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Author: Vegard Wiik Vollset	
Programme coordinator: Petter Osmundsen Supervisor(s): Petter Osmundsen	
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ABSTRACT

This thesis analyzes the financing and risk-return picture for European offshore wind parks and compares it to offshore oil and gas projects. In order to do this, a three-step approach was used, where firstly financial data was gathered for a portfolio of offshore wind parks in Europe (n=47), which had a financial investment decision from 2014 to 2019. Secondly, from a subset of the portfolio (n=27), the return (IRR), was calculated by creating a simplified valuation model in order to assess the risk-return picture. Thirdly, the risk-return picture was then compared to offshore oil and gas, by evaluating the return (IRR) for a portfolio of European offshore oil and gas projects (n=35) which had a financial investment decision from 2010 to 2019. This was supplemented by qualitative data, in the form of semi-structured interviews, where financial actors were interviewed on the financing aspects and risk-return picture of offshore wind.

This study finds that offshore wind is attracting significant investment interest as a green, low-risk investment. It is further benefiting from the fact that there is currently a lack of alternative low-risk investment opportunities as the interest rates are low or negative. Project finance is the prevalent source of financing in offshore wind. A possible reason being that it can gain companies access to cheaper financing and financing facilities specifically tasked with ESG type investments, whilst simultaneously improving their perceived returns through leveraging. This is especially true for companies who have their core industry outside the offshore wind space i.e. oil and gas companies.

The study also shows that offshore wind projects which managed to secure high subsidies have the highest returns. However, given the competitive nature of the offshore wind space, the subsidies have been decreasing and the offshore wind parks scheduled to start up in mid-2020 have a lower return picture. Comparing this to the oil and gas industry, which has experienced high returns in the same time period, the study finds that the risk-return picture between the two industries are fundamentally different and a lower return for offshore wind must be expected. However, the low risk of offshore wind is underpinned by subsidies guaranteeing the price, and as such, the future risk picture of offshore wind in Europe is uncertain as the subsidies are decreasing.

A number of oil and gas companies have entered the offshore wind market. In addition to the benefit of cheaper financing mentioned above, they also benefit from; diversifying their energy portfolio, lowering their overall risk picture whilst simultaneously 'green-washing' their image. It seems likely that offshore oil and gas companies are also attracted to the offshore wind market due to the clear synergies between the industries. However, the data analysed here has illustrated that such gains are yet to be realized, at least for bottom-fixed offshore wind parks.

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TABLE OF CONTENTS

List of figures

List of Tables

1 INTRODUCTION

A key topic of interest in 2019 was the Energy Transition. More specifically, how will society overcome the risks of climate change while simultaneously producing enough energy to supply not only an increasing population, but one whose energy demand is also on the rise. And how are we going to shift from a fossil-fueled energy supply to an energy supply driven by renewable energy. An important piece of the puzzle is the power sector. It is the largest single contributor to global greenhouse gas emissions (GHG), and in order to limit global temperature increases, it is essential to transform national energy systems and scale-up investments in renewable energy [1]. According to the Intergovernmental Panel on Climate Change (IPCC), to limit global warming to 1.5°C, the world needs to reach a net zero CO_2 emission by 2050. This needs to be achieved primarily through reduced fossil fuel usage, with reductions of 87% and 78% for oil and gas, compared to 2010 numbers [2].

In the center of the public debate is the role of the oil and gas companies, as they are the ones who will ultimately have to redefine their business models by 2050, in order to survive the transition into a low-carbon emission future. Several of the largest oil and gas companies have already began altering their business model. For example, ENI, BP and Equinor have all announced goals of a net-zero carbon footprint by 2040-2050 [3] [4] [5]. Offshore Wind represents one of the major building blocks in achieving this transition. In 2018, it provided just 0.3% of global electricity supply, however, by 2040 the International Energy Agency (IEA) predict that the offshore wind industry will have a 15-fold increase in capacity and attract around $1 trillion of cumulative investments [6]. Some of these investments will come from oil & gas companies, and there are examples of companies who have already entered the offshore wind space, with Equinor and Shell leading the way [7].

1.1 THE ECONOMICS OF OFFSHORE WIND

In recent years the economics of offshore winds have improved drastically. A widely used metric, is the Levelized Cost of Electricity (LCOE). The LCOE represents the average revenue per unit of electricity generated, required to recover the costs of building and operating a power plant. Key inputs to calculate the LCOE are: Capital costs (CAPEX), fuel costs, fixed and variable operations and maintenance costs, financing costs and an assumed utilization rate for each plant type (load factor) [8]. In Europe, the average LCOE have dropped by over 50 EUR/MWh from 2010 to 2020 for the bottom-fixed wind parks (there is currently a limited number of floating offshore wind parks installed) (Figure 1). The main reason for this is the reduction in cost as a consequence of improvements in technology, primarily an increase in turbine size, which has grown from 3MW to 12MW over the course of the last 10 years [6].

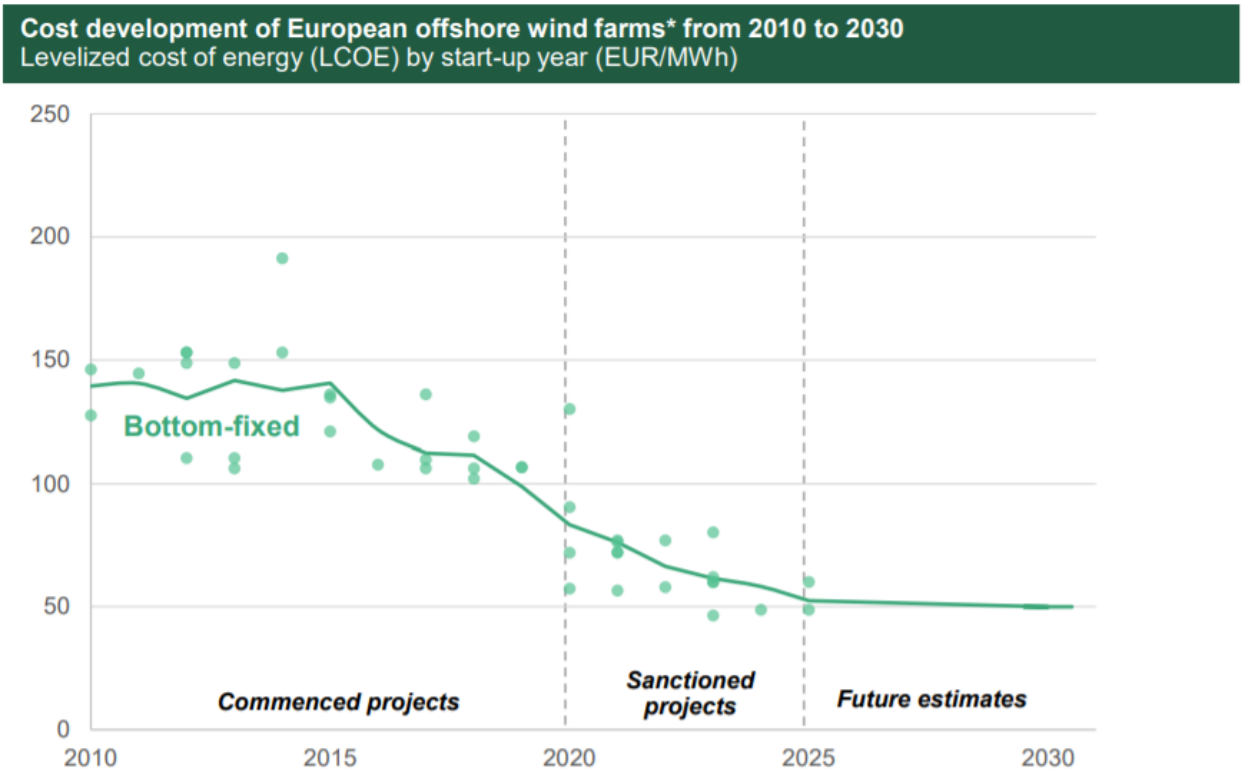

Figure 1 - Cost Development of European Offshore Bottom-fixed Wind Farms - Source: IEA 2019, IRENA 2018, Equinor, BVG Associates 2018, EOLFI 2018, Catapult, Carbonbrief, Rystad Energy research and analysis, Graph Created by: Rystad Energy

However, IEA has reported that another significant driver of decreased LCOE, is the reduced cost of financing, as non-governmental sources have increased their willingness for providing debt financing to offshore wind projects. This is reflected in the increase from 60% to 75% debt-to-equity ratio, which has an outsized impact on offshore wind projects due to the low margins of most projects. In addition, the indicative cost of debt and equity has come down substantially. This has reduced the Weighted Average Cost of Capital (WACC), which is one of the largest components of LCOE [6]. This is further helped by the increased focus on Environmental, Social and Governance (ESG), with the European Investment Bank (EIB) being a key example. EIB announced in November 2019 that they will stop financing fossil fuel projects by 2021 and have a goal of reaching a 32% renewable energy share throughout the EU by 2039 [9].

This influx of capital is also driven by policy initiatives, international energy agreements and climate laws. For example, in the European Union, all the major offshore wind producing countries have set policy capacity targets, with the UK being the most aggressive by recently increasing their policy target for 2030 from 30GW to 40GW [6] (currently capacity 8GW [10]). As a means of reaching these ambitious targets, the offshore wind industry has historically seen large governmental subsidies [11]. UK, Germany and Denmark, the 3 largest European offshore wind producing countries, have created subsidy schemes, which have been necessary for the offshore wind projects to make a profit. However, with an ever more competitive landscape, subsides

have been declining as developers claim to be able to sanction projects at progressively lower costs [12]. With this decrease in subsidies, questions have started to rise around the topic of the returns on offshore wind projects. Developers that became involved at an early stage of the subsidies, have seen great returns on projects, as the cost levels have come down substantially after the subsidies have been awarded. Furthermore, several developers have sold wind parks with a substantial uplift after the construction phase [13]. Consequently, many of the key players in the offshore wind have seen a significant growth in share price. With Ørsted leading the way, both with the largest global market share of the offshore wind parks, and also with a share price growth of over 100% in the last 3 years (Figure 2).

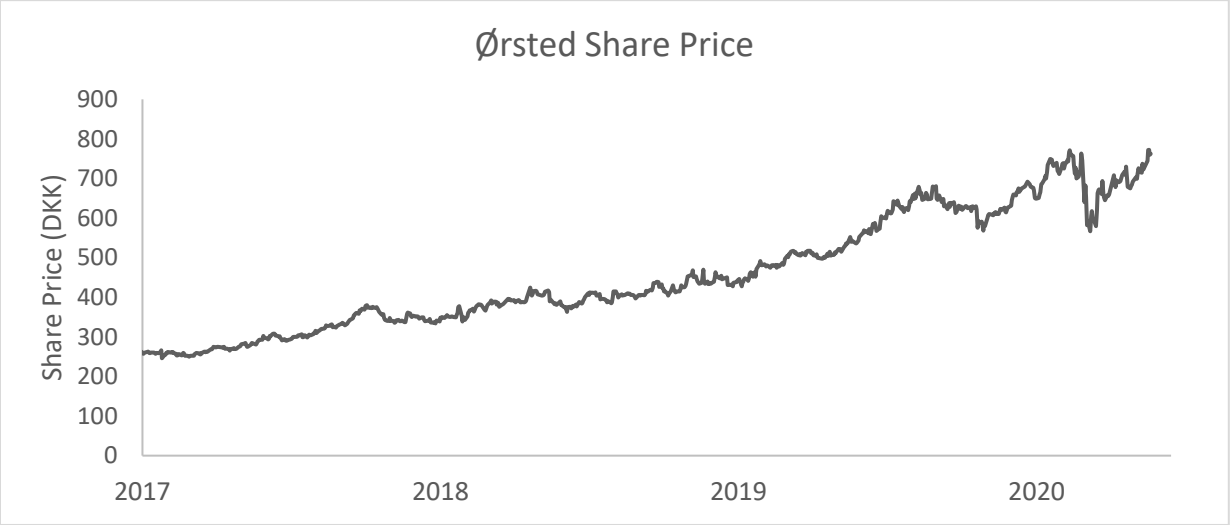

Figure 2 - Ørsted Share Price Evolution – Source data: https://orsted.com/en/investors/shares/share-price-monitor

A possible reason for the interest in Ørsted's shares is due to the fact that their offshore wind portfolio has had a solid return on capital employed (ROCE). Reporting an average of 23% the last 4 years, as can be seen Figure 3 [14]. However, a large part of the ROCE reported, especially in 2017 and 2018, was due to their divestments in offshore wind parks, as they themselves reported in their 2019 Annual Report - *"In 2017 and 2018, ROCE was positively impacted by substantial profits from new partnership agreements, particularly divestment gains ".* And looking forward, Ørsted has stated that the target ROCE for the period from 2019 to 2025 to be 10%, indicating that the high ROCE due to divestments, are a thing of the past.

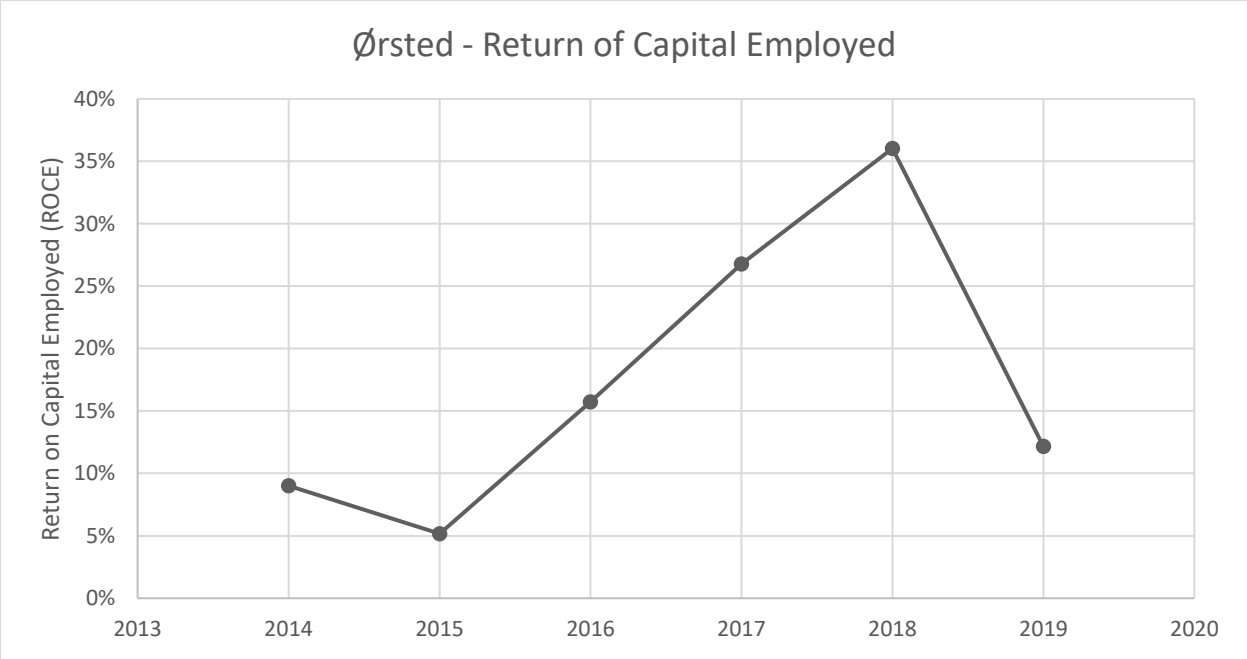

Figure 3 - Ørsted Return on Capital Employed - Source: Ørsted Annual Report 2019

1.2 Oil and Gas companies in offshore wind

Several oil and gas companies have already starting investing in and operating offshore wind parks. Equinor is the biggest player, with ownership in several operating wind parks in Europe (Dudgeon, Arkona & Sheringham Shoal), as well as having large plans for developments in Poland and the United States. They also recently announced that they have been awarded contracts to develop the world's largest offshore wind farm, Dogger Bank in the UK, with a total capacity of 3.6GW [15]. Shell is another oil and gas company who has entered the offshore wind space, with ownership in windfarms in the Netherlands and the United States. They also recently launched their plans for the world's largest offshore wind park in the Netherlands, which could grow as large as 10GW by 2040 [16] [17].

One of the reasons that offshore wind could be of special interest to oil and gas companies, and especially offshore focused oil and gas companies, is due to the significant synergies that exist between the two industries. IEA estimates that approximately 40% of the full lifetime costs of an offshore wind project share significant synergies with the offshore oil and gas industry [6]. However, the risk and return picture of offshore wind projects is different than that of oil and gas projects. For offshore wind projects there is at current relatively little price risk, but the same cannot be said for oil and gas projects. Therefore, the challenge for oil and gas companies becomes: How can they maintain their historically high returns, when venturing into this new industry?

1.3 RESEARCH QUESTIONS

Offshore wind is currently experiencing considerable public and industry interest. The amount of reporting on the subject is substantial, but the conclusions of these reports can be contradictory. Some newspapers have reported historical high returns for some of the wind parks, without understanding that 70% of the returns were due to refinancing, and not actual profits from the operational side of the wind farm [18] [19]. And while share prices are skyrocketing, and reports of record high returns in offshore winds are published, there are reports of projects to be developed which have a return closer to 5% [20]. In addition, there are also reports of how the marginal returns of wind projects can be increased with increased leverage through project financing. For instance, IEA recently published a report showing how an IRR from an onshore wind farm could grow from 6% to 8.5% by increased leverage [21]. Further, Equinor also recently reported in their Capital Markets Update in 2020, that their expected unleveraged real returns were in the range of 6-10%, but that the project financing structure gives them an option to leverage returns [22]. This means that an important part of understanding the offshore wind industry is to also understand how it is financed.

This thesis aims to provide an overview of the offshore wind market and to assess how oil and gas companies may navigate a transition from oil & gas investments to offshore wind.

The following research questions has been formulated:

- ***How are offshore wind parks financed and why?***
- ***What is the current risk-return picture of offshore wind?***
- ***How does the risk-return picture compare to offshore oil & gas investments?***

2 THEORY

2.1 FINANCING

2.1.1 Capital Structure

In order to understand how projects and companies are financed, it is important to first detail the fundamentals of capital structure. The capital structure is the particular combination of debt and equity used by a company to finance its overall operations and growth. Debt comes in the form of bond issues or loans, while equity may come in the form of common stock, preferred stock, or retained earnings. Short-term debt, such as working capital requirements, are also considered to be part of the capital structure [22].

2.1.1.1 Leverage Ratio – Debt to Equity ratio

One way of evaluating how a company is financed is by looking at a leverage ratio. A leverage ratio is any one of several financial measurements that look at how much capital comes in the form of debt (loans). Essentially assessing the ability of a company to meet its financial obligations [23].

One often used leverage ratio is the **debt to equity** ratio, which looks at all the total liabilities and the total shareholder's equity:

$$Debt - to - Equity = \frac{Total\ Liabilities}{Total\ Shareholder's\ Equity} \qquad Eq.\ 1$$

A high **debt to equity** ratio can therefore mean that the company has been aggressive in financing it's growth with debt.

2.1.1.2 Modigliani and Miller

When discussing the capital structure, it is impossible to avoid the Modigliani-miller theorem, as it forms the basis for modern thinking of capital structure. The papers they published have formed the basis for considerable further research into the matter of capital structure, and the logic that they presented has been widely accepted [24].

2.1.1.3 Without Taxes

Modigliani and Miller proposed in their famous 1958 paper, that the value of a firm is independent of the capital structure. In other words, the value of a levered firm is equivalent to that of an unlevered firm [25]. The basis of the conclusion was that with perfect market conditions, if the individual borrows (and lends) at the same rates as the firms, the individual can recreate any leverage effect of the corporation on their own. Thus, in effect, any corporate leverage should not impact the valuation. This came to be known as Modigliani and Miller's proposition I (**MM Proposition I**), and can be written as:

$$V_L = V_{UL} \quad \textit{Eq. 2}$$

Where V_L is the value of the levered company whereas V_{UL} is the value of the unlevered company.

In addition, they also developed a second proposition (**MM Proposition II**). This came from the reasoning that since leveraged equity has greater risk, there should also be a higher return associated to the higher level of leverage. This can be written as:

$$R_S = R_O + \frac{B}{S}(R_O - R_B) \quad \text{Eq. 3}$$

Where

$R_S =$ required return on equity,

$R_O = Cost\ of\ capital\ for\ an\ all\ equity\ firm,$

$R_B = Cost\ of\ debt,$

$B = the\ value\ of\ the\ firm's\ debt\ or\ bonds$ and

$S = the\ value\ of\ the\ firm's\ stock\ or\ equity$

2.1.1.4 With Taxes

However, Modigliani and Miller also acknowledged that there were some nuances to their initial view, and in 1963, they published a new paper, *Corporate income taxes and the cost of capital: a correction*. Here they took into account the effect of taxes [26]. Their new paper showed that in the presence of corporate taxes, when the interest on debt is tax-deductible, the value of the levered firm V_L becomes:

$$V_L = V_{UL} + t_c B \quad \text{Eq. 4}$$

Where t_c = corporate tax rate.

In other words, their new view argued that the value of the firm increases with increased leverage.

2.1.1.5 Trade-off theory

Based on Miller and Modigliani's proposition with taxes, it seems that all companies should aim to take on as much debt as possible in order to increase their valuation. However, Miller and Modigliani acknowledged that their proposition had some underlying assumptions which might not be viable in real life. One of these assumptions was that it does not consider the cost of financial distress i.e. the costs of bankruptcy or reorganization.

The trade-off theory handles this aspect, and goes back to Kraus and Litzenberger [27], who in 1974 stated that "*the market value of a levered firm is equal to its unlevered market value plus the present value over all states of the difference between the tax advantage of leverage and bankruptcy costs*". In other words, there is a balancing optimum between the positive benefits of the tax shield and the negative effect of the financial distress costs:

$$V_L = V_{UL} + t_c B - present\ value\ of\ financial\ distress\ costs \qquad \text{Eq. 5}$$

Where the present value of financial distress costs is increasing as the leverage increases. Visually this can be shown as:

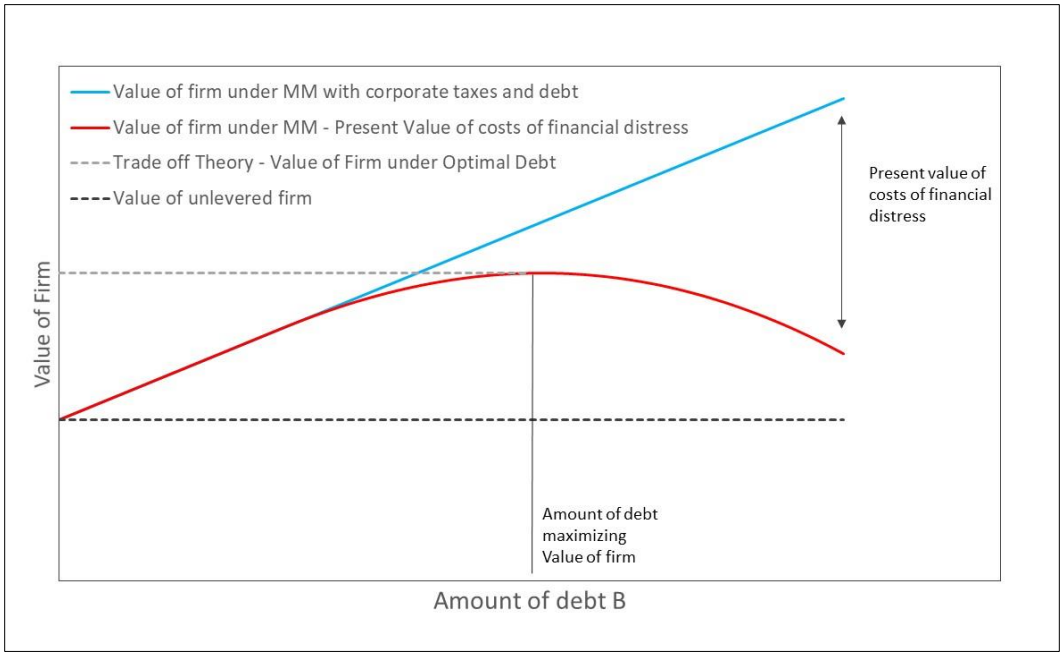

Figure 4 - Valuation of firm - Trade-off theory

2.1.2 Project Finance

As previously discussed, a common trend in offshore wind financing, is the utilization of project finance. This chapter discusses what project financing entails, and some of the reasons why project finance is utilized.

When financing a project, a company can choose between two main types of financing: *Corporate Financing* i.e. financing against the balance sheet of the sponsors of the project, and *Project Financing*. There are several definitions of project finance, with slight variations. However, there are some basic definitions which are widely accepted, and which are the most relevant for the discussion in this thesis [28] [29]:

- Project Finance is the structured financing of major projects, based on lending which is done against the cash flow generated by the project
- The financing requires the setup of a Special Purpose Vehicle (SPV), which is legally and commercially self-contained and serves only to realize the project [30]
- The loans are non-recourse loans, which means that they are secured by the project assets and paid entirely from project cash flow, rather than from the general assets or creditworthiness of the project sponsors

2.1.2.1 Why use Project Finance

An SPV, unlike a corporate borrower, has no large balance sheet to fall back on in case problems arise, and due to this, lenders must be confident that the debt will be repaid. This means that for project financing, the lenders must have a higher degree of confidence compared to that of corporate financing. Both, in that the project will not have any cost overruns and also that it will run according to schedule. In addition, they need to evaluate in detail the risk elements related to the project and have a comprehensive oversight of the operating cash flow, as this is what will be servicing the debt repayments. This process, known as "due diligence", is the reason why project finance is often slower, more complex and more costly that corporate financing [28] [29]. So, given the issues above, why do companies choose to Project finance? Below are some of the reasoning listed by Gatti (2008) [28] and Yescombe (20014) [29].

2.1.2.1.1 Securitisation – Decrease financing cost

One of the reasons for utilizing project finance, can be for a company which has most of its core business in high risk activities, to separate and securitize low risks assets into its own entity. This way these low risk assets can be financed at a lower cost [31]. This is particularly relevant for an oil & gas company whose core business is high risk oil and gas assets. When they then want to finance a lower risk asset, like an offshore wind project, the finance costs they achieve on a corporate level might be higher than if they separate the project into its own entity by project financing it.

2.1.2.1.2 Debt overhang

By corporate financing a project, all the equity and debt are put on the company's balance sheet. This in turn means that the strength of the balance sheet can be a limiting factor of how a project is financed, especially if the debt-to-equity ratio is high. In such cases, project finance is an effective way to finance these projects as it disconnects the project completely from the sponsor's balance sheet [32]. Although project finance often increases the level of debt that can be borrowed against a project, it is not normally counted against the corporate credit lines and may thus increase an investor's overall borrowing capacity.

2.1.2.1.3 Higher debt ratio (leverage)

Due to the nature of project finance, where there is non-recourse and thus the lenders must perform a thorough due-diligence, the risk picture is normally quite low. This allows for a higher leverage ratio compared to corporate finance and can create value through higher tax shields [33]. Comparing this to previously discussed corporate-finance theory, we see from **Miller-Modigliani Proposition II**, that a higher leverage equals higher risk. This in effect means that the lenders are content with a lower return if there is a lower leverage. Hence, for lenders to accept low returns at a high leverage, the risk must be low.

2.1.2.1.4 Contamination risk

Utilizing corporate finance to finance a new project, means that the project will be included on the balance sheet and the risk-return picture of the company. In the case of a project having a higher risk picture than the company's existing portfolio, means that the project can have a negative impact on the company's ability to acquire more debt and increase the financing cost, in the event of poor performance of the project. This is especially true if the project size is substantial compared to the size of the company [32] [28] [31]. Project financing, and realizing the project in a separate entity, enables the company to avoid this contamination risk, and reduce its financing cost. This is often referred to as the text-book reason for using project finance [28]. The contamination effect is more likely to occur if the project investment in question is large compared to the size of the company, and if the cash flows are large, risky and correlated with the existing business [31].

2.1.2.1.5 Off-balance Sheet Financing

Under corporate financing the debt raised will be put on the company's balance sheet. While under a project finance scheme, the company is able to keep the debt off its balance sheet. This in turn could be beneficial in the financial markets. But this can usually only be done if the investor is a minority shareholder in the project, something that can be achieved if the project is owned through a joint venture. However, a company's shareholder and lenders should take into account the risks involved in any off-balance-sheet activities. Due to

this project finance is not usually undertaken purely to keep the debt off the investors' balance sheets [29]. This is looked at more in detail in the next chapter.

2.1.3 Balance-sheet reporting

Due to that a possible objective of project financing is the use of off-balance sheet accounting techniques, it is important to understand the accounting methods available when companies are part of a joint venture. We see several examples of joint ventures in the offshore wind space, with Dogger Bank in the UK and Luchterduinen in Belgium being two examples [34] [35]. Accounting rules generally require the consolidation of financial statements of a company, its subsidiaries and other entities over which it can exercise control. A subsidiary that is controlled more than fifty percent by the parent company is consolidated on a line by line basis with the parent. Otherwise, and in the case of a joint venture, the equity method of accounting is used. [36] [37]

2.1.3.1 Equity Method

The equity method of accounting is an accounting technique where the company records the profits earned through its investment/ownership in another company or joint venture. Whether or not a company is able to use the equity method of accounting is based on whether the company can exert significant influence over the other company or joint venture. The profits reported are proportional to the percentage of its equity investment in the company or joint venture, and while the share of profits are reported, liabilities are not, enabling companies to keep debt off their balance sheets. [36] [37]

2.2 RISK VERSUS RETURN

An important part of understanding the difference in investments in oil & gas and offshore wind is to understand the risk and return picture, and the inherent relationship that exists between them. Investment theory describes the concept of relationship between risk and return. However, to clearly understand this relationship, we must first define what is meant by risk and return and what are the impacting factors.

First of all, for risk, it can be subdivided into two main types, systematic risk and unsystematic risk.

2.2.1 Systematic risk

Systematic risks are risk factors which affect the entire market [38]. Market prices, fiscal regimes and subsidy schemes are all examples of elements which could be viewed as systematic risk as they effect the entire market, or subsets of markets.

2.2.2 Unsystematic Risk

Unsystematic risk are factors that are company or project specific [38]. It can be further subdivided into two factors, Business and Financial risk:

2.2.2.1 Business risk

Business risk can be defined as the uncertainty related to the income due to the nature of the firms's business. If the income for the firm is uncertain, this also generates an uncertainty for the income for the investor, and thus a risk premium is often demanded to account for this uncertainty

For both offshore wind and oil & gas, business risk would relate to the uncertainty of the volume of energy produced, and to a certain extent the price received, as this could both be a result of the wider market (when the risk would be of a systematic risk), or the specific price an asset receives (in case of subsidies or disconnection from the wider market). A higher certainty for the income would ultimately lead to a reduced risk premium for the investors [39].

2.2.2.2 Financial risk

Financial risk is the uncertainty related to how a company finances its investments. This uncertainty does not occur if the investments are financed only through common stock/equity. However, if a company borrows money to finance investments, the interest payments to creditors get priority over equity holders, and thus the uncertainty of the returns to the equity investors will increase with a higher portion of the investment financed with debt (higher leverage).This increase in uncertainty due to interest payments is called financial risk and causes an increase in the risk premium [39].

2.2.3 The relationship between risk and return (CAPM and SML)

Harry Markowitz (1959) [40] developed the model of portfolio choice which is commonly referred to as the mean-variance model. He showed that the variance of rate of return could be used as a measure of portfolio risk, and subsequently showed that given an expected return or variance (risk), an investor would always choose the portfolio which maximized the expected return or minimizes the variance (risk).

Following the development of the Markowitz portfolio model, several authors considered the implications of assuming the existence of a risk-free asset, that is, an asset with zero variance. This assumption allowed them to derive a generalized theory of capital asset pricing under conditions of uncertainty based on the Markowitz portfolio theory. This is exactly what Sharpe (1964) [41] and Lintner (1965) [42] did, when they took Markowitz's mean-variance model and further developed it into the Capital Asset Pricing Model (CAPM).

The CAPM model gives the relationship between expected return and the variance. In order to do this the CAPM redefines the relevant measure of risk to only include the non-diversifiable portion of that total risk (i.e., systematic risk). This new risk measure is called the beta coefficient, and it calculates the level of an asset's systematic risk compared to that of the market portfolio. Beta is defined as:

$$\beta = \frac{Cov\ (R_i, R_M)}{\sigma^2(R_M)}$$

Where:

$Cov\ (R_i, R_M)$ = covariance between the return of the asset i and the return on the market

R_i = return of the asset i

R_M = return on the market

$\sigma^2(R_M)$ = variance of the market

The CAPM model can then be defined as:

$$R_i = R_F + \beta\ *(R_M - R_F) \qquad \text{Eq. 6}$$

Where:

R_F = risk-free return

$(R_M - R_F)$ = the difference in risk free return and the return of the market portfolio

An important assumption of the CAPM, is that for the risk-free return, an investor can borrow or lend any amount. This in practice means that if an investor wants to recreate a higher or lower return than what's

possible in the current asset, he can increase the risk picture by lending at the risk free return and further invest into the asset. This effectively leverages up and increases both the expected return, but also the variance (risk).

If we then take the beta as defined above, as the relevant measure of risk, we can then deduce an expression of expected return. The expression can be decomposed into the risk free return (R_F) and the expected risk premium (RPi) [39]:

$$R_i = R_F + RPi \quad \text{Eq. 7}$$

This expression shows that investors increase their required rates of return as perceived risk (uncertainty) increases. The line that reflects the combination of risk and return available on alternative investments is referred to as the security market line (SML). Plotting then the SML in Figure 5, which shows the linear relationship of risk and return, where R_f is the risk-free return, we can understand how risk and return affect each other.

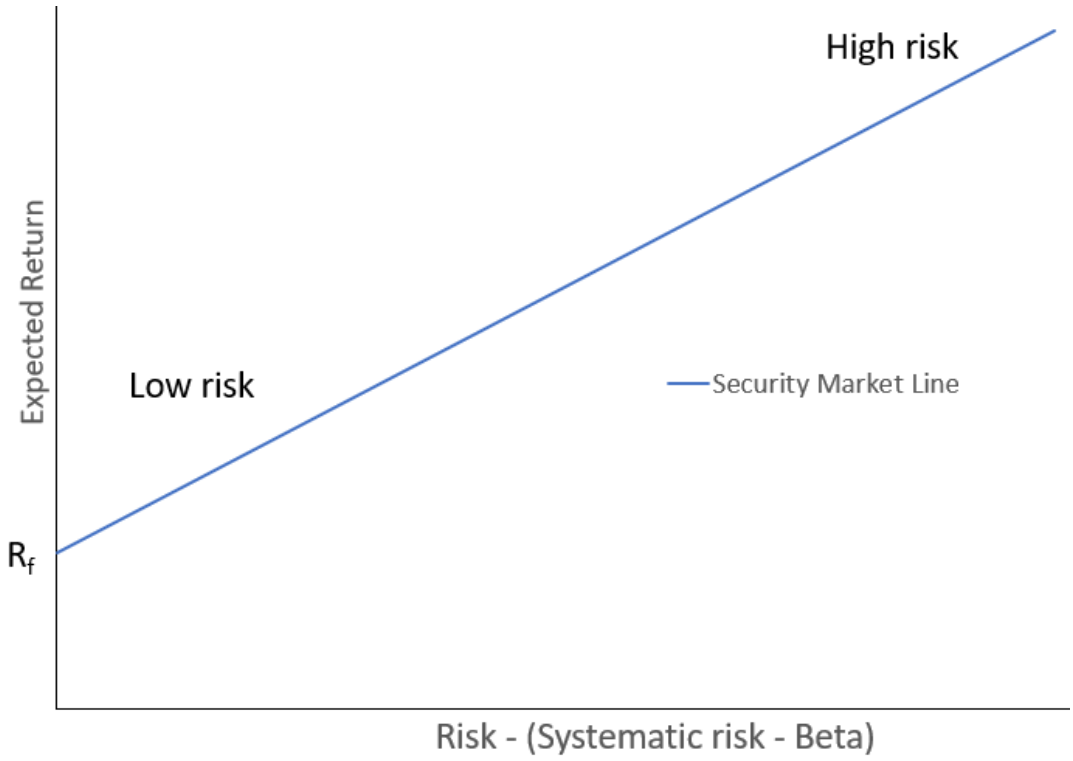

Figure 5 - Relationship between Risk and Return – Security Market Line

2.3 PREVIOUS RESEARCH

The research presented below summarizes the return and financing aspects of offshore wind and offshore oil & gas projects.

2.3.1 Financing of offshore wind projects

On the topic of financing of offshore wind projects, Steffen (2018) [30], performed a comprehensive study on likelihood of renewable projects utilizing project financing. The study based on a dataset of 468 powerplants in Germany that were put on production in the period between 2010 and 2016 (>10MW). His data showed that 88% of onshore wind projects and 50% of offshore wind projects were project financed.

IEA in the Renewable Energy Investments Report for 2019, also showed that the use of project finance had increased from 2013 to 2018, and stated that "the use of project finance for financing new projects has grown in recent years, with its largest contribution now in the utility-scale renewable power sector. The average debt-to-equity ratio in project finance has generally been around 80:20." [43]. While in their latest report on offshore wind, it was reported that project finance now represents the largest source of new asset financing. Furthermore, they indicated that this suggests - "improved investor confidence in offshore wind developments and a greater degree of project standardization than a few years ago, when most finance came from the balance sheets of developers and government-backed sources" [6] .

The Frankfurt School & UNEP Collaborating Centre for Sustainable Energy Finance published their Global Trends In Renewable Investment 2019, where they reported a 38% use of non-recourse project finance in renewable energy in 2018., They also highlighted that of the list of the 15 largest renewable project finance asset deals, there was a clear dominance of offshore wind [44].

Wind Europe has looked more specifically at the offshore wind market and reported a historic high in terms of the proportion projects being bankrolled by the use of project finance in Europe in 2018, where 77% of all capital raised for new asset finance was in the form of non-recourse project finance. In addition, they found that of the new assets that were project financed, the debt-to-capital ratio was 90% [45].

2.3.2 Risk and Return of offshore wind projects

Offshore wind projects can be characterized as capital intensive projects, which require high initial investments, followed by relatively small maintenance and operating costs. These high initial investments include mainly the capital expenditure on wind turbines, foundations and grid connections. However, once the installations are in place, the wind parks require relatively little maintenance, and have a close to zero marginal cost of production, as it does not cost anything for the wind to blow [46].

A key aspect of understanding the offshore wind market is the concept of intermittency. That means, that offshore wind only produces energy when the wind is blowing, which in effect then means, that there can be some discrepancy between the supply of energy and the demand for it. Combining this with the fact that electricity cannot be stored efficiently, creates a lot of uncertainty in terms of the electricity prices which offshore wind can obtain [47].

As a means of combating this issue, governments have provided offshore wind producers certain advantages compared to non-renewable sources. In Germany for instance, they have provided a system which prioritizes renewable energy when entering the grid [48]. In addition, several governments have implemented subsidy schemes in order to provide a long-term visibility of the price obtained and reducing the uncertainty for offshore wind operators. These subsidies could be in the form of a fixed price guarantee, which has been the case in Germany, feed-in premiums which we have seen in Denmark, or Green Certificates which we have examples of in Belgium. The different subsidy schemes are detailed in Section 3.3.1.3.8. As a result of these income guarantees, the price risk is reduced (or eliminated in the case of feed-in tariff), and the main risk of an offshore wind farm becomes related to how much electricity is produced (volume risk) and cost/time overruns in the construction phase (construction risk).

The limited downside price risk of these projects due to subsidies, means that the amount of electricity produced (volume) and the resulting revenue, will ultimately depend on wind speeds over time at the wind farm site [49]. Since wind speeds are inherently uncertain, developers utilize a probabilistic method to describe the amount of expected energy to be produced at the wind farm location. Estimates such as P50 and P90 are commonly used to describe the expected amount of energy to be produced [50]. DNV-GL performed a benchmarking of expected vs actual P50 and P90 of 11 offshore wind parks in Great Britain, with a combined 59 wind farm years [51]. They reported an estimated P90 to P50 ratio of 89.1% compared to an actual of 96.5% illustrating that there is limited uncertainty in the volume produced.

Another estimate of the volume risk of offshore wind is the Interannual Variability (IAV), which is used to describe the year-to-year variability. The IAV for annual mean wind speeds at sites across Europe has historically been characterized as having a normal distribution with a standard deviation of 6% [52]. However,

recent studies have shown that even this could be too conservative an estimate [53], indicating a relatively low uncertainty of year on year electricity output for offshore wind parks. However, volume risks still exist, as was evident last year when Ørsted had to adjust down their expected load factors[1] on seven of their wind parks, as they had underestimated the negative effects of the wake and blockage effect [54].

On the construction risk side, Sovacool et. al (2017), performed a review of 33 offshore wind projects which showed an average cost overrun of 9.6% [55], indicating that construction risk exists in offshore wind parks, however it seems to be limited.

Looking at the return side of offshore wind, there has been less empirical work performed. Osmundsen et al. (2020) [56] looked at returns of five sanctioned and already producing offshore wind parks in Germany and found that three out of five netted double-digit returns. However, none of the projects had a positive NPV without subsidy schemes in place, and the results indicated that the cost of offshore wind had to be reduced by an additional 60% to meet the level of expected variable market price for electricity. In addition, they concluded that "previous calculations that conclude that new offshore windmills are profitable at current market prices must be of a socio-economic nature, applying a much lower rate of return requirement than what is demanded by private investors."

There are also examples of companies reporting guiding for their project's IRR's to the financial market. Ørsted for example sent out a press release in October 2019, reporting that their unlevered IRR for seven of their projects to be in the range of 7-8% [57]. Another example is Equinor who recently reported in their Capital Markets Update in 2020, that their expected unleveraged real returns were in the range of 6-10%, but that the project financing structure gives them an option to leverage returns [58]. This is in line with "The Oil and Gas Industry in Energy Transitions" report published in 2020 [7] by IEA who state that "typical energy project IRR" for an offshore wind farm is approximately 7.5%.

[1] The load factor is the fraction of how much electricity is produced compared to how much capacity is installed

2.3.3 Risk and Return of oil & gas projects

Oil & gas projects are, similarly to offshore wind projects, very capital-intensive projects, with large up-front investments. These investments (CAPEX) can for instance include; the processing facilities, the cost of drilling and completing the wells, infrastructure to transport the oil and gas to the point of sale, and in the case of offshore projects, the platform installation. The majority of the costs for extracting the oil and gas go into the operational phase in the form of Operational Expenditure (OPEX).

The relative share of how much money is spent on CAPEX vs OPEX varies depending on what the type of oil and gas supply segment it is. As shown below in Figure 6, the differences between the different supply segments can vary drastically; for an Offshore Deepwater[2] project, CAPEX can constitute 60% of the total investment, while this number is drastically lower for an Oil Sands Project, where the OPEX is a significantly higher share of the total investments as the costs of excavating and transporting the oil can be substantial.

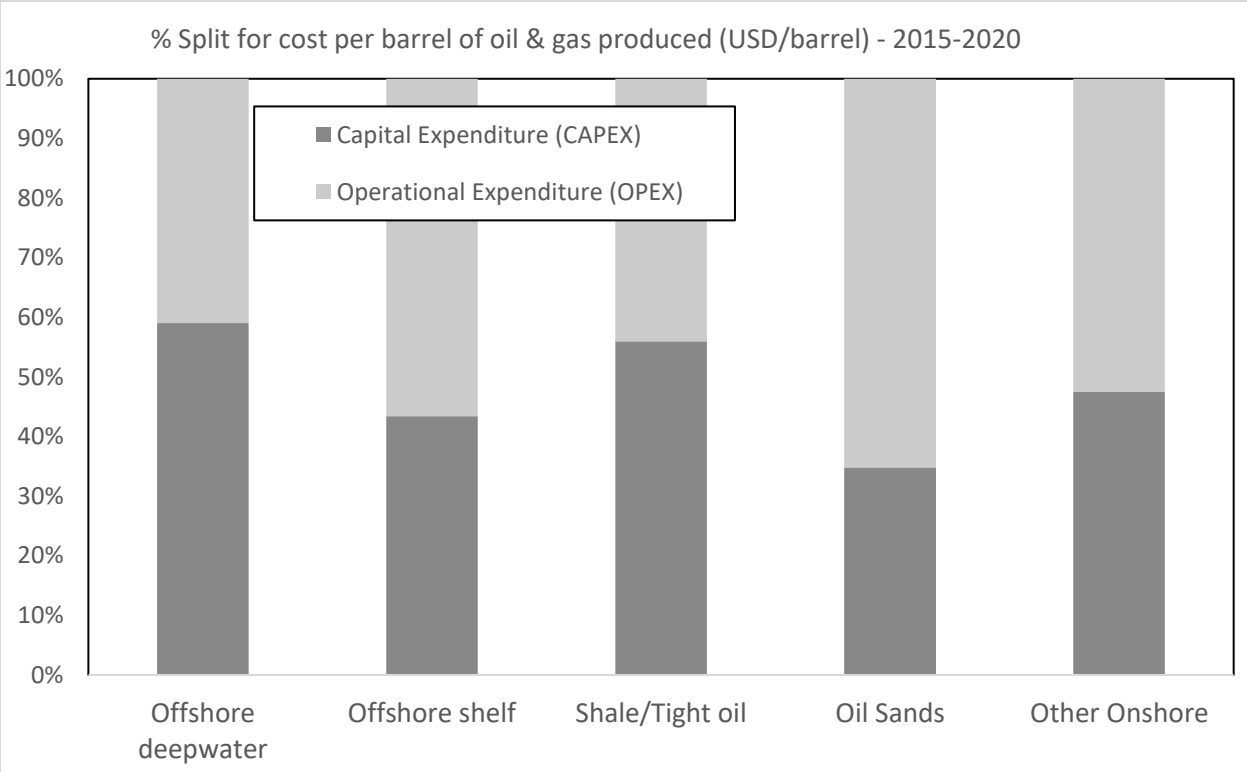

Figure 6 - Cost per Barrel of oil & gas Produced – 2015-2020 – Source Data: Rystad Energy UCube

In addition, the cash flow for the different types of oil and gas supply segments are very different. Whereas a typical offshore project has a payback period of 6-13 years, a shale/tight oil project, has a payback of 2-3 years [58]. In other words, the risk picture for the different supply segments are quite different. Therefore,

[2] Deepwater referring to projects with a water depth over 125 meters

for the purpose of this thesis, the focus will be on *offshore* oil and gas projects, as they are the projects which IEA sees the most synergies in terms of oil and gas companies venturing into the offshore wind space [6].

On the risk side of oil and gas, there are several elements to consider. First and foremost, there is a substantial price risk for oil and gas projects, as there are no subsidies which act as a price floor. Figure 7 shows the oil price for the last 15 years, clearly illustrating the volatility in the price over time.

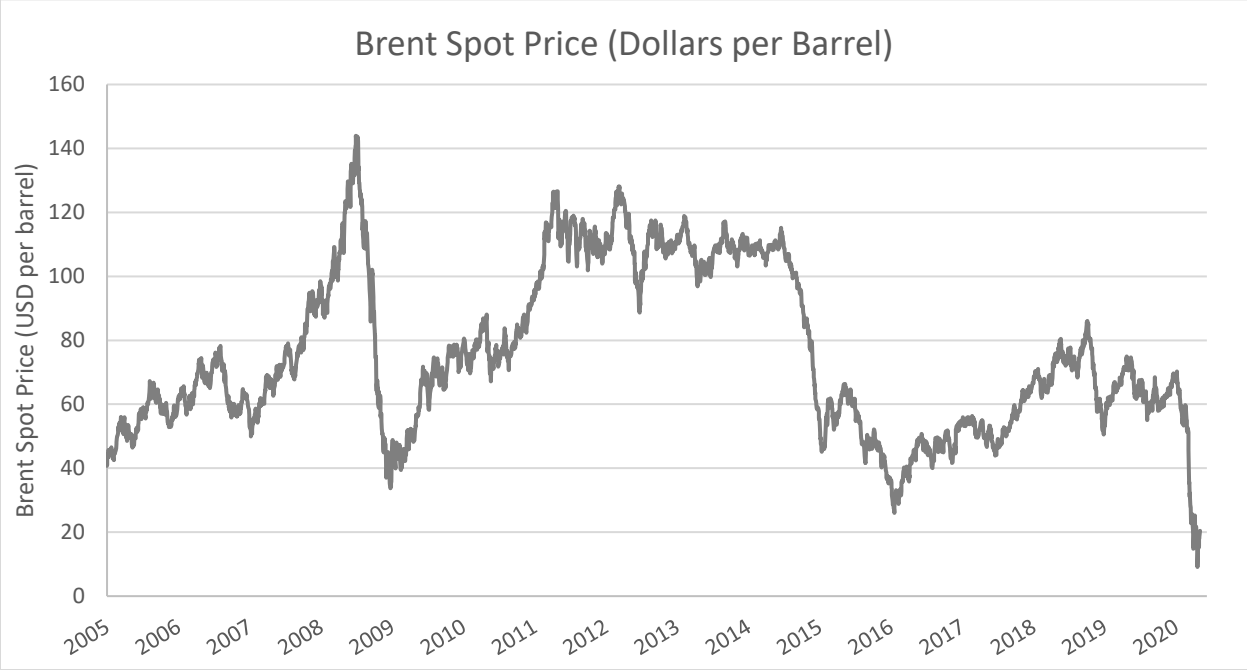

Figure 7 - Brent Spot Price - 2005-2020 – Source Data: IEA

Another risk aspect for oil and gas projects is related to the uncertainty regarding the volumes to be produced. A typical offshore oil and gas field can have large uncertainty in the underlying volumes, even after the fields have started producing. This can be seen by looking at the reported reserves estimates of the top publicly traded oil and gas companies, where the ratio of the 1P to 2P reserves in 2019 are in the range of 55-62%, as can be seen below in Figure 8.[3]

[3] 1P & 2P reserves refer to proven and probable reserves as per the Society of Petroleum Engineers' Petroleum Resources Management System (SPE-PRMS). This in probabilistic terms corresponds with the P90 and the P50 estimates of producible volumes.

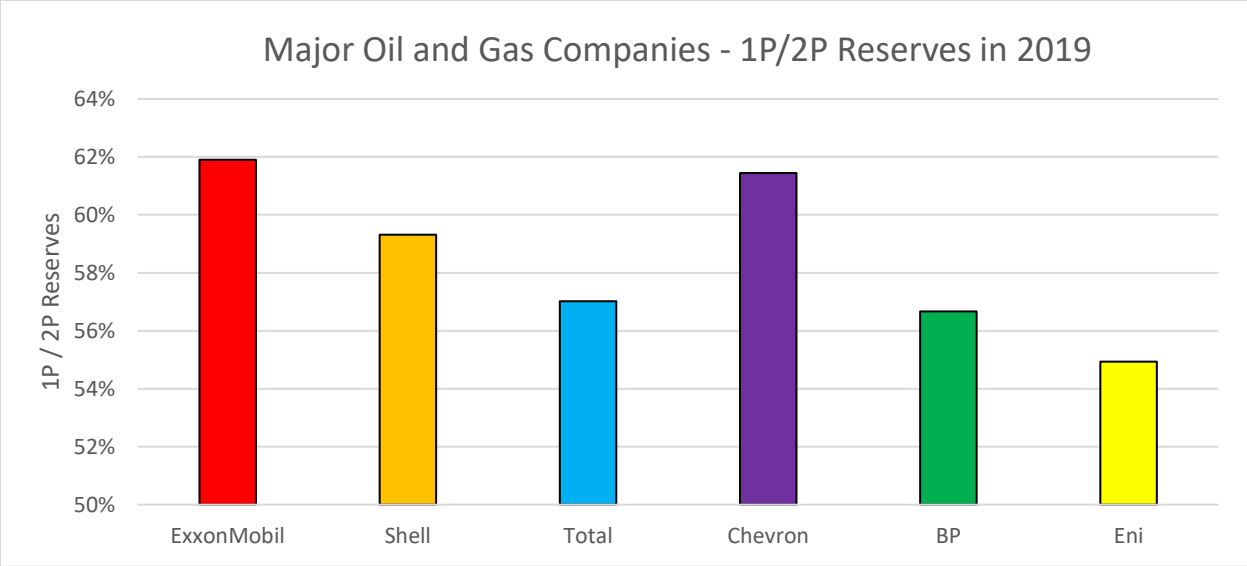

Figure 8 - 1P/2P Reserves in 2019 - Major Oil and Gas Companies – Source Data: Rystad Energy UCube

Also, similarly to the offshore wind projects, there exists construction risk, as offshore oil and gas projects are typically large complex multibillion-dollar constructions, which need to work under extreme conditions, both in terms of weather, but also in terms of pressure and temperature. Lorentzen et al. (2007) reviewed a dataset of 79 different offshore oil and gas projects on the Norwegian Continental Shelf between 2000 and 2013, and found that on average there was a cost overrun of 21%, and that 64 of the 79 projects experienced a cost overrun [59]. All in all, indicating a considerable construction risk.

The required return on oil & gas projects has been a topic of much debate. In Norway for instance, a governmental report published in 2018, reported that there seems to be discrepancies between what the Norwegian Government uses as a required rate of return and what the oil & gas companies are utilizing [60]. A survey done in 2018 by Wood Mackenzie, an energy market intelligence house, indicated that oil and gas companies are using a required rate of return of 13-14% in order to approve oil and gas projects [61]. In addition, Emhjellen and Osmundsen (2017), has seen evidence from several major oil & companies, that they also operate with additional investment criteria. This is best illustrated by the fact that the oil and gas companies have an expected future oil price of 60-70 USD barrel, while at the same time they demand that their projects are profitable at certain oil prices, also called break-even prices (BEP), as low as 30 USD per barrel [62] [63]. For instance, Total, have communicated in their Investor Day Presentation 2018, that their BEP for all new acquisitions in 2015-2018 was under 30 USD per barrel , while their long term assumption in all other metrics was 60 USD per barrel [64]. These additional investment criteria, in effect mean that the actual required rate of return for oil and gas companies are higher than what the estimates from Wood Mackenzie's survey suggest.

Rystad Energy has also looked at the IRR of oil and gas projects, and in a report written for Norwep in 2018, showed an average IRR or 23% and 38%[4] for the top 30 projects on the Norwegian Continental Shelf in terms of resources, with a final investment decision between 2015 and 2020 [58].

[4] 23% for Standalone projects (projects with its platform or production vessel) and 38% for tiebacks (which are projects which produce via an existing platform or production vessel), with a fixed real oil price of 70 USD per barrel.

3 METHODOLOGY & DATA

3.1 CHOOSING A RESEARCH METHODOLOGY

Two routes of research were followed to provide an optimal overview of the offshore wind space.

