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Executive MBA
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Value measurement and Value creation in the specific context of the emerging business sector “Renewable Energies” – A case study on acquisition from a Financial Investor’s point of view

A Master’s Thesis submitted for the degree of
“Master of Business Administration”

supervised by
Dr. Otto Randl

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Vienna, 18. 06. 2010

Affidavit

I, **INGRID SCHWANK**, hereby declare

1. that I am the sole author of the present Master's Thesis, "VALUE MEASUREMENT AND VALUE CREATION IN THE SPECIFIC CONTEXT OF THE EMERGING BUSINESS SECTOR "RENEWABLE ENERGIES" – A CASE STUDY ON ACQUISITION FROM A FINANCIAL INVESTOR'S POINT OF VIEW", 114 pages, bound, and that I have not used any source or tool other than those referenced or any other illicit aid or tool, and
2. that I have not prior to this date submitted this Master's Thesis as an examination paper in any form in Austria or abroad.

Vienna, 18.06.2010

Signature

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And a big thank you to all the people, who provided me with precious background information on the industry and the economic market as such. I enjoyed our conversations and I am tremendously thankful for your expertise!

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List of abbreviations

EU	European Union
US	United States of America
Solon	Solon SE
REC	REC Group
EDPR	EDP Renovaveis
EDP	Energias de Portugal
EDF	Electricite de France
EDF EN	EDF Energies Nouvelles
DCF	Discounted Cash Flow
APV	Adjusted Present Value
WACC	Weighted Average Cost of Capital
EBIT	Earnings before Interest and Taxes
NOPLAT	Net Operating Profit less Adjusted Taxes
ROIC	Return on Invested Capital
FCF	Free Cash Flow
ERP	Equity Risk Premium
MARKET CAP	Market capitalization
CAPEX	Capital Expenditure

Abstract

Value measurement and value creation in the Renewable Energy sector

This work explores historical, current and projected economic indicators and market conditions in the industry of Renewable Energy relevant to value creation. Three companies in the sectors of solar energy manufacturing and wind power project development and generation are evaluated by means of a comparables analysis and a Discounted Cash Flow Analysis. In particular, the Return on Invested Capital (ROIC), the growth and the performance efficiency factors as well as the business situation of the companies and the development of the companies' stocks are assessed. Conclusions on the value-creating effects and projections on the economic performance of the specific companies and the industry as such are formulated. By way of a case study, the resolution on the value-creating potential of the companies and their future economic perspectives form the basis for a financial investor's decision on a possible acquisition in a range from 30%-100% of shares. Consecutively, value-creating holding periods in the range of 5-10 years (or more) and acquisition plans are discussed.

In essence, the study on this industry sector shows a pattern of a fast-paced, growth-oriented company development, which was terribly shaken by the economic crisis in the years 2008 to 2010. The risk involved in mere growth-investing becomes evident in this economically challenging time and will have possible long-term effects on the industry. As the market environment enforces a differentiation of "good" and "bad" companies, earning the ROIC becomes pivotal to Renewable Energy companies, while growth remains the leading driver of the industry. This study deals with the central question of how companies in this emerging business sector can meet these challenges for the years to come, focusing on persistent value creation along with attractive returns on equity for their shareholders.

1. Introduction

Acquisition forms one of the three pillars of activities, which companies usually employ in, if they want to pursue a healthy, long-term growth development. The other two are restructuring and organic growth. An instructor of mine, Mr. Klien, once said, that if you do not occupy yourself as a corporate consultant with M&A activities, because economy goes downhill on that wave, you surely be well advised to offer restructuring advice and expertise. It's either or, and it comes in waves – so called "M&A life-cycles".

However, sometimes an industry is so moving, so fast-paced, that restructuring and M&A business comes as a challenge all at once. Companies in the field of Renewable Energies face various challenges today, which force them to work on major cost reduction and, likewise, to grow, to grow organically and through acquisition activity. In my thesis I will attempt to look at companies in this growth-oriented industry and track back their corporate and business development. I will make an effort to provide a sound assessment of the companies and of their industry sub-sectors, the solar and the wind energy sector.

1.1 Motivation

My personal motivation to occupy myself with a study on value creation and value enhancement in the sector Renewable Energies stems from my professional experience with this sector, having been a counsellor to a firm for several years. Even before that, the topic of "green energy generation" had been of interest for me as an environmentally conscious person.

In order to clarify the reader's expectations right from the beginning, I must say that this is not a thesis running into sophisticated details on estimations and calculations. As Rosenbaum (2009) and Damodaran (2002) note in their books, one can loose contact with his/her reason of valuation while developing the most sophisticated spread sheets and formulas. Rather, I will strive to explore the fundamental value drivers "Growth", "Return on Invested Capital" (ROIC) and "Weighted Average Cost of Capital" (WACC) and their influence on the value of companies in a young, fast growing industry like Renewable Energies.

1.2 Definition of the research problem

Value creation in the context of an acquisition of (shares in) young, high-growth companies in a risky business sector is a burning issue for financial investors. Since growth should drive value, such investments seem all too attractive to loose out on them. In this context, it will be examined, if the companies selected for this case study have done a good job on value creation of their businesses in the past and if they have a realistic potential to create value for their investors in the future solar and wind energy markets within a time frame of 5 to 10 years or more. The Return on Invested Capital and the Return on Equity are the major indicators motivating investors to step in, yet they should not be entirely. There are many more economic, macroeconomic and management factors, which influence the future success and failure of a company. What a financial investor should expect from high-growth companies in the fast-paced industry sector “Renewable Energies” will be treated in this study.

1.3 Outline of the main research question

At the heart of this study, the main research question focuses on the measurement of company value, the companies’ potentials for value creation and resulting recommendations for value creating acquisition plans. Typical paradigms and beliefs concerning value creation and value drivers such as Growth rate and Return on Invested Capital (ROIC) can be reflected on in face of this present assessment of the Renewable Energy Industry. Possible industry-specific value drivers as well as conditions with value creating effects, which might play a role in the specific context of this emerging business sector, will be looked at.

By ways of a case study of three companies in the field of Renewable Energies, these issues shall be explored and discussed.

A Case study

A case forms the setting for this valuation study, which is hypothetical, yet pragmatic enough, so as to represent a real case of acquisition:

“The executive management of an international financial investor considers value creation and value progression through possible acquisitions of (shares in) three companies in the field of Renewable Energies. By way of a share deal the financial investor wants to become a major shareholder of the companies (minimum scenario:

30% shareholdings, maximum scenario: 100 % shareholdings). The financial investor is looking for a long-term investment in the range of 5 to 10 years, gaining considerable control over the company.

A valuation study of three Renewable Energy companies (500 – 1.000 Million Euro revenue p.a.) is carried out. All three targets are listed at the stock exchange. Important factors for value creation like growth rate, ROIC and WACC, but also capital structure, stock development and the economic situation of the industry as such will be discussed. The relevance and meaning of these factors for the valuation and the consecutive assessment of each company will be addressed. Central and pivotal considerations of the financial investor in the process of acquisition and decision making will be elaborated.

The question of how well the Discounted Cash Flow (DCF) Analysis can be applied to an emerging business sector as Renewable Energies, with high potential growth rates, but also unpredictable conditions, will be addressed.

The financial investor is operating internationally with various locations all over the globe. He is headquartered in Luxembourg. The location has implications on acquisition planning and especially on international tax issues in the process of acquisition. Hence, some tax considerations will be added to the recommended acquisition scenarios."

1.4 Hypothesis

The research hypothesis is an open research question in this case study: How do economic indicators, multiples and value drivers such as ROIC and Growth rate "behave" in the young, fast growing industry "Renewable Energies", at what point and to what extent can value creation be expected in future?

1.5 Aims and structure of the Thesis

The aim of this thesis is a sound evaluation of the pros and cons of each company, the risks and preconditions when buying and the value creating effect in the next five to ten years to come. By gaining understanding of the industry Renewable Energies as such, this enterprise shall be accomplished.

Light shall be shed on:

- Spotting and assessing value creation through acquisition activities

- Insights with reference to valuation and value creation in the young, emerging business sector “Renewable Energies”
- Considerations of a financial investor prior to decisions on acquisition

The thesis is structured in an introductory part, covering the main research question and the methodology applied as well as helpful background information on the sector “Renewable Energies”. This section is followed by the valuation of the companies, including an analysis of the industry, presentations and main assumptions about the companies and their valuation with a valuation model applied. The third section of the thesis is devoted to acquisition planning and tax implications. In the final part, I will present my insights on and conclusions from this study.

Structure and methodical approach in a nutshell

A short overview of the Renewable Energies industry, of its general conditions and its opportunities for growth for the upcoming years will be given. This information shall support a reflection on the current business environment the three companies find themselves in.

In view of possible alternative methods, it will be reasoned why the DCF-Analysis is one of the preferred methods, in order to assess the present and future value of the companies in this case study. The DCF-Analysis will be carried through for the three companies. In addition to that, the current situation of the companies is estimated thoroughly by taking into account the shareholder structure, the capital structure, its economic environment, its competitors and different sources of information on the status of the companies and their future perspectives. For this purpose, information and data made available on the companies’ websites as well as information on indicators and risk factors from various internet sources and specialist literature will be used. A Purchase Price Determination for all three companies will be carried out. On this basis and the results of the DCF-Analysis and the comparables analysis, an assessment of a possible value creation through an acquisition of these companies will be given. Favourable acquisition plans and scenarios are developed and demonstrated by modelling the Free Cash Flows (FCFs) and debt repayments with their respective interest payments. As a result the planned acquisition financing structure shall be demonstrated. Finally, from the view of the financial investor’s company located in Luxembourg, the relevant international tax issues in the valuation and acquisition process will be considered.

2. Investing in renewable energies

When we talk about renewable energies, we speak of natural resources like wind, solar power and biomass. This industry has a history of tremendous growth in the past two decades and was highly subsidised. The return on equity was fuelled by these facts and investors could benefit from a certain macroeconomic stability supporting the inflow of stable subsidies.

Today, the global financial and economic crisis does affect this industry sector, even though the outlook of a continuously high growth is very promising. As stated in the Solon Letter to the Shareholders in the Annual Report 2008 (p.8), the solar industry needs much capital to finance investments and to enable growth at the desired speed. On top, an industry, which reinvests its cash flows intensely, is more prone to cost-cutting in times of economic downfalls. For example, the resources, built up as human capital, might be affected by it, which is an unfortunate position because they are the “capital” for future investments and value creation indeed. Naturally, a financial cushion is recommendable for Renewable Energy companies to prepare for such situations. But who would have thought of a Plan B, in face of the last decades of reliable growth, especially if growth is, what drives the returns in this sector? While Solon SE seemingly made it to the top in the business, it still struggles with cuts in revenues and used up all of its capital reserves to finally end up with a continuing recession of its business. Certainly, Solon is an extreme example of a company hit by the crisis, but we can see by the effects, that the macroeconomic situation is far more decisive for this industry sector than it might be for saturated, slowly growing industries. Today a return on investment can only be expected in areas, where the development of solar and wind electricity generation is subsidized, and only as long as the costs for generating solar and wind electricity remain higher than those for electricity from conventional energy sources (Solon Annual Report, 2008, p.24). While funding capital for solar and wind power projects becomes increasingly scarce in Europe, we can see future opportunities in several markets. As the market is driven by human expectations, not only the stock market, we see a new rising of Renewable Energies in selected markets.

2.1 Investing for the long term – stock-markets in rebellion

In the Credit Suisse Global Returns Yearbook 2009 Elroy Dimson et al. give notice to investors to prepare for extended holding periods (Dimson et al., p.5), in order to receive the high returns historically given by stocks. They comment, that this situation has to be dealt with as a consequence of the financial crisis starting in 2007. This argument plays investors in the hands of Renewable Energy companies, which stand for long-term investing strategies, yet many of them do so with consistent yearly reinvestment of potential dividends in growth. The later is objected by Dimson et al. They report, that the longer the investment horizon, the more important is dividend income, wherein the value of the investment corresponds closely to the present value of dividends.

While this is an important message to the long-term investor, he should also consider the high chance, that the overall equity returns are and will be far more volatile and less predictable concerning their timing than in the past (Dimson et al., 2009, p.9)[1]. On the other side, one can observe, that the current situation makes investors more risk-averse, because they might receive high returns on short-term investments, but also at a high risk. Investors, hence, might discount cash flows at a higher rate, which lowers stock prices (Dimson et al., 2009, p.12). As long as investors consider the sector Renewable Energies as being able to generate attractive returns with steady long-term income based on legally guaranteed feed-in tariffs and other subsidies, they will be prone to step in, also at the expense of yearly dividends. As soon as they, understandably or not, loose trust in this stability and in the ability of the company's management to secure it, investing in Renewable Energies might become more a business of traders than of long-term investors.

2.2 Political Drive in Renewable Energies

In the industry of Renewable Energies, companies in all segments of the value chain rely on government conditions, either directly or indirectly, to support their businesses, from silicon and wind mill producers to project developers of solar and wind power plants. In recent years the intensified promotion of Renewable Energies has become in vogue, since the European Union fosters "green energy" in its endeavour to reduce CO2-emissions.

[1] Please also refer to http://online.wsj.com/article/SB123561056456077505.html.

The 2009 EU-Directive[2] for the Promotion of Renewable Energy Sources aims at a considerable increase of production of Renewable Energy from 8,5% in the year 2005 up to 20% by 2020[3]. This EU-Directive was translated to country-specific targets. I take Austria as an example for demonstration. Since Austria had already achieved a quota of 23,3% percent by 2005, because of its rich opportunities to originate energy from water power and biomass, its country-specific targets were reset to 34%.

In essence these targets are supported by different forms of subsidies as feed-in tariffs, cash grants, tax credits and EU-project financing. When it comes to feed-in tariffs, in order to give a rough orientation of the market, one can look at this box of Austrian Feed-In tariffs for the year 2010.

Feed-in tariffs Austria 2010:

For each kWh

-the solar energy operator receives 35 cents (for a 5-20 kW-Plant); every additional kWh: 25 cents

-the wind energy operator receives 9,7 cents per kWh

-the biomass (wood) energy operator receives 16 cent per kWh

Figure 1: Feed-in tariffs in Austria 2010, source E-Control[4]

As mentioned above, these tariffs are subsidised. In comparison to that, the average market price for "conventional" electricity, speaking of nuclear or fossil fuels, was 4,166 Cent/kWh in the second quarter of 2010 according to E-Control[5]. In order to achieve Grid Parity[6], which is the final goal pushed by the governments, the electricity springing from Renewable Energies must achieve this market price of 4 to 5 cent per kWh.

[2] An EU Directive for the Promotion of Renewable Energy sources was resolved in April 2009. Renewable Energy production shall increase up to 20% EU-wide by 2020 (21% for the EU25). For further information refer to http://www.e-control.at/de/marktteilnehmer/oeko-energie/oekostrom-ausbauziele and http://www.e-control.at/de/konsumenten/oeko-energie/klima-und-umwelt/20-20-20-ziele. This directive is based on the "Renewable Energy Directive" from 2001, revised and reaffirmed in 2007 with the presentation of a "Renewable Energy Roadmap".

[3] The target means the production of Renewable Energy, not Renewable Electricity. Renewable electricity is only a part of Renewable Energy consumption (Iberdrola Renovables offers a view on the EU's percentage of renewable electricity versus renewable energy consumption in 2006 and the goals for 2020 in its Strategic plan 08/12).

[4] Please refer to http://portalapp.e-control.at/portal/page/portal/medienbibliothek/oeko-energie/dokumente/pdfs/uebersicht-einspeisetarife_2010.pdf

[5] Please refer to http://www.e-control.at/de/marktteilnehmer/oeko-energie/marktpreis

[6] Grid Parity: Getting the cost of producing renewable energy down to the point where there is no difference between it and competing fossil fuels like natural gas and coal.

Speaking of the promotion of Renewable Energies, the US started off later, but seems to get ahead of Europe in only short time with its strong system of subsidies resolved by the American Recovery and Reinvestment Act 2009[7], with very positive continuing incentives for 2010 and further years ahead. The system is very flexible to the point, where Renewable Energy businesses in all stages of development can opt for one or another form of subsidy (e.g. cash grants, tax credits). With the support of the government, the US aims at a capacity of 100.000 MW of wind energy until 2015 (Iberdrola Renovables, Strategic Plan 08/12), which is quite impressive. In the field of solar energy, the US will soon surpass Germany as the world's largest solar market (Solon Annual Report 2009)[8].

In view of these commitments on the European and on the US side, one should remain hopeful for a constant promotion of Renewable Energies. However, as a result of the recent crisis, different forms of subsidies have already been cut or are in danger of being cut, especially in the European Union[9]. The cause of this sudden slow-down of what was an economic boost can be found in the indebtedness of the EU-countries. This reaction of EU governments evokes uncertainty among companies and investors in the market and the ones, who can, start switching their expansion plans to emerging markets as the US and China.

Indeed, the US government, which is highly indebted, encounters the crisis with a clear enforcement and "Yes" to green energy, which it perceives as a motor of economic growth and "green job" creation. Instead of cutting on subsidies, the US has made the system more flexible and attractive to foreign companies and investors.

Another emerging market, which benefits from strong capital support by its government, is China. As much as its system of support might differ from the US one, it can, likewise, be considered an emerging market. Chinese companies managed to produce solar modules with 50% of the costs of a European producer, which finally caused a major cut in worldwide module prices in the last two years.

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[7] For further information on the US key tax incentives for 2009, there is a good summary in the 2009 EDPR Press release "Approval of key-energy related tax incentives applicable to Horizon Wind Energy".

[8] For further information on the European and US systems, I can recommend EDPR Annual Report 2008 (p.35 f.), which describes very thoroughly the legal frameworks and conditions country-by-country.

[9] The assumption, that governments will continue to support "environmental priorities" throughout the economic downturn (REC Annual Report, 2008, p. 5), has not proven as true looking at new amendments of countries as Germany and Spain. The Spanish market, which was a core market of many companies, made strong cuts on subsidies to the detriment of many enterprises (Refer also to Solon Annual Report 2009).

In general one can come to the conclusion, that the Renewable Energy sector is highly dependent on Acts (e.g. Renewable Energy Sources Act, 2004, Germany) and their annual amendments in consideration of the actually existing macroeconomic market situations. Especially, the government induced changes, usually reductions of annual feed-in tariffs for electricity from photovoltaic and wind energy installations, are decisive for the advancement and sustainable growth in this industry sector. The industry is very fragile to changes in the legal frameworks of local governments. Possibly, the European Union will try to stabilize its subsidies policies again to enable organic sector growth for the next decades to come. Yet, the scarcity and distribution of subsidies among the community of alternative energy providers will cause much debate on what technology to focus more and what less on. A preference might be given to the big energy companies over the small renewable energy firms, in order to develop effective exit scenarios from fossils to renewable energies. Furthermore, one can observe the competitive advantage of big energy companies in this highly capital intensive market. A cut of subsidies most likely is about to hit the small firms with high equity, but low liquidity, poor capital reserves for financing, which they invested in growth, and less flexibility to shift their operations to other countries and markets. Contrary to that, huge energy companies can afford building up and expanding their Renewable Energies business with reserves and cash flows from their stable, conventional energy business. This is a tactic of preferring the big ones over the small ones, most likely induced by targeted lobbying in the European community to my mind.

2.3 Investor's intent

Certainly, an investor's major intent is to grow revenue in his portfolios, to rely on the company's stable cash flows he invested in and to rejoice in attractive returns on equity. While one could make a lot of money in the field of Renewable Energies in recent decades, it has become much harder today in view of the effects of the crisis, increasingly clarifying laws to abide by and more companies on the market to compete with.

Hence, a financial investor with a focus on long-term value creation must care even more about the company's specific pros and cons upon deciding for or against investing today. He should be interested in how the company is managed and, possibly, take an active part in it, further in its ability to create a brand, to generate profits, to issue new products and to acquire new clients. Money is not the problem

for the financial investor. Today's challenge is his necessary involvement in strategic management. In the service of value creation, it must be his utmost interest to take influence in the companies he buys into on a long-term basis. In this sense, the financial investor is well advised to not sit back and wait, but to find his role in a financial-strategic engagement these days. He must be learned about the strategy of his company in the market, even though it does not affect him as it does a strategic investor.

Kiyosaki (2000, p.65 ff.) describes this fact more accentuated, when he claims, that the financial investor needs to work out a plan on how he wants to create value when taking over control of a company. While, in the case of a fund manager, funds are financial products he offers to his business and private customers, his very own intent must be to have a clear outlook of what he wants to do, quite similar to the one of a business owner.

As the investor strives for a sound insight into the executive management team of the company, he poses the following questions: Does the management leave the impression that it has regular operational reviews and updates of its goals, are the targets formulated in concrete terms? Does it have a real plan? How did it perform in the past? Does it have a plan B or C, e.g. as a provision in case of default?

