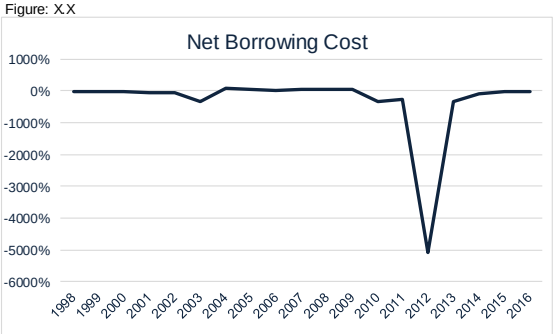
Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



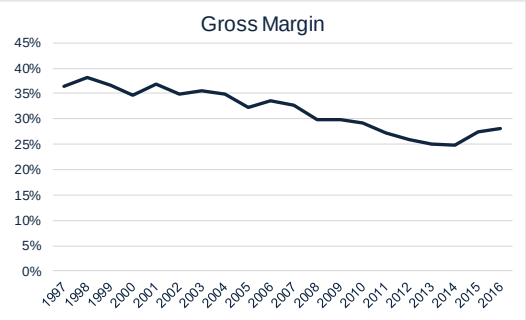
Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



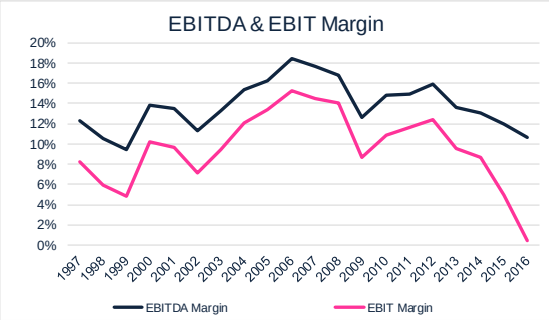
Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



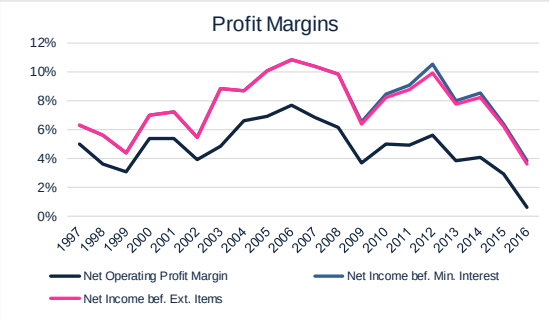
Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



Source: Thomson Reuters Eikon / Own Contribution

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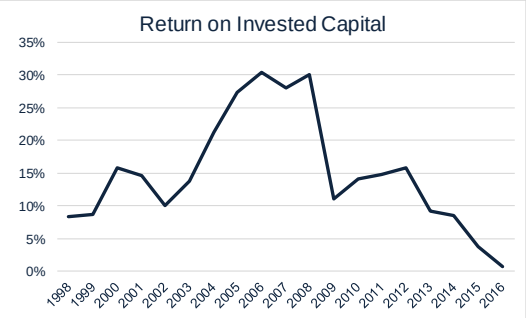
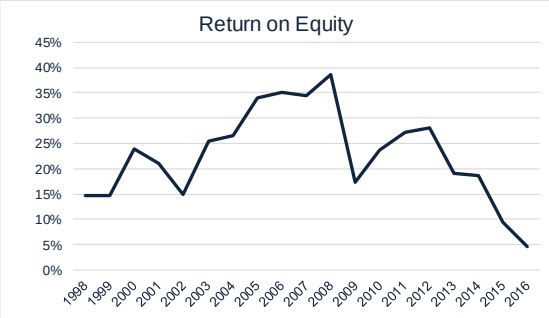


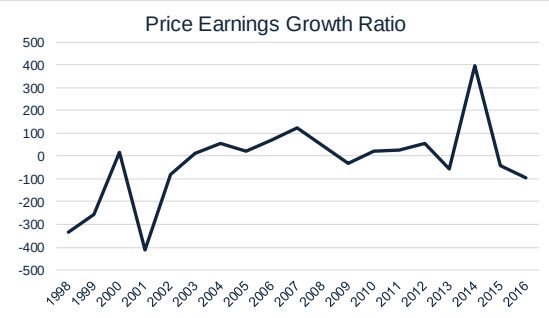
Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X

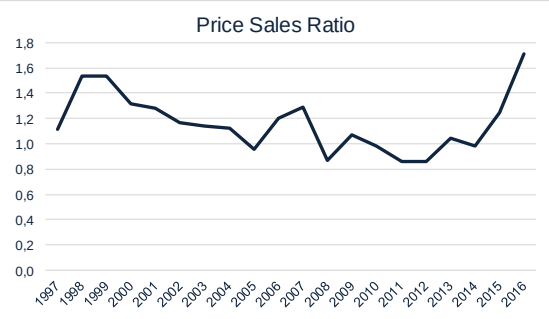


Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X

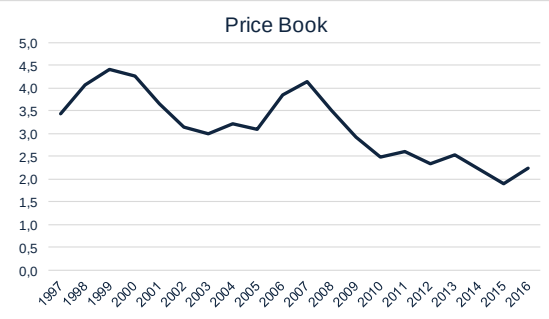
Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



Source: Thomson Reuters Eikon / Own Contribution

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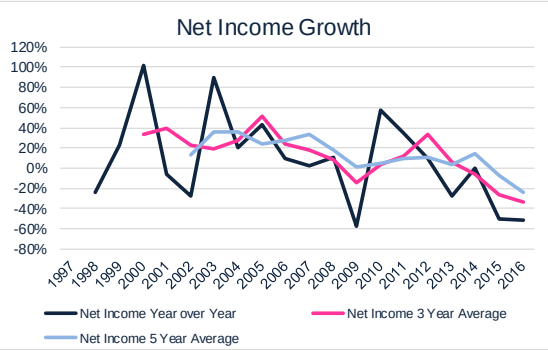