One, qualitative research was performed, where financial actors in the offshore wind space were interviewed to give a better understanding of the nuances and the general market consensus, which is hard to determine by analyzing the data alone. This also provided an opportunity to determine which datapoints could be of most interest when looking at the quantitative data.

Secondly, quantitative research was performed, where financial data was gathered for offshore wind projects. This allowed quantification of the historical evolution of project financing, but also provided further insight into the risk-return picture of offshore wind.

Key information such as how subsidies have evolved over time, how the economics of projects with and without subsidies compare, in combination with how the costs have evolved are all important pieces of information that combine to give an understanding of the risk-return picture.

A similar quantitative exercise was performed for offshore oil and gas projects so that a comparison of the risk-return picture could be made between the two industries.

3.2 QUALITATIVE METHODOLOGY

3.2.1 Semi-structured interview

The qualitative part of the data gathering took the form of interviews, both in person and over the phone. When it comes to using interviews as a research methodology, there are several approaches ranging themselves from quantitative to qualitative. On the quantitative end of the scale would be structured interviews and surveys. While on the other side of the scale are the more qualitative approaches, namely semi-structured and unstructured methods, which are characterized by increasing levels of flexibility and lack of structure [65].

The interviews for this thesis took the form of a semi-structured interview allowing for the collection of data from interviewees who have personal experiences, and perceptions related to the topic of interest. A benefit of this method is that it allows flexibility in the interviewing process, as it acknowledges the fact that the interviewer might not know up front what topics could be of interest to take a deep dive in. Furthermore, it gives the interviewer the opportunity to adjust or add questions based on the responses.

An additional reason for choosing the semi-structured interview as a research methodology, is due to the goal of having a more open-ended discussion with the interviewees. As different interviewees have expertise on different elements related to the research and hence it can be beneficial to allow them to drive the discussion. For instance, the investor side might not have a detailed overview of the criteria for using project finance, but would may be more knowledgeable on the risk-return picture for offshore wind.

A potential issue with qualitative interviews however, and open-ended questions in general, is the fact that they can become biased by the opinion of the interviewer. This may be revealed by their choice of follow-up questions and which questions are given more time during the interview.

Statements have been amended according to the respondents´ comments and approved by the interviewees.

3.2.2 Questions – Topics – Prompts

The following list of questions were the outline of the general interview held with each participant, however as mentioned previously, there was flexibility in the interviewing process, as the different interviewees had different topics of interest & specialty:

1. What trends do you see regarding financing of offshore wind projects? Do they tend to be corporate or project financed?
2. What criteria are used to decide how a project will be financed?
3. How do you perceive the evolution of the risk-return picture in offshore wind?
4. What are the trends in cost development?
5. Do you see any competitive advantage for oil and gas companies venturing into offshore wind?

3.2.3 Respondents

In order to get as wide a picture as possible regarding both financing trends, but also the risk return picture of offshore wind, it was important to interview participants both from the lending side and also the investor side. This allowed for feedback both on how the investor side viewed the risk-return picture, but also how the lending side viewed the risk picture, and trends they have seen in terms of the financing.

Eksport Credit:

Eksport Credit is a Norwegian national credit guarantee agency. Export Credit Norway helps Norwegian exporters abroad by offering Norwegian and foreign companies financing, when buying goods and services from Norwegian exporters.

- Ivar Slyngesol - Director Strategy and Business Development

DNB:

DNB is Norway's largest financial services group and one of the largest in the Nordic region in terms of market capitalisation.

- Sigurd Kayser – Senior Vice President - Power & Renewables
- Einar Kilde Evensen – Senior Vice President - SVP / Client Advisor, Renewables & Infrastructure

Swedbank:

Swedbank is one of the primary banks in Sweden. The have extensive experience acting as financial advisors in renewable energy acquisition.

- Peter Knutzen – Managing Director, Corporate Finance Norway

Clarkons Platou Securities:

Clarksons Platou Securities is the investment banking arm of the Clarksons Group. The bank specializes in the Clarksons Platou Group's core maritime sectors.

- Viktor van der Feer - Investment Banking, Renewable Energy

Danske bank:

Danske bank is the largest bank in Denmark, who offer expertise in funding, risk management, investment services, corporate finance advisory services, and transaction banking solutions

- Christian Yggeseth – Head of Equity Research Norway
- Jørgen Lande – Analyst

Nordea:

Nordea is a leading financial services group in the Nordic region and one of the biggest banks in Europe.

- Jørgen Bruaset – Senior Equity Research Analyst

Pareto Securities:

Pareto Securities is an independent full-service investment bank with a leading position in the Nordic capital markets and a strong international presence within the energy sectors.

- Bård Rosef – Financial Analyst

3.3 QUANTITATIVE METHODOLOGY

3.3.1 Offshore wind

With the desire to get an overview of how the offshore wind parks are making a return, it was decided to focus on a range of specific projects. For each the following, information was collated; the investments in each project, how each project was financed and finally, for a subset of projects, how did the return picture look.

3.3.1.1 Case Selection

The starting point for case selection was the Rystad Energy's database for Offshore Wind, which is a complete global database of all Offshore Wind Projects world-wide. In order to limit the number of datapoints to research, and to limit the different fiscal and subsidy regimes, it was decided to only focus on European projects, which had a Financial Close Date (Final Investment Decision) in the time range 2014 to 2019.

Furthermore, after discussions with Alexander Fløtre (Head of Offshore Wind in Rystad Energy), it was decided to only include projects above 100MW in order to exclude pilot-projects or test-projects which wouldn't be representative in this dataset.

This left a database of 47 offshore wind projects spread over the following 6 countries in Europe: United Kingdom, Germany, Netherlands, France, Denmark and Belgium. The full list is show below in Table 1.

Table 1 - Offshore Wind Parks in Dataset

List of Wind Farms in Dataset					
Germany	**United Kingdom**	**Netherlands**	**Denmark**	**Belgium**	**France**
Amrumbank West, DE	Beatrice, GB	Borssele 1 & 2, NL	Kriegers Flak, DK	Nobelwind (Belwind II), BE	Saint-Nazaire, FR
Arkona Offshore Wind Farm, DE	Burbo Bank Extension, GB	Borssele 3 & 4, NL		Norther, BE	
Baltic 2, DE	Dudgeon East, GB	Westermeerwind, NL		Northwester 2, BE	
Borkum Riffgrund 2, DE	East Anglia One, GB	Windpark Fryslân, NL		Rentel, BE	
Butendiek, DE	Galloper Wind Farm, GB	Eneco Luchterduinen, NL		Seamade (Mermaid), BE	
Deutsche Bucht, DE	Gwynt y Mor, GB	Gemini, NL		Seamade (Seastar), BE	
Global Tech I, DE	Hornsea Project Two a, GB				
Gode Wind 1, DE	Humber Gateway A, GB				
Hohe See, DE	Moray East, GB				
Merkur Offshore, DE	Neart na Gaoithe (NnG), GB				
Nordergrunde, DE	Race Bank, GB				
Nordsee One, DE	Rampion Offshore Wind Farm, GB				
Nordsee Ost, DE	Triton Knoll, GB				
Sandbank, DE	Walney 3, GB				
Trianel Windpark Borkum I, DE	Westermost Rough A, GB				
Trianel Windpark Borkum II, DE					
Veja Mate, DE					
Wikinger, DE					

The database contains the information as shown in Table 2 on each project.

Table 2 - Rystad Energy Offshore Wind Database - Datapoints

Offshore Wind Project
Country
Start-up year
Current Status
Wind farm capacity (MW)
Number of turbines
Turbine capacity (MW)
Turbine type
Average hub height (m)
Average rotor diameter (m)
Foundation concept
Water depth (m)
Operator
Developer

All financial data; total investments, financing (corporate or project financed), amount of non-recourse debt, fiscal regimes, and subsidy schemes was gathered and collated in this database.

3.3.1.2 Data

3.3.1.2.1 Financial data for each project

Datapoints gathered:

- Total investments (CAPEX)
- Financial Close Date (Final Investment Decision)
- Project financed/corporate financed
- Amount of debt/equity in project finance

For each individual data point, the data was gathered with the following methodology:

- Firstly - for each project the annual report of the developer, if available, was utilized to determine the total investments and if a project was project financed or not, and if so, how much was financed with debt. However, it was quite rare that the developer disclosed significant information on all elements

- Secondly - for each project, press releases were researched, as it was quite common for the banks who participated in the project financing to release press statements related to the deal.
- Thirdly – news reporting on the projects from market intelligence providers and newspapers were utilized.

3.3.1.2.1.1 Financial Data – Data Source Credibility

Data credibility is a vital part of any analysis as it determines if data points can be relied on and used as part of the analysis. All the data gathered is from publicly available sources (company reporting or press releases). However, due to the uncertainty in data from news reporting (as underlying sources are not always available), where possible, several sources were utilized for each datapoint in order to ensure validity. However, as this uncertainty could not be completely removed, the discussions and conclusions following, have been made on the basis of trends and key observations rather than single datapoints.

3.3.1.3 Project Economics – return on investments

3.3.1.3.1 Valuation Methodology – Internal Rate of Return

In order to assess the returns of the individual projects, the Internal Rate of Return (**IRR**) was calculated. The **IRR** is a valuation method which bases itself of the Net Present Value (**NPV**) calculation

Net Present Value can be defined as the present value of all the expected future cash flows and can be written as:

$$NPV = -Initial\ investment + \frac{CF_1}{(1+r)} + \frac{CF_2}{(1+r)^2} + \cdots + \frac{CF_n}{(1+r)^n} \quad \text{Eq. 8}$$

Where:

$CF_i = Cash\ Flow\ in\ Year\ i$

$r = discount\ rate$

$n = number\ of\ individual\ cash\ flows - normally\ per\ year$

Conceptually, the discount rate, *r,* on a project is the return that one can expect to earn on a financial asset of comparable risk. The discount rate is often referred to as an opportunity cost, since the corporate investments in the project takes away an opportunity for the company to invest the same cash in a financial asset [38].

The Internal Rate of Return (**IRR**), is defined as what the discount rate must be to make the NPV of the project equal to zero and is calculated by trial and error:

$$NPV = 0 = -Initial\ investment + \frac{CF_1}{(1+IRR)} + \frac{CF_2}{(1+IRR)^2} + \cdots + \frac{CF_n}{(1+IRR)^n} \quad \text{Eq. 9}$$

In this thesis the IRR was calculated by Excel's built in IRR function.

3.3.1.3.2 Breakeven Price

To assess the cost evolution of the offshore wind projects, the breakeven price was calculated.

The breakeven price is the price needed to make the NPV of the project equal to zero with a fixed discount rate and is calculated by trial and error. In this thesis the breakeven price was calculated by Excel's goal-seek functionality. The discount rate chosen for the breakeven calculations was set to 6%, as this aligns well with the typical WACC reported by IEA for offshore wind [6].

3.3.1.3.3 Case Selection for IRR calculations

27 projects in Germany and the United Kingdom were chosen for IRR calculations. The reasoning for choosing only these two countries was due to time constraints (implementing the fiscal regimes and subsidy schemes of all 6 different countries into a valuation models was infeasible), and mostly because over 75% of the projects are located in these two countries.

In addition, only projects which have received subsidies under the current subsidy schemes were included to ensure consistency between the datapoints. This means 'Contract for Difference' (CfD) for the United Kingdom assets and 'Fixed Feed in tariff under market Premium' for German assets. The different subsidy schemes are detailed in section 3.3.1.3.11. In addition, the three Dogger Bank projects were also added. Even though these wind parks have yet to have a financial close (final investment decision), they have been awarded a CfD, and also, Equinor has communicated the CAPEX for these wind parks. This gave 27 assets[5] for which the return could be calculated Table 3.

Table 3 - List of Offshore Wind Assets for IRR Calculations

List of Assets for IRR Calculations	
United Kingdom	**Germany**
Beatrice, GB	Arkona Offshore Wind Farm, DE
Burbo Bank Extension (Burbo Bank 2), GB	Borkum Riffgrund 2, DE
Dudgeon East, GB	Butendiek, DE
Dogger Bank Creyke Beck A, GB	Deutsche Bucht, DE
Dogger Bank Creyke Beck B, GB	Gode Wind 1, DE

[5] Hornsea Project Two was purposefully left out as there is limited available information about the total investments.

Dogger Bank Teesside A, GB	Hohe See, DE
East Anglia One, GB	Merkur Offshore, DE
Hornsea Project One - Heron & Njord, GB	Nordergrunde, DE
Moray East, GB	Nordsee One, DE
Neart na Gaoithe (NnG), GB	Nordsee Ost, DE
Triton Knoll, GB	Sandbank, DE
Walney 3, GB	Trianel Windpark Borkum I, DE
	Trianel Windpark Borkum II, DE
	Veja Mate, DE
	Wikinger, DE

3.3.1.3.4 Investment and lifetime assumptions

Simplified assumptions were made on the investment side, and the CAPEX investments are modelled as a one-year investment, one year before the start-up of the project. The lifetime of the offshore wind parks is assumed to be 25 years, which is a typical lifetime of an offshore wind park according to IEA [6]

3.3.1.3.5 Project operating cost

According the IEA in their Offshore Wind Energy Comparative Analysis [66], the annual operational cost (OPEX) of a project was between 1.7-1.9% of the total construction (CAPEX) for European countries in 2017 compared to 2.2% which is the global baseline for the same period. Based on this, an OPEX cost of 1.8% was assumed for all the projects, with an increase of 2% each year due to inflation.

In addition, for offshore wind farm owners in the United Kingdom pay seabed leasing charges to the Crown Estate, fixed at 1% of gross wind farm revenues.

3.3.1.3.6 Abandonment cost

The abandonment cost (ABEX) was modelled as 20% of the CAPEX in the year after the last year of electricity production [66].

3.3.1.3.7 Capacity utilization (Load Factor)

An important part of estimating the income from offshore wind parks, is to understand the capacity utilization (also often referred to as Load Factor). The capacity utilization is the fraction of how much is produced compared to how much capacity is installed. It is a complex element to estimate as it depends on several variables but is primarily determined by the wind. Capacity utilization is reported to range from 30-55% [66] and hence, in this study a fixed capacity utilization of 45% has been used.

3.3.1.3.8 Subsidy and income assumptions

Governmental webpages of the different countries provided ample information on the individual subsidy schemes and fiscal regimes in place in the different countries and for the individual offshore wind parks. In addition, the IEA keeps a detailed overview of all energy policies related to renewable energy [67]. An overview of the different subsidy schemes can be found in Table 4.

3.3.1.3.8.1 Germany

The German subsidy scheme is the market premium under fixed feed-in-tariff, which has a base remuneration of 154 Euro/MWh (nominal), which is granted for a period of 12 years, followed by an 8-year period of 39 Euro/MWh (nominal). One option for the operators, is to apply for the "Stauchungsmodell" (acceleration model) which enables the operators to receive an increased remuneration of 194 Euro/MWh (or 184 Euros/MWh (nominal) if the offshore wind park was sanctioned after 2017). To be eligible for this, the offshore wind park must have been commissioned before 2021. When using this option, the period of 39 Euro/MWh (nominal) is increased to 12 years.

In addition, Germany has increased the initial remuneration based on the site conditions, meaning that if the offshore wind park is at least 12 nautical miles from the coast and/or at water depths more than 20 meters, the period of utilization of the acceleration model increases from 8 to 10 years.

Looking at the wind farms commissioned in 2017 and 2018, they are on average in water depths of 29 meters, and an average distance to shore of 35km. Therefore, a 10-year period of 194 Euro/MWh or 184 Euro/MWh (nominal) has been assumed, followed by 39 Euro/MWh (nominal) the next 10 years [66].

3.3.1.3.8.2 United Kingdom

In the UK the Contract for Difference (CfD), has been the main source of subsidy for the offshore wind since its implementation in 2017 (the first auction was held in 2015, but the first delivery year for offshore wind was in 2017). The UK government defines it as "… a private law contract between a low carbon electricity generator and the Low Carbon Contracts Company (LCCC), a government-owned company. A generator party to a CFD is paid the difference between the 'strike price' – a price for electricity reflecting the cost of investing in a particular low carbon technology – and the 'reference price'– a measure of the average market price for electricity in the GB market. It gives greater certainty and stability of revenues to electricity generators by reducing their exposure to volatile wholesale prices, whilst protecting consumers from paying for higher support costs when electricity prices are high." [68]. In other words, the operators are guaranteed a fixed price for their electricity, regardless of the electricity price. All CfD's are awarded with a 15-year maturity.

There have been 3 auction rounds so far in the UK, with the strike prices dropping significantly for each round. Prior to the first round, the highest CfD for offshore wind in the UK was as high as 150 GBP/MWh. However with every successive round, the prices have dropped further, and the last round saw prices down at 39.65 GBP/MWh (strike prices are all referenced in 2012 prices) [69]. For the projects assessed, the strike prices are retrieved from the governmental webpages and prices are indexed to the start-up year with an average inflation of 2% [70].

Table 4 - Offshore Wind Subsidy Overview - European Countries

	Subsidy Scheme	Detailed Explanation	Duration	Source
United Kingdom	**CfDs (Contracts for Difference)** replaced **ROCs (Renewable Obligation Certificates)** as the primary support mechanism from April 2017.	**CfDs** are government-backed contracts where developers are paid a flat (indexed) rate for the electricity they produce over a 15-year period. **Renewable Obligation Certificates (ROCs)** – a green certificate mechanism – are available to projects that have received grace periods until March 2018.	15 years (CfD) & 20 years (ROC)	www.thecrownestate.co.uk/energy-minerals-and-infrastructure/offshore-wind-energy/our-portfolio/project-details/ , https://www.thecrownestate.co.uk/media/3321/tce-r4-information-memorandum.pdf , https://www.iea.org/policies/5731-contract-for-difference-cfd?country=United%20Kingdom&qs=den&region=Europe&technology=Wind
France	**Feed in-tariff**	Guaranteed price (feed-in tariff, depending on tender round, location and bid)	20 years	French Ministry for Energy (2016): www.developpement-durable.gouv.fr/-Energies,198-.html
Belgium	**Green Power Certificates**	Offshore wind operators receive green power certificates for every MWh produced at a guaranteed minimum price over a defined year period	Ranging from 17 to 19 years for the most recently awarded wind farms	https://www.creg.be/fr/professionnels/productio
Denmark	Tender: Contracts for Difference, **Open door**: set subsidy per kWh	**Open Door**: For wind turbines connected after January 1, 2014 and before February 20, 2018, the state will pay an subsidy of 25 øre/kWh. This is capped so that the market price plus the surchage cannot exceed a total of 58 øre / kWh. In 2019 a new subsidy scheme was put in place where CfD's are he primary subsidy scheme, but if prices are higher than pre-agreed rate, the profit is divided between developer and government.	Tender: 20 years. Open door: formula combining 6,600 hours of full load plus 5.6 MWh per are of wing area	https://ens.dk/ansvarsomraader/vindenergi/aaben-doer-ordningen-havvindmoeller/information-projektudviklere-om-aaben , https://www.iea.org/policies/4888-feed-in-premium-tariffs-for-renewable-power-promotion-of-renewable-energy-act?country=Denmark&qs=den&region=Europe&technology=Wind
Germany	For projects commissioned until 2021: market premium under fixed feed-in tariff system. For projects commissioned from 2021: market premium under a base price awarded in tender	For projects commissioned until 2021: market premium under fixed feed-in tariff system. For projects commissioned from 2021: market premium under a base price awarded in tender	Until 2021: 20 years + year of commissioning After 2021: 20 years	http://www.res-legal.eu/search-by-country/germany/single/s/res-e/t/promotion/aid/feed-in-tariff-eeg-feed-in-tariff/lastp/135/ , https://www.iea.org/policies/6526-the-offshore-wind-energy-act-windseeg?country=Germany&region=Europe&technology=Wind
Netherlands	**Subsidieregeling Duurzame Energie+ (SDE+)**	Guaranteed price lowered by the electricity market price (market premium).	Max 15 years + 1 year banking	https://www.rvo.nl/subsidie-en-financieringswijzer/stimulering-duurzame-energieproductie-sde/aanvragen-sde/berekening-sde

3.3.1.3.9 Electricity Prices

In addition to the subsidies, an assumption has been made for the electricity prices in both Germany and the United Kingdom. Both in order to assess the return picture in case there are no subsides in place, but also due to the fact that the subsidies in United Kingdom and Germany only lasts for 15 and 20 years, meaning that the offshore wind parks are exposed to the electricity market after that.

The electricity prices chosen for the study were based on the average electricity price over the last three years based on information from Nordpool. A fixed price of 35 Euro/MWh was assumed for German electricity prices, which is indexed at 2020, and increased by 2% every year due to inflation [71]. For United Kingdom a fixed price of 50 GBP/MWh with the same indexing and inflation [72]. In addition, the United Kingdom electricity providers face a transmission tariff, which varies based on the distance from shore. In this study it was assumed to be fixed at 10 GBP/MWh, based on historical data from previous offshore wind parks [73]. The price utilized then becomes a fixed 45 Euro/MWh.

3.3.1.3.10 Inflation

The inflation factor will influence both how the prices will evolve, but also how the OPEX will change for the offshore wind parks during their lifetime. Looking at the historical data for United Kingdom and Germany, we see fluctuations in the inflation rate over the last decade, however the average over the last 3 years has been 2% [74] [75] and therefore this was chosen as the fixed long-term inflation for the study. This aligns well with the long term forecast of Statista (2%) [76] [77] and the European Central Bank (1.8%) [78].

3.3.1.3.11 Fiscal Regimes

3.3.1.3.11.1 Germany

In Germany, at present there does not exist any specialized fiscal regime for offshore wind. Instead the corporate taxes apply, with a corporation tax of 29.83% and tax depreciation follows a straight-line depreciation of 16 years [66].

3.3.1.3.11.2 United Kingdom

In the UK, at present there is no specialized fiscal regime for offshore wind. Instead the corporate taxes apply, with a corporation tax of 19% (as of April 2017). In addition, the UK allows for tax depreciation (referred to as Capital Allowances) at 18% using the declining balance method [66].

3.3.2 Offshore Oil & Gas

To allow for a comparison of the risk return picture of offshore wind projects with oil and gas projects a similar approach to that of the offshore wind was performed, were an IRR was calculated for a portfolio of oil and gas projects.

3.3.2.1 Case Selection

In order to minimize external factors such as geopolitical risk, it was decided that the projects to be selected should be in the same geographical region as that of the offshore wind projects (Europe). In addition, the cases selected were *offshore* oil and gas projects, as they are the predominantly the projects where there are the most synergies with offshore wind. Due to this synergy, one can envision that for an oil and gas company entering the offshore wind space, these would be the projects which would be in direct competition for allocation of capital [6].

The starting point for identifying projects was the Rystad Energy's *UCube*, a global upstream database, with over 65,000 oil- and gas fields and licenses. This database provides oil and gas production values, reserves and economics for each individual field [79].

The project list was then further narrowed down by only focusing on projects which had a Final Investment Decision (FID) between 2010 and 2019, and finally only fields which were operated by oil and gas companies which have entered the offshore wind space (Equinor and Shell). In addition, to limit the number of fiscal regimes, only the projects sanctioned in the United Kingdom and Norway were selected (this eliminated 3 Dutch projects).

The remaining 35 projects can be seen below in **Table 5.**

Table 5 - List of Oil & Gas Projects for IRR evaluation

Project	Country	Operator	FID
Barnacle, GB	United Kingdom	Equinor	2019
Fram (29/03a- 6), GB	United Kingdom	Shell	2018
Pierce (gas blowdown), GB	United Kingdom	Shell	2019
Njord Northwest, NO	Norway	Equinor	2011
Utgard, GB	United Kingdom	Equinor	2017
34/11-6 S (Valemon West), NO	Norway	Equinor	2017
Bauge, NO	Norway	Equinor	2017

Penguins (redevelop), GB	United Kingdom	Shell	2018
Stjerne, NO	Norway	Equinor	2011
Visund South, NO	Norway	Equinor	2011
Troll West (Gas), NO	Norway	Equinor	2018
Johan Sverdrup-Phase 2, NO	Norway	Equinor	2019
Johan Sverdrup-Phase 1, NO	Norway	Equinor	2015
Svalin, NO	Norway	Equinor	2012
Vigdis Northeast, NO	Norway	Equinor	2011
Byrding, NO	Norway	Equinor	2017
Snorre Expansion, NO	Norway	Equinor	2018
Arran (x- Barbara, Phyllis) (23/16c- 8), GB	United Kingdom	Shell	2018
Johan Castberg, NO	Norway	Equinor	2018
Utgard, NO	Norway	Equinor	2017
Trestakk, NO	Norway	Equinor	2017
Skuld, NO	Norway	Equinor	2012
Gudrun, NO	Norway	Equinor	2010
Snohvit Phase 2 (Askeladd), NO	Norway	Equinor	2018
Hyme, NO	Norway	Equinor	2011
Njord Future, NO	Norway	Equinor	2017
Martin Linge, NO	Norway	Equinor	2012
Aasta Hansteen, NO	Norway	Equinor	2013
Gina Krog, NO	Norway	Equinor	2013
Mariner, GB	United Kingdom	Equinor	2013
Gaupe, NO	Norway	Shell	2010
Valemon, NO	Norway	Equinor	2011
Knarr, NO	Norway	Shell	2011
Fram H Nord, NO	Norway	Equinor	2012
Sindre, NO	Norway	Equinor	2017

3.3.2.2 Data

Rystad Energy's database has a field by field overview of the production, but also, more importantly, full economic metrics, such as investments, operational costs, governmental take, taxes, free cash flow and NPV.

In addition, the database is built with a flexibility allowing the user to input any flat oil price (in real terms) and automatically calculate the NPV and IRR for any project.

3.3.2.2.1 Oil and Gas Data – Data Source Credibility

As with the offshore wind data, an evaluation of the data source is of vital importance when conducting any sort of research. In the context of the oil and gas data gathered, all the data is from the Rystad Energy Database.

Rystad Energy uses only publicly available information as sources for their data, whether that being governmental released data (as is the case for the majority of the information in Norway), company annual reports or press releases.

In terms of Rystad Energy itself, the company is a credible source of information, being a major energy market intelligence house. Their data is being used by organisations such as IEA [43] and the Organisation of the Petroleum Exporting Countries (OPEC) [80].

3.3.2.3 Project Economics – return on investment

As for offshore wind, the valuation methodology used for the oil and gas projects was the Internal Rate of Return (IRR), which is described in Section 3.3.1.3.1. For the IRR, the calculation was done by Rystad Energy's Upstream Database UCube, which takes into account all revenues, expenditures, fiscal regimes and inflation for each individual oil & gas project.

3.3.2.3.1 Operational Expenditure (OPEX) and Capital Expenditure (CAPEX) assumptions

The OPEX and CAPEX can be split into two parts[6]:

- Historical data - the Rystad Energy Database is based on publicly available information and estimated based on project level activity reported by operators in their annual reports.
- Future data:
    - **CAPEX values** are estimated based on current drilling activity in different projects and take into consideration when the projects will start major decline, and at which point drilling activity reduces significantly. The CAPEX is further subdivided into two main categories:
        - **Facility Capex** – Cost associated with the construction and implementation of the facility required for the processing and production of the field as well as costs related to the maintenance and improvements required to keep the facility operational. This is estimated based on type of facility and the production rate the facility is designed for (also called plateau rate).
        - **Well Capex** - Well capex is capitalized costs related to well construction, including drilling costs, rig lease, well completion, well stimulation, steel costs and materials. This is estimated by looking at the field type and estimated drilling cost per amount of resources.
    - **OPEX values** are estimated at a project level, calibrated against company reported values and is split into four separate cost classes:
        - **Abandonment Cost** – Cost associated with shutting down and dismantling the production facilities. It is based on a field specific characteristic such as facility type and number of wells to be shut down and abandoned.
        - **Production Opex -** Estimated as a cost per produced barrel and fixed element based on plateau production.

[6] Source: Rystad Energy – Client Portal – Help Centre: https://www.rystadenergy.com/clients/help-center/

- **Transportation Opex** – Cost of bringing the oil and gas from production site to pricing point. Estimated as a cost per produced barrel. The unit cost is based on location.
- **SG&A Opex** - Represents operation expenses not directly associated with field operations. Estimated as a percentage of total OPEX.

3.3.2.3.2 Income assumptions – Oil price

Since the future oil price has by far the greatest effect on the IRR of the projects, it was decided to run the IRR calculation on two scenarios. One, the base case of Rystad Energy as of the time of extraction of data from the database (April 2020), and one with a flat real oil price of 65 USD per barrel. The reason for choosing a flat real oil price of 65, was that this aligns well with the company's long-term oil price forecast (Shell and Equinor) and gives an indication of what the predicted IRR was at the time of sanctioning.

Rystad Energy's base case assumption for oil price can be found below. After 2025, the price is increased by the inflation:

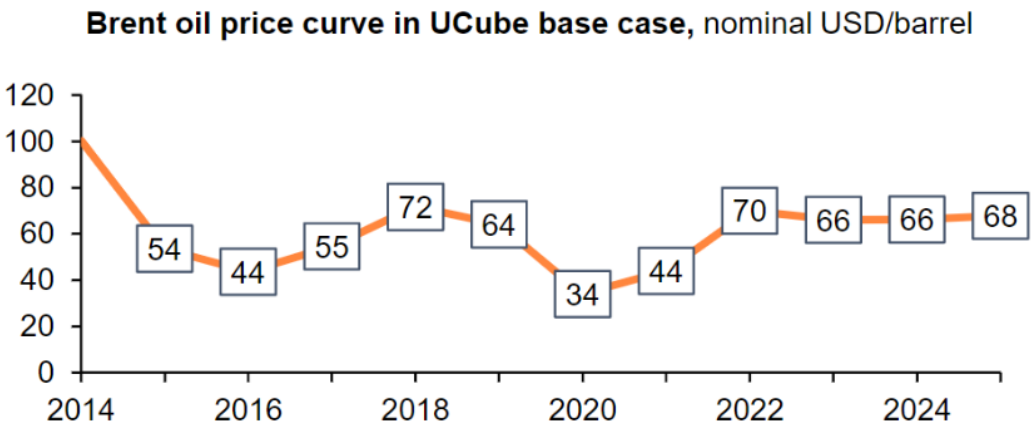

Figure 9 - Rystad Energy Base Case Oil Price (Nominal Prices) – as of April 2020 – Source: Rystad Energy

3.3.2.3.3 Inflation

A flat inflation of 2.5% is used in the Rystad Energy Databases.

3.3.2.3.4 Fiscal regimes

3.3.2.3.4.1 United Kingdom

The United Kingdom has a corporate income tax of 30% for oil and gas companies with incomes over 300,000 GBP. In addition, there is a supplementary charge of 10%, which was 20% up until 1st of January 2016, and 30% up until 1st of January 2015.

All CAPEX can be depreciated over 1 year [81].

3.3.2.3.4.2 Norway

Because of the extraordinary returns on production of petroleum resources, oil companies are subject to an additional special tax. The ordinary company tax rate is 22 % combined with the special tax rate of 56 %, which gives a marginal tax rate of 78 %.

To ensure a neutral tax system, only the company's net profit is taxable, and losses may be carried forward with interest. All CAPEX can be depreciated over 6 years, and all CAPEX can be uplifted with 21.6% over 4 years. Before 2013, this uplift was 30% [82].

4 RESULTS & ANALYSIS

4.1 OFFSHORE WIND PROJECTS

The following offshore wind results section is divided into two sections, one focusing on the financing while the other focusing on the return aspects.

4.1.1 Financing

4.1.1.1 Interview responses:

4.1.1.1.1 Trends in financing of offshore wind:

Platou Securities:

Historically the companies with large balance sheets (e.g. Ørsted, RWE, Iberdrola) have been more willing to fund projects on their own balance sheets, as the cost of project financing has been higher, and there is a larger complexity related to setting up a project financing structure. However, in recent years the terms for project financing has been reduced, with the risk premium having been halved, tenders have increased and the ticket sizes for the individual banks have increased. So even companies which historically have funded projects on their own balance sheets, are now more likely to project finance.

Eksportkreditt:

Banks are comfortable with the risks in offshore wind and are even taking on construction risk. Furthermore, there are even examples of banks taking merchant risk (no subsidies).

In addition, they have seen that the amount of project financing has increased in the last years and has been becoming more and more prevalent with more banks wanting to participate.

An example is the Beatrice project where Eksportkreditt offered financing but was told that the financing pool was vastly over-subscribed.

DNB:

Good appetite for lenders to become part of offshore wind projects, with some of the reasons being that it is a predictable cash flow, where they see Contracts for Difference or feed-in tariffs for large part of the cash flows. In addition, banks have become more comfortable to the risks related to offshore wind over the last years.

Swedbank:

For onshore wind there is a clear trend of increasing project financing and as of today, practically all onshore wind parks are project financed. Given that offshore wind projects share a similar risk picture, it seems likely that offshore wind projects will follow a similar development in terms of financing.

Many banks are now competing for the debt side of offshore wind projects, as they have become comfortable with the risk side, in addition to having more and more green ambitions. Combining this with the fact that there is zero to negative interest rates, means that there is a lot of money available to be invested in the offshore wind industry.

Nordea:

Important element is that as an industry matures, there will exist more and more sources of financing, and at the moment in the offshore wind space, having a low cost of debt is one of the most competitive advantages one can have.

Danske Bank:

There is a large appetite for projects with low "safe" returns. As interest rates all over the world are close to 0% or even negative, there are investors who are very willing to employ capital for longer time periods with a 2-3% return. And offshore wind is viewed as an attractive low risk investment with guaranteed returns.

Furthermore, many offshore wind projects nowadays are project financed, with the aim to leverage the equity return.

Pareto Securities:

There is a clear trend towards an increasing use of project finance, with 90% of last year's projects being project financed. However, as there are few projects in total being sanctioned, the relative share is very sensitive to whether Ørsted sanctions a project that year, as they are consistently financing on their own balance sheet.

Interest rates are decreasing, and pensions funds and others low-risk investors are starting to look at offshore wind as interest bearing securities, as the perceived risk has gone down.

4.1.1.1.2 Criteria for project financing:

DNB:

The most important is to have cash-flow certainty, whether that being by subsidy schemes (CfD or Feed-in tariffs) or by a Power Purchasing Agreement[7].Furthermore, in order to get comfortable with the construction and operational risks, a due diligence is performed, firstly on the sponsors and their construction and operational track record. Secondly for construction risk, a due diligence of the different contractors is also performed, going into the individual contracts for foundation, turbines and balance of plant. For the operational risk, the experience and the contract with the operation and maintenance service provider is also very important.

Every bank has made its own models in terms of evaluations and criteria. Regulators want different banks to have different sweet spots and has therefore not enforced any specific regulations in terms of financing. Some banks might be more flexible on the gearing, but more restrictive on structure and covenants for instance.

The debt service coverage ratio (DSCR)[8] is typically based on the P90 profile (of predicted energy volume) which is assessed by the turbine manufacturer and verified by a third-party technical engineer, and the debt sizing ratios can typically be around 1.2-1.4.

Swedbank:

It is seen as most important to have price hedging, and to have secured the revenue side.

Swedbank have most experience from onshore wind where they have seen a change in the financing picture over the last 5 years: 3-4 years ago it was typical to have 30-40% equity and to have long PPAs (with a DSCR of 1.2-1.4), with a duration of at least 10-15 years. But in recent years the equity is more typically 40-50% with lower requirements for having security in project, and shorter PPAs (5-10 years). In short, the banks are accepting more merchant risk, as the construction risk has gone down. It is likely that this could be the future for offshore wind as well when banks are more comfortable with the risk picture.

[7] Commercial or financial contract where a counterparty agrees to a fixed purchase price
[8] Debt Service Coverage Ratio is the ratio of Net Operating Income divided by the Total Debt Service [57]

Clarksons Platou Securities:

It is dependent on subsidy scheme in each country, but in general very few banks are willing to be exposed to electricity prices.

Pension funds and infrastructure funds especially, having more strict regulations on what risk they can take, and therefore are more accepting to a lower return (4-5%). Historically many investors were less willing to take on construction risk, but as the investors have gotten a better overview of the supply chain, the risk picture has gone down.

In addition, many institutional investors are struggling to get the returns they want, as the interest rates are very low, and thus there is a lot of capital wanting to get placed into the industry.

Danske Bank:

Secure cash flow is key for the banks, and the project financing structure allows for a detailed review of the company. If secured cash flows disappear, it is likely that we will see the return of more traditional corporate finance, and then the balance sheet of the developer will become more important.

Pareto Securities:

Criteria for project finance are getting looser and looser, as there is more and more competition between the financers. A couple of years ago it would have been completely unacceptable to take on construction risk, however, this is more acceptable now and the banks are getting in at an early stage in the construction phase. Market risk perception has gone down substantially, but this can also be seen as a consequence of competition as there are a lot of actors wanting to invest.

4.1.1.2 Quantitative data - Financing

Figure 10 shows the total investments per country where we see that the total investments in utility scale offshore wind in Europe had its peak in 2016, with Germany and United Kingdom driving the main portion of the investments (79% of the total investments).

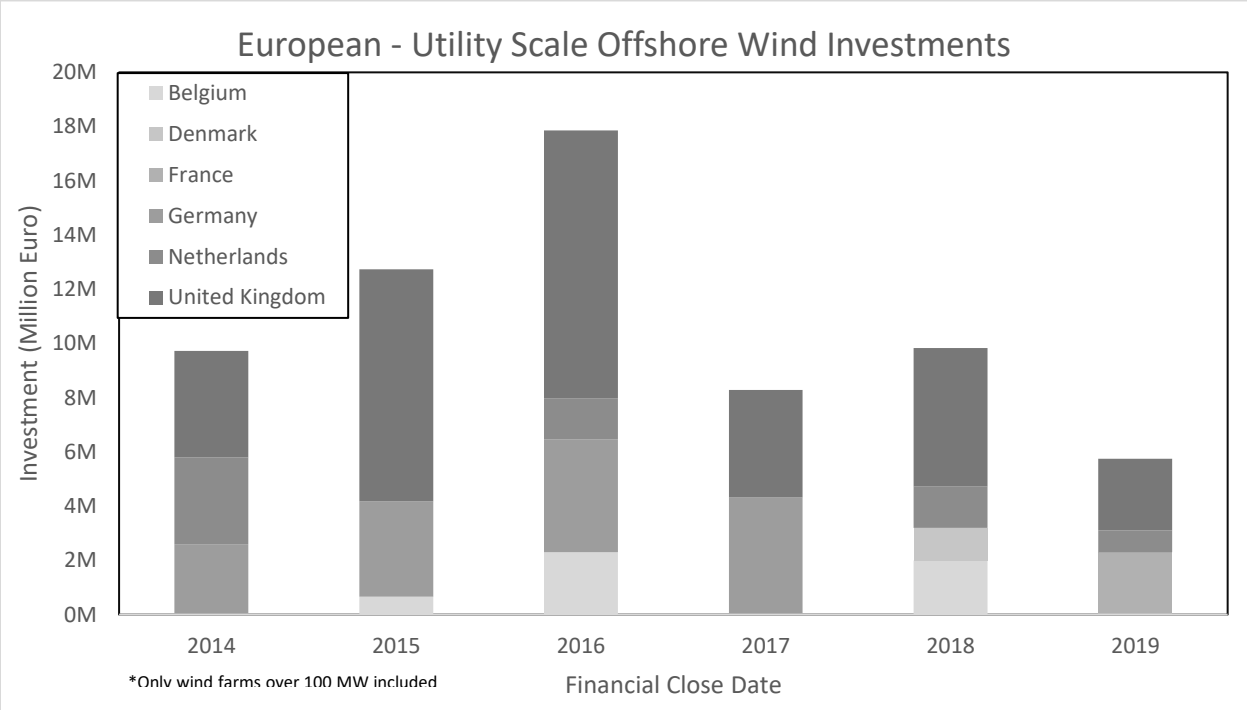

Figure 10 - Utility Scale Offshore Wind Investments - Europe

Figure 11 shows the split between how the investments were financed; corporate, or project financed. The figure shows an increase in the amount of non-recourse debt being used in the financing of new investments. The exception being 2017, where of the total of five offshore wind parks which had a financial close that year, the two largest (Hornsea 1, and Hohe See) were corporate financed.

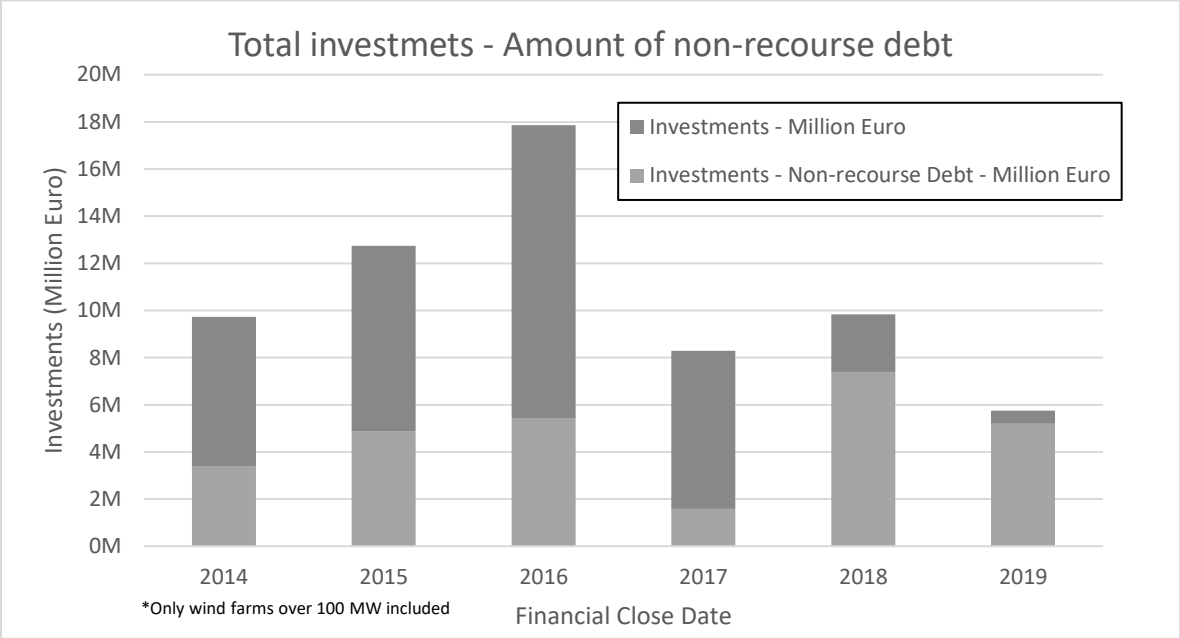

Figure 11 - Total Investments - Total investments & Non-recourse debt

However, the proportion of parks using project financing has been steadily increasing since 2016, and in 2019, of the three projects which had a financial close, all three were project financed (Figure 12).

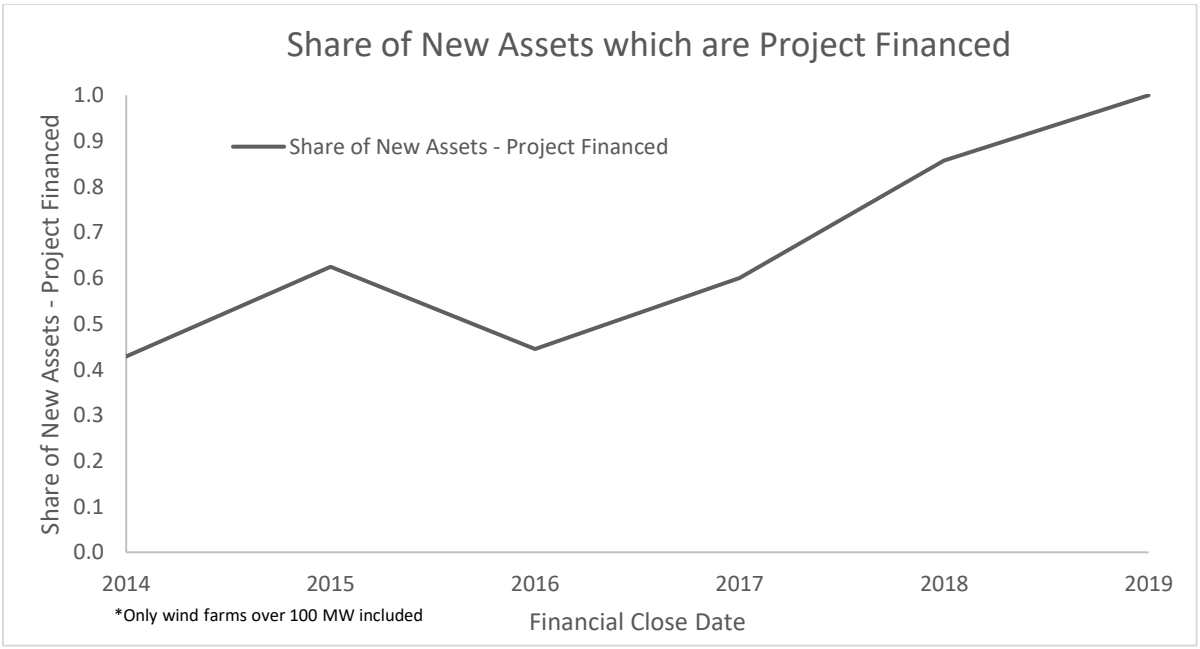

Figure 12 - Share of New Assets which are Project Financed

Another factor which can be looked at is evaluating the average debt is as a share of the total Investment (CAPEX) for projects which are project financed. In Figure 13, we can then see that the average share of debt has varied over the last 6 years, from around 80% to 65%, and the latest projects to be sanctioned have seen debt accounting for up to 90% of the investment.

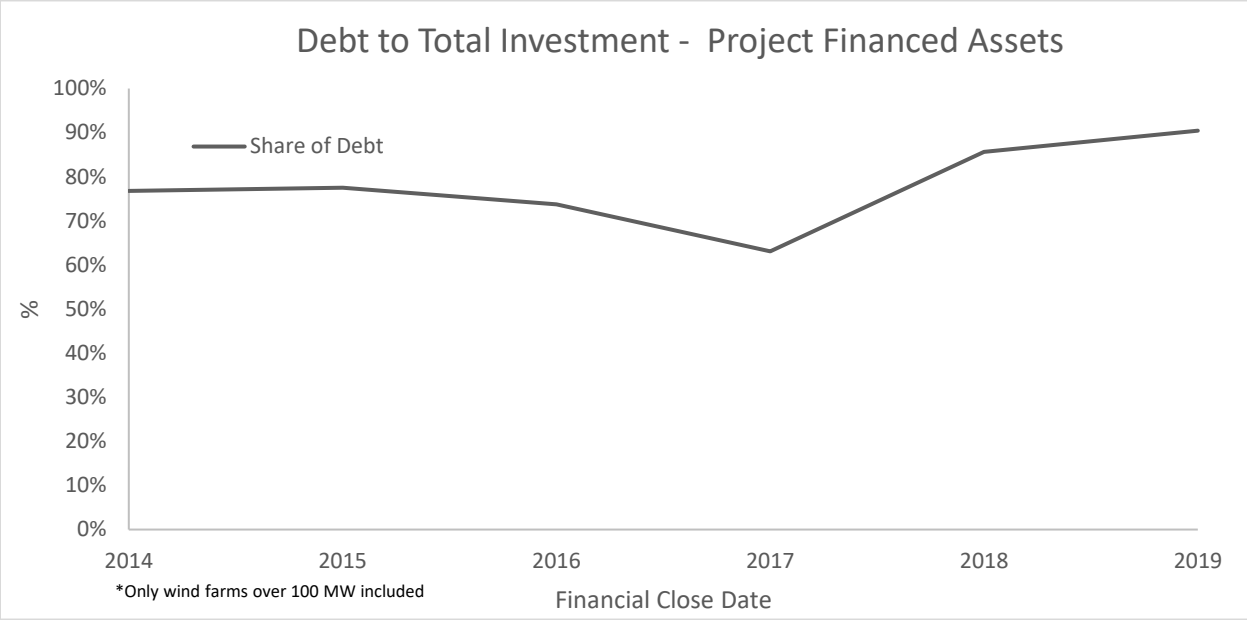

Figure 13 - Debt to Total Investment - Project Financed Projects

4.1.1.2.1 Financing for the different developers

When looking at the different developers and how they choose to finance their offshore wind farm developments, we see in Figure 14 and Figure 15 that although in general there seems to be a common trend to utilize project finance, some developers are still financing projects on their own balance sheets. Ørsted being noticeably the biggest one, both in monetary terms and in total capacity sanctioned.

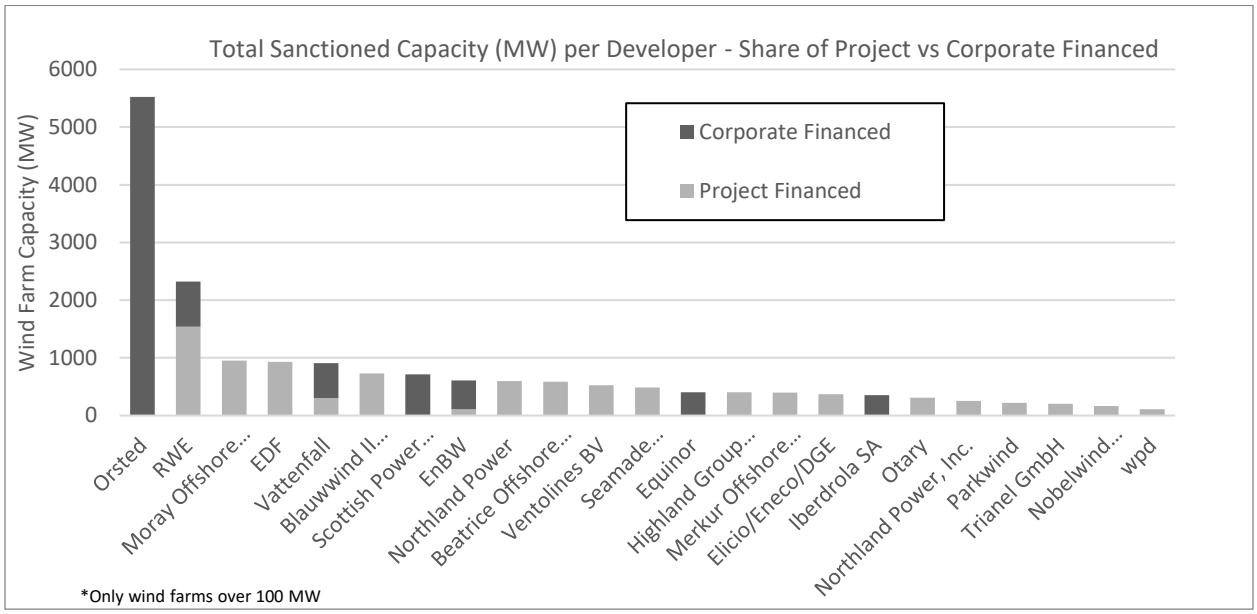

Figure 14 - Total Sanctioned Capacity (MW) per Developer - Project vs Corporate Financed

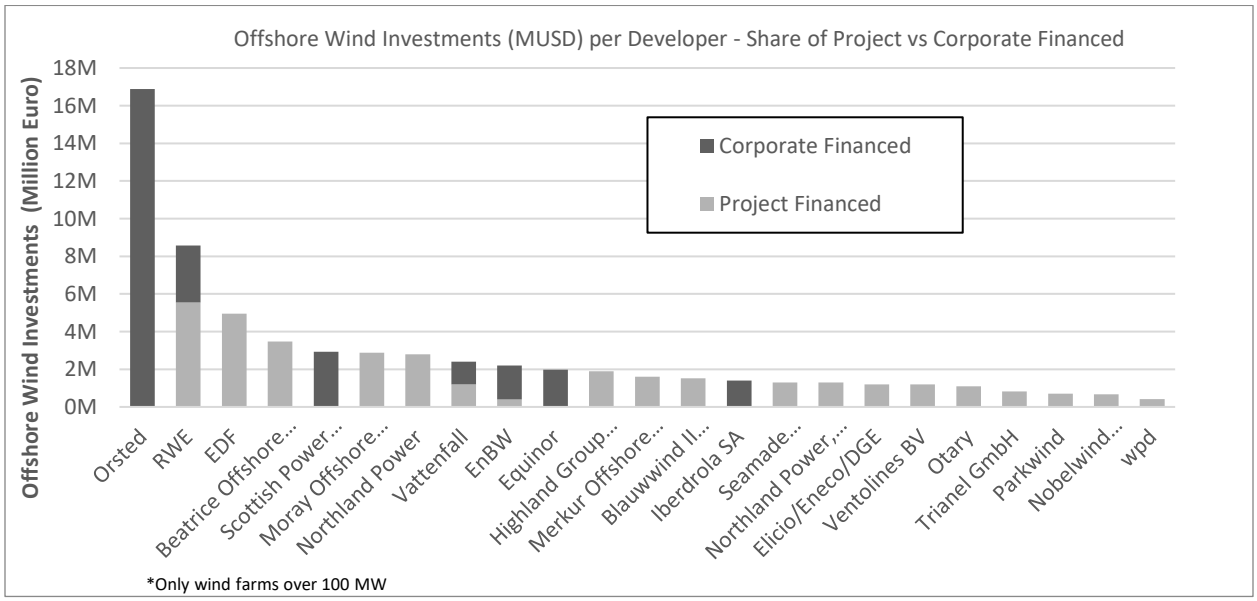

Figure 15 - Offshore Wind Investments per Developer - Project vs Corporate Financed

4.1.2 Returns

4.1.2.1 Interview responses

4.1.2.1.1 Returns on Offshore Wind Parks

DNB:

DNB has seen examples of super returns for Ørsted, as they have sold projects at or just after commercial operation and there are a lot of investors willing to invest out there. In general, a large oversupply of investors wanting to go into renewables, in particular low yielding life insurance and pension fund money.

For DNB itself it is not paramount to calculate the project return, as the most important is Cash Flow/Debt coverage. But can run sensitivities to make sure that Equity does not go to 0.

Clarksons Platou Securities:

The companies that got in early enough for the high subsidies, are now seeing high returns. However, the future project returns look to come down, as the competitive nature of the subsidy auctions means that the subsidies will come down drastically and subsequently also the returns. See for example the latest CfD round in UK where Equinor got the winning bid with 40GBP/Mwh.

Another example is Ørsted , who is caught in a bit of a winner's curse, as they are priced to continue their high growth rate, and in order to maintain their growth rate and win these subsidy auctions, they will have to put in progressively lower and lower bids which will ultimately decrease the returns of the projects.

Nordea:

The IRR is the most important project metric for offshore wind projects and is strategically very important.