In essence this case study describes a financial investor, who finds himself with an attitude of saying "Growth investing is value investing" due to the particularities of the industry. Damodaran describes both types of investors and states, that the difference between a value investor and a growth investor lies in the focus of valuation (2006, p.21 and p.11). In our case, while our investor is interested at acquiring cash flow generating assets in place at less than their true value (feasible in this current crisis), he must be interested in the development of future cash flows, since he finds himself in a growth industry. Also, he will consider the management factors, which influence the value of a company. Hence I would prefer considering this financial investor a conglomerate.

3. Description of the methodical approach

3.1 Modelling and working methods

The modelling and working methods applied are based on a “7 Steps to acquisition” Road map, which I developed, with a focus on studying the industry and its driving economic factors. The following sections explain the single steps taken and the methodical approach implied.

3.1.1 Presentation and analysis of the companies

The companies subject to valuation are examined in the form of a directed information search, using predominantly information from press releases and annual reports. The current situation of the companies is described thoroughly by taking its core competences and market position, its capital structure, its financing and its business results into account. This presentation goes along with estimations about causal relations and assumptions of the company’s future perspectives on my part. My analytic remarks are linked to research (expert opinions, market studies etc.) I have done beforehand or to the future outlook addressed by the companies in their Annual Reports.

Since the presentation and the analysis serve as a necessary foundation for a sound judgement on the companies and the industry as such, as much information and as current as possible will be collected. For this purpose information and data made available on the companies’ websites as well as from Rating agencies and the media will be employed. Data on the industry found in the web will complete this information search[10].

3.1.2 Comparison of industry/company indicators and multiples

The comparison of indicators and multiples[11] serves as a sound evaluation of the industry and the stance of the companies on a market basis. I do not aim at a complete Comparative Analysis, but rather pick several industry comparables to gain an understanding of what is going on in this business. Furthermore this

[10] Also refer to Rosenbaum & Pearl, who define sources of information for such an examination (2009, p.21 f.)

[11] When I refer to indicators I mean “pure” figures as revenue, EBIT (Earnings before Interest and Taxes) and Invested Capital. When I speak of multiples, I refer to ratios like ROIC (Return on Invested Capital), EBIT/revenue or net income/revenue.

evaluation also helps me to double-check the assumptions underlying my DCF-Analyses[12]. The Analysis unfolds step-by-step starting with the overall stock price development. I will move on with "pure indicators", which should give a broad picture of the industry sectors. In the end, I introduce some multiples for further discussion, because I am convinced that one should first look at the simple data and then progress for the advanced and less transparent one.

I opted to take slightly different approaches in the selection of comparables, indicators and multiples in the sub-sectors "Solar" and "Wind Power". Whereas I chose many comparables for different levels of evaluation in the solar sector, I decided to take two comparables for EDPR in the wind power sector and go into detail comparing them to the point, where I also included instalment capacities as indicators of performance.

3.1.3 Valuation with Discounted Cash Flow Analysis

Upon carrying through the Discounted Cash Flow Analysis (DCF-Analysis)[13] I use the model attached to the book "Valuation – Measuring and Managing the Value of Companies" (Koller et. al., 2005). One needs to be aware of the fact that in this model, calculations of certain indicators as working capital can be different from calculations commonly applied. For this purpose I created a sheet in the Appendix, which explains my definitions of indicators and ratios and the definitions within the model explicitly ("Definitions of Calculations"). For further information, please refer to the Appendix.

When performing a Cash Flow Analysis, there is a lot of uncertainty (Damodaran, 2006, p.5) and subjectivity involved. In reality a DCF-Analysis of a company or an asset is not a one time event, but an instrument that calls for constant adjustments of projections on a regular basis. Despite this vulnerability to changes, the underlying assumptions of the model should be well-founded with economic reasoning. Playing with the interrelations of indicators within the model, one can experience the inner logic, the "ticking", of the specific company and relevant factors of its success. Hence, the assumptions as wells as the results of the DCF-Analysis,

[12] Damodaran takes an even more radical view on relative valuation when he states: "While the focus of classrooms and academic discussions remains on DCF valuation, the reality is that most assets are valued on a relative basis." (Damodaran, 2006, p.16).

[13] The DCF-Analysis relates the value of an asset to the present value of expected future cash flows on the asset. "The value of an asset is not what someone perceives it to be worth, but rather it is a function of the expected cash flows on that asset" (Damodaran, 2006, p.10).

tell a lot about it's creator's opinion on the status and the future success or failure of the company.

I chose a DCF-Analysis with an expected cash flow approach, because it is a broadly accepted method of valuation, and I wanted to contrast and supplement it with an analysis of comparables. At the time, when I decided to apply the DCF-Analysis, all companies had a stable financial and capital structure and a fairly stable Cost of Capital[14]. This obviously changed throughout the course of my study, because 2009 has been a really bad year for the Renewable Energy sector, especially upstream. Thus, the Adjusted Present Value (APV) method, which separates the value of debt financing from the value of the assets of the business, would be an alternative in case of a strong increase of a company's leverage (Damodaran, 2006, p.13). An advantage of the specific DCF-Model applied is, that it also offers an Economic Profit Calculation, which gives the opportunity to understand the company's performance in each single year.

One major and decisive part of the DCF-Analysis is the preceding estimation of the Weighted Average Cost of Capital (WACC), which I will carry out for all firms for the years 2009 and 2010. In preparation of that, I will do some research on the defining indicators of the WACC-calculation as risk-free rate, Betas, Equity Risk Premium (ERP) and interest rates on Cost of debt.

With respect to the inputs in the DCF-Model, I will elaborate my macroeconomic and my company-specific assumptions, which form the basis for my inputs. I will also refer to specific assumptions or prerequisites, the financial investor considers in view of a possible acquisition.

3.1.4 Interpretation of valuation results

The interpretation of the valuation results is done from the perspective of the financial investor, who looks at the value of the company and the indicators of value creation. The Valuation Summary will be integrated in the Thesis and serves as the result sheet for further interpretation and discussion. By all means, the limitations of a forecast up to 10 or 15 years must be expressed, which confine the methodology (as mentioned in 3.1.3). In fact, forecasts of 2-3 years are already a challenge in this

[14] Retrospectively speaking, I could have considered the Adjusted Present Value method, which would have been an option in the case of Solon SE, since its stable capital structure was busted as a result of the crisis (Koller et al., 2005, p.119). On top, this method might be useful for firms, which work with subsidies, but only as long as one can clearly subtract the subsidies from the rest of the revenues, which is only partially the case in our companies under valuation.

fast-paced, high growth industry sector. Hence the value output in the Valuation Summaries is demonstrated on a five, respectively ten year, and on a terminal value base, in order to ease this effect and clarify the exit scenario after 5, 10 or more than 10 years.

3.1.5 Purchase Price Determination[15]

A Purchase Price Determination based on the companies' current market capitalizations (market caps) will be carried out. By looking at asset-based values of equity and debt, at debt-to-equity structures and possible risks for the acquirer, this current market cap will be solidified or rejected as a first approach to determining the purchase price. Possible value creation through expected future cash flows, namely the results of the DCF-Analysis, is neglected in this price determination, for it is founded on the market's expectations of the company rather than on the investor's expectation of expected free cash flows. Future value creation can be pondered on in negotiations with the seller, but the investor does not disclose them upfront. Naturally he wants to buy the stock as cheap as possible, granted that the stock is undervalued. This first determination of the price based on current market caps and capital structure of the company most likely does not reflect the final price to be expected after negotiations with the seller.

3.1.6 Acquisition Plan and Financing

Following the price determination, an acquisition plan will be laid out. In this section the FCFs of the DCF-Analysis, which represent the investor's expectations, as well as the debt repayments and interest payments of the investor will be modelled for the respective planned holding periods.

Upon creating my own individual debt repayment schedules, I employ a model of Rosenbaum and Pearl from one of their Spread Sheets in the Book (2009, p.219, "Debt Schedule"). However I will put in nominal FCFs, as opposed to operating, financing and investing cash flows, and discount them back with the DCF-Analysis' yearly discount factors. Then I will subtract the, likewise discounted, yearly total debt repayments of the investor from the discounted FCFs to arrive at a residual cash

[15] The price, which is determined in this study, does not reflect the expected cash flows of the investor (Damodaran, 2002, p.1), but rather the current market situation.

flow at par value. As a consequence, the investor can judge, how much cash flow will remain for the company after paying off his yearly debt payments.
Also the Return on Invested Capital (ROIC), the result of the DCF-Analysis, will be displayed to judge the acquisition case.
The logic behind this method is the same as Rosenbaum & Pearl suggest in their LBO Analysis (2009, p.195), but it will be carried out in a very modest way. The investor looks at the cash flow generation, the financing structure and debt repayments as well as credit risks and investment returns over the planned period.

3.1.7 Tax implications in share deals

In the last section some cautious projections on possible tax implications in view of the deal structures will be attempted. International tax implications and management considerations on taxes will be brought into relation with the acquisitions planned. As much as it is known that taxes have a great impact on acquisition planning, this expertise must be left to experts. Hence this section merely offers a couple of thoughts on tax optimization and tax reduction opportunities in the acquisition process and thereafter.

3.2 Data

3.2.1 Literature

Most of the company and related industry data will be drawn from internet sources, cited in the Bibliography, where applicable. The background knowledge on the various fields of discipline covered in my thesis such as valuation, acquisition finance and tax planning stems from books and papers as cited in the Bibliography. The inherent knowledge of industry experts I talked to in the process of gaining a broader understanding of the industry and its sub-sectors serves as background information and is complemented by my own thoughts on the industry. For the purpose of citation and due to privacy reasons, I will withdraw and cite the corresponding information from publicly available data.

3.2.2 Description and Discussion of the data used and collected

The data I work with are, in essence, the companies' Annual reports and miscellaneous information found on the companies' websites. The Annual Reports 2008 are the point of reference for my DCF-Analysis, as I started writing on my thesis in October 2009. Since my thesis will be published a short time after the Annual Reports 2009 come out, I will make an effort to include as much updated information from Annual Reports 2009 as well as from current quarterly and half-year reports as possible. I decided not to include analysts' reports on companies as a piece of evidence for their future development. Upon studying some of them I came to the personal conclusion, that most of the analysts look back and interpret the past and presence, in order to draw conclusions about the future of a company. This cautious approach to predictions might be caused by their ultimate and indispensable task to "say the right things"[16]. As a consequence I rather focus on media releases and double-check them with the Ad-hoc announcements on the company pages to be on the safe side.

With respect to stock information, industry indicators and ratios, I steered a course through internet pages and service sites from Bloomberg to Thomson Reuters, from Investopedia to Finanzen.net and Yahoo Finance, from Aswath Damodaran to Elroy Dimson, and so on and so forth. Many of the sources will be cited.

[16] Please also refer to the compound work of Womack and Michaely on analysts' assessment behaviour. For example, in their paper "Conflict of Interest and the Credibility of Underwriter Analyst Recommendations" (1999), they provide evidence that underwriter analysts' judgments for IPOs were both optimistically biased and conflicted due to agency issues.

4. Presentations of the companies and analysis of the company data

Because of length and time reasons, this section of the Thesis can only offer a short presentation on each company and the markets involved. For further information, the company websites offer very comprehensive information on all relevant data needed to technically perform a valuation of the companies. The analysis of the companies' specific economic and financial situation is done in the consecutive subsections of this chapter. The main distinction of the companies presented is their position in the value chain: While Solon and REC are producers of solar products operating in various segments of the value chain, EDP Renovaveis is an energy provider. The perspective of a producer to the one of a project developer and energy provider is quite different.

Company ratings

As for official ratings such as done by the rating agencies Moody's, S&P, Fitch and Egan Jones, it has to be noted that none of the companies actually does have an official rating.

4.1 Solon SE (Solon)

4.1.1 Company and Markets

Solon SE has been one of the leading producers of solar modules (Components segment) in Europe. It was the first solar company to enlist on the German market in 1998. According to the value chain of solar products, it basically owns a "sandwich position"[17] and therefore has to secure its raw material via long-term contracts with third parties. Solon SE has also been considerably employed in the manufacturing of power plant systems and the construction of power plants (Systems Technology segment), to a minor part in project development carried out by Solon Investment GmbH. Solon mainly profited from the good years before the crisis, especially on

[17] In the Annual Report 2009 (p. 10), Solon refers to itself as a company operating in the downstream levels of the value chain. In fact it offers supreme quality products in the Components and System Technology segment, the later also including the project development of solar plants. However, they do not operate at the downstream end of the value chain: First of all, project development only makes up for a minor part of their business, second of all, the value chain also includes companies with its core competence in project development and/or energy generation at the very downstream end of the value chain.

the German and Spanish solar market. When crisis hit, the management seemed rather unprepared and clueless and left the shareholders with gloomy projections of the expected outcome in 2009 (see Annual Report 2008, Letter to the Shareholders). Solon is currently owned by Mithril GmbH (30,39%), a German Asset Management company, and Rivendell Holding AG (5,71%), a Swiss investor. The rest comprises the Free Float[18]. It holds subsidiaries in Germany, Austria, Switzerland, Italy and the US. Since its centre of operations is Berlin, it is subject to German tax law.

Solon has been investing in manufacturing sites in Germany, Switzerland, Austria and the US. The US operations were acquired in 2008, which means, that manufacturing and a stronger focus on selling in the US market are a "young enterprise" of Solon in comparison with its competitors. Most of Solon's sales took place in Germany, Spain, Italy and other European countries until year-end 2008. In terms of market growth and expansion, Solon left potential investors at year-end 2008 without any specific, definitive targets for 2009. Speaking of revenues, the Systems segment showed a faster growth than the Components segment in recent years. In 2008 the Systems segment (55%) overruled the Components segment (45%). This situation changed in 2009, when the Systems segment share in total revenues decreased to 28%[19]. Some considerable effort has been put into updating and refining products and production process optimization throughout 2008. Solon's expenses on R&D amounted to 0.3 percent of the total operating performance in 2008 (Annual Report 2008, p. 52), as also in the previous year 2007, which is comparably modest as opposed to its competitors[20]. This might have been one of the inherent problems of Solon. In 2009 this ratio was increased to 1.1 percent despite the major loss of revenues, which is a sign of focus on R&D.

In late 2009 and early 2010 Solon has been catching up again on revenues as can be seen in the first quarter report of 2010 and wins back market base, apparently with efficient performance factors and not at the cost of an increase of negative EBIT and net income. The segment System Technology (20% of total revenues) loses even more ground as opposed to the components sector in 2010[21]. The German market seems to be core for Solon in 2010 with 60% of total sales, mainly due to the rise of demand in the components sector. Solon defines its core markets

[18] Solon Annual Report 2009

[19] "The rapid recovery of the international project business, which had been expected for 2009, failed to materialize for the most part" (Solon Annual Report 2009, p.18).

[20] For example, the competitor REC spent 304 Million NOK in 2009 (213 Million NOK in 2008), corresponding to 3,32% (2,6%) of its revenue.

[21] The System Technology segment is highly dependent on project financing available for investors/companies.

as Europe, specifically Germany, Italy and France, and North America in its Annual Report 2009.

4.1.2 Capital Structure and Financing

Solon increased its leverage in year 2009, however it was not able to manage its economic and financial problems, which fully revealed its dimension by the end of year 2009[22]. Its equity-to-assets ratio dropped from 41,6% in 2008 (47,6% in 2007) to 17,2% in just one year. Solon has been leading intensive refinancing negotiations with banks and the government in the first quarter of 2010. Today it is highly levered with a granted state guarantee of 146 Million Euro out of "Deutschlandfonds" to cover short-term debt (current liabilities 2009: 313 Million Euro), in order to reduce total liabilities of 532 Million Euro[23]. In January 2010 Stefan Säuberlich, the former CFO of Wadan-Werften, was appointed as new CEO of Solon SE with the task of realizing a new positioning of the company and of carrying on an intensive capital restructuring program, which had been started in 2009. The main rationale behind this program is the reduction of production costs, the possible sale of operations[24] and other cost reduction measurements. In terms of growth through capital expenditure, the company is bound by high debt and a destructive decrease of revenues at this point in time, which makes trouble double. The capex of 2009 (38 Million Euro) falls behind the amount spent in 2007 (47 Million Euro), whereas the revenue of 354 Million equals the level of revenue in 2006.

4.1.3 Current situation in figures

Solon's situation has been quite dramatic throughout the year 2009 continuing into 2010 in such a way, that the future existence of the company can be questioned. When confronted with the final figures of 2009, it became clear that Solon needs financial support from third parties to survive. Solon suffered from a considerable decline of revenues from 815 Million Euro in 2008 to 354 Million Euro in 2009.

[22] One fact that increased Solon's problems was, that it invested strongly in the acquisition of new companies and shares in companies in 2008, e.g. so as to secure raw material supply or expand operations in the US (105 Million Euro in 2008 versus a maximum of 45 Million Euros in the other years). Also the prepayments on raw material according to unfavourable long-term contracts with suppliers closed in 2008 added to this situation.

[23] Overall commitments for cash credit facilities and facilities by way of bank guarantees of 275 Million Euro and an 80% default guarantee by the German state and federal states on a partial loan amount of 146 Million Euro until 2011 (Solon 1st quarter presentation, p. 5).

[24] Solon pondered on a possible divestment of Solon Hilber mid-2009, which it eventually did not carry out until year-end (Solon Homepage, News 2009).

Correspondingly, EBIT dropped from 58 Million in 2008 to -199 Million in 2009 and net income of 33 Million in 2008 turned into a loss of -272 Million Euro in 2009. Solon was faced with massive write-downs on shares in daughter companies and financial assets and write-downs on inventory, which contributed to its 2009 loss with an amount of 122 Million Euro and 60 Million Euro respectively. We can see that Solon suffered the same effects as the module producer Sovello in 2009, namely drastic revenue decline and EBIT(DA) decline. However there are signs of hope, when we look at the positive operating cash flow of year-end 2009 (93 Million Euro), mainly attributable to a change in trade payables, in inventories and a major change in trade receivables. Also the liquidity situation has improved with 61 Million "Cash and Cash equivalents" year-end 2009 (as opposed to 4 Million year-end 2008). 2010 promises to be the tough year of trial and perseverance for Solon. Whereas revenue along with EBIT and net income finds its road back to efficiency, the capital expenditure decreased sharply in the first quarter of 2010 and Solon loses on its equity-to-assets ratio, which was already extremely low by the end of 2009.

4.1.4 Challenges for the upcoming years

Besides extensive financial restructuring and cost-cutting to ensure short- and mid-term financing, Solon will, at the same time, be challenged to do the necessary strategic and visionary work, in order to set long-term business goals and to position itself against the growing number of competitors in the market.

The pity is, that a significant gain of revenues, meaning a gain of market shares in order to compensate for the constant decline in market prices and to catch up with the speed of growth of Solon's competitors, cannot be attained by cost restructuring and cost reduction in production alone. While these are very good targets to pursue, at the same time, capital expenditure and R&D drives the market growth in this industry and must be undertaken in a considerable amount in the next years, in spite of smaller revenue sizes. Otherwise Solon will be lagging way behind its competitors and finally loose, because the quality of its modules and systems completely depends on its suppliers, who carry the necessary know-how, but not on themselves. The argument, that there is a growing global market potential unfortunately does not count. If the product is not up to date, customers will abstain from buying it. This situation calls for more than a concentration on core competences (Annual Report 2009), it implies a total new positioning.

In today's world Solon will, as many others, have to "conquer" instead of "secure" markets, with aggressive methods of acquisition and a year-by-year increase in module efficiency. Solon has increased the presence of its sales and distribution offices internationally in 2009, which is a good start, but must be enforced and invested in in the years to come.

Concerning Solon's attitude towards its business as such, it is observable, that the language Solon uses in its Annual Report 2008 is one of an observer to the market rather than an active player. While the managers realize the importance of cost reduction of production and module and system efficiency, they hardly ever write "we will" or "Solon will", and when they do, the projections remain very generally formulated. Their reports seem to lack visions and company-specific targets. In this report, the "company" appears to the reader as being the greatest risk to Solon, with a rather nostalgic and overly optimistic view of its stance in technological advances and towards its competitors (Annual Report 2008, p.66). Year-end 2009 and in the beginning of 2010, this mode changes as a result of the restructuring program turning into concrete, hard targets to be achieved. It is expressed, that Solon wants to attain a balance in 2010 with a break-even EBIT. Solon's management needs more of a teeth-fletching attitude, as it faces highly competitive pressure from Asia and a decline of the demand for project business and of market prices, which could lead to considerable impairment losses. Since the US market raises expectations of a yearly growth rate up to 100% becoming the world's largest solar market by 2012 (Solon Annual Report, p.48), the focus on this market might be pivotal to Solon's success in 2010.

4.2 Renewable Energy Corporation (REC)

4.2.1 Company and markets

REC is one of the leading companies in the solar industry, which operates along the value chain as a vertically integrated producer of solar energy products. With its business segments REC Silicon, REC Wafer and REC Solar it covers the production cycle from the raw materials polysilicon and silane gas to the development and production of wafers, cells and modules, to the installation of systems (System Technology) and, to a lesser extent, the development of projects. REC is headquartered in Sandvika nearby Oslo, Norway, where it is subject to Norwegian tax law. It has been listed at the Oslo Stock Exchange since 2006. In general, REC

is owned by diverse companies and institutions. Interestingly, the German company Q-Cells AG held a 17,19% share in REC until 2009 (REC Annual Report 2008, p.27)[25]. Hence the industry comparable did not only act as a competitor in the market, as we will see further below, but also as a REC shareholder, a REC customer[26] of its raw materials and wafer supply and, until most recently, as a REC partner in Sovello AG.