Source: Thomson Reuters Eikon / Own Contribution

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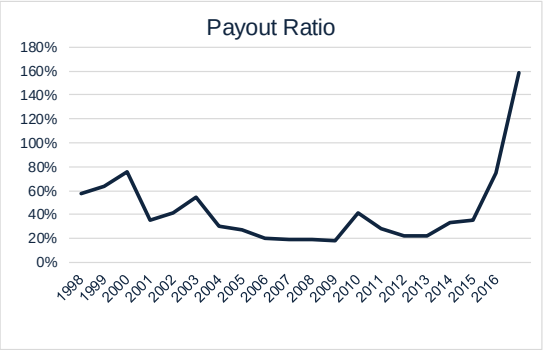
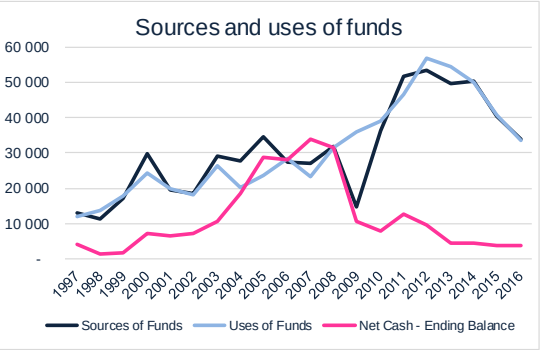


Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X

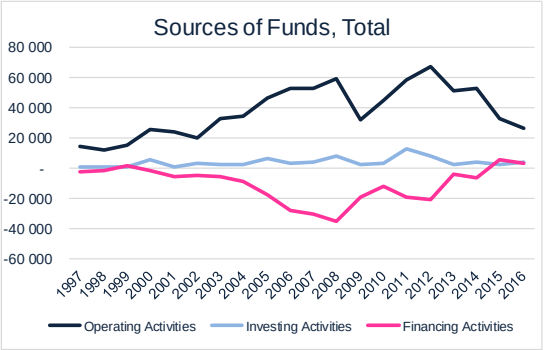


Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X

Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



Source: Thomson Reuters Eikon / Own Contribution

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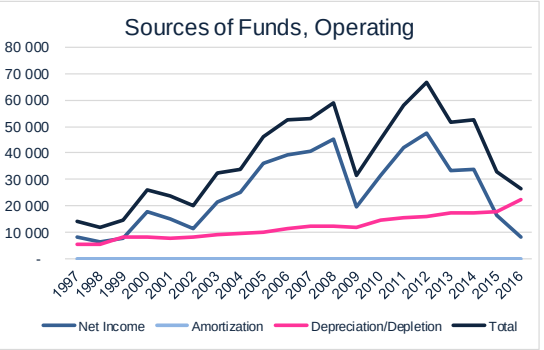
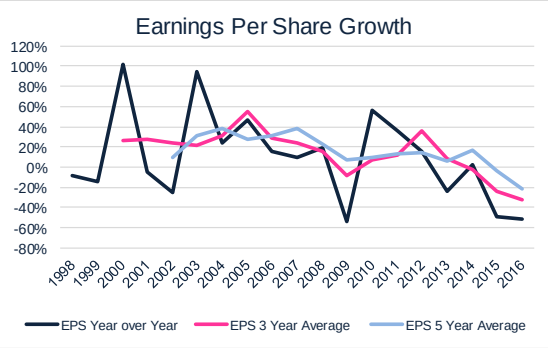


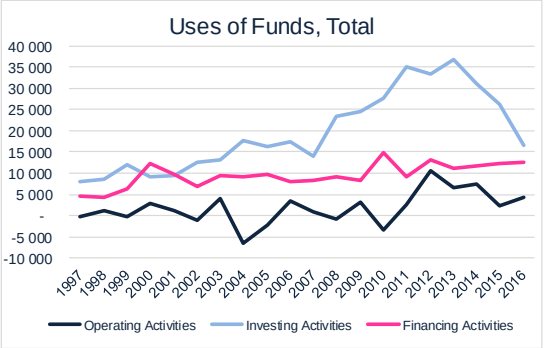
Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



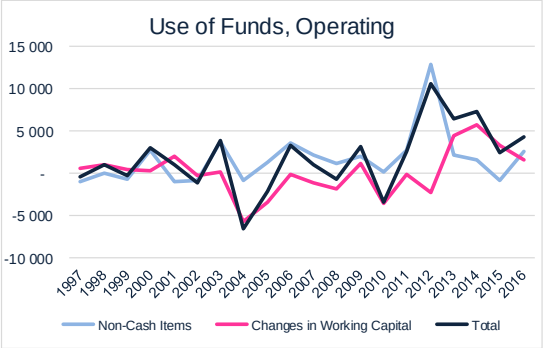
Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



Source: Thomson Reuters Eikon / Own Contribution

Figure: X.X



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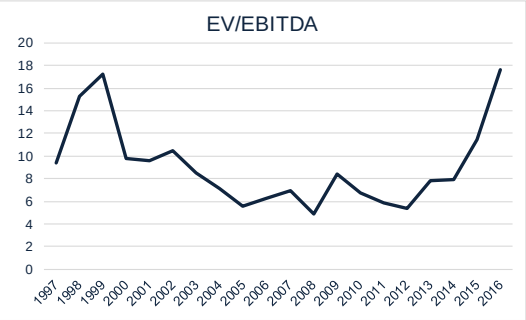

Source: Thomson Reuters Eikon / Own Contribution

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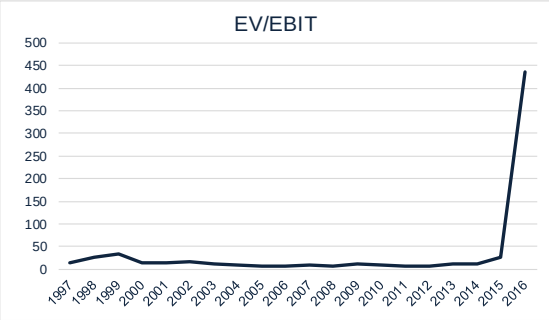

Source: Thomson Reuters Eikon / Own Contribution

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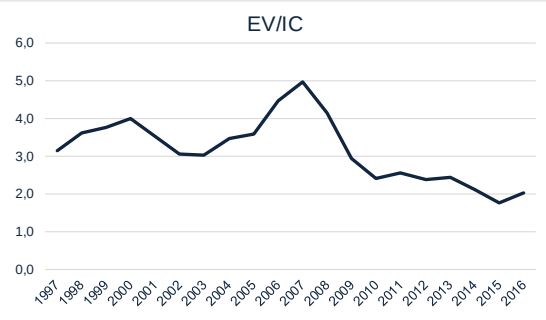

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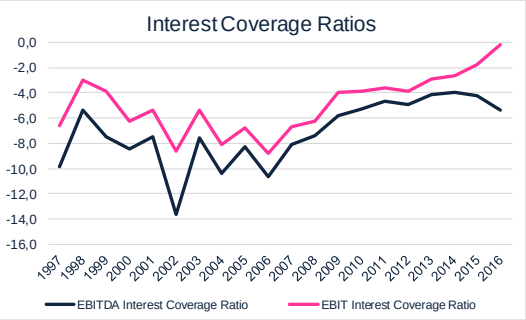