However large spreads in how different analysts estimate this, as the number one impacting factor is the load factor, and you can see a large variation of the load factors different analysts utilize when calculating the IRR for the same projects.

Looking at Ørsted, they have had wave like returns on their projects, where they, in the early 2000s experienced relatively low IRR's, followed in later years by a much higher IRR as more and more subsidies funded their projects at the same time as the costs came down. Especially the projects which had a financial close date around 2014-2016, where they managed to lock in high CfDs in the United Kingdom, are seeing very high IRRs. However, now we see a return to the more somber project IRR estimates as the subsidies have been reduced.

The Ørsted trend demonstrates how it is difficult at present day, to maintain a high IRR, as the subsidies have been reduced, and the market has become increasingly competitive. Copenhagen Investment Partners (CIP), is a key example of how there is limited "barriers of entry" in the market as they have managed to demonstrate successful returns without being a fully vertical integrated player. It also shows how the key success factor for Ørsted doesn't seem to be project management and development, but more timing in terms of entering the market at an ideal time.

In short, the high IRR that offshore wind has historically seen is due to high subsidies, and cost reductions. However, as subsidies have been reduced it is clear that these high IRR's are no longer attainable going forward. This is demonstrated by Ørsted IRR project guiding of around 7-8%, while a similar value is seen for Equinor.

Danske Bank:

Danske bank struggle to see any reason for why returns should be high, as the current return picture for Dogger Bank shows, combined with the fact that they see limited possibility for the cost side to be substantially reduced as service companies are already seeing low margins.

Pareto Securities:

In general things have gotten tighter as there is more competition. A key example of this is the quote made by the CEO of MRP – Andy Kinsella – "*When we were in the market looking to sell the Hornsea offshore wind project [in 2015], for instance, equity investors were looking for 12-14% levered IRRs post-COD[9]. Now, equity investors are prepared to take 7.5% levered IRRs pre-construction. That is a huge change."*

4.1.2.1.2 Cost Development:

Eksportkreditt:

Seen a large decrease in costs with 30-40% driven by reduction in capital costs, whereas the rest has been a reduction in technology cost and learning effects. The question for the future is how fast and how far this reduction in technology costs and learning effects can continue. The cost of capital is already at a very low level and there is limited room for decrease here.

A prime example of the cost development is comparing the Dudgeon East vs the Dogger Bank strike price which has gone from 150 GBP/MWh to 40 GBP/MWh.

[9] COD – Commercial Operation Date

Danske Bank:

Seen historically a price of 3.5-5 USD/MW for offshore wind parks which, based on the communications and the recent CfD's, should go down to 1.5-2 USD/MW. The question is how much further this can go, as they have seen examples of service companies who already have very low margins, so there isn't much room for further reductions.

Pareto Securities:

Costs are going down continuously. A key component of this reduction is the increase in turbine size, as the turbines are a key component of the total CAPEX (60-70%). A recent example is that Siemens recently came out with news of their latest 14MW turbine, and GE will probably also as a consequence scale up to 14-15MW with their new turbines.

In addition, the benefit of larger turbines is greater for offshore than for onshore wind parks, as the maintenance is done per turbine. Furthermore, cabling is more expensive offshore compared to onshore, which also can benefit more from fewer, but bigger turbines.

4.1.2.1.3 Oil & Gas companies' ability to obtain high IRR

Nordea:

Doesn't see a competitive advantage for oil & gas companies in the offshore wind bottom-fixed space (however, there could be an advantage in offshore floating wind), and no real reason why they should be able to obtain a higher IRR than the market in general. For instance, for Dogger Bank which is Equinor's latest project, their latest CAPEX estimates per MW are substantially higher than the Hornsea Project 1, 2 and 3 which is of equivalent size.

Also heard that an argument for Equinor getting future high IRR is the fact that there will be a high secondhand market for offshore wind parks after construction, however this then takes a bet on that the debt will remain cheap, as an increase of interest rates will substantially shrink the available capital in this space.

Danske Bank:

Equinor has managed to maintain a high Return on Equity (ROE) on their current offshore wind portfolio, but this has in part been due to selling down on projects which have benefitted from lucrative subsidies. For instance, when they sold down on the Arkona wind project, their offshore wind portfolio ROE went from 10% to 14%.

The big question is regarding what the future holds, as the subsidies reduce so will the returns. For instance, for Dogger Bank, Danske Bank has calculated an IRR of roughly 5%, and see then instead a need for financial acrobatics to achieve acceptable IRR's (leveraging).

Also, Equinor has communicated that their strategy is to sell down from 50% during construction phase to 25% after, in order to capture some of the value of the construction risk.

Swedbank:

Oil and gas companies have large balance sheets and therefore have the capability to invest in new business areas. They have also extensive experience in offshore, which exceeds what any financial actors might have.

Swedbank also predict that the future will be increasingly homogeneous in terms of developer's competitiveness as the market matures, and the largest barrier of entry into the offshore wind space is capital. Everything else you can acquire.

Pareto Securities:

Oil & gas companies have offshore experience, and also experience within project execution. However, 60-70% of the CAPEX is the turbines, and for the first 5 years of operation, it is the service providers (Siemens Gamesa, GE, etc) who installs and can operate the parks for you. Due to this, the service providers also sit on a lot of operational data and can capitalize on this in terms of preventative maintenance, and utilizing big data to optimize, which oil & gas companies don't sit on at the moment.

A competitive advantage that oil & gas companies do have though, is a large balance sheet. And in a future where the offshore wind parks are exposed to merchant risk, this can become an important asset, as they can afford to be exposed to the price fluctuations.

4.1.2.2 Quantitative data

Looking at the quantitative data, we can see that for both the United Kingdom and Germany, the offshore wind parks have healthy projected returns.

4.1.2.2.1 United Kingdom

Seven out of the twelve projects demonstrate double digit returns projections. However, the data also shows that without the subsidies, none of the projects manage to generate a proper return, with the highest showing a return of 4%.

Table 6 - Offshore Wind Parks UK - IRR and Breakeven Prices

United Kingdom

Start-up year	Wind Farm Name	IRR	IRR wo subsidy	Breakeven price (Euro/MWh)
2017	Burbo Bank ext.	20%	-5%	76
2017	Dudgeon	13%	NA	102
2018	Walney 3	19%	-7%	82
2019	Beatrice	9%	NA	123
2020	EA1	14%	-7%	85
2020	Hornsea 1	27%	1%	59
2021	Moray East	7%	1%	60
2022	Triton Knoll	15%	4%	54
2023	NnG	6%	NA	122
2023	Dogger Bank - Creyke A	4%	2%	60
2024	Dogger Bank - Creyke B	5%	3%	60
2025	Dogger Bank - Teeside A	5%	3%	60

By looking at the evolution of internal rate of return over time in Figure 16, we see that the most recent approved projects show the lowest estimated returns. In contrast to this, the projects which had a start-up between 2017 and 2020 show some of the highest returns, averaging an IRR of 18%.

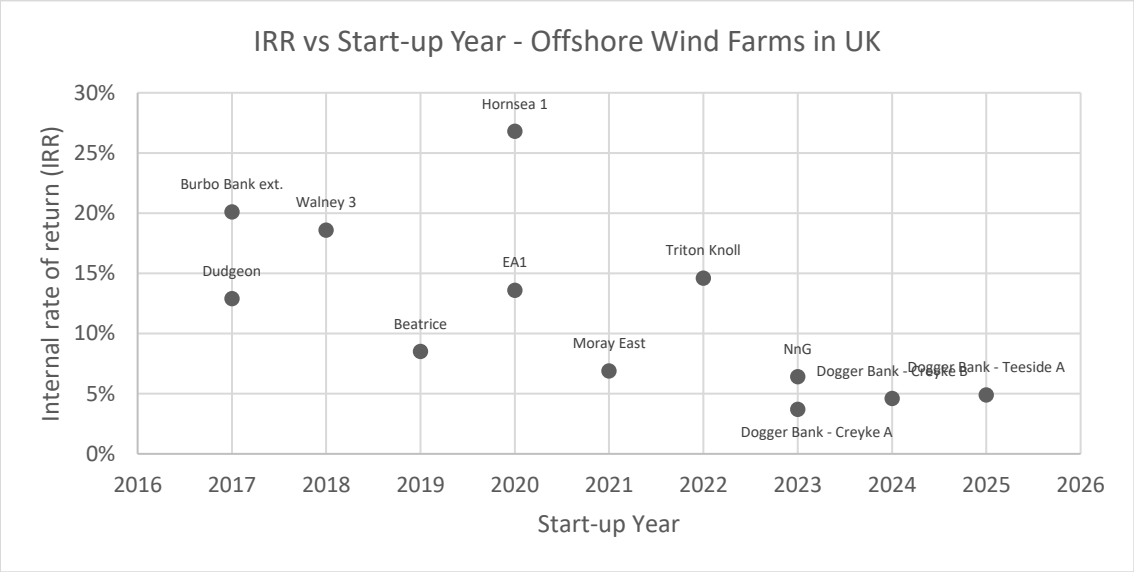

Figure 16 - IRR vs Start-up Year - Offshore Wind Parks in UK

This trend aligns well with the evolution of subsidies from Contracts for Difference (CfD) which has been awarded in the UK. It shows a sharp decrease in the awarded strike price (Figure 17), as the bidders have gotten progressively more and more aggressive in their bids. Figure 17 illustrates how the strike price has gone from 150 GBP/MWh in 2014 down to a historic low of 39.65GBP/MWh in the latest award in 2019[10].

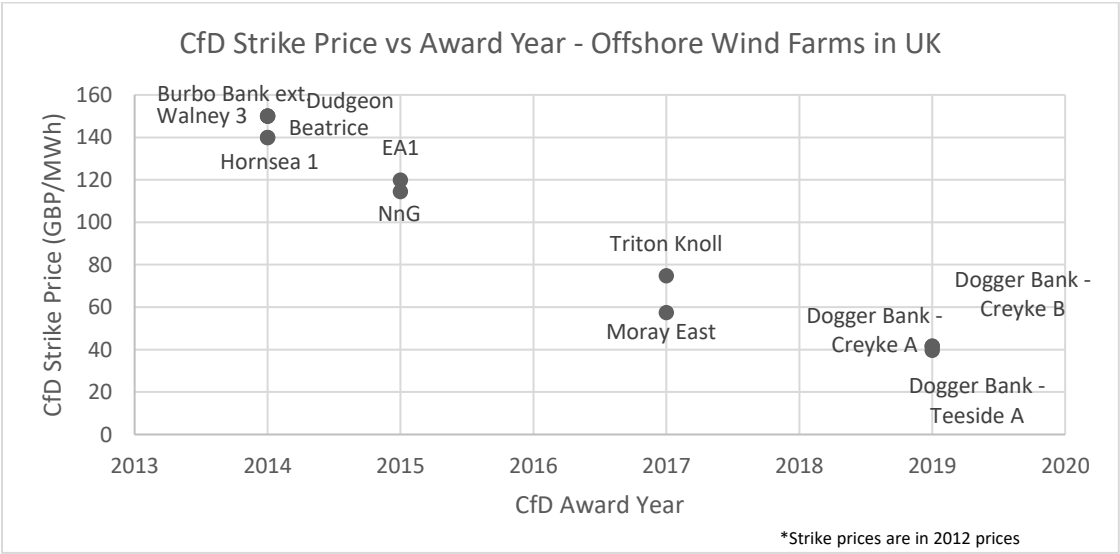

Figure 17 - CfD Strike Price vs Award Year

[10] Strike price are in 2012 prices

However, this decrease in CfD price does not show the entire picture. If we look at the evolution of the breakeven prices for the same projects (Figure 18), we can see that this has also been reduced since 2017 and has levelled out at around 50-60 Euro/MWh for the projects starting up from 2021 to 2025[11]. This is a drastic reduction from the offshore wind parks starting up from 2017 to 2020 which had an average breakeven price of 90Euro/MWh. This indicates a substantial cost reduction in the offshore wind space.

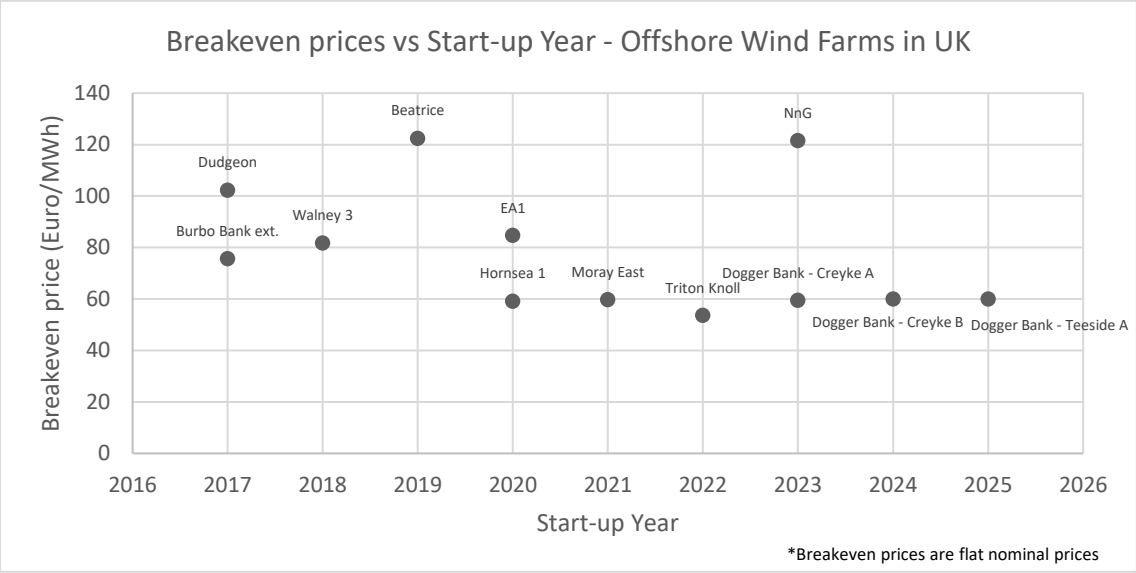

Figure 18 - Breakeven Prices vs Start-up Year - Offshore Wind Parks in UK

[11] Neart Na Goithe (NnG) is an outlier as it was initially awarded a CfD in 2015 at a strike price of 114.39GBP/MWh, but due to delays (nearly lost its CfD) it did not have a Financial Close until 2019.

4.1.2.2.2 Germany

For the German wind parks, we see a slightly lower return picture, with 3 out of the 16 parks demonstrating a projected double-digit return. Also, without subsidies, none of the German offshore wind parks manage to demonstrate a positive internal rate of return.

Table 7 - Offshore Wind Parks Germany - IRR and Breakeven Prices

Germany

Start-up year	Wind Farm Name	IRR	IRR wo subsidy	Break-even price (Euro/MWh)
2015	Butendiek	4%	NA	119
2015	Nordsee Ost	4%	NA	116
2015	Trianel WP Borkum I	-1%	NA	133
2017	Nordergrunde	9%	NA	97
2017	Nordsee One	9%	NA	95
2017	Sandbank	7%	NA	104
2017	Veja Mate	3%	NA	124
2017	Wikinger	7%	NA	104
2018	Gode Wind 1	8%	NA	99
2018	Merkur	6%	NA	106
2019	Arkona	11%	NA	86
2019	Borkum Riffg. 2	14%	-5%	75
2019	Hohe See	8%	NA	95
2020	Deutsche Butch	1%	NA	127
2020	Trianel WP Borkum 2	6%	NA	106

Looking at the evolution of the IRR we see a difference between the UK wind parks and the German ones. Whereas for the UK wind parks the IRR trended downwards over time, there seems more to be an upward trends in the projected IRR of the German wind parks as can be seen in Figure 19.

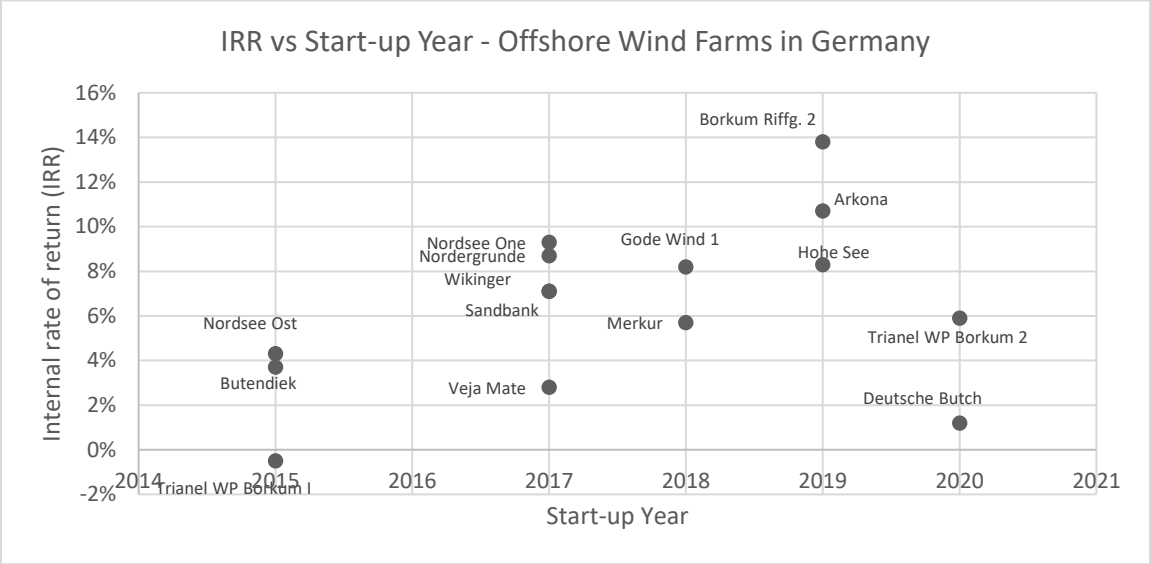

Figure 19 IRR vs Start-up Year - Offshore Wind Parks in Germany

Comparing the breakeven prices for the different projects in Figure 20, we see a similar trend to the UK, with a downward trend in breakeven prices, indicating a cost reduction. However, the main difference between the projects for UK and Germany, is that for the UK, the subsidies have decreased year on year. On the other hand in Germany, the subsidies have up until recently remained flat. This could indicate that all the benefits of the cost reductions seen in the German offshore wind parks, have gone to the developer. In effect, the developers who has managed to decrease their cost, has subsequently increased their returns, as the income has remained stable due to the flat subsidy system.

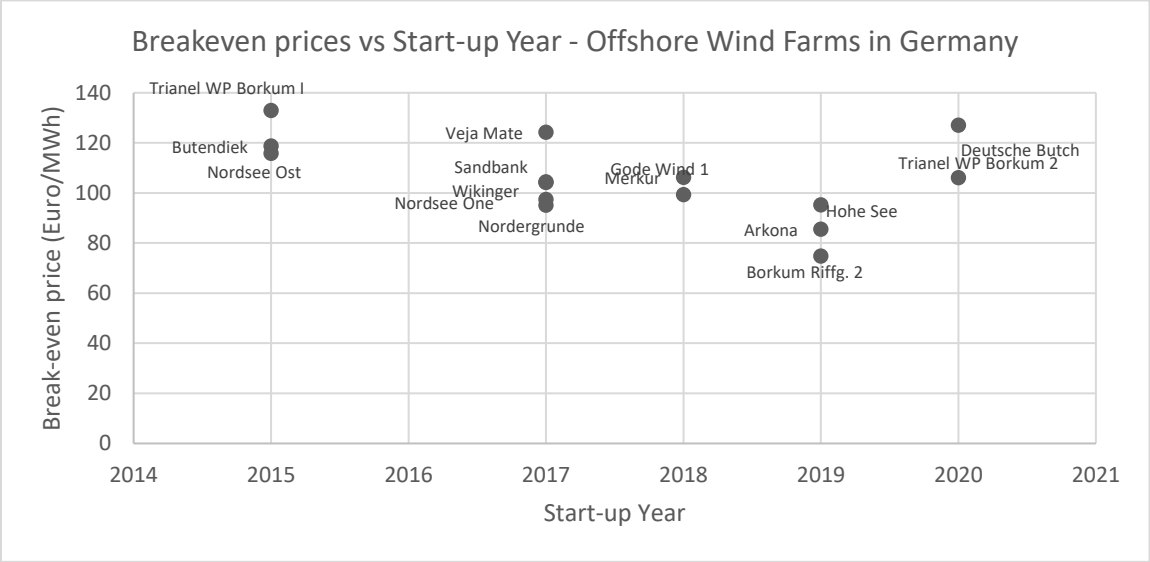

Figure 20 - Breakeven Prices vs Start-up Year - Offshore Wind Parks in Germany

The effect of the fixed tariffs becomes even clearer when we plot the IRR versus the break-even for the German offshore wind parks, as can be seen in Figure 21. This trend has possibly been noted by the German government and is therefore the reason why they, in 2017, implemented changes to their subsidies system. In their new subsidy they will have an auction-based system similar to that of United Kingdom, which will come fully into effect in 2026 [85].

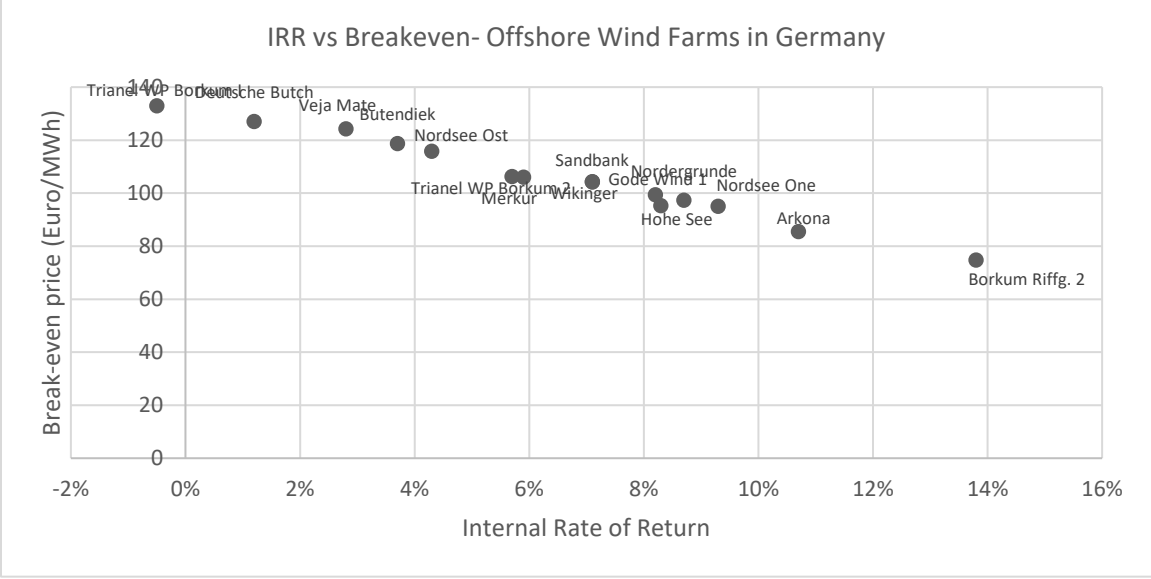

Figure 21 - IRR vs Breakeven - Offshore Wind Parks in Germany

4.1.3 Case study - Equinor's Dogger Bank

When looking at the evolution of the return of offshore wind, it is interesting to take a deep dive into the Dogger Bank projects. The Dogger Bank projects are the offshore wind parks which have received the lowest Contracts for Difference in the UK system. They are also some of the few wind parks that, although yet to reach financial close, have communicated their CAPEX. This makes it possible to perform an analysis of IRR and breakeven of the projects which are scheduled to start up in 2023-2025. In addition, it is of course of special interest as it is owned by an oil and gas company, Equinor, and is aimed to be financed through non-recourse project financing. This means that is a relevant case study in order to understand the return, but also the effect financing can have on the leveraged return, which has been communicated to be an upside potential for Dogger Bank IRR [34].

The numbers in the previous section show a project IRR for Dogger Bank are summarized below in Table 8 and shows an IRR of 4-5%.

Table 8 - Dogger Bank Projects - IRR and Breakevens

Start-up year	Wind Farm Name	IRR	IRR wo subsidy	Breakeven price (Euro/MWh)
2023	Dogger Bank - Creyke A	4%	2%	60
2024	Dogger Bank - Creyke B	5%	3%	60
2025	Dogger Bank - Teeside A	5%	3%	60

4.1.3.1 Internal Rate of Return Uncertainty Analysis

This IRR's presented above are however based on the assumptions made and presented in section 3.3.1.3. In order to look at the uncertainty spread of this number, a simplistic mono-variable uncertainty analysis has been performed. Some of the key influencing factors have been modified to illustrate how much the IRR can vary based on the input variables. The input variables and their ranges are listed below in Table 9.

Table 9 - List of Uncertainty Parameters

Uncertainty Factor	Low Estimate	Base Estimate	High Estimate
Load Factor	40%	45%	50%
Electricity Price (Euro/MWh**)**	30	45	60
OPEX Share of Capex	3%	1.8%	1%
Capex Increase/Decrease %	20%	0%	-20%

To get an estimate of which factors have the most significant effect on the IRR, Dogger Bank Teeside A was chosen as base case scenario. Thereafter, IRR calculations was done for each of these variables one by one, while holding the other parameters static. This way we can get an estimate for which of these factors have the most significant effect on the IRR.

The results are presented in Figure 22, and show how the base case IRR is affected by each input variable. The numbers presented below are percentage points change from the base case value of 4.9%. So, for instance for the first variable, Capex Increase/Decrease %, the project IRR goes from 4.9% in the base case to 7.6% in the high case.

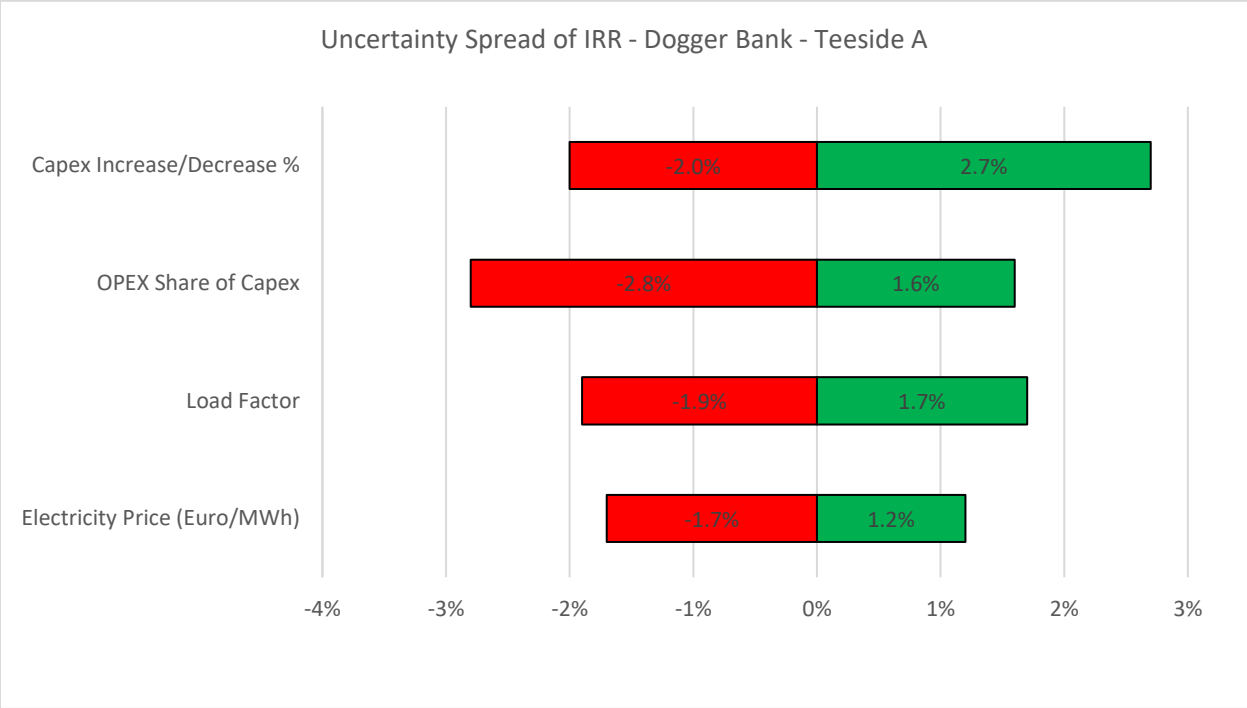

Figure 22 - Tornado Chart - IRR Uncertainty - Dogger Bank - Teeside A

4.1.3.2 Leverage IRR – Project Finance

Increasing the leverage and subsequently increasing the equity IRR, is an opportunity which has been communicated both by offshore wind developers, but also by the interview participants. Equinor has also communicated this specifically for Dogger Bank, and stated that the IRR can be increased by leveraging [22].

Therefore, it is of interest to see how this IRR will change in a project finance scenario, when only looking at the equity cash flows. This scenario has been set up for Dogger Bank Teeside A and is based on a "typical" project financing situation, which comes from the financing data gathered in the previous chapter. However, an element missing is the cost of performing a due diligence and setting up a project finance SPV. Therefore, this can be seen as a high estimate for the impact on leveraged returns.

4.1.3.2.1 Assumptions

For the project finance scenario, the assumptions made for the terms of the loan is:

- Debt to total investment of 68% - in order to maintain a debt-service coverage ratio of 1.2
- The debt has a maturity of 15 years
- Interest rate of 2% as indicated as average interest rate for project financed offshore wind parks in the latest report by Wind Europe [45]

4.1.3.2.2 Cash Flows & IRR

The equity cash flow from the equity investment in a project finance version of Dogger Bank Teeside A, is shown in Figure 23, while the unleveraged and the leveraged IRR (IRR only based on the equity portion of the cash flows) is shown in Table 10. The results show that the leveraged IRR can be significantly higher compared to the base case IRR (50% increase).

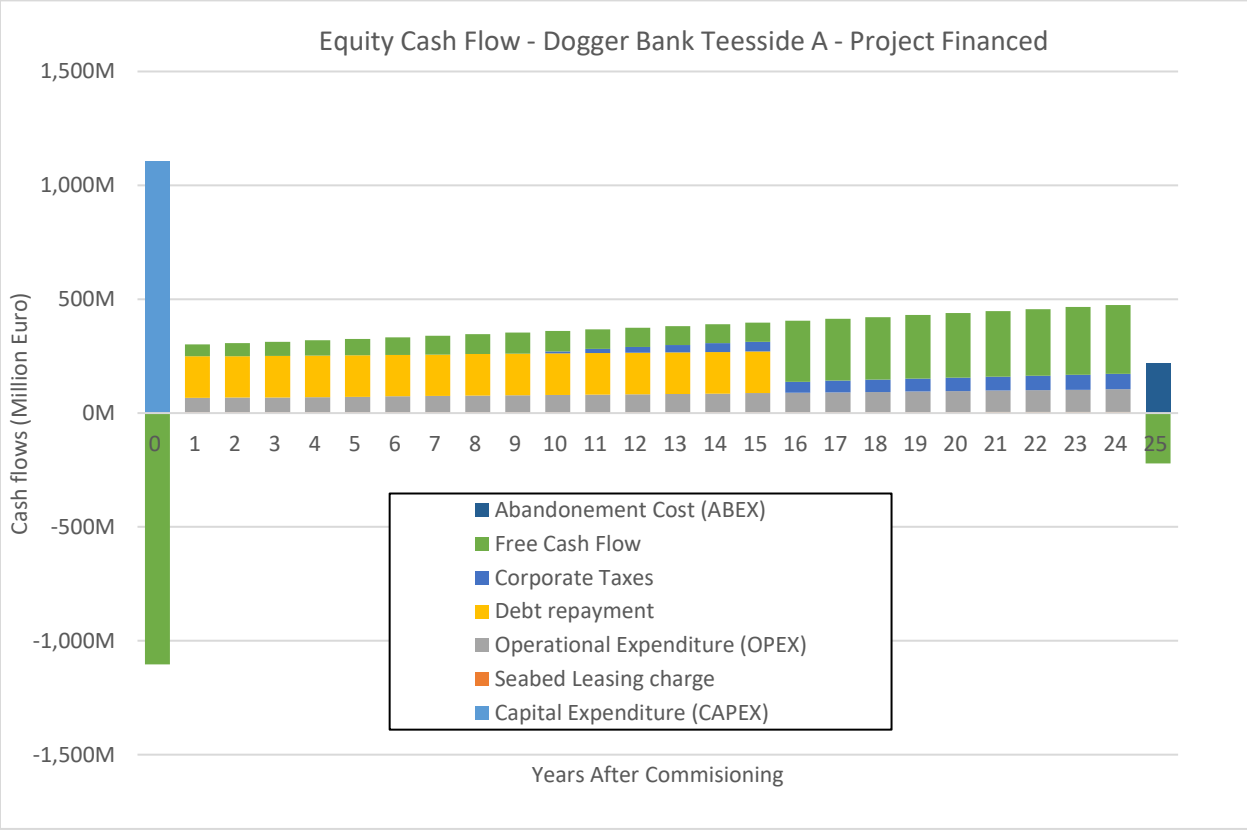

Figure 23 - Equity Cash Flow - Dogger Bank Teeside A - Project Financed

Table 10 - Dogger Bank Teeside A - IRR - Project Financed Leveraged vs Unleveraged

Scenario	**Internal Rate of Return**
Dogger Bank Teeside A - Unleveraged	4.9%
Dogger Bank Teeside A - Project Finance – 68% debt	7.5%

4.2 Oil & gas Projects

4.2.1 Returns

The returns of offshore oil and gas projects in Europe, which have been sanctioned between 2010 and 2019, have generally be high. But also, a large spread of the returns can be seen. For the base case oil price, we have IRR's as high as 70%, while at the same time there are projects with negative returns. Also, for the flat real oil price of 65 USD per barrel, we see in general high returns, with the highest projects having an IRR over 90%.

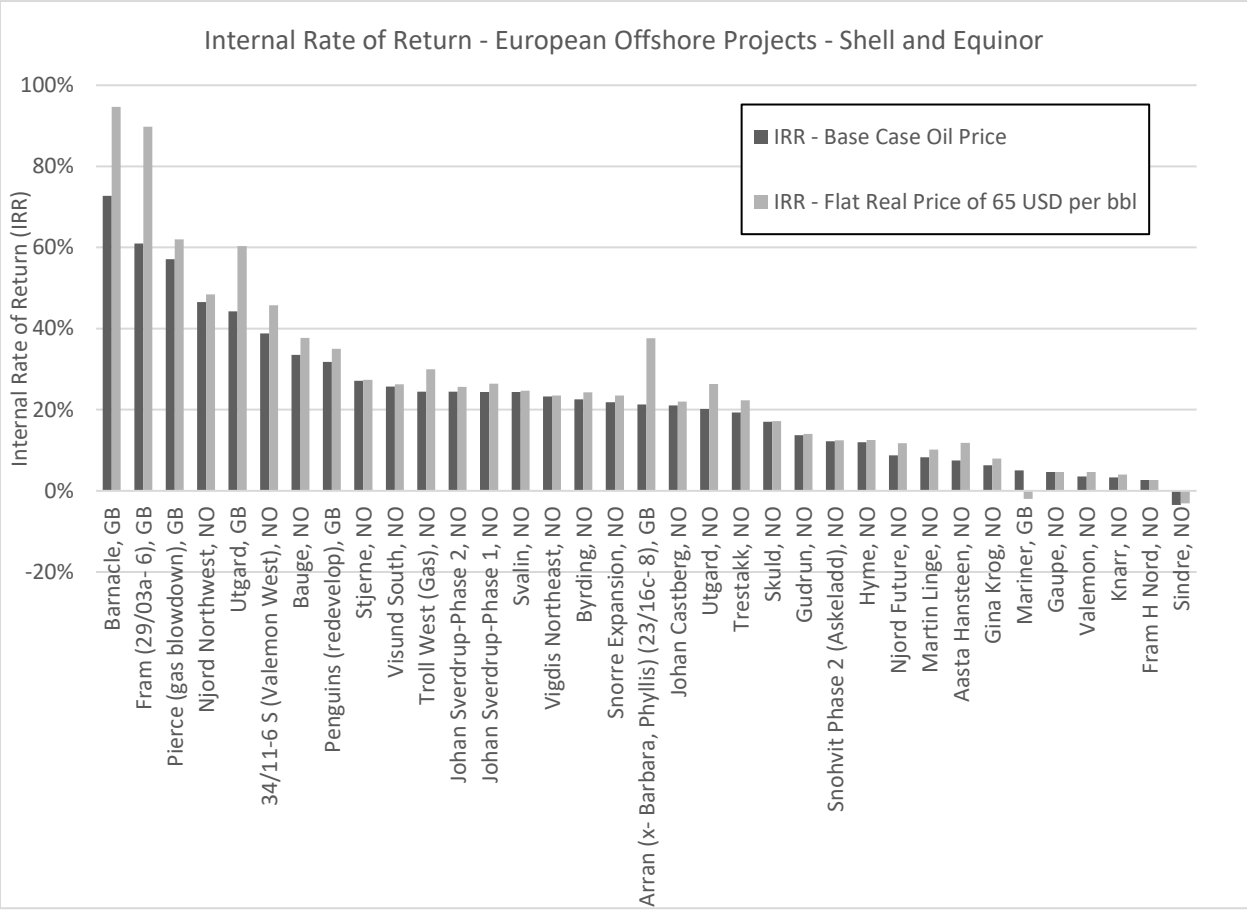

Figure 24 - IRR - European Offshore Oil and Gas Projects - Shell and Equinor

Looking then at the average IRR per year, by weighting the average on the CAPEX of the projects, we get the graph in Figure 25. This shows how the evolution of IRR has been the last 10 years. The beginning of the decade saw a more modest return picture, with a total lack of sanctioning of projects from 2014-2016, except for the mega project Johan Sverdrup which had a Final Investment Decision in 2015. A possible reason for

these low returns seen in the first half, could be explained by the high oil prices at the time. This would have gaven rise to a high cost picture, followed by a sharp decline in the oil price in 2014-2016, when these fields would have started up.

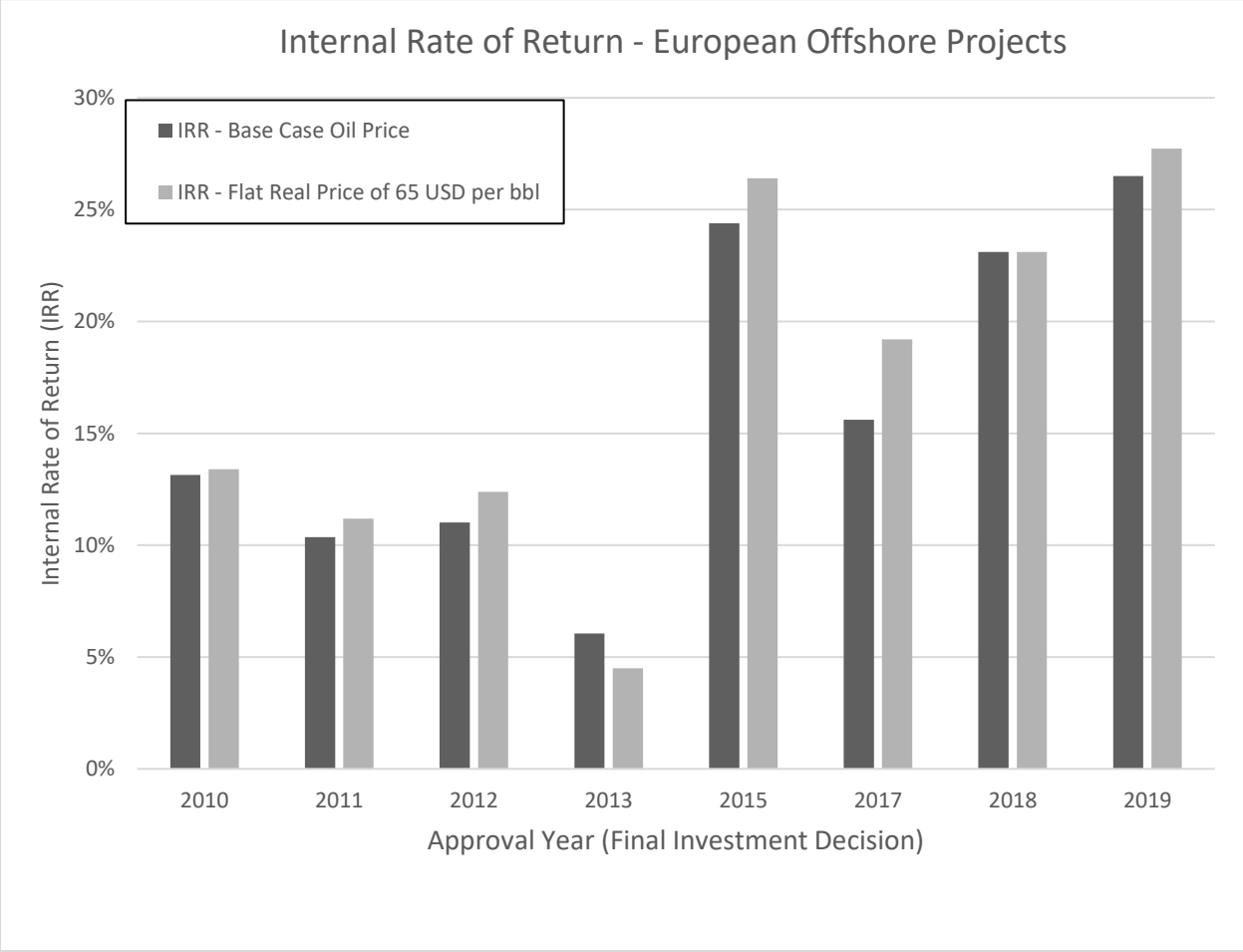

Figure 25 - Internal Rate of Return - Offshore Oil and Gas Projects - United Kingdom & Norway - Shell and Equinor

Taking the average CAPEX weighted IRR of the full time period, we get an IRR as shown below for the two scenarios.

Table 11 - IRR - Offshore Oil & Gas Projects - Norway & United Kingdom - Shell & Equinor - Approval date: 2010-2019

Oil Price Scenario	IRR
Base Case Oil Price	16%
65 USD per barrel	17%

5 DISCUSSION

5.1 FINANCING OF OFFSHORE WIND

All interviewees in this study highlighted that there is a lot a capital available suggesting that investors are motivated to invest in the offshore wind space in Europe. A potential reason for this is the low or negative interest rates currently seen in Europe and that there are limited investment opportunities for investors or lenders who are looking for low risk investment. And while offshore wind is deemed to be low risk, it has at the same time the benefit of being a "green" investment (i.e. renewable energy).

An increase in usage of project finance can both be seen in the quantitative data gathered and from the interviews. Progressively fewer developers are choosing to finance offshore wind parks on their own balance sheets. Instead they are opting for project financing with a substantial amount of non-recourse debt.

There could be different reasons for choosing project finance. Some of the key arguments are discussed below in relation to offshore wind.

5.1.1 Securitisation – decreasing financing costs

For a company which has most of its core business in high risk activities, the possibility of separating and securing low risks assets into its own entity via project finance can be a reason for utilizing project finance. This way these low risk assets can be financed at a lower cost [31]. This is a particularly attractive option for an oil and gas company whose core business consists of high-risk oil and gas assets. When they then want to finance a lower risk asset, like an offshore wind project, the finance costs they achieve on a corporate level might be higher than if they separate the project into its own entity by project financing it.

There is a mix of companies entering the offshore wind space, with some being purely renewable focused, such as Ørsted, while others are primarily focused on oil & gas. From a securitisation point of view, it is hard to see why companies like Ørsted would get lower interest rates on a project finance basis. As the core business is the same, the interest rates on issuing bonds on a corporate level would be similar, as the risk picture of the core business is the same. However, the argument for securitisation can be made for the oil and gas companies, as the risk picture between the two are quite different. An example of this is Equinor, who managed to secure a 558 Million GBP 8-year maturity loan for their Dudgeon Offshore Wind Park (which was project financed during the construction phase), for 0.9% over the LIBOR in 2018, which at the time was around 1%, indicating an interest rate of ~2% [83]. At the same time they issued a 1 Billion USD 10-

year corporate loan with an interest rate of 3.65% [84]. This implies that securitisation could be a reason for utilizing project financing for some of the players. Especially those who have a core business with a different risk picture to offshore wind. In addition, given the recent focus on ESG where several banks and institutional funds have stopped investing in fossil fuels, securitisation could open up opportunities for oil & gas companies. By financing at the project instead of at the corporate level, the company can tap into financing facilities specifically tasked with ESG type investments, otherwise unavailable to them.

5.1.2 Debt overhang

By issuing debt at the corporate level to finance a project, all the equity and debt are put on the company's balance sheet. This will in turn mean that the strength of the balance sheet can be a limiting factor of how a project is financed, especially if the debt-to-equity ratio is high. Thus, there could be cases of companies with limited balance-sheets, who see a benefit of project financing in order to obtain the debt needed to finance these capital-intensive projects. A company like Copenhagen Infrastructure Partners, who's balance sheet is limited could for instance be a prime candidate for this.

5.1.3 Higher debt ratio (leverage)

Several interviewees as well as project developers [34] stated that a key reason for utilizing project finance was due to the ability to obtain higher debt ratio with an aim then being to increase gearing. The debt ratios obtained for the most recent offshore wind parks are over 90%. This indicates that the banks see a limited risk picture with offshore wind as the risk premium on the interest is still decreasing [6]. A higher return on equity should be expected if the gearing goes up and is aligned with the Miller Modigliani II Proposition as discussed previously. However, the question is why this should be done on a project basis, and seen as a positive, when investors can recreate the debt/equity ratio on their own side and gear up their own returns. One reason could be that since the risk picture of an offshore wind park is seen as very low, the negative effect of the financial distress cost is also low. According to the trade-off theory, the optimal debt/equity ratio will then be high as you have positive benefits of the tax shield. The argument for project financing then becomes even more relevant for companies with a core industry with a different risk picture. These companies are then able to optimize the debt/equity for lower risk projects like offshore wind, while still maintaining a different debt/equity ratio for their core business. Also, a company who can obtain a lower financing cost when project financing one could argue that having as high leverage as possible is beneficial. This could be the reason why companies like Equinor chose to project finance their offshore wind parks, while Ørsted does not.

5.1.4 Contamination risk

Contamination risk, which is the risk that the project can have a negative impact on the company's ability to acquire debt, does not seem to be a reason for utilizing project finance. The key reason being that the risk picture for offshore wind is considered to be low. This is especially true for oil and gas companies, as the risk picture for oil and gas can considered to be higher than offshore wind.

5.1.5 Off-balance Sheet Financing

A last reason for utilizing project finance, could be to raise debt, which the company can keep of their balance sheets. As showed in section 2.1.2.1.5, this is possible to do under some accounting principles, by utilizing the equity method of accounting. However, this requires that the company is unable to exert significant influence, and typically has an ownership of less than 50%. This could be possible if the ownership structure is for instance a joint venture. Many offshore wind parks have an ownership structure shared amongst several companies. For instance: Beatrice, Dudgeon, Galloper, Gwynt Y More, Race Bank, Rampion and Walney are examples in United Kingdom who have shared ownership structure with no single owner having an ownership over 50%. A potential reason for this ownership structure, could be the ability to have off-balance sheet financing, however this is hard to deduce from the available data.

5.1.6 The Case of Ørsted

The one big outlier, when looking at the financing data for offshore wind in Europe is Ørsted. Ørtsted has by far developed the most wind parks and has had a history of financing all their assets on their own balance sheets, which goes against the general trends of utilizing project financing for offshore wind projects. Instead of project financing, Ørsted has had a business strategy of developing offshore wind parks, and then divesting parts of them to infrastructure funds or institutional investors. However, they have always retained at least 50% ownership. This has historically been a successful strategy for Ørsted, as they have managed to obtain high values for their assets when divesting them. However, the question is whether this can continue. The returns Ørsted has received for some of the assets they have divested has been very high, but going forward they are guiding for a more sombre return picture [57]. Also, we now see cases of Ørsted utilizing project finance to finance new projects. This could indicate that in order to maintain their current growth rate, the capital raised from divesting assets may not be sufficient to fund their future activity [85].

5.2 Risk and Return for Offshore Wind Projects

5.2.1 Return

Both the quantitative data and the interview responses agree that the projects which managed to land high subsidies have managed to obtain high returns (IRR), ranging from 10% to 20%. However, going forward, there are indications that this is a thing of the past, with recently sanctioned projects indicating a more modest IRR. There are also examples of limited barriers of entry into the offshore wind space, meaning that there is little competitive advantage. This makes it unlikely that returns of offshore wind can return to their previous higher levels, and instead future returns are likely to be lower. However, it is not only the subsidies that are being reduced, the cost side is also experiencing a downward trend. This can be seen in the evolution of breakeven price for the offshore wind parks evaluated, but also by the fact that there have been examples of recent zero subsidy bids in Germany. Three offshore wind parks won at tender with zero-subsidy bids in 2017 [86], meaning that the projects will rely solely on the wholesale electricity price or power purchasing agreements, when commissioned. If the costs picture can continue this downward trend, it could mean that offshore wind could get higher returns in the future even when exposed to merchant risk. However, the big question then becomes, if offshore wind is profitable and there are limited barriers of entry, how quickly will the market be saturated with wind projects? In this event, intermittency will become the primary issue which ultimately reduces the profitability. There are already signs of an electricity market which is saturated with renewable energy in Germany. In February 2020, wind power accounted for 45% of the total power production which caused several periods of negative electricity prices [87].

5.2.1.1 Effect of subsidy scheme on returns – difference between United Kingdom and Germany

An interesting difference between the projects studied in the United Kingdom and Germany, seems to be that the evolution of returns has gone opposite ways. The German offshore wind parks have seen higher returns as the cost picture has gone down, however, this is not clear from the data in the United Kingdom. In the UK, although the cost has gone down, the returns on the offshore wind parks have also decreased. Comparing the subsidy schemes of the UK and Germany, this could indicate that the competitive auctioning system used in United Kingdom has some benefits in terms of enabling the offshore wind parks to be sanctioned with lower and lower subsidies. This lets the cost reductions seen in the offshore wind space, also be to the benefit of the government rather than purely the developer.

5.2.2 Risk Picture

All interviewees confirmed that the current market view, that there is limited risk for offshore wind. From the quantitative results we see a high use of project finance, and that the debt ratios obtained for the most recent offshore wind parks are over 90%. This is also an indicator that the banks see a limited risk picture, especially as the risk premium on the interest is still decreasing [45]. This market view of offshore wind having limited risk is also demonstrated by the entry of several financial actors who have a lower return requirement (low yielding pension funds for instance) into the market. A key reason for this, is that the prices are secured. In addition, there is relatively little variation in production and limited construction risk as discussed in section 2.3.2. An interesting topic of debate, however, is whether this low risk assumption is valid. There are limited examples of offshore wind parks operating for the predicted 25 years. This means that the assumptions on lifetime of the wind parks, and predicted OPEX, could be wrong e.g. maintenance costs may be higher than expected. Further, there has been examples of already awarded subsidies being cut [88], and recently, Ørsted reported that they had previously underestimated the negative impact the wake and blockage effect has on the load factor, and subsequently reduced their guided IRR [57]. Both of these examples could indicate that the apparent limited systematic risk seen in the market could be underestimated.

Another factor which could impact the long-term risk-return picture of wind, is the decrease in subsidies and the potential that they might be eliminated completely, which will expose future wind parks to merchant risk. The feedback from the interviewees indicate that cash flow certainty is paramount, and little willingness from the lending side to be exposed to price risk. What then will happen with the project financing structure if subsidies are removed? And also, what will happen with the expected returns, as the risk increases? One solution which has been proposed could be the introduction of commercial or financial options, like power purchasing agreements (PPA). A PPA is a commercial or financial contract where a counterparty agrees to a fixed purchase price. However, if this market is big enough to cover all future wind parks remains to be seen.

5.3 RISK AND RETURN FOR OIL & GAS PROJECTS

The results presented indicate in general high returns, but also a large variation, indicating that the risk picture can also be substantial. Looking at the average CAPEX weighted returns of the offshore oil and gas projects we see that the average for the 10-year period is over 15%, for both price scenarios. This is substantially higher than that of the latest sanctioned offshore wind projects. This is also aligned with previously published studies on the returns for oil and gas which indicate a required rate of return above 13-14%. In addition, additional investment criteria indicate an even higher effective required rate of return as discussed in section 2.3.3.

However, even though these projects most likely have a required rate of return at sanctioning above 13-14%, some of them failed to achieve this, with some cases of negative IRR. These variations in returns can be seen both for the base case oil price, which has fluctuated widely in the last decade, but also for the fixed real oil price scenario (65 USD/bbl). This could indicate that even with no price risk, the remaining risk picture is high. The fact that you have these large variations in returns, and negative outliers, aligns well with previous studies. This could either be due to cost overruns, which is a commonality in offshore oil and gas projects as shown by Lorentsen et al (2017) [59], or due to lower than expected volumes produced (reserves). The latter is also to be expected from some fields, as can be shown by evaluating the ratio of 1P to 2P reserves estimates of oil and gas companies which can be as low as ~50% (as shown in section 2.3.3).

5.4 OFFSHORE WIND RETURNS FOR OIL & GAS COMPANIES

The risk-return picture of offshore wind and offshore oil & gas are fundamentally different. While the risk-return picture of offshore wind seems to be low, the same cannot be said for offshore oil and gas. Even taking into account a future without subsidies and full merchant risk for offshore wind parks, the risk picture is still lower compared to offshore oil and gas. Both the volume risk and construction risk, as discussed in Chapter 2.3, are less, and consequently the risk-return picture is different.

It is important to note however, that there are uncertainties in the numbers evaluated. This is indicated by the case study on Dogger Bank Teeside A. The case study shows that the IRR can increase by 1.5-2.7 percentage points (30-50%) if the developer and/or operator is able to reduce the CAPEX or OPEX. This indicates that if a company with an efficient project organization can to demonstrate a competitive advantage in terms of the project execution, potential upsides can be realized. This is especially true if the goal is to sell parts of the project to a third party who has a lower return requirement (infrastructure funds or

pensions funds for instance) after the construction phase. This strategy of divesting parts of the offshore wind park after construction phase has been a communicated strategy by oil and gas companies to increase returns and has historically been a success story for companies like Ørsted. However, with the IRR for projects coming down, the question becomes how much of a risk premium will remain for the construction phase of an offshore wind park. Especially as more and more banks and funds are willing to finance and invest in projects prior to the construction phase. This strategy also assumes that the investor willingness to invest in low return investments will remain high and that the interest rates will remain low.