REC has been investing in rapid growth consistently, focusing especially on international locations like the US and Asia[27]. In the US, REC built production sites for polysilicon and silane gas, which provides and secures enough raw materials along its value chain production, and enlarges the market of a supplier to solar cell and module producers and the electronic industry. This competitive advantage proves particularly valuable in times of price fluctuations on the raw material as well as on the module side.

Furthermore the Asian market shall be served with a new, fully integrated wafer, cell and module plant complex in Singapore, which doubles REC's production capacity and ensures high sales volumes in the Asian area. Thereby REC gains cost and market advantages in the US and Asia. Even if the market in Europe is stagnating REC will profit from module price flexibility and attractive production capacities. REC assumes a big business in the silane gas and polysilicon sector, where it is heavily investing in production facilities. A positive effect is that this sector is not entirely dependent on the photovoltaic market, since it also provides the electronics industry. REC's large amount of granted and pending patents and the set-up and development of three technology centers give an impression of its R&D-activity along the value. Strategically, REC has been working in time on international representations not only in production but also through sales offices in Japan, China, the US, Germany, Italy and Spain. The international presence adds another competitive advantage in times of market uncertainty and uncertainty of government measurements and provisions.

The main advantage as opposed to Solon is, that REC was able to partially compensate the strong price decrease of modules in 2009 with increased sales in

[25] REC's shareholder structure as of 31/12/2009: The 3 main shareholders holding shares above 5% are ELKEM AS (23,45%), ORKLA ASA (16,28%) and HAFSLUND Venture AS (11,54%). For further information, please refer to REC Annual Report 2009, p.29.

[26] Among many, REC Wafer also provides Suntech Power, another industry comparable and competitor, with wafer products (REC Annual Report 2008, p.8).

[27] The capital expenditure of 10 Billion NOK in 2008 in production facilities in the US was increased in 2009. The investment decision for the Singapore project in the amount of 13 Billion NOK was made in 2008 (REC Annual Report 2008 and 4th Quarter Report 2009).

the respective markets because of its cost and supply advantage in production[28]. We see that REC Group's revenues for 2009 did not drop contrary to Solon's[29], whereas EBIT(DA) and profit decreased dramatically as it was the case with Solon. While REC Silicon only made a few price adjustments in 2009 in their long-term contracts with customers, REC Wafer committed to price cuts (down to 20% price decrease in 4th quarter 2009) to oblige the heavily price-shaken module and cell producers, even though REC had the chance to call on very stringent long-term contracts with its customers in terms of price. As a consequence of the crisis, REC considerably suffered from lower capacity utilization in wafer production in 2009 (with summer breaks). These two reasons affected the lower EBITDA of REC Wafer in 2009.

4.2.2 Capital Structure and Financing

REC's capital structure has been very robust in the years before the crisis. As it seems, Financing has not been an issue. REC demonstrates a very solid Equity-to-assets ratio, which it reduced from 76% in 2006 to 50% by the end of year 2009 (55% in 2008). This fortunate status certainly helped and helps the group in negotiating with banks and refinancing their debt structure in the years 2009 and 2010 affected by the economic crisis.

Even throughout the crisis one can observe that REC is well backed by banks and shareholders in order to perform two issuances of new shares in the amount of 4 Billion NOK (Norwegian Krone) each time in order to increase equity, in 2009[30] and 2010[31]. This capital raise came along with the "successful" launch of two corporate bonds in 2009 in service of debt restructuring (REC 4th Quarter report 2009), a convertible bond of 320 Million Euro in the 4th Quarter of 2009 and a fixed-rate Norwegian bond of 1.250 Billion NOK in the third quarter of 2009. On top of that, REC was able to raise additional debt capital in the amount of 3 Billion NOK in June 2009 (REC, 4th Quarter Report 2009, p.11).

[28] Internal deliveries of polysilicon to REC companies accounted for about 40 – 60 % in the fourth quarters of 2009 and 2008 (REC, 4th Quarter Report, p.8) and 70% in the years 2008 and 2007 (REC Annual Report 2008,p.10)

[29] Revenue from 2008 to 2009 REC: plus 12%, Solon: minus 57%

[30] Equity increase through a share issue in the third quarter of 2009 in the amount of 4.4 Billion NOK net proceeds (REC, 4th Quarter Report 2009, p.11)

[31] REC replaces existing syndicated bank credit and guarantee facilities and issues new equity with fully underwritten equity rights in the amount of 4 Billion NOK (31.03.2010, Media section, internet site: www.recgroup.com).

By the end of 2009 REC faced a net debt of 10.3 Billion NOK, which means a net debt increase of 4.2 Billion NOK from 2008 to 2009, including the net debt of Sovello AG and the 2009 convertible bond. The increase in debt explains REC's intensive capital raising program, it is caused by negative operating performance and simultaneous huge investments in growth, which were continued and increased despite the crisis.

The growth-oriented mind-set is a very typical one for the industry and explains its drive. If it remains a good behaviour in years (to come) affected by the crisis, needs to be shown. Certainly, with respect to these actions one could analyze, that growth investing is value investing at high risk, meaning that what might remain at the end of the day is growth and a loss of equity to banks.

In addition to the issuance of new shares in 2010 the company sets forth with the sale of Sovello AG, a producer of solar modules (formerly EverQ GmbH) in Thalheim, Germany, which it owned in a joint venture with Q-Cells and Evergreen, each with a share of 33,3 percent. It was a red flag sale wherein the buyer, Ventizz Capital[32], saved Sovello AG from insolvency. It can be speculated that REC wanted to get rid of the troubling module business in Germany in a time when it needed to focus on its investments abroad and free itself from additional debt of a company in a problematic module market[33].

As in the case of Solon, REC likewise has been opting for the policy of not distributing dividends to shareholders since its IPO in 2006, but directly reinvesting the earnings into extensive and fast growth.

Financial management made an effort to make cash flows from operations and financing always look positive at the end of the year reports, even in their quarterly reports of 2009 and 2008 this seemed to be the stringent goal for cash flows from operations.

REC's outlook on Financing for 2010 has already positive aspects as it may draw on financial resources from US grants in the form of tax credits, it has already been rewarded for (REC, 4th Quarter Report 2009).

[32] "Sovello AG sold to Ventizz Capital" (24.03.2010, Media section, internet site: www.recgroup.com)

[33] Q-Cells has written losses in 2009 in its core business and REC most likely did not want to engage in another troublesome business

4.2.3 Current situation in figures

As many other companies', REC's operating results of 2009 were affected by reduced selling prices for modules (by approximately 1/3) and wafers, impairment on Property, Plant and Equipment (PPE) and intangibles, high amounts of write-downs on assets, especially inventories, and write-offs of shares in subsidiaries and associates.

In coherence with the general financial situation of REC the figures, however, are not as alarming as in the case of Solon. Revenues increased from 8.191 Million NOK (1.023 Million Euro)[34] in 2008 to 9.156 Million NOK (1.144 Million Euro) in 2009. Yet, on the EBIT level, a great decrease from 2.529 Million NOK (316 Million Euro) in 2008 to -1.824 Million NOK (-228 Million Euro) in 2009 took place, the negative EBIT includes impairment charges of 277 Million Euro. REC closed with a loss of -293 Million Euro in 2009.

The strong increase of net profit from 2007 to 2008 and the support of a positive cash flow from operating activities in 2009 can be attributed to non-cash gains on embedded derivatives. The management of derivatives is something particular to REC and should be explored further, since it seems to stabilize and counterbalance the results of REC.

REC Silicon's revenues and EBITDA clearly profited from the higher prices for silane gas and polysilicon in 2008, on-going throughout 2009 due to long-term price-insensitive contracts with its customers. REC took advantage of contract closures in 2008, when polysilicon and silane gas was scarcely available and module producers' demand for it was high (volume 25 Billion NOK, including deliveries to Sovello).

REC Solar's increase of production of cells and modules in 2008, by 181 percent and 90 percent respectively, happened because REC Solar had entered into sales contracts for about 80 percent of the 2009 planned productions of cells and modules by the end of 2008.

REC Solar was not suffering a drastic revenue decline as module producers Sovello and Solon because of its favourable position as a fully integrated player, however EBITDA was highly negative due to the price decrease of solar modules.

Currently REC is also struggling with customers, who are not able to pay because of insolvency or other difficult financial situations, which is demonstrated by the

[34] The convergence from Norwegian Krone (NOK) to Euro is done by the factor 0,124912, which represented the exchange rate as of 03/2010. This convergence rate is also used in further citations, inputs and calculations.

growing negative figures of receivables (REC 4th Quarter Report 2009). Cash Flow expectations of 2010 might be at risk because of this situation. Also the average selling prices for wafers are expected to decrease by another 20 percent throughout 2010 because of its customers' on-going struggle with harsher market conditions and decreasing module prices. Since the solar module market is very much dependent on available project financing in the respective countries, governments' incentives for 2010 will be decisive for all parties involved in the solar value chain.

A look at REC's cash flow statement 2009 shows that while they managed to save positive cash flow from operations on the paper, the key drivers for positive cash flow were "depreciation, amortization and impairment", "changes in provisions", and "changes in derivatives". The status of "receivables" and "inventories" worsened in comparison with 2008. As for financing activities, the real cash provider 2009 has been the issuance of new shares to increase equity and further proceeds from borrowings (debt refinancing). The later promotes liquidity and REC's ability to generate cash and pay the bills in 2009. Considerably high proceeds from borrowings in 2008 contributed to a positive cash flow from financing activities in the respective period.

4.2.4 Challenges for the upcoming years

The most immanent challenge for the upcoming years is the conquest of the Asian and US markets. Strong competitors as Suntech Power and Yingli Green Energy, operating with a huge back up by their governments, have the chance to grow fast and fairly safe, granted that the crisis is not prolonged by extraordinary effects. Investments in Research and Development, so as to cut down on costs in cell and module production and to increase the efficiency of the products, will be pivotal to the branch and Suntech Power is making strong promises to achieve grid parity by 2012 supported by its permanent investment in R&D (See Article Suntech and REC Annual Report 2008, p.5). Like Solon, REC's improvements in cell efficiency and module manufacturing costs are not as great as expected. REC's goal is to reduce module production costs to below 1 Euro per watt through the Singapore plant by 2011[35].

Another challenge is the competition from European, fully integrated companies like Solarworld AG, which manage to survive the crisis and compete with REC Group on

[35] The Singapore plant offers a wafer capacity of 740 MW, a cell capacity of 550 MW and a module capacity of 590 MW with the main hard core goal to compete with traditional grid-based technology (REC Annual Report 2008).

German and international markets. This situation likely causes a turn from demand to supply markets in a couple of years.

4.3 EDP Renovaveis (EDPR)

4.3.1 Company and markets

EDP Renovaveis is one of the world's largest wind generator and project developer with a realized installed capacity of 6.227 MW[36] as of 2009, year-end. EDPR is headquartered in Oviedo, Spain[37] with operating businesses in Europe, the US, and Brazil. Correspondingly it has three different business segments: "Renewables North America", "Renewables Europe" and "Renewables Other Regions". Its major shareholder, its mother company EDP[38], owns a stake of 77,5% (EDP Financial Results 2009, p.16) and holds 62,02% of the share capital (EDPR Annual Report 2008). Another 15,5% is owned by Hidrocantabrico, a Spanish company, and 22,5% comprise the Free Float[39]. 2008 has been a year of intensive acquisitions and so has been 2009, which demonstrates EDPR's financial capacities [40] to grow organically as well as by M&A activities. In 2008, EDPR carried out its IPO on the Euronext Lisbon Stock Exchange and offered 22,47% of its shares at a price range of 7,40 to 8,90 Euro per share. EDP Renovaveis holds a current market cap of 4,66 Billion Euro as of 23.04.2010 (source: Yahoo Finance). Currently EDPR's Wind electricity output amounts to more than 11.000 GWh (EDP Financial Results 2009, p.18).

Since the US has developed a favourable framework for subsidies in 2008 the wind (and solar) power market has grown tremendously making the US the world's largest wind power market[41], and China is soon to follow (EDPR Annual Report 2008,p.33). To a small, but growing extent, it engages in solar thermal and photovoltaic power as well as wave and hydropower.

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[36] EDPR "Results 2009"

[37] Since its headquarter is Spain, not Portugal, it is subject to Spanish tax legislation (Principle of double taxation).

[38] Energias de Portugal S.A., one of Europe's main energy operators (electricity and gas), turnover of 12.198,2 Million Euro (EDP Report 2009) and market capitalization of 13.150 Million Euro (23/04/2010, Yahoo Finance).

[39] Current data of EDPR Annual Report 2009, p.98, quote 62% EDP, 15,5% Hidroelectrica de Cantabrico, S.A. and 22,5% Free Float.

[40] EDPR's financial strength springs from the stable financial resources of its mother company, which offers various attractive conditions as short- and long-term company loans at an attractive fixed rate (EDPR Annual Report 2008).

[41] The US commissioned a record number of 8.358 MW in 2008 according to the American Wind Energy Association (EDPR Annual Report, p.33).

EDPR is operating in a capital intensive market since the costs for fixed assets in the process of developing and constructing wind parks are very high, leading to strong effects on capital expenditure and depreciation charges of assets[42] (Property, Plant and Equipment) not yet in use to create revenues. Such investments on fixed assets are long-term and, hence, need to be considered in view of risk management, especially the quality of turbines, the load factor and technological advances. Further the financing structure of projects with a time frame of about 5 years until productive electricity/energy output needs to be taken into account when planning the optimal debt financing structure. In order to secure revenues and stable EBITDAs, EDPR is committed to arranging its sale of electricity/energy with a high ratio of PPA (Power Purchase Agreements)[43] with fixed long-term price conditions (average: 15 years).

EDPR has been renegotiating agreements with its suppliers in order to reach long-term contract frameworks with more flexibility in price and volume (EDPR Annual Report 2008, p.45), so as to be not bound to one supplier in case of price fluctuations or production shortages, which is good in view of the economically uncertain times to come in the next years.

4.3.2 Capital Structure and Financing

As mentioned further above the capital structure of EDPR is stabilized by EDP in many ways. Not only is EDPR profiting from loans at very attractive interest rates, but also from the support of EDP's R&D Department, naturally supplied with great equipment and gifted employees. This fact ensures a safe and fast growth of the company under the roof of its parent, also in economically rough times as have been the years 2008 to 2010.

The growth appears to be one of empire building in the purest sense due to the favourable capital structure and the main shareholder EDP. Empire building is done with "value creation" because EDPR targets the high-growth potential in the emerging markets creating long-term company value[44].

[42] Developers are dependent on price fluctuations and over-all supply of raw material and wind turbines. Wind turbines make up for 70-80% of a wind farms capex (EDPR Annual Report 2008, p. 43).

[43] For example: 73% of EDP Renovaveis NA's EBITDA covered by PPAs (EDPR Annual Report 2008)

[44] "Value creation" mentioned in this context does not refer to findings on EDPR's recent and current ROICs and WACCs.

One needs to point out that from 2007 to 2008 the debt structure changed considerably leading to a smaller leverage effect (net debt/EBITDA of 2,4 in 2008 versus 10,5 in 2007) and a higher equity-to-assets ratio (29% in 2007 versus 54% in 2008)[45], caused by EDPR's IPO. The equity-to-assets ratio was only slightly reduced in 2009 to 47%, whereas net debt increased by almost 100% to 2.133,5 Million Euro due to very committed investment strategies. However, in 2009 net debt made up for 23% of the company's enterprise value, which speaks for a very solid capital structure[46]. In terms of financing EDPR draws from loans provided by EDP Group Related Companies in an extensive way, amounting to 61,7% of total loans in 2008 and 79,7% of total loans in 2009. This demonstrates the rougher market conditions in terms of loans and financing throughout the crisis year 2009, wherein additional credit risk was not taken and financing needs for investments were covered and stabilized with higher amounts of inter-company loans.

EDP Renovaveis NA has specialized on the construction of institutional equity partnerships on a project basis for raising capital and claims to work on its economic and financial efficiency consistently by looking at each project's most favourable financial structure (Homepage, Press Releases 2008 and 2009). In 2008 EDPR NA performed an institutional investor partnership transaction, a tax equity deal, with JP Morgan Capital and New York Life Insurance Company raising 265 Million US Dollars in 2008. However, performance efficiency is a paradigm for EDPR.

4.3.3 Current situation in figures

EDPR is currently making up for 35,44% of EDP's market capitalization, more than a third of the mother company's shareholder's equity[47]. EDPR's growth in installed capacity by 1.175 MW (Gross MW) from 2008 and 2009 almost totals the complete amount of growth of EDP's installed capacity year-on-year, which was 2.034 MW, if one takes into account the company size of the mother in relation to the daughter. Likewise, the capital expenditure of EDP for EDP Renovaveis investments amounted to 58% of total capex, while in general 75% of total capex of EDP were

[45] Nebt debt was reduced from 2.414 Million in 2007 to 1.070 Million in 2008, while capital expenditure increased.

[46] As much as one can consider the market value, the enterprise value of a company in a young, emerging industry sector, as solid basis. Hence it is compared with the equity ratio and net debt/EBITDA here to draw a complete picture.

[47] Market capitalization as of 24/04/2010, source Yahoo Finance: EDP (13,15 Billion Euro) and EDPR (4,66 Billion Euro).

spent on wind and hydro enterprises of the group (EDP Financial Results 2009, p. 6). EDP leaves no doubt as to the future business focus of its enterprise.

EDPR has already profited from US cash grants in 2009 reducing EDP Renovaveis NA's CAPEX of 826 Million Euro by 156 Million Euro, which makes this emerging market quite attractive.

In terms of performance efficiency EDPR has a very high EBITDA/revenue ratio, which it holds above 80% since 2008, whereas EBITDA growth slowed down from 90% in 2008 to 24% in 2009 and revenue growth from 68,59% to 21,75%[48].

Performance Efficiency, overall, seems to be a central paradigm for EDPR Renovaveis, which it keeps track off rigidly in times of growth. The negative working capital in recent years (2007 to 2009)[49] shows the fast track of growth, EDPR finds itself in, and reflects its conviction of its long-term project plans to materialize as projected and its certainty of future revenues, supported by Power Purchase Agreements for the most part.

4.3.4 Challenges for the upcoming years

In 2008 EDPR managed an additional of 1.413 MW installed capacity and the construction of 2,2 GW, which is above the goal of building an average of 1,4 GW per year and growing at a compound annual rate of 20% until 2012[50]. Regulatory problems with the closure of US PPAs related to lower energy prices lead EDPR to lower its growth pace of 1,4 GW by 500 MW for 2010 and 2011 for the time being (EDP Financial Results 2009, p.17).

EDPR has concrete prospects to engage in offshore wind projects in 2010. In early 2010 it entered in a joint venture with SeaEnergy Renewables Limited with a 75% share to build 1,3 GW of off-shore wind farms in the UK. Brazil has an installed capacity potential of 143 GW with only 751 MW of installed capacity to be completed by 2009 (EDPR Annual Report 2008, p.56) and thus offers great opportunities as an emerging market. Also the Eastern European market has a high growth potential, wherein EDPR already settled by the acquisition of Renovatio Power SRL and Cernavoda Power SRL in 2008 (Homepage, Press Release 2008). EDPR also engages in purchasing activities in the promising Italian market by the acquisition of

[48] Revenue and EBITDA growth development is similar to peers EDF EN and Iberdrola Renovables for the years 2007 to 2009. See also comparables analysis.
[49] 2007: -185 Million Euro; 2008:-638 Million Euro; 2009: -608 Million Euro
[50] In 2012 EDPR wants to reach the goal of 10,5 GW installed capacity (EDPR Annual Report 2008).

Italian Wind srl with a project volume of 520 MW in early 2010 (Homepage, Press Releases).

Further, offshore opportunities in the UK will and are already taken. The country starts off at 0,9 GW in 2009 and is aiming for 30-40 GW installed capacity by the year 2020 (Iberdrola Renovables Presentation Investor's Day 2010, p.14). EDPR will consistently be employed with managing merchant price decreases in Spain and other countries, which should be hedged in order to stabilize the revenue risk factor. The US system of tax credit and cash grants offers great chances in the US to reduce Capital Expenditure and to invest in growth. Some experts say that there will be a technological shift in the production of wind turbines in the upcoming years, especially due to the great growth potential of offshore wind energy production. It might be smart to stay alert to this. The US market holds potentials of 100 GW installed by 2015, of which about 17 GW were installed by 2007 (Iberdrola Renovables Presentation Strategy 2008-2012, p. 7).