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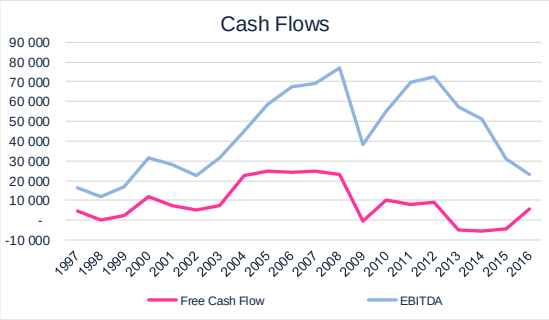

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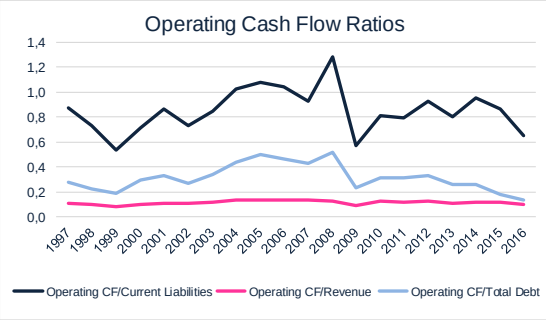

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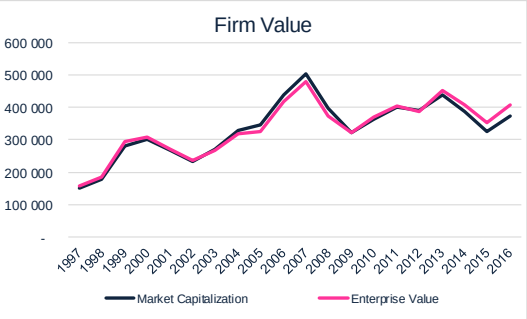

Source: Thomson Reuters Eikon / Own Contribution

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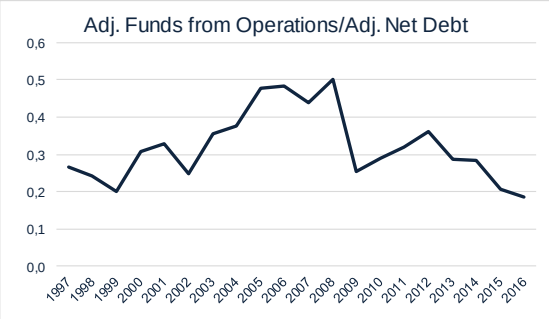

Source: Thomson Reuters Eikon / Own Contribution

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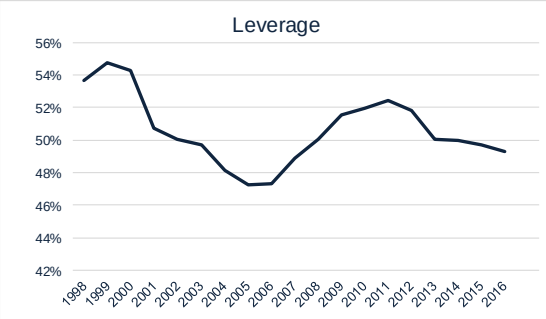

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APPENDIX 7: FIRM SPECIFIC GROSS MARGIN