As mentioned above, competitive advantage in the development phase is a potential upside for oil and gas companies, especially if they are able capitalize on their offshore experience. However, if we take the communicated CAPEX by Equinor for Dogger Bank as a benchmark and compare that to other projects of equivalent size in the United Kingdom, there are no indications so far that any such benefits have been realized. That said, Equinor has not yet reached a financial close of the Dogger Bank wind parks, and the CAPEX might still come down. Furthermore, a reduction in CAPEX of 20% can lead to a 50% increase in IRR (2.7 percentage points) as shown by the sensitivities run on the Dogger Bank case study.

Another strategy communicated by the oil and gas companies is to gear up their returns by project financing and increase leverage. This gearing is illustrated by the case study on the Dogger Bank Teeside A, where the difference in project IRR and leveraged equity IRR is ~50%. The overarching question then becomes if this is more of a case of financial acrobatics, rather than actually creating any value as discussed in section 5.1.3. Even so, this seems to be a strategy that oil & gas companies are utilizing. A possible reason could be that oil and gas companies are benchmarked against their peer companies and any reported increase in returns is viewed positively in the financial markets. Therefore, project financing can be a win-win situation; (1) gaining the company access to cheaper financing and financing facilities specifically tasked with ESG type investments, whilst (2) simultaneously improving their perceived returns. However, even with a divestment strategy after the construction phase and gearing up returns, the risk-return of offshore wind appears to be lower than offshore oil & gas. This seems to be something oil & gas companies have to accept when investing in offshore wind.

6 CONCLUSION

There is a significant amount of capital poised to be invested in offshore wind in Europe, and it seems that given the current low or negative interest rates, there is a lack of alternative low-risk investment opportunities. Offshore wind therefore is an attractive investment opportunity as it is deemed to be low risk and at the same time as it has the benefit of being a "green" investment. Coming back to the initial research questions of this thesis, we can draw some conclusions:

- ***How are offshore wind parks financed and why?***

Project finance has become the prevalent source of financing for the offshore wind industry in Europe over recent years. This is possible because financers perceive offshore wind to be low risk, with cash flows secured at fixed prices. However, whether this trend will continue as the subsidies decrease, and projects ultimately will be exposed to merchant risk, is yet to be seen.

From the developer's side, the rationale behind choosing project finance appears to be related to securitization. This is especially true for oil and gas companies as it allows them to obtain a lower cost of financing and gain access to ESG specific financing facilities. Obtaining a higher leverage with the aim of leveraging the return is another possible reason. An explanation for this could be that it increases the value of the project as the positive benefits of the tax shield outweighs the negative effect of the financial distress cost. This occurs as the perceived risk in offshore wind is low. This could especially be true for companies who have their core industry outside offshore wind and could explain why Ørsted does not project finance while Equinor does.

- ***What is the current risk-return picture of offshore wind?***

Looking at the risk-return picture of offshore wind in Europe, projects which managed to secure high subsidies have the highest returns. However, the competitive nature of the offshore wind space combined with the low risk, has driven down the subsidies awarded. As a consequence, there are clear indications that the previous high returns will not continue. Going forward, perhaps the only way of showing strong returns in this market, is to demonstrate a competitive advantage in terms of reducing CAPEX or OPEX costs. The question is therefore whether oil and gas companies are better suited to do this, given both their offshore experience and project execution experience. However current communicated estimates of CAPEX indicate this is not yet being realized, at least not for bottom-fixed offshore wind parks.

- ***How does the risk-return picture compare to offshore oil and gas investments?***

The risk-return picture of the two industries are clearly very different. Consequently, oil and gas companies seeking to transition into offshore wind, must accept lower, but ultimately safer returns compared to their core industry.

7 LIMITATIONS AND FURTHER RESEARCH

It is important to keep in mind that the numbers presented, and specifically regarding the IRR calculations of offshore wind, are made with simplified assumptions, and as such, the numbers are inherently uncertain. Furthermore, the input data gathered also contains uncertainty, as CAPEX estimates are sometimes based on press releases from third parties, and not from the developers themselves. Therefore, as much as possible, the discussions and conclusions have been made on the basis of trends and key observations rather than single datapoints. It is of special importance to note that the numbers on the case study of Dogger Bank are based on a simplified model, and the discussions therefore attempt to focus on the possible impact on leveraging returns, and reducing CAPEX/OPEX, rather than the deterministic value of IRR calculated in the base case. In addition, the study as a whole was performed on relatively limited dataset, and thus any conclusions have to be seen in relation to the limitations of the sample size.

Also, the study only looked at bottom-fixed offshore wind parks, while there also exists a large future potential for floating offshore wind.

The research has highlighted a number of avenues which could be of interest to further research. On the financing side, the research focused on New Asset Finance, i.e. financing before the construction risk, however there is a large refinancing market in offshore wind, where projects are refinanced after or during the construction phase and changed to a project finance structure. This was the case for Equinor's Dudgeon offshore wind park. Also looking at the interest rates obtained, and the evolution of the risk premium for the loans the offshore wind parks get would be interesting, as this reflects further the risk picture. Further analysis on the different companies who project finance, could also be relevant, to see if there are any trends related to who project finance; size of balance sheet of developer, risk profile of company's core business relative to offshore wind, leverage of balance sheet, size of project, to name a few.

On the topic of risk and return for offshore wind, the valuation model could be vastly improved by including a more complex cost model for the offshore wind parks. In addition, site specific load factors would also greatly elevate the quality of the results. And of course, including IRR calculations for more offshore wind parks, by including countries and subsidy schemes outside Germany and United Kingdom would improve the sample size.

Regarding offshore oil and gas, the same argument can be made for the sample size, and therefore further studies could benefit of including a larger dataset.

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Appendix A-1 OFFSHORE WIND FINANCIAL DATA

Table 12 Offshore Wind Financial Data

Wind farm name	Country	Start-up year	Wind farm capacity (MW)	Total Cost (Euro)	Feed in Tariff/Subsidies	German Tariff (Euro/MWh)	CfD Strike Price (GBP/MWh)	Financial Close date
Arkona Offshore Wind Farm, DE	Germany	2019	384	1248	FiT	184		2016
Beatrice, GB	United Kingdom	2019	588	3481	CFD		140	2016
Borkum Riffgrund 2, DE	Germany	2019	465	1322	FiT	184		2016
Burbo Bank Extension (Burbo Bank 2), GB	United Kingdom	2017	258	944	CFD		150	2014
Butendiek, DE	Germany	2015	288	1300	FiT	194		2013
Deutsche Bucht, DE	Germany	2020	269	1300	FiT	184		2017
Dogger Bank Creyke Beck A, GB	United Kingdom	2023	1200	3450	CFD		40	
Dogger Bank Creyke Beck B, GB	United Kingdom	2024	1200	3450	CFD		42	
Dogger Bank Teesside A, GB	United Kingdom	2025	1200	3450	CFD		42	
Dudgeon East, GB	United Kingdom	2017	402	1987	CFD		150	2014
East Anglia One, GB	United Kingdom	2020	714	2926	CFD		120	2016
Gode Wind 1, DE	Germany	2016	582	2200	FiT	194		2011
Hohe See, DE	Germany	2019	497	1800	FiT	184		2017
Hornsea Project One - Heron & Njord, GB	United Kingdom	2020	1218	3486	CFD		140	2016
Merkur Offshore, DE	Germany	2018	396	1600	FiT	184		2016
Moray East, GB	United Kingdom	2021	950	2886	CFD		58	2018
Neart na Gaoithe (NnG), GB	United Kingdom	2023	450	2645	CFD		114	2019
Nordergrunde, DE	Germany	2017	111	410	FiT	194		2015
Nordsee One, DE	Germany	2017	332	1200	FiT	194		2015
Nordsee Ost, DE	Germany	2015	295	1300	FiT	194		2012
Sandbank, DE	Germany	2017	302	1200	FiT	194		2014
Trianel Windpark Borkum I, DE	Germany	2015	200	1011	FiT	194		2013
Trianel Windpark Borkum II, DE	Germany	2020	203	817	FiT	184		2017
Triton Knoll, GB	United Kingdom	2022	855	2220	CFD		75	2018
Veja Mate, DE	Germany	2017	402	1900	FiT	194		2015
Walney 3, GB	United Kingdom	2018	659	2605	CFD		150	2015
Wikinger, DE	Germany	2017	354	1400	FiT	194		2014

Table 13 - Offshore Wind data - Subsidies and CAPEX

Wind farm name	Country	Start-up year	Current Status	Wind farm capacity (MW)	Operator	Developer	Total Cost (Euro)	Debt (Euro)	Debt/Equity	Project financed (yes/no)	Financial Close (Yes/no)	Financial Close Date
Albatros, DE	Germany	2019	Operational	112	EnBW	EnBW	400	0	0.0	1	1	2017
Amrumbank West, DE	Germany	2015	Operational	302	RWE	RWE	1009	0	0.0	0	1	2011
Arkona Offshore Wind Farm, DE	Germany	2019	Operational	384	RWE	RWE	1248	0	0.0	0	1	2016
Beatrice, GB	United Kingdom	2019	Operational	588	Beatrice Offshore Windfarm Limi	Beatrice Offshore Windfarm Limi	3481	2624	0.8	1	1	2016
Borkum Riffgrund 2, DE	Germany	2019	Operational	465	Orsted	Orsted	1322	0	0.0	0	1	2016
Borssele 1& 2, NL	Netherlands	2020	Under construct	752	Orsted	Orsted	1500	0	0.0	0	1	2016
Borssele 3 & 4, NL	Netherlands	2021	Under construct	732	Blauwwind II Consortium	Blauwwind II Consortium	1526	1337	0.9	1	1	2018
Burbo Bank Extension (Burbo Bank 2), GB	United Kingdom	2017	Operational	258	Orsted	Orsted	944	0	0.0	0	1	2014
Butendiek, DE	Germany	2015	Operational	288	wpd	wpd	1300	850	0.7	1	1	2013
Deutsche Bucht, DE	Germany	2020	Under construct	269	Northland Power, Inc.	Northland Power, Inc.	1300	988	0.8	1	1	2017
Dudgeon East, GB	United Kingdom	2017	Operational	402	Equinor	Equinor	1987	0	0.0	0	1	2014
East Anglia One, GB	United Kingdom	2020	Under construct	714	Scottish Power Renewables	Scottish Power Renewables	2926	0	0.0	0	1	2016
Eneco Luchterduinen, NL	Netherlands	2015	Operational	129	Eneco/Mitsubishi	Eneco/Mitsubishi	450	0	0.0	0	1	2013
Galloper Wind Farm, GB	United Kingdom	2018	Operational	353	RWE	RWE	2120	1937	0.9	1	1	2015
Gemini, NL	Netherlands	2017	Operational	600	Northland Power	Northland Power	2800	2100	0.8	1	1	2014
Global Tech I, DE	Germany	2015	Operational	400	Global Tech I (SWM/ENTEGA/A	Global Tech I (SWM/ENTEGA/A	1600	1047	0.7	1	1	2011
Gode Wind 1&2, DE	Germany	2016	Operational	582	Orsted	Orsted	2200	0	0.0	0	1	2013
Gwynt y Mor, GB	United Kingdom	2015	Operational	576	RWE	RWE	2313	0	0.0	0	1	2011
Hohe See, DE	Germany	2019	Operational	497	EnBW	EnBW	1800	0	0.0	0	1	2017
Hornsea Project One - Heron & Njord, GB	United Kingdom	2020	Under construct	1218	Orsted	Orsted	3486	0	0.0	0	1	2016
Hornsea Project Two - Optimus and Breesea, GB	United Kingdom	2022	Under construct	1386	Orsted	Orsted	3967	0	0.0	0	1	2017
Humber Gateway A, GB	United Kingdom	2015	Operational	219	RWE	RWE	1073	0	0.0	0	1	2011
Kriegers Flak, DK	Denmark	2021	Under construct	605	Vattenfall	Vattenfall	1200	0	0.0	0	1	2018
Merkur Offshore, DE	Germany	2018	Operational	396	Merkur Offshore GmbH	Merkur Offshore GmbH	1600	1101	0.7	1	1	2016
Moray East, GB	United Kingdom	2021	Under construct	950	EDP Renewables	Moray Offshore Windfarm (East)	2886	2331	0.8	1	1	2018
Neart na Gaoithe (NnG), GB	United Kingdom	2023	Approved	450	EDF	EDF	2645	2116	0.8	1	1	2019
Nobelwind (Belwind II), BE	Belgium	2017	Operational	165	Nobelwind (Parkwind/Sumitomo	Nobelwind (Parkwind/Sumitomo	665	500	0.8	1	1	2015
Nordergrunde, DE	Germany	2017	Operational	111	wpd	wpd	410	328	0.8	1	1	2015
Nordsee One, DE	Germany	2017	Operational	332	RWE	RWE	1200	840	0.7	1	1	2015
Nordsee Ost, DE	Germany	2015	Operational	295	RWE	RWE	1300	0	0.0	0	1	2012
Norther, BE	Belgium	2019	Operational	370	Elicio/Eneco/DGE	Elicio/Eneco/DGE	1200	870	0.7	1	1	2016
Northwester 2, BE	Belgium	2020	Under construct	219	Parkwind/Sumitomo	Parkwind	700	481	0.7	1	1	2018
Race Bank, GB	United Kingdom	2018	Operational	573	Orsted	Orsted	2055	0	0.0	0	1	2015
Rampion Offshore Wind Farm, GB	United Kingdom	2017	Operational	400	RWE	RWE	1781	0	0.0	0	1	2015
Rentel, BE	Belgium	2018	Operational	309	Otary	Otary	1100	850	0.8	1	1	2016
Saint-Nazaire, FR	France	2022	Approved	480	EDF	EDF	2300	2300	1.0	1	1	2019
Sandbank, DE	Germany	2017	Operational	302	Vattenfall	Vattenfall	1200	960	0.8	1	1	2014
Seamade (Mermaid), BE	Belgium	2020	Under construct	235	Seamade (Otary/Engie/Eneco)	Seamade (Otary/Engie/Eneco)	650	650	1.0	1	1	2018
Seamade (Seastar), BE	Belgium	2020	Under construct	252	Seamade (Otary/Engie/Eneco)	Seamade (Otary/Engie/Eneco)	650	650	1.0	1	1	2018
Trianel Windpark Borkum I, DE	Germany	2015	Operational	200	Trianel GmbH	Trianel GmbH	1011	470	0.5	1	1	2013
Trianel Windpark Borkum II, DE	Germany	2020	Under construct	203	Trianel GmbH	Trianel GmbH	817	600	0.7	1	1	2017
Triton Knoll, GB	United Kingdom	2022	Under construct	855	RWE	RWE	2220	1943	0.9	1	1	2018
Veja Mate, DE	Germany	2017	Operational	402	Highland Group Holdings	Highland Group Holdings	1900	1275	0.7	1	1	2015
Walney 3, GB	United Kingdom	2018	Operational	659	Orsted	Orsted	2605	1443	0.6	0	1	2015
Westermeerwind, NL	Netherlands	2016	Operational	144	Ventolines	Ventolines BV	400	320	0.8	1	1	2014
Westermost Rough A, GB	United Kingdom	2015	Operational	210	Orsted	Orsted	1000	457	0.5	0	1	2014
Wikinger, DE	Germany	2017	Operational	354	Iberdrola SA	Iberdrola SA	1400	0	0.0	0	1	2014
Windpark Fryslân, NL	Netherlands	2021	Under construct	383	Windpark Fryslân	Ventolines BV	800	780	1.0	1	1	2019

Appendix A-2 OFFSHORE WIND DATA SOURCES

Table 14 - Offshore Wind– Data Sources

Wind farm name	Data Sources
Albatros, DE	https://ijglobal.com/data/transaction/48450/hohe-see-and-albatros-offshore-wind-farm-609mw-refinancing
Amrumbank West, DE	https://en.wikipedia.org/wiki/Amrumbank_West , https://www.4coffshore.com/windfarms/germany/project-dates-for-amrumbank-west-de05.html
Arkona Offshore Wind Farm, DE	https://ijglobal.com/data/transaction/ , https://www.energymarketprice.com/energy-news/german-offshore-wind-farm-arkona-built-in--record--time?act=ps&pid=125&prid=4, https://nawindpower.com/e-on-equinor-open-arkona-offshore-wind-farm-in-baltic-sea
Beatrice, GB	https://www.mufgemea.com/case-studies/project-beatrice/ , https://renews.biz/54248/beatrice-completes-debt-refinancing/ , https://www.offshorewind.biz/2016/05/18/beatrice-offshore-wind-farm-to-reach-financial-close-by-end-of-may/
Borkum Riffgrund 2, DE	https://www.globenewswire.com/news-release/2019/01/31/1708059/0/en/Annual-report-2018-All-time-high-results-and-strategic-progress.html , https://orsted.com/-/media/WWW/Docs/Corp/COM/News/FIDBorkum2_Factsheet_EN.ashx?la=en&hash=499CC22FADEB40DB0A69D50C8E00E3662EA3C012 , https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-mid-year-offshore-statistics-2016.pdf

Borssele 1 & 2, NL	https://www.4coffshore.com/windfarms/netherlands/project-dates-for-borssele-1-and-2-nl0b.html , https://www.offshorewind.biz/2020/02/06/orsted-seeks-eib-financing-for-dutch-offshore-wind-farm/ , https://ewsdata.rightsindevelopment.org/projects/20190715-borssele-1-and-2-offshore-wind-farm/
Borssele 3 & 4, NL	http://www.mhivestasoffshore.com/blauwwind-reaches-financial-close-on-borssele-3-4/
Burbo Bank Extension (Burbo Bank 2), GB	https://www.4coffshore.com/windfarms/project-dates-for-burbo-bank-extension-uk59.html?ctl00_Body_Main_Content_RadGrid1ChangePage=2_50 , https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Offshore-Statistics-2016.pdf , https://www.gov.uk/government/news/record-investments-of-40-billion-in-renewable-electricity-to-bring-green-jobs-and-growth-to-the-uk
Butendiek, DE	https://www.offshorewind.biz/2017/03/10/butendiek-owners-seal-eur-950-million-refinancing-deal/ , https://www.owp-butendiek.de/media/press-releases/?pid=409
Deutsche Bucht, DE	https://green-giraffe.eu/article/deutsche-bucht-reaches-financial-close-press-release , https://ijglobal.com/data/transaction/ ,
Dudgeon East, GB	https://www.oedigital.com/news/460710-dudgeon-offshore-wind-bags-1-77b-refinancing; http://dudgeonoffshorewind.co.uk/news/news-13-05-16; https://renews.biz/54298/danske-commodities-signs-dudgeon-off-take-deal/ ,

East Anglia One, GB	https://www.iberdrola.com/about-us/lines-business/flagship-projects/east-anglia-one-offshore-wind-farm , https://www.windpowermonthly.com/article/1384825/spr-completes-finance-east-anglia-one, https://www.nsenergybusiness.com/projects/east-anglia-one-offshore-wind-farm/
Eneco Luchterduinen , NL	https://www.4coffshore.com/windfarms/netherlands/project-dates-for-eneco-luchterduinen-nl32.html , https://www.deingenieur.nl/artikel/offshore-wind-power-costs-more-than-12-5-billion , https://www.power-technology.com/projects/eneco-luchterduinen-offshore-wind-farm-noordwijk/
Galloper Wind Farm, GB	http://www.galloperwindfarm.com/double-honour-for-galloper-finance-deal/ ; https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Offshore-Statistics-2016.pdf;
Gemini, NL	https://www.offshorewind.biz/2014/07/23/financing-wind-farms-how-the-largest-project-finance-in-offshore-wind-was-established/ , https://www.deingenieur.nl/artikel/offshore-wind-power-costs-more-than-12-5-billion
Global Tech I, DE	https://www.ing.com/Newsroom/News/Features/Features-old/Offshore-wind-financing-a-new-first-for-ING.htm , https://www.power-technology.com/projects/global-tech-i-offshore-wind-farm/ , https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Offshore-Statistics-2016.pdf

Gode Wind 1&2, DE	https://www.power-technology.com/projects/gode-wind-1-and-2-offshore-wind-farms/ , https://www.offshorewind.biz/2019/06/03/trig-to-take-25-stake-in-gode-wind-1/ , https://orsted.com/en/Regulatory-Report-List/2013/11/1224797
Gwynt y Mor, GB	https://ijglobal.com/data/search-transactions#search-transactions , https://www.4coffshore.com/windfarms/united-kingdom/project-dates-for-gwynt-y-m%C3%B4r-uk09.html
Hohe See, DE	https://www.windpowermonthly.com/article/1424558/enbw-completes-financing-497mw-hohe , https://www.4coffshore.com/windfarms/germany/project-dates-for-hohe-see-de11.html
Hornsea Project One - Heron & Njord, GB	https://www.wfw.com/press/wfw-advises-ekf-on-3-5bn-hornsea-one-mega-offshore-wind-farm-acquisition-financing/ , https://renews.biz/101385/dong-commits-to-hornsea-build , https://group.intesasanpaolo.com/content/dam/portalgroup/repository-documenti/sostenibilt%C3%A0/inglese/equator-principles/hornsea%20project%20one.pdf, https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-mid-year-offshore-statistics-2016.pdf
Hornsea Project Two - Optimus and Breesea, GB	https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Offshore-Statistics-2016.pdf
Humber Gateway A, GB	https://www.power-technology.com/projects/humber-gateway-offshore-wind-farm/ , https://www.4coffshore.com/windfarms/united-kingdom/project-dates-for-humber-gateway-uk10.html
Kriegers Flak, DK	https://www.windpowermonthly.com/article/1414947/vattenfall-wins-kriegers-flak-%E2%82%AC499-mwh-bid

Merkur Offshore, DE	https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Offshore-Statistics-2016.pdf , https://www.ircp.com/our-investments/infrastructure/merkur-offshore-wind-farm-germany/
Moray East, GB	http://www.morayoffshore.com/2018/12/07/moray-east-offshore-windfarm-confirms-financial-close/ , https://wholesale.banking.societegenerale.com/en/about/equator-principles-report/2018-equator-principles-report/project-name-reporting-for-project-finance/ , https://ijglobal.com/data/search-transactions#search-transactions , https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Offshore-Statistics-2018.pdf , https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/643560/CFD_allocation_round_2_outcome_FINAL.pdf
Neart na Gaoithe (NnG), GB	https://ijglobal.com/articles/144550/neart-na-gaoithe-offshore-wind-farm-scotland , https://www.mufgemea.com/media/mufg-plays-key-role-in-the-2-3bn-financing-of-offshore-wind-farm/
Nobelwind (Belwind II), BE	http://www.nobelwind.eu/ , https://renews.biz/45624/belwind-2-secures-financial-close/ , https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Offshore-Statistics-2016.pdf , http://en.meewindbeheerder.nl/nieuws/persbericht-financial-close-offshore-windpark-nobelwind-geslaagd/
Nordergrunde, DE	https://www.power-technology.com/projects/nordergrunde-offshore-windfarm/ , https://ijglobal.com/data/search-transactions#search-transactions , https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Offshore-Statistics-2016.pdf
Nordsee One, DE	https://www.nordseeone.com/company/the-company.html, https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Offshore-Statistics-2016.pdf , https://www.power-technology.com/projects/nordsee-one-offshore-wind-project-north-sea/, https://green-giraffe.eu/sites/green-giraffe.eu/files/150319_n1_press_release.pdf

Nordsee Ost, DE	https://www.researchgate.net/profile/Genia_Kostka/publication/316341821_Pioneer_Risks_in_Large_Infrastructure_Projects_in_Germany/links/5b6ca502a6fdcc87df7031bd/Pioneer-Risks-in-Large-Infrastructure-Projects-in-Germany.pdf ,
Norther, BE	https://green-giraffe.eu/article/norther-reaches-financial-close-press-release , https://green-giraffe.eu/projects/norther#detail , https://www.loyensloeff.com/en/en/news/news-articles/loyens-loeff-congratulates-belwind-with-the-refinancing-of-its-offshore-wind-farm-n11662/ , https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Offshore-Statistics-2016.pdf
Northwester 2, BE	https://wholesale.banking.societegenerale.com/en/about/equator-principles-report/2018-equator-principles-report/project-name-reporting-for-project-finance/ , https://kw.be/nieuws/milieu-en-natuur/bouw-van-nieuw-offshore-windenergiepark-northwester-2-kan-in-mei-beginnen/article-normal-341473.html?cookie_check=1586685697
Race Bank, GB	https://renewablesnow.com/news/refinancing-secured-for-573-mw-race-bank-offshore-wind-farm-637121/ , https://windeurope.org/wp-content/uploads/files/about-wind/reports/Financing-and-Investment-Trends-2018.pdf , https://www.ca-cib.com/pressroom/news/race-bank-offshore-wind-project-incorporated-joint-venture , https://windeurope.org/wp-content/uploads/files/about-wind/statistics/EWEA-European-Offshore-Statistics-H1-2015.pdf, https://www.power-technology.com/projects/race-bank-wind-farm/
Rampion Offshore Wind Farm, GB	https://www.renewableenergyworld.com/2015/06/16/securing-wind-energy-finance-in-just-one-step/#gref , https://windeurope.org/wp-content/uploads/files/about-wind/statistics/EWEA-European-Offshore-Statistics-H1-2015.pdf

Rentel, BE	https://www.otary.be/en/news/detail/rentel-reaches-financial-close , https://green-giraffe.eu/article/rentel-reaches-financial-close-press-release , https://green-giraffe.eu/projects/rentel#detail , https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Offshore-Statistics-2016.pdf
Saint-Nazaire, FR	https://www.kfw-ipex-bank.de/Presse/News/Pressemitteilungsdetails_549568-2.html , https://www.offshorewind.biz/2018/06/20/france-reduces-feed-in-tariffs-for-6-offshore-wind-projects/ , https://ijglobal.com/articles/142764/saint-nazaire-offshore-wind-farm-france, https://cib.bnpparibas.com/sustain/winds-of-change-french-offshore-wind-powers-into-the-future_a-3-3188.html
Sandbank, DE	https://www.offshorewindindustry.com/news/turbine-installation-sandbank-offshore-wind, https://www.4coffshore.com/windfarms/germany/project-dates-for-sandbank-de12.html, https://webcache.googleusercontent.com/search?q=cache:ZzID3MMoCL8J:https://www.taylorwessing.com/fileadmin/files/docs/European_Renewable_Energy_Investment_Review_Q4.14.pdf+&cd=11&hl=en&ct=clnk&gl=no
Seamade (Mermaid), BE	https://www.maritimejournal.com/news101/marine-renewable-energy/financial-close-for-belgian-windfarm , https://www.tijd.be/content/tijd/nl/mme-articles/10/07/53/79/10075379 , https://wholesale.banking.societegenerale.com/en/about/equator-principles-report/2018-equator-principles-report/project-name-reporting-for-project-finance/ , https://ijglobal.com/data/search-transactions#search-transactions , https://www.offshorewind.biz/2017/10/27/belgium-agrees-on-eur-79mwh-for-three-offshore-wind-farms/ , https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Offshore-Statistics-2018.pdf
Seamade (Seastar), BE	https://www.maritimejournal.com/news101/marine-renewable-energy/financial-close-for-belgian-windfarm , https://www.tijd.be/content/tijd/nl/mme-articles/10/07/53/79/10075379 , https://wholesale.banking.societegenerale.com/en/about/equator-principles-report/2018-equator-principles-report/project-name-reporting-for-project-finance/ , https://www.offshorewind.biz/2017/10/27/belgium-agrees-on-eur-79mwh-for-three-offshore-wind-farms/

Trianel Windpark Borkum I, DE	http://www.trianel-borkum.de/en/pm/way-cleared-for-trianel-offshore-wind-farm-borkum-1/, https://www.nsenergybusiness.com/projects/trianel-wind-farm-borkum/
Trianel Windpark Borkum II, DE	https://www.kfw.de/KfW-Group/Newsroom/Latest-News/Pressemitteilungen-Details_417280.html , https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Offshore-Statistics-2016.pdf
Triton Knoll, GB	https://www.kfw-ipex-bank.de/International-financing/KfW-IPEX-Bank/Business-sectors/Power-Renewables-and-Water/Wind-power/Offshore-wind-power/ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/643560/CFD_allocation_round_2_outcome_FINAL.pdf
Veja Mate, DE	https://green-giraffe.eu/article/veja-mate-reaches-financial-close-press-release
Walney 3, GB	https://www.inframationgroup.com/emea-case-study%C2%A0walney-extension-marks-new-template-non-bank-wind-debt , https://www.offshorewind.biz/2017/11/23/wfw-helps-investors-close-walney-extension-deal/ , https://www.4coffshore.com/windfarms/united-kingdom/project-dates-for-walney-extension-uk63.html
Westermeerwind, NL	https://windeurope.org/wp-content/uploads/files/about-wind/statistics/EWEA-European-Offshore-Statistics-2014.pdf, https://green-giraffe.eu/projects/westermeerwind#detail,

Westermost Rough A, GB	https://www.offshorewind.biz/2014/10/08/sgurrenergy-advises-on-50-of-westermost-rough-financing/ , https://windeurope.org/wp-content/uploads/files/about-wind/statistics/EWEA-European-Offshore-Statistics-2014.pdf, https://www.marubeni.com/en/news/2014/release/00038.html
Wikinger, DE	https://renews.biz/48755/iberdrola-cuts-wikinger-ribbon/ , https://www.4coffshore.com/windfarms/germany/project-dates-for-wikinger-de47.html
Windpark Fryslân, NL	https://www.4coffshore.com/windfarms/netherlands/project-dates-for-windpark-frysl%C3%A2n-nl0g.html, https://green-giraffe.eu/article/windpark-frysl%C3%A2n-reaches-financial-close-press-release

Table 15 - Offshore Wind Investments - Non-recourse Debt vs non-debt investments

	Offshore Wind Investments (Million Euro)		
	Non-recourse debt	**Investments - non debt**	**Total Cost**
FID	Million Euro	Million Euro	Million Euro
2014	3380	6351	9731
2015	4880	7856	12736
2016	5445	12418	17862
2017	1588	6696	8284
2018	7391	2440	9832
2019	5196	549	5745

Table 16 - Offshore WInd - Investments per Country

Investments Per Country - (Million Euro)

Country	**Belgium**	**Denmark**	**France**	**Germany**	**Netherlands**	**United Kingdom**	**Grand Total**
2014				2600	3200	3931	9731
2015	665			3510		8561	12736
2016	2300			4169	1500	9893	17862
2017				4317		3967	8284
2018	2000	1200			1526	5106	9832
2019			2300		800	2645	5745
Grand Total	**4965**	**1200**	**2300**	**14597**	**7026**	**34103**	**64191**

Table 17 - Wind Farm Capacity Per Developer (MW)

Wind Farm Capacity per Developer (MW)

Developer	Corporate Finance	Project Financed	Grand Total
Orsted	5521		5521
RWE	784	1540	2324
Moray Offshore Windfarm (East) Ltd		950	950
EDF		930	930
Vattenfall	605	302	907
Blauwwind II Consortium		732	732
Scottish Power Renewables	714		714
EnBW	497	112	609
Northland Power		600	600
Beatrice Offshore Windfarm Limited		588	588
Ventolines BV		527	527
Seamade (Otary/Engie/Eneco)		487	487
Equinor	402		402
Highland Group Holdings		402	402
Merkur Offshore GmbH		396	396
Elicio/Eneco/DGE		370	370
Iberdrola SA	354		354
Otary		309	309
Northland Power, Inc.		252	252
Parkwind		219	219
Trianel GmbH		203	203
Nobelwind (Parkwind/Sumitomo/Meewind)		165	165
wpd		111	111
Grand Total	**8876**	**9194**	**18070**

Table 18 - New Asset Investments per Developer (Million Euro)

New Asset Investments per Developer (Million Euro)

Developer	Corporate Finance	Project Financed	Grand Total
Orsted	16879		16879
RWE	3029	5540	8569
EDF		4945	4945
Beatrice Offshore Windfarm Limited		3481	3481
Scottish Power Renewables	2926		2926
Moray Offshore Windfarm (East) Ltd		2886	2886
Northland Power		2800	2800
Vattenfall	1200	1200	2400
EnBW	1800	400	2200
Equinor	1987		1987
Highland Group Holdings		1900	1900
Merkur Offshore GmbH		1600	1600
Blauwwind II Consortium		1526	1526
Iberdrola SA	1400		1400
Seamade (Otary/Engie/Eneco)		1300	1300
Northland Power, Inc.		1300	1300
Elicio/Eneco/DGE		1200	1200
Ventolines BV		1200	1200
Otary		1100	1100
Trianel GmbH		817	817
Parkwind		700	700
Nobelwind (Parkwind/Sumitomo/Meewind)		665	665
wpd		410	410
Grand Total	**29221**	**34970**	**64191**

Appendix A-1 IRR CALCULATIONS OFFSHORE WIND UK

Table 19 - Beatrice IRR Calculations

Wind ParkName	Beatrice, GB
Start-up Year	2019
Country	United Kingdom
Investment Euro	3481
Wind Farm Capacity	588
Load Factors	45%
Electricity price in 2020	45.0

Million Euro
MW

Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation	18%
OPEX share of Capex	2%
Tax	19%
Subsidy (yes=1, no=0)	1
Abex share of total CAPEX	20%

Subsidy Price Year	2012
Fixed price subsidy Euro/MWh (in start-up year)	180.11
Feed-in tariff Euro/MWh	0

Debt Financing (yes=1, no=0)	1
Interest Rate	2.0%
Payment time	15
Debt/Equity Ratio	68%
Interest tax deductability (max of EBIDTA)	30%

NPV	€ 706,077,552 Euro
IRR	8.5%
Leveraged IRR	17.5%

Goal-seek Breakeven	45.0 Euro/MWh

	Year	0	1	2	3	4	5	6	7	8	9
CAPEX	Euro	-€ 3,480,733,944.95									
OPEX	Euro		-€ 63,906,275.23	-€ 65,184,400.73	-€ 66,488,088.75	-€ 67,817,850.52	-€ 69,174,207.53	-€ 70,557,691.68	-€ 71,968,845.52	-€ 73,408,222.43	-€ 74,876,386.88
ABEX											
Electricity	MWh		2,317,896	2,317,896	2,317,896	2,317,896	2,317,896	2,317,896	2,317,896	2,317,896	2,317,896
Power Price	Euro/MWh		€ 180.11	€ 183.72	€ 187.39	€ 191.14	€ 194.96	€ 198.86	€ 202.84	€ 206.89	€ 211.03
Feed-in tariff	Euro/MWh		€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Price received	Euro/MWh		€ 180.11	€ 183.72	€ 187.39	€ 191.14	€ 194.96	€ 198.86	€ 202.84	€ 206.89	€ 211.03
Seabed Leasing Charge		€ -	€ 4,174,853.18	€ 4,258,350.24	€ 4,343,517.25	€ 4,430,387.59	€ 4,518,995.34	€ 4,609,375.25	€ 4,701,562.75	€ 4,795,594.01	€ 4,891,505.89
Revenue	Euro	€ -	€ 417,485,317.76	€ 425,835,024.12	€ 434,351,724.60	€ 443,038,759.09	€ 451,899,534.27	€ 460,937,524.96	€ 470,156,275.46	€ 479,559,400.97	€ 489,150,588.99
EBIDTA	Euro	-€ 3,480,733,944.95	€ 349,404,189.36	€ 356,392,273.14	€ 363,520,118.61	€ 370,790,520.98	€ 378,206,331.40	€ 385,770,458.03	€ 393,485,867.19	€ 401,355,584.53	€ 409,382,696.22
Book Value capex	Euro	€ 3,480,733,944.95	€ 3,480,733,944.95	€ 3,131,329,755.60	€ 2,774,937,482.46	€ 2,411,417,363.85	€ 2,040,626,842.87	€ 1,673,314,011.16	€ 1,372,117,489.15	€ 1,125,136,341.10	€ 922,611,799.70
Depreciation	Euro		€ 349,404,189.36	€ 356,392,273.14	€ 363,520,118.61	€ 370,790,520.98	€ 367,312,831.72	€ 301,196,522.01	€ 246,981,148.05	€ 202,524,541.40	€ 166,070,123.95
Taxable Income	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ 10,893,489.68	€ 84,573,936.02	€ 146,504,719.14	€ 198,831,043.13	€ 243,312,572.27
Corporate Taxes	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ 2,069,764.94	€ 16,069,047.84	€ 27,835,896.64	€ 37,777,898.19	€ 46,229,388.73
Income	Euro	-€ 3,480,733,944.95	€ 349,404,189.36	€ 356,392,273.14	€ 363,520,118.61	€ 370,790,520.98	€ 380,276,096.34	€ 401,839,500.87	€ 421,321,763.82	€ 439,133,482.72	€ 455,612,084.95
Debt Financing											
Opening balance	Euro	€ -	€ 2,366,899,082.57	€ 2,230,032,025.35	€ 2,090,427,626.99	€ 1,948,031,140.66	€ 1,802,786,724.60	€ 1,654,637,420.22	€ 1,503,525,129.76	€ 1,349,390,593.48	€ 1,192,173,366.48
Drawdown	Euro		-€ 136,867,057.22	-€ 139,604,398.36	-€ 142,396,486.33	-€ 145,244,416.06	-€ 148,149,304.38	-€ 151,112,290.47	-€ 154,134,536.27	-€ 157,217,227.00	-€ 160,361,571.54
Interest Repayment	Euro		€ 47,337,981.65	€ 44,600,640.51	€ 41,808,552.54	€ 38,960,622.81	€ 36,055,734.49	€ 33,092,748.40	€ 30,070,502.60	€ 26,987,811.87	€ 23,843,467.33
Cash flow financing	Euro		-€ 184,205,038.87	-€ 184,205,038.87	-€ 184,205,038.87	-€ 184,205,038.87	-€ 184,205,038.87	-€ 184,205,038.87	-€ 184,205,038.87	-€ 184,205,038.87	-€ 184,205,038.87
Taxable Income	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ 51,481,187.61	€ 116,434,216.54	€ 171,843,231.26	€ 219,469,104.94
Taxes	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ 9,781,425.65	€ 22,122,501.14	€ 32,650,213.94	€ 41,699,129.94
Equity Income with financing	Euro	-€ 1,113,834,862.39	€ 165,199,150.49	€ 172,187,234.27	€ 179,315,079.74	€ 186,585,482.11	€ 194,001,292.53	€ 211,346,844.80	€ 231,403,329.46	€ 249,800,759.60	€ 266,876,787.29
Debt coverage ratio		-	1.90	1.93	1.97	2.01	2.06	2.18	2.29	2.38	2.47

10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 76,373,914.61	-€ 77,901,392.91	-€ 79,459,420.77	-€ 81,048,609.18	-€ 82,669,581.36	-€ 84,322,972.99	-€ 86,009,432.45	-€ 87,729,621.10	-€ 89,484,213.52	-€ 91,273,897.79	-€ 93,099,375.75	-€ 94,961,363.26	-€ 96,860,590.53	-€ 98,797,802.34	-€ 100,773,758.39	
															-€ 696,146,788.99
2,317,896	2,317,896	2,317,896	2,317,896	2,317,896	2,317,896	2,317,896	2,317,896	2,317,896	2,317,896	2,317,896	2,317,896	2,317,896	2,317,896	2,317,896	
€ 215.25	€ 219.56	€ 223.95	€ 228.43	€ 233.00	€ 237.66	€ 59.38	€ 60.56	€ 61.78	€ 63.01	€ 64.27	€ 65.56	€ 66.87	€ 68.20	€ 69.57	€ 70.96
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	
€ 215.25	€ 219.56	€ 223.95	€ 228.43	€ 233.00	€ 237.66	€ 59.38	€ 60.56	€ 61.78	€ 63.01	€ 64.27	€ 65.56	€ 66.87	€ 68.20	€ 69.57	
€ 4,989,336.01	€ 5,089,122.73	€ 5,190,905.18	€ 5,294,723.29	€ 5,400,617.75	€ 5,508,630.11	€ 1,376,286.55	€ 1,403,812.28	€ 1,431,888.52	€ 1,460,526.29	€ 1,489,736.82	€ 1,519,531.56	€ 1,549,922.19	€ 1,580,920.63	€ 1,612,539.04	€ -
€ 498,933,600.77	€ 508,912,272.78	€ 519,090,518.24	€ 529,472,328.60	€ 540,061,775.17	€ 550,863,010.68	€ 137,628,654.61	€ 140,381,227.71	€ 143,188,852.26	€ 146,052,629.31	€ 148,973,681.89	€ 151,953,155.53	€ 154,992,218.64	€ 158,092,063.01	€ 161,253,904.27	€ -
€ 417,570,350.14	€ 425,921,757.15	€ 434,440,192.29	€ 443,128,996.14	€ 451,991,576.06	€ 461,031,407.58	€ 50,242,935.62	€ 51,247,794.33	€ 52,272,750.22	€ 53,318,205.22	€ 54,384,569.32	€ 55,472,260.71	€ 56,581,705.93	€ 57,713,340.04	€ 58,867,606.84	-€ 696,146,788.99
€ 756,541,675.76	€ 620,364,174.12	€ 508,698,622.78	€ 417,132,870.68	€ 342,048,953.96	€ 280,480,142.24	€ 229,993,716.64	€ 188,594,847.65	€ 154,647,775.07	€ 126,811,175.56	€ 103,985,163.96	€ 85,267,834.44	€ 69,919,624.24	€ 57,334,091.88	€ 47,013,955.34	€ 38,551,443.38
€ 136,177,501.64	€ 111,665,551.34	€ 91,565,752.10	€ 75,083,916.72	€ 61,568,811.71	€ 50,486,425.60	€ 41,398,869.00	€ 33,947,072.58	€ 27,836,599.51	€ 22,826,011.60	€ 18,717,329.51	€ 15,348,210.20	€ 12,585,592.36	€ 10,320,136.54	€ 8,462,511.96	-€ 696,146,788.99
€ 281,392,848.51	€ 314,256,205.81	€ 342,874,440.19	€ 368,045,079.41	€ 390,422,764.35	€ 410,544,981.98	€ 8,844,066.62	€ 17,300,721.75	€ 24,436,150.70	€ 30,492,193.62	€ 35,667,239.81	€ 40,124,050.51	€ 43,996,173.56	€ 47,393,203.51	€ 50,405,094.88	€ -
€ 53,464,641.22	€ 59,708,679.10	€ 65,146,143.64	€ 69,928,565.09	€ 74,180,325.23	€ 78,003,546.58	€ 1,680,372.66	€ 3,287,137.13	€ 4,642,868.63	€ 5,793,516.79	€ 6,776,775.56	€ 7,623,569.60	€ 8,359,272.98	€ 9,004,708.67	€ 9,576,968.03	€ -
€ 471,034,991.36	€ 485,630,436.25	€ 499,586,335.93	€ 513,057,561.22	€ 526,171,901.28	€ 539,034,954.16	€ 51,923,308.28	€ 54,534,931.46	€ 56,915,618.85	€ 59,111,722.01	€ 61,161,344.89	€ 63,095,830.31	€ 64,940,978.90	€ 66,718,048.71	€ 68,444,574.87	-€ 696,146,788.99
€ 1,031,811,794.94	€ 868,242,991.97	€ 701,402,812.94	€ 531,225,830.33	€ 357,645,308.07	€ 180,593,175.36	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
-€ 163,568,802.97	-€ 166,840,179.03	-€ 170,176,982.61	-€ 173,580,522.26	-€ 177,052,132.71	-€ 180,593,175.36	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
-€ 20,636,235.90	-€ 17,364,859.84	-€ 14,028,056.26	-€ 10,624,516.61	-€ 7,152,906.16	-€ 3,611,863.51	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
-€ 184,205,038.87	-€ 184,205,038.87	-€ 184,205,038.87	-€ 184,205,038.87	-€ 184,205,038.87	-€ 184,205,038.87										
€ 260,756,612.61	€ 296,891,345.97	€ 328,846,383.93	€ 357,420,562.81	€ 383,269,858.19	€ 406,933,118.47	€ 8,844,066.62	€ 17,300,721.75	€ 24,436,150.70	€ 30,492,193.62	€ 35,667,239.81	€ 40,124,050.51	€ 43,996,173.56	€ 47,393,203.51	€ 50,405,094.88	€ 208,844,036.70
€ 49,543,756.40	€ 56,409,355.73	€ 62,480,812.95	€ 67,909,906.93	€ 72,821,273.06	€ 77,317,292.51	€ 1,680,372.66	€ 3,287,137.13	€ 4,642,868.63	€ 5,793,516.79	€ 6,776,775.56	€ 7,623,569.60	€ 8,359,272.98	€ 9,004,708.67	€ 9,576,968.03	
€ 282,909,067.67	€ 298,126,074.01	€ 312,713,966.37	€ 326,833,864.20	€ 340,607,810.24	€ 354,143,661.22	€ 51,923,308.28	€ 54,534,931.46	€ 56,915,618.85	€ 59,111,722.01	€ 61,161,344.89	€ 63,095,830.31	€ 64,940,978.90	€ 66,718,048.71	€ 68,444,574.87	-€ 696,146,788.99
2.56	2.64	2.71	2.79	2.86	2.93										

Table 20 - Burbobank - IRR Calculations

Wind ParkName	Burbo Bank Extension (Burbo Bank 2), GB
Start-up Year	2017
Country	United Kingdom
Investment Euro	944
Wind Farm Capacity	258
Load Factors	45%
Electricity price in 2020	45.0

Million Euro
MW

Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation	18%
OPEX share of Capex	2%
Tax	19%
Subsidy (yes=1, no=0)	1
Abex share of total CAPEX	20%

Subsidy Price Year	2012
Fixed price subsidy Euro/MWh (in start-up year)	185.49
Feed-in tariff Euro/MWh	0

Debt Financing (yes=1, no=0)	1
Interest Rate	2.0%
Payment time	15
Debt/Equity Ratio	68%
Interest tax deductability (max of EBIDTA)	30%

NPV	€ 1,117,438,222	Euro
IRR	20.1%	
Leveraged IRR	45.0%	
Goal-seek Breakeven	45.0	Euro/MWh

	Year	0	1	2	3	4	5	6	7	8	9
CAPEX	Euro	-€ 944,036,697.25									
OPEX	Euro		-€ 17,332,513.76	-€ 17,679,164.04	-€ 18,032,747.32	-€ 18,393,402.26	-€ 18,761,270.31	-€ 19,136,495.72	-€ 19,519,225.63	-€ 19,909,610.14	-€ 20,307,802.34
ABEX											
Electricity	MWh		1,017,036	1,017,036	1,017,036	1,017,036	1,017,036	1,017,036	1,017,036	1,017,036	1,017,036
Power Price	Euro/MWh		€ 185.49	€ 189.20	€ 192.98	€ 196.84	€ 200.78	€ 204.79	€ 208.89	€ 213.06	€ 217.33
Feed-in tariff	Euro/MWh		€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Price received	Euro/MWh		€ 185.49	€ 189.20	€ 192.98	€ 196.84	€ 200.78	€ 204.79	€ 208.89	€ 213.06	€ 217.33
Seabed Leasing Charge		€ -	€ 1,886,455.07	€ 1,924,184.17	€ 1,962,667.86	€ 2,001,921.21	€ 2,041,959.64	€ 2,082,798.83	€ 2,124,454.81	€ 2,166,943.90	€ 2,210,282.78
Revenue	Euro	€ -	€ 188,645,507.19	€ 192,418,417.34	€ 196,266,785.68	€ 200,192,121.40	€ 204,195,963.82	€ 208,279,883.10	€ 212,445,480.76	€ 216,694,390.38	€ 221,028,278.19
EBIDTA	Euro	-€ 944,036,697.25	€ 169,426,538.36	€ 172,815,069.13	€ 176,271,370.51	€ 179,796,797.92	€ 183,392,733.88	€ 187,060,588.55	€ 190,801,800.33	€ 194,617,836.33	€ 198,510,193.06
Book Value capex	Euro	€ 944,036,697.25	€ 774,610,158.89	€ 635,180,330.29	€ 520,847,870.84	€ 427,095,254.09	€ 350,218,108.35	€ 287,178,848.85	€ 235,486,656.06	€ 193,099,057.97	
Depreciation	Euro		€ 169,426,538.36	€ 139,429,828.60	€ 114,332,459.45	€ 93,752,616.75	€ 76,877,145.74	€ 63,039,259.50	€ 51,692,192.79	€ 42,387,598.09	€ 34,757,830.43
Taxable Income	Euro	€ -	€ -	€ 33,385,240.53	€ 61,938,911.06	€ 86,044,181.17	€ 106,515,588.14	€ 124,021,329.05	€ 139,109,607.53	€ 152,230,238.24	€ 163,752,362.63
Corporate Taxes	Euro	€ -	€ -	€ 6,343,195.70	€ 11,768,393.10	€ 16,348,394.42	€ 20,237,961.75	€ 23,564,052.52	€ 26,430,825.43	€ 28,923,745.27	€ 31,112,948.90
Income	Euro	-€ 944,036,697.25	€ 169,426,538.36	€ 179,158,264.83	€ 188,039,763.61	€ 196,145,192.34	€ 203,630,695.62	€ 210,624,641.07	€ 217,232,625.76	€ 223,541,581.60	€ 229,623,141.96
Debt Financing											
Opening balance	Euro	€ -	€ 641,944,954.13	€ 604,824,184.00	€ 566,960,998.46	€ 528,340,549.22	€ 488,947,690.99	€ 448,766,975.60	€ 407,782,645.89	€ 365,978,629.60	€ 323,338,532.98
Drawdown	Euro		-€ 37,120,770.13	-€ 37,863,185.53	-€ 38,620,449.24	-€ 39,392,858.23	-€ 40,180,715.39	-€ 40,984,329.70	-€ 41,804,016.30	-€ 42,640,096.62	-€ 43,492,898.55
Interest Repayment	Euro		€ 12,838,899.08	€ 12,096,483.68	€ 11,339,219.97	€ 10,566,810.98	€ 9,778,953.82	€ 8,975,339.51	€ 8,155,652.92	€ 7,319,572.59	€ 6,466,770.66
Cash flow financing	Euro		-€ 49,959,669.21	-€ 49,959,669.21	-€ 49,959,669.21	-€ 49,959,669.21	-€ 49,959,669.21	-€ 49,959,669.21	-€ 49,959,669.21	-€ 49,959,669.21	-€ 49,959,669.21
Taxable Income	Euro	€ -	€ -	€ 21,288,756.85	€ 50,599,691.09	€ 75,477,370.18	€ 96,736,634.32	€ 115,045,989.54	€ 130,953,954.62	€ 144,910,665.65	€ 157,285,591.97
Taxes	Euro	€ -	€ -	€ 4,044,863.80	€ 9,613,941.31	€ 14,340,700.33	€ 18,379,960.52	€ 21,858,738.01	€ 24,881,251.38	€ 27,533,026.47	€ 29,884,262.47
Equity Income with financing	Euro	-€ 302,091,743.12	€ 119,466,869.15	€ 126,900,263.71	€ 135,925,642.60	€ 144,177,829.04	€ 151,813,025.18	€ 158,959,657.35	€ 165,723,382.49	€ 172,191,193.59	€ 178,434,786.32
Debt coverage ratio		-	3.39	3.59	3.76	3.93	4.08	4.22	4.35	4.47	4.60

10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 20,713,958.39	-€ 21,128,237.56	-€ 21,550,802.31	-€ 21,981,818.36	-€ 22,421,454.72	-€ 22,869,883.82	-€ 23,327,281.50	-€ 23,793,827.13	-€ 24,269,703.67	-€ 24,755,097.74	-€ 25,250,199.70	-€ 25,755,203.69	-€ 26,270,307.76	-€ 26,795,713.92	-€ 27,331,628.20	
															-€ 188,807,339.45
1,017,036	1,017,036	1,017,036	1,017,036	1,017,036	1,017,036	1,017,036	1,017,036	1,017,036	1,017,036	1,017,036	1,017,036	1,017,036	1,017,036	1,017,036	
€ 221.67	€ 226.11	€ 230.63	€ 235.24	€ 239.95	€ 244.74	€ 57.07	€ 58.21	€ 59.38	€ 60.56	€ 61.78	€ 63.01	€ 64.27	€ 65.56	€ 66.87	€ 68.20
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	
€ 221.67	€ 226.11	€ 230.63	€ 235.24	€ 239.95	€ 244.74	€ 57.07	€ 58.21	€ 59.38	€ 60.56	€ 61.78	€ 63.01	€ 64.27	€ 65.56	€ 66.87	
€ 2,254,488.44	€ 2,299,578.21	€ 2,345,569.77	€ 2,392,481.17	€ 2,440,330.79	€ 2,489,137.40	€ 580,431.40	€ 592,040.03	€ 603,880.83	€ 615,958.45	€ 628,277.62	€ 640,843.17	€ 653,660.03	€ 666,733.23	€ 680,067.90	€ -
€ 225,448,843.75	€ 229,957,820.62	€ 234,556,977.04	€ 239,248,116.58	€ 244,033,078.91	€ 248,913,740.49	€ 58,043,140.28	€ 59,204,003.09	€ 60,388,083.15	€ 61,595,844.81	€ 62,827,761.71	€ 64,084,316.94	€ 65,366,003.28	€ 66,673,323.34	€ 68,006,789.81	€ -
€ 202,480,396.92	€ 206,530,004.86	€ 210,660,604.96	€ 214,873,817.05	€ 219,171,293.40	€ 223,554,719.26	€ 34,135,427.38	€ 34,818,135.93	€ 35,514,498.65	€ 36,224,788.62	€ 36,949,284.39	€ 37,688,270.08	€ 38,442,035.48	€ 39,210,876.19	€ 39,995,093.72	-€ 188,807,339.45
€ 158,341,227.53	€ 129,839,806.58	€ 106,468,641.39	€ 87,304,285.94	€ 71,589,514.47	€ 58,703,401.87	€ 48,136,789.53	€ 39,472,167.42	€ 32,367,177.28	€ 26,541,085.37	€ 21,763,690.00	€ 17,846,225.80	€ 14,633,905.16	€ 11,999,802.23	€ 9,839,837.83	€ 8,068,667.02
€ 28,501,420.96	€ 23,371,165.18	€ 19,164,355.45	€ 15,714,771.47	€ 12,886,112.60	€ 10,566,612.34	€ 8,664,622.12	€ 7,104,990.13	€ 5,826,091.91	€ 4,777,395.37	€ 3,917,464.20	€ 3,212,320.64	€ 2,634,102.93	€ 2,159,964.40	€ 1,771,170.81	-€ 188,807,339.45
€ 173,978,975.96	€ 183,158,839.67	€ 191,496,249.51	€ 199,159,045.59	€ 206,285,180.79	€ 212,988,106.93	€ 25,470,805.27	€ 27,713,145.79	€ 29,688,406.74	€ 31,447,393.25	€ 33,031,820.19	€ 34,475,949.44	€ 35,807,932.55	€ 37,050,911.79	€ 38,223,922.91	€ -
€ 33,056,005.43	€ 34,800,179.54	€ 36,384,287.41	€ 37,840,218.66	€ 39,194,184.35	€ 40,467,740.32	€ 4,839,453.00	€ 5,265,497.70	€ 5,640,797.28	€ 5,975,004.72	€ 6,276,045.84	€ 6,550,430.39	€ 6,803,507.19	€ 7,039,673.24	€ 7,262,545.35	€ -
€ 235,536,402.35	€ 241,330,184.40	€ 247,044,892.36	€ 252,714,035.72	€ 258,365,477.75	€ 264,022,459.58	€ 38,974,880.38	€ 40,083,633.63	€ 41,155,295.93	€ 42,199,793.34	€ 43,225,330.23	€ 44,238,700.47	€ 45,245,542.67	€ 46,250,549.43	€ 47,257,639.07	-€ 188,807,339.45
€ 279,845,634.42	€ 235,482,877.90	€ 190,232,866.24	€ 144,077,854.35	€ 96,999,742.23	€ 48,980,067.86	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
-€ 44,362,756.53	-€ 45,250,011.66	-€ 46,155,011.89	-€ 47,078,112.13	-€ 48,019,674.37	-€ 48,980,067.86	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
€ 5,596,912.69	€ 4,709,657.56	€ 3,804,657.32	€ 2,881,557.09	€ 1,939,994.84	€ 979,601.36	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
-€ 49,959,669.21	-€ 49,959,669.21	-€ 49,959,669.21	-€ 49,959,669.21	-€ 49,959,669.21	-€ 49,959,669.21										
€ 168,382,063.28	€ 178,449,182.12	€ 187,691,392.18	€ 196,277,488.50	€ 204,345,185.95	€ 212,008,505.57	€ 25,470,805.27	€ 27,713,145.79	€ 29,688,406.74	€ 31,447,393.25	€ 33,031,820.19	€ 34,475,949.44	€ 35,807,932.55	€ 37,050,911.79	€ 38,223,922.91	€ 36,642,201.83
€ 31,992,592.02	€ 33,905,344.60	€ 35,661,402.51	€ 37,292,722.81	€ 38,825,585.33	€ 40,281,616.06	€ 4,839,453.00	€ 5,265,497.70	€ 5,640,797.28	€ 5,975,004.72	€ 6,276,045.84	€ 6,550,430.39	€ 6,803,507.19	€ 7,039,673.24	€ 7,262,545.35	
€ 184,513,319.73	€ 190,475,680.25	€ 196,362,338.26	€ 202,206,870.66	€ 208,037,209.51	€ 213,876,666.11	€ 38,974,880.38	€ 40,083,633.63	€ 41,155,295.93	€ 42,199,793.34	€ 43,225,330.23	€ 44,238,700.47	€ 45,245,542.67	€ 46,250,549.43	€ 47,257,639.07	-€ 188,807,339.45
4.71	4.83	4.94	5.06	5.17	5.28										