5. Industry and Company-specific indicators

5.1 Multiples of the industry sector

While there is not the place in this thesis to perform a full-blown “Comparable Companies Analysis”, which is very common in a valuation process precedent to acquisition planning and financing (Rosenbaum & Pearl, 2009, p.11 ff.), I will look at the industry indicators and multiples over time, in order to make projections for the valuation of the companies. For this purpose I contacted several investment bankers, private equity fund managers and industry experts to draw on their expertise, their examinations and assumptions for the future in the solar and wind power market. Main indicators, as included in the WACC-calculation, are derived from these assumptions. In sum I interviewed 10 persons. For privacy reasons, I will cite the inherent information, obtained by these expert opinions, from sources, which are publicly available.

5.1.1 Comparison with companies in the solar industry for Solon and REC

The comparables chosen comprise a selection of companies of similar revenue size and development in view of an international competition in the market of solar producers. The following analysis will examine performance indicators and multiples of the competitors Solarworld AG, Q-Cells, Suntech Power, Yingli Green Energy, Solon SE and REC Group. Some attention will be given to successful and promising solar energy companies of smaller revenue size in terms of their current business situation and their stock price development, meaning Aleo Solar, Solar Millenium and Centrotherm.

At a deeper level of analysis, the indicators applied for a comparison of Solon, Solarworld, REC and Suntech are the growth of revenues and the growth of Earnings Before Interest and Taxes minus Taxes (EBIT minus Taxes), the later representing the operating result in place of the Net Operating Profit Less Adjusted Taxes (NOPLAT). It was not possible to retrieve NOPLAT directly from most of the companies’ consolidated financial data. Also, in my calculations on EBIT minus Taxes I applied the country corporate tax rate, in order to measure the operative performance of the company rather than its ability to profit from tax efficient

structures[51]. A further indicator of value creation is the Return on Invested Capital (ROIC)[52], which was calculated and compared with historical WACCs of the companies, where available[53].

The Value chain of operations

The selected comparables are operating in different segments of the value chain or across the value chain as vertically integrated market players. The producers of silicon, wafers, cells and modules find themselves in very different financial and economic business situations, also because of their diverse positioning in the value chain.

The following chart picked from Solon SE's Annual Report 2009 (p.10) helps envision the solar value chain.

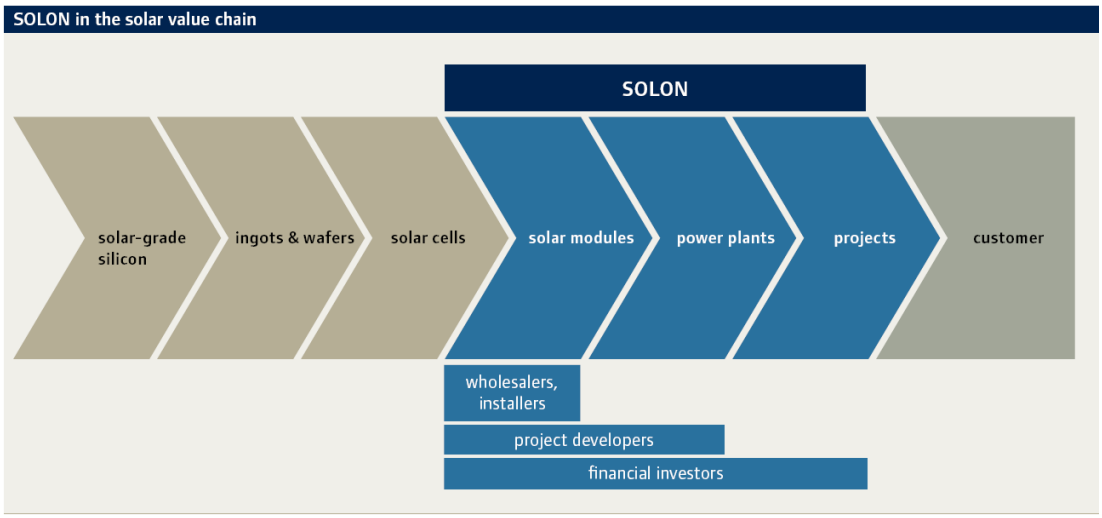

Figure 2: Value Chain – Solar Industry (Solon Annual Report 2009)

Considering the private end customer, this chart leaves out the energy generators and operators. Usually they acquire projects from project development companies or they get involved in project management themselves. The listing of value chain segments most likely looks like the following.

[51] Corporate tax rates are drawn from KPMG's Corporate Tax Rate Surveys available in the internet.
http://www.kpmg.com/Global/en/IssuesAndInsights/ArticlesPublications/Pages/KPMG's-Corporate-and-Indirect-Tax-Rate-Survey-2009.aspx

[52] The ROIC is calculated as the EBIT minus taxes (corresponding to NOPLAT) divided by Invested Capital. The Invested Capital is calculated taking the Total Assets minus Accounts Receivable minus Inventory minus Other current assets.
http://www.investopedia.com/university/EVA/EVA3.asp

[53] Historical WACCs are taken from the Annual Reports.

Value chain downstream:

- Solar grade silicon
- Ingots and wafers
- Solar Cells
- Solar modules
- Power Plants / System Technology
- Projects
- Energy Generators and Operators/ Investors/Private Customers
- End User (Customer of Energy Operators)

Market components and current business situation of Solon SE, REC Group and assorted comparables

Solon SE is a major German producer of solar modules and systems technology, to a minor part also an installer of solar power plants and project developer. In 2009 Solon SE experienced a dramatic drop in revenues from 815 Million Euro (2008) to 354 Million Euro. A positive EBIT of 58 Million in 2008 turned into a strongly negative result of -199 Million Euro in 2009, along with a net loss of -272 Million Euro (net income 2008: 32,7 Million Euro). Solon is struggling for survival in this crisis. A major cause of Solon's loss was the drop in revenues and the massive write-downs on shares in daughter companies and financial assets of 122 Million Euro as well as write-downs on inventories of 60 Million Euro due to a 1/3 price drop[54] of solar modules in the market.

Solarworld AG is a German competitor of Solon operating along the value chain from the production of silicon, solar cells, wafers, modules to the development of projects and the instalment of solar power plants. It could attain a revenue of 1.013 Million Euro in 2009 as opposed to 900 Million Euro in 2008. Apparently, the increase in sales volume of 38% helped compensating for the industry-wide price cut of solar modules. One cannot help but suspect that the German competitor Solarworld took away of Solon's business throughout the crisis starting in 4th Quarter 2008. On the EBIT level Solarworld must recognize a "loss" as well, since it closed 2009 with 152 Million Euro versus 263 Million Euro in 2008. Net Income decreased from 149 Million in 2008[55] to 59 Million in 2009. Solarworld has wide-spread sales

[54] Data on write-downs from Article "Solon im Tal der Finsternis", IT-Times (24/02/2010)
[55] The position "Change in work of progress and finished goods" of 117 Million Euro blows up the income statement and the balance on the yearly profit (See Annual Report 2008).

offices, which benefits its sales force. It focuses on Free Liquidity as one of its important performance indicators.

Q-Cells SE is one of the German competitors, who focused and specialized on the production of solar cells. The company offers mono- and polycrystalline, silicon-based solar cells, also modules and systems. Project development is a minor part of its business. Q-Cells suffered a decrease of 1/3 of its revenues from 2008 (1.251 Million Euro) to 2009 ending at a balance of 802 Million Euro in 2009. On the EBIT level Q-Cells fell from a positive (205 Million Euro in 2008) to negative (-486 Million Euro in 2009) result. A tremendous net loss of 1.386 Million in 2009 stands against a net profit of 187 Million Euro in 2008 and included write-downs of subsidiaries in the amount of 952 Million Euro[56].

REC Group is a Norwegian, vertically integrated market player, with a strong and growing business in the upstream part of the value chain. This part comprises the production of silane gas and polysilicon, multicrystalline wafers and monocrystalline ingots. In addition, the manufacturing of solar cells, solar modules and systems is also a core-business of REC. REC undertakes some project development activities. REC managed to increase its revenue from 8.191 Million NOK (1.023 Million Euro)[57] in 2008 to 9.156 Million NOK (1.144 Million Euro) in 2009. On the EBIT level we find a different situation leaving REC with a negative EBIT of -1.824 Million NOK (-228 Million Euro) as opposed to an EBIT of 2.529 Million NOK (316 Million in 2008). Impairment charges of 2.214 Milllion NOK (277 Million Euro) on PPE and intangible assets make a major contribution to this negative EBIT. REC's loss for the year 2009 amounts to -2.347 Million NOK (-293 Million Euro) versus a profit of 3.064 Million NOK (383 Million Euro) in 2009.

Suntech Power is a Chinese producer of solar cells and modules with a diversified, high-quality product portfolio. Suntech's revenue slightly decreased from 1.924 US Dollars in 2008 to 1.700 Million US Dollars in 2009. In comparison with the other companies above, Suntech was able to keep its EBIT level in the crisis year 2009 with 174 Million US Dollars versus 183 Million US Dollars in 2008. Even better than that, Suntech's net income ended at a balance of 86 Million US Dollars in 2009 as

[56] Data on write-downs springs from Article "Q-Cells 2009 abgestürzt", Handelsblatt (23/02/2010).
[57] In my thesis I apply a fixed currency conversion rate factor of 0,124912 from NOK to Euro.

opposed to 31 Million in 2008 (143 Million in 2007). Suntech faced higher impairment charges already in 2008 (74 Million US Dollars, Suntech Annual Report F-20), which it managed to partially offset by a gain generated from buybacks of its 2012 convertible note buy-back (24 Million US Dollars). Suntech challenges its competitors with its announcement of achieving grid parity by 2012.

Yingli Green Energy (Yingli Solar) is another strong Chinese solar producer, operating vertically all along the value chain from the production of polysilicon to cells and modules with wide-spread international markets and sales offices. Yingli's polysilicon business is in the start-up phase, which makes the company more dependent on external suppliers than REC at this point in time. Yingli achieved a revenue of 1.062 Million US Dollars in 2009 versus 1.107 Million US Dollars in 2008[58]. Income from operations in 2008 amounted to 239 Million US Dollars. Various Yingli could keep its pace on the revenue level throughout the crisis, it turned its Year 2008-net income of 98 Million US Dollars into a loss of 67,3 Million US Dollars in 2009.

Businesses of smaller revenue size than the comparables mentioned above are Aleo Solar[59], Solar Millenium[60] and Centrotherm[61], German solar energy companies on the rise. The crisis has hit them in another stage of their business development and, thus, apparently less hard or not at all in 2009. Yet, the effect of the crisis might kick in later. Aleo Solar could keep its revenue level with 355 Million Euro in 2009 (382 Million Euro in 2008), EBIT and profit decreased, but remained clearly positive (EBIT 2009: 16 Million Euro; profit 2009: 10 Million Euro). Solar Millenium demonstrates an impressive increase in sales from year 2007/08 to 2008/09 from 32 Million Euro to 201 Million Euro. This strong increase is also observed on the EBIT and on the profit level. Centrotherm could raise its revenue from 375 Million Euro in 2008 to 509 Million Euro in 2009, while it suffered minor losses on the EBIT and the net income level.

[58] Yingli Green Energy compensated the industry-wide price reduction on modules with a significant increase in sales. PV module shipments increased by 86,6% (Yingli Annual Report 2009).
[59] Core competence in the production of solar modules; specialized products
[60] Solar Milleniums core competence lies in the development and installation of solar-thermal power plants, which is on the bottom part of the solar energy value chain. Hence it cannot be compared with solar producers operating mainly in the upper segments of the value chain directly.
[61] Centrotherm operates along the value chain offering specialized technology and turnkey-solutions to production lines from the production of wafers and ingots to the production of cells and modules.

Stock price development

Needless to say, that the stock prices of all comparables fell throughout the crisis, but certainly, some were more affected by it than others. As prices are driven by human expectations more than by numbers, one could suspect, that future expectations about companies outweigh the current crisis situation. It is remarkable that in some cases the share price dropped surprisingly much, reflecting more the current business status of the companies than their future economic perspectives.

The figures below show the share price development, the share prices and the current market capitalizations of the selected comparables.

Figure 3: Solon's stock price development: 5-year chart (Finanzen.net, 15/03/2010)

Figure 4: Solon's stock price development since 2000 (Finanzen.net, 15/03/2010)

Figure 5: Solarworld's stock price development: 5-year chart (Finanzen.net, 15/03/2010)

Figure 6: Solarworld's stock price development since 2000 (Finanzen.net, 15/03/2010)

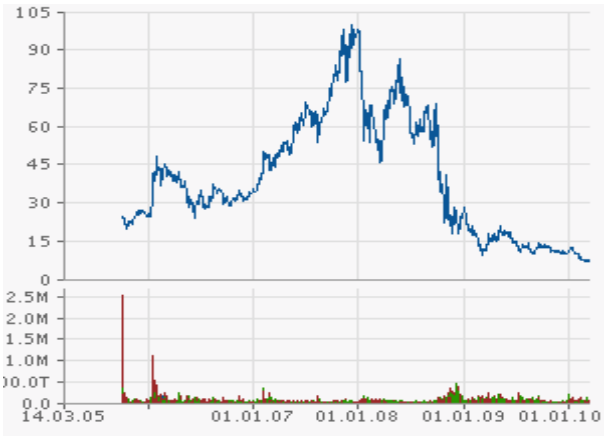

Figure 7: Q-Cells' stock price development: 5-year chart (Finanzen.net, 15/03/2010)

Figure 8: REC Group's stock price development: 5-year chart (Finanzen.net, 15/03/2010)

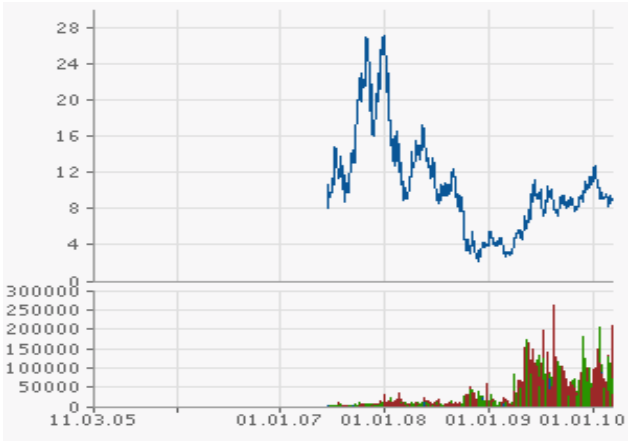

Figure 9: Yingli Green Energy's stock price development: 5-year chart (Finanzen.net, 15/03/2010)

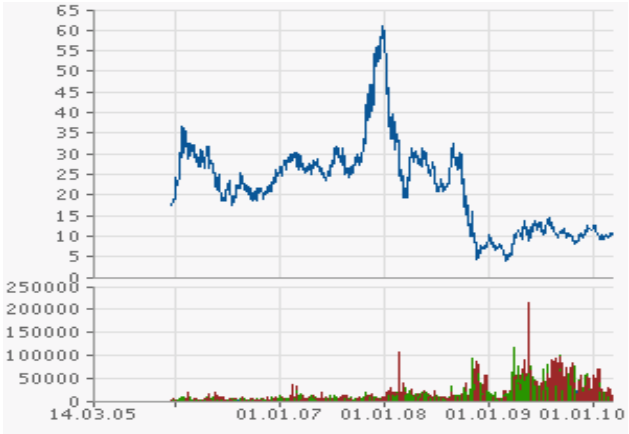

Figure 10: Suntech Power's stock price development: 5-year chart (Finanzen.net, 15/03/2010)

In addition to these charts, I retrieved data on the smaller companies mentioned above from Finanzen.net on 28/05/2010. The share price development of Aleo Solar experienced a sharp drop throughout 2009, yet the stock was able to recover to around 10 Euro in 2010 (as opposed to around 16 Euro in 2007). Solar Millenium was also able to find back on track after the crisis at year-end 2009 with a stock price of 45 Euro (versus a stock price of up to 45 Euro in 2007). Presumably, the sudden drop of its stock price in March/April 2010 is due to the cut in subsidies in several European markets, which hits the industry of solar power plant developers naturally (currently 16,25 Euro). Centrotherm shares this story with Solar Millenium. While it could achieve a high stock price 2009 year-end (around 44 Euro versus peaks of up to 70 Euro in 2007), the share price dropped from beginning of 2010 down to 25,80 Euro.

The charts on the comparables' stock performance further above as well as the following table demonstrate, that apparently, the market gives credit to companies performing better than others throughout the crisis. In Europe this applies to Solarworld, whereas Solon and Q-Cells lost much credibility on the way. REC finds itself at an all time historical and critical low of its share price right now, although its economic perspective as a vertically integrated company, which could keep revenues throughout 2009 at the level of 2008 seems much better than the one of Solon and Q-Cells. Also Yingli and Suntech lost to a major extent on their share value, Suntech's stock price is lower than it was at its IPO. What I find outstanding about the data in general are the two peaks in share price development in 2008 and 2009, which are very well observable in the Q-Cells and REC charts. Furthermore, the share prices of the companies, which reached the highest peaks, dropped more radically in the following period than others, speaking of Solon and Q-Cells.

	Stock price 20.03.2010 in Euro	**Stock price** 06.04.2010 in Euro		**Market cap** in Million Euro
SOLON SE	5,17	5,55		67,31
SOLARWORLD	10,24	10,99		1.231,71
Q-CELLS	7,11	7,38		866,21
REC GROUP	3,01	3,34	26,92 NOK	1.761,74
SUNTECH POWER	10,36	10,48	14,18 USD	1.601,69
YINGLI GREEN ENERGY	8,75	9,35	12,52 USD	1.393,29
ALEO SOLAR	9,35	10,49		136,82
SOLAR MILLENIUM	20,85	19,02		237,31
CENTROTHERM	33,8	32,41		678,68

Figure 11: Stock prices in the Solar sector as of 20/03/2010 and 06/04/2010, market capitalization as of 06/04/2010 (source: Finanzen.net)

Performance indicators of growth

The following tables mark the development of the comparables Solon, Solarworld, REC and Suntech, in order to take a closer look at their revenue growth and their operating performance as such. It is remarkable, that all companies showed high growth rates in revenues and also in EBIT minus taxes until 2009. In 2009 all companies suffered on the "EBIT minus taxes"- level, Suntech the least, presumably due to its cost efficiency.

SOLON GROWTH RATES

2002	2003	2004	2005	2006	2007	2008	**2009**	
20.970	37.738	103.544	201.169	346.376	503.080	815.095	**354.400**	**Revenues**
	80%	174%	94%	72%	45%	62%	**-57%**	**Growth rate**
-2.258	-785	2.651	8.948	15.321	21.673	40.676	**-199.000**	**EBIT- taxes**
		437,71%	237,53%	71,22%	41,46%	87,68%	**-389,23%**	**Growth rate**

Figure 12: Solon's historical growth rates
No tax deduction on negative EBIT of 2002, 2003 and 2009

SOLARWORLD GROWTH RATES

2002	2003	2004	2005	2006	2007	2008	**2009**	
108.896	98.477	199.933	355.971	515.246	698.818	900.311	**1.012.575**	**Revenues**
	-9,57%	103,03%	78,05%	44,74%	35,63%	28,83%	**12,47%**	**Growth rate**
1.484	-3.102	20.297	54.666	109.495	122.585	185.572	**107.782**	**EBIT- taxes***
	-309,02%	754,31%	169,48%	100,30%	11,96%	51,38%	**-41,92%**	**Growth rate**

Figure 13: Solarworld's historical growth rates
No tax deduction on negative EBIT of 2003
*"Operating result from continued operations" minus taxes in Solarworld Annual Reports as equivalent of EBIT minus taxes

REC GROWTH RATES 0,124912 factor

2002	2003	2004	2005	2006	2007	2008	**2009**[62]	
54.012	89.064	158.662	306.524	541.378	829.671	1.023.130	**1.143.694**	**Revenues (Euro)**
432.400	713.011	1.270.192	2.453.916	4.334.072	6.642.043	8.190.806	**9.156.000**	**Revenues (NOK)**
	65%	79%	93%	77%	53%	23%	**12%**	**G-rate**
	-20.283	3.582	54.092	145.096	232.728	227.431	**-227.839**	**EBIT-tax. (Euro)**
	-162.376	28.673	433.042	1.161.588	1.863.138	1.820.732	**-1.824.000**	**EBIT-tax. (NOK)**
		117,66%	1410,28%	168,24%	60,40%	-2,30%	**-200,18%**	**G-rate***

Figure 14: REC's historical growth rates
No tax deduction on negative EBIT of 2003 and 2009
= Growth rate

SUNTECH GROWTH RATES (in US Dollars)

2002	2003	2004	2005	2006	2007	2008	**2009**[63]	
3.025	13.888	85.300	226.000	598.900	1.348.300	1.923.500	**1.700.000**	**Revenues**
	359,11%	514,20%	164,95%	164,60%	125,13%	42,66%	**-11,62%**	**Growth rate**
-1.042	504	13.467	29.480	70.149	123.280	136.875	**130.500,00**	**EBIT-taxes***
	148,37%	2572,02%	118,00%	137,96%	75,74%	11,03%	**-4,66%**	**Growth rate**

Figure 15: Suntech's historical growth rates
No tax deduction on negative EBIT of 2002
*"Income from operations" minus taxes in Suntech Annual Reports as equivalent of EBIT minus taxes

ROIC[64] and WACC[65]

The relation of the return on invested capital and the WACC is a twisted one in this industry sub-sector, as the following tables show. Unfortunately we have only historical data of pre-tax WACC available from Solon's and REC's Annual Reports. We can see, that in some years value creation was realized, in others not at all. When examining the ROICs, it seems that the typical ROIC of European companies circles around 10%, whereas Suntech's average is around 7%, leaving out the crisis

[62] For the year 2009, data from the 4th Quarter Report was taken, since the Annual Report 2009 was not published yet.
[63] For the year 2009, data from the 4th Quarter Report was taken, since the Annual Report 2009 was not published yet.
[64] For definitions of calculations of the Return on Invested Capital and Invested Capital, please refer to the Appendix "Definitions of Calculations".
[65] For further information on WACC data and estimations, please refer to the section "Estimating the Weighted Average Cost of Capital".

year of 2009. Suntech's low ROIC could lead to two assumptions: first of all, that Suntech might benefit from an incredibly low Cost of Capital, respectively Cost of debt, in view of its high portion of Invested Capital, which eventually enables it to create value instead of destroying it, at least in one or the other year, and second of all, that its shareholders are seemingly committed to high growth investing at the cost of high returns on invested capital[66] (not meaning returns on equity) for several years.