Gross Margin		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Oil and ga	BP	18 %	32 %	31 %	24 %	15 %	13 %	14 %	15 %	21 %	19 %	19 %	16 %	20 %	4 %	15 %	11 %	12 %	12 %	9 %	11 %
	Chevron	50 %	53 %	49 %	46 %	42 %	42 %	41 %	32 %	29 %	33 %	33 %	32 %	36 %	37 %	35 %	35 %	35 %	36 %	41 %	40 %
	Conoco	24 %	24 %	24 %	30 %	24 %	13 %	15 %	15 %	16 %	21 %	21 %	19 %	16 %	18 %	15 %	45 %	45 %	42 %	35 %	34 %
	Eni	39 %	39 %	39 %	61 %	63 %	66 %	66 %	65 %	55 %	50 %	34 %	30 %	31 %	52 %	46 %	42 %	39 %	39 %	43 %	21 %
	Exxon	36 %	38 %	37 %	35 %	37 %	35 %	36 %	35 %	32 %	34 %	33 %	30 %	30 %	29 %	27 %	26 %	25 %	25 %	27 %	28 %
	Shell						17 %	17 %	16 %	18 %	18 %	17 %	14 %	18 %	16 %	16 %	15 %	15 %	15 %	16 %	18 %
	Statoil	46 %	47 %	41 %	39 %	43 %	39 %	40 %	39 %	40 %	44 %	50 %	50 %	56 %	51 %	52 %	49 %	50 %	50 %	55 %	53 %
	Total	11 %	11 %	13 %	17 %	17 %	16 %	17 %	18 %	24 %	22 %	23 %	31 %	37 %	34 %	32 %	30 %	30 %	29 %	33 %	34 %
RE Corps	ABG	50 %	47 %	48 %	42 %	46 %	41 %	41 %	44 %	43 %	42 %	41 %	35 %	43 %	42 %	28 %	38 %	44 %	40 %	35 %	
	AES	30 %	34 %	31 %	25 %	25 %	22 %	29 %	29 %	29 %	29 %	25 %	23 %	25 %	24 %	24 %	20 %	20 %	18 %	19 %	18 %
	Dong													12 %	19 %	33 %	15 %	25 %	30 %	31 %	27 %
	Eon	15 %	15 %	16 %	15 %	17 %	26 %	23 %	25 %	21 %	19 %	28 %	24 %	25 %	21 %	14 %	13 %	12 %	12 %	11 %	
	EDF	100 %	100 %	100 %	57 %	50 %	47 %	50 %	50 %	82 %	85 %	84 %	84 %	83 %	84 %	85 %	86 %	66 %	66 %	66 %	67 %
	EDPR											78 %	81 %	80 %	80 %	79 %	80 %	84 %	83 %	84 %	85 %
	EKTG			27 %	24 %	19 %	25 %	39 %	59 %	57 %	100 %	52 %	45 %	62 %	66 %	72 %	86 %	57 %	51 %	49 %	
	Engie	40 %	43 %	46 %	35 %	34 %	38 %	38 %	36 %	31 %	28 %	30 %	47 %	48 %	47 %	49 %	46 %	43 %	41 %	44 %	
	IBE	57 %	67 %	47 %	45 %	44 %	43 %	47 %	50 %	37 %	46 %	40 %	33 %	37 %	33 %	32 %	31 %	33 %	35 %	35 %	39 %
	IGY																	19 %	19 %	21 %	
	NPI	61 %	60 %	58 %	58 %	58 %	56 %	56 %	57 %	60 %	60 %	60 %	57 %	59 %	59 %	57 %	64 %	64 %	62 %	69 %	82 %
	NRG	60 %	71 %	46 %	40 %	38 %	34 %	27 %	37 %	24 %	42 %	44 %	48 %	41 %	31 %	26 %	28 %	28 %	26 %	27 %	31 %
	SSO	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	20 %	28 %	90 %	99 %	100 %	100 %
	SUNEQ	13 %	-4 %	-1 %	15 %	-8 %	25 %	30 %	36 %	33 %	45 %	52 %	50 %	11 %	15 %	11 %	13 %	7 %	9 %		
	Terna	0 %	0 %	0 %	0 %	0 %	0 %	0 %	34 %	25 %	34 %	38 %	33 %	34 %	38 %	42 %	39 %	35 %	31 %	34 %	
YieldCo	Atlantica																96 %	93 %	90 %	93 %	93 %
	HASI												100 %	100 %	100 %	100 %	100 %	60 %	63 %	55 %	44 %
	HWAG													100 %	99 %	85 %	85 %	89 %	95 %	99 %	
	NEP																100 %	100 %	100 %	100 %	100 %
	NYLDA														32 %	37 %	38 %	59 %	63 %	64 %	70 %
	PEGI														36 %	48 %	27 %	30 %	31 %	22 %	14 %
	SAY																	105 %	100 %	100 %	100 %
	TERP																90 %	89 %	85 %	81 %	
	TRIG																	92 %	99 %	99 %	100 %
Count Oil and Gas		7	7	7	7	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Count Renewables		11	11	12	12	12	12	12	12	12	12	13	13	14	14	14	14	15	15	14	8
Count YieldCos		0	0	0	0	0	0	0	0	0	0	0	1	2	4	4	7	9	9	9	7
Mean Oil and Gas		32 %	35 %	33 %	36 %	34 %	30 %	31 %	29 %	29 %	30 %	29 %	28 %	30 %	30 %	30 %	32 %	32 %	31 %	32 %	30 %
Mean Renewables		47 %	48 %	42 %	36 %	32 %	36 %	38 %	41 %	40 %	48 %	48 %	47 %	43 %	43 %	41 %	42 %	42 %	41 %	45 %	56 %
Mean YieldCos		0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	100 %	100 %	67 %	67 %	77 %	80 %	81 %	79 %	74 %
Median Oil and Gas		36 %	38 %	37 %	35 %	37 %	26 %	26 %	25 %	27 %	28 %	28 %	30 %	30 %	31 %	29 %	33 %	32 %	33 %	34 %	31 %
Median Renewables		50 %	47 %	46 %	38 %	36 %	36 %	38 %	37 %	33 %	42 %	42 %	46 %	41 %	38 %	33 %	35 %	35 %	35 %	35 %	53 %
Median YieldCos		0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	100 %	100 %	68 %	66 %	90 %	89 %	90 %	93 %	93 %
Min Oil and Gas		11 %	11 %	13 %	17 %	15 %	13 %	14 %	15 %	16 %	18 %	17 %	14 %	16 %	4 %	15 %	11 %	12 %	12 %	9 %	11 %
Max Oil and Gas		50 %	53 %	49 %	61 %	63 %	66 %	66 %	65 %	55 %	50 %	50 %	50 %	56 %	52 %	52 %	49 %	50 %	50 %	55 %	53 %
Min Renewables		13 %	-4 %	-1 %	15 %	-8 %	22 %	23 %	25 %	21 %	19 %	25 %	23 %	11 %	15 %	11 %	13 %	7 %	9 %	11 %	18 %
Max Renewables		100 %	100 %	100 %	58 %	58 %	56 %	56 %	59 %	82 %	100 %	84 %	84 %	83 %	84 %	85 %	86 %	90 %	99 %	100 %	100 %
Min YieldCos		0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	100 %	100 %	32 %	37 %	27 %	30 %	31 %	22 %	14 %
Max YieldCos		0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	100 %	100 %	100 %	100 %	100 %	105 %	100 %	100 %	100 %