Table 21 - Dogger Bank Creyke Beck A IRR Calculation

Wind ParkName	Dogger Bank Creyke Beck A, GB
Start-up Year	2023
Country	United Kingdom
Investment Euro	3450 Million Euro
Wind Farm Capacity	1200 MW
Load Factors	45%
Electricity price in 2020	45.0 Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation	18%
OPEX share of Capex	2%
Tax	19%
Subsidy (yes=1, no=0)	1
Abex share of total CAPEX	20%

Subsidy Price Year	2012
Fixed price subsidy Euro/MWh (in start-up year)	55.22
Feed-in tariff Euro/MWh	0

Debt Financing (yes=1, no=0)	1
Interest Rate	2.0%
Payment time	15
Debt/Equity Ratio	68%
Interest tax deductability (max of EBIDTA)	30%

NPV	-€ 460,590,530	Euro
IRR	3.7%	
Leveraged IRR	5.3%	

Goal-seek Breakeven	45.0	Euro/MWh

	Year	0	1	2	3	4	5	6	7	8	9
CAPEX	Euro	-€ 3,450,000,000.00									
OPEX	Euro		-€ 63,342,000.00	-€ 64,608,840.00	-€ 65,901,016.80	-€ 67,219,037.14	-€ 68,563,417.88	-€ 69,934,686.24	-€ 71,333,379.96	-€ 72,760,047.56	-€ 74,215,248.51
ABEX											
Electricity	MWh		4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400
Power Price	Euro/MWh		€ 55.22	€ 56.32	€ 57.45	€ 58.60	€ 59.77	€ 60.96	€ 62.18	€ 63.43	€ 64.69
Feed-in tariff	Euro/MWh		€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Price received	Euro/MWh		€ 55.22	€ 56.32	€ 57.45	€ 58.60	€ 59.77	€ 60.96	€ 62.18	€ 63.43	€ 64.69
Seabed Leasing Charge		€ -	€ 2,611,926.61	€ 2,664,165.14	€ 2,717,448.44	€ 2,771,797.41	€ 2,827,233.36	€ 2,883,778.03	€ 2,941,453.59	€ 3,000,282.66	€ 3,060,288.31
Revenue	Euro	€ -	€ 261,192,660.84	€ 266,416,514.06	€ 271,744,844.34	€ 277,179,741.23	€ 282,723,336.05	€ 288,377,802.78	€ 294,145,358.83	€ 300,028,266.01	€ 306,028,831.33
EBIDTA	Euro	-€ 3,450,000,000.00	€ 195,238,734.24	€ 199,143,508.92	€ 203,126,379.10	€ 207,188,906.68	€ 211,332,684.82	€ 215,559,338.51	€ 219,870,525.28	€ 224,267,935.79	€ 228,753,294.50
Book Value capex	Euro	€ 3,450,000,000.00	€ 3,450,000,000.00	€ 3,254,761,265.76	€ 3,055,617,756.84	€ 2,852,491,377.74	€ 2,645,302,471.06	€ 2,433,969,786.25	€ 2,218,410,447.73	€ 1,998,539,922.45	€ 1,774,271,986.67
Depreciation	Euro		€ 195,238,734.24	€ 199,143,508.92	€ 203,126,379.10	€ 207,188,906.68	€ 211,332,684.82	€ 215,559,338.51	€ 219,870,525.28	€ 224,267,935.79	€ 228,753,294.50
Taxable Income	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Corporate Taxes	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Income	Euro	-€ 3,450,000,000.00	€ 195,238,734.24	€ 199,143,508.92	€ 203,126,379.10	€ 207,188,906.68	€ 211,332,684.82	€ 215,559,338.51	€ 219,870,525.28	€ 224,267,935.79	€ 228,753,294.50
Debt Financing											
Opening balance	Euro	€ -	€ 2,346,000,000.00	€ 2,210,341,442.10	€ 2,071,969,713.04	€ 1,930,830,549.41	€ 1,786,868,602.49	€ 1,640,027,416.65	€ 1,490,249,407.08	€ 1,337,475,837.32	€ 1,181,646,796.17
Drawdown	Euro		-€ 135,658,557.90	-€ 138,371,729.06	-€ 141,139,163.64	-€ 143,961,946.91	-€ 146,841,185.85	-€ 149,778,009.57	-€ 152,773,569.76	-€ 155,829,041.15	-€ 158,945,621.98
Interest Repayment	Euro		€ 46,920,000.00	€ 44,206,828.84	€ 41,439,394.26	€ 38,616,610.99	€ 35,737,372.05	€ 32,800,548.33	€ 29,804,988.14	€ 26,749,516.75	€ 23,632,935.92
Cash flow financing	Euro		-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90
Taxable Income	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Taxes	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Equity Income with financing	Euro	-€ 1,104,000,000.00	€ 12,660,176.34	€ 16,564,951.02	€ 20,547,821.20	€ 24,610,348.78	€ 28,754,126.92	€ 32,980,780.61	€ 37,291,967.38	€ 41,689,377.89	€ 46,174,736.60
Debt coverage ratio		-	1.07	1.09	1.11	1.13	1.16	1.18	1.20	1.23	1.25

10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 75,699,553.48	-€ 77,213,544.55	-€ 78,757,815.44	-€ 80,332,971.75	-€ 81,939,631.19	-€ 83,578,423.81	-€ 85,249,992.29	-€ 86,954,992.13	-€ 88,694,091.97	-€ 90,467,973.81	-€ 92,277,333.29	-€ 94,122,879.96	-€ 96,005,337.56	-€ 97,925,444.31	-€ 99,883,953.19	
															-€ 690,000,000.00
4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	
€ 65.99	€ 67.31	€ 68.65	€ 70.03	€ 71.43	€ 72.86	€ 64.27	€ 65.56	€ 66.87	€ 68.20	€ 69.57	€ 70.96	€ 72.38	€ 73.83	€ 75.30	€ 76.81
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	
€ 65.99	€ 67.31	€ 68.65	€ 70.03	€ 71.43	€ 72.86	€ 64.27	€ 65.56	€ 66.87	€ 68.20	€ 69.57	€ 70.96	€ 72.38	€ 73.83	€ 75.30	
€ 3,121,494.08	€ 3,183,923.96	€ 3,247,602.44	€ 3,312,554.49	€ 3,378,805.58	€ 3,446,381.69	€ 3,040,279.22	€ 3,101,084.81	€ 3,163,106.50	€ 3,226,368.63	€ 3,290,896.01	€ 3,356,713.93	€ 3,423,848.20	€ 3,492,325.17	€ 3,562,171.67	€ -
€ 312,149,407.95	€ 318,392,396.11	€ 324,760,244.04	€ 331,255,448.92	€ 337,880,557.89	€ 344,638,169.05	€ 304,027,922.23	€ 310,108,480.67	€ 316,310,650.29	€ 322,636,863.29	€ 329,089,600.56	€ 335,671,392.57	€ 342,384,820.42	€ 349,232,516.83	€ 356,217,167.17	€ -
€ 233,328,360.39	€ 237,994,927.60	€ 242,754,826.15	€ 247,609,922.68	€ 252,562,121.13	€ 257,613,363.55	€ 215,737,650.72	€ 220,052,403.74	€ 224,453,451.81	€ 228,942,520.85	€ 233,521,371.26	€ 238,191,798.69	€ 242,955,634.66	€ 247,814,747.36	€ 252,771,042.30	-€ 690,000,000.00
€ 1,543,518,692.16	€ 1,312,190,331.77	€ 1,075,996,072.05	€ 882,316,779.08	€ 723,499,758.85	€ 593,269,802.25	€ 486,481,237.85	€ 398,914,615.04	€ 327,109,984.33	€ 268,230,187.15	€ 219,948,753.46	€ 180,357,377.84	€ 147,893,541.83	€ 121,272,704.30	€ 99,443,617.53	€ 81,543,766.37
€ 233,328,360.39	€ 236,194,259.72	€ 193,679,292.97	€ 158,817,020.23	€ 130,229,956.59	€ 106,788,564.41	€ 87,566,622.81	€ 71,804,630.71	€ 58,879,797.18	€ 48,281,433.69	€ 39,590,775.62	€ 32,464,436.01	€ 26,620,837.53	€ 21,829,086.77	€ 17,899,851.15	-€ 690,000,000.00
€ -	€ 1,800,667.88	€ 49,075,533.18	€ 88,792,902.44	€ 122,332,164.54	€ 150,824,799.15	€ 128,171,027.91	€ 148,247,773.03	€ 165,573,654.63	€ 180,661,087.16	€ 193,930,595.64	€ 205,727,362.68	€ 216,334,797.13	€ 225,985,660.58	€ 234,871,191.15	€ -
€ -	€ 342,126.90	€ 9,324,351.30	€ 16,870,651.46	€ 23,243,111.26	€ 28,656,711.84	€ 24,352,495.30	€ 28,167,076.88	€ 31,458,994.38	€ 34,325,606.56	€ 36,846,813.17	€ 39,088,198.91	€ 41,103,611.46	€ 42,937,275.51	€ 44,625,526.32	€ -
€ 233,328,360.39	€ 238,337,054.50	€ 252,079,177.46	€ 264,480,574.14	€ 275,805,232.39	€ 286,270,075.39	€ 240,090,146.02	€ 248,219,480.61	€ 255,912,446.19	€ 263,268,127.41	€ 270,368,184.43	€ 277,279,997.60	€ 284,059,246.12	€ 290,752,022.87	€ 297,396,568.62	-€ 690,000,000.00
€ 1,022,701,174.19	€ 860,576,639.78	€ 695,209,614.67	€ 526,535,249.07	€ 354,487,396.15	€ 178,998,586.18	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
-€ 162,124,534.42	-€ 165,367,025.10	-€ 168,674,365.61	-€ 172,047,852.92	-€ 175,488,809.98	-€ 178,998,586.18	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
€ 20,454,023.48	€ 17,211,532.80	€ 13,904,192.29	€ 10,530,704.98	€ 7,089,747.92	€ 3,579,971.72	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90										
€ -	€ -	€ 33,171,340.89	€ 78,262,197.46	€ 115,242,416.61	€ 147,244,827.42	€ 128,171,027.91	€ 148,247,773.03	€ 165,573,654.63	€ 180,661,087.16	€ 193,930,595.64	€ 205,727,362.68	€ 216,334,797.13	€ 225,985,660.58	€ 234,871,191.15	€ 207,000,000.00
€ -	€ -	€ 6,682,554.77	€ 14,869,817.52	€ 21,896,059.16	€ 27,976,317.21	€ 24,352,495.30	€ 28,167,076.88	€ 31,458,994.38	€ 34,325,606.56	€ 36,846,813.17	€ 39,088,198.91	€ 41,103,611.46	€ 42,937,275.51	€ 44,625,526.32	
€ 50,749,802.49	€ 55,416,369.70	€ 66,858,823.02	€ 79,901,182.29	€ 91,879,622.39	€ 103,011,322.86	€ 240,090,146.02	€ 248,219,480.61	€ 255,912,446.19	€ 263,268,127.41	€ 270,368,184.43	€ 277,279,997.60	€ 284,059,246.12	€ 290,752,022.87	€ 297,396,568.62	-€ 690,000,000.00
1.28	1.31	1.38	1.45	1.51	1.57										

Table 22 - Dogger Bank Creyke Beck B IRR Calculations

Wind ParkName	Dogger Bank Creyke Beck B, GB
Start-up Year	2024
Country	United Kingdom
Investment Euro	3450 Million Euro
Wind Farm Capacity	1200 MW
Load Factors	45%
Electricity price in 2020	45.0 Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation	18%
OPEX share of Capex	2%
Tax	19%
Subsidy (yes=1, no=0)	1
Abex share of total CAPEX	20%

Subsidy Price Year	2012
Fixed price subsidy Euro/MWh (in start-up year)	59.10
Feed-in tariff Euro/MWh	0

Debt Financing (yes=1, no=0)	1
Interest Rate	2.0%
Payment time	15
Debt/Equity Ratio	68%
Interest tax deductability (max of EBIDTA)	30%

NPV	-€ 240,372,647	Euro
IRR	4.6%	
Leveraged IRR	6.9%	
Goal-seek Breakeven	45.0	Euro/MWh

	Year	0	1	2	3	4	5	6	7	8	9
CAPEX	Euro	-€ 3,450,000,000.00									
OPEX	Euro		-€ 63,342,000.00	-€ 64,608,840.00	-€ 65,901,016.80	-€ 67,219,037.14	-€ 68,563,417.88	-€ 69,934,686.24	-€ 71,333,379.96	-€ 72,760,047.56	-€ 74,215,248.51
ABEX											
Electricity	MWh		4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400
Power Price	Euro/MWh		€ 59.10	€ 60.29	€ 61.49	€ 62.72	€ 63.98	€ 65.26	€ 66.56	€ 67.89	€ 69.25
Feed-in tariff	Euro/MWh		€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Price received	Euro/MWh		€ 59.10	€ 60.29	€ 61.49	€ 62.72	€ 63.98	€ 65.26	€ 66.56	€ 67.89	€ 69.25
Seabed Leasing Charge		€ -	€ 2,795,861.58	€ 2,851,778.81	€ 2,908,814.38	€ 2,966,990.67	€ 3,026,330.49	€ 3,086,857.09	€ 3,148,594.24	€ 3,211,566.12	€ 3,275,797.44
Revenue	Euro	€ -	€ 279,586,157.63	€ 285,177,880.78	€ 290,881,438.40	€ 296,699,067.17	€ 302,633,048.51	€ 308,685,709.48	€ 314,859,423.67	€ 321,156,612.15	€ 327,579,744.39
EBIDTA	Euro	-€ 3,450,000,000.00	€ 213,448,296.06	€ 217,717,261.98	€ 222,071,607.22	€ 226,513,039.36	€ 231,043,300.15	€ 235,664,166.15	€ 240,377,449.47	€ 245,184,998.46	€ 250,088,698.43
Book Value capex	Euro	€ 3,450,000,000.00	€ 3,450,000,000.00	€ 3,236,551,703.94	€ 3,018,834,441.97	€ 2,796,762,834.75	€ 2,570,249,795.39	€ 2,339,206,495.24	€ 2,103,542,329.09	€ 1,863,164,879.62	€ 1,617,979,881.15
Depreciation	Euro		€ 213,448,296.06	€ 217,717,261.98	€ 222,071,607.22	€ 226,513,039.36	€ 231,043,300.15	€ 235,664,166.15	€ 240,377,449.47	€ 245,184,998.46	€ 250,088,698.43
Taxable Income	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Corporate Taxes	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Income	Euro	-€ 3,450,000,000.00	€ 213,448,296.06	€ 217,717,261.98	€ 222,071,607.22	€ 226,513,039.36	€ 231,043,300.15	€ 235,664,166.15	€ 240,377,449.47	€ 245,184,998.46	€ 250,088,698.43
Debt Financing											
Opening balance	Euro	€ -	€ 2,346,000,000.00	€ 2,210,341,442.10	€ 2,071,969,713.04	€ 1,930,830,549.41	€ 1,786,868,602.49	€ 1,640,027,416.65	€ 1,490,249,407.08	€ 1,337,475,837.32	€ 1,181,646,796.17
Drawdown	Euro		-€ 135,658,557.90	-€ 138,371,729.06	-€ 141,139,163.64	-€ 143,961,946.91	-€ 146,841,185.85	-€ 149,778,009.57	-€ 152,773,569.76	-€ 155,829,041.15	-€ 158,945,621.98
Interest Repayment	Euro		€ 46,920,000.00	€ 44,206,828.84	€ 41,439,394.26	€ 38,616,610.99	€ 35,737,372.05	€ 32,800,548.33	€ 29,804,988.14	€ 26,749,516.75	€ 23,632,935.92
Cash flow financing	Euro		-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90
Taxable Income	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Taxes	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Equity income with financing	Euro	-€ 1,104,000,000.00	€ 30,869,738.16	€ 35,138,704.08	€ 39,493,049.32	€ 43,934,481.46	€ 48,464,742.25	€ 53,085,608.25	€ 57,798,891.57	€ 62,606,440.56	€ 67,510,140.53
Debt coverage ratio		-	1.17	1.19	1.22	1.24	1.27	1.29	1.32	1.34	1.37

10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 75,699,553.48	-€ 77,213,544.55	-€ 78,757,815.44	-€ 80,332,971.75	-€ 81,939,631.19	-€ 83,578,423.81	-€ 85,249,992.29	-€ 86,954,992.13	-€ 88,694,091.97	-€ 90,467,973.81	-€ 92,277,333.29	-€ 94,122,879.96	-€ 96,005,337.56	-€ 97,925,444.31	-€ 99,883,953.19	
															-€ 690,000,000.00
4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	
€ 70.63	€ 72.05	€ 73.49	€ 74.96	€ 76.46	€ 77.99	€ 65.56	€ 66.87	€ 68.20	€ 69.57	€ 70.96	€ 72.38	€ 73.83	€ 75.30	€ 76.81	€ 78.35
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	
€ 70.63	€ 72.05	€ 73.49	€ 74.96	€ 76.46	€ 77.99	€ 65.56	€ 66.87	€ 68.20	€ 69.57	€ 70.96	€ 72.38	€ 73.83	€ 75.30	€ 76.81	
€ 3,341,313.39	€ 3,408,139.66	€ 3,476,302.45	€ 3,545,828.50	€ 3,616,745.07	€ 3,689,079.97	€ 3,101,084.81	€ 3,163,106.50	€ 3,226,368.63	€ 3,290,896.01	€ 3,356,713.93	€ 3,423,848.20	€ 3,492,325.17	€ 3,562,171.67	€ 3,633,415.11	€ -
€ 334,131,339.28	€ 340,813,966.06	€ 347,630,245.38	€ 354,582,850.29	€ 361,674,507.30	€ 368,907,997.44	€ 310,108,480.67	€ 316,310,650.29	€ 322,636,863.29	€ 329,089,600.56	€ 335,671,392.57	€ 342,384,820.42	€ 349,232,516.83	€ 356,217,167.17	€ 363,341,510.51	€ -
€ 255,090,472.40	€ 260,192,281.85	€ 265,396,127.49	€ 270,704,050.04	€ 276,118,131.04	€ 281,640,493.66	€ 221,757,403.58	€ 226,192,551.65	€ 230,716,402.69	€ 235,330,730.74	€ 240,037,345.35	€ 244,838,092.26	€ 249,734,854.11	€ 254,729,551.19	€ 259,824,142.21	-€ 690,000,000.00
€ 1,367,891,182.72	€ 1,121,670,769.83	€ 919,770,031.26	€ 754,211,425.63	€ 618,453,369.02	€ 507,131,762.60	€ 415,848,045.33	€ 340,995,397.17	€ 279,616,225.68	€ 229,285,305.06	€ 188,013,950.15	€ 154,171,439.12	€ 126,420,580.08	€ 103,664,875.66	€ 85,005,198.04	€ 69,704,262.40
€ 246,220,412.89	€ 201,900,738.57	€ 165,558,605.63	€ 135,758,056.61	€ 111,321,606.42	€ 91,283,717.27	€ 74,852,648.16	€ 61,379,171.49	€ 50,330,920.62	€ 41,271,354.91	€ 33,842,511.03	€ 27,750,859.04	€ 22,755,704.41	€ 18,659,677.62	€ 15,300,935.65	-€ 690,000,000.00
€ 8,870,059.51	€ 58,291,543.28	€ 99,837,521.86	€ 134,945,993.42	€ 164,796,524.61	€ 190,356,776.39	€ 146,904,755.42	€ 164,813,380.16	€ 180,385,482.06	€ 194,059,375.83	€ 206,194,834.33	€ 217,087,233.22	€ 226,979,149.69	€ 236,069,873.57	€ 244,523,206.56	€ -
€ 1,685,311.31	€ 11,073,393.22	€ 18,969,129.15	€ 25,639,788.75	€ 31,311,339.68	€ 36,167,787.51	€ 27,911,903.53	€ 31,314,542.23	€ 34,273,241.59	€ 36,871,281.41	€ 39,177,018.52	€ 41,246,574.31	€ 43,126,038.44	€ 44,853,275.98	€ 46,459,409.25	€ -
€ 256,775,783.71	€ 271,267,675.07	€ 284,365,256.64	€ 296,343,788.79	€ 307,429,470.71	€ 317,808,281.17	€ 249,669,307.11	€ 257,507,093.88	€ 264,989,644.28	€ 272,202,012.15	€ 279,214,363.88	€ 286,084,666.57	€ 292,860,892.55	€ 299,582,827.17	€ 306,283,551.46	-€ 690,000,000.00
€ 1,022,701,174.19	€ 860,576,639.78	€ 695,209,614.67	€ 526,535,249.07	€ 354,487,396.15	€ 178,998,586.18	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
-€ 162,124,534.42	-€ 165,367,025.10	-€ 168,674,365.61	-€ 172,047,852.92	-€ 175,488,809.98	-€ 178,998,586.18	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
€ 20,454,023.48	€ 17,211,532.80	€ 13,904,192.29	€ 10,530,704.98	€ 7,089,747.92	€ 3,579,971.72	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90										
€ -	€ 41,080,010.48	€ 85,933,329.57	€ 124,415,288.44	€ 157,706,776.69	€ 186,776,804.67	€ 146,904,755.42	€ 164,813,380.16	€ 180,385,482.06	€ 194,059,375.83	€ 206,194,834.33	€ 217,087,233.22	€ 226,979,149.69	€ 236,069,873.57	€ 244,523,206.56	€ 207,000,000.00
€ -	€ 7,805,201.99	€ 16,327,332.62	€ 23,638,904.80	€ 29,964,287.57	€ 35,487,592.89	€ 27,911,903.53	€ 31,314,542.23	€ 34,273,241.59	€ 36,871,281.41	€ 39,177,018.52	€ 41,246,574.31	€ 43,126,038.44	€ 44,853,275.98	€ 46,459,409.25	
€ 72,511,914.50	€ 85,418,925.94	€ 99,144,902.20	€ 111,764,396.94	€ 123,503,860.71	€ 134,549,528.65	€ 249,669,307.11	€ 257,507,093.88	€ 264,989,644.28	€ 272,202,012.15	€ 279,214,363.88	€ 286,084,666.57	€ 292,860,892.55	€ 299,582,827.17	€ 306,283,551.46	-€ 690,000,000.00
1.41	1.49	1.56	1.62	1.68	1.74										

Table 23 - Dogger Bank Teeside A IRR Calculations

Wind ParkName	Dogger Bank Teesside A, GB
Start-up Year	2025
Country	United Kingdom
Investment Euro	3450
Wind Farm Capacity	1200
Load Factors	45%
Electricity price in 2020	45.0

Million Euro
MW

Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation	18%
OPEX share of Capex	2%
Tax	19%
Subsidy (yes=1, no=0)	1
Abex share of total CAPEX	20%

Subsidy Price Year	2012
Fixed price subsidy Euro/MWh (in start-up year)	60.29
Feed-in tariff Euro/MWh	0

Debt Financing (yes=1, no=0)	1
Interest Rate	2.0%
Payment time	15
Debt/Equity Ratio	68%
Interest tax deductability (max of EBIDTA)	30%

NPV	-€ 159,142,260	Euro
IRR	4.9%	
Leveraged IRR	7.5%	

Goal-seek Breakeven	45.0	Euro/MWh

	Year	0	1	2	3	4	5	6	7	8	9
CAPEX	Euro	-€ 3,450,000,000.00									
OPEX	Euro		-€ 63,342,000.00	-€ 64,608,840.00	-€ 65,901,016.80	-€ 67,219,037.14	-€ 68,563,417.88	-€ 69,934,686.24	-€ 71,333,379.96	-€ 72,760,047.56	-€ 74,215,248.51
ABEX											
Electricity	MWh		4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400
Power Price	Euro/MWh		€ 60.29	€ 61.49	€ 62.72	€ 63.98	€ 65.26	€ 66.56	€ 67.89	€ 69.25	€ 70.63
Feed-in tariff	Euro/MWh		€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Price received	Euro/MWh		€ 60.29	€ 61.49	€ 62.72	€ 63.98	€ 65.26	€ 66.56	€ 67.89	€ 69.25	€ 70.63
Seabed Leasing Charge		€ -	€ 2,851,778.81	€ 2,908,814.38	€ 2,966,990.67	€ 3,026,330.49	€ 3,086,857.09	€ 3,148,594.24	€ 3,211,566.12	€ 3,275,797.44	€ 3,341,313.39
Revenue	Euro	€ -	€ 285,177,880.78	€ 290,881,438.40	€ 296,699,067.17	€ 302,633,048.51	€ 308,685,709.48	€ 314,859,423.67	€ 321,156,612.15	€ 327,579,744.39	€ 334,131,339.28
EBIDTA	Euro	-€ 3,450,000,000.00	€ 218,984,101.98	€ 223,363,784.02	€ 227,831,059.70	€ 232,387,680.89	€ 237,035,434.51	€ 241,776,143.20	€ 246,611,666.06	€ 251,543,899.38	€ 256,574,777.37
Book Value capex	Euro	€ 3,450,000,000.00	€ 3,450,000,000.00	€ 3,231,015,898.02	€ 3,007,652,114.01	€ 2,779,821,054.31	€ 2,547,433,373.42	€ 2,310,397,938.91	€ 2,068,621,795.71	€ 1,822,010,129.65	€ 1,570,466,230.27
Depreciation	Euro		€ 218,984,101.98	€ 223,363,784.02	€ 227,831,059.70	€ 232,387,680.89	€ 237,035,434.51	€ 241,776,143.20	€ 246,611,666.06	€ 251,543,899.38	€ 256,574,777.37
Taxable Income	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Corporate Taxes	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Income	Euro	-€ 3,450,000,000.00	€ 218,984,101.98	€ 223,363,784.02	€ 227,831,059.70	€ 232,387,680.89	€ 237,035,434.51	€ 241,776,143.20	€ 246,611,666.06	€ 251,543,899.38	€ 256,574,777.37
Debt Financing											
Opening balance	Euro	€ -	€ 2,346,000,000.00	€ 2,210,341,442.10	€ 2,071,969,713.04	€ 1,930,830,549.41	€ 1,786,868,602.49	€ 1,640,027,416.65	€ 1,490,249,407.08	€ 1,337,475,837.32	€ 1,181,646,796.17
Drawdown	Euro		-€ 135,658,557.90	-€ 138,371,729.06	-€ 141,139,163.64	-€ 143,961,946.91	-€ 146,841,185.85	-€ 149,778,009.57	-€ 152,773,569.76	-€ 155,829,041.15	-€ 158,945,621.98
Interest Repayment	Euro		€ 46,920,000.00	€ 44,206,828.84	€ 41,439,394.26	€ 38,616,610.99	€ 35,737,372.05	€ 32,800,548.33	€ 29,804,988.14	€ 26,749,516.75	€ 23,632,935.92
Cash flow financing	Euro		-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90
Taxable Income	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Taxes	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Equity Income with financing	Euro	-€ 1,104,000,000.00	€ 36,405,544.08	€ 40,785,226.12	€ 45,252,501.80	€ 49,809,122.99	€ 54,456,876.61	€ 59,197,585.30	€ 64,033,108.16	€ 68,965,341.48	€ 73,996,219.47
Debt coverage ratio		-	1.20	1.22	1.25	1.27	1.30	1.32	1.35	1.38	1.41

10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 75,699,553.48	-€ 77,213,544.55	-€ 78,757,815.44	-€ 80,332,971.75	-€ 81,939,631.19	-€ 83,578,423.81	-€ 85,249,992.29	-€ 86,954,992.13	-€ 88,694,091.97	-€ 90,467,973.81	-€ 92,277,333.29	-€ 94,122,879.96	-€ 96,005,337.56	-€ 97,925,444.31	-€ 99,883,953.19	
															-€ 690,000,000.00
4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	4,730,400	
€ 72.05	€ 73.49	€ 74.96	€ 76.46	€ 77.99	€ 79.55	€ 66.87	€ 68.20	€ 69.57	€ 70.96	€ 72.38	€ 73.83	€ 75.30	€ 76.81	€ 78.35	€ 79.91
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	
€ 72.05	€ 73.49	€ 74.96	€ 76.46	€ 77.99	€ 79.55	€ 66.87	€ 68.20	€ 69.57	€ 70.96	€ 72.38	€ 73.83	€ 75.30	€ 76.81	€ 78.35	
€ 3,408,139.66	€ 3,476,302.45	€ 3,545,828.50	€ 3,616,745.07	€ 3,689,079.97	€ 3,762,861.57	€ 3,163,106.50	€ 3,226,368.63	€ 3,290,896.01	€ 3,356,713.93	€ 3,423,848.20	€ 3,492,325.17	€ 3,562,171.67	€ 3,633,415.11	€ 3,706,083.41	€ -
€ 340,813,966.06	€ 347,630,245.38	€ 354,582,850.29	€ 361,674,507.30	€ 368,907,997.44	€ 376,286,157.39	€ 316,310,650.29	€ 322,636,863.29	€ 329,089,600.56	€ 335,671,392.57	€ 342,384,820.42	€ 349,232,516.83	€ 356,217,167.17	€ 363,341,510.51	€ 370,608,340.72	€ -
€ 261,706,272.92	€ 266,940,398.38	€ 272,279,206.34	€ 277,724,790.47	€ 283,279,286.28	€ 288,944,872.01	€ 227,897,551.50	€ 232,455,502.53	€ 237,104,612.58	€ 241,846,704.83	€ 246,683,638.93	€ 251,617,311.71	€ 256,649,657.94	€ 261,782,651.10	€ 267,018,304.12	-€ 690,000,000.00
€ 1,313,891,452.89	€ 1,077,390,991.37	€ 883,460,612.93	€ 724,437,702.60	€ 594,038,916.13	€ 487,111,911.23	€ 399,431,767.21	€ 327,534,049.11	€ 268,577,920.27	€ 220,233,894.62	€ 180,591,793.59	€ 148,085,270.74	€ 121,429,922.01	€ 99,572,536.05	€ 81,649,479.56	€ 66,952,573.24
€ 236,500,461.52	€ 193,930,378.45	€ 159,022,910.33	€ 130,398,786.47	€ 106,927,004.90	€ 87,680,144.02	€ 71,897,718.10	€ 58,956,128.84	€ 48,344,025.65	€ 39,642,101.03	€ 32,506,522.85	€ 26,655,348.73	€ 21,857,385.96	€ 17,923,056.49	€ 14,696,906.32	-€ 690,000,000.00
€ 25,205,811.40	€ 73,010,019.93	€ 113,256,296.02	€ 147,326,004.00	€ 176,352,281.38	€ 201,264,727.99	€ 155,999,833.40	€ 173,499,373.69	€ 188,760,586.93	€ 202,204,603.80	€ 214,177,116.08	€ 224,961,962.97	€ 234,792,271.98	€ 243,859,594.61	€ 252,321,397.80	€ -
€ 4,789,104.17	€ 13,871,903.79	€ 21,518,696.24	€ 27,991,940.76	€ 33,506,933.46	€ 38,240,298.32	€ 29,639,968.35	€ 32,964,881.00	€ 35,864,511.52	€ 38,418,874.72	€ 40,693,652.06	€ 42,742,772.96	€ 44,610,531.68	€ 46,333,322.98	€ 47,941,065.58	€ -
€ 266,495,377.08	€ 280,812,302.16	€ 293,797,902.59	€ 305,716,731.23	€ 316,786,219.74	€ 327,185,170.32	€ 257,537,519.84	€ 265,420,383.53	€ 272,969,124.10	€ 280,265,579.55	€ 287,377,290.98	€ 294,360,084.67	€ 301,260,189.62	€ 308,115,974.07	€ 314,959,369.70	-€ 690,000,000.00
€ 1,022,701,174.19	€ 860,576,639.78	€ 695,209,614.67	€ 526,535,249.07	€ 354,487,396.15	€ 178,998,586.18	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
-€ 162,124,534.42	-€ 165,367,025.10	-€ 168,674,365.61	-€ 172,047,852.92	-€ 175,488,809.98	-€ 178,998,586.18	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
€ 20,454,023.48	€ 17,211,532.80	€ 13,904,192.29	€ 10,530,704.98	€ 7,089,747.92	€ 3,579,971.72	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90	-€ 182,578,557.90										
€ 4,751,787.91	€ 55,798,487.13	€ 99,352,103.72	€ 136,795,299.02	€ 169,262,533.45	€ 197,684,756.26	€ 155,999,833.40	€ 173,499,373.69	€ 188,760,586.93	€ 202,204,603.80	€ 214,177,116.08	€ 224,961,962.97	€ 234,792,271.98	€ 243,859,594.61	€ 252,321,397.80	€ 207,000,000.00
€ 902,839.70	€ 10,601,712.56	€ 18,876,899.71	€ 25,991,106.81	€ 32,159,881.36	€ 37,560,103.69	€ 29,639,968.35	€ 32,964,881.00	€ 35,864,511.52	€ 38,418,874.72	€ 40,693,652.06	€ 42,742,772.96	€ 44,610,531.68	€ 46,333,322.98	€ 47,941,065.58	
€ 80,030,554.72	€ 94,963,553.03	€ 108,577,548.15	€ 121,137,339.39	€ 132,860,609.74	€ 143,926,417.80	€ 257,537,519.84	€ 265,420,383.53	€ 272,969,124.10	€ 280,265,579.55	€ 287,377,290.98	€ 294,360,084.67	€ 301,260,189.62	€ 308,115,974.07	€ 314,959,369.70	-€ 690,000,000.00
1.46	1.54	1.61	1.67	1.74	1.79										

Table 24 - East Anglia 1 IRR Calculations

Wind ParkName	East Anglia One, GB
Start-up Year	2020
Country	United Kingdom
Investment Euro	2926 Million Euro
Wind Farm Capacity	714 MW
Load Factors	45%
Electricity price in 2020	45.0 Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation	18%
OPEX share of Capex	2%
Tax	19%
Subsidy (yes=1, no=0)	1
Abex share of total CAPEX	20%

Subsidy Price Year	2012
Fixed price subsidy Euro/MWh (in start-up year)	157.33
Feed-in tariff Euro/MWh	0

Debt Financing (yes=1, no=0)	1
Interest Rate	2.0%
Payment time	15
Debt/Equity Ratio	68%
Interest tax deductability (max of EBIDTA)	30%

NPV	€ 1,810,772,188 Euro
IRR	13.6%
Leveraged IRR	28.7%
Goal-seek Breakeven	45.0 Euro/MWh

	Year	0	1	2	3	4	5	6	7	8	9
CAPEX	Euro	-€ 2,926,000,000.00									
OPEX	Euro		-€ 53,721,360.00	-€ 54,795,787.20	-€ 55,891,702.94	-€ 57,009,537.00	-€ 58,149,727.74	-€ 59,312,722.30	-€ 60,498,976.74	-€ 61,708,956.28	-€ 62,943,135.40
ABEX											
Electricity	MWh		2,814,588	2,814,588	2,814,588	2,814,588	2,814,588	2,814,588	2,814,588	2,814,588	2,814,588
Power Price	Euro/MWh		€ 157.33	€ 160.47	€ 163.68	€ 166.96	€ 170.30	€ 173.70	€ 177.18	€ 180.72	€ 184.33
Feed-in tariff	Euro/MWh		€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Price received	Euro/MWh		€ 157.33	€ 160.47	€ 163.68	€ 166.96	€ 170.30	€ 173.70	€ 177.18	€ 180.72	€ 184.33
Seabed Leasing Charge		€ -	€ 4,428,097.64	€ 4,516,659.59	€ 4,606,992.79	€ 4,699,132.64	€ 4,793,115.29	€ 4,888,977.60	€ 4,986,757.15	€ 5,086,492.30	€ 5,188,222.14
Revenue	Euro	€ -	€ 442,809,764.14	€ 451,665,959.42	€ 460,699,278.61	€ 469,913,264.18	€ 479,311,529.46	€ 488,897,760.05	€ 498,675,715.25	€ 508,649,229.56	€ 518,822,214.15
EBIDTA	Euro	-€ 2,926,000,000.00	€ 384,660,306.49	€ 392,353,512.62	€ 400,200,582.88	€ 408,204,594.33	€ 416,368,686.42	€ 424,696,060.15	€ 433,189,981.36	€ 441,853,780.98	€ 450,690,856.60
Book Value capex	Euro	€ 2,926,000,000.00	€ 2,926,000,000.00	€ 2,541,339,693.51	€ 2,148,986,180.88	€ 1,762,168,668.32	€ 1,444,978,308.03	€ 1,184,882,212.58	€ 971,603,414.32	€ 796,714,799.74	€ 653,306,135.79
Depreciation	Euro		€ 384,660,306.49	€ 392,353,512.62	€ 386,817,512.56	€ 317,190,360.30	€ 260,096,093.44	€ 213,276,798.26	€ 174,888,614.58	€ 143,408,663.95	€ 117,595,104.44
Taxable Income	Euro	€ -	€ -	€ -	€ 13,383,070.32	€ 91,014,234.04	€ 156,272,590.98	€ 211,417,261.89	€ 258,301,366.78	€ 298,445,117.03	€ 333,095,752.16
Corporate Taxes	Euro	€ -	€ -	€ -	€ 2,542,783.36	€ 17,292,704.50	€ 29,691,792.29	€ 40,169,279.76	€ 49,077,259.69	€ 56,704,572.24	€ 63,288,192.91
Income	Euro	-€ 2,926,000,000.00	€ 384,660,306.49	€ 392,353,512.62	€ 402,743,366.24	€ 425,497,299.04	€ 446,060,478.71	€ 464,865,339.91	€ 482,267,241.04	€ 498,558,353.22	€ 513,979,049.51
Debt Financing											
Opening balance	Euro	€ -	€ 1,989,680,000.00	€ 1,874,625,814.37	€ 1,757,270,545.03	€ 1,637,568,170.31	€ 1,515,471,748.09	€ 1,390,933,397.42	€ 1,263,904,279.74	€ 1,134,334,579.71	€ 1,002,173,485.68
Drawdown	Euro		-€ 115,054,185.63	-€ 117,355,269.34	-€ 119,702,374.73	-€ 122,096,422.22	-€ 124,538,350.67	-€ 127,029,117.68	-€ 129,569,700.03	-€ 132,161,094.03	-€ 134,804,315.91
Interest Repayment	Euro		€ 39,793,600.00	€ 37,492,516.29	€ 35,145,410.90	€ 32,751,363.41	€ 30,309,434.96	€ 27,818,667.95	€ 25,278,085.59	€ 22,686,691.59	€ 20,043,469.71
Cash flow financing	Euro		-€ 154,847,785.63	-€ 154,847,785.63	-€ 154,847,785.63	-€ 154,847,785.63	-€ 154,847,785.63	-€ 154,847,785.63	-€ 154,847,785.63	-€ 154,847,785.63	-€ 154,847,785.63
Taxable Income	Euro	€ -	€ -	€ -	€ -	€ 58,262,870.83	€ 125,963,156.02	€ 183,598,593.94	€ 233,023,281.18	€ 275,758,425.44	€ 313,052,282.45
Taxes	Euro	€ -	€ -	€ -	€ -	€ 11,069,945.46	€ 23,932,999.64	€ 34,883,732.85	€ 44,274,423.43	€ 52,394,100.83	€ 59,479,933.67
Equity Income with financing	Euro	-€ 936,320,000.00	€ 229,812,520.87	€ 237,305,727.00	€ 245,352,797.25	€ 264,426,754.36	€ 285,453,900.44	€ 304,732,007.37	€ 322,616,619.15	€ 339,400,096.19	€ 355,323,004.64
Debt coverage ratio		-	2.48	2.53	2.60	2.75	2.88	3.00	3.11	3.22	3.32

	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	-€ 64,201,998.11	-€ 65,486,038.07	-€ 66,795,758.84	-€ 68,131,674.01	-€ 69,494,307.49	-€ 70,884,193.64	-€ 72,301,877.52	-€ 73,747,915.07	-€ 75,222,873.37	-€ 76,727,330.83	-€ 78,261,877.45	-€ 79,827,115.00	-€ 81,423,657.30	-€ 83,052,130.45	-€ 84,713,173.06	
																-€ 585,200,000.00
	2,814,588	2,814,588	2,814,588	2,814,588	2,814,588	2,814,588	2,814,588	2,814,588	2,814,588	2,814,588	2,814,588	2,814,588	2,814,588	2,814,588	2,814,588	
	€ 188.02	€ 191.78	€ 195.62	€ 199.53	€ 203.52	€ 207.59	€ 60.56	€ 61.78	€ 63.01	€ 64.27	€ 65.56	€ 66.87	€ 68.20	€ 69.57	€ 70.96	€ 72.38
	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
	€ 188.02	€ 191.78	€ 195.62	€ 199.53	€ 203.52	€ 207.59	€ 60.56	€ 61.78	€ 63.01	€ 64.27	€ 65.56	€ 66.87	€ 68.20	€ 69.57	€ 70.96	
	€ 5,291,986.58	€ 5,397,826.32	€ 5,505,782.84	€ 5,615,898.50	€ 5,728,216.47	€ 5,842,780.80	€ 1,704,629.19	€ 1,738,721.78	€ 1,773,496.21	€ 1,808,966.14	€ 1,845,145.46	€ 1,882,048.37	€ 1,919,689.34	€ 1,958,083.12	€ 1,997,244.79	€ -
	€ 529,198,658.43	€ 539,782,631.60	€ 550,578,284.23	€ 561,589,849.92	€ 572,821,646.92	€ 584,278,079.85	€ 170,462,919.36	€ 173,872,177.75	€ 177,349,621.30	€ 180,896,613.73	€ 184,514,546.00	€ 188,204,836.92	€ 191,968,933.66	€ 195,808,312.33	€ 199,724,478.58	€ -
	€ 459,704,673.73	€ 468,898,767.21	€ 478,276,742.55	€ 487,842,277.40	€ 497,599,122.95	€ 507,551,105.41	€ 96,456,412.65	€ 98,385,540.90	€ 100,353,251.72	€ 102,360,316.75	€ 104,407,523.09	€ 106,495,673.55	€ 108,625,587.02	€ 110,798,098.76	€ 113,014,060.74	-€ 585,200,000.00
	€ 535,711,031.34	€ 439,283,045.70	€ 360,212,097.48	€ 295,373,919.93	€ 242,206,614.34	€ 198,609,423.76	€ 162,859,727.48	€ 133,544,976.54	€ 109,506,880.76	€ 89,795,642.22	€ 73,632,426.62	€ 60,378,589.83	€ 49,510,443.66	€ 40,598,563.80	€ 33,290,822.32	€ 27,298,474.30
	€ 96,427,985.64	€ 79,070,948.23	€ 64,838,177.55	€ 53,167,305.59	€ 43,597,190.58	€ 35,749,696.28	€ 29,314,750.95	€ 24,038,095.78	€ 19,711,238.54	€ 16,163,215.60	€ 13,253,836.79	€ 10,868,146.17	€ 8,911,879.86	€ 7,307,741.48	€ 5,992,348.02	-€ 585,200,000.00
	€ 363,276,688.09	€ 389,827,818.98	€ 413,488,565.01	€ 434,674,971.82	€ 454,001,932.37	€ 471,801,409.13	€ 67,141,661.70	€ 74,347,445.13	€ 80,642,013.18	€ 86,197,101.15	€ 91,153,686.30	€ 95,627,527.38	€ 99,713,707.16	€ 103,490,357.28	€ 107,021,712.72	€ -
	€ 69,022,570.74	€ 74,067,285.61	€ 78,553,327.35	€ 82,588,244.65	€ 86,260,367.15	€ 89,642,267.74	€ 12,756,915.72	€ 14,126,014.57	€ 15,321,982.50	€ 16,377,449.22	€ 17,319,200.40	€ 18,169,230.20	€ 18,945,604.36	€ 19,663,167.88	€ 20,334,125.42	€ -
	€ 528,727,244.47	€ 542,966,052.82	€ 556,830,069.91	€ 570,430,522.05	€ 583,859,490.10	€ 597,193,373.15	€ 109,213,328.37	€ 112,511,555.48	€ 115,675,234.22	€ 118,737,765.97	€ 121,726,723.49	€ 124,664,903.75	€ 127,571,191.38	€ 130,461,266.65	€ 133,348,186.15	-€ 585,200,000.00
	€ 867,369,169.77	€ 729,868,767.53	€ 589,618,357.26	€ 446,562,938.78	€ 300,646,411.92	€ 151,811,554.54	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
	-€ 137,500,402.23	-€ 140,250,410.28	-€ 143,055,418.48	-€ 145,916,526.85	-€ 148,834,857.39	-€ 151,811,554.54	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
	€ 17,347,383.40	€ 14,597,375.35	€ 11,792,367.15	€ 8,931,258.78	€ 6,012,928.24	€ 3,036,231.09	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
	-€ 154,847,785.63	-€ 154,847,785.63	-€ 154,847,785.63	-€ 154,847,785.63	-€ 154,847,785.63	-€ 154,847,785.63										
	€ 345,929,304.70	€ 375,230,443.63	€ 401,646,197.86	€ 425,743,713.04	€ 447,989,004.13	€ 468,765,178.04	€ 67,141,661.70	€ 74,347,445.13	€ 80,642,013.18	€ 86,197,101.15	€ 91,153,686.30	€ 95,627,527.38	€ 99,713,707.16	€ 103,490,357.28	€ 107,021,712.72	€ 175,560,000.00
	€ 65,726,567.89	€ 71,293,784.29	€ 76,312,777.59	€ 80,891,305.48	€ 85,117,910.79	€ 89,065,383.83	€ 12,756,915.72	€ 14,126,014.57	€ 15,321,982.50	€ 16,377,449.22	€ 17,319,200.40	€ 18,169,230.20	€ 18,945,604.36	€ 19,663,167.88	€ 20,334,125.42	
	€ 370,583,456.00	€ 385,344,765.87	€ 399,741,734.52	€ 413,885,797.26	€ 427,869,248.11	€ 441,768,703.61	€ 109,213,328.37	€ 112,511,555.48	€ 115,675,234.22	€ 118,737,765.97	€ 121,726,723.49	€ 124,664,903.75	€ 127,571,191.38	€ 130,461,266.65	€ 133,348,186.15	-€ 585,200,000.00
	3.41	3.51	3.60	3.68	3.77	3.86										

Table 25 - Hornsea Project One IRR Calculations

Wind ParkName	Hornsea Project One - Heron & Njord, GB
Start-up Year	2020
Country	United Kingdom
Investment Euro	3486 Milion Euro
Wind Farm Capacity	1218 MW
Load Factors	45%
Electricity price in 2020	45.0 Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation	18%
OPEX share of Capex	2%
Tax	19%
Subsidy (yes=1, no=0)	1
Abex share of total CAPEX	20%

Subsidy Price Year	2012
Fixed price subsidy Euro/MWh (in start-up year)	183.72
Feed-in tariff Euro/MWh	0

Debt Financing (yes=1, no=0)	1
Interest Rate	2.0%
Payment time	15
Debt/Equity Ratio	68%
Interest tax deductability (max of EBIDTA)	30%

NPV	€ 6,502,228,214 Euro
IRR	26.8%
Leveraged IRR	63.5%
Goal-seek Breakeven	45.0 Euro/MWh

	Year	0	1	2	3	4	5	6	7	8	9
CAPEX	Euro	-€ 3,486,238,532.11									
OPEX	Euro		-€ 64,007,339.45	-€ 65,287,486.24	-€ 66,593,235.96	-€ 67,925,100.68	-€ 69,283,602.70	-€ 70,669,274.75	-€ 72,082,660.25	-€ 73,524,313.45	-€ 74,994,799.72
ABEX											
Electricity	MWh		4,801,356	4,801,356	4,801,356	4,801,356	4,801,356	4,801,356	4,801,356	4,801,356	4,801,356
Power Price	Euro/MWh		€ 183.72	€ 187.39	€ 191.14	€ 194.96	€ 198.86	€ 202.84	€ 206.89	€ 211.03	€ 215.25
Feed-in tariff	Euro/MWh		€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Price received	Euro/MWh		€ 183.72	€ 187.39	€ 191.14	€ 194.96	€ 198.86	€ 202.84	€ 206.89	€ 211.03	€ 215.25
Seabed Leasing Charge		€ -	€ 8,820,868.36	€ 8,997,285.72	€ 9,177,231.44	€ 9,360,776.07	€ 9,547,991.59	€ 9,738,951.42	€ 9,933,730.45	€ 10,132,405.06	€ 10,335,053.16
Revenue	Euro	€ -	€ 882,086,835.67	€ 899,728,572.39	€ 917,723,143.83	€ 936,077,606.71	€ 954,799,158.84	€ 973,895,142.02	€ 993,373,044.86	€ 1,013,240,505.76	€ 1,033,505,315.87
EBIDTA	Euro	-€ 3,486,238,532.11	€ 809,258,627.87	€ 825,443,800.42	€ 841,952,676.43	€ 858,791,729.96	€ 875,967,564.56	€ 893,486,915.85	€ 911,356,654.17	€ 929,583,787.25	€ 948,175,463.00
Book Value capex	Euro	€ 3,486,238,532.11	€ 3,486,238,532.11	€ 2,858,715,596.33	€ 2,344,146,788.99	€ 1,922,200,366.97	€ 1,576,204,300.92	€ 1,292,487,526.75	€ 1,059,839,771.94	€ 869,068,612.99	€ 712,636,262.65
Depreciation	Euro		€ 627,522,935.78	€ 514,568,807.34	€ 421,946,422.02	€ 345,996,066.06	€ 283,716,774.17	€ 232,647,754.82	€ 190,771,158.95	€ 156,432,350.34	€ 128,274,527.28
Taxable Income	Euro	€ -	€ 181,735,692.09	€ 310,874,993.08	€ 420,006,254.41	€ 512,795,663.91	€ 592,250,790.39	€ 660,839,161.04	€ 720,585,495.22	€ 773,151,436.91	€ 819,900,935.72
Corporate Taxes	Euro	€ -	€ 34,529,781.50	€ 59,066,248.69	€ 79,801,188.34	€ 97,431,176.14	€ 112,527,650.17	€ 125,559,440.60	€ 136,911,244.09	€ 146,898,773.01	€ 155,781,177.79
Income	Euro	-€ 3,486,238,532.11	€ 843,788,409.36	€ 884,510,049.11	€ 921,753,864.77	€ 956,222,906.10	€ 988,495,214.73	€ 1,019,046,356.45	€ 1,048,267,898.26	€ 1,076,482,560.26	€ 1,103,956,640.78
Debt Financing											
Opening balance	Euro	€ -	€ 2,370,642,201.83	€ 2,233,558,696.98	€ 2,093,733,522.02	€ 1,951,111,843.57	€ 1,805,637,731.55	€ 1,657,254,137.28	€ 1,505,902,871.13	€ 1,351,524,579.66	€ 1,194,058,722.36
Drawdown	Euro		-€ 137,083,504.86	-€ 139,825,174.95	-€ 142,621,678.45	-€ 145,474,112.02	-€ 148,383,594.26	-€ 151,351,266.15	-€ 154,378,291.47	-€ 157,465,857.30	-€ 160,615,174.45
Interest Repayment	Euro		€ 47,412,844.04	€ 44,671,173.94	€ 41,874,670.44	€ 39,022,236.87	€ 36,112,754.63	€ 33,145,082.75	€ 30,118,057.42	€ 27,030,491.59	€ 23,881,174.45
Cash flow financing	Euro		-€ 184,496,348.89	-€ 184,496,348.89	-€ 184,496,348.89	-€ 184,496,348.89	-€ 184,496,348.89	-€ 184,496,348.89	-€ 184,496,348.89	-€ 184,496,348.89	-€ 184,496,348.89
Taxable Income	Euro	€ -	€ 134,322,848.05	€ 266,203,819.14	€ 378,131,583.97	€ 473,773,427.03	€ 556,138,035.76	€ 627,694,078.29	€ 690,467,437.80	€ 746,120,945.32	€ 796,019,761.27
Taxes	Euro	€ -	€ 25,521,341.13	€ 50,578,725.64	€ 71,845,000.95	€ 90,016,951.14	€ 105,666,226.80	€ 119,261,874.88	€ 131,188,813.18	€ 141,762,979.61	€ 151,243,754.64
Equity Income with financing	Euro	-€ 1,115,596,330.28	€ 650,283,620.10	€ 691,526,177.17	€ 729,301,328.49	€ 764,312,332.20	€ 797,137,442.46	€ 828,252,441.83	€ 858,049,118.46	€ 886,850,417.97	€ 914,922,868.74
Debt coverage ratio		-	4.57	4.79	5.00	5.18	5.36	5.52	5.68	5.83	5.98