SOLON'S RETURN ON INVESTED CAPITAL AND WACC

2003	2004	2005	2006	2007	2008	**2009**	
-785	2.651	8.948	15.321	21.673	40.676	**-199.000**	**EBIT-taxes**
6.431	26.472	88.817	129.876	409.140	422.872	**395.543**	**Invested Capital**
-0,122065	0,100146	0,100748	0,117964	0,052973	0,09619	-0,50311	ROIC
-12,2%	**10%**	**10,1%**	**11,8%**	**5,3%**	**9,6%**	**-50,3%**	**ROIC %**
		18,98	**13,77**	**13,75**	**10,92**	**8,63**	**WACC**

Figure 16: Solon's historical ROICs and WACCs
No tax deduction on negative EBIT of 2003 and 2009
WACC out of Annual Reports, where available, pre-tax WACC
WACC 2005: simple average instead of weighted average of the two sector WACCS

SOLARWORLD'S RETURN ON INVESTED CAPITAL

2002	2003	2004	2005	2006	2007	2008	**2009**	
1.484	-3.102	20.297	54.666	109.495	122.585	185.572	**107.782**	**EBIT-taxes**
170.755	196.859	212.986	338.989	668.521	1.236.545	1.504.473	**1.394.508**	**Invested Capital**
0,0086	-0,015	0,095	0,161	0,164	0,099	0,122	**0,0772**	ROIC
0,86%	-1,5%	9,50%	16,10%	16,40%	9,90%	12,00%	**7,72%**	**ROIC %**

Figure 17: Solarworld's historical ROICs
No tax deduction on negative EBIT of 2003
No data on WACC (Cost of Capital) in Solarworld Annual Reports
ROIC higher because of higher amount of inventory in 2009

[66] The higher the Return on Invested Capital, the more efficiently the company uses its capital. If the amount of invested capital is high, this fact becomes even more critical.

REC's RETURN ON INVESTED CAPITAL AND WACC

2003	2004	2005	2006	2007	2008	**2009**	
-162.376	28.673	433.042	1.161.588	1.863.138	1.820.732	**-1.824.000**	**EBIT-taxes (N)**
1.135.067	1.750.346	5.245.033	13.175.525	16.156.780	25.985.379	**28.975.000**	**Invested Capital (N)**
-14,30%	1,64%	8,26%	8,82%	11,53%	7,20%	-6,30%	ROIC %
-14,3%	1,6%	8,3%	**8,8%**	**11,5%**	**7,2%**	**-6,3%**	**ROIC %**
			9,2	**9,7**	**8,4**		**WACC**

Figure 18: REC's historical ROICs and WACCS
No tax deduction on negative EBIT of 2003 and 2009
Derivatives and restricted bank accounts were subtracted in the Invested Capital-calculation, their possible inclusion has little effect on the present ROIC-result.
WACC 2006 -2008: average of business sectors, WACC (pre-tax)
No data available on WACC in Annual Report 2009 and in reports before Year 2006

SUNTECH`S RETURN ON INVESTED CAPITAL (in US Dollars)

2003	2004	2005	2006	2007	2008	**2009***	
504	13.467	29.480	70.149	123.280	136.875	**130.500**	**EBIT-taxes**
NA	NA	437.169	793.510	1.512.000	2.726.300	**3.273.200**	**Invested Capital**
		0,0674	0,0884	0,0815	0,050	0,040	ROIC
		6,70%	**8,80%**	**8,15%**	**5,00%**	**4,00%**	**ROIC %**

Figure 19: Suntech's historical ROICs
*Data 2009 from Annual Report 20-F
WACC was not deductible from Annual Reports

Risk factors in the solar industry

Resulting from this analysis a main risk factor for current and future solar producers seems to be the operation in the middle segments of the value chain contrary to fully-integrated production. This risk is determined by the uncertainty of supply and price fluctuations of raw materials and products in previous stages of the value chain, which are pivotal to the production of cells and modules. Moreover, because of the significant cost reduction of modules in the solar industry, the survival of enterprises will be ensured by its ability to secure low cost raw material supply and to achieve a challenging degree of module efficiency (R&D) on a yearly basis[67]. Also, the number of competitors in the market has increased in the last decade to the extent, where cost-efficiency in production and technological advances guarantee the survival of a company. In this period of consolidation triggered by the crisis, the companies,

[67] The goal of the industry is grid parity and the first ones to attain it, will be the ones, who "win the game".

which were able to win market shares as opposed to their competitors, are most likely the ones to survive. The risk of a prolonged situation of high cost or inaccessibility of financing for solar energy projects affects revenues and profits of solar producers and, with a certain delay, of solar power plant developers and installers. If it remains hard to receive credit for PV system project financing in Europe throughout 2010 and 2011, this market will be without future prospects for the upcoming years. Presently, producers focus more and more on emerging markets with attractive subsidy systems like the US and China. In the end, the market of solar producers is very capital-intensive, especially upstream in terms of PPE and intangibles (patents etc.), which need to be invested before they come into use.

The development of a company in relation to the market is one of the risk indicators I looked at. When I checked the company Betas, it turned out that Suntech and Yingli have the highest Betas in the group of comparables. For a complete demonstration of the Betas, please refer to the Section “Estimating the Weighted Average Cost of Capital”.

Risk factors

Producing in a middle segment of the value chain versus vertical integration
Raw material supply
Market price development of raw material and modules
Cost reduction of the production of solar modules
Efficiency of solar modules and grid parity
Subsidies in the countries of operation
Many competitors on the market – not all will survive the crisis

Conclusion

The comparative analysis shows that the business and financial situation of the companies has been quite different over the years and its strengths and pitfalls became most obvious during the crisis year Q4/2008 to Q4/2009. The crisis continues to prevail throughout 2010, which again is a tough year of consolidation in the market, unfortunately also due to macroeconomic factors, which are effects of the crisis as such[68].

[68] The indebtedness of European countries (e.g. Greece) might cause a major fallback in the promotion of Renewable Energy with subsidies.

When examining the consolidated financial statements, it becomes clear, at which point the companies have been struggling throughout the crisis years. Some suffered a serious revenue decline, whereas others faced a negative EBIT and/or a loss and only a few were able to keep in line with their past performance or progress in terms of revenue size, operating result (EBIT) and net income (profit)[69]. In general it can be observed that the European vertically integrated producers like REC and Solarworld were doing much better on the revenue level than the European companies, which focused on one segment of the value chain (e.g. module production). They were more flexible in low-cost raw material supply to themselves and they profited from good, existing contracts with third parties. They could partly compensate the price fall of modules with increasing sales and benefited from their diverse product portfolio. These advantages enabled them to keep up with falling prices on modules. Q-Cells, Solon's German competitor in the solar cell and module market, suffered even more loss than Solon, which shows, how critical this "sandwich position" turned out to be in the crisis. This holds true, at least for the European and especially the German market.

Looking towards China, we see that the fast growing module and cell producers Suntech and Yingli could not increase their sales in 2009, whereas Suntech has done much better than Yingli in terms of performance efficiency. Both of them claim to make cost-efficiency in production their primary goal, which might have helped them to increase sales in 2009 and, thus, to keep their revenues at the level of 2008.

5.1.2 Comparison with companies in the wind power market for EDPR

The selected comparables are identical with the "peer companies" posted on EDPR's website, namely EDF Energies Nouvelles and Iberdrola Renovables. Other than in the case of the solar industry comparables described above, the revenue sizes of these wind power comparables are subject to a wider spread. However, the companies share the same situation as subsidiaries of strong international players in the Energy market, namely EDP (Portugal/Spain), EDF (France) and Iberdrola (Spain). While conducting my research on appropriate comparables, I discovered

[69] A word of caution must be said when it comes to companies' financial statements. Taking a closer look, I discovered at some points that the relation between EBIT and net income (or profit) differed between the companies, in some cases the financial result made up for the company's profit (increase) of the year, in another case "derivatives" were added to the Cash Flow from Operating Activities securing fairly positive results in 2009 (I am referring to REC Group), in a further case "Change in inventories of finished goods and work in progress" affected Solarworld's 2009 EBIT positively and even more its positive result on net income.

that it was hard to find a Renewable energy provider with its core competence in the development of wind energy projects on an international scale, listed as well as comparable to EDP Renovaveis in revenue size. So I decided to stick with the companies, EDP Renovaveis calls its "peers"[70] on its company website.

Stock Price Development

The stock prices[71] have undergone some movement in the last years. Whereas EDF Energies Nouvelles recovered quickly after the crisis to a share price of 34,52 Euro, EDPR's share did so as well almost reaching its "point of departure"-share price of 8 Euro (IPO price), but then decreased sharply in the second half of 2009 down to 5,62 Euro. Iberdrola Renovables experienced a similar decline in share price development as EDPR during the crisis. Starting from 5,5 Euro in the beginning of 2008 the price "smoothed out" after the crisis in the beginning of 2009 at a level of around 3 to 3,5 Euro, where it has remained constant up to April 2010 (3,18). The contrary is the case when we look at US quotas of Iberdrola Renovables US, which shoot up to 25 US Dollars in the second half of 2009 (shortly after Iberdrola Renovables' enlisting at NASO) [72] This jump most likely happened as a consequence of President Obama's measures to promote Renewable Energies and investors' expectations in view of the great potential of instalment opportunities in the US. Currently the US share price is 21,15 US Dollars. The following charts show the stock price developments in a one year and a three year time[73] frame for all three companies.

[70] EDPR also compares its performance to Acciona and NextEra (EDPR Company Presentation 2009). Acciona offers a very wide-spread portfolio of services and thus I did not choose it as an immediate comparable. Yet, Acciona Energy might be an interesting comparable in a wider range with relevance to project development and revenue growth. This also applies to NextEra, which has in its substance a very diversified portfolio of "clean energy" products including 37% natural gas, 14% nuclear energy and 41% wind energy. Gamesa is also not considered as a direct comparable to EDPR in the comparables analysis, because its businesses involve manufacturing and project development/ power generation.

[71] Information of stock quotes and stock development was drawn from www.finanzen.net on 13/04/2010.

[72] On 11/06/2009 Iberdrola Renovables launches a sponsored Level 1 American Depository Receipt Programme allowing US investors to purchase shares of the company (Homepage, Press Release, Second Quarter, 2009)

[73] The 1-year time frame is more precise on the time scale. This is why I included it.

Figure 20: EDPR's stock price development: 1-year chart (Finanzen.net, 19/04/2010)

Figure 21: EDPR's stock price development: 3-year chart (Finanzen.net, 19/04/2010)

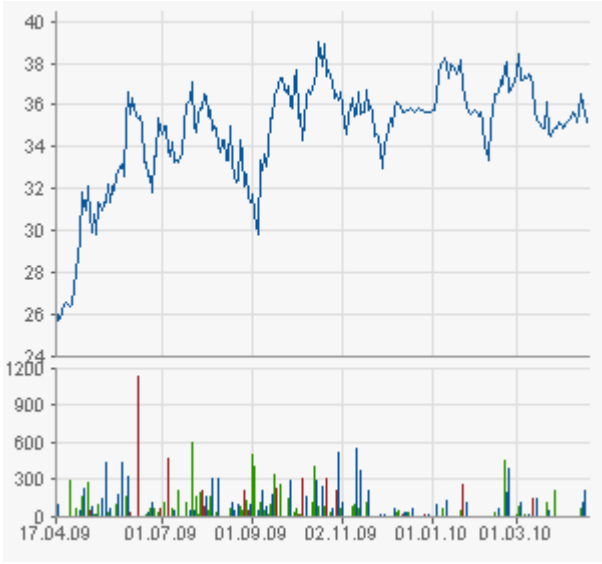

Figure 22: EDF Energies Nouvelles' stock price development : 1-year chart (Finanzen.net, 19/04/2010)

Figure 23: EDF Energies Nouvelles' stock price development : 3-year chart (Finanzen.net, 19/04/2010)

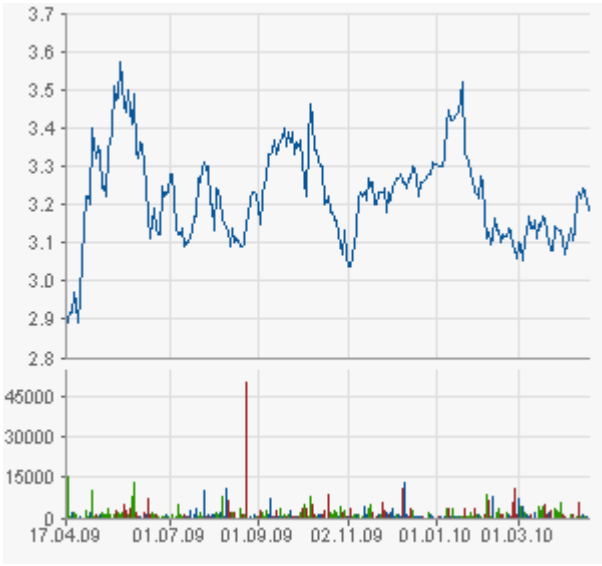

Figure 24: Iberdrola Renovables' stock price development: 1-year chart (Finanzen.net, 19/04/2010)

Figure 25: Iberdrola Renovables' stock price development: 3-year chart (Finanzen.net, 19/04/2010)

Figure 26: Iberdrola Renovables' stock price development: US 1-year chart (Finanzen.net, 19/04/2010)

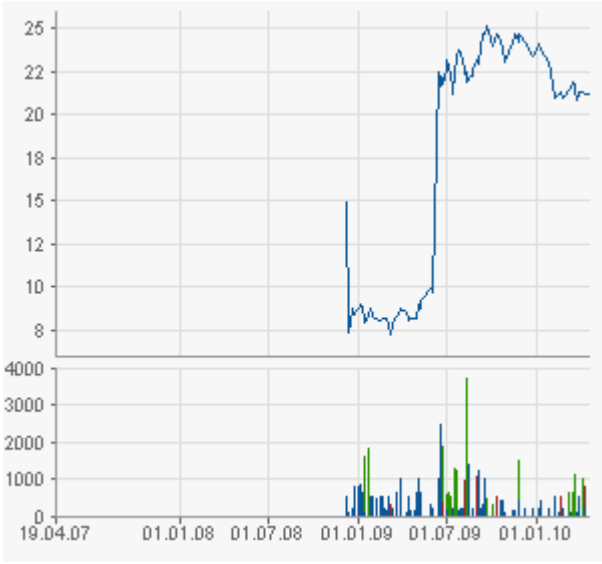

Figure 27: Iberdrola Renovables' stock price development: US 3-year chart (Finanzen.net, 19/04/2010)

By all means, the varying market caps of these industry comparables over time affect enterprise values and specific ratios, which should evoke a cautious judgment of market-based multiples, when it comes to the value-adding factor of growth of each company in question. They might not be representative of the actual value of the companies.

Performance multiples and efficiency[74]

As stated above, EDF Energies Nouvelles (EDF EN), Iberdola Renovables and EDPR differ in revenue sizes. In 2009 Iberdrola Renovables achieved a revenue of 2.009 Million Euro in comparison with EDF EN (1.173 Million Euro) and EDPR (648,2 Million Euro). Whereas the progression of revenues and EBITDAs in the years 2007 to 2009 in sum is very similar in all three cases showing 2008 as the high-yield year and a more or less drastic slow-down of growth in 2009, the ratios of EBITDA/revenue are quite divers with a remarkably high efficiency on the part of EDPR (EBITDA/revenue: 83,69%). Likewise EDPR's EBITDA/Gross Profit has proven as stable and high over the last two years with 75%.

At the level of operating results I calculated EBIT and subtracted the corporate tax rates of the respective countries (marginal tax rates) to get an impression of the operating performance, neglecting tax efficient income structures[75]. Interestingly, EDPR and Iberdrola Renovables are head on head when you compare their ratios of (EBIT-taxes)/revenue and Net profit/revenue. They seem to pursue a stringent policy to achieve ratios of around 25% on the EBIT level and 20% on the profit level. In view of these performance indicators they are very close to each other, as much as EDPR still lacks behind in revenue and EBIT(DA) sizes. EDF EN does not demonstrate this stringent commitment to performance efficiency factors at all, however it shows a strong focus on EBITDA growth, which amounted to 149% from 2007 to 2009. As regards the Working Capital, EDPR and Iberdrola Renovables demonstrate negative values over the last three years, which seems consistent with their growth strategy combined with performance efficiency, whereas EDF EN reveals inconsistency in the handling of its working capital.

In terms of capital structures I opted for a comparison of net debt/enterprise value with the equity-to-assets ratio in order to reflect market and book values and look at their coherence. Again, EDPR and Iberdrola Renovables are pretty much in the same positions in their equity status (equity-to-assets ratios around 50%), which EDPR seemed to be able to realize with its IPO in 2008. EDPR's net debt/EBITDA ratio of 2007 also explains, why raising equity capital was necessary in view of the fast growth and the investitures ahead, causing high amounts of net debt. As for EDF EN, this company seems rather carefree when it comes to its net debt. The equity-to-assets base is low (25,7% in 2009), and debt is high in view of future

[74] For a concise overview of the performance indicators of the respective companies in all areas, please refer to the Appendix, EDPR Analysis of Comparables.

[75] Effective tax rates are more a question of optimal financing structures in projects and overall than of operating performance in a narrower sense.

investments (net debt/enterprise value of 49,17%). A high net debt/EBITDA ratio (8,2 in 2009) would put EDF EN in a high risk position as a company traded on the market, yet with the huge mother company EDF in its back the game seems to be safe[76]. High leverage, yet safety and commitment to growth make an acquisition of its shares very attractive. Maybe this is an explanation why the share price is so high as opposed to EDPR and Iberdrola Renovables.

As Capex (Capital Expenditure) is often related to net debt and the essential figure of expenditures on investments, I compared the Capexes of the respective companies with their EBITDAs. One must notice that the Capex of the world wind power leader Iberdrola Renovables (2.000 Million Euros in 2009) is astonishingly low in comparison with EDPR (1.846 Million Euros), when one takes Iberdrola Renovables' and Iberdrola's market caps and revenue sizes into account. Iberdrola Renovables' CAPEX/EBITDA ratio has been constantly low around 1,9 to 1,5 from 2007 to 2009, whereas EDP Renovaveis and EDF EN show ratios from 3,4 to 4,8 (with the exception of EDPR with 7,5 in 2007).

Price-to-Book Ratio and Price-to-Sales Ratio[77]

Whereas the Price-to-Book ratios of all three comparables range from 1,45 to 1,78, the Price-to-Sales ratios diverge from 8,93 (EDPR) to 6,98 (Iberdrola Renovables) and 2,18 (EDF EN) for the year 2009. It is very common for young industries to demonstrate a price-to-sales ratio higher than 1, in essence these figures tell us a very diverse status within the wind power industry. One assumption could be that the capital structure of these companies is quite different causing this divergent effect. This holds true for EDF EN with a net debt/enterprise ratio of 49,17% versus its peers (21% – 27%). It's low price-to-sales ratio makes its stocks very attractive for investors, provided it remains stable over time. Yet, the true value of the stocks must be checked thoroughly, since the price-to-sales ratio is not only affected by the debt structure, but also by the profit margin, which is lower for EDF EN (around 9%) compared to EDPR (18,17%) and Iberdrola Renovables (18,76%). In sum we can conclude that price-to-sales ratios vary widely within this specific industry sector caused by investors' various presumptions on growth development. On the basis of

[76] Market capitalization of EDF as of 23.04.2010: 74,94 Billion Euro; Market capitalization of EDF EN as of 23. 04. 2010: 2,83 Billion Euro (source: Yahoo Finance). In comparison to that, the market caps of EDPR and Iberdrola Renovables comprise 35 – 40% of the total market caps of their mothers EDP and Iberdrola.