APPENDIX 8: FIRM SPECIFIC PROFIT MARGIN

	Profit Margin	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Oil and gas	BP	6 %	4 %	5 %	7 %	5 %	4 %	4 %	5 %	9 %	8 %	7 %	6 %	7 %	-1 %	7 %	3 %	6 %	1 %	-3 %	0 %
	Chevron	8 %	4 %	6 %	10 %	4 %	1 %	6 %	9 %	7 %	8 %	9 %	9 %	6 %	10 %	11 %	11 %	10 %	10 %	4 %	0 %
	Conoco	6 %	2 %	4 %	9 %	6 %	1 %	4 %	6 %	8 %	8 %	6 %	-7 %	3 %	6 %	5 %	13 %	15 %	11 %	-15 %	-15 %
	Eni	8 %	8 %	9 %	9 %	12 %	7 %	8 %	10 %	12 %	11 %	11 %	8 %	5 %	6 %	6 %	3 %	4 %	1 %	-11 %	-2 %
	Exxon	6 %	6 %	4 %	7 %	7 %	5 %	9 %	9 %	10 %	11 %	10 %	10 %	6 %	8 %	9 %	10 %	8 %	8 %	6 %	4 %
	Shell						6 %	6 %	6 %	8 %	8 %	9 %	6 %	4 %	5 %	7 %	6 %	4 %	4 %	1 %	2 %
	Statoil	6 %	2 %	2 %	7 %	7 %	7 %	7 %	8 %	8 %	10 %	8 %	7 %	4 %	7 %	12 %	10 %	6 %	4 %	-8 %	-6 %
	Total	4 %	4 %	5 %	6 %	7 %	6 %	7 %	8 %	10 %	9 %	10 %	7 %	8 %	8 %	7 %	6 %	5 %	2 %	3 %	5 %
RE Corps	ABG	3 %	3 %	2 %	3 %	3 %	3 %	3 %	3 %	3 %	4 %	3 %	3 %	3 %	3 %	2 %	2 %	1 %	2 %	-21 %	
	AES	13 %	13 %	8 %	10 %	5 %	-30 %	4 %	3 %	6 %	1 %	4 %	8 %	5 %	-1 %	3 %	-5 %	2 %	5 %	2 %	0 %
	Dong													2 %	8 %	6 %	-7 %	-2 %	-3 %	-13 %	18 %
	Eon	4 %	3 %	5 %	5 %	4 %	-2 %	9 %	10 %	8 %	8 %	10 %	2 %	10 %	7 %	-2 %	2 %	2 %	-3 %	-6 %	
	EDF	100 %	100 %	100 %	3 %	2 %	1 %	2 %	3 %	6 %	10 %	9 %	5 %	6 %	1 %	5 %	5 %	5 %	5 %	2 %	4 %
	EDPR	0 %										7 %	17 %	15 %	8 %	8 %	10 %	10 %	10 %	11 %	3 %
	EKTG	0 %		8 %	8 %	6 %	6 %	0 %	-13 %	0 %	-11 %	4 %	3 %	-5 %	-8 %	10 %	0 %	12 %	9 %	11 %	
	Engie	3 %	4 %	5 %	3 %	6 %	26 %	7 %	6 %	8 %	8 %	9 %	7 %	6 %	5 %	4 %	2 %	-10 %	3 %	-7 %	
	IBE	13 %	16 %	12 %	12 %	11 %	10 %	11 %	12 %	12 %	15 %	13 %	11 %	12 %	9 %	9 %	8 %	8 %	8 %	8 %	9 %
	IGY	0 %																1 %	3 %	4 %	
	NPI	18 %	28 %	31 %	31 %	30 %	26 %	21 %	30 %	35 %	21 %	-15 %	34 %	17 %	-1 %	-18 %	-3 %	27 %	-14 %	0 %	11 %
	NRG	19 %	23 %	11 %	8 %	9 %	-127 %	130 %	7 %	3 %	10 %	10 %	15 %	11 %	5 %	2 %	7 %	-3 %	1 %	-43 %	-6 %
	SSO	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	3 %	4 %	-27 %	-4 %	8 %	0 %
	SUNEQ	-1 %	-42 %	-22 %	-5 %	-84 %	-1 %	15 %	22 %	23 %	24 %	43 %	19 %	-6 %	2 %	-57 %	-6 %	-29 %	-48 %		
	Terna	0 %	0 %	0 %	0 %	0 %	0 %	0 %	18 %	12 %	18 %	24 %	33 %	22 %	16 %	26 %	11 %	3 %	4 %	9 %	
YieldCo	Atlantica																1 %	-2 %	-9 %	-26 %	-0,5%
	HASI												-7 %	32 %	92 %	-70 %	22 %	-43 %	21 %	14 %	18 %
	HWAG													-2180 %	13 %	-3 %	19 %	23 %	33 %	17 %	
	NEP																17 %	8 %	10 %	2 %	32 %
	NYLDA														3 %	4 %	7 %	21 %	6 %	1 %	7 %
	PEGI														9 %	7 %	-5 %	8 %	-12 %	-10 %	-6 %
	SAY																	-41 %	16 %	7 %	11 %
	TERP																5 %	-2 %	-43 %	-17 %	
	TRIG																	68 %	101 %	107 %	89 %
Count Oil and Gas		7	7	7	7	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Count Renewables		14	11	12	12	12	12	12	12	12	12	13	13	14	14	14	14	15	15	14	8
Count YieldCos		0	0	0	0	0	0	0	0	0	0	0	1	2	4	4	7	9	9	9	7
Mean Oil and Gas		6 %	4 %	5 %	8 %	7 %	5 %	6 %	8 %	9 %	9 %	9 %	6 %	6 %	6 %	8 %	8 %	7 %	5 %	-3 %	-2 %
Mean Renewables		19 %	16 %	16 %	8 %	-1 %	-9 %	20 %	9 %	10 %	10 %	10 %	13 %	8 %	4 %	0 %	2 %	0 %	-1 %	-3 %	5 %
Mean YieldCos		0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	-7 %	-1074 %	29 %	-15 %	9 %	5 %	14 %	11 %	22 %
Median Oil and Gas		6 %	4 %	5 %	7 %	7 %	6 %	6 %	8 %	9 %	9 %	9 %	7 %	6 %	7 %	7 %	8 %	6 %	4 %	-1 %	0 %
Median Renewables		13 %	13 %	8 %	6 %	6 %	2 %	8 %	7 %	8 %	10 %	9 %	9 %	6 %	5 %	4 %	2 %	2 %	3 %	2 %	4 %
Median YieldCos		0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	-7 %	2 %	11 %	1 %	7 %	8 %	10 %	2 %	11 %
Min Oil and Gas		4 %	2 %	2 %	6 %	4 %	1 %	4 %	5 %	7 %	8 %	6 %	-7 %	3 %	-1 %	5 %	3 %	4 %	1 %	-15 %	-15 %
Max Oil and Gas		8 %	8 %	9 %	10 %	12 %	7 %	9 %	10 %	12 %	11 %	11 %	10 %	8 %	10 %	12 %	13 %	15 %	11 %	6 %	5 %
Min Renewables		-1 %	-42 %	-22 %	-5 %	-84 %	-127 %	0 %	-13 %	0 %	-11 %	-15 %	2 %	-6 %	-8 %	-57 %	-7 %	-29 %	-48 %	-43 %	-6 %
Max Renewables		100 %	100 %	100 %	31 %	30 %	26 %	130 %	30 %	35 %	24 %	43 %	34 %	22 %	16 %	26 %	11 %	27 %	10 %	11 %	18 %
Min YieldCos		0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	-7 %	-2180 %	3 %	-70 %	-5 %	-43 %	-43 %	-26 %	-6 %
Max YieldCos		0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	-7 %	32 %	92 %	7 %	22 %	68 %	101 %	107 %	89 %