10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 76,494,695.71	-€ 78,024,589.63	-€ 79,585,081.42	-€ 81,176,783.05	-€ 82,800,318.71	-€ 84,456,325.08	-€ 86,145,451.59	-€ 87,868,360.62	-€ 89,625,727.83	-€ 91,418,242.39	-€ 93,246,607.23	-€ 95,111,539.38	-€ 97,013,770.17	-€ 98,954,045.57	-€ 100,933,126.48	
															-€ 697,247,706.42
4,801,356	4,801,356	4,801,356	4,801,356	4,801,356	4,801,356	4,801,356	4,801,356	4,801,356	4,801,356	4,801,356	4,801,356	4,801,356	4,801,356	4,801,356	
€ 219.56	€ 223.95	€ 228.43	€ 233.00	€ 237.66	€ 242.41	€ 60.56	€ 61.78	€ 63.01	€ 64.27	€ 65.56	€ 66.87	€ 68.20	€ 69.57	€ 70.96	€ 72.38
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	
€ 219.56	€ 223.95	€ 228.43	€ 233.00	€ 237.66	€ 242.41	€ 60.56	€ 61.78	€ 63.01	€ 64.27	€ 65.56	€ 66.87	€ 68.20	€ 69.57	€ 70.96	
€ 10,541,754.22	€ 10,752,589.31	€ 10,967,641.09	€ 11,186,993.91	€ 11,410,733.79	€ 11,638,948.47	€ 2,907,896.86	€ 2,966,054.80	€ 3,025,375.89	€ 3,085,883.41	€ 3,147,601.08	€ 3,210,553.10	€ 3,274,764.16	€ 3,340,259.45	€ 3,407,064.63	€ -
€ 1,054,175,422.19	€ 1,075,258,930.64	€ 1,096,764,109.25	€ 1,118,699,391.43	€ 1,141,073,379.26	€ 1,163,894,846.85	€ 290,789,685.96	€ 296,605,479.68	€ 302,537,589.28	€ 308,588,341.06	€ 314,760,107.88	€ 321,055,310.04	€ 327,476,416.24	€ 334,025,944.57	€ 340,706,463.46	€ -
€ 967,138,972.26	€ 986,481,751.70	€ 1,006,211,386.74	€ 1,026,335,614.47	€ 1,046,862,326.76	€ 1,067,799,573.29	€ 201,736,337.52	€ 205,771,064.27	€ 209,886,485.55	€ 214,084,215.27	€ 218,365,899.57	€ 222,733,217.56	€ 227,187,881.91	€ 231,731,639.55	€ 236,366,272.34	-€ 697,247,706.42
€ 584,361,735.37	€ 479,176,623.01	€ 392,924,830.87	€ 322,198,361.31	€ 264,202,656.27	€ 216,646,178.14	€ 177,649,866.08	€ 145,672,890.18	€ 119,451,769.95	€ 97,950,451.36	€ 80,319,370.12	€ 65,861,883.49	€ 54,006,744.47	€ 44,285,530.46	€ 36,314,134.98	€ 29,777,590.68
€ 105,185,112.37	€ 86,251,792.14	€ 70,726,469.56	€ 57,995,705.04	€ 47,556,478.13	€ 38,996,312.07	€ 31,976,975.89	€ 26,221,120.23	€ 21,501,318.59	€ 17,631,081.24	€ 14,457,486.62	€ 11,855,139.03	€ 9,721,214.00	€ 7,971,395.48	€ 6,536,544.30	-€ 697,247,706.42
€ 861,953,859.89	€ 900,229,959.56	€ 935,484,917.18	€ 968,339,909.43	€ 999,305,848.63	€ 1,028,803,261.23	€ 169,759,361.62	€ 179,549,944.04	€ 188,385,166.96	€ 196,453,134.02	€ 203,908,412.95	€ 210,878,078.53	€ 217,466,667.91	€ 223,760,244.07	€ 229,829,728.05	€ -
€ 163,771,233.38	€ 171,043,692.32	€ 177,742,134.26	€ 183,984,582.79	€ 189,868,111.24	€ 195,472,619.63	€ 32,254,278.71	€ 34,114,489.37	€ 35,793,181.72	€ 37,326,095.46	€ 38,742,598.46	€ 40,066,834.92	€ 41,318,666.90	€ 42,514,446.37	€ 43,667,648.33	€ -
€ 1,130,910,205.64	€ 1,157,525,444.02	€ 1,183,953,521.00	€ 1,210,320,197.26	€ 1,236,730,438.00	€ 1,263,272,192.93	€ 233,990,616.23	€ 239,885,553.64	€ 245,679,667.28	€ 251,410,310.73	€ 257,108,498.03	€ 262,800,052.48	€ 268,506,548.82	€ 274,246,085.93	€ 280,033,920.67	-€ 697,247,706.42
€ 1,033,443,547.92	€ 869,616,069.98	€ 702,512,042.48	€ 532,065,934.44	€ 358,210,904.24	€ 180,878,773.43	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00
-€ 163,827,477.94	-€ 167,104,027.49	-€ 170,446,108.04	-€ 173,855,030.21	-€ 177,332,130.81	-€ 180,878,773.43	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00
€ 20,668,870.96	€ 17,392,321.40	€ 14,050,240.85	€ 10,641,318.69	€ 7,164,218.08	€ 3,617,575.47	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00
-€ 184,496,348.89	-€ 184,496,348.89	-€ 184,496,348.89	-€ 184,496,348.89	-€ 184,496,348.89	-€ 184,496,348.89										
€ 841,284,988.93	€ 882,837,638.16	€ 921,434,676.33	€ 957,698,590.75	€ 992,141,630.55	€ 1,025,185,685.76	€ 169,759,361.62	€ 179,549,944.04	€ 188,385,166.96	€ 196,453,134.02	€ 203,908,412.95	€ 210,878,078.53	€ 217,466,667.91	€ 223,760,244.07	€ 229,829,728.05	€ 209,174,311.93
€ 159,844,147.90	€ 167,739,151.25	€ 175,072,588.50	€ 181,962,732.24	€ 188,506,909.80	€ 194,785,280.29	€ 32,254,278.71	€ 34,114,489.37	€ 35,793,181.72	€ 37,326,095.46	€ 38,742,598.46	€ 40,066,834.92	€ 41,318,666.90	€ 42,514,446.37	€ 43,667,648.33	
€ 942,486,771.26	€ 969,724,554.06	€ 996,787,626.34	€ 1,023,801,997.82	€ 1,050,872,887.67	€ 1,078,088,504.70	€ 233,990,616.23	€ 239,885,553.64	€ 245,679,667.28	€ 251,410,310.73	€ 257,108,498.03	€ 262,800,052.48	€ 268,506,548.82	€ 274,246,085.93	€ 280,033,920.67	-€ 697,247,706.42
6.13	6.27	6.42	6.56	6.70	6.85										

Table 26 - Moray East IRR Calculations

Wind ParkName	Moray East, GB
Start-up Year	2021
Country	United Kingdom
Investment Euro	2886
Wind Farm Capacity	950
Load Factors	45%
Electricity price in 2020	45.0

Million Euro
MW

Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation	18%
OPEX share of Capex	2%
Tax	19%
Subsidy (yes=1, no=0)	1
Abex share of total CAPEX	20%

Subsidy Price Year	2012
Fixed price subsidy Euro/MWh (in start-up year)	76.96
Feed-in tariff Euro/MWh	0

Debt Financing (yes=1, no=0)	1
Interest Rate	2.0%
Payment time	15
Debt/Equity Ratio	68%
Interest tax deductability (max of EBIDTA)	30%

NPV	€ 310,363,833 Euro
IRR	6.9%
Leveraged IRR	12.1%

Goal-seek Breakeven	45.0 Euro/MWh

	Year	0	1	2	3	4	5	6	7	8	9
CAPEX	Euro	-€ 2,886,000,000.00									
OPEX	Euro		-€ 52,986,960.00	-€ 54,046,699.20	-€ 55,127,633.18	-€ 56,230,185.85	-€ 57,354,789.56	-€ 58,501,885.36	-€ 59,671,923.06	-€ 60,865,361.52	-€ 62,082,668.75
ABEX											
Electricity	MWh		3,744,900	3,744,900	3,744,900	3,744,900	3,744,900	3,744,900	3,744,900	3,744,900	3,744,900
Power Price	Euro/MWh		€ 76.96	€ 78.50	€ 80.07	€ 81.67	€ 83.31	€ 84.97	€ 86.67	€ 88.41	€ 90.18
Feed-in tariff	Euro/MWh		€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Price received	Euro/MWh		€ 76.96	€ 78.50	€ 80.07	€ 81.67	€ 83.31	€ 84.97	€ 86.67	€ 88.41	€ 90.18
Seabed Leasing Charge		€ -	€ 2,882,223.39	€ 2,939,867.86	€ 2,998,665.22	€ 3,058,638.52	€ 3,119,811.29	€ 3,182,207.52	€ 3,245,851.67	€ 3,310,768.70	€ 3,376,984.07
Revenue	Euro	€ -	€ 288,222,339.12	€ 293,986,785.90	€ 299,866,521.62	€ 305,863,852.05	€ 311,981,129.09	€ 318,220,751.67	€ 324,585,166.71	€ 331,076,870.04	€ 337,698,407.44
EBIDTA	Euro	-€ 2,886,000,000.00	€ 232,353,155.73	€ 237,000,218.84	€ 241,740,223.22	€ 246,575,027.68	€ 251,506,528.24	€ 256,536,658.80	€ 261,667,391.98	€ 266,900,739.82	€ 272,238,754.61
Book Value capex	Euro	€ 2,886,000,000.00	€ 2,886,000,000.00	€ 2,653,646,844.27	€ 2,416,646,625.43	€ 2,174,906,402.21	€ 1,928,331,374.53	€ 1,676,824,846.29	€ 1,420,288,187.49	€ 1,164,636,313.74	€ 955,001,777.27
Depreciation	Euro		€ 232,353,155.73	€ 237,000,218.84	€ 241,740,223.22	€ 246,575,027.68	€ 251,506,528.24	€ 256,536,658.80	€ 255,651,873.75	€ 209,634,536.47	€ 171,900,319.91
Taxable Income	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 6,015,518.23	€ 57,266,203.34	€ 100,338,434.71
Corporate Taxes	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 1,142,948.46	€ 10,880,578.64	€ 19,064,302.59
Income	Euro	-€ 2,886,000,000.00	€ 232,353,155.73	€ 237,000,218.84	€ 241,740,223.22	€ 246,575,027.68	€ 251,506,528.24	€ 256,536,658.80	€ 262,810,340.44	€ 277,781,318.45	€ 291,303,057.21
Debt Financing											
Opening balance	Euro	€ -	€ 1,962,480,000.00	€ 1,848,998,667.22	€ 1,733,247,707.78	€ 1,615,181,729.16	€ 1,494,754,430.96	€ 1,371,918,586.79	€ 1,246,626,025.75	€ 1,118,827,613.48	€ 988,473,232.97
Drawdown	Euro		-€ 113,481,332.78	-€ 115,750,959.44	-€ 118,065,978.63	-€ 120,427,298.20	-€ 122,835,844.16	-€ 125,292,561.05	-€ 127,798,412.27	-€ 130,354,380.51	-€ 132,961,468.12
Interest Repayment	Euro		€ 39,249,600.00	€ 36,979,973.34	€ 34,664,954.16	€ 32,303,634.58	€ 29,895,088.62	€ 27,438,371.74	€ 24,932,520.51	€ 22,376,552.27	€ 19,769,464.66
Cash flow financing	Euro		-€ 152,730,932.78	-€ 152,730,932.78	-€ 152,730,932.78	-€ 152,730,932.78	-€ 152,730,932.78	-€ 152,730,932.78	-€ 152,730,932.78	-€ 152,730,932.78	-€ 152,730,932.78
Taxable Income	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 34,889,651.07	€ 80,568,970.05
Taxes	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 6,629,033.70	€ 15,308,104.31
Equity Income with financing	Euro	-€ 923,520,000.00	€ 79,622,222.95	€ 84,269,286.06	€ 89,009,290.44	€ 93,844,094.90	€ 98,775,595.46	€ 103,805,726.02	€ 108,936,459.20	€ 120,798,840.74	€ 134,815,926.14
Debt coverage ratio		-	1.52	1.55	1.58	1.61	1.65	1.68	1.72	1.82	1.91

10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 63,324,322.13	-€ 64,590,808.57	-€ 65,882,624.74	-€ 67,200,277.24	-€ 68,544,282.78	-€ 69,915,168.44	-€ 71,313,471.81	-€ 72,739,741.24	-€ 74,194,536.07	-€ 75,678,426.79	-€ 77,191,995.33	-€ 78,735,835.23	-€ 80,310,551.94	-€ 81,916,762.98	-€ 83,555,098.24	
															-€ 577,200,000.00
3,744,900	3,744,900	3,744,900	3,744,900	3,744,900	3,744,900	3,744,900	3,744,900	3,744,900	3,744,900	3,744,900	3,744,900	3,744,900	3,744,900	3,744,900	
€ 91.98	€ 93.82	€ 95.70	€ 97.61	€ 99.56	€ 101.55	€ 61.78	€ 63.01	€ 64.27	€ 65.56	€ 66.87	€ 68.20	€ 69.57	€ 70.96	€ 72.38	€ 73.83
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	
€ 91.98	€ 93.82	€ 95.70	€ 97.61	€ 99.56	€ 101.55	€ 61.78	€ 63.01	€ 64.27	€ 65.56	€ 66.87	€ 68.20	€ 69.57	€ 70.96	€ 72.38	
€ 3,444,523.76	€ 3,513,414.23	€ 3,583,682.52	€ 3,655,356.17	€ 3,728,463.29	€ 3,803,032.56	€ 2,313,425.33	€ 2,359,693.84	€ 2,406,887.72	€ 2,455,025.47	€ 2,504,125.98	€ 2,554,208.50	€ 2,605,292.67	€ 2,657,398.52	€ 2,710,546.50	€ -
€ 344,452,375.59	€ 351,341,423.10	€ 358,368,251.57	€ 365,535,616.60	€ 372,846,328.93	€ 380,303,255.51	€ 231,342,533.41	€ 235,969,384.08	€ 240,688,771.76	€ 245,502,547.20	€ 250,412,598.14	€ 255,420,850.11	€ 260,529,267.11	€ 265,739,852.45	€ 271,054,649.50	€ -
€ 277,683,529.71	€ 283,237,200.30	€ 288,901,944.31	€ 294,679,983.19	€ 300,573,582.86	€ 306,585,054.51	€ 157,715,636.27	€ 160,869,949.00	€ 164,087,347.98	€ 167,369,094.94	€ 170,716,476.84	€ 174,130,806.37	€ 177,613,422.50	€ 181,165,690.95	€ 184,789,004.77	-€ 577,200,000.00
€ 783,101,457.36	€ 642,143,195.03	€ 526,557,419.93	€ 431,777,084.34	€ 354,057,209.16	€ 290,326,911.51	€ 238,068,067.44	€ 195,215,815.30	€ 160,076,968.55	€ 131,263,114.21	€ 107,635,753.65	€ 88,261,317.99	€ 72,374,280.75	€ 59,346,910.22	€ 48,664,466.38	€ 39,904,862.43
€ 140,958,262.32	€ 115,585,775.11	€ 94,780,335.59	€ 77,719,875.18	€ 63,730,297.65	€ 52,258,844.07	€ 42,852,252.14	€ 35,138,846.75	€ 28,813,854.34	€ 23,627,360.56	€ 19,374,435.66	€ 15,887,037.24	€ 13,027,370.54	€ 10,682,443.84	€ 8,759,603.95	-€ 577,200,000.00
€ 136,725,267.38	€ 167,651,425.19	€ 194,121,608.72	€ 216,960,108.01	€ 236,843,285.21	€ 254,326,210.44	€ 114,863,384.13	€ 125,731,102.24	€ 135,273,493.64	€ 143,741,734.38	€ 151,342,041.18	€ 158,243,769.13	€ 164,586,051.96	€ 170,483,247.11	€ 176,029,400.82	€ -
€ 25,977,800.80	€ 31,853,770.79	€ 36,883,105.66	€ 41,222,420.52	€ 45,000,224.19	€ 48,321,979.98	€ 21,824,042.99	€ 23,888,909.43	€ 25,701,963.79	€ 27,310,929.53	€ 28,754,987.82	€ 30,066,316.14	€ 31,271,349.87	€ 32,391,816.95	€ 33,445,586.16	€ -
€ 303,661,330.51	€ 315,090,971.09	€ 325,785,049.96	€ 335,902,403.71	€ 345,573,807.05	€ 354,907,034.50	€ 179,539,679.26	€ 184,758,858.42	€ 189,789,311.77	€ 194,680,024.47	€ 199,471,464.66	€ 204,197,122.51	€ 208,884,772.37	€ 213,557,507.90	€ 218,234,590.93	-€ 577,200,000.00
€ 855,511,764.85	€ 719,891,067.36	€ 581,557,955.93	€ 440,458,182.26	€ 296,536,413.13	€ 149,736,208.61	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
-€ 135,620,697.48	-€ 138,333,111.43	-€ 141,099,773.66	-€ 143,921,769.14	-€ 146,800,204.52	-€ 149,736,208.61	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
€ 17,110,235.30	€ 14,397,821.35	€ 11,631,159.12	€ 8,809,163.65	€ 5,930,728.26	€ 2,994,724.17	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
-€ 152,730,932.78	-€ 152,730,932.78	-€ 152,730,932.78	-€ 152,730,932.78	-€ 152,730,932.78	-€ 152,730,932.78										
€ 119,615,032.08	€ 153,253,603.85	€ 182,490,449.60	€ 208,150,944.37	€ 230,912,556.95	€ 251,331,486.27	€ 114,863,384.13	€ 125,731,102.24	€ 135,273,493.64	€ 143,741,734.38	€ 151,342,041.18	€ 158,243,769.13	€ 164,586,051.96	€ 170,483,247.11	€ 176,029,400.82	€ 173,160,000.00
€ 22,726,856.10	€ 29,118,184.73	€ 34,673,185.42	€ 39,548,679.43	€ 43,873,385.82	€ 47,752,982.39	€ 21,824,042.99	€ 23,888,909.43	€ 25,701,963.79	€ 27,310,929.53	€ 28,754,987.82	€ 30,066,316.14	€ 31,271,349.87	€ 32,391,816.95	€ 33,445,586.16	
€ 147,679,453.02	€ 159,624,452.25	€ 170,844,196.95	€ 181,497,729.84	€ 191,716,035.89	€ 201,607,104.12	€ 179,539,679.26	€ 184,758,858.42	€ 189,789,311.77	€ 194,680,024.47	€ 199,471,464.66	€ 204,197,122.51	€ 208,884,772.37	€ 213,557,507.90	€ 218,234,590.93	-€ 577,200,000.00
1.99	2.06	2.13	2.20	2.26	2.32										

Table 27 - Neart na Gaoithe IRR Calculations

Wind ParkName	Neart na Gaoithe (NnG), GB
Start-up Year	2023
Country	United Kingdom
Investment Euro	2645 Million Euro
Wind Farm Capacity	450 MW
Load Factors	45%
Electricity price in 2020	45.0 Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation	18%
OPEX share of Capex	2%
Tax	19%
Subsidy (yes=1, no=0)	1
Abex share of total CAPEX	20%

NPV	€ 176,756,475 Euro
IRR	6.4%
Leveraged IRR	12.7%
Goal-seek Breakeven	45.0 Euro/MWh

Subsidy Price Year	2012
Fixed price subsidy Euro/MWh (in start-up year)	159.30
Feed-in tariff Euro/MWh	0

Debt Financing (yes=1, no=0)	1
Interest Rate	2.0%
Payment time	15
Debt/Equity Ratio	68%
Interest tax deductability (max of EBIDTA)	30%

Year		0	1	2	3	4	5	6	7	8	9
CAPEX	Euro	-€ 2,645,000,000.00									
OPEX	Euro		-€ 48,562,200.00	-€ 49,533,444.00	-€ 50,524,112.88	-€ 51,534,595.14	-€ 52,565,287.04	-€ 53,616,592.78	-€ 54,688,924.64	-€ 55,782,703.13	-€ 56,898,357.19
ABEX											
Electricity	MWh		1,773,900	1,773,900	1,773,900	1,773,900	1,773,900	1,773,900	1,773,900	1,773,900	1,773,900
Power Price	Euro/MWh		€ 159.30	€ 162.48	€ 165.73	€ 169.05	€ 172.43	€ 175.88	€ 179.39	€ 182.98	€ 186.64
Feed-in tariff	Euro/MWh		€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Price received	Euro/MWh		€ 159.30	€ 162.48	€ 165.73	€ 169.05	€ 172.43	€ 175.88	€ 179.39	€ 182.98	€ 186.64
Seabed Leasing Charge		€ -	€ 2,825,771.92	€ 2,882,287.36	€ 2,939,933.11	€ 2,998,731.77	€ 3,058,706.41	€ 3,119,880.54	€ 3,182,278.15	€ 3,245,923.71	€ 3,310,842.18
Revenue	Euro	€ -	€ 282,577,192.38	€ 288,228,736.23	€ 293,993,310.95	€ 299,873,177.17	€ 305,870,640.71	€ 311,988,053.53	€ 318,227,814.60	€ 324,592,370.89	€ 331,084,218.31
EBIDTA	Euro	-€ 2,645,000,000.00	€ 231,189,220.45	€ 235,813,004.86	€ 240,529,264.96	€ 245,339,850.26	€ 250,246,647.26	€ 255,251,580.21	€ 260,356,611.81	€ 265,563,744.05	€ 270,875,018.93
Book Value capex	Euro	€ 2,645,000,000.00	€ 2,645,000,000.00	€ 2,413,810,779.55	€ 2,177,997,774.68	€ 1,937,468,509.72	€ 1,692,128,659.46	€ 1,441,882,012.20	€ 1,186,630,431.99	€ 973,036,954.23	€ 797,890,302.47
Depreciation	Euro		€ 231,189,220.45	€ 235,813,004.86	€ 240,529,264.96	€ 245,339,850.26	€ 250,246,647.26	€ 255,251,580.21	€ 213,593,477.76	€ 175,146,651.76	€ 143,620,254.44
Taxable Income	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 46,763,134.06	€ 90,417,092.29	€ 127,254,764.49
Corporate Taxes	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 8,884,995.47	€ 17,179,247.53	€ 24,178,405.25
Income	Euro	-€ 2,645,000,000.00	€ 231,189,220.45	€ 235,813,004.86	€ 240,529,264.96	€ 245,339,850.26	€ 250,246,647.26	€ 255,251,580.21	€ 269,241,607.28	€ 282,742,991.59	€ 295,053,424.18
Debt Financing											
Opening balance	Euro	€ -	€ 1,798,600,000.00	€ 1,694,595,105.61	€ 1,588,510,113.33	€ 1,480,303,421.21	€ 1,369,932,595.25	€ 1,257,354,352.76	€ 1,142,524,545.43	€ 1,025,398,141.95	€ 905,929,210.40
Drawdown	Euro		-€ 104,004,894.39	-€ 106,084,992.28	-€ 108,206,692.12	-€ 110,370,825.97	-€ 112,578,242.48	-€ 114,829,807.33	-€ 117,126,403.48	-€ 119,468,931.55	-€ 121,858,310.18
Interest Repayment	Euro		€ 33,972,000.00	€ 33,891,902.11	€ 31,770,202.27	€ 29,606,068.42	€ 27,398,651.90	€ 25,147,087.06	€ 22,850,490.91	€ 20,507,962.84	€ 18,118,584.21
Cash flow financing	Euro		-€ 139,976,894.39	-€ 139,976,894.39	-€ 139,976,894.39	-€ 139,976,894.39	-€ 139,976,894.39	-€ 139,976,894.39	-€ 139,976,894.39	-€ 139,976,894.39	-€ 139,976,894.39
Taxable Income	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 23,912,643.15	€ 69,909,129.45	€ 109,136,180.28
Taxes	Euro	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 4,543,402.20	€ 13,282,734.60	€ 20,735,874.25
Equity Income with financing	Euro	-€ 846,400,000.00	€ 91,212,326.06	€ 95,836,110.47	€ 100,552,370.57	€ 105,362,955.87	€ 110,269,752.88	€ 115,274,685.82	€ 124,923,119.62	€ 138,869,584.26	€ 151,633,998.79
Debt coverage ratio		-	1.65	1.68	1.72	1.75	1.79	1.82	1.92	2.02	2.11

10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 58,036,324.34	-€ 59,197,050.82	-€ 60,380,991.84	-€ 61,588,611.68	-€ 62,820,383.91	-€ 64,076,791.59	-€ 65,358,327.42	-€ 66,665,493.97	-€ 67,998,803.85	-€ 69,358,779.92	-€ 70,745,955.52	-€ 72,160,874.63	-€ 73,604,092.13	-€ 75,076,173.97	-€ 76,577,697.45	
															-€ 529,000,000.00
1,773,900	1,773,900	1,773,900	1,773,900	1,773,900	1,773,900	1,773,900	1,773,900	1,773,900	1,773,900	1,773,900	1,773,900	1,773,900	1,773,900	1,773,900	
€ 190.37	€ 194.18	€ 198.07	€ 202.03	€ 206.07	€ 210.19	€ 64.27	€ 65.56	€ 66.87	€ 68.20	€ 69.57	€ 70.96	€ 72.38	€ 73.83	€ 75.30	€ 76.81
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	
€ 190.37	€ 194.18	€ 198.07	€ 202.03	€ 206.07	€ 210.19	€ 64.27	€ 65.56	€ 66.87	€ 68.20	€ 69.57	€ 70.96	€ 72.38	€ 73.83	€ 75.30	
€ 3,377,059.03	€ 3,444,600.21	€ 3,513,492.21	€ 3,583,762.06	€ 3,655,437.30	€ 3,728,546.04	€ 1,140,104.71	€ 1,162,906.80	€ 1,186,164.94	€ 1,209,888.24	€ 1,234,086.00	€ 1,258,767.72	€ 1,283,943.08	€ 1,309,621.94	€ 1,335,814.38	€ -
€ 337,705,902.67	€ 344,460,020.73	€ 351,349,221.14	€ 358,376,205.56	€ 365,543,729.67	€ 372,854,604.27	€ 114,010,470.84	€ 116,290,680.25	€ 118,616,493.86	€ 120,988,823.73	€ 123,408,600.21	€ 125,876,772.21	€ 128,394,307.66	€ 130,962,193.81	€ 133,581,437.69	€ -
€ 276,292,519.31	€ 281,818,369.70	€ 287,454,737.09	€ 293,203,831.83	€ 299,067,908.47	€ 305,049,266.64	€ 47,512,038.71	€ 48,462,279.48	€ 49,431,525.07	€ 50,420,155.57	€ 51,428,558.68	€ 52,457,129.86	€ 53,506,272.46	€ 54,576,397.90	€ 55,667,925.86	-€ 529,000,000.00
€ 654,270,048.03	€ 536,501,439.38	€ 439,931,180.29	€ 360,743,567.84	€ 295,809,725.63	€ 242,563,975.02	€ 198,902,459.51	€ 163,100,016.80	€ 133,742,013.78	€ 109,668,451.30	€ 89,928,130.06	€ 73,741,066.65	€ 60,467,674.65	€ 49,583,493.22	€ 40,658,464.44	€ 33,339,940.84
€ 117,768,608.64	€ 96,570,259.09	€ 79,187,612.43	€ 64,933,842.21	€ 53,245,750.61	€ 43,661,315.50	€ 35,802,442.71	€ 29,358,003.02	€ 24,073,562.48	€ 19,740,321.23	€ 16,187,063.41	€ 13,273,392.00	€ 10,884,181.44	€ 8,925,028.78	€ 7,318,523.60	-€ 529,000,000.00
€ 158,323,910.67	€ 185,248,110.61	€ 208,267,124.64	€ 228,269,989.62	€ 245,822,157.86	€ 261,387,751.14	€ 11,709,596.00	€ 19,104,276.46	€ 25,357,962.59	€ 30,679,834.34	€ 35,241,495.27	€ 39,183,737.86	€ 42,622,091.02	€ 45,651,369.13	€ 48,349,402.26	€ -
€ 30,119,543.03	€ 35,197,141.02	€ 39,570,753.68	€ 43,371,298.03	€ 46,706,209.99	€ 49,663,672.72	€ 2,224,823.24	€ 3,629,812.53	€ 4,818,012.89	€ 5,829,168.52	€ 6,695,884.10	€ 7,444,910.19	€ 8,098,197.29	€ 8,673,760.13	€ 9,186,386.43	€ -
€ 306,412,062.34	€ 317,015,510.71	€ 327,025,490.77	€ 336,575,129.86	€ 345,774,118.46	€ 354,712,939.35	€ 49,736,861.95	€ 52,092,092.01	€ 54,249,537.96	€ 56,249,324.10	€ 58,124,442.79	€ 59,902,040.05	€ 61,604,469.75	€ 63,250,158.04	€ 64,854,312.29	-€ 529,000,000.00
€ 784,070,900.22	€ 659,775,423.83	€ 532,994,037.92	€ 403,677,024.29	€ 271,773,670.38	€ 137,232,249.40	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
-€ 124,295,476.38	-€ 126,781,385.91	-€ 129,317,013.63	-€ 131,903,353.90	-€ 134,541,420.98	-€ 137,232,249.40	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
€ 15,681,418.00	€ 13,195,508.48	€ 10,659,880.76	€ 8,073,540.49	€ 5,435,473.41	€ 2,744,644.99	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
-€ 139,976,894.39	-€ 139,976,894.39	-€ 139,976,894.39	-€ 139,976,894.39	-€ 139,976,894.39	-€ 139,976,894.39										
€ 142,842,492.66	€ 172,052,602.13	€ 197,607,243.88	€ 220,196,449.13	€ 240,386,684.45	€ 258,643,106.15	€ 11,709,596.00	€ 19,104,276.46	€ 25,357,962.59	€ 30,679,834.34	€ 35,241,495.27	€ 39,183,737.86	€ 42,622,091.02	€ 45,651,369.13	€ 48,349,402.26	€ 158,700,000.00
€ 27,140,073.61	€ 32,689,994.40	€ 37,545,376.34	€ 41,837,325.34	€ 45,673,470.05	€ 49,142,190.17	€ 2,224,823.24	€ 3,629,812.53	€ 4,818,012.89	€ 5,829,168.52	€ 6,695,884.10	€ 7,444,910.19	€ 8,098,197.29	€ 8,673,760.13	€ 9,186,386.43	
€ 163,455,698.53	€ 174,531,469.71	€ 185,023,219.04	€ 195,064,262.78	€ 204,764,484.12	€ 214,214,562.42	€ 49,736,861.95	€ 52,092,092.01	€ 54,249,537.96	€ 56,249,324.10	€ 58,124,442.79	€ 59,902,040.05	€ 61,604,469.75	€ 63,250,158.04	€ 64,854,312.29	-€ 529,000,000.00
2.19	2.26	2.34	2.40	2.47	2.53										

Table 28 - Triton Knoll IRR Calculations

Wind ParkName	Triton Knoll, GB
Start-up Year	2022
Country	United Kingdom
Investment Euro	2220
Wind Farm Capacity	855
Load Factors	45%
Electricity price in 2020	45.0

Million Euro
MW
Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation	18%
OPEX share of Capex	2%
Tax	19%
Subsidy (yes=1, no=0)	1
Abex share of total CAPEX	20%

Subsidy Price Year	2012
Fixed price subsidy Euro/MWh (in start-up year)	102.05
Feed-in tariff Euro/MWh	0

Debt Financing (yes=1, no=0)	1
Interest Rate	2.0%
Payment time	15
Debt/Equity Ratio	68%
Interest tax deductability (max of EBIDTA)	30%

NPV	€ 1,730,874,971	Euro
IRR	14.6%	
Leveraged IRR	30.1%	

Goal-seek Breakeven	45.0	Euro/MWh

	Year	0	1	2	3	4	5	6	7	8	9
CAPEX	Euro	-€ 2,220,000,000.00									
OPEX	Euro		-€ 40,759,200.00	-€ 41,574,384.00	-€ 42,405,871.68	-€ 43,253,989.11	-€ 44,119,068.90	-€ 45,001,450.27	-€ 45,901,479.28	-€ 46,819,508.86	-€ 47,755,899.04
ABEX											
Electricity	MWh		3,370,410	3,370,410	3,370,410	3,370,410	3,370,410	3,370,410	3,370,410	3,370,410	3,370,410
Power Price	Euro/MWh		€ 102.05	€ 104.10	€ 106.18	€ 108.30	€ 110.47	€ 112.68	€ 114.93	€ 117.23	€ 119.57
Feed-in tariff	Euro/MWh		€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Price received	Euro/MWh		€ 102.05	€ 104.10	€ 106.18	€ 108.30	€ 110.47	€ 112.68	€ 114.93	€ 117.23	€ 119.57
Seabed Leasing Charge		€ -	€ 3,439,645.40	€ 3,508,438.30	€ 3,578,607.07	€ 3,650,179.21	€ 3,723,182.79	€ 3,797,646.45	€ 3,873,599.38	€ 3,951,071.37	€ 4,030,092.79
Revenue	Euro	€ -	€ 343,964,539.50	€ 350,843,830.29	€ 357,860,706.90	€ 365,017,921.04	€ 372,318,279.46	€ 379,764,645.05	€ 387,359,937.95	€ 395,107,136.71	€ 403,009,279.44
EBIDTA	Euro	-€ 2,220,000,000.00	€ 299,765,694.11	€ 305,761,007.99	€ 311,876,228.15	€ 318,113,752.71	€ 324,476,027.77	€ 330,965,548.32	€ 337,584,859.29	€ 344,336,556.48	€ 351,223,287.61
Book Value capex	Euro	€ 2,220,000,000.00	€ 2,220,000,000.00	€ 1,920,234,305.89	€ 1,614,473,297.90	€ 1,323,868,104.28	€ 1,085,571,845.51	€ 890,168,913.32	€ 729,938,508.92	€ 598,549,577.31	€ 490,810,653.40
Depreciation	Euro		€ 299,765,694.11	€ 305,761,007.99	€ 290,605,193.62	€ 238,296,258.77	€ 195,402,932.19	€ 160,230,404.40	€ 131,388,931.61	€ 107,738,923.92	€ 88,345,917.61
Taxable Income	Euro	€ -	€ -	€ -	€ 21,271,034.53	€ 79,817,493.94	€ 129,073,095.58	€ 170,735,143.93	€ 206,195,927.69	€ 236,597,632.56	€ 262,877,369.99
Corporate Taxes	Euro	€ -	€ -	€ -	€ 4,041,496.56	€ 15,165,323.85	€ 24,523,888.16	€ 32,439,677.35	€ 39,177,226.26	€ 44,953,550.19	€ 49,946,700.30
Income	Euro	-€ 2,220,000,000.00	€ 299,765,694.11	€ 305,761,007.99	€ 315,917,724.71	€ 333,279,076.56	€ 348,999,915.93	€ 363,405,225.67	€ 376,762,085.55	€ 389,290,106.66	€ 401,169,987.91
Debt Financing											
Opening balance	Euro	€ -	€ 1,509,600,000.00	€ 1,422,306,667.09	€ 1,333,267,467.52	€ 1,242,447,483.97	€ 1,149,811,100.74	€ 1,055,321,989.84	€ 958,943,096.73	€ 860,636,625.75	€ 760,364,025.36
Drawdown	Euro		-€ 87,293,332.91	-€ 89,039,199.57	-€ 90,819,983.56	-€ 92,636,383.23	-€ 94,489,110.89	-€ 96,378,893.11	-€ 98,306,470.97	-€ 100,272,600.39	-€ 102,278,052.40
Interest Repayment	Euro		€ 30,192,000.00	€ 28,446,133.34	€ 26,665,349.35	€ 24,848,949.68	€ 22,996,222.01	€ 21,106,439.80	€ 19,178,861.93	€ 17,212,732.52	€ 15,207,280.51
Cash flow financing	Euro		-€ 117,485,332.91	-€ 117,485,332.91	-€ 117,485,332.91	-€ 117,485,332.91	-€ 117,485,332.91	-€ 117,485,332.91	-€ 117,485,332.91	-€ 117,485,332.91	-€ 117,485,332.91
Taxable Income	Euro	€ -	€ -	€ -	€ -	€ 54,968,544.27	€ 106,076,873.56	€ 149,628,704.13	€ 187,017,065.75	€ 219,384,900.05	€ 247,670,089.49
Taxes	Euro	€ -	€ -	€ -	€ -	€ 10,444,023.41	€ 20,154,605.98	€ 28,429,453.78	€ 35,533,242.49	€ 41,683,131.01	€ 47,057,317.00
Equity Income with financing	Euro	-€ 710,400,000.00	€ 182,280,361.20	€ 188,275,675.08	€ 194,390,895.24	€ 211,072,443.22	€ 227,145,300.84	€ 241,909,669.20	€ 255,632,768.87	€ 268,534,354.58	€ 280,795,271.70
Debt coverage ratio		-	2.55	2.60	2.69	2.84	2.97	3.09	3.21	3.31	3.41

10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 48,711,017.02	-€ 49,685,237.36	-€ 50,678,942.11	-€ 51,692,520.95	-€ 52,726,371.37	-€ 53,780,898.80	-€ 54,856,516.78	-€ 55,953,647.11	-€ 57,072,720.05	-€ 58,214,174.45	-€ 59,378,457.94	-€ 60,566,027.10	-€ 61,777,347.64	-€ 63,012,894.60	-€ 64,273,152.49	
															-€ 444,000,000.00
3,370,410	3,370,410	3,370,410	3,370,410	3,370,410	3,370,410	3,370,410	3,370,410	3,370,410	3,370,410	3,370,410	3,370,410	3,370,410	3,370,410	3,370,410	
€ 121.96	€ 124.40	€ 126.89	€ 129.43	€ 132.02	€ 134.66	€ 63.01	€ 64.27	€ 65.56	€ 66.87	€ 68.20	€ 69.57	€ 70.96	€ 72.38	€ 73.83	€ 75.30
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	
€ 121.96	€ 124.40	€ 126.89	€ 129.43	€ 132.02	€ 134.66	€ 63.01	€ 64.27	€ 65.56	€ 66.87	€ 68.20	€ 69.57	€ 70.96	€ 72.38	€ 73.83	
€ 4,110,694.65	€ 4,192,908.54	€ 4,276,766.71	€ 4,362,302.05	€ 4,449,548.09	€ 4,538,539.05	€ 2,123,724.46	€ 2,166,198.95	€ 2,209,522.92	€ 2,253,713.38	€ 2,298,787.65	€ 2,344,763.40	€ 2,391,658.67	€ 2,439,491.85	€ 2,488,281.68	€ -
€ 411,069,465.03	€ 419,290,854.33	€ 427,676,671.42	€ 436,230,204.85	€ 444,954,808.94	€ 453,853,905.12	€ 212,372,445.67	€ 216,619,894.59	€ 220,952,292.48	€ 225,371,338.33	€ 229,878,765.10	€ 234,476,340.40	€ 239,165,867.21	€ 243,949,184.55	€ 248,828,168.24	€ -
€ 358,247,753.36	€ 365,412,708.43	€ 372,720,962.59	€ 380,175,381.85	€ 387,778,889.48	€ 395,534,467.27	€ 155,392,204.44	€ 158,500,048.53	€ 161,670,049.50	€ 164,903,450.49	€ 168,201,519.50	€ 171,565,549.89	€ 174,996,860.89	€ 178,496,798.11	€ 182,066,734.07	-€ 444,000,000.00
€ 402,464,735.79	€ 330,021,083.34	€ 270,617,288.34	€ 221,906,176.44	€ 181,963,064.68	€ 149,209,713.04	€ 122,351,964.69	€ 100,328,611.05	€ 82,269,461.06	€ 67,460,958.07	€ 55,317,985.62	€ 45,360,748.21	€ 37,195,813.53	€ 30,500,567.09	€ 25,010,465.02	€ 20,508,581.31
€ 72,443,652.44	€ 59,403,795.00	€ 48,711,111.90	€ 39,943,111.76	€ 32,753,351.64	€ 26,857,748.35	€ 22,023,353.64	€ 18,059,149.99	€ 14,808,502.99	€ 12,142,972.45	€ 9,957,237.41	€ 8,164,934.68	€ 6,695,246.44	€ 5,490,102.08	€ 4,501,883.70	-€ 444,000,000.00
€ 285,804,100.92	€ 306,008,913.42	€ 324,009,850.69	€ 340,232,270.09	€ 355,025,537.84	€ 368,676,718.93	€ 133,368,850.80	€ 140,440,898.54	€ 146,861,546.51	€ 152,760,478.04	€ 158,244,282.09	€ 163,400,615.22	€ 168,301,614.45	€ 173,006,696.03	€ 177,564,850.37	€ -
€ 54,302,779.17	€ 58,141,693.55	€ 61,561,871.63	€ 64,644,131.32	€ 67,454,852.19	€ 70,048,576.60	€ 25,340,081.65	€ 26,683,770.72	€ 27,903,693.84	€ 29,024,490.83	€ 30,066,413.60	€ 31,046,116.89	€ 31,977,306.75	€ 32,871,272.25	€ 33,737,321.57	€ -
€ 412,550,532.53	€ 423,554,401.98	€ 434,282,834.23	€ 444,819,513.16	€ 455,233,741.67	€ 465,583,043.87	€ 180,732,286.09	€ 185,183,819.25	€ 189,573,743.34	€ 193,927,941.32	€ 198,267,933.10	€ 202,611,666.78	€ 206,974,167.64	€ 211,368,070.35	€ 215,804,055.64	-€ 444,000,000.00
€ 658,085,972.96	€ 553,762,359.51	€ 447,352,273.79	€ 338,813,986.36	€ 228,104,933.18	€ 115,181,698.93	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00
-€ 104,323,613.45	-€ 106,410,085.72	-€ 108,538,287.43	-€ 110,709,053.18	-€ 112,923,234.25	-€ 115,181,698.93	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00
€ 13,161,719.46	€ 11,075,247.19	€ 8,947,045.48	€ 6,776,279.73	€ 4,562,098.66	€ 2,303,633.98	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00	-€ 0.00
-€ 117,485,332.91	-€ 117,485,332.91	-€ 117,485,332.91	-€ 117,485,332.91	-€ 117,485,332.91	-€ 117,485,332.91										
€ 272,642,381.46	€ 294,933,666.23	€ 315,062,805.22	€ 333,455,990.36	€ 350,463,439.18	€ 366,373,084.95	€ 133,368,850.80	€ 140,440,898.54	€ 146,861,546.51	€ 152,760,478.04	€ 158,244,282.09	€ 163,400,615.22	€ 168,301,614.45	€ 173,006,696.03	€ 177,564,850.37	€ 133,200,000.00
€ 51,802,052.48	€ 56,037,396.58	€ 59,861,932.99	€ 63,326,638.17	€ 66,588,053.44	€ 69,610,886.14	€ 25,340,081.65	€ 26,683,770.72	€ 27,903,693.84	€ 29,024,490.83	€ 30,066,413.60	€ 31,046,116.89	€ 31,977,306.75	€ 32,871,272.25	€ 33,737,321.57	
€ 292,564,472.93	€ 303,964,772.10	€ 315,097,562.68	€ 326,046,687.11	€ 336,881,610.02	€ 347,660,020.50	€ 180,732,286.09	€ 185,183,819.25	€ 189,573,743.34	€ 193,927,941.32	€ 198,267,933.10	€ 202,611,666.78	€ 206,974,167.64	€ 211,368,070.35	€ 215,804,055.64	-€ 444,000,000.00
3.51	3.61	3.70	3.79	3.87	3.96										

Table 29 - Walney 3 IRR Calculations

Wind ParkName	Walney 3, GB
Start-up Year	2018
Country	United Kingdom
Investment Euro	2605 Million Euro
Wind Farm Capacity	659 MW
Load Factors	45%
Electricity price in 2020	45.0 Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation	18%
OPEX share of Capex	2%
Tax	19%
Subsidy (yes=1, no=0)	1
Abex share of total CAPEX	20%

NPV	€ 2,721,993,519 Euro
IRR	18.6%
Leveraged IRR	41.2%
Goal-seek Breakeven	45.0 Euro/MWh

Subsidy Price Year	2012
Fixed price subsidy Euro/MWh (in start-up year)	189.20
Feed-in tariff Euro/MWh	0

Debt Financing (yes=1, no=0)	1
Interest Rate	2.0%
Payment time	15
Debt/Equity Ratio	68%
Interest tax deductability (max of EBIDTA)	30%

Year		0	1	2	3	4	5	6	7	8	9
CAPEX	Euro	-€ 2,605,000,000.00									
OPEX	Euro		-€ 47,827,800.00	-€ 48,784,356.00	-€ 49,760,043.12	-€ 50,755,243.98	-€ 51,770,348.86	-€ 52,805,755.84	-€ 53,861,870.96	-€ 54,939,108.38	-€ 56,037,890.54
ABEX											
Electricity	MWh		2,597,778	2,597,778	2,597,778	2,597,778	2,597,778	2,597,778	2,597,778	2,597,778	2,597,778
Power Price	Euro/MWh		€ 189.20	€ 192.98	€ 196.84	€ 200.78	€ 204.79	€ 208.89	€ 213.06	€ 217.33	€ 221.67
Feed-in tariff	Euro/MWh		€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Price received	Euro/MWh		€ 189.20	€ 192.98	€ 196.84	€ 200.78	€ 204.79	€ 208.89	€ 213.06	€ 217.33	€ 221.67
Seabed Leasing Charge		€ -	€ 4,914,873.53	€ 5,013,171.00	€ 5,113,434.42	€ 5,215,703.11	€ 5,320,017.17	€ 5,426,417.51	€ 5,534,945.86	€ 5,645,644.78	€ 5,758,557.68
Revenue	Euro	€ -	€ 491,487,352.81	€ 501,317,099.86	€ 511,343,441.86	€ 521,570,310.70	€ 532,001,716.91	€ 542,641,751.25	€ 553,494,586.28	€ 564,564,478.00	€ 575,855,767.56
EBIDTA	Euro	-€ 2,605,000,000.00	€ 438,744,679.28	€ 447,519,572.87	€ 456,469,964.32	€ 465,599,363.61	€ 474,911,350.88	€ 484,409,577.90	€ 494,097,769.46	€ 503,979,724.85	€ 514,059,319.34
Book Value capex	Euro	€ 2,605,000,000.00	€ 2,605,000,000.00	€ 2,166,255,320.72	€ 1,776,329,362.99	€ 1,456,590,077.65	€ 1,194,403,863.67	€ 979,411,168.21	€ 803,117,157.93	€ 658,556,069.51	€ 540,015,977.00
Depreciation	Euro		€ 438,744,679.28	€ 389,925,957.73	€ 319,739,285.34	€ 262,186,213.98	€ 214,992,695.46	€ 176,294,010.28	€ 144,561,088.43	€ 118,540,092.51	€ 97,202,875.86
Taxable Income	Euro	€ -	€ -	€ 57,593,615.14	€ 136,730,678.98	€ 203,413,149.63	€ 259,918,655.42	€ 308,115,567.62	€ 349,536,681.03	€ 385,439,632.34	€ 416,856,443.48
Corporate Taxes	Euro	€ -	€ -	€ 10,942,786.88	€ 25,978,829.01	€ 38,648,488.43	€ 49,384,544.53	€ 58,541,957.85	€ 66,411,969.40	€ 73,233,530.14	€ 79,202,724.26
Income	Euro	-€ 2,605,000,000.00	€ 438,744,679.28	€ 458,462,359.74	€ 482,448,793.33	€ 504,247,862.04	€ 524,295,895.41	€ 542,951,535.75	€ 560,509,738.85	€ 577,213,254.99	€ 593,262,043.61
Debt Financing											
Opening balance	Euro	€ -	€ 1,771,400,000.00	€ 1,668,967,958.46	€ 1,564,487,276.08	€ 1,457,916,980.06	€ 1,349,215,278.12	€ 1,238,339,542.13	€ 1,125,246,291.43	€ 1,009,891,175.72	€ 892,228,957.69
Drawdown	Euro		-€ 102,432,041.54	-€ 104,480,682.37	-€ 106,570,296.02	-€ 108,701,701.94	-€ 110,875,735.98	-€ 113,093,250.70	-€ 115,355,115.72	-€ 117,662,218.03	-€ 120,015,462.39
Interest Repayment	Euro		€ 33,428,000.00	€ 33,379,359.17	€ 31,289,745.52	€ 29,158,339.60	€ 26,984,305.56	€ 24,766,790.84	€ 22,504,925.83	€ 20,197,823.51	€ 17,844,579.15
Cash flow financing	Euro		-€ 137,860,041.54	-€ 137,860,041.54	-€ 137,860,041.54	-€ 137,860,041.54	-€ 137,860,041.54	-€ 137,860,041.54	-€ 137,860,041.54	-€ 137,860,041.54	-€ 137,860,041.54
Taxable Income	Euro	€ -	€ -	€ 24,214,253.97	€ 105,440,933.46	€ 174,254,810.03	€ 232,934,349.86	€ 283,348,776.78	€ 327,031,755.20	€ 365,241,808.82	€ 399,011,864.33
Taxes	Euro	€ -	€ -	€ 4,600,708.63	€ 20,033,777.36	€ 33,108,413.91	€ 44,257,526.47	€ 53,836,267.59	€ 62,136,033.49	€ 69,395,943.68	€ 75,812,254.22
Equity Income with financing	Euro	-€ 833,600,000.00	€ 300,884,637.74	€ 314,260,239.96	€ 338,643,700.14	€ 360,847,735.97	€ 381,308,835.81	€ 400,385,803.94	€ 418,373,761.40	€ 435,515,626.98	€ 452,011,532.02
Debt coverage ratio		-	3.18	3.33	3.50	3.66	3.80	3.94	4.07	4.19	4.30

10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 57,158,648.35	-€ 58,301,821.32	-€ 59,467,857.75	-€ 60,657,214.90	-€ 61,870,359.20	-€ 63,107,766.38	-€ 64,369,921.71	-€ 65,657,320.15	-€ 66,970,466.55	-€ 68,309,875.88	-€ 69,676,073.40	-€ 71,069,594.87	-€ 72,490,986.76	-€ 73,940,806.50	-€ 75,419,622.63	
															-€ 521,000,000.00
2,597,778	2,597,778	2,597,778	2,597,778	2,597,778	2,597,778	2,597,778	2,597,778	2,597,778	2,597,778	2,597,778	2,597,778	2,597,778	2,597,778	2,597,778	
€ 226.11	€ 230.63	€ 235.24	€ 239.95	€ 244.74	€ 249.64	€ 58.21	€ 59.38	€ 60.56	€ 61.78	€ 63.01	€ 64.27	€ 65.56	€ 66.87	€ 68.20	€ 69.57
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	
€ 226.11	€ 230.63	€ 235.24	€ 239.95	€ 244.74	€ 249.64	€ 58.21	€ 59.38	€ 60.56	€ 61.78	€ 63.01	€ 64.27	€ 65.56	€ 66.87	€ 68.20	
€ 5,873,728.83	€ 5,991,203.41	€ 6,111,027.47	€ 6,233,248.02	€ 6,357,912.98	€ 6,485,071.24	€ 1,512,226.28	€ 1,542,470.81	€ 1,573,320.22	€ 1,604,786.63	€ 1,636,882.36	€ 1,669,620.01	€ 1,703,012.41	€ 1,737,072.65	€ 1,771,814.11	€ -
€ 587,372,882.91	€ 599,120,340.57	€ 611,102,747.38	€ 623,324,802.33	€ 635,791,298.38	€ 648,507,124.34	€ 151,222,628.04	€ 154,247,080.60	€ 157,332,022.21	€ 160,478,662.65	€ 163,688,235.91	€ 166,962,000.62	€ 170,301,240.64	€ 173,707,265.45	€ 177,181,410.76	€ -
€ 524,340,505.73	€ 534,827,315.84	€ 545,523,862.16	€ 556,434,339.40	€ 567,563,026.19	€ 578,914,286.72	€ 85,340,480.04	€ 87,047,289.64	€ 88,788,235.44	€ 90,564,000.15	€ 92,375,280.15	€ 94,222,785.75	€ 96,107,241.47	€ 98,029,386.30	€ 99,989,974.02	-€ 521,000,000.00
€ 442,813,101.14	€ 363,106,742.93	€ 297,747,529.20	€ 244,152,973.95	€ 200,205,438.64	€ 164,168,459.68	€ 134,618,136.94	€ 110,386,872.29	€ 90,517,235.28	€ 74,224,132.93	€ 60,863,789.00	€ 49,908,306.98	€ 40,924,811.72	€ 33,558,345.61	€ 27,517,843.40	€ 22,564,631.59
€ 79,706,358.20	€ 65,359,213.73	€ 53,594,555.26	€ 43,947,593.31	€ 36,036,978.95	€ 29,550,322.74	€ 24,231,264.65	€ 19,869,637.01	€ 16,293,102.35	€ 13,360,343.93	€ 10,955,482.02	€ 8,983,495.26	€ 7,366,466.11	€ 6,040,302.21	€ 4,953,211.81	-€ 521,000,000.00
€ 444,634,147.53	€ 469,468,102.12	€ 491,929,306.90	€ 512,486,804.09	€ 531,526,047.24	€ 549,363,963.97	€ 61,109,215.39	€ 67,177,652.63	€ 72,495,133.09	€ 77,203,656.22	€ 81,419,798.13	€ 85,239,290.50	€ 88,740,775.36	€ 91,988,884.09	€ 95,036,762.21	€ -
€ 84,480,488.03	€ 89,198,939.40	€ 93,466,568.31	€ 97,372,492.78	€ 100,989,948.98	€ 104,379,153.16	€ 11,610,750.93	€ 12,763,754.00	€ 13,774,075.29	€ 14,668,694.68	€ 15,469,761.64	€ 16,195,465.19	€ 16,860,747.32	€ 17,477,887.98	€ 18,056,984.82	€ -
€ 608,820,993.76	€ 624,026,255.25	€ 638,990,430.47	€ 653,806,832.18	€ 668,552,975.17	€ 683,293,439.87	€ 96,951,230.97	€ 99,811,043.65	€ 102,562,310.72	€ 105,232,694.83	€ 107,845,041.79	€ 110,418,250.95	€ 112,967,988.79	€ 115,507,274.27	€ 118,046,958.84	-€ 521,000,000.00
€ 772,213,495.30	€ 649,797,723.66	€ 524,933,636.59	€ 397,572,267.78	€ 267,663,671.59	€ 135,156,903.47	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
-€ 122,415,771.64	-€ 124,864,087.07	-€ 127,361,368.81	-€ 129,908,596.19	-€ 132,506,768.11	-€ 135,156,903.47	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
€ 15,444,269.91	€ 12,995,954.47	€ 10,498,672.73	€ 7,951,445.36	€ 5,353,273.43	€ 2,703,138.07	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
-€ 137,860,041.54	-€ 137,860,041.54	-€ 137,860,041.54	-€ 137,860,041.54	-€ 137,860,041.54	-€ 137,860,041.54										
€ 429,189,877.62	€ 456,472,147.64	€ 481,430,634.17	€ 504,535,358.74	€ 526,172,773.81	€ 546,660,825.90	€ 61,109,215.39	€ 67,177,652.63	€ 72,495,133.09	€ 77,203,656.22	€ 81,419,798.13	€ 85,239,290.50	€ 88,740,775.36	€ 91,988,884.09	€ 95,036,762.21	€ 156,300,000.00
€ 81,546,076.75	€ 86,729,708.05	€ 91,471,820.49	€ 95,861,718.16	€ 99,972,827.02	€ 103,865,556.92	€ 11,610,750.93	€ 12,763,754.00	€ 13,774,075.29	€ 14,668,694.68	€ 15,469,761.64	€ 16,195,465.19	€ 16,860,747.32	€ 17,477,887.98	€ 18,056,984.82	
€ 468,026,540.93	€ 483,696,982.35	€ 499,135,641.11	€ 514,436,016.02	€ 529,675,811.67	€ 544,919,802.09	€ 96,951,230.97	€ 99,811,043.65	€ 102,562,310.72	€ 105,232,694.83	€ 107,845,041.79	€ 110,418,250.95	€ 112,967,988.79	€ 115,507,274.27	€ 118,046,958.84	-€ 521,000,000.00
4.42	4.53	4.64	4.74	4.85	4.96										