[77] The Price-to-Sales ratio is helpful in the case of companies, which suffer one-time losses, are still unprofitable (young industries) or do not show a consistent stock earnings policy in order to measure the Price-to-Earnings ratio.

the price-to-sales ratio and its underlying critical factors it could be argued that EDF EN might be overvalued in terms of the price of its stock compared to its peers and that EDPR could be overvalued in view of its high EV/Sales ratio (12,21). In all three cases the raising of equity capital in the form of issuance of new shares will push the price-to-sales ratio up, which might continue to happen in the years to come in order to keep up with the high growth pace.

ROIC[78] and WACC

The ROICs (Returns on Invested Capital) of all three companies are low as can be seen in the respective Chart in the Appendix. WACC figures are not estimated but taken from Bloomberg and serve as an approximate figure of orientation, referring to the year 2010. The most pivotal factor of value-oriented growth is, that the company earns its Cost of Capital. If this is not the case over a longer period of time (after about 3 years for a start-up company), the company is destroying value. In 2009 EDF EN offers the highest and most consistent ROIC of around 3,3%, followed by Iberdrola Renovables of around 2,4% and EDPR of around 1,5%[79]. Bloomberg's estimated WACCs for 2010 range from 6,74% (EDF EN) to 11,29% (Iberdrola Renovables) and 10,89% (EDPR)[80]. Even if we take a variation in the calculations of ROICs and in the WACC estimations into account, we must conclude that all three companies are currently destroying value for the sake of future growth and expansion. In this case, growth turns from a value driver to a value destroyer, looking at the current situation of the companies and not at the future expected sales and profit margins. In effect, the capital, which finally secures their growth, springs from the subsidies, "the invested capital of the government". This portion of capital is not considered completely in the ROIC- calculation applied[81] .

[78] Return on Invested Capital = Total Assets – Inventory – Receivables – Other current assets (Please refer to http://www.investopedia.com/university/EVA/EVA3.asp).
[79] The calculation of ROIC can vary depending on the formula in use. For example, Thomson Reuters cites an ROIC of 2,42% for the year 2008 for EDPR.
[80] Since the companies do not offer reliable Cost of Capital information in their annual reports, we must rely on Bloomberg's estimations for the time being. Also estimations can vary considerably.
[81] The Wind Power Industry and its investors live and profit from subsidies, e.g. in the form of tax credits, cash grants and fixed feed-in tariffs. Feed-in tariffs are included in "Trade receivables", tax credits in "Other Current Assets" (EDPR, "Tax receivables"). My calculation of Invested Capital does subtract "Receiveables" and "Other current assets". In a sense such subsidies are part of the invested capital, but not part of the company's and its investor's invested capital. For the purpose of demonstration and transparency I did not include these positions in the ROIC-calculation.

Installed capacities and average final tariffs

Corresponding to the revenue and EBITDA developments, growth of installed capacities has slowed down in 2009 in all three companies with a growth factor of 15 to 30%. The figures of actually realized and installed capacities are wide-spread as are the goals for future projects to be realized. Whereas Iberdrola Renovables has already achieved 10.752 MW installed capacity by the end of 2009, EDPR realized 6.227 MW and EDF EN 2.945 MW, all companies with roughly 730 to 930 MW currently under construction. Likewise the goal for total capacity installed by 2012 is 18.000 MW in the case of Iberdrola Renovables, 4.200 MW net capacity installed in the case of EDF EN[82] and 10.500 MW capacity installed in the case of EDPR. In its company presentation 2008 Iberdrola Renovables set its target of constructions of 2.000 MW annually for the upcoming consecutive 7 years, which it obviously could not keep from 2008 to 2009, where it shows a growth of installed capacity of 1.450 MW year on year[83], with currently 937 MW under construction. Iberdrola Renovables' current project pipeline and prospects are also ambitious with 58,4 GW of installed capacity, of which 43% shall be realized in the US. EDPR has a similar focus on US projects with 45% of its capex spent in the US in 2009 (57% in 2008) and 64% of its total pipeline projects and prospects planned in the US. EDPR's total project plans add up to 30,31 GW in pipeline and prospect stages. EDPR added 1.175 MW installed capacity in 2009, also missing its target of annual instalment of 1,4 GW. EDF EN added 670 MW to its 2008 installed capacity in 2009. Its strategy also includes a focus on US wind projects, which make up for more than 50% of its total project pipeline and prospects (13,86 GW), with an additional pipeline of solar energy projects of 2,771 GW. Whereas EDF EN sets modest goals, which it might reach easily by 2012, EDP Renovaveis and Iberdrola Renovables have entered in a real race for MWs, especially in emerging markets.

Both companies have a strong endeavour to secure as much Power Purchase Agreements (PPAs) as possible[84], which guarantee a fixed tariff over many years (from about 7 up to 20 years on average). EDPR's average price for the production of energy is 87,2 Euro/MWh in Europe and 86,0 Euro/MWh in the US (EDPR

[82] Net capacity means the capacity corresponding to the portion actually owned by EDF EN. For example, at the end of 2009 EDF EN had an installed capacity of 2.945 Gross MW corresponding to 2.257 Net MW.

[83] In 2008 Iberdrola Renovables managed to install 2.204 MW, which evens out the results of 2009 to some extent.

[84] EDPR covers 84% of its 2009 electricity output with PPAs, fixed feed-in tariffs and through hedging merchant prices, hence with no or limited exposure to market volatility (EDPR Company Presentation 2009, p.11).

Results 2009), whereas Iberdrola Renovables sells for 73,8 Euro/MWh on average (Iberdrola Renovables Results Presentation 2009, p.14) and targets 90% of its contracts being covered with PPAs[85].

5.2 Estimating the Weighted Average Cost of Capital (WACC)[86]

For the purpose of the DCF-Analysis, the WACCs of the years 2009 and 2010 were estimated, taking into account the changing capital structures of the three companies throughout the crisis years 2009 and 2010. Precise calculations have been carried out for these two years. For a detailed presentation of the WACC calculations and inputs, please refer to the Appendix. The historical (pre-tax) WACCs of 2006, 2007 and 2008 are drawn from the respective Annual Reports, where available.

Estimating and calculating the Cost of Capital is one of the critical issues in valuation. The estimation was carried out separately for the three companies, depending on each one's capital structure and the specific market environment of the solar and the wind power sector. Essentially the discount rate (or WACC) should reflect the riskiness of the cash flows in an appropriate, not too optimistic, manner.

The formula below was applied for the calculation of WACC[87]:

$$WACC = (E/V) \times c(e) + (D/V) \times c(d) \times (1-T)$$

5.2.1 Historical Company WACCs 2006, 2007, 2008 in DCF

As for the input of historical WACCs in the DCF, in the case of Solon SE the WACCs before taxes for the Components and for the Systems sector cited in the Annual Reports were taken and weighted according to the percentage size of the business sectors. In the case of REC Group, the WACCs before taxes for the subsidiaries as well as for the mother company in Norway were taken into account

[85] 90% of the capacity under construction is covered by PPAs (Iberdrola Renovables Results Presentation 2009)

[86] WACC = The Weighted Average of the costs of the different components of financing including debt, equity and hybrid securities. WACC is used by a firm to fund its financial requirements (www.investopedia.com and Damodaran, 2006).

[87] WACC is equal to Equity (E) divided by Enterprise Value (V) multiplied with Cost of Equity c(e) plus Debt (D) divided by Enterprise Value (V) multiplied with the Cost of Debt c(d) and with (1 minus taxes on Cost of Debt (T)). For the WACC-Formula, please refer to Koller et al. (2005, p. 292).

and an average of these figures was calculated[88]. Unfortunately, EDPR does not offer any notes on its historical Cost of Capital in its report, thus the data was left out in the DCF-Analysis.

5.2.2 Typical Costs of WACC for industry-sector Renewable Energies

Upon looking at the industry-sector, I found that there is no such thing as a typical WACC for the solar industry. The table of historical WACCs of some companies in the solar industry sector below shows, how diverse the area is. As regards data on Cost of Capital in the field of Wind Power, none of the comparables offered information on it in historical Annual Reports.

Industry WACC ranges - Solar Industry		Approx. figures
2006, Solon SE, Germany	Solon SE	13,77%
2007, Solon SE, Germany	Solon SE	13,75%
2008, Solon SE, Germany	Solon SE	10,92%
2007, REC Silicon, US	REC ASA	9,70%
2008, REC Silicon, US	REC ASA	7,70%
2007, Sovello, Germany	REC ASA	9,60%
2008, Sovello, Germany	REC ASA	8,00%
2007 Operations Norway	REC ASA	9,60%
2008 Operations Norway	REC ASA	10,00%
2010 Bloomberg on REC ASA	REC ASA	12,00%
Estimate up to 2019, Q-Cells, Germany	Q-Cells	11,50%
American appraisal estimate 07-10*	YINGLI SOLAR	18,00%
*See Annual Report, Yingli, 2008: based on a compariosn with 11 competitors		
**pre-tax for Solon and REC		

Industry WACC ranges - Energy Sector Austria		Approx. figures
2009, Verbund	Verbund	7,75%
2008/09,EVN	EVN	6,50%

Figure 28: Sample of Industry WACCs in the Solar Sector in comparison with Verbund and EVN
All data was retrieved from Annual Reports of the respective companies.

For a closer look at returns actually materialized, I cited data from the two comparables Solon SE and Solarworld in section 5.2.7. Please also refer to the detailed table in the Appendix.

[88] A simple calculation of an average was applied, since the WACCs did not vary widely. For 2008 e.g.: REC Silicon, US (7,7%), REC Norway (9,6%), Sorvello (8%)

5.2.3 Equity Risk Premium (ERP)

The cost of equity is an implicit cost and cannot be observed directly. Even retrospectively, when we look at the materialized returns on equity of a company, it cannot be deduced from them. Essentially, the cost of equity is determined and most sensitive to the equity risk premium, the difference between the risk free rate and the expected market return of an investment[89].

As an effect of the volatile capital markets in the 1st half of the 21st century and the recent financial crisis, government bonds have become less reliable and less risk-free investments with Greece as the most prominent but not single example[90]. While the average rate of return of government bonds might increase, the bond will also become a riskier investment (I assumed 4% as the risk-free rate). In this heated market environment the ERP most likely climbs up in the short term, especially if another financial crisis might hit us within the next years, Kiyosaki says between 2014 and 2016 (2000 and 2002).

Long-term projections on the ERP of the 21st century predict a lower average ERP. Elroy Dimson et al. suggest that the average equity premium relative to bills we can expect for the world index[91] in future will be 3% to 3,5% as opposed to the long-term historical premium of 4,2% (Dimson et al., 2009, p.12)[92]. The decrease of the equity risk premium is also reflected in my assumptions on the risk-free rate (4% instead of the more common assumption of 3%) and a reduced market return of 12-16% in the solar industry and the wind power industry (as opposed to 15-20% in recent years).

On top, companies in the sector of Renewable Energies profit from more of less high amounts of subsidies, which makes estimations of ERPs somewhat prone to very arbitrary assumptions.

In the case of Solon, I did not display the current high risk of an investment in this company in the form of a special risk premium add-on, but rather in an increase of Beta for 2010 up to 1,8.

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[89] It must be noted that the ERP reflects the riskiness or safety of an investment. Consequently, risk includes a good or a bad outcome. It is very tempting to neglect the downside risk, when we look at WACC calculations, wherein ERPs are cited.

[90] The creditworthiness of countries is pivotal to a stable market (Credit Suisse Global Investment Returns Yearbook, 2009, p.3), hence reliable and stable returns on government bonds.

[91] Dimson makes a strong case for using a projection of the global ERP instead of a country-by-country approach in an increasingly globalized, international capital market (Dimson et al., 2002, p.16)

[92] The historical average risk premium of 4,2% includes excess returns, which are not considered in the expected ERP (Dimson et al., 2002, p.9).

5.2.4 Betas

When examining industry betas (e.g. at Damodaran Online, "Betas by Sector" and "Betas Europe", see Appendix), I would only find information on the sector Energy (Oil/Gas) or "Electric Utilities", but not on the specific industry sector of Renewable Energies. Hence I decided to work with the specific Company Betas provided by Bloomberg for precise estimations of WACC in the years 2009 and 2010. In general I was surprised that the Company Betas did not change as much over time considering a time frame from about 2007 up to 2010, which means they were not driven by the general market situation of the crisis as I expected. However, the comparison of Betas demonstrates, that the industry sector of solar producers is more sensitive and volatile to changes in the market situation than the wind power sector[93].

The following tables show the Betas for Solon SE, REC Group and EDPR and some comparables in order to make a quick judgment of how they were or were not driven by the general market situation.

Company Betas - Adjusted Betas			
	2008	2009	2010*
Solon SE	1,247	1,433	1,369
REC Group	1,255	1,247	1,189
EDPR	1,157	1,009	1,002

Figure 29: Company Betas of Solon SE, REC Group and EDPR (Data source: Bloomberg)
*Figures for 2010 are an approx. two year average from 2008 to 2010

Company Betas - Adjusted Betas Comparables Solar Industry	
	2010*
Suntech	2,139
Yingli Green	2,225
Solarworld	1,462
Solar Millenium	1,039
Q-Cells	1,540
Aleo Solar	0,961

Figure 30: Company Betas of Competitors in the Solar Sector (Data source: Bloomberg)
*Figures for 2010 are an approx. two year average from 2008 to 2010

[93] The low sensitivity to the market situation in the wind power industry might also be influenced by the strong mother companies of the wind power enterprises I chose for my valuation.

Company Betas - Adjusted Betas Comparables Wind Power	
	2010*
EDF EN	0,863
Iberdrola Renov.	0,882

Figure 31: Company Betas of Competitors in the Wind Power Sector (Data source: Bloomberg)
*Figures for 2010 are an approx. two year average from 2008 to 2010

In view of the dramatic business situation Solon SE had to face 2009, which became obvious upon the presentation of its Company results year-end 2009, it is quite surprising, that the Beta would remain fairly constant according to Bloomberg's data. In my WACC calculation for 2010, I set the Beta at 1,8 for this very reason.

5.2.5 Risk Free Rate

The risk free rate for a given period has been based on government bonds for the longest time, because governments were perceived as stable and their returns were regarded as a "guarantee". Typically the interest rate of a 10-year government bond is the theoretical rate of return for an investment, which has practically zero risk and makes sense as an indicator for a long-term investment[94]. The expected "risk-free" rate of return for a 10-year German government bond e.g. currently lies at 3,3%, the historical low was 3%, the historical high 5,7% (source: Bloomberg, time-frame: 01/01/1999 – 11/03/2010, withdrawn on 12/03/2010)[95].

In my assumption the global market instability of the first half of the 21st century will make the risk-free rate based on government bonds rise again over all[96]. The year-on-year rates on government bonds will become more volatile to the market situation and the government bond as an indicator of a risk-free rate will be questioned as such. The risk-free rate has become a bit riskier and more volatile vis-à-vis the market risk rate. In fact the market risk of the solar industry will also rise.

[94] Treasury bills are even less risky than government bonds, as they are short-term, default-free government securities (Dimson et. al, 2009, p.7), but would not serve as a good benchmark for a long-term investment. Refer also to Damodaran, 2002, p.155.
[95] In comparison to that, a 5 year US-Treasury bond currently lies at 2,34 US Dollars, a 10-year US Treasury bond lies at 3,69 US Dollars (source: Bloomberg, 11/03/2010).
[96] My assumption of 4% is based on an average global estimate on government bonds of industrialized countries. In an increasingly global financial market I decided that a general rate of return would be a better indicator of performance than the return of a country-based government bond. This stance is contrary to Damodaran, who suggests that the choice of a risk-free rate should be based on the currency, in which the cash flows on the firm are estimated, which implies a Euro-bond (2002, p.158).

5.2.6 Market indices

As a relative benchmark an index indicates the performance of the investment against a market index. Market indices for the Renewable Energy sector are in developing stages and interesting to observe, but overall still very young in order to benchmark them and make sound judgments. Some of the interesting market indices, which were created in the recent years, are SOLEX, SOLEXD, ERIX, WAEX, PPVX, RENIXX, S&P Custom/ABN-Amro Clean Renewable Energy Index and S&P Custom/Öko-Invest Index[97]. They are either composed of companies operating in a sub-segment of the industry such as solar or of various companies, which are operating in different sub-segments (wind power, solar power, bioenergy etc.). Currently the selected companies within the index portfolios, especially the solar portfolios, perform very diversely, either with high gains or great losses. Hence a benchmarking of the index performance to a specific company's performance is not very supportive, since the diversifying effect is too big within the index. However it can be noted that the performance of Renewable Energy indices dropped considerably from 2008 to 2010 as a consequence of the crisis[98], a general indication of how the market is doing.

5.2.7 Returns

For a quick look at the Return on Equity for the companies Solon SE, REC Group and EDPR I checked the data source of Thomson Reuters. Please also refer to the sheet on returns in the Appendix.

Return on Equity			
	2007	2008	2009
Solon	15,64%	8,85%	-111,77%
REC	11,91%	21,68%	-14,05%
EDPR	n.a.	2,92%	2,21%

Figure 32: Companies' Returns on Equity from 2007 to 2009 (Data source: Thomson Reuters)

[97] Launching year of the market indices: SOLEX (2006), ERIX (2005), WAEX (2006), PPVX (2001), RENIXX (2006), S&P Custom/ABN AMRO Clean Renewable Energy Total Return (2005), S&P Custom/Öko-Invest Total Return Index (2006). In general, an index should exist for at least three years in order to apply its performance to a specific company performance.

[98] Please refer to http://www.iwr.de/re/iwr/10/05/2001.html, http://www.geld.com/aktien/news_5814.html, http://boerse.freenet.de/SG0WAX-Index_Zertifikat_auf_WAEX_TR_Soci_t_G_n_rale-Zertifikate-Profil?zeitraum=6

In general, investors were expecting returns on equity of minimum 10-15% before the crisis[99]. Now, after the crisis, they will expect a minimum of 15%, because the market environment has become riskier[100].

The solar sector most likely offers less after the crisis with an expected market return of around 12% (15-18% before the crisis) and a cost of equity of 13% to 15%. Market returns for the wind power sector have been higher and might end up at an expected return of 15% after the crisis (20% before the crisis) for the upcoming years. The reduction of market returns can also be attributed to a consolidation of the solar and wind power market with fewer, but stronger and larger companies.

In the case of REC Group one could also assume a market return of 14% instead of 12% for estimating the WACC 2010, including a special return premium for the company operating along the value chain.

5.2.8 Cost of debt[101]

The interest rate on debt capital is the determining factor for the company's cost of debt. The cost of debt needs to incorporate a default premium or a spread of the default risk in the debt. Also the interest rates charged should include a bank margin. But in recent years the money market interest rates have been extremely low (in the range of max. 2% for the Euro and 1% for the US Dollar) and as it looks like they will continue to remain low in order to keep the risk-prone, fragile market condition going[102].

In comparison to that, the interest rates for debt capital (loans) for private lenders today (2010) range between 7% and 11%, affected by current fears of a rising inflation (Consumer Price Index on the rise) and increased default risk. I assumed a 5% interest rate in my WACC calculations to pay tribute to a hopefully stabilizing market and to the amount of long-term debt, which is included in the cost of debt. In the special case of Solon SE I assumed an interest rate of 10% for my projection of its WACC 2010 for the time being.

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[99] In the golden years, the bull market, American investors would not even consider investments below 20% return on equity.

[100] In general investors should be aware of the fact that their returns on equity will be very volatile after the crisis. This state will continue for a while (Dimson et al, 2009, p.9).

[101] Cost of debt includes short and long-term debt.

[102] In a stable to highly profitable market condition rates should range from 4,5%-5% to 6-7%. An interest rate of 6-7% would currently kill the market, which cannot bear more than 2%.The problem lies in the excess of money supply to banks.

6. Valuation and results

6.1 Underlying assumptions and valuation inputs

My estimations refer to the consecutive years 2009-2019. Although I opted to calculate a terminal value after 2023 going along with this model, I consider the first 5 years of development (2009 – 2013) as the most decisive from the financial investor's perspective involved in an industry with high risk and great chances. The years from then on up to 2019 play with the potential of a "healthy" strong company with a favourable financial structure facing the economic, especially the market challenges, of the time being ideally.

I included my perspectives on developments in the markets up to 2020, which goes along with political goals, technological changes, market growth and market differentiation as much as one can see or speculate ahead of time. I also included estimations of experts I interviewed beforehand on these topics.

6.1.1 Macroeconomic and industry[103]-specific assumptions

- There will be another financial/economic crisis between 2014 and 2016, similar to the one of 2007/2008 (Kiyosaki, 2002 und 2000)[104]
- The growth of renewable energies will be pushed by governments according to the 2020 targets of the European Union, e.g. for Germany up to 18% and for Portugal up to 31%[105].
- Governments will change their concessions, incentives and subsidies along with the economic situation on a yearly basis. This "political actionism" favours producers and project developers, who are flexible to supply and demand changes and can operate in highly internationalized markets. If one market is down, another one will make up for the loss, so as to say.
- Feed-in tariffs[106] for solar energy and wind power will be reduced in view of grid parity, giving an advantage to producers, who are able to reduce their production costs and increase output efficiency.