APPENDIX 9: FIRM SPECIFIC ASSET TURNOVER

Asset Turnover		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Oil and gas	BP		1,96	1,81	2,16	1,87	1,96	2,54	3,03	2,60	2,71	2,57	3,12	2,02	2,52	3,04	2,72	2,63	2,57	1,80	1,48
	Chevron		1,43	1,61	2,28	3,17	2,34	3,04	3,79	3,94	3,38	3,21	3,55	2,00	2,17	2,45	2,05	1,64	1,28	0,76	0,62
	Conoco		1,38	1,52	1,87	1,46	1,57	2,07	2,51	3,01	2,16	1,76	2,58	1,78	2,35	3,12	0,81	0,85	0,78	0,46	0,41
	Eni		1,59	1,45	2,38	1,74	1,72	2,07	2,40	1,94	2,45	2,52	2,62	1,85	1,81	1,77	2,11	2,13	1,86	1,07	0,87
	Exxon		2,29	2,82	2,94	2,71	2,58	2,84	3,23	3,94	3,96	4,09	4,91	3,02	2,81	2,99	2,82	2,42	2,07	1,31	1,08
	Shell						4,33	2,43	3,14	3,63	3,27	3,05	3,59	1,98	2,28	2,64	2,43	2,22	2,13	1,43	1,08
	Statoil		1,51	1,81	2,73	2,98	3,05	3,16	3,33	3,67	3,29	2,97	3,13	1,77	1,79	2,18	1,97	1,61	1,48	0,99	0,86
	Total		1,81	2,72	2,52	2,34	2,32	2,58	3,00	2,60	2,48	2,44	2,80	1,74	1,93	2,24	2,10	1,93	1,78	1,23	1,08
RE Corps	ABG	3,90	3,08	3,16	2,54	1,86	1,91	2,04	2,11	1,89	1,68	1,35	1,19	1,20	1,03	0,95	0,87	0,77	0,82	0,72	
	AES		0,32	0,28	0,37	0,39	0,37	0,45	0,53	0,63	0,68	0,80	0,88	0,71	0,79	0,74	0,74	0,69	0,75	0,66	0,63
	Dong													1,61	0,88	0,90	0,94	0,99	1,09	1,27	1,00
	Eon	3,47	2,84	3,05	3,06	2,50	1,11	1,09	1,15	1,27	1,37	1,24	1,41	1,27	1,51	2,05	2,62	2,64	2,94	4,70	
	EDF				2,21	1,22	1,28	1,09	1,17	1,41	1,77	2,10	2,29	1,43	1,09	1,13	1,19	1,29	1,39	1,40	1,30
	EDPR											0,01	0,12	0,12	0,13	0,13	0,15	0,16	0,14	0,16	0,17
	EKTG			56,68	14,36	4,84	2,39	1,21	0,48	0,45	0,18	0,48	0,64	0,36	0,37	0,62	0,26	0,53	0,65	0,86	
	Engie		5,44	2,97	2,11	1,75	1,35	1,23	1,29	1,50	1,60	1,44	1,30	0,92	0,93	0,95	0,97	1,01	0,99	0,97	
	IBE		0,34	0,48	0,48	0,48	0,53	0,52	0,56	0,61	0,52	0,51	0,52	0,48	0,59	0,57	0,57	0,54	0,50	0,51	0,45
	IGY																	3,24	1,50	1,44	
	NPI	0,17	0,24	0,25	0,28	0,27	0,31	0,25	0,29	0,32	0,34	0,42	0,24	0,22	0,23	0,21	0,26	0,26	0,16	0,18	0,00
	NRG	0,33	0,24	0,52	0,39	0,26	0,33	0,47	0,62	0,64	0,46	0,52	0,65	0,66	0,63	0,42	0,47	0,60	0,60	0,61	0,00
	SSO															2,89	1,37	0,13	0,21	0,22	0,21
	SUNEQ	0,84	0,59	0,54	0,66	0,86	7,33	5,42	3,00	2,01	2,51	2,82	2,32	0,82	1,10	1,28	1,16	0,68	0,50		
	Terna								1,36	0,30	0,53	0,54	0,42	0,28	0,17	0,18	0,21	0,21	0,26	0,30	
YieldCo	Atlantica																0,10	0,06	0,08	0,13	0,14
	HASI												0,06	0,07	0,09	0,04	0,09	0,20	0,31	0,17	0,20
	HWAG													0,00	0,14	0,18	0,15	0,13	0,12	0,12	
	NEP																0,09	0,06	0,13	0,14	0,15
	NYLDA														0,65	0,24	0,14	0,19	0,18	0,15	0,15
	PEGI															0,24	0,08	0,12	0,15	0,15	0,14
	SAY																	0,27	0,16	0,16	0,18
	TERP																0,24	0,06	0,13	0,14	
	TRIG																	0,10	0,06	0,03	0,10

Count Oil and Gas	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Count Renewables	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	8
Count YieldCos	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9

Mean Oil and Gas	0 %	171 %	196 %	241 %	232 %	248 %	259 %	305 %	317 %	296 %	283 %	329 %	202 %	221 %	255 %	213 %	193 %	174 %	113 %	93 %
Mean Renewables	174 %	164 %	755 %	265 %	144 %	169 %	138 %	114 %	100 %	106 %	102 %	100 %	78 %	73 %	93 %	84 %	92 %	83 %	100 %	63 %
Mean YieldCos														29 %	18 %	13 %	13 %	15 %	13 %	15 %

Median Oil and Gas	0 %	159 %	181 %	238 %	234 %	233 %	256 %	308 %	332 %	299 %	277 %	313 %	191 %	223 %	255 %	211 %	203 %	182 %	115 %	97 %
Median Renewables	84 %	46 %	54 %	138 %	104 %	119 %	109 %	115 %	64 %	68 %	67 %	76 %	71 %	79 %	82 %	81 %	68 %	65 %	69 %	54 %
Median YieldCos														14 %	21 %	10 %	12 %	13 %	14 %	15 %

Min Oil and Gas	0 %	138 %	145 %	187 %	146 %	157 %	207 %	240 %	194 %	216 %	176 %	258 %	174 %	179 %	177 %	81 %	85 %	78 %	46 %	41 %
Max Oil and Gas	0 %	91 %	137 %	107 %	171 %	276 %	109 %	139 %	201 %	181 %	233 %	233 %	128 %	102 %	135 %	202 %	179 %	179 %	134 %	107 %
Min Renewables	17 %	24 %	25 %	28 %	26 %	31 %	25 %	29 %	30 %	18 %	1 %	12 %	12 %	13 %	13 %	15 %	13 %	14 %	16 %	17 %
Max Renewables	390 %	544 %	5668 %	1436 %	484 %	733 %	542 %	300 %	201 %	251 %	282 %	232 %	161 %	151 %	289 %	262 %	324 %	294 %	470 %	130 %
Min YieldCos	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	6 %	0 %	9 %	4 %	8 %	6 %	6 %	3 %	10 %
Max YieldCos	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	6 %	7 %	65 %	24 %	24 %	27 %	31 %	17 %	20 %