Appendix A-4 OFFSHORE WIND IRR CALCULATIONS GERMANY

Table 30 - Arkona IRR Calculations

Wind farm Name	Arkona Offshore Wind Farm, DE	
Start-up Year	2019	
Country	Germany	
Investment Euro	1248	Million Euro
Wind Farm Capacity	384	MW
Load Factors	45%	
Electricity price in 2020	35	Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation %	6.3%
OPEX share of Capex	2%
Tax %	30%
Subsidy (yes=1, no=0)	1
Abex share of CAPEX	20%

NPV	€	309,279,829
IRR		10.7%
Goal-seek Breakeven		35 Euro/MWh

Fixed price subsidy Euro/MWh (in start-up year)	0	Euro/MWh
Feed-in tariff	184	Euro/MWh
Tariff duration	10	Years
Reduced Tariff	39	Euro/MWh
Financing	1	
Interest Rate	3.0%	
Payment time	15	
Debt/Equity Ratio	80%	
Interest tax deductability (max of EBIDTA)	30%	

	Year	0	1	2	3	4	5	6	7	8	9	10
CAPEX	Euro	-€ 1,247,706,422.02										
OPEX	Euro		-€ 22,907,889.91	-€ 23,366,047.71	-€ 23,833,368.66	-€ 24,310,036.03	-€ 24,796,236.75	-€ 25,292,161.49	-€ 25,798,004.72	-€ 26,313,964.81	-€ 26,840,244.11	-€ 27,377,048.99
ABEX												
Electricity	MWh		1,513,728	1,513,728	1,513,728	1,513,728	1,513,728	1,513,728	1,513,728	1,513,728	1,513,728	1,513,728
Power Price	Euro/MWh		€ 34.31	€ 35.00	€ 35.70	€ 36.41	€ 37.14	€ 37.89	€ 38.64	€ 39.42	€ 40.20	€ 41.01
Feed-in tariff	Euro/MWh		€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00
Price received	Euro/MWh		€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00
Revenue	Euro	€ -	€ 278,525,956.15	€ 278,525,956.15	€ 278,525,956.15	€ 278,525,956.15	€ 278,525,956.15	€ 278,525,956.15	€ 278,525,956.15	€ 278,525,956.15	€ 278,525,956.15	€ 278,525,956.15
EBIDTA	Euro	-€ 1,247,706,422.02	€ 255,618,066.24	€ 255,159,908.44	€ 254,692,587.49	€ 254,215,920.12	€ 253,729,719.40	€ 253,233,794.66	€ 252,727,951.43	€ 252,211,991.34	€ 251,685,712.04	€ 251,148,907.16
Book Value capex	Euro	€ 1,247,706,422.02	€ 1,247,706,422.02	€ 1,169,724,770.64	€ 1,096,616,972.48	€ 1,028,078,411.70	€ 963,823,510.97	€ 903,584,541.53	€ 847,110,507.69	€ 794,166,100.95	€ 744,530,719.65	€ 697,997,549.67
Depreciation	Euro		€ 77,981,651.38	€ 73,107,798.17	€ 68,538,560.78	€ 64,254,900.73	€ 60,238,969.44	€ 56,474,033.85	€ 52,944,406.73	€ 49,635,381.31	€ 46,533,169.98	€ 43,624,846.85
Taxable Income	Euro	€ -	€ 177,636,414.87	€ 182,052,110.28	€ 186,154,026.71	€ 189,961,019.39	€ 193,490,749.96	€ 196,759,760.82	€ 199,783,544.70	€ 202,576,610.03	€ 205,152,542.06	€ 207,524,060.30
Corporate Taxes	Euro	€ -	€ 52,988,942.55	€ 54,306,144.50	€ 55,529,746.17	€ 56,665,372.08	€ 57,718,290.71	€ 58,693,436.65	€ 59,595,431.38	€ 60,428,602.77	€ 61,197,003.30	€ 61,904,427.19
Income	Euro	-€ 1,247,706,422.02	€ 202,629,123.69	€ 200,853,763.95	€ 199,162,841.32	€ 197,550,548.03	€ 196,011,428.68	€ 194,540,358.01	€ 193,132,520.05	€ 191,783,388.57	€ 190,488,708.74	€ 189,244,479.97

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 27,924,589.97	-€ 28,483,081.77	-€ 29,052,743.41	-€ 29,633,798.28	-€ 30,226,474.24	-€ 30,831,003.73	-€ 31,447,623.80	-€ 32,076,576.28	-€ 32,718,107.80	-€ 33,372,469.96	-€ 34,039,919.36	-€ 34,720,717.74	-€ 35,415,132.10	-€ 36,123,434.74	
														-€ 249,541,284.40
1,513,728	1,513,728	1,513,728	1,513,728	1,513,728	1,513,728	1,513,728	1,513,728	1,513,728	1,513,728	1,513,728	1,513,728	1,513,728	1,513,728	
€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	€ 53.05	€ 54.11	
€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	
€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	€ 53.05	€ 54.11	
€ 63,316,578.87	€ 64,582,910.45	€ 65,874,568.66	€ 67,192,060.03	€ 68,535,901.23	€ 69,906,619.26	€ 71,304,751.64	€ 72,730,846.68	€ 74,185,463.61	€ 75,669,172.88	€ 77,182,556.34	€ 78,726,207.47	€ 80,300,731.62	€ 81,906,746.25	€ -
€ 35,391,988.90	€ 36,099,828.68	€ 36,821,825.25	€ 37,558,261.76	€ 38,309,426.99	€ 39,075,615.53	€ 39,857,127.84	€ 40,654,270.40	€ 41,467,355.81	€ 42,296,702.92	€ 43,142,636.98	€ 44,005,489.72	€ 44,885,599.52	€ 45,783,311.51	-€ 249,541,284.40
€ 654,372,702.81	€ 618,980,713.91	€ 582,880,885.23	€ 546,450,829.91	€ 512,297,653.04	€ 480,279,049.72	€ 450,261,609.11	€ 422,120,258.54	€ 395,737,742.39	€ 371,004,133.49	€ 347,816,375.14	€ 326,077,851.70	€ 305,697,985.97	€ 286,591,861.84	€ 268,679,870.48
€ 35,391,988.90	€ 36,099,828.68	€ 36,430,055.33	€ 34,153,176.87	€ 32,018,603.31	€ 30,017,440.61	€ 28,141,350.57	€ 26,382,516.16	€ 24,733,608.90	€ 23,187,758.34	€ 21,738,523.45	€ 20,379,865.73	€ 19,106,124.12	€ 17,911,991.37	-€ 249,541,284.40
€ -	€ -	€ 391,769.93	€ 3,405,084.89	€ 6,290,823.68	€ 9,058,174.93	€ 11,715,777.27	€ 14,271,754.24	€ 16,733,746.91	€ 19,108,944.58	€ 21,404,113.54	€ 23,625,623.99	€ 25,779,475.39	€ 27,871,320.14	€ -
€ -	€ -	€ 116,864.97	€ 1,015,736.82	€ 1,876,552.70	€ 2,702,053.58	€ 3,494,816.36	€ 4,257,264.29	€ 4,991,676.70	€ 5,700,198.17	€ 6,384,847.07	€ 7,047,523.64	€ 7,690,017.51	€ 8,314,014.80	€ -
€ 35,391,988.90	€ 36,099,828.68	€ 36,704,960.28	€ 36,542,524.94	€ 36,482,874.29	€ 36,373,561.95	€ 36,362,311.48	€ 36,397,006.11	€ 36,475,679.11	€ 36,596,504.76	€ 36,757,789.92	€ 36,957,966.09	€ 37,195,582.01	€ 37,469,296.71	-€ 249,541,284.40

Table 31Borkum Riffgrund 2 IRR Calculations

Wind farm Name	Borkum Riffgrund 2, DE	
Start-up Year	2019	
Country	Germany	
Investment Euro	1322	Million Euro
Wind Farm Capacity	465	MW
Load Factors	45%	
Electricity price in 2020	35	Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation %	6.3%
OPEX share of Capex	2%
Tax %	30%
Subsidy (yes=1, no=0)	1
Abex share of CAPEX	20%

NPV	€	570,215,785
IRR		13.8%
Goal-seek Breakeven		35 Euro/MWh

Fixed price subsidy Euro/MWh (in start-up year)	0	Euro/MWh
Feed-in tariff	184	Euro/MWh
Tariff duration	10	Years
Reduced Tariff	39	Euro/MWh
Financing	1	
Interest Rate	3.0%	
Payment time	15	
Debt/Equity Ratio	80%	
Interest tax deductability (max of EBIDTA)	30%	

	Year	0	1	2	3	4	5	6	7	8	9	10
CAPEX	Euro	-€ 1,321,733,944.95										
OPEX	Euro		-€ 24,267,035.23	-€ 24,752,375.93	-€ 25,247,423.45	-€ 25,752,371.92	-€ 26,267,419.36	-€ 26,792,767.73	-€ 27,328,623.10	-€ 27,875,195.56	-€ 28,432,699.48	-€ 29,001,353.47
ABEX												
Electricity	MWh		1,832,242	1,832,242	1,832,242	1,832,242	1,832,242	1,832,242	1,832,242	1,832,242	1,832,242	1,832,242
Power Price	Euro/MWh		€ 34.31	€ 35.00	€ 35.70	€ 36.41	€ 37.14	€ 37.89	€ 38.64	€ 39.42	€ 40.20	€ 41.01
Feed-in tariff	Euro/MWh		€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00
Price received	Euro/MWh		€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00
Revenue	Euro	€ -	€ 337,132,462.15	€ 337,132,462.15	€ 337,132,462.15	€ 337,132,462.15	€ 337,132,462.15	€ 337,132,462.15	337,132,462.15	€ 337,132,462.15	€ 337,132,462.15	€ 337,132,462.15
EBIDTA	Euro	-€ 1,321,733,944.95	€ 312,865,426.92	€ 312,380,086.21	€ 311,885,038.69	€ 311,380,090.23	€ 310,865,042.79	€ 310,339,694.40	€ 309,803,839.05	€ 309,257,266.58	€ 308,699,762.67	€ 308,131,108.68
Book Value capex	Euro	€ 1,321,733,944.95	€ 1,321,733,944.95	€ 1,239,125,573.39	€ 1,161,680,225.06	€ 1,089,075,210.99	€ 1,021,008,010.30	€ 957,195,009.66	€ 897,370,321.56	€ 841,284,676.46	€ 788,704,384.18	€ 739,410,360.17
Depreciation	Euro		€ 82,608,371.56	€ 77,445,348.34	€ 72,605,014.07	€ 68,067,200.69	€ 63,813,000.64	€ 59,824,688.10	€ 56,085,645.10	€ 52,580,292.28	€ 49,294,024.01	€ 46,213,147.51
Taxable Income	Euro	€ -	€ 230,257,055.36	€ 234,934,737.88	€ 239,280,024.63	€ 243,312,889.54	€ 247,052,042.14	€ 250,515,006.30	€ 253,718,193.95	€ 256,676,974.30	€ 259,405,738.66	€ 261,917,961.17
Corporate Taxes	Euro	€ -	€ 68,685,679.61	€ 70,081,032.31	€ 71,377,231.35	€ 72,580,234.95	€ 73,695,624.17	€ 74,728,626.38	€ 75,684,137.25	€ 76,566,741.43	€ 77,380,731.84	€ 78,130,127.82
Income	Euro	-€ 1,321,733,944.95	€ 244,179,747.30	€ 242,299,053.90	€ 240,507,807.35	€ 238,799,855.28	€ 237,169,418.62	€ 235,611,068.02	€ 234,119,701.79	€ 232,690,525.15	€ 231,319,030.83	€ 230,000,980.86

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 29,581,380.53	-€ 30,173,008.15	-€ 30,776,468.31	-€ 31,391,997.67	-€ 32,019,837.63	-€ 32,660,234.38	-€ 33,313,439.07	-€ 33,979,707.85	-€ 34,659,302.01	-€ 35,352,488.05	-€ 36,059,537.81	-€ 36,780,728.56	-€ 37,516,343.13	-€ 38,266,670.00	
														-€ 264,346,788.99
1,832,242	1,832,242	1,832,242	1,832,242	1,832,242	1,832,242	1,832,242	1,832,242	1,832,242	1,832,242	1,832,242	1,832,242	1,832,242	1,832,242	
€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	€ 53.05	€ 54.11	
€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	
€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	€ 53.05	€ 54.11	
€ 76,639,442.96	€ 78,172,231.82	€ 79,735,676.46	€ 81,330,389.99	€ 82,956,997.79	€ 84,616,137.74	€ 86,308,460.50	€ 88,034,629.71	€ 89,795,322.30	€ 91,591,228.75	€ 93,423,053.32	€ 95,291,514.39	€ 97,197,344.68	€ 99,141,291.57	€ -
€ 47,058,062.43	€ 47,999,223.68	€ 48,959,208.15	€ 49,938,392.31	€ 50,937,160.16	€ 51,955,903.36	€ 52,995,021.43	€ 54,054,921.86	€ 55,136,020.30	€ 56,238,740.70	€ 57,363,515.52	€ 58,510,785.83	€ 59,681,001.54	€ 60,874,621.58	-€ 264,346,788.99
€ 693,197,212.66	€ 649,872,386.87	€ 609,255,362.69	€ 571,176,902.52	€ 535,478,346.11	€ 502,010,949.48	€ 470,635,265.14	€ 441,220,561.07	€ 413,644,276.00	€ 387,791,508.75	€ 363,554,539.45	€ 340,832,380.74	€ 319,530,356.94	€ 299,559,709.63	€ 280,837,227.78
€ 43,324,825.79	€ 40,617,024.18	€ 38,078,460.17	€ 35,698,556.41	€ 33,467,396.63	€ 31,375,684.34	€ 29,414,704.07	€ 27,576,285.07	€ 25,852,767.25	€ 24,236,969.30	€ 22,722,158.72	€ 21,302,023.80	€ 19,970,647.31	€ 18,722,481.85	-€ 264,346,788.99
€ 3,733,236.64	€ 7,382,199.50	€ 10,880,747.98	€ 14,239,835.91	€ 17,469,763.53	€ 20,580,219.02	€ 23,580,317.36	€ 26,478,636.79	€ 29,283,253.05	€ 32,001,771.41	€ 34,641,356.80	€ 37,208,762.03	€ 39,710,354.24	€ 42,152,139.72	€ -
€ 1,113,624.49	€ 2,202,110.11	€ 3,245,727.12	€ 4,247,743.05	€ 5,211,230.46	€ 6,139,079.33	€ 7,034,008.67	€ 7,898,577.36	€ 8,735,194.38	€ 9,546,128.41	€ 10,333,516.73	€ 11,099,373.71	€ 11,845,598.67	€ 12,573,983.28	€ -
€ 45,944,437.94	€ 45,797,113.57	€ 45,713,481.03	€ 45,690,649.26	€ 45,725,929.70	€ 45,816,824.03	€ 45,961,012.76	€ 46,156,344.50	€ 46,400,825.91	€ 46,692,612.29	€ 47,029,998.78	€ 47,411,412.11	€ 47,835,402.88	€ 48,300,638.30	-€ 264,346,788.99

Table 32 - Butendiek IRR Calculations

Wind farm Name	Butendiek, DE	
Start-up Year	2015	
Country	Germany	
Investment Euro	1300	Million Euro
Wind Farm Capacity	288	MW
Load Factors	45%	
Electricity price in 2020	35	Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation %	6.3%
OPEX share of Capex	2%
Tax %	30%
Subsidy (yes=1, no=0)	1
Abex share of CAPEX	20%

NPV	-€	123,581,251
IRR		3.7%
Goal-seek Breakeven		35 Euro/MWh

Fixed price subsidy Euro/MWh (in start-up year)	0	Euro/MWh
Feed-in tariff	194	Euro/MWh
Tariff duration	10	Years
Reduced Tariff	39	Euro/MWh
Financing	1	
Interest Rate	3.0%	
Payment time	15	
Debt/Equity Ratio	80%	
Interest tax deductability (max of EBIDTA)	30%	

	Year	0	1	2	3	4	5	6	7	8	9	10
CAPEX	Euro	-€ 1,300,000,000.00										
OPEX	Euro		-€ 23,868,000.00	-€ 24,345,360.00	-€ 24,832,267.20	-€ 25,328,912.54	-€ 25,835,490.79	-€ 26,352,200.61	-€ 26,879,244.62	-€ 27,416,829.52	-€ 27,965,166.11	-€ 28,524,469.43
ABEX												
Electricity	MWh		1,135,296	1,135,296	1,135,296	1,135,296	1,135,296	1,135,296	1,135,296	1,135,296	1,135,296	1,135,296
Power Price	Euro/MWh		€ 31.70	€ 32.33	€ 32.98	€ 33.64	€ 34.31	€ 35.00	€ 35.70	€ 36.41	€ 37.14	€ 37.89
Feed-in tariff	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Price received	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Revenue	Euro	€ -	€ 220,247,418.17	€ 220,247,418.17	€ 220,247,418.17	€ 220,247,418.17	€ 220,247,418.17	€ 220,247,418.17	€ 220,247,418.17	€ 220,247,418.17	€ 220,247,418.17	€ 220,247,418.17
EBIDTA	Euro	-€ 1,300,000,000.00	€ 196,379,418.17	€ 195,902,058.17	€ 195,415,150.97	€ 194,918,505.62	€ 194,411,927.37	€ 193,895,217.55	€ 193,368,173.54	€ 192,830,588.65	€ 192,282,252.06	€ 191,722,948.74
Book Value capex	Euro	€ 1,300,000,000.00	€ 1,300,000,000.00	€ 1,218,750,000.00	€ 1,142,578,125.00	€ 1,071,166,992.19	€ 1,004,219,055.18	€ 941,455,364.23	€ 882,614,403.96	€ 827,451,003.72	€ 775,735,315.98	€ 727,251,858.73
Depreciation	Euro		€ 81,250,000.00	€ 76,171,875.00	€ 71,411,132.81	€ 66,947,937.01	€ 62,763,690.95	€ 58,840,960.26	€ 55,163,400.25	€ 51,715,687.73	€ 48,483,457.23	€ 45,453,241.17
Taxable Income	Euro	€ -	€ 115,129,418.17	€ 119,730,183.17	€ 124,004,018.15	€ 127,970,568.61	€ 131,648,236.42	€ 135,054,257.29	€ 138,204,773.29	€ 141,114,900.92	€ 143,798,794.81	€ 146,269,707.57
Corporate Taxes	Euro	€ -	€ 34,343,105.44	€ 35,715,513.64	€ 36,990,398.62	€ 38,173,620.62	€ 39,270,668.92	€ 40,286,684.95	€ 41,226,483.87	€ 42,094,574.94	€ 42,895,180.49	€ 43,632,253.77
Income	Euro	-€ 1,300,000,000.00	€ 162,036,312.73	€ 160,186,544.53	€ 158,424,752.35	€ 156,744,885.01	€ 155,141,258.45	€ 153,608,532.60	€ 152,141,689.67	€ 150,736,013.71	€ 149,387,071.57	€ 148,090,694.97

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 29,094,958.82	-€ 29,676,857.99	-€ 30,270,395.15	-€ 30,875,803.06	-€ 31,493,319.12	-€ 32,123,185.50	-€ 32,765,649.21	-€ 33,420,962.19	-€ 34,089,381.44	-€ 34,771,169.07	-€ 35,466,592.45	-€ 36,175,924.30	-€ 36,899,442.78	-€ 37,637,431.64	
														-€ 260,000,000.00
1,135,296	1,135,296	1,135,296	1,135,296	1,135,296	1,135,296	1,135,296	1,135,296	1,135,296	1,135,296	1,135,296	1,135,296	1,135,296	1,135,296	
€ 38.64	€ 39.42	€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	
€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	
€ 38.64	€ 39.42	€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	
€ 43,871,047.02	€ 44,748,467.96	€ 45,643,437.32	€ 46,556,306.07	€ 47,487,432.19	€ 48,437,180.83	€ 49,405,924.45	€ 50,394,042.94	€ 51,401,923.80	€ 52,429,962.27	€ 53,478,561.52	€ 54,548,132.75	€ 55,639,095.40	€ 56,751,877.31	€ -
€ 14,776,088.21	€ 15,071,609.97	€ 15,373,042.17	€ 15,680,503.01	€ 15,994,113.07	€ 16,313,995.33	€ 16,640,275.24	€ 16,973,080.75	€ 17,312,542.36	€ 17,658,793.21	€ 18,011,969.07	€ 18,372,208.45	€ 18,739,652.62	€ 19,114,445.67	-€ 260,000,000.00
€ 681,798,617.56	€ 667,022,529.36	€ 651,950,919.39	€ 636,577,877.22	€ 620,897,374.21	€ 604,903,261.13	€ 588,589,265.80	€ 571,948,990.56	€ 554,975,909.81	€ 537,663,367.45	€ 520,004,574.24	€ 501,992,605.17	€ 483,620,396.72	€ 464,880,744.10	€ 445,766,298.42
€ 14,776,088.21	€ 15,071,609.97	€ 15,373,042.17	€ 15,680,503.01	€ 15,994,113.07	€ 16,313,995.33	€ 16,640,275.24	€ 16,973,080.75	€ 17,312,542.36	€ 17,658,793.21	€ 18,011,969.07	€ 18,372,208.45	€ 18,739,652.62	€ 19,114,445.67	-€ 260,000,000.00
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
€ 14,776,088.21	€ 15,071,609.97	€ 15,373,042.17	€ 15,680,503.01	€ 15,994,113.07	€ 16,313,995.33	€ 16,640,275.24	€ 16,973,080.75	€ 17,312,542.36	€ 17,658,793.21	€ 18,011,969.07	€ 18,372,208.45	€ 18,739,652.62	€ 19,114,445.67	-€ 260,000,000.00

Table 33 - Butendiek IRR Calculations

Wind farm Name	Deutsche Bucht, DE
Start-up Year	2020
Country	Germany
Investment Euro	1300 Million Euro
Wind Farm Capacity	269 MW
Load Factors	45%
Electricity price in 2020	35 Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation %	6.3%
OPEX share of Capex	2%
Tax %	30%
Subsidy (yes=1, no=0)	1
Abex share of CAPEX	20%

NPV	-€ 238,524,807
IRR	1.2%

Goal-seek Breakeven	35	Euro/MWh

Fixed price subsidy Euro/MWh (in start-up year)	0 Euro/MWh
Feed-in tariff	184 Euro/MWh
Tariff duration	10 Years
Reduced Tariff	39 Euro/MWh
Financing	1
Interest Rate	3.0%
Payment time	15
Debt/Equity Ratio	80%
Interest tax deductability (max of EBIDTA)	30%

	Year	0	1	2	3	4	5	6	7	8	9	10
CAPEX	Euro	-€ 1,300,000,000.00										
OPEX	Euro		-€ 23,868,000.00	-€ 24,345,360.00	-€ 24,832,267.20	-€ 25,328,912.54	-€ 25,835,490.79	-€ 26,352,200.61	-€ 26,879,244.62	-€ 27,416,829.52	-€ 27,965,166.11	-€ 28,524,469.43
ABEX												
Electricity	MWh		1,060,398	1,060,398	1,060,398	1,060,398	1,060,398	1,060,398	1,060,398	1,060,398	1,060,398	1,060,398
Power Price	Euro/MWh		€ 35.00	€ 35.70	€ 36.41	€ 37.14	€ 37.89	€ 38.64	€ 39.42	€ 40.20	€ 41.01	€ 41.83
Feed-in tariff	Euro/MWh		€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00
Price received	Euro/MWh		€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00
Revenue	Euro	€ -	€ 195,113,232.00	€ 195,113,232.00	€ 195,113,232.00	€ 195,113,232.00	€ 195,113,232.00	€ 195,113,232.00	€ 195,113,232.00	€ 195,113,232.00	€ 195,113,232.00	€ 195,113,232.00
EBIDTA	Euro	-€ 1,300,000,000.00	€ 171,245,232.00	€ 170,767,872.00	€ 170,280,964.80	€ 169,784,319.46	€ 169,277,741.21	€ 168,761,031.39	€ 168,233,987.38	€ 167,696,402.48	€ 167,148,065.89	€ 166,588,762.57
Book Value capex	Euro	€ 1,300,000,000.00	€ 1,300,000,000.00	€ 1,218,750,000.00	€ 1,142,578,125.00	€ 1,071,166,992.19	€ 1,004,219,055.18	€ 941,455,364.23	€ 882,614,403.96	€ 827,451,003.72	€ 775,735,315.98	€ 727,251,858.73
Depreciation	Euro		€ 81,250,000.00	€ 76,171,875.00	€ 71,411,132.81	€ 66,947,937.01	€ 62,763,690.95	€ 58,840,960.26	€ 55,163,400.25	€ 51,715,687.73	€ 48,483,457.25	€ 45,453,241.17
Taxable Income	Euro	€ -	€ 89,995,232.00	€ 94,595,997.00	€ 98,869,831.99	€ 102,836,382.44	€ 106,514,050.26	€ 109,920,071.13	€ 113,070,587.13	€ 115,980,714.75	€ 118,664,608.65	€ 121,135,521.40
Corporate Taxes	Euro	€ -	€ 26,845,577.71	€ 28,217,985.91	€ 29,492,870.88	€ 30,676,092.88	€ 31,773,141.19	€ 32,789,157.22	€ 33,728,956.14	€ 34,597,047.21	€ 35,397,652.76	€ 36,134,726.03
Income	Euro	-€ 1,300,000,000.00	€ 144,399,654.29	€ 142,549,886.09	€ 140,788,093.92	€ 139,108,226.57	€ 137,504,600.01	€ 135,971,874.17	€ 134,505,031.24	€ 133,099,355.27	€ 131,750,413.14	€ 130,454,036.54

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 29,094,958.82	-€ 29,676,857.99	-€ 30,270,395.15	-€ 30,875,803.06	-€ 31,493,319.12	-€ 32,123,185.50	-€ 32,765,649.21	-€ 33,420,962.19	-€ 34,089,381.44	-€ 34,771,169.07	-€ 35,466,592.45	-€ 36,175,924.30	-€ 36,899,442.78	-€ 37,637,431.64	
														-€ 260,000,000.00
1,060,398	1,060,398	1,060,398	1,060,398	1,060,398	1,060,398	1,060,398	1,060,398	1,060,398	1,060,398	1,060,398	1,060,398	1,060,398	1,060,398	
€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	€ 53.05	€ 54.11	€ 55.19	
€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	
€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	€ 53.05	€ 54.11	€ 55.19	
€ 45,241,673.57	€ 46,146,507.05	€ 47,069,437.19	€ 48,010,825.93	€ 48,971,042.45	€ 49,950,463.30	€ 50,949,472.56	€ 51,968,462.02	€ 53,007,831.26	€ 54,067,987.88	€ 55,149,347.64	€ 56,252,334.59	€ 57,377,381.28	€ 58,524,928.91	€ -
€ 16,146,714.76	€ 16,469,649.05	€ 16,799,042.03	€ 17,135,022.87	€ 17,477,723.33	€ 17,827,277.80	€ 18,183,823.35	€ 18,547,499.82	€ 18,918,449.82	€ 19,296,818.81	€ 19,682,755.19	€ 20,076,410.29	€ 20,477,938.50	€ 20,887,497.27	-€ 260,000,000.00
€ 681,798,617.56	€ 665,651,902.81	€ 649,182,253.75	€ 632,383,211.72	€ 615,248,188.84	€ 597,770,465.51	€ 579,943,187.71	€ 561,759,364.36	€ 543,211,864.54	€ 524,293,414.72	€ 504,996,595.90	€ 485,313,840.71	€ 465,237,430.42	€ 444,759,491.92	€ 423,871,994.65
€ 16,146,714.76	€ 16,469,649.05	€ 16,799,042.03	€ 17,135,022.87	€ 17,477,723.33	€ 17,827,277.80	€ 18,183,823.35	€ 18,547,499.82	€ 18,918,449.82	€ 19,296,818.81	€ 19,682,755.19	€ 20,076,410.29	€ 20,477,938.50	€ 20,887,497.27	-€ 260,000,000.00
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
€ 16,146,714.76	€ 16,469,649.05	€ 16,799,042.03	€ 17,135,022.87	€ 17,477,723.33	€ 17,827,277.80	€ 18,183,823.35	€ 18,547,499.82	€ 18,918,449.82	€ 19,296,818.81	€ 19,682,755.19	€ 20,076,410.29	€ 20,477,938.50	€ 20,887,497.27	-€ 260,000,000.00

Table 34 - Gode Vind 1 IRR Calculations

Wind farm Name	Gode Wind 1, DE	
Start-up Year	2016	
Country	Germany	
Investment Euro	2200	Million Euro
Wind Farm Capacity	582	MW
Load Factors	45%	
Electricity price in 2020	35	Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation %	6.3%
OPEX share of Capex	2%
Tax %	30%
Subsidy (yes=1, no=0)	1
Abex share of CAPEX	20%

NPV	€	228,508,481
IRR		8.2%

Goal-seek Breakeven	35	Euro/MWh

Fixed price subsidy Euro/MWh (in start-up year)	0	Euro/MWh
Feed-in tariff	194	Euro/MWh
Tariff duration	10	Years
Reduced Tariff	39	Euro/MWh
Financing	1	
Interest Rate	3.0%	
Payment time	15	
Debt/Equity Ratio	80%	
Interest tax deductability (max of EBIDTA)	30%	

	Year	0	1	2	3	4	5	6	7	8	9	10
CAPEX	Euro	-€ 2,200,000,000.00										
OPEX	Euro		-€ 40,392,000.00	-€ 41,199,840.00	-€ 42,023,836.80	-€ 42,864,313.54	-€ 43,721,599.81	-€ 44,596,031.80	-€ 45,487,952.44	-€ 46,397,711.49	-€ 47,325,665.72	-€ 48,272,179.03
ABEX												
Electricity	MWh		2,294,244	2,294,244	2,294,244	2,294,244	2,294,244	2,294,244	2,294,244	2,294,244	2,294,244	2,294,244
Power Price	Euro/MWh		€ 32.33	€ 32.98	€ 33.64	€ 34.31	€ 35.00	€ 35.70	€ 36.41	€ 37.14	€ 37.89	€ 38.64
Feed-in tariff	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Price received	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Revenue	Euro	€ -	€ 445,083,336.00	€ 445,083,336.00	€ 445,083,336.00	€ 445,083,336.00	€ 445,083,336.00	€ 445,083,336.00	€ 445,083,336.00	€ 445,083,336.00	€ 445,083,336.00	€ 445,083,336.00
EBIDTA	Euro	-€ 2,200,000,000.00	€ 404,691,336.00	€ 403,883,496.00	€ 403,059,499.20	€ 402,219,022.46	€ 401,361,736.19	€ 400,487,304.20	€ 399,595,383.56	€ 398,685,624.51	€ 397,757,670.28	€ 396,811,156.97
Book Value capex	Euro	€ 2,200,000,000.00	€ 2,200,000,000.00	€ 2,062,500,000.00	€ 1,933,593,750.00	€ 1,812,744,140.63	€ 1,699,447,631.84	€ 1,593,232,154.85	€ 1,493,655,145.17	€ 1,400,301,698.60	€ 1,312,782,842.43	€ 1,230,733,914.78
Depreciation	Euro		€ 137,500,000.00	€ 128,906,250.00	€ 120,849,609.38	€ 113,296,508.79	€ 106,215,476.99	€ 99,577,009.68	€ 93,353,446.57	€ 87,518,856.16	€ 82,048,927.65	€ 76,920,869.67
Taxable Income	Euro	€ -	€ 267,191,336.00	€ 274,977,246.00	€ 282,209,889.83	€ 288,922,513.67	€ 295,146,259.20	€ 300,910,294.52	€ 306,241,936.99	€ 311,166,768.35	€ 315,708,742.63	€ 319,890,287.29
Corporate Taxes	Euro	€ -	€ 79,703,175.53	€ 82,025,712.48	€ 84,183,210.13	€ 86,185,585.83	€ 88,042,129.12	€ 89,761,540.86	€ 91,351,969.80	€ 92,821,047.00	€ 94,175,917.93	€ 95,423,272.70
Income	Euro	-€ 2,200,000,000.00	€ 324,988,160.47	€ 321,857,783.52	€ 318,876,289.07	€ 316,033,436.63	€ 313,319,607.07	€ 310,725,763.34	€ 308,243,413.76	€ 305,864,577.51	€ 303,581,752.36	€ 301,387,884.27

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 49,237,622.61	-€ 50,222,375.06	-€ 51,226,822.57	-€ 52,251,359.02	-€ 53,296,386.20	-€ 54,362,313.92	-€ 55,449,560.20	-€ 56,558,551.40	-€ 57,689,722.43	-€ 58,843,516.88	-€ 60,020,387.22	-€ 61,220,794.96	-€ 62,445,210.86	-€ 63,694,115.08	
														-€ 440,000,000.00
2,294,244	2,294,244	2,294,244	2,294,244	2,294,244	2,294,244	2,294,244	2,294,244	2,294,244	2,294,244	2,294,244	2,294,244	2,294,244	2,294,244	
€ 39.42	€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	
€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	
€ 39.42	€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	
€ 90,429,198.07	€ 92,237,782.03	€ 94,082,537.67	€ 95,964,188.43	€ 97,883,472.19	€ 99,841,141.64	€ 101,837,964.47	€ 103,874,723.76	€ 105,952,218.23	€ 108,071,262.60	€ 110,232,687.85	€ 112,437,341.61	€ 114,686,088.44	€ 116,979,810.21	€ -
€ 41,191,573.46	€ 42,015,406.97	€ 42,855,715.11	€ 43,712,829.41	€ 44,587,086.00	€ 45,478,827.72	€ 46,388,404.27	€ 47,316,172.36	€ 48,262,495.80	€ 49,227,745.72	€ 50,212,300.63	€ 51,216,546.65	€ 52,240,877.58	€ 53,285,695.13	-€ 440,000,000.00
€ 1,153,813,045.11	€ 1,112,621,469.65	€ 1,070,606,062.68	€ 1,027,750,347.58	€ 984,037,518.17	€ 939,450,432.17	€ 893,971,604.46	€ 847,583,200.19	€ 800,267,027.83	€ 752,004,532.03	€ 705,004,248.78	€ 660,941,483.23	€ 619,632,640.53	€ 580,905,600.49	€ 544,599,000.46
€ 41,191,573.46	€ 42,015,406.97	€ 42,855,715.11	€ 43,712,829.41	€ 44,587,086.00	€ 45,478,827.72	€ 46,388,404.27	€ 47,316,172.36	€ 48,262,495.80	€ 47,000,283.25	€ 44,062,765.55	€ 41,308,842.70	€ 38,727,040.03	€ 36,306,600.03	-€ 440,000,000.00
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 2,227,462.47	€ 6,149,535.08	€ 9,907,703.94	€ 13,513,837.55	€ 16,979,095.10	€ -
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 664,452.05	€ 1,834,406.32	€ 2,955,468.09	€ 4,031,177.74	€ 5,064,864.07	€ -
€ 41,191,573.46	€ 42,015,406.97	€ 42,855,715.11	€ 43,712,829.41	€ 44,587,086.00	€ 45,478,827.72	€ 46,388,404.27	€ 47,316,172.36	€ 48,262,495.80	€ 48,563,293.66	€ 48,377,894.32	€ 48,261,078.56	€ 48,209,699.84	€ 48,220,831.06	-€ 440,000,000.00

Table 35 - Hohe See IRR Calculations

Wind farm Name	Hohe See, DE
Start-up Year	2019
Country	Germany
Investment Euro	1800 Million Euro
Wind Farm Capacity	497 MW
Load Factors	45%
Electricity price in 2020	35 Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation %	6.3%
OPEX share of Capex	2%
Tax %	30%
Subsidy (yes=1, no=0)	1
Abex share of CAPEX	20%

NPV	€ 205,348,216
IRR	8.3%
Goal-seek Breakeven	33 Euro/MWh

Fixed price subsidy Euro/MWh (in start-up year)	0 Euro/MWh
Feed-in tariff	184 Euro/MWh
Tariff duration	10 Years
Reduced Tariff	39 Euro/MWh
Financing	1
Interest Rate	3.0%
Payment time	15
Debt/Equity Ratio	80%
Interest tax deductability (max of EBIDTA)	30%

		0	1	2	3	4	5	6	7	8	9	10
Year												
CAPEX	Euro	-€ 1,800,000,000.00										
OPEX	Euro		-€ 33,048,000.00	-€ 33,708,960.00	-€ 34,383,139.20	-€ 35,070,801.98	-€ 35,772,218.02	-€ 36,487,662.38	-€ 37,217,415.63	-€ 37,961,763.94	-€ 38,720,999.22	-€ 39,495,419.21
ABEX												
Electricity	MWh		1,959,174	1,959,174	1,959,174	1,959,174	1,959,174	1,959,174	1,959,174	1,959,174	1,959,174	1,959,174
Power Price	Euro/MWh		€ 34.31	€ 35.00	€ 35.70	€ 36.41	€ 37.14	€ 37.89	€ 38.64	€ 39.42	€ 40.20	€ 41.01
Feed-in tariff	Euro/MWh		€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00
Price received	Euro/MWh		€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00
Revenue	Euro	€ -	€ 360,488,016.00	€ 360,488,016.00	€ 360,488,016.00	€ 360,488,016.00	€ 360,488,016.00	€ 360,488,016.00	€ 360,488,016.00	€ 360,488,016.00	€ 360,488,016.00	€ 360,488,016.00
EBIDTA	Euro	-€ 1,800,000,000.00	€ 327,440,016.00	€ 326,779,056.00	€ 326,104,876.80	€ 325,417,214.02	€ 324,715,797.98	€ 324,000,353.62	€ 323,270,600.37	€ 322,526,252.06	€ 321,767,016.78	€ 320,992,596.79
Book Value capex	Euro	€ 1,800,000,000.00	€ 1,800,000,000.00	€ 1,687,500,000.00	€ 1,582,031,250.00	€ 1,483,154,296.88	€ 1,390,457,153.32	€ 1,303,553,581.24	€ 1,222,081,482.41	€ 1,145,701,389.76	€ 1,074,095,052.90	€ 1,006,964,112.09
Depreciation	Euro		€ 112,500,000.00	€ 105,468,750.00	€ 98,876,953.13	€ 92,697,143.55	€ 86,903,572.08	€ 81,472,098.83	€ 76,380,092.65	€ 71,606,336.86	€ 67,130,940.81	€ 62,993,257.01
Taxable Income	Euro	€ -	€ 214,940,016.00	€ 221,310,306.00	€ 227,227,923.68	€ 232,720,070.46	€ 237,812,225.89	€ 242,528,254.79	€ 246,890,507.72	€ 250,919,915.20	€ 254,636,075.97	€ 258,057,339.79
Corporate Taxes	Euro	€ -	€ 64,116,606.77	€ 66,016,864.28	€ 67,782,089.63	€ 69,420,397.02	€ 70,939,386.98	€ 72,346,178.40	€ 73,647,438.45	€ 74,849,410.70	€ 75,957,941.46	€ 76,978,504.46
Income	Euro	-€ 1,800,000,000.00	€ 263,323,409.23	€ 260,762,191.72	€ 258,322,787.17	€ 255,996,817.00	€ 253,776,410.99	€ 251,654,175.21	€ 249,623,161.92	€ 247,676,841.35	€ 245,809,075.31	€ 244,014,092.33

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 40,285,327.59	-€ 41,091,034.14	-€ 41,912,854.83	-€ 42,751,111.92	-€ 43,606,134.16	-€ 44,478,256.84	-€ 45,367,821.98	-€ 46,275,178.42	-€ 47,200,681.99	-€ 48,144,695.63	-€ 49,107,589.54	-€ 50,089,741.33	-€ 51,091,536.16	-€ 52,113,366.88	
														-€ 360,000,000.00
1,959,174	1,959,174	1,959,174	1,959,174	1,959,174	1,959,174	1,959,174	1,959,174	1,959,174	1,959,174	1,959,174	1,959,174	1,959,174	1,959,174	
€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	€ 53.05	€ 54.11	
€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	
€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	€ 53.05	€ 54.11	
€ 81,948,800.08	€ 83,587,776.08	€ 85,259,531.60	€ 86,964,722.24	€ 88,704,016.68	€ 90,478,097.02	€ 92,287,658.96	€ 94,133,412.13	€ 96,016,080.38	€ 97,936,401.98	€ 99,895,130.02	€ 101,893,032.62	€ 103,930,893.28	€ 106,009,511.14	€ -
€ 41,663,472.49	€ 42,496,741.94	€ 43,346,676.78	€ 44,213,610.31	€ 45,097,882.52	€ 45,999,840.17	€ 46,919,836.97	€ 47,858,233.71	€ 48,815,398.39	€ 49,791,706.36	€ 50,787,540.48	€ 51,803,291.29	€ 52,839,357.12	€ 53,896,144.26	-€ 360,000,000.00
€ 944,028,855.09	€ 902,365,382.60	€ 859,868,640.66	€ 816,521,963.88	€ 772,308,353.57	€ 727,210,471.05	€ 681,759,816.61	€ 639,149,828.07	€ 599,202,963.82	€ 561,752,778.58	€ 526,643,229.92	€ 493,728,028.05	€ 462,870,026.29	€ 433,940,649.65	€ 406,819,359.05
€ 41,663,472.49	€ 42,496,741.94	€ 43,346,676.78	€ 44,213,610.31	€ 45,097,882.52	€ 45,450,654.44	€ 42,609,988.54	€ 39,946,864.25	€ 37,450,185.24	€ 35,109,548.66	€ 32,915,201.87	€ 30,858,001.75	€ 28,929,376.64	€ 27,121,290.60	-€ 360,000,000.00
€ -	€ -	€ -	€ -	€ -	€ 549,185.73	€ 4,309,848.44	€ 7,911,369.46	€ 11,365,213.15	€ 14,682,157.69	€ 17,872,338.61	€ 20,945,289.54	€ 23,909,980.47	€ 26,774,853.66	€ -
€ -	€ -	€ -	€ -	€ -	€ 163,822.10	€ 1,285,627.79	€ 2,359,961.51	€ 3,390,243.08	€ 4,379,687.64	€ 5,331,318.61	€ 6,247,979.87	€ 7,132,347.18	€ 7,986,938.85	€ -
€ 41,663,472.49	€ 42,496,741.94	€ 43,346,676.78	€ 44,213,610.31	€ 45,097,882.52	€ 45,836,018.07	€ 45,634,209.19	€ 45,498,272.20	€ 45,425,155.30	€ 45,412,018.71	€ 45,456,221.87	€ 45,555,311.42	€ 45,707,009.94	€ 45,909,205.41	-€ 360,000,000.00

Table 36 - Merkur Offshore IRR Calculations

Wind farm Name	Merkur Offshore, DE	
Start-up Year	2018	
Country	Germany	
Investment Euro	1600	Million Euro
Wind Farm Capacity	396	MW
Load Factors	45%	
Electricity price in 2020	35	Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation %	6.3%
OPEX share of Capex	2%
Tax %	30%
Subsidy (yes=1, no=0)	1
Abex share of CAPEX	20%

NPV	-€	19,979,302
IRR		5.7%

Goal-seek Breakeven	33	Euro/MWh

Fixed price subsidy Euro/MWh (in start-up year)	0	Euro/MWh
Feed-in tariff	184	Euro/MWh
Tariff duration	10	Years
Reduced Tariff	39	Euro/MWh
Financing	1	
Interest Rate	3.0%	
Payment time	15	
Debt/Equity Ratio	80%	
Interest tax deductability (max of EBIDTA)	30%	

Year		0	1	2	3	4	5	6	7	8	9	10
CAPEX	Euro	-€ 1,600,000,000.00										
OPEX	Euro		-€ 29,376,000.00	-€ 29,963,520.00	-€ 30,562,790.40	-€ 31,174,046.21	-€ 31,797,527.13	-€ 32,433,477.67	-€ 33,082,147.23	-€ 33,743,790.17	-€ 34,418,665.98	-€ 35,107,039.30
ABEX												
Electricity	MWh		1,561,032	1,561,032	1,561,032	1,561,032	1,561,032	1,561,032	1,561,032	1,561,032	1,561,032	1,561,032
Power Price	Euro/MWh		€ 33.64	€ 34.31	€ 35.00	€ 35.70	€ 36.41	€ 37.14	€ 37.89	€ 38.64	€ 39.42	€ 40.20
Feed-in tariff	Euro/MWh		€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00
Price received	Euro/MWh		€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00
Revenue	Euro	€ -	€ 287,229,888.00	€ 287,229,888.00	€ 287,229,888.00	€ 287,229,888.00	€ 287,229,888.00	€ 287,229,888.00	€ 287,229,888.00	€ 287,229,888.00	€ 287,229,888.00	€ 287,229,888.00
EBIDTA	Euro	-€ 1,600,000,000.00	€ 257,853,888.00	€ 257,266,368.00	€ 256,667,097.60	€ 256,055,841.79	€ 255,432,360.87	€ 254,796,410.33	€ 254,147,740.77	€ 253,486,097.83	€ 252,811,222.02	€ 252,122,848.70
Book Value capex	Euro	€ 1,600,000,000.00	€ 1,600,000,000.00	€ 1,500,000,000.00	€ 1,406,250,000.00	€ 1,318,359,375.00	€ 1,235,961,914.06	€ 1,158,714,294.43	€ 1,086,294,651.03	€ 1,018,401,235.34	€ 954,751,158.13	€ 895,079,210.75
Depreciation	Euro		€ 100,000,000.00	€ 93,750,000.00	€ 87,890,625.00	€ 82,397,460.94	€ 77,247,619.63	€ 72,419,643.40	€ 67,893,415.69	€ 63,650,077.21	€ 59,671,947.38	€ 55,942,450.67
Taxable Income	Euro	€ -	€ 157,853,888.00	€ 163,516,368.00	€ 168,776,472.60	€ 173,658,380.85	€ 178,184,741.24	€ 182,376,766.92	€ 186,254,325.08	€ 189,836,020.62	€ 193,139,274.64	€ 196,180,398.03
Corporate Taxes	Euro	€ -	€ 47,087,814.79	€ 48,776,932.57	€ 50,346,021.78	€ 51,802,295.01	€ 53,152,508.31	€ 54,402,989.57	€ 55,559,665.17	€ 56,628,084.95	€ 57,613,445.63	€ 58,520,612.73
Income	Euro	-€ 1,600,000,000.00	€ 210,766,073.21	€ 208,489,435.43	€ 206,321,075.82	€ 204,253,546.78	€ 202,279,852.56	€ 200,393,420.75	€ 198,588,075.60	€ 196,858,012.88	€ 195,197,776.40	€ 193,602,235.97

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 35,809,180.08	-€ 36,525,363.68	-€ 37,255,870.96	-€ 38,000,988.38	-€ 38,761,008.14	-€ 39,536,228.31	-€ 40,326,952.87	-€ 41,133,491.93	-€ 41,956,161.77	-€ 42,795,285.00	-€ 43,651,190.70	-€ 44,524,214.52	-€ 45,414,698.81	-€ 46,322,992.78	
														-€ 320,000,000.00
1,561,032	1,561,032	1,561,032	1,561,032	1,561,032	1,561,032	1,561,032	1,561,032	1,561,032	1,561,032	1,561,032	1,561,032	1,561,032	1,561,032	
€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	€ 53.05	
€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	
€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	€ 53.05	
€ 64,014,922.54	€ 65,295,220.99	€ 66,601,125.41	€ 67,933,147.92	€ 69,291,810.88	€ 70,677,647.09	€ 72,091,200.04	€ 73,533,024.04	€ 75,003,684.52	€ 76,503,758.21	€ 78,033,833.37	€ 79,594,510.04	€ 81,186,400.24	€ 82,810,128.25	€ -
€ 28,205,742.46	€ 28,769,857.31	€ 29,345,254.45	€ 29,932,159.54	€ 30,530,802.73	€ 31,141,418.79	€ 31,764,247.16	€ 32,399,532.11	€ 33,047,522.75	€ 33,708,473.20	€ 34,382,642.67	€ 35,070,295.52	€ 35,771,701.43	€ 36,487,135.46	-€ 320,000,000.00
€ 839,136,760.08	€ 810,931,017.62	€ 782,161,160.31	€ 752,815,905.86	€ 722,883,746.32	€ 692,352,943.58	€ 661,211,524.80	€ 629,447,277.63	€ 597,047,745.53	€ 564,000,222.78	€ 530,291,749.57	€ 497,148,515.23	€ 466,076,733.02	€ 436,946,937.21	€ 409,637,753.63
€ 28,205,742.46	€ 28,769,857.31	€ 29,345,254.45	€ 29,932,159.54	€ 30,530,802.73	€ 31,141,418.79	€ 31,764,247.16	€ 32,399,532.11	€ 33,047,522.75	€ 33,708,473.20	€ 33,143,234.35	€ 31,071,782.20	€ 29,129,795.81	€ 27,309,183.58	-€ 320,000,000.00
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 1,239,408.32	€ 3,998,513.32	€ 6,641,905.62	€ 9,177,951.88	€ -
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 369,715.50	€ 1,192,756.52	€ 1,981,280.45	€ 2,737,783.05	€ -
€ 28,205,742.46	€ 28,769,857.31	€ 29,345,254.45	€ 29,932,159.54	€ 30,530,802.73	€ 31,141,418.79	€ 31,764,247.16	€ 32,399,532.11	€ 33,047,522.75	€ 33,708,473.20	€ 34,012,927.17	€ 33,877,539.00	€ 33,790,420.99	€ 33,749,352.41	-€ 320,000,000.00

Table 37 - Nordergrunde IRR Calculations

Wind farm Name	Nordergrunde, DE	
Start-up Year	2017	
Country	Germany	
Investment Euro	410	Million Euro
Wind Farm Capacity	111	MW
Load Factors	45%	
Electricity price in 2020	35	Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation %	6.3%
OPEX share of Capex	2%
Tax %	30%
Subsidy (yes=1, no=0)	1
Abex share of CAPEX	20%

NPV	€	54,162,018
IRR		8.7%

Goal-seek Breakeven	35	Euro/MWh

Fixed price subsidy Euro/MWh (in start-up year)	0 Euro/MWh
Feed-in tariff	194 Euro/MWh
Tariff duration	10 Years
Reduced Tariff	39 Euro/MWh
Financing	1
Interest Rate	3.0%
Payment time	15
Debt/Equity Ratio	80%
Interest tax deductability (max of EBIDTA)	30%

	Year	0	1	2	3	4	5	6	7	8	9	10
CAPEX	Euro	-€ 410,000,000.00										
OPEX	Euro		-€ 7,527,600.00	-€ 7,678,152.00	-€ 7,831,715.04	-€ 7,988,349.34	-€ 8,148,116.33	-€ 8,311,078.65	-€ 8,477,300.23	-€ 8,646,846.23	-€ 8,819,783.16	-€ 8,996,178.82
ABEX												
Electricity	MWh		436,379	436,379	436,379	436,379	436,379	436,379	436,379	436,379	436,379	436,379
Power Price	Euro/MWh		€ 32.98	€ 33.64	€ 34.31	€ 35.00	€ 35.70	€ 36.41	€ 37.14	€ 37.89	€ 38.64	€ 39.42
Feed-in tariff	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Price received	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Revenue	Euro	€ -	€ 84,657,604.91	€ 84,657,604.91	€ 84,657,604.91	€ 84,657,604.91	€ 84,657,604.91	€ 84,657,604.91	€ 84,657,604.91	€ 84,657,604.91	€ 84,657,604.91	€ 84,657,604.91
EBIDTA	Euro	-€ 410,000,000.00	€ 77,130,004.91	€ 76,979,452.91	€ 76,825,889.87	€ 76,669,255.57	€ 76,509,488.59	€ 76,346,526.26	€ 76,180,304.69	€ 76,010,758.68	€ 75,837,821.76	€ 75,661,426.09
Book Value capex	Euro	€ 410,000,000.00	€ 410,000,000.00	€ 384,375,000.00	€ 360,351,562.50	€ 337,829,589.84	€ 316,715,240.48	€ 296,920,537.95	€ 278,363,004.33	€ 260,965,316.56	€ 244,654,984.27	€ 229,364,047.75
Depreciation	Euro		€ 25,625,000.00	€ 24,023,437.50	€ 22,521,972.66	€ 21,114,349.37	€ 19,794,702.53	€ 18,557,533.62	€ 17,397,687.77	€ 16,310,332.28	€ 15,290,936.52	€ 14,335,252.98
Taxable Income	Euro	€ -	€ 51,505,004.91	€ 52,956,015.41	€ 54,303,917.22	€ 55,554,906.21	€ 56,714,786.06	€ 57,788,992.64	€ 58,782,616.92	€ 59,700,426.40	€ 60,546,885.24	€ 61,326,173.11
Corporate Taxes	Euro	€ -	€ 15,363,942.97	€ 15,796,779.40	€ 16,198,858.51	€ 16,572,028.52	€ 16,918,020.68	€ 17,238,456.50	€ 17,534,854.63	€ 17,808,637.19	€ 18,061,135.87	€ 18,293,597.44
Income	Euro	-€ 410,000,000.00	€ 61,766,061.95	€ 61,182,673.52	€ 60,627,031.37	€ 60,097,227.05	€ 59,591,467.90	€ 59,108,069.76	€ 58,645,450.06	€ 58,202,121.49	€ 57,776,685.89	€ 57,367,828.65