[103] "Industry-specific" refers to the sector Renewable Energies. Specific assumptions about the sub-sectors "solar" and "wind power" are cited in the company-specific assumptions.
[104] This assumption is not only based on Kiyosaki's "Rich Dad's Guide to Investing" (2000) but also supported by private equity managers and bankers I was able to interview throughout my evaluation of the industry Renewable Energies. Some suggested a crisis scenario by 2013. Also refer to Kiyosaki's Rich Dad's Prophecy (2002).
[105] For further information on country-specific targets refer to http://www.e-control.at/de/marktteilnehmer/oeko-energie/oekostrom-ausbauziele

- Currently one can observe that the Emerging Markets for Renewable Energies, specifically for the solar and wind power industry, are the US[107] and Asia (China, Korea e.g.). Companies, which operate and provide their products in these markets, have a much higher chance to survive than those, which focused on the European market for the recent years without any considerable infrastructure to move to other markets/continents.
- Because of the crisis and a growing number of companies, small-, medium-size and large ones, the industry meets a decade of differentiation (at least in Europe), wherein some will survive and some won't. To my mind this will lead to a structure of large, fully-integrated producers, of large to medium-size highly specialized companies offering technical add-ons to the large ones, and of small- to medium-size service providers offering project development or other specialized services along the value chain.
- Currently, in 2010, Europe and the world market phases a very challenging situation. The indebtedness of European countries within the Euro-Zone such as Greece endangers the stability and strength of the Euro. This leads governments to cut down on subsidies and raise taxes. The sector of Renewable Energies is one of the first ones to feel these effects. If the EU does not manage to overcome this problem, 2010 will be another year of great losses for many Renewable Energy companies across the value chain. As regards producers of solar and wind power products (modules, wind mills etc.), the effects will be felt by international non-European companies (e.g. US, Chinese producers) very strongly, for they loose income on currency gains of their sales in the European market[108] and might face severe losses.
- There will be a shift towards a totally new technology in the production of solar cells, solar modules and wind mills (towards micro-size, highly efficient products) in about three years. This is why one of the risk factors of the next

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[106] For the purpose of orientation: the feed-in tariffs in Austria 2010: for each kWh the operator receives about 35 cents for solar energy, 9,7 cents for wind power and about 15 cents for bioenergy (e.g. wood). Regular energy providers charge about 4-5 cents per kWh (e.g. nuclear power). For detailed information refer to http://portalapp.e-control.at/portal/page/portal/medienbibliothek/oeko-energie/dokumente/pdfs/uebersicht-einspeisetarife_2010.pdf and http://www.e-control.at/de/marktteilnehmer/oeko-energie/marktpreis

[107] US President Barack Obama developed an attractive program, intensely promoting Renewable Energies in the US with subsidies (tax credits) in 2010

[108] For further information, please refer to the Article "Greek Crisis and Euro Fall Snare Clean Energy Stocks", http://www.bloomberg.com/apps/news?pid=email_en&sid=aKN0JaQ5T9bU. See also Appendix.

years is R&D and investments in R&D projects are most important to companies, which want to stay in the market[109].

6.1.2 Solon SE

Assumptions

The basic assumptions which underlie this DCF-valuation of Solon SE are:

- The company is in a severe crisis and we don't know if it will survive 2010. The DCF-Analysis is based on the assumption of Solon SE managing to survive with the help of a financial investor.
- For survival the management needs to stabilize the mid-term financial structure right now.
- At the same time Solon needs to invest to catch up with competitors on growth, R&D and important technological advances.
- By 2012 Suntech Power attacks Europe with modules, more efficient in terms of output and with lower production costs[110]. Since Suntech power is one of the biggest module producers it acts in direct competition with Solon on German and on international markets. Solon does not have any concrete, compatible plans on cost reduction of production or increase in cell efficiency (Solon Annual Report 2008) and is currently busy with ensuring its financial and economic survival (Solon Annual Report 2009).
- Because of production overcapacity in 2009 (more is produced than consumed), competition in sales/revenues of modules is higher in 2009 and 2010, since producers reduce their inventories.
- The competitive situation will also be enforced by a cut down of subsidies in Europe, leading to the construction of fewer solar power plants as expected. In general the global crisis has hurt the ability of solar customers to get project financing in Europe and elsewhere. Hence, the product quality of a company and the costs of its products are its decisive existential issue in a supply market.

[109] Besides R&D and raw material supply (as mentioned above), personnel costs will have some effect on cost reduction, but not as much as one might expect. The production processes become increasingly fully automated, with less staff needed.

[110] Suntech Power has announced considerable reduction of production costs and increase in cell output efficiency by 2012 (Appendix: "China's new king of solar", Article from CNN Money.com). Refer also to http://money.cnn.com/2009/02/11/news/international/powell_shi.fortune/index.htm

Further assumptions on the financial investor's side

- The Financial investor considers a 100% acquisition of Solon SE together with a strong international strategic partner on a 50-50 basis with the premise of a radical new positioning.
- The Financial investor wants a joint venture. He has good contacts with possible strategic partners in the industry he can invite for this undertaking.
- The Financial investor is completely free to act and not bound to any restrictions in choosing his targets or possible partners.
- The Financial investor is risk-prone, experienced with emergency "red flag" M&A situations and knows how to create value with a multi-scenario risk management plan.
- The Financial investor has time to create value through growth and is ready to get involved in management processes and to assume control.

6.1.3 REC Group

Assumptions

The basic assumptions which underlie this DCF-valuation of REC are:

- The Singapore production site will increase REC's wafer production capacity to 2,4 GW and solar cell and module capacity to 700 MW (increased by 550 MW through Singapore project), when fully running in 2011 (REC 4th Quarter Reporter 2009, p.6).
- REC's polysilicon production will triple between 2008 and 2011 (REC 4th Quarter Reporter 2009, p.7).
- In sum production capacities almost double by 2011.
- The many new production lines coming into use in 2010 are expected to negatively affect margins during ramp-up period, 600 Million NOK effect (ramp-up and expansion costs combined).
- Depreciation and amortization increases with these assets put into use, mainly from 2011 on (REC 4th Quarter Report 2009, p.5).
- By 2012 Suntech attacks Europe with modules, more efficient in terms of output[111] and with lower productions costs. REC will have to enter into heavy

[111] Suntech Power wants to achieve grid parity (in comparison with fossil fuels like natural gas and coal) reducing output costs down to 14 US cents per kWh by 2012 (Appendix: China's king of solar, Article from CNN Money.com).

competition with Suntech and other low-cost producers. Yet, it is less challenged than Solon, because it benefits from its Wafer and Silicon business, wherein it serves as a supplier to Suntech and other strong players in the market. Furthermore, REC is able to produce modules at lower costs from 2011 on in its Singapore complex[112].

- REC did not put expansion plans on hold as Suntech Power did throughout the crisis year 2009, which is an inherent risk factor. This is why they will be heavily challenged in their financing from 2009 to 2011, possibly even 2012.

Further assumptions on the financial investor's side

- The Financial investor enters the business with the intention to control and co-manage it. The focus will lie on cost-cutting, mainly in production, but also in transport costs and company structures, and on winning potential REC partners, who serve this goal (scientists, experts in the industry, suppliers and strategic alliances with "soft competitors")[113].
- R&D must be a core-competence to invest in and the commitment of REC to this business goal is a prerequisite for the financial investor to enter with a 50% share.
- REC must commit to further internationalize its locations of production and distribution.
- REC must work on alliances with strategic partners in all areas of the value chain in order to increase its sales in the right spots, geographically and economically speaking.
- REC must work on optimising its corporate effective tax rate, e.g. through attractive tax group systems.

[112] Productions costs at Asian sites are typically lower because of lower personnel costs, inexpensive land and lower material costs. Also refer to Appendix: China's king of solar, Article from CNN Money.com)

[113] Competitors, which compete with REC in one area of the value chain, but might be very interested in working together with REC in another part of its value chain production. As almost all Renewable Energy companies are hit today by the crisis, the main weakness of one company can be outweighed by the strength of another to secure the survival of both.

6.1.4 EDP Renovaveis

Assumptions

The basic assumptions which underlie this DCF-valuation of EDPR are:

- EDPR will continue to be well-supported by its mother company EDP in terms of financing, M&A activities, infrastructural expenses as R&D[114] and lobbying in favour of political support for subsidies and other beneficial grants in the countries of its market presence.
- In particular EDPR will continue to hold on tight to its performance efficiency and the maintenance of top efficiency ratios ("Balance Sheet Discipline", Company Presentation 2009).
- The increase in demand of wind turbines, caused by the political and economic promotion of wind energy projects, might lead to higher prices for wind turbines in the upcoming years (increase of COGS).
- Accounts receivable will be less and less because of a constant decrease of governmental support in terms of feed-in tariffs (Major goal: Grid parity).
- The tax receivable ("Other current assets", "Debtors and other assets") will increase because of US tax credits. Thus, "Other current assets" will increase between 2010 and 2015 because of a high US tax income ("other income") for EDPR. These provisions lead to a higher liquidity for EDPR[115].
- M&A activity will continue along with organic growth. There is a great potential of small wind energy businesses in the market, which are of interest to the market leaders.
- The depreciation of PPE, not yet in use, might be higher in times of heavy construction.
- I put in my own estimates for WACC 2009 and 2010. Unfortunately EDPR does not offer any information on its WACC of 2008 in its Company reports. Hence I took my own estimate (after-tax WACC). In general I expect a stable WACC because of EDPR's support in financing by EDP. Also, wind project developers have not yet been as much affected by the crisis as solar producers[116]. This allows a more stable forecast.

[114] Refer to EDPR Annual Report 2008, p.67
[115] US operations have the choice between Production Tax Credits, a 30% Investment Tax Credit or cash grants. This flexibility helps firms in their various developmental stages and drives the economy forward (EDPR Annual Report 2008).
[116] With the currently critical situation of the Euro and a possible major cut on subsidies in the European market, this situation might change for wind project developers and operators

- In 2012 a capital raise of 2 Billion of share capital is assumed. Alternatively a future financial investor could contribute 2 Billion to finance investments. It can be expected that with a sound growth management the share price will be up at 6 Euro by 2012.

Further assumptions on the financial investor's side

- EDPR shows stable revenue growth with an extraordinary EBITDA margin. Its performance efficiency as opposed to its peers make it an attractive company to invest in.
- EDPR lacks capital to maintain its performance efficiency and speed of growth. The investor can enhance the investment process in the upcoming five years.
- EDPR demonstrates consistency in its growth. With an attractive financial injection it might be able to speed up growth in developing markets like the US and China. As a financial investor a 50% controlling share in the US business[117] and a 50% share in a possibly future Chinese business (EDPR China) might enable EDPR to catch the great investing opportunities faster and more daring in view of more M&A activity in emerging markets[118], not giving way to market giant Iberdrola Renovables. A catch-up with Iberdrola Renovables seems feasible. A challenge for the investor's acquisition of EDPR shares might be the existing partnerships of Horizon Wind Energy LLC, for example with a consortium of institutional equity investors established in 2008 for the purpose of investing in a portfolio of wind farm projects, which were already in operation in 2008 (Homepage, Press Release 2008). As a financial investor on the corporate level, investors in projects are not necessarily welcome, unless they lead to an unusually high progression in value of the projects (e.g. through growth) and hence of the company in time. In such a case a special agreement with project investors must be found[119].

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and also effect the large international players, not only the small- to medium sized companies.

[117] EDPR's subsidiary Horizon Wind Energy LLC, EDP Renovaveis NA

[118] "The expansion in the US has been largely "organic" rather than driven through acquisitions" (EDPR Annual Report 2008, p. 52).

[119] Since 2006 EDP Renovaveis NA has specialized in raising capital through partnership structures, wherein the investor takes advantage of tax benefits and/or of the cash grants awarded to EDPR NA in return for providing cash funds to EDPR NA (Homepage, Press Release 2009, "Tax Equity Agreements")

- EDP must act as a reliable business partner with the commitment to focus more on the EDPR business, which currently holds 35,44% of EDP's equity value according to current market capitalization data (23/04/2010, Yahoo Finance) and could rise to 50% in the near future through faster growth and investments in emerging markets with a stable financial structure.
- Wind energy generators and developers have not (yet) been hit as hard by the crisis as producers of solar products. The business appears to be less prone to price fluctuations of raw materials and products, as long as the companies have flexible framework contracts with their suppliers. The product "Generation of electricity" adds to the company value of wind energy operators on a consistent and reliable basis, especially of the ones of big size as EDPR. The world will not run out of the need of electricity generation. Of course, the actual risk of a cut-down of subsidies for wind projects, as mentioned above, remains and lurks around all over Europe these days.

6.2 Presentation and interpretation of valuation results

For a detailed overview of the valuation results of the DCF-Analysis, please refer to the Valuation Summaries of the companies in the Appendix. In this context, it must be noted that the calculations of indicators and ratios in the DCF-Analysis differ from the calculations applied for the analysis of comparables. In order to get a notion of this, please refer to the "Definitions of Calculations"-Sheet in the Appendix. Of course, there are many more calculations specific to this DCF-Analysis, which cannot be demonstrated here, but must be checked out upon using McKinsey's model. I just want to make the reader aware of it, when he/she might tumble over discrepancies between ratios and figures of the comparables analysis and the DCF-Analysis[120]. Also, the historical growth rates in the section "Comparison of Key Ratios", namely Adjusted EBITA and NOPLAT, should be interpreted carefully. The growth rates are the result of historical inputs, wherein I placed "Changes in inventories" (REC) and "Changes in work in progress and finished goods" under the position "Special Items" and not in the first input section, which computes the EBITA. Naturally, this careful interpretation also applies to Adjusted EBIT/revenues. In the case of EDPR, it was not possible to compute the growth rate of Adjusted EBITA, of NOPLAT and Invested Capital, because I opted for a historical data input of two

[120] Please note, that Solon's and REC's historical WACCs are pre-tax, whereas the projections are after-tax.

years, 2007 and 2008 respectively, instead of three years. For more information on historical growth rates, please refer to the comparables analysis.

Furthermore I want to stress, that present values and some figures in the DCF-Model are the result of the very specific forecasts, I put in, and the resulting cash flow expectations. The present values of the enterprises, of their equity respectively, represent the assets in place and the growth assets, which are determined by the specific valuation inputs[121]. Thus they differ from current market caps and market-based enterprise values [122] ,because they are built on the future cash flow expectations and economic scenarios of the Model. Likewise, the values of the shares reflect these scenarios, but not the current price of the shares. Taking an extreme example, we can see that Solon‘s value per share of over 281,63 Euro is extremely high. If I change the model's output from a time frame up to 2023 to a time frame up to 2010, the value per share equals -16,73 Euro. However the current market price is 5,55 Euro (06.04.2010, finanzen.net) per share. This example also shows, that the DCF-method measures the intrinsic value of a company based on a specific scenario and forecast, whereas the market represents its extrinsic value[123]. The challenge lies in the comparison of the two realms to make sound judgements about present values and value creation.

For the purpose of a transparent presentation and discussion, I decided to include all three time frame scenarios for each company, meaning 2009 to 2013 year-end, 2009 to 2018 year-end and 2009 to 2023 year-end, which can be looked up in the Appendix.

Certainly, my projected forecast scenarios describe cases under the condition of a survival of the companies in the near future (2009-2014) and of a management, which runs smooth, is able to win markets and live up to its economic potential. Essentially, all predictions over a 3 year-time frame reflect the opinion of the evaluator about the future performance of the company and the market more than anything else. On that note, let's have a look at the companies.

[121] Present value of the enterprise equals assets in place and growth assets or equity and debt in the form of all claims on the firm (Damodaran, 2006).

[122] Market-based figures reflect the current market expectations, wherein the amount of yearly cash flow projections and the time-frame of projections remain undefined and very individual.

[123] For portfolio managers the extrinsic value is an important factor and the DCF-Analysis is not sufficient to estimate the value of an asset, especially in an overvalued market (Damodaran, 2006).

6.2.1 Solon SE

In the case of Solon, the application of the DCF-method comes with a big caveat, because Solon's crisis has changed its capital structure completely. A constant capital structure is a prerequisite for a method like the DCF-Analysis using WACC as a fundamental element and discount factor (Ballwieser et al., 2005, p.85; Damodaran, 2006). The APV-method would be more appropriate in the case of Solon, although one might say that in such a red flag-scenario, none of the methods might do justice to Solon's situation. To my mind, chances that Solon will survive profitably within the next years are not very high, possibly 20%. I opted to pursue the DCF-method to value Solon under the premise of a potential investor's financial contributions from 2010 on, which I regard as necessary for the company to survive and progress.

When we look at Solon's Valuation Summary in the Appendix, the DCF-Analysis shows attractive ROICs. Especially in the valuation with a 15-year time frame, we see that the ROIC is extremely high. Not a lot of companies make ROICs above 30%, and according to a Wall Street study only 1/3 of them have a market cap above 5 Billion[124]. On the basis of the model's results, if Solon manages to survive the next five years and finds a new and strong position in the market, it will be very profitable to investors and highly efficient in the use of its invested capital. While a five year-scenario would not create value yet, due to the crisis affected years 2008 year-end to 2010, it would already lead to an increase in enterprise value and equity value respectively. The focus on revenue growth, but even more on the growth of EBIT(A) and NOPLAT would add to Solon's strength in the market.

What Solon needs most, is a sound commitment to performance efficiency, speaking of cost reduction of production in the next years, in order to make up for losses from 4th quarter 2008 to 2010 and to catch up with competitors. While it needs to win markets in terms of revenue growth, it must stay adherent to its cost structure and performance indicators as EBIT (EBITA) and net profit (NOPLAT)[125]. If so, it can also afford to slow-down on its invested capital growth, which does not do away with the fact that Solon needs more Invested Capital between 2009 and 2013 than in the other time periods (Revenue/Invested Capital: 1,3). The relation of invested capital to revenue remains high throughout these five years. It's a time of investitures in order to reap the fruits later on. So the first five years are rather

[124] Refer to http://pennysleuth.com/roic-wall-streets-road-kill/

[125] The negative Adjusted EBIT/revenues in the time frame 2009-2013 is mainly influenced by the disastrous result in 2009 and a possibly negative result in 2010 (Adjusted EBITA/revenues in the "Results").

marked by hard work and perseverance for investors and shareholders. Clearly, the preferable holding period for the financial investor would lie in the realm of ten years or more.

If the company improves its Adjusted EBIT/revenues up to 16% in the period of 2014 to 2018, it is able to increase its ROIC to an all time historically high percentage. While Adjusted EBIT/revenues also drives the ROIC in the time-frame of 2019 to 2023, the incredibly high ROIC of 37,4% cannot be achieved without a growth in invested capital[126]. Seemingly, the growth in invested capital and the Adjusted EBIT/revenues ratio drive the ROIC in this time frame, to put it in a very simplified perspective.

Solon's sustainability of positive and stable Free Cash Flows should be secured by this commitment to performance efficiency and market positioning, so that Solon SE is well-prepared for a future economic crisis. If it finds its way to a strong market position in this five-year time frame, it might be better armed than many of its competitors.

Solon's high value per share does not only spring from the valuation inputs and the logic of the DCF-Model as explained further above, but also from the fact, that it currently has a smaller number of shares outstanding (12.530.196) than its competitors (REC: 494.300.000; 2008 year-end)[127]. It is very likely, that Solon will carry out an issuance of shares or a share-split some time in the mid-term future, if it copes with the next years. As Solon's share value at the end of 2010 would be negative according to the DCF-Model, one could conclude, that its share is currently overvalued (5,55 Euro). This conclusion adds another reason to the presumption, that Solon might be an interesting long-term investment[128].

[126] Attention: the growth in Invested Capital merely relates to the increase in Invested Capital in this 5-year time frame, it neither says anything about the amount of capital invested in this period of time, nor does it compare these amounts to the amounts invested in the pervious time frame (2014-2018).

[127] "After all, the share price of a company is in some sense arbitrary since it is a function of the number of shares outstanding; a two-for-one stock split would half the price." (Damodaran, 2006, p.16).

[128] If stock prices rise disproportionately relative to the underlying earnings and cash flows because of market perceptions, DCF-models are likely to find stocks overvalued, which speaks for the fact that they are interesting in acquisition processes for long-term investors (Damodaran, 2006).