APPENDIX 10: FIRM SPECIFIC DEBT LEVERAGE

IBD/(IBD+Equity)		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Oil and gas	BP	24 %	25 %	25 %	22 %	22 %	24 %	23 %	23 %	19 %	22 %	25 %	27 %	25 %	32 %	28 %	29 %	27 %	32 %	35 %	38 %
	Chevron	26 %	31 %	33 %	24 %	34 %	34 %	26 %	20 %	17 %	12 %	9 %	9 %	10 %	10 %	8 %	8 %	12 %	15 %	20 %	24 %
	Conoco	43 %	54 %	52 %	55 %	39 %	41 %	34 %	26 %	19 %	25 %	20 %	33 %	31 %	26 %	26 %	31 %	29 %	30 %	38 %	44 %
	Eni	46 %	37 %	34 %	33 %	30 %	35 %	35 %	28 %	26 %	23 %	33 %	32 %	35 %	35 %	35 %	29 %	31 %	30 %	35 %	34 %
	Exxon	19 %	17 %	23 %	16 %	13 %	13 %	10 %	8 %	7 %	7 %	7 %	8 %	8 %	9 %	10 %	7 %	12 %	14 %	18 %	20 %
	Shell						25 %	22 %	14 %	12 %	13 %	13 %	15 %	20 %	23 %	18 %	17 %	20 %	21 %	26 %	33 %
	Statoil	43 %	53 %	55 %	43 %	48 %	39 %	35 %	30 %	24 %	23 %	22 %	26 %	34 %	34 %	32 %	27 %	34 %	38 %	45 %	47 %
	Total	32 %	32 %	41 %	32 %	30 %	32 %	31 %	30 %	30 %	33 %	30 %	33 %	34 %	34 %	32 %	31 %	32 %	39 %	38 %	35 %
RE Corps	ABG	51 %	66 %	66 %	70 %	69 %	74 %	73 %	73 %	80 %	88 %	88 %	92 %	89 %	89 %	89 %	92 %	90 %	88 %	99 %	
	AES	79 %	80 %	84 %	80 %	81 %	102 %	97 %	95 %	91 %	84 %	85 %	83 %	81 %	75 %	79 %	82 %	83 %	83 %	87 %	88 %
	Dong													49 %	49 %	50 %	56 %	51 %	40 %	45 %	32 %
	Eon	18 %	21 %	26 %	33 %	40 %	49 %	42 %	38 %	24 %	22 %	30 %	54 %	48 %	44 %	46 %	43 %	41 %	44 %	52 %	
	EDF				63 %	65 %	68 %	61 %	59 %	65 %	55 %	42 %	55 %	66 %	60 %	62 %	70 %	61 %	61 %	65 %	65 %
	EDPR											59 %	22 %	34 %	40 %	42 %	42 %	40 %	42 %	43 %	40 %
	EKTG			54 %	21 %	21 %	32 %	39 %	42 %	65 %	71 %	75 %	78 %	78 %	82 %	83 %	90 %	87 %	87 %	85 %	
	Engie		35 %	21 %	39 %	37 %	33 %	36 %	32 %	24 %	25 %	23 %	40 %	41 %	43 %	47 %	49 %	46 %	44 %	47 %	
	IBE	42 %	44 %	47 %	51 %	57 %	58 %	56 %	55 %	58 %	58 %	46 %	57 %	54 %	52 %	50 %	49 %	46 %	43 %	44 %	45 %
	IGY																	51 %	49 %	53 %	
	NPI	30 %			1 %		27 %	8 %	35 %	29 %	24 %	26 %	25 %	52 %	50 %	61 %	67 %	68 %	79 %	84 %	87 %
	NRG		52 %	72 %	72 %	80 %	108 %	65 %	62 %	56 %	64 %	64 %	56 %	53 %	53 %	56 %	61 %	63 %	67 %	87 %	90 %
	SSO															70 %	68 %	96 %	85 %	87 %	88 %
	SUNEQ	48 %	70 %	67 %	75 %	110 %	109 %	40 %	24 %	7 %	3 %	1 %	2 %	16 %	23 %	72 %	80 %	94 %	97 %		
	Terna								53 %	60 %	60 %	24 %	30 %	34 %	36 %	45 %	57 %	54 %	58 %	61 %	
YieldCo	Atlantica																56 %	76 %	71 %	77 %	77 %
	HASI												100 %	100 %	88 %	90 %	91 %	70 %	70 %	68 %	63 %
	HWAG													0 %	64 %	69 %	70 %	62 %	73 %	78 %	
	NEP																67 %	72 %	77 %	79 %	67 %
	NYLDA														73 %	53 %	48 %	64 %	77 %	72 %	76 %
	PEGI															71 %	72 %	73 %	70 %	68 %	61 %
	SAY																	76 %	78 %	61 %	74 %
	TERP																78 %	99 %	77 %	79 %	
	TRIG																				

Count Oil and Gas		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Count Renewables		15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Count YieldCos		9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Mean Oil and Gas		33 %	35 %	38 %	32 %	31 %	30 %	27 %	22 %	19 %	20 %	20 %	23 %	25 %	25 %	24 %	22 %	25 %	27 %	32 %	34 %
Mean Renewables		45 %	53 %	55 %	51 %	62 %	66 %	52 %	52 %	51 %	50 %	47 %	50 %	53 %	54 %	61 %	65 %	65 %	64 %	67 %	67 %
Mean YieldCos		0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	100 %	50 %	75 %	71 %	69 %	74 %	74 %	73 %	70 %
Median Oil and Gas		0 %	32 %	34 %	32 %	30 %	33 %	28 %	25 %	19 %	22 %	21 %	26 %	28 %	29 %	27 %	28 %	28 %	30 %	35 %	35 %
Median Renewables		45 %	52 %	60 %	57 %	65 %	63 %	49 %	53 %	58 %	58 %	44 %	55 %	52 %	50 %	58 %	64 %	61 %	61 %	63 %	76 %
Median YieldCos															73 %	70 %	70 %	72 %	75 %	74 %	71 %
Min Oil and Gas		19 %	17 %	23 %	16 %	13 %	13 %	10 %	8 %	7 %	7 %	7 %	8 %	8 %	9 %	8 %	7 %	12 %	14 %	18 %	20 %
Max Oil and Gas		46 %	54 %	55 %	55 %	48 %	41 %	35 %	30 %	30 %	33 %	33 %	33 %	35 %	35 %	35 %	31 %	34 %	39 %	45 %	47 %
Min Renewables		18 %	21 %	21 %	1 %	21 %	27 %	8 %	24 %	7 %	3 %	1 %	2 %	16 %	23 %	42 %	42 %	40 %	40 %	43 %	32 %
Max Renewables		79 %	80 %	84 %	80 %	110 %	109 %	97 %	95 %	91 %	88 %	88 %	92 %	89 %	89 %	89 %	92 %	96 %	97 %	99 %	90 %
Min YieldCos		0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	100 %	0 %	64 %	53 %	48 %	62 %	70 %	61 %	61 %
Max YieldCos		0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	100 %	100 %	88 %	90 %	91 %	99 %	78 %	79 %	77 %