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 9,176,102.40	-€ 9,359,624.44	-€ 9,546,816.93	-€ 9,737,753.27	-€ 9,932,508.34	-€ 10,131,158.50	-€ 10,333,781.67	-€ 10,540,457.31	-€ 10,751,266.45	-€ 10,966,291.78	-€ 11,185,617.62	-€ 11,409,329.97	-€ 11,637,516.57	-€ 11,870,266.90	
														-€ 82,000,000.00
436,379	436,379	436,379	436,379	436,379	436,379	436,379	436,379	436,379	436,379	436,379	436,379	436,379	436,379	
€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	
€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	
€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	
€ 17,544,196.96	€ 17,895,080.90	€ 18,252,982.51	€ 18,618,042.16	€ 18,990,403.01	€ 19,370,211.07	€ 19,757,615.29	€ 20,152,767.60	€ 20,555,822.95	€ 20,966,939.41	€ 21,386,278.19	€ 21,814,003.76	€ 22,250,283.83	€ 22,695,289.51	€ -
€ 8,368,094.56	€ 8,535,456.45	€ 8,706,165.58	€ 8,880,288.89	€ 9,057,894.67	€ 9,239,052.56	€ 9,423,833.62	€ 9,612,310.29	€ 9,804,556.49	€ 10,000,647.62	€ 10,200,660.58	€ 10,404,673.79	€ 10,612,767.26	€ 10,825,022.61	-€ 82,000,000.00
€ 215,028,794.77	€ 206,660,700.21	€ 198,125,243.76	€ 189,419,078.17	€ 180,538,789.28	€ 171,480,894.61	€ 162,241,842.05	€ 152,818,008.43	€ 143,266,882.90	€ 134,312,702.72	€ 125,918,158.80	€ 118,048,273.88	€ 110,670,256.76	€ 103,753,365.71	€ 97,268,780.35
€ 8,368,094.56	€ 8,535,456.45	€ 8,706,165.58	€ 8,880,288.89	€ 9,057,894.67	€ 9,239,052.56	€ 9,423,833.62	€ 9,551,125.53	€ 8,954,180.18	€ 8,394,543.92	€ 7,869,884.93	€ 7,378,017.12	€ 6,916,891.05	€ 6,484,585.36	-€ 82,000,000.00
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 61,184.76	€ 850,376.31	€ 1,606,103.70	€ 2,330,775.65	€ 3,026,656.67	€ 3,695,876.22	€ 4,340,437.25	€ -
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 18,251.41	€ 253,667.25	€ 479,100.73	€ 695,270.38	€ 902,851.68	€ 1,102,479.88	€ 1,294,752.43	€ -
€ 8,368,094.56	€ 8,535,456.45	€ 8,706,165.58	€ 8,880,288.89	€ 9,057,894.67	€ 9,239,052.56	€ 9,423,833.62	€ 9,594,058.87	€ 9,550,889.24	€ 9,521,546.89	€ 9,505,390.20	€ 9,501,822.10	€ 9,510,287.39	€ 9,530,270.18	-€ 82,000,000.00

Table 38 - Nordsee One IRR Calculations

Wind farm Name	Nordsee One, DE	
Start-up Year	2017	
Country	Germany	
Investment Euro	1200	Million Euro
Wind Farm Capacity	332	MW
Load Factors	45%	
Electricity price in 2020	35	Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation %	6.3%
OPEX share of Capex	2%
Tax %	30%
Subsidy (yes=1, no=0)	1
Abex share of CAPEX	20%

NPV	€	194,540,589
IRR		9.3%
Goal-seek Breakeven		35 Euro/MWh

Fixed price subsidy Euro/MWh (in start-up year)	0	Euro/MWh
Feed-in tariff	194	Euro/MWh
Tariff duration	10	Years
Reduced Tariff	39	Euro/MWh
Financing	1	
Interest Rate	3.0%	
Payment time	15	
Debt/Equity Ratio	80%	
Interest tax deductability (max of EBIDTA)	30%	

Year		0	1	2	3	4	5	6	7	8	9	10
CAPEX	Euro	-€ 1,200,000,000.00										
OPEX	Euro		-€ 22,032,000.00	-€ 22,472,640.00	-€ 22,922,092.80	-€ 23,380,534.66	-€ 23,848,145.35	-€ 24,325,108.26	-€ 24,811,610.42	-€ 25,307,842.63	-€ 25,813,999.48	-€ 26,330,279.47
ABEX												
Electricity	MWh		1,309,138	1,309,138	1,309,138	1,309,138	1,309,138	1,309,138	1,309,138	1,309,138	1,309,138	1,309,138
Power Price	Euro/MWh		€ 32.98	€ 33.64	€ 34.31	€ 35.00	€ 35.70	€ 36.41	€ 37.14	€ 37.89	€ 38.64	€ 39.42
Feed-in tariff	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Price received	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Revenue	Euro	€ -	€ 253,972,814.74	€ 253,972,814.74	€ 253,972,814.74	€ 253,972,814.74	€ 253,972,814.74	€ 253,972,814.74	€ 253,972,814.74	€ 253,972,814.74	€ 253,972,814.74	€ 253,972,814.74
EBIDTA	Euro	-€ 1,200,000,000.00	€ 231,940,814.74	€ 231,500,174.74	€ 231,050,721.94	€ 230,592,280.08	€ 230,124,669.39	€ 229,647,706.48	€ 229,161,204.32	€ 228,664,972.11	€ 228,158,815.26	€ 227,642,535.27
Book Value capex	Euro	€ 1,200,000,000.00	€ 1,200,000,000.00	€ 1,125,000,000.00	€ 1,054,687,500.00	€ 988,769,531.25	€ 926,971,435.55	€ 869,035,720.83	€ 814,720,988.27	€ 763,800,926.51	€ 716,063,368.60	€ 671,309,408.06
Depreciation	Euro		€ 75,000,000.00	€ 70,312,500.00	€ 65,917,968.75	€ 61,798,095.70	€ 57,935,714.72	€ 54,314,732.55	€ 50,920,061.77	€ 47,737,557.91	€ 44,753,960.54	€ 41,956,838.00
Taxable Income	Euro	€ -	€ 156,940,814.74	€ 161,187,674.74	€ 165,132,753.19	€ 168,794,184.38	€ 172,188,954.67	€ 175,332,973.93	€ 178,241,142.55	€ 180,927,414.20	€ 183,404,854.72	€ 185,685,697.26
Corporate Taxes	Euro	€ -	€ 46,815,445.04	€ 48,082,283.37	€ 49,259,100.28	€ 50,351,305.20	€ 51,363,965.18	€ 52,301,826.12	€ 53,169,332.82	€ 53,970,647.66	€ 54,709,668.16	€ 55,390,043.49
Income	Euro	-€ 1,200,000,000.00	€ 185,125,369.70	€ 183,417,891.36	€ 181,791,621.66	€ 180,240,974.88	€ 178,760,704.21	€ 177,345,880.36	€ 175,991,871.49	€ 174,694,324.45	€ 173,448,147.09	€ 172,252,491.77

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 26,856,885.06	-€ 27,394,022.76	-€ 27,941,903.22	-€ 28,500,741.28	-€ 29,070,756.11	-€ 29,652,171.23	-€ 30,245,214.65	-€ 30,850,118.95	-€ 31,467,121.33	-€ 32,096,463.75	-€ 32,738,393.03	-€ 33,393,160.89	-€ 34,061,024.11	-€ 34,742,244.59	
														-€ 240,000,000.00
1,309,138	1,309,138	1,309,138	1,309,138	1,309,138	1,309,138	1,309,138	1,309,138	1,309,138	1,309,138	1,309,138	1,309,138	1,309,138	1,309,138	
€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	
€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	
€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	
€ 52,632,590.87	€ 53,685,242.69	€ 54,758,947.54	€ 55,854,126.49	€ 56,971,209.02	€ 58,110,633.20	€ 59,272,845.87	€ 60,458,302.79	€ 61,667,468.84	€ 62,900,818.22	€ 64,158,834.58	€ 65,442,011.27	€ 66,750,851.50	€ 68,085,868.53	€ -
€ 25,775,705.81	€ 26,291,219.93	€ 26,817,044.33	€ 27,353,385.21	€ 27,900,452.92	€ 28,458,461.97	€ 29,027,631.21	€ 29,608,183.84	€ 30,200,347.52	€ 30,804,354.47	€ 31,420,441.55	€ 32,048,850.39	€ 32,689,827.39	€ 33,343,623.94	-€ 240,000,000.00
€ 629,352,570.06	€ 603,576,864.25	€ 577,285,644.32	€ 550,468,600.00	€ 523,115,214.78	€ 495,214,761.87	€ 466,756,299.89	€ 437,728,668.68	€ 410,370,626.89	€ 384,722,462.71	€ 360,677,308.79	€ 338,134,976.99	€ 317,001,540.93	€ 297,188,944.62	€ 278,614,635.58
€ 25,775,705.81	€ 26,291,219.93	€ 26,817,044.33	€ 27,353,385.21	€ 27,900,452.92	€ 28,458,461.97	€ 29,027,631.21	€ 27,358,041.79	€ 25,648,164.18	€ 24,045,153.92	€ 22,542,331.80	€ 21,133,436.06	€ 19,812,596.31	€ 18,574,309.04	-€ 240,000,000.00
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 2,250,142.05	€ 4,552,183.33	€ 6,759,200.55	€ 8,878,109.76	€ 10,915,414.32	€ 12,877,231.09	€ 14,769,314.90	€ -
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 671,217.37	€ 1,357,916.29	€ 2,016,269.52	€ 2,648,340.14	€ 3,256,068.09	€ 3,841,278.03	€ 4,405,686.64	€ -
€ 25,775,705.81	€ 26,291,219.93	€ 26,817,044.33	€ 27,353,385.21	€ 27,900,452.92	€ 28,458,461.97	€ 29,027,631.21	€ 28,936,966.47	€ 28,842,431.23	€ 28,788,084.94	€ 28,772,101.41	€ 28,792,782.29	€ 28,848,549.36	€ 28,937,937.31	-€ 240,000,000.00

Table 39 - Nordsee Ost IRR Calculations

Wind farm Name	Nordsee Ost, DE	
Start-up Year	2015	
Country	Germany	
Investment Euro	1300	Million Euro
Wind Farm Capacity	295	MW
Load Factors	45%	
Electricity price in 2020	35	Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation %	6.3%
OPEX share of Capex	2%
Tax %	30%
Subsidy (yes=1, no=0)	1
Abex share of CAPEX	20%

NPV	-€	90,739,276
IRR		4.3%

Goal-seek Breakeven	35	Euro/MWh

Fixed price subsidy Euro/MWh (in start-up year)	0	Euro/MWh
Feed-in tariff	194	Euro/MWh
Tariff duration	10	Years
Reduced Tariff	39	Euro/MWh
Financing	1	
Interest Rate	3.0%	
Payment time	15	
Debt/Equity Ratio	80%	
Interest tax deductability (max of EBIDTA)	30%	

Year		0	1	2	3	4	5	6	7	8	9	10
CAPEX	Euro	-€ 1,300,000,000.00										
OPEX	Euro		-€ 23,868,000.00	-€ 24,345,360.00	-€ 24,832,267.20	-€ 25,328,912.54	-€ 25,835,490.79	-€ 26,352,200.61	-€ 26,879,244.62	-€ 27,416,829.52	-€ 27,965,166.11	-€ 28,524,469.43
ABEX												
Electricity	MWh		1,163,678	1,163,678	1,163,678	1,163,678	1,163,678	1,163,678	1,163,678	1,163,678	1,163,678	1,163,678
Power Price	Euro/MWh		€ 31.70	€ 32.33	€ 32.98	€ 33.64	€ 34.31	€ 35.00	€ 35.70	€ 36.41	€ 37.14	€ 37.89
Feed-in tariff	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Price received	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Revenue	Euro	€ -	€ 225,753,613.10	€ 225,753,613.10	€ 225,753,613.10	€ 225,753,613.10	€ 225,753,613.10	€ 225,753,613.10	€ 225,753,613.10	€ 225,753,613.10	€ 225,753,613.10	€ 225,753,613.10
EBIDTA	Euro	-€ 1,300,000,000.00	€ 201,885,613.10	€ 201,408,253.10	€ 200,921,345.90	€ 200,424,700.56	€ 199,918,122.31	€ 199,401,412.49	€ 198,874,368.48	€ 198,336,783.59	€ 197,788,446.99	€ 197,229,143.67
Book Value capex	Euro	€ 1,300,000,000.00	€ 1,300,000,000.00	€ 1,218,750,000.00	€ 1,142,578,125.00	€ 1,071,166,992.19	€ 1,004,219,055.18	€ 941,455,364.23	€ 882,614,403.96	€ 827,451,003.71	€ 775,735,315.98	€ 727,251,858.73
Depreciation	Euro		€ 81,250,000.00	€ 76,171,875.00	€ 71,411,132.81	€ 66,947,937.01	€ 62,763,690.95	€ 58,840,960.26	€ 55,163,400.25	€ 51,715,687.73	€ 48,483,457.25	€ 45,453,241.17
Taxable Income	Euro	€ -	€ 120,635,613.10	€ 125,236,378.10	€ 129,510,213.09	€ 133,476,763.55	€ 137,154,431.36	€ 140,560,452.23	€ 143,710,968.23	€ 146,621,095.85	€ 149,304,989.75	€ 151,775,902.50
Corporate Taxes	Euro	€ -	€ 35,985,603.39	€ 37,358,011.59	€ 38,632,896.56	€ 39,816,118.57	€ 40,913,166.87	€ 41,929,182.90	€ 42,868,981.82	€ 43,737,072.89	€ 44,537,678.44	€ 45,274,751.72
Income	Euro	-€ 1,300,000,000.00	€ 165,900,009.71	€ 164,050,241.51	€ 162,288,449.34	€ 160,608,581.99	€ 159,004,955.43	€ 157,472,229.59	€ 156,005,386.65	€ 154,599,710.69	€ 153,250,768.55	€ 151,954,391.96

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 29,094,958.82	-€ 29,676,857.99	-€ 30,270,395.15	-€ 30,875,803.06	-€ 31,493,319.12	-€ 32,123,185.50	-€ 32,765,649.21	-€ 33,420,962.19	-€ 34,089,381.44	-€ 34,771,169.07	-€ 35,466,592.45	-€ 36,175,924.30	-€ 36,899,442.78	-€ 37,637,431.64	
														-€ 260,000,000.00
1,163,678	1,163,678	1,163,678	1,163,678	1,163,678	1,163,678	1,163,678	1,163,678	1,163,678	1,163,678	1,163,678	1,163,678	1,163,678	1,163,678	
€ 38.64	€ 39.42	€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	
€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	
€ 38.64	€ 39.42	€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	
€ 44,967,825.09	€ 45,867,181.59	€ 46,784,525.22	€ 47,720,215.72	€ 48,674,620.04	€ 49,648,112.44	€ 50,641,074.69	€ 51,653,896.18	€ 52,686,974.11	€ 53,740,713.59	€ 54,815,527.86	€ 55,911,838.42	€ 57,030,075.18	€ 58,170,676.69	€ -
€ 15,872,866.27	€ 16,190,323.60	€ 16,514,130.07	€ 16,844,412.67	€ 17,181,300.92	€ 17,524,926.94	€ 17,875,425.48	€ 18,232,933.99	€ 18,597,592.67	€ 18,969,544.52	€ 19,348,935.41	€ 19,735,914.12	€ 20,130,632.40	€ 20,533,245.05	-€ 260,000,000.00
€ 681,798,617.56	€ 665,925,751.29	€ 649,735,427.70	€ 633,221,297.63	€ 616,376,884.96	€ 599,195,584.04	€ 581,670,657.10	€ 563,795,231.62	€ 545,562,297.63	€ 526,964,704.97	€ 507,995,160.44	€ 488,646,225.03	€ 468,910,310.91	€ 448,779,678.51	€ 428,246,433.46
€ 15,872,866.27	€ 16,190,323.60	€ 16,514,130.07	€ 16,844,412.67	€ 17,181,300.92	€ 17,524,926.94	€ 17,875,425.48	€ 18,232,933.99	€ 18,597,592.67	€ 18,969,544.52	€ 19,348,935.41	€ 19,735,914.12	€ 20,130,632.40	€ 20,533,245.05	-€ 260,000,000.00
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
€ 15,872,866.27	€ 16,190,323.60	€ 16,514,130.07	€ 16,844,412.67	€ 17,181,300.92	€ 17,524,926.94	€ 17,875,425.48	€ 18,232,933.99	€ 18,597,592.67	€ 18,969,544.52	€ 19,348,935.41	€ 19,735,914.12	€ 20,130,632.40	€ 20,533,245.05	-€ 260,000,000.00

Table 40 - Sandbank IRR Calculations

Wind farm Name	Sandbank, DE	
Start-up Year	2017	
Country	Germany	
Investment Euro	1200	Million Euro
Wind Farm Capacity	302	MW
Load Factors	45%	
Electricity price in 2020	35	Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation %	6.3%
OPEX share of Capex	2%
Tax %	30%
Subsidy (yes=1, no=0)	1
Abex share of CAPEX	20%

NPV	€	61,758,565
IRR		7.1%

Goal-seek Breakeven	35	Euro/MWh

Fixed price subsidy Euro/MWh (in start-up year)	0	Euro/MWh
Feed-in tariff	194	Euro/MWh
Tariff duration	10	Years
Reduced Tariff	39	Euro/MWh
Financing	1	
Interest Rate	3.0%	
Payment time	15	
Debt/Equity Ratio	80%	
Interest tax deductability (max of EBIDTA)	30%	

	Year	0	1	2	3	4	5	6	7	8	9	10
CAPEX	Euro	-€ 1,200,000,000.00										
OPEX	Euro		-€ 22,032,000.00	-€ 22,472,640.00	-€ 22,922,092.80	-€ 23,380,534.66	-€ 23,848,145.35	-€ 24,325,108.26	-€ 24,811,610.42	-€ 25,307,842.63	-€ 25,813,999.48	-€ 26,330,279.47
ABEX												
Electricity	MWh		1,192,061	1,192,061	1,192,061	1,192,061	1,192,061	1,192,061	1,192,061	1,192,061	1,192,061	1,192,061
Power Price	Euro/MWh		€ 32.98	€ 33.64	€ 34.31	€ 35.00	€ 35.70	€ 36.41	€ 37.14	€ 37.89	€ 38.64	€ 39.42
Feed-in tariff	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Price received	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Revenue	Euro	€ -	€ 231,259,784.70	€ 231,259,784.70	€ 231,259,784.70	€ 231,259,784.70	€ 231,259,784.70	€ 231,259,784.70	€ 231,259,784.70	€ 231,259,784.70	€ 231,259,784.70	€ 231,259,784.70
EBIDTA	Euro	-€ 1,200,000,000.00	€ 209,227,784.70	€ 208,787,144.70	€ 208,337,691.90	€ 207,879,250.04	€ 207,411,639.35	€ 206,934,676.44	€ 206,448,174.28	€ 205,951,942.07	€ 205,445,785.22	€ 204,929,505.23
Book Value capex	Euro	€ 1,200,000,000.00	€ 1,200,000,000.00	€ 1,125,000,000.00	€ 1,054,687,500.00	€ 988,769,531.25	€ 926,971,435.55	€ 869,035,720.83	€ 814,720,988.27	€ 763,800,926.51	€ 716,063,368.60	€ 671,309,408.06
Depreciation	Euro		€ 75,000,000.00	€ 70,312,500.00	€ 65,917,968.75	€ 61,798,095.70	€ 57,935,714.72	€ 54,314,732.55	€ 50,920,061.77	€ 47,737,557.91	€ 44,753,960.54	€ 41,956,838.00
Taxable Income	Euro	€ -	€ 134,227,784.70	€ 138,474,644.70	€ 142,419,723.15	€ 146,081,154.34	€ 149,475,924.63	€ 152,619,943.89	€ 155,528,112.51	€ 158,214,384.16	€ 160,691,824.68	€ 162,972,667.22
Corporate Taxes	Euro	€ -	€ 40,040,148.18	€ 41,306,986.51	€ 42,483,803.41	€ 43,576,008.34	€ 44,588,668.32	€ 45,526,529.26	€ 46,394,035.96	€ 47,195,350.80	€ 47,934,371.30	€ 48,614,746.63
Income	Euro	-€ 1,200,000,000.00	€ 169,187,636.52	€ 167,480,158.18	€ 165,853,888.48	€ 164,303,241.70	€ 162,822,971.03	€ 161,408,147.18	€ 160,054,138.31	€ 158,756,591.27	€ 157,511,413.91	€ 156,314,758.59

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 26,856,885.06	-€ 27,394,022.76	-€ 27,941,903.22	-€ 28,500,741.28	-€ 29,070,756.11	-€ 29,652,171.23	-€ 30,245,214.65	-€ 30,850,118.95	-€ 31,467,121.33	-€ 32,096,463.75	-€ 32,738,393.03	-€ 33,393,160.89	-€ 34,061,024.11	-€ 34,742,244.59	
														-€ 240,000,000.00
1,192,061	1,192,061	1,192,061	1,192,061	1,192,061	1,192,061	1,192,061	1,192,061	1,192,061	1,192,061	1,192,061	1,192,061	1,192,061	1,192,061	
€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	
€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	
€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	
€ 47,925,608.28	€ 48,884,120.45	€ 49,861,802.86	€ 50,859,038.91	€ 51,876,219.69	€ 52,913,744.08	€ 53,972,018.97	€ 55,051,459.35	€ 56,152,488.53	€ 57,275,538.30	€ 58,421,049.07	€ 59,589,470.05	€ 60,781,259.45	€ 61,996,884.64	€ -
€ 21,068,723.22	€ 21,490,097.68	€ 21,919,899.64	€ 22,358,297.63	€ 22,805,463.58	€ 23,261,572.85	€ 23,726,804.31	€ 24,201,340.40	€ 24,685,367.21	€ 25,179,074.55	€ 25,682,656.04	€ 26,196,309.16	€ 26,720,235.35	€ 27,254,640.05	-€ 240,000,000.00
€ 629,352,570.06	€ 608,283,846.84	€ 586,793,749.15	€ 564,873,849.52	€ 542,515,551.89	€ 519,710,088.30	€ 496,448,515.45	€ 472,721,711.14	€ 448,520,370.74	€ 423,835,003.53	€ 398,655,928.98	€ 373,739,933.42	€ 350,381,187.58	€ 328,482,363.36	€ 307,952,215.65
€ 21,068,723.22	€ 21,490,097.68	€ 21,919,899.64	€ 22,358,297.63	€ 22,805,463.58	€ 23,261,572.85	€ 23,726,804.31	€ 24,201,340.40	€ 24,685,367.21	€ 25,179,074.55	€ 24,915,995.36	€ 23,358,745.84	€ 21,898,824.22	€ 20,530,147.71	-€ 240,000,000.00
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 766,660.48	€ 2,837,563.32	€ 4,821,411.12	€ 6,724,492.34	€ -
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 228,694.82	€ 846,445.14	€ 1,438,226.94	€ 2,005,916.07	€ -
€ 21,068,723.22	€ 21,490,097.68	€ 21,919,899.64	€ 22,358,297.63	€ 22,805,463.58	€ 23,261,572.85	€ 23,726,804.31	€ 24,201,340.40	€ 24,685,367.21	€ 25,179,074.55	€ 25,453,961.22	€ 25,349,864.02	€ 25,282,008.41	€ 25,248,723.99	-€ 240,000,000.00

Table 41 - Trianel Windpark Borkum I IRR Calculations

Wind farm Name	Trianel Windpark Borkum I, DE	
Start-up Year	2015	
Country	Germany	
Investment Euro	1011	Million Euro
Wind Farm Capacity	200	MW
Load Factors	45%	
Electricity price in 2020	35	Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation %	6.3%
OPEX share of Capex	2%
Tax %	30%
Subsidy (yes=1, no=0)	1
Abex share of CAPEX	20%

NPV	-€	206,015,381
IRR		-0.5%
Goal-seek Breakeven		35 Euro/MWh

Fixed price subsidy Euro/MWh (in start-up year)	0	Euro/MWh
Feed-in tariff	194	Euro/MWh
Tariff duration	10	Years
Reduced Tariff	39	Euro/MWh
Financing	1	
Interest Rate	3.0%	
Payment time	15	
Debt/Equity Ratio	80%	
Interest tax deductability (max of EBIDTA)	30%	

	Year	0	1	2	3	4	5	6	7	8	9	10
CAPEX	Euro	-€ 1,011,494,252.87										
OPEX	Euro		-€ 18,571,034.48	-€ 18,942,455.17	-€ 19,321,304.28	-€ 19,707,730.36	-€ 20,101,884.97	-€ 20,503,922.67	-€ 20,914,001.12	-€ 21,332,281.14	-€ 21,758,926.77	-€ 22,194,105.30
ABEX												
Electricity	MWh		788,400	788,400	788,400	788,400	788,400	788,400	788,400	788,400	788,400	788,400
Power Price	Euro/MWh		€ 31.70	€ 32.33	€ 32.98	€ 33.64	€ 34.31	€ 35.00	€ 35.70	€ 36.41	€ 37.14	€ 37.89
Feed-in tariff	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Price received	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Revenue	Euro	€ -	€ 152,949,600.00	€ 152,949,600.00	€ 152,949,600.00	€ 152,949,600.00	€ 152,949,600.00	€ 152,949,600.00	€ 152,949,600.00	€ 152,949,600.00	€ 152,949,600.00	€ 152,949,600.00
EBIDTA	Euro	-€ 1,011,494,252.87	€ 134,378,565.52	€ 134,007,144.83	€ 133,628,295.72	€ 133,241,869.64	€ 132,847,715.03	€ 132,445,677.33	€ 132,035,598.88	€ 131,617,318.86	€ 131,190,673.23	€ 130,755,494.70
Book Value capex	Euro	€ 1,011,494,252.87	€ 1,011,494,252.87	€ 948,275,862.07	€ 889,008,620.69	€ 833,445,581.90	€ 781,355,233.03	€ 732,520,530.96	€ 686,737,997.78	€ 643,816,872.92	€ 603,578,318.36	€ 565,854,673.46
Depreciation	Euro		€ 63,218,390.80	€ 59,267,241.38	€ 55,563,038.79	€ 52,090,348.87	€ 48,834,702.06	€ 45,782,533.19	€ 42,921,124.86	€ 40,238,554.56	€ 37,723,644.90	€ 35,365,917.09
Taxable Income	Euro	€ -	€ 71,160,174.71	€ 74,739,903.45	€ 78,065,256.93	€ 81,151,520.77	€ 84,013,012.97	€ 86,663,144.15	€ 89,114,474.02	€ 91,378,764.30	€ 93,467,028.34	€ 95,389,577.61
Corporate Taxes	Euro	€ -	€ 21,227,080.12	€ 22,294,913.20	€ 23,286,866.14	€ 24,207,498.65	€ 25,061,081.77	€ 25,851,615.90	€ 26,582,847.60	€ 27,258,285.39	€ 27,881,214.55	€ 28,454,711.00
Income	Euro	-€ 1,011,494,252.87	€ 113,151,485.40	€ 111,712,231.63	€ 110,341,429.58	€ 109,034,370.99	€ 107,786,633.26	€ 106,594,061.43	€ 105,452,751.28	€ 104,359,033.47	€ 103,309,458.68	€ 102,300,783.70

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 22,637,987.41	-€ 23,090,747.16	-€ 23,552,562.10	-€ 24,023,613.34	-€ 24,504,085.61	-€ 24,994,167.32	-€ 25,494,050.67	-€ 26,003,931.68	-€ 26,524,010.31	-€ 27,054,490.52	-€ 27,595,580.33	-€ 28,147,491.94	-€ 28,710,441.78	-€ 29,284,650.61	
														-€ 202,298,850.57
788,400	788,400	788,400	788,400	788,400	788,400	788,400	788,400	788,400	788,400	788,400	788,400	788,400	788,400	
€ 38.64	€ 39.42	€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	
€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	
€ 38.64	€ 39.42	€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	
€ 30,466,005.68	€ 31,075,325.80	€ 31,696,832.31	€ 32,330,768.96	€ 32,977,384.34	€ 33,636,932.03	€ 34,309,670.67	€ 34,995,864.08	€ 35,695,781.36	€ 36,409,696.99	€ 37,137,890.93	€ 37,880,648.75	€ 38,638,261.72	€ 39,411,026.96	€ -
€ 7,828,018.28	€ 7,984,578.64	€ 8,144,270.21	€ 8,307,155.62	€ 8,473,298.73	€ 8,642,764.71	€ 8,815,620.00	€ 8,991,932.40	€ 9,171,771.05	€ 9,355,206.47	€ 9,542,310.60	€ 9,733,156.81	€ 9,927,819.95	€ 10,126,376.34	-€ 202,298,850.57
€ 530,488,756.37	€ 522,660,738.10	€ 514,676,159.45	€ 506,531,889.24	€ 498,224,733.62	€ 489,751,434.89	€ 481,108,670.19	€ 472,293,050.19	€ 463,301,117.79	€ 454,129,346.74	€ 444,774,140.27	€ 435,231,829.68	€ 425,498,672.87	€ 415,570,852.92	€ 405,444,476.58
€ 7,828,018.28	€ 7,984,578.64	€ 8,144,270.21	€ 8,307,155.62	€ 8,473,298.73	€ 8,642,764.71	€ 8,815,620.00	€ 8,991,932.40	€ 9,171,771.05	€ 9,355,206.47	€ 9,542,310.60	€ 9,733,156.81	€ 9,927,819.95	€ 10,126,376.34	-€ 202,298,850.57
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
€ 7,828,018.28	€ 7,984,578.64	€ 8,144,270.21	€ 8,307,155.62	€ 8,473,298.73	€ 8,642,764.71	€ 8,815,620.00	€ 8,991,932.40	€ 9,171,771.05	€ 9,355,206.47	€ 9,542,310.60	€ 9,733,156.81	€ 9,927,819.95	€ 10,126,376.34	-€ 202,298,850.57

Table 42 - Trianel Windpark Borkum II IRR Calculations

Wind farm Name	Trianel Windpark Borkum II, DE	
Start-up Year	2020	
Country	Germany	
Investment Euro	817	Million Euro
Wind Farm Capacity	203	MW
Load Factors	45%	
Electricity price in 2020	35	Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation %	6.3%
OPEX share of Capex	2%
Tax %	30%
Subsidy (yes=1, no=0)	1
Abex share of CAPEX	20%

NPV	-€	2,569,727
IRR		5.9%

Goal-seek Breakeven	35	Euro/MWh

Fixed price subsidy Euro/MWh (in start-up year)	0	Euro/MWh
Feed-in tariff	184	Euro/MWh
Tariff duration	10	Years
Reduced Tariff	39	Euro/MWh
Financing	1	
Interest Rate	3.0%	
Payment time	15	
Debt/Equity Ratio	80%	
Interest tax deductability (max of EBIDTA)	30%	

	Year	0	1	2	3	4	5	6	7	8	9	10
CAPEX	Euro	-€ 817,241,379.31										
OPEX	Euro		-€ 15,004,551.72	-€ 15,304,642.76	-€ 15,610,735.61	-€ 15,922,950.33	-€ 16,241,409.33	-€ 16,566,237.52	-€ 16,897,562.27	-€ 17,235,513.52	-€ 17,580,223.79	-€ 17,931,828.26
ABEX												
Electricity	MWh		798,492	798,492	798,492	798,492	798,492	798,492	798,492	798,492	798,492	798,492
Power Price	Euro/MWh		€ 35.00	€ 35.70	€ 36.41	€ 37.14	€ 37.89	€ 38.64	€ 39.42	€ 40.20	€ 41.01	€ 41.83
Feed-in tariff	Euro/MWh		€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00
Price received	Euro/MWh		€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00	€ 184.00
Revenue	Euro	€ -	€ 146,922,437.91	€ 146,922,437.91	€ 146,922,437.91	€ 146,922,437.91	€ 146,922,437.91	€ 146,922,437.91	€ 146,922,437.91	€ 146,922,437.91	€ 146,922,437.91	€ 146,922,437.91
EBIDTA	Euro	-€ 817,241,379.31	€ 131,917,886.19	€ 131,617,795.15	€ 131,311,702.30	€ 130,999,487.58	€ 130,681,028.58	€ 130,356,200.39	€ 130,024,875.64	€ 129,686,924.39	€ 129,342,214.12	€ 128,990,609.65
Book Value capex	Euro	€ 817,241,379.31	€ 817,241,379.31	€ 766,163,793.10	€ 718,278,556.03	€ 673,386,146.28	€ 631,299,512.14	€ 591,843,292.63	€ 554,853,086.84	€ 520,174,768.91	€ 487,663,845.86	€ 457,184,855.49
Depreciation	Euro		€ 51,077,586.21	€ 47,885,237.07	€ 44,892,409.75	€ 42,086,634.14	€ 39,456,219.51	€ 36,990,205.79	€ 34,678,317.93	€ 32,510,923.06	€ 30,478,990.37	€ 28,574,053.47
Taxable Income	Euro	€ -	€ 80,840,299.98	€ 83,732,558.08	€ 86,419,292.54	€ 88,912,853.44	€ 91,224,809.07	€ 93,365,994.60	€ 95,346,557.71	€ 97,176,001.34	€ 98,863,223.76	€ 100,416,556.18
Corporate Taxes	Euro	€ -	€ 24,114,661.48	€ 24,977,422.08	€ 25,778,874.97	€ 26,522,704.18	€ 27,212,360.54	€ 27,851,076.19	€ 28,441,878.17	€ 28,987,601.20	€ 29,490,899.65	€ 29,954,258.71
Income	Euro	-€ 817,241,379.31	€ 107,803,224.70	€ 106,640,373.07	€ 105,532,827.33	€ 104,476,783.40	€ 103,468,668.03	€ 102,505,124.20	€ 101,582,997.47	€ 100,699,323.20	€ 99,851,314.48	€ 99,036,350.94

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 18,290,464.83	-€ 18,656,274.12	-€ 19,029,399.61	-€ 19,409,987.60	-€ 19,798,187.35	-€ 20,194,151.10	-€ 20,598,034.12	-€ 21,009,994.80	-€ 21,430,194.70	-€ 21,858,798.59	-€ 22,295,974.56	-€ 22,741,894.05	-€ 23,196,731.93	-€ 23,660,666.57	
														-€ 163,448,275.86
798,492	798,492	798,492	798,492	798,492	798,492	798,492	798,492	798,492	798,492	798,492	798,492	798,492	798,492	
€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	€ 53.05	€ 54.11	€ 55.19	
€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	
€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	€ 53.05	€ 54.11	€ 55.19	
€ 34,067,484.34	€ 34,748,834.03	€ 35,443,810.71	€ 36,152,686.93	€ 36,875,740.66	€ 37,613,255.48	€ 38,365,520.59	€ 39,132,831.00	€ 39,915,487.62	€ 40,713,797.37	€ 41,528,073.32	€ 42,358,634.79	€ 43,205,807.48	€ 44,069,923.63	€ -
€ 15,777,019.52	€ 16,092,559.91	€ 16,414,411.11	€ 16,742,699.33	€ 17,077,553.32	€ 17,419,104.38	€ 17,767,486.47	€ 18,122,836.20	€ 18,485,292.92	€ 18,854,998.78	€ 19,232,098.76	€ 19,616,740.73	€ 20,009,075.55	€ 20,409,257.06	-€ 163,448,275.86
€ 428,610,802.02	€ 412,833,782.50	€ 396,741,222.60	€ 380,326,811.49	€ 363,584,112.16	€ 346,506,558.84	€ 329,087,454.46	€ 311,319,967.99	€ 293,197,131.79	€ 274,872,311.06	€ 257,692,791.62	€ 241,586,992.14	€ 226,487,805.13	€ 212,332,317.31	€ 199,061,547.48
€ 15,777,019.52	€ 16,092,559.91	€ 16,414,411.11	€ 16,742,699.33	€ 17,077,553.32	€ 17,419,104.38	€ 17,767,486.47	€ 18,122,836.20	€ 18,324,820.74	€ 17,179,519.44	€ 16,105,799.48	€ 15,099,187.01	€ 14,155,487.82	€ 13,270,769.83	-€ 163,448,275.86
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 160,472.19	€ 1,675,479.34	€ 3,126,299.28	€ 4,517,553.72	€ 5,853,587.73	€ 7,138,487.23	€ -
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 47,868.85	€ 499,795.49	€ 932,575.08	€ 1,347,586.28	€ 1,746,125.22	€ 2,129,410.74	€ -
€ 15,777,019.52	€ 16,092,559.91	€ 16,414,411.11	€ 16,742,699.33	€ 17,077,553.32	€ 17,419,104.38	€ 17,767,486.47	€ 18,122,836.20	€ 18,437,424.07	€ 18,355,203.29	€ 18,299,523.68	€ 18,269,154.46	€ 18,262,950.33	€ 18,279,846.32	-€ 163,448,275.86

Table 43 - Veja Mate IRR Calculations

Wind farm Name	Veja Mate, DE	
Start-up Year	2017	
Country	Germany	
Investment Euro	1900	Million Euro
Wind Farm Capacity	402	MW
Load Factors	45%	
Electricity price in 2020	35	Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation %	6.3%
OPEX share of Capex	2%
Tax %	30%
Subsidy (yes=1, no=0)	1
Abex share of CAPEX	20%

NPV	-€	253,367,365
IRR		2.6%

Goal-seek Breakeven	33	Euro/MWh

Fixed price subsidy Euro/MWh (in start-up year)	0	Euro/MWh
Feed-in tariff	194	Euro/MWh
Tariff duration	10	Years
Reduced Tariff	39	Euro/MWh
Financing	1	
Interest Rate	3.0%	
Payment time	15	
Debt/Equity Ratio	80%	
Interest tax deductability (max of EBIDTA)	30%	

Year		0	1	2	3	4	5	6	7	8	9	10
CAPEX	Euro	-€ 1,900,000,000.00										
OPEX	Euro		-€ 34,884,000.00	-€ 35,581,680.00	-€ 36,293,313.60	-€ 37,019,179.87	-€ 37,759,563.47	-€ 38,514,754.74	-€ 39,285,049.83	-€ 40,070,750.83	-€ 40,872,165.85	-€ 41,689,609.16
ABEX												
Electricity	MWh		1,584,684	1,584,684	1,584,684	1,584,684	1,584,684	1,584,684	1,584,684	1,584,684	1,584,684	1,584,684
Power Price	Euro/MWh		€ 32.98	€ 33.64	€ 34.31	€ 35.00	€ 35.70	€ 36.41	€ 37.14	€ 37.89	€ 38.64	€ 39.42
Feed-in tariff	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Price received	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Revenue	Euro	€ -	€ 307,428,696.00	€ 307,428,696.00	€ 307,428,696.00	€ 307,428,696.00	€ 307,428,696.00	€ 307,428,696.00	€ 307,428,696.00	€ 307,428,696.00	€ 307,428,696.00	€ 307,428,696.00
EBIDTA	Euro	-€ 1,900,000,000.00	€ 272,544,696.00	€ 271,847,016.00	€ 271,135,382.40	€ 270,409,516.13	€ 269,669,132.53	€ 268,913,941.26	€ 268,143,646.17	€ 267,357,945.17	€ 266,556,530.15	€ 265,739,086.84
Book Value capex	Euro	€ 1,900,000,000.00	€ 1,900,000,000.00	€ 1,781,250,000.00	€ 1,669,921,875.00	€ 1,565,551,757.81	€ 1,467,704,772.95	€ 1,375,973,224.64	€ 1,289,974,898.10	€ 1,209,351,466.97	€ 1,133,767,000.28	€ 1,062,906,562.77
Depreciation	Euro		€ 118,750,000.00	€ 111,328,125.00	€ 104,370,117.19	€ 97,846,984.86	€ 91,731,548.31	€ 85,998,326.54	€ 80,623,431.13	€ 75,584,466.69	€ 70,860,437.52	€ 66,431,660.17
Taxable Income	Euro	€ -	€ 153,794,696.00	€ 160,518,891.00	€ 166,765,265.21	€ 172,562,531.26	€ 177,937,584.22	€ 182,915,614.72	€ 187,520,215.04	€ 191,773,478.48	€ 195,696,092.64	€ 199,307,426.66
Corporate Taxes	Euro	€ -	€ 45,876,957.82	€ 47,882,785.19	€ 49,746,078.61	€ 51,475,403.08	€ 53,078,781.37	€ 54,563,727.87	€ 55,937,280.14	€ 57,206,028.63	€ 58,376,144.43	€ 59,453,405.37
Income	Euro	-€ 1,900,000,000.00	€ 226,667,738.18	€ 223,964,230.81	€ 221,389,303.79	€ 218,934,113.05	€ 216,590,351.16	€ 214,350,213.39	€ 212,206,366.02	€ 210,151,916.54	€ 208,180,385.72	€ 206,285,681.46

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 42,523,401.35	-€ 43,373,869.37	-€ 44,241,346.76	-€ 45,126,173.70	-€ 46,028,697.17	-€ 46,949,271.11	-€ 47,888,256.54	-€ 48,846,021.67	-€ 49,822,942.10	-€ 50,819,400.94	-€ 51,835,788.96	-€ 52,872,504.74	-€ 53,929,954.84	-€ 55,008,553.93	
														-€ 380,000,000.00
1,584,684	1,584,684	1,584,684	1,584,684	1,584,684	1,584,684	1,584,684	1,584,684	1,584,684	1,584,684	1,584,684	1,584,684	1,584,684	1,584,684	
€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	
€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	
€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	
€ 63,710,632.95	€ 64,984,845.61	€ 66,284,542.52	€ 67,610,233.37	€ 68,962,438.04	€ 70,341,686.80	€ 71,748,520.54	€ 73,183,490.95	€ 74,647,160.76	€ 76,140,103.98	€ 77,662,906.06	€ 79,216,164.18	€ 80,800,487.46	€ 82,416,497.21	€ -
€ 21,187,231.60	€ 21,610,976.23	€ 22,043,195.76	€ 22,484,059.67	€ 22,933,740.87	€ 23,392,415.69	€ 23,860,264.00	€ 24,337,469.28	€ 24,824,218.66	€ 25,320,703.04	€ 25,827,117.10	€ 26,343,659.44	€ 26,870,532.63	€ 27,407,943.28	-€ 380,000,000.00
€ 996,474,902.59	€ 975,287,670.99	€ 953,676,694.76	€ 931,633,499.00	€ 909,149,439.32	€ 886,215,698.46	€ 862,823,282.77	€ 838,963,018.77	€ 814,625,549.49	€ 789,801,330.83	€ 764,480,627.79	€ 738,653,510.69	€ 712,309,851.25	€ 685,439,318.62	€ 658,031,375.34
€ 21,187,231.60	€ 21,610,976.23	€ 22,043,195.76	€ 22,484,059.67	€ 22,933,740.87	€ 23,392,415.69	€ 23,860,264.00	€ 24,337,469.28	€ 24,824,218.66	€ 25,320,703.04	€ 25,827,117.10	€ 26,343,659.44	€ 26,870,532.63	€ 27,407,943.28	-€ 380,000,000.00
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -
€ 21,187,231.60	€ 21,610,976.23	€ 22,043,195.76	€ 22,484,059.67	€ 22,933,740.87	€ 23,392,415.69	€ 23,860,264.00	€ 24,337,469.28	€ 24,824,218.66	€ 25,320,703.04	€ 25,827,117.10	€ 26,343,659.44	€ 26,870,532.63	€ 27,407,943.28	-€ 380,000,000.00

Table 44 - WIkinger IRR Calculations

Wind farm Name	Wikinger, DE	
Start-up Year	2017	
Country	Germany	
Investment Euro	1400	Million Euro
Wind Farm Capacity	354	MW
Load Factors	45%	
Electricity price in 2020	35	Euro/MWh

Inflation	2.00%
Discount Rate	6.00%
Depreciation %	6.3%
OPEX share of Capex	2%
Tax %	30%
Subsidy (yes=1, no=0)	1
Abex share of CAPEX	20%

NPV	€	75,204,965
IRR		7.1%

Goal-seek Breakeven	35	Euro/MWh

Fixed price subsidy Euro/MWh (in start-up year)	0	Euro/MWh
Feed-in tariff	194	Euro/MWh
Tariff duration	10	Years
Reduced Tariff	39	Euro/MWh
Financing	1	
Interest Rate	3.0%	
Payment time	15	
Debt/Equity Ratio	80%	
Interest tax deductability (max of EBIDTA)	30%	

	Year	0	1	2	3	4	5	6	7	8	9	10
CAPEX	Euro	-€ 1,400,000,000.00										
OPEX	Euro		-€ 25,704,000.00	-€ 26,218,080.00	-€ 26,742,441.60	-€ 27,277,290.43	-€ 27,822,836.24	-€ 28,379,292.97	-€ 28,946,878.82	-€ 29,525,816.40	-€ 30,116,332.73	-€ 30,718,659.38
ABEX												
Electricity	MWh		1,393,497	1,393,497	1,393,497	1,393,497	1,393,497	1,393,497	1,393,497	1,393,497	1,393,497	1,393,497
Power Price	Euro/MWh		€ 32.98	€ 33.64	€ 34.31	€ 35.00	€ 35.70	€ 36.41	€ 37.14	€ 37.89	€ 38.64	€ 39.42
Feed-in tariff	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Price received	Euro/MWh		€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00	€ 194.00
Revenue	Euro	€ -	€ 270,338,428.21	€ 270,338,428.21	€ 270,338,428.21	€ 270,338,428.21	€ 270,338,428.21	€ 270,338,428.21	€ 270,338,428.21	€ 270,338,428.21	€ 270,338,428.21	€ 270,338,428.21
EBIDTA	Euro	-€ 1,400,000,000.00	€ 244,634,428.21	€ 244,120,348.21	€ 243,595,986.61	€ 243,061,137.78	€ 242,515,591.97	€ 241,959,135.25	€ 241,391,549.39	€ 240,812,611.81	€ 240,222,085.48	€ 239,619,768.83
Book Value capex	Euro	€ 1,400,000,000.00	€ 1,400,000,000.00	€ 1,312,500,000.00	€ 1,230,468,750.00	€ 1,153,564,453.13	€ 1,081,466,674.80	€ 1,013,875,007.63	€ 950,507,819.65	€ 891,101,080.92	€ 835,407,263.37	€ 783,194,309.41
Depreciation	Euro		€ 87,500,000.00	€ 82,031,250.00	€ 76,904,296.88	€ 72,097,778.32	€ 67,591,667.18	€ 63,367,187.98	€ 59,406,738.73	€ 55,693,817.56	€ 52,212,953.96	€ 48,949,644.34
Taxable Income	Euro	€ -	€ 157,134,428.21	€ 162,089,098.21	€ 166,691,689.74	€ 170,963,359.46	€ 174,923,924.79	€ 178,591,947.27	€ 181,984,810.66	€ 185,118,794.25	€ 188,009,141.52	€ 190,670,124.49
Corporate Taxes	Euro	€ -	€ 46,873,199.94	€ 48,351,178.00	€ 49,724,131.05	€ 50,998,370.13	€ 52,179,806.77	€ 53,273,977.87	€ 54,286,069.02	€ 55,220,936.33	€ 56,083,126.92	€ 56,876,898.13
Income	Euro	-€ 1,400,000,000.00	€ 197,761,228.28	€ 195,769,170.21	€ 193,871,855.56	€ 192,062,767.65	€ 190,335,785.20	€ 188,685,157.37	€ 187,105,480.37	€ 185,591,675.48	€ 184,138,968.57	€ 182,742,870.69

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-€ 31,333,032.57	-€ 31,959,693.22	-€ 32,598,887.09	-€ 33,250,864.83	-€ 33,915,882.13	-€ 34,594,199.77	-€ 35,286,083.76	-€ 35,991,805.44	-€ 36,711,641.55	-€ 37,445,874.38	-€ 38,194,791.87	-€ 38,958,687.70	-€ 39,737,861.46	-€ 40,532,618.69	
														-€ 280,000,000.00
1,393,497	1,393,497	1,393,497	1,393,497	1,393,497	1,393,497	1,393,497	1,393,497	1,393,497	1,393,497	1,393,497	1,393,497	1,393,497	1,393,497	
€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	
€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	€ 39.00	
€ 40.20	€ 41.01	€ 41.83	€ 42.66	€ 43.52	€ 44.39	€ 45.28	€ 46.18	€ 47.11	€ 48.05	€ 49.01	€ 49.99	€ 50.99	€ 52.01	
€ 56,024,153.23	€ 57,144,636.29	€ 58,287,529.02	€ 59,453,279.60	€ 60,642,345.19	€ 61,855,192.10	€ 63,092,295.94	€ 64,354,141.86	€ 65,641,224.69	€ 66,954,049.19	€ 68,293,130.17	€ 69,658,992.78	€ 71,052,172.63	€ 72,473,216.08	€ -
€ 24,691,120.66	€ 25,184,943.07	€ 25,688,641.93	€ 26,202,414.77	€ 26,726,463.07	€ 27,260,992.33	€ 27,806,212.17	€ 28,362,336.42	€ 28,929,583.15	€ 29,508,174.81	€ 30,098,338.31	€ 30,700,305.07	€ 31,314,311.17	€ 31,940,597.40	-€ 280,000,000.00
€ 734,244,665.07	€ 709,553,544.41	€ 684,368,601.34	€ 658,679,959.41	€ 632,477,544.64	€ 605,751,081.57	€ 578,490,089.24	€ 550,683,877.07	€ 522,321,540.65	€ 493,391,957.50	€ 463,883,782.69	€ 434,891,046.28	€ 407,710,355.88	€ 382,228,458.64	€ 358,339,179.98
€ 24,691,120.66	€ 25,184,943.07	€ 25,688,641.93	€ 26,202,414.77	€ 26,726,463.07	€ 27,260,992.33	€ 27,806,212.17	€ 28,362,336.42	€ 28,929,583.15	€ 29,508,174.81	€ 28,992,736.42	€ 27,180,690.39	€ 25,481,897.24	€ 23,889,278.67	-€ 280,000,000.00
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 1,105,601.89	€ 3,519,614.68	€ 5,832,413.93	€ 8,051,318.73	€ -
€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 329,801.04	€ 1,049,901.06	€ 1,739,809.08	€ 2,401,708.38	€ -
€ 24,691,120.66	€ 25,184,943.07	€ 25,688,641.93	€ 26,202,414.77	€ 26,726,463.07	€ 27,260,992.33	€ 27,806,212.17	€ 28,362,336.42	€ 28,929,583.15	€ 29,508,174.81	€ 29,768,537.26	€ 29,650,404.01	€ 29,574,502.10	€ 29,538,889.02	-€ 280,000,000.00

Table 45 - Offshore Oil & Gas - CAPEX and IRR for projects sanctioned from 2010-2019 in UK and Norway by Shell and Equinor – Source: Rystad Energy

Asset	Country	Operator	Sanctioning Year	CAPEX (MUSD)	IRR - Flat Real Price of 65 USD per bbl	IRR - Base Case Oil Price
Barnacle, GB	United Kingdom	Equinor	2019	53	95%	73%
Fram (29/03a- 6), GB	United Kingdom	Shell	2018	219	90%	61%
Pierce (gas blowdown), GB	United Kingdom	Shell	2019	447	62%	57%
Njord Northwest, NO	Norway	Equinor	2011	312	48%	47%
Utgard, GB	United Kingdom	Equinor	2017	166	60%	44%
34/11-6 S (Valemon West), NO	Norway	Equinor	2017	56	46%	39%
Bauge, NO	Norway	Equinor	2017	692	38%	33%
Penguins (redevelop), GB	United Kingdom	Shell	2018	1802	35%	32%
Stjerne, NO	Norway	Equinor	2011	705	27%	27%
Visund South, NO	Norway	Equinor	2011	890	26%	26%
Troll West (Gas), NO	Norway	Equinor	2018	3042	30%	24%
Johan Sverdrup-Phase 2, NO	Norway	Equinor	2019	7772	26%	24%
Johan Sverdrup-Phase 1, NO	Norway	Equinor	2015	20945	26%	24%
Svalin, NO	Norway	Equinor	2012	1038	25%	24%
Vigdis Northeast, NO	Norway	Equinor	2011	642	24%	23%
Byrding, NO	Norway	Equinor	2017	131	24%	23%
Snorre Expansion, NO	Norway	Equinor	2018	1731	23%	22%
Arran (x- Barbara, Phyllis) (23/16c- 8), GB	United Kingdom	Shell	2018	408	38%	21%
Johan Castberg, NO	Norway	Equinor	2018	7259	22%	21%
Utgard, NO	Norway	Equinor	2017	244	26%	20%
Trestakk, NO	Norway	Equinor	2017	1080	22%	19%
Skuld, NO	Norway	Equinor	2012	1889	17%	17%
Gudrun, NO	Norway	Equinor	2010	6096	14%	14%
Snohvit Phase 2 (Askeladd), NO	Norway	Equinor	2018	973	12%	12%
Hyme, NO	Norway	Equinor	2011	925	13%	12%
Njord Future, NO	Norway	Equinor	2017	3478	12%	9%
Martin Linge, NO	Norway	Equinor	2012	7985	10%	8%
Aasta Hansteen, NO	Norway	Equinor	2013	5185	12%	7%
Gina Krog, NO	Norway	Equinor	2013	6136	8%	6%
Mariner, GB	United Kingdom	Equinor	2013	9237	-2%	5%
Gaupe, NO	Norway	Shell	2010	415	5%	5%

Valemon, NO	Norway	Equinor	2011	4720	5%	4%
Knarr, NO	Norway	Shell	2011	2025	4%	3%
Fram H Nord, NO	Norway	Equinor	2012	424	3%	3%
Sindre, NO	Norway	Equinor	2017	40	-3%	-3%