APPENDIX 11: FIRM SPECIFIC NET DEBT LEVERAGE

NIBD/(NIBD+Equity)		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Oil and gas	BP	23 %	24 %	23 %	21 %	21 %	23 %	21 %	22 %	14 %	18 %	21 %	19 %	18 %	15 %	18 %	16 %	12 %	13 %	19 %	25 %
	Chevron	15 %	20 %	22 %	7 %	24 %	21 %	8 %	-13 %	-8 %	-9 %	-9 %	-10 %	-4 %	-12 %	-15 %	-14 %	0 %	6 %	13 %	19 %
	Conoco	41 %	52 %	51 %	54 %	39 %	40 %	33 %	24 %	16 %	23 %	17 %	31 %	29 %	13 %	18 %	26 %	20 %	24 %	35 %	39 %
	Eni	28 %	21 %	18 %	22 %	22 %	28 %	29 %	22 %	22 %	15 %	27 %	26 %	33 %	34 %	33 %	22 %	19 %	16 %	23 %	22 %
	Exxon	12 %	14 %	19 %	8 %	5 %	5 %	-1 %	-11 %	-23 %	-21 %	-26 %	-25 %	-1 %	5 %	3 %	-2 %	6 %	10 %	15 %	17 %
	Shell						20 %	18 %	-12 %	-3 %	1 %	2 %	1 %	11 %	13 %	9 %	5 %	13 %	9 %	11 %	26 %
	Statoil	37 %	49 %	47 %	27 %	44 %	24 %	8 %	12 %	9 %	14 %	13 %	16 %	27 %	26 %	21 %	10 %	13 %	19 %	25 %	34 %
	Total	20 %	21 %	34 %	24 %	23 %	21 %	20 %	21 %	24 %	25 %	21 %	19 %	20 %	18 %	19 %	16 %	18 %	23 %	21 %	18 %
RE Corps	ABG	27 %	31 %	31 %	57 %	60 %	64 %	58 %	57 %	71 %	80 %	81 %	89 %	85 %	83 %	83 %	89 %	85 %	83 %	99 %	
	AES	78 %	78 %	82 %	78 %	79 %	102 %	96 %	94 %	91 %	82 %	82 %	81 %	77 %	70 %	77 %	80 %	81 %	81 %	86 %	87 %
	Dong													40 %	37 %	39 %	43 %	37 %	8 %	22 %	8 %
	Eon	14 %	18 %	19 %	8 %	3 %	36 %	22 %	15 %	-6 %	8 %	16 %	46 %	38 %	28 %	31 %	28 %	24 %	22 %	7 %	
	EDF				56 %	62 %	65 %	56 %	53 %	46 %	25 %	-6 %	24 %	55 %	46 %	47 %	60 %	35 %	33 %	36 %	37 %
	EDPR											54 %	17 %	28 %	36 %	39 %	38 %	35 %	36 %	39 %	36 %
	EKTG			-98 %	-276 %	-99 %	-34 %	-2 %	10 %	48 %	61 %	64 %	68 %	69 %	73 %	70 %	87 %	84 %	82 %	77 %	
	Engie		30 %	6 %	35 %	31 %	28 %	32 %	26 %	9 %	13 %	8 %	32 %	31 %	34 %	36 %	41 %	37 %	34 %	37 %	
	IBE	36 %	38 %	43 %	50 %	55 %	56 %	55 %	53 %	53 %	54 %	44 %	55 %	48 %	44 %	45 %	43 %	43 %	40 %	42 %	43 %
	IGY																	45 %	43 %	46 %	
	NPI	28 %	-5 %	-4 %	0 %	-1 %	26 %	-35 %	18 %	12 %	12 %	11 %	1 %	45 %	46 %	55 %	63 %	63 %	76 %	83 %	86 %
	NRG		47 %	72 %	71 %	79 %	109 %	56 %	45 %	45 %	60 %	59 %	50 %	43 %	36 %	52 %	57 %	60 %	64 %	86 %	89 %
	SSO															64 %	58 %	93 %	80 %	83 %	85 %
	SUNEQ	46 %	69 %	67 %	73 %	122 %	126 %	0 %	10 %	-16 %	-89 %	-172 %	-113 %	-18 %	-2 %	64 %	75 %	93 %	96 %		
	Terna								39 %	51 %	48 %	-151 %	-73 %	-17 %	3 %	26 %	48 %	44 %	46 %	50 %	
YieldCo	Atlantica																51 %	72 %	65 %	74 %	74 %
	HASI												100 %	100 %	88 %	90 %	90 %	-171 %	5 %	16 %	-20 %
	HWAG		-6 %	52 %	20 %	64 %	67 %	100 %	57 %	-42 %	-208 %	-166 %	-170 %	-82 %	58 %	65 %	67 %	59 %	70 %	77 %	
	NEP																66 %	71 %	76 %	78 %	66 %
	NYLDA														71 %	52 %	46 %	63 %	75 %	72 %	74 %
	PEGI															67 %	70 %	70 %	68 %	66 %	60 %
	SAY																	73 %	75 %	56 %	71 %
	TERP																77 %	99 %	70 %	77 %	
	TRIG																	-5 %	-3 %	-2 %	-2 %

Count Oil and Gas		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Count Renewables		15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Count YieldCos		9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Mean Oil and Gas		25 %	29 %	31 %	23 %	25 %	23 %	17 %	8 %	7 %	8 %	8 %	10 %	17 %	14 %	13 %	10 %	13 %	15 %	20 %	25 %
Mean Renewables		38 %	38 %	24 %	15 %	39 %	58 %	34 %	38 %	37 %	32 %	8 %	23 %	40 %	41 %	52 %	58 %	57 %	55 %	57 %	59 %
Mean YieldCos		0 %	-6 %	52 %	20 %	64 %	67 %	100 %	57 %	-42 %	-208 %	-166 %	-35 %	9 %	72 %	69 %	67 %	37 %	56 %	57 %	46 %
Median Oil and Gas		0 %	21 %	23 %	22 %	23 %	22 %	19 %	16 %	12 %	15 %	15 %	18 %	19 %	14 %	18 %	13 %	13 %	14 %	20 %	24 %
Median Renewables		32 %	35 %	31 %	53 %	58 %	60 %	43 %	39 %	46 %	48 %	30 %	39 %	43 %	37 %	50 %	58 %	45 %	46 %	48 %	64 %
Median YieldCos															71 %	66 %	67 %	70 %	70 %	72 %	66 %
Min Oil and Gas		12 %	14 %	18 %	7 %	5 %	5 %	-1 %	-13 %	-23 %	-21 %	-26 %	-25 %	-4 %	-12 %	-15 %	-14 %	0 %	6 %	11 %	17 %
Max Oil and Gas		41 %	52 %	51 %	54 %	44 %	40 %	33 %	24 %	24 %	25 %	27 %	31 %	33 %	34 %	33 %	26 %	20 %	24 %	35 %	39 %
Min Renewables		14 %	-5 %	-98 %	-276 %	-99 %	-34 %	-35 %	10 %	-16 %	-89 %	-172 %	-113 %	-18 %	-2 %	26 %	28 %	24 %	8 %	7 %	8 %
Max Renewables		78 %	78 %	82 %	78 %	122 %	126 %	96 %	94 %	91 %	82 %	82 %	89 %	85 %	83 %	83 %	89 %	93 %	96 %	99 %	89 %
Min YieldCos		0 %	-6 %	52 %	20 %	64 %	67 %	100 %	57 %	-42 %	-208 %	-166 %	-170 %	-82 %	58 %	52 %	46 %	-171 %	-3 %	-2 %	-20 %
Max YieldCos		0 %	-6 %	52 %	20 %	64 %	67 %	100 %	57 %	-42 %	-208 %	-166 %	100 %	100 %	88 %	90 %	90 %	99 %	76 %	78 %	74 %