6.2.2 REC Group

Whereas Solon has to do much work between the years 2009 to 2013 to catch up on EBITA and NOPLAT growth in relation to their revenue growth, REC does not face this challenge as much. Also the relation of its Invested Capital to revenues remains fairly stable over time, as assumed. A prolonged growth of invested capital takes place in the second projection period. I suppose that the time frame between 2014 and 2017 will be REC's 2nd round of great expenditures, which it will do at the cost of Free Cash Flow or with another capital raise[129]. At the same time the second crisis will hit the industry. So it leaves REC unprepared with further capital-intensive expansion and a decline in the price of products and demand, especially downstream in the module segment. Since REC is creating its value by growth, expansion and capital raising, it is more at risk between 2014 and 2018 than Solon, which lost grounds on this track, yet is forced to stabilize its performance efficiency, especially cost structure, in the worst case at the expense of its speed of growth and expansion projects[130]. At the same time, the valuation shows that REC must catch up on its Adjusted EBIT/revenue ratio, which suffered as a result of the crisis and the years thereafter. REC needs to recapture its EBIT margin in the time-frame of 2009 to 2013 in order to have a positive effect long-term on its operating results and cash flows as well as on ROIC. In the current valuation the EBIT margin from 2014 onward would be 31%, which equals the EBIT margin level of 2008 (39% in 2007; please refer to the data in the comparables analysis). As a financial investor, it would be crucial to work on improving the EBIT level over these historical levels to achieve higher ROICs than 15%.

While, in the comparables analysis, I calculated a 2009 ROIC of 7,72% (as opposed to 12% in 2008), the other four years of this time-frame look rather bleak in terms of return on Invested Capital. Consequently, the prediction implies that REC will not create value for the upcoming years considering its WACC. They progress slower in achieving performance efficiency factors in the next five years and end up at a Return on Invested Capital of 15% by the second period up to 10 years. As the investor announced its participation in REC would come along with strong strategic

[129] In my valuation inputs I included a share increase of 750 Million Euro by 2012, which equals to 150 Million shares at a price of 5 Euro (3,34 Euro as of 06.04.2010, Finanzen.net).
[130] It might sound absurd, but if Solon survives, this is the safer way through the second crisis ahead for the investor.

business partners and alliances, he must think about how he could increase EBIT margins and ROIC in a ten year investing period[131].

In fact there is another problem, the financial investor would have to face upon acquiring REC Group. As it looks the present value of the free cash flows, hence the enterprise value, is almost entirely supported by free cash flows expected after 2023 (Continuing value). This would imply a higher risk for the investor. Hence I would recommend to the financial investor to work on NOPLAT efficiency and thus invest a higher amount of capital (capex) more efficiently beginning in the time-frame 2009 to 2013, especially towards the years 2012 and 2013[132]. Strategic thinking and strong alliances with partners can support this goal. Also the operating value and the continuing value are higher in the 5-year scenario, than in the 10-year scenario, probably affected by the 2nd crisis predictions. So, in a way, we can resume, that for REC Group, there is no time to loose to work on the same factors as Solon does right from the period of 2009 to 2013 to secure value creation based on Free Cash Flows. In acquisition planning, REC can be considered as a growth asset for a financial investor, but he must know, how to resolve the issue of value-creating cash flows in the near future in order to be successful and minimize his risk of failure. REC is another example for the fact, that some investors' strong belief in high cash flows should be balanced with a guard for what business performance factors of a company drive the value drivers "ROIC" and "Growth".

6.2.3 EDP Renovaveis

In my valuation of EDPR I included the assumption of a capital raise in 2012 in the amount of 2 Billion Euro with a share issue of 333.333.333 at a share price of 6 Euro (5,62 Euro as of 19.04.2010; 4,43 Euro as of 08.06.2010; Finanzen.net), especially in view of the future expected cash flows this price could be realistic in 2012, after the crises years.

In general my inputs should be understood as an average forecast of free cash flows over the significant periods of 5, 10 and 15 years. It is very likely, that EDPR's Free Cash Flows remain negative for the years 2010 and 2011, but progress

[131] Depending on whether this ROIC by that time (2014-2018) is high or rather low compared to the solar industry sector average, REC should improve its ROIC (if low) or Growth of revenues and NOPLAT (if high) to create value. On the basis of our assumptions about Solon's ROIC from 2014-2018, we would assume that REC's expected ROIC is low.

[132] Free Cash Flow = Operating Cash Flows minus Capex minus Dividends (www.investorwords.com). Operating cash flows are very high in the years 2012 and 2013.

steadily towards the target positive value by 2014[133]. The macroeconomic assumption of another crisis between 2014 and 2016 breaks this rhythm with a low, but positive cash flow of 161 Million Euro in 2016. A fast recovery of the wind power company EDPR is assumed. Again an average of FCFs of the three years in this crisis could be taken as an alternative input.

Overall, the financial investor is well advised to buy into EDPR, when market caps are low and capital for further growth is needed, which is the case at this point in time (Please refer to comparables analysis and acquisition planning). In any case, he must recognize that EDPR might not offer a value-creating ROIC for roughly the next five years[134]. After this period, the investment could turn into a real "gold mine" and EDPR will use its money very efficiently.

In the years to come EDPR shows a nice performance on revenues for two projection periods from 2009 to 2013 and from 2014 to 2018, while following strictly its performance efficiency factors, as Adjusted EBIT/revenue ratio is, as compared to an EBIT/revenue ratio of 35,6% in 2008 and 43,5% in 2007 according to the data of the comparables analysis. Since NOPLAT and EBIT-figures look already very good, the driving value should be growth from 2009 to 2014, growth of instalments and resulting revenues. A financial investor as ours could contribute the necessary capital for growth from 2009 on, without EDPR touching a single of its cash flows in that time frame for additional capital invested. As a consequence, EDPR can elevate its ROIC between 2009 and 2014. On top, we have the same situation we saw in the discussion of Solon's evaluation. The growth of invested capital between 2019 and 2023 seems to have a driving, increasing effect on ROIC. EDPR, respectively its financial investor, should consider finding means to invest this portion of capital in earlier phases of EDPR's expected cash flow development to profit from it.

Over all, however, one must say that EDPR as a wind power generator seems more robust to a crisis with sustainable cash flows, even in a possible second crisis scenario. The risk of the financial investor engaging in EDPR is fairly low. If we suppose that the investor manages to improve EDPR's ROIC between 2009 and 2013 and likewise EDPR succeeds in securing more inter-company loans with EDP at a low WACC, a balanced scenario between ROIC and WACC is imaginable, which avoids value destruction.

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[133] Essentially, the Free Cash Flow-results depend very much on the inputs for capital expenditure and invested capital in general.

[134] However, the ROIC and the Return on Equity of selected companies should be higher than the one displayed in the DCF-Analysis for the years to come, since the investor is aiming at a special business concept with investitures in selected subsidiaries in emerging markets, which offer high returns (Refer to assumptions and acquisition planning).

A holding period of ten years or more does not only make sense in view of the projected ROICs and WACCs, but also with regard to the enterprise value based on expected cash flows. The enterprise value for a 10-year holding period grows by approximately 100% compared to 2008, the equity value increases by 151% compared to a 5-year holding period. From 2019 to 2023, the enterprise value grows for another 76% of its value of 2018, whereas the value of equity increases by 40%. This supports the endeavour by the financial investor to think about ways of how he can place this effect in prior investment periods as mentioned above.

6.3 Suggestions for Purchase Price Determination, acquisition plans and financing

In this section I will discuss the determination of a purchase price, the acquisition planning and the holding period, which I would recommend to the financial investor given the specific situations of the companies. A simple debt repayment schedule will be developed[135] and contrasted with the expected FCFs and the ROICs on the basis of the DCF-Analysis, in order to envision and compare the investor's planned expenditure with the companies' expected cash flows and their expected enterprise value. An Acquisition structure and tactic will be suggested. This section will not discuss the financial investor's sources of funding and various debt instruments, but rather focus on the acquisition strategy of the investor, who intends to create value in a 5-10 year time frame. The impact of taxes is also pivotal to the determination of the purchase price and should be treated in a detailed acquisition planning and financing[136]. In the following purchase price determinations a special attention is given to the debt situation in terms of net debt and total liabilities, since the acquirer of the company shares "bears any historical and future ongoing tax and non-tax liabilities of the target company" (PWC, 2006, p. 218) and is liable to the amount of equity he holds in the company. The final price in this calculation is the basis for first considerations on fine-tuning and negotiations[137].

[135] The format used for the debt repayment schedule is drawn from a "Debt Schedule" for LBOs suggested by Rosenbaum & Pearl (2009, p. 217), which demonstrates the annual projected cash available for debt repayment.
[136] "Far too often, deal makers do not attempt to identify tax strategies and risks that could seriously affect the price at which a transaction is undertaken." (PWC, 2006, p.1)
[137] Goodwill is understood as a premium above the market price (market premium) in this study. For the purpose of demonstration, I only refer to this part of the Goodwill here. However, I am aware of the fact that Goodwill is defined as the price paid minus the book value of the target, whereas the procedure of its allocation is even more complex (Rosenbaum & Pearl, 2009, p.212).

The purchase price determination is based on current market caps and not on the results of the DCF-Analysis. Hence the purchase price determination does not value future cash flows. The results of the DCF-Analysis provide the investor with an orientation of the future possible value creation and outlook of the companies in terms of a “Buy” or “Don’t Buy” decision, which he does not share with the seller 1:1 in negotiations.

Also, the current market caps are taken as a definitive basis for the purchase price determination in this calculation. According to legal take-over regulations, it is indispensable that the average share price of a year is the minimum price to be paid by the acquirer, which is not considered in this determination. On the basis of a minimum, legally required purchase price, the problem of largely varying market caps over a year, which might even fall below book value, can be resolved.

Furthermore, the value of control, representing the effects on value of changing the management and restructuring the target (Damodaran, 2006, p. 23), is not included in this purchase price determination. Merely, the value of acquiring additional controlling rights is added to the purchase price determination.

6.3.1 Solon SE

Purchase Price Determination, Acquisition and Investment Plan

In the case of Solon, a Purchase Price determination is a real challenge and might depend on many outside factors as state contributions to financing, state guarantees and special loans, tax credits (incentives) and relieves granted by the state. The proposed acquisition scenario of a financial investor buying into Solon with a strategic partner can be played out in many ways.

Under the current circumstances Solon SE must be considered as a high-risk investment and many financial investors would refrain from this risk, as there are various other opportunities to acquire companies, which rest on stronger pillars.

In my opinion, the only way to buy into such a company is a very quick one with many concessions provided by the German government. On top such an acquisition does not make sense, if the financial investor does not ally with a strong strategic international player on a 50:50 Joint Venture basis[138]. The strategic partner should

[138] In this distressed acquisition scenario, a 100 % share deal with the financial investor and a strategic investor is assumed and a fast acquisition procedure is suggested, so as to achieve a turnaround against all odds. Alternatively, as the last resort, asset deal constructions could be considered.

provide product and innovation leadership and preferably be a vertically integrated business.

The company value of Solon SE must be determined by the purchaser on the basis of future realistic economic opportunities, the intrinsic value so as to speak. Regarding a purchase price determination as a basis for first negotiations with the seller, the current market cap is not very indicative of Solon's actual financial and economic status, because it is oriented towards the market's future expectations of cash flows and does not necessarily take Solon's current and critical debt situation into full account.

In view of Solon's financial struggling I would recommend a share deal to settle matters right away. The strategic positioning would need a total work-over and financial and economic risks and opportunities must be elaborated very thoroughly, before making first cautious projections with acquisition analyses tools under various scenarios[139].

One should expect a fairly low price in this distressed acquisition, since Solon's indebtedness, especially short-term and mid-term, is high as well as its risk of default. The investor, along with its strategic partner, might very well end up with a negative Acquisition Premium[140] (Goodwill) in Acquisition Planning, because Solon's current value contains more risks than opportunities. In view of a low acquisition price - the market cap of Solon SE amounts to roughly 56 Million Euro (05/06/2010; Finanzen.net) - a 5-10 year debt repayment schedule does not make any sense at this point, because sustaining cash flows and the company are more of an issue than the acquisition price and its comparison with the expected ROICs. In essence, a holding period of 3-5 years will be a critical point for the financial investor. If Solon does not manage to find back on its track and create value by then, it never will. For further information on Solon's cash flow and ROIC-projections, please refer to the section "Presentation of valuation results".

[139] A thorough analysis should be performed in advance, so as to analyze Solon's performance under multiple financing structures and operating scenarios (Rosenbaum & Pearl, 2009, p.195). The DCF-Analysis is only one method, which can be applied to project scenarios in acquisition planning.

[140] Acquisition premium is the difference between the actual cost of acquiring a target firm and the estimate made of its value before the acquisition, preferably book value.

6.3.2 REC Group

Purchase Price Determination

REC Group's purchase price determination was calculated taking the market capitalization of 29.748 Million NOK (3.715,88 Million Euro) as of 31/12/2009, hence taking the market-value of equity as the basis of the purchase price. Total net debt of 2009 is added to the market cap to determine the enterprise value 2009. The market cap of 2009 is compared with Bloomberg's as of 12/03/2010 and a current one from Finanzen.net in order to check on possible fluctuations. Market caps are considered in relation to the company's leverage ratios and resulting enterprise values.

Future value creation, as being part of the DCF and of Goodwill, is not added to the purchase price since the financial investor rather commits to a guaranteed investiture of 400 Million Euro in place of Goodwill, in order to speed up growth in the upcoming years. The investor leaves further financial injections open, which he will decide on together with REC Group in each particular case.

Calculation[141]

	Euro
Data 2009, year-end	
Market cap (2009, year-end)[142]	3.715.882.176
50% of Market cap (year-end, 2009)	1.857.941.088
Net debt (2009, year-end)[143]	1.286.593.600
Total liabilities (2009,year-end)[144]	2.151.609.200
Enterprise Value[145] (2009, year-end)	5.002.475.776
50% Enterprise value (2009, year-end)	2.501.237.888
Bloomberg 12/03/2010	
Market cap[146]	4.210.001.571
50% of market cap	2.105.000.785
Enterprise value[147]	5.745.669.699

[141] Calculated with the factor 0,124912 in the conversion from NOK to Euro
[142] At year-end market cap amounts to 29.748 Million NOK (REC Annual Report 2009, p.28)
[143] Net debt of 2009: 10,3 Billion NOK (REC Fourth Quarter 2009 Report, p.4)
[144] 17.225 Million NOK (REC Annual Report 2009)
[145] Enterprise Value = Market capitalization + Net debt
[146] Quote from Bloomberg (12/03/2010): 33.703,74 Million NOK
[147] Quote from Bloomberg (12/03/2010): 45.997,74 Million NOK; Enterprise value quoted as market cap plus total debt (ST and LT)

50% Enterprise value	2.872.834.835
Company's debt	1.535.668.128
50% Company's debt	767.834.064
Finanzen.net 08/05/2010	
Market cap[148]	1.502.380.200
50% market cap	751.190.100
Current Enterprise Value (with net debt 2009)	2.788.973.800
Asset-based Company value (Book values 2009)	
50% Company value on asset base[149](2009)	2.131.935.560
50% Total liabilities on assets base (2009)	1.075.867.056
Debt[150]	
Debt/Equity Ratio (book)	50:50
Net Debt (of Enterprise Value) 2009	26%
Net Debt 2009 (of current Enterprise Value)[151]	46%
Debt/EBITDA[152]	9,89
Credit Default Risk[153]	Low
Share[154]	High

[148] REC's share price dropped dramatically from 44,75 NOK (2009, year-end) to 16,79 NOK (2,26 Euro) as of 08/05/2010; number of shares: 664,77 Million (source: Finanzen.net).
[149] Total assets: 34.135 Million NOK (4.263,87) 2009, year-end (equity plus liabilities at book value)
[150] Since the Financial investor is liable for debt with the 50% share in the company, REC's debt financing must be considered in the Purchase Price Determination (Speechley, 2008,p.35), primarily the leverage factor (D/E and Debt/EBITDA ratio) and the debt risk. See also Ballwieser et al., 2005, p.97 ff.
[151] Currently in the crisis, debt/enterprise value increases and market value of equity drops, which may cause a big problem for the whole industry.
[152] EBITDA of 1.741 Million NOK in 2009 (REC Annual Report 2009)
[153] Low because of stable capital structure with comfortable Debt/Equity Ratio and net debt/enterprise value, although debt/EBITDA is fairly high (young industry); rated as high risk stock for traders on Finanzen.net (08/05/2010) because of share price decay/fluctuations
[154] rated as high risk stock for traders on Finanzen.net (08/05/2010); share price decay/fluctuations

Comparison Premium[155]	not applicable
For add. controlling rights	
Equity 50% Price	751.190.100
Compare with	
Company Value minus debt 50%, asset-based	1.056.068.504
Final 50% Equity Price	751.190.100
Equity 50%	751.190.100
Acquisition Fees (3%)	22.535.703
Goodwill[156]	0
Final Price	773.725.803
Investiture[157]	400.000.000
Investiture	400.000.000
Final Price	773.725.803
Cost of senior debt[158] (fixed 5%, 10 years)	161.387.300
Management fee[159]	1.000.000
Final Cost	1.336.113.103
Expected Capital Return (ROIC)[160]:	14,1%
10 year holding period	
Expected Capital Return (ROIC):	14,5%
15 year holding period	

[155] Based on changes in market caps and enterprise values reflecting the risk; Comparison of current market cap with market cap year-end 2009, which reflects a time-frame of a Quarter; (50% Current market cap minus 50% Market cap year-end) divided by 2 results in a Comparison Premium for additional controlling rights, which might not be exercised in this case because 50% provides enough controlling rights for the investor.
[156] Usually, Goodwill is paid in order to value the future opportunities of the company. In this Purchase Price Determination, Goodwill is not recognized in form of "Goodwill", but in form of a guaranteed investiture of 400 Million Euro. The Financial Investor might add further financial investitures in the upcoming years. The goal is to keep Goodwill fairly small or even Null (Ballwieser et. al. 2005, Vorwort and p.98) in order to circumvent Impairment Tests. Hence instead of Goodwill, the amount of 400 Million Euro will be treated as a direct and immediate investment by the financial investor in REC.
[157] This investiture will be attributed to REC's capex for the next 2 years.
[158] 50% of acquisition price and investiture are debt-financed
[159] The management fee means the costs for management tasks adopted by the financial investor himself, since he must get involved in the strategic work of REC more intensely compared to a rather passive role of financial investors in the past decades.
[160] Amount of investor's return on total investment including debt and interest (Speechley, 2008, p.304). See also ROIC in DCF-Analysis.

Debt Repayment Schedule

The debt repayment schedule is performed on a 10-year basis. The amount of debt comprises 50% of the planned investiture of 400 Million Euro (200 Million Euro) and 50% of the Purchase Price, which is 386.862.901 Euro.

NOMINAL VALUE	TOTAL 10 YEARS
Interest payments	161.387.300
Debt payments	586.862.900
Total debt	748.250.200
Total equity	586.862.901
Total investment	1.335.113.101

Figure 33: REC acquisition: Total Investment in nominal figures

For the detailed repayment schedule[161], please refer to the Appendix.

The total capital invested for a period of 10 years would add up to 1.335.113.101 Euro.

Acquisition and Investment Plan

As the Financial Investor considers acquiring 50% of REC, which gives him considerable controlling and decision rights, he must be interested in strategic issues and their positive future solutions. REC Group has a lot of potential from new locations for the production of raw materials up to innovation and science. The vertical player's focus of positioning must be redone however, new partnerships and joint ventures must be considered. The financial investor buys into a company by way of a simple share deal, yet the work hereafter starts. Attractive returns on investment can be managed within the next 5 -10 years, but not without the financial investor getting involved in the business. REC needs support in financing on the debt side, attractive loans need to be sought out and new business partners must be won. In terms of acquisition financing the price of the 50% share in REC will be paid immediately**.** The 400.000 Euro investiture can be seen as a contribution to REC's capex for the next 2 years. The debt repayment schedule of the investor includes a payback scheme of 10 years, which will likely correspond with the targeted holding period of the financial investor.

[161] The debt repayment schedule serves as a rough orientation, for example the cost of equity is not considered in this calculation. Also, the interest rate is assumed with 5% for all ten years on average, leaving out a progression from 3% to 5% as suggested in the debt schedule of Rosenbaum & Pearl (2009, p. 217).

Return on Total Investment

According to the DCF-Analysis, the Financial Investor expects a return on his invested capital (773.725.803 Euro plus 400.000.000 Euro) of 14,1% between 2014 and 2018 and a 50% enterprise value of 8.158.753 Euro by 2019 on the basis of a ten-year holding period. By all means, he wants to find ways to improve these figures.

6.3.3 EDP Renovaveis

Purchase Price Determination

The purchase price determination was calculated taking the market capitalization of 5.783.403.114 Euro as of 31/12/2009 into account, hence taking the market-value of equity as the basis of the purchase price. Total net debt of 2009 is added to the market cap to take a look at the enterprise value 2009. The market cap of 2009 is compared with a current one of Yahoo Finance in order to check on possible fluctuations. Market caps are considered in relation to the company's leverage ratios and resulting enterprise values.

Future value creation, as being part of the DCF-analysis and of Goodwill, is not added to the purchase price, since the financial investor rather commits to money injections to speed up growth in the upcoming years (around 2 Billion Euro), which he is able to decide on together with EDPR in each particular case.

Calculation

	Euro
Data 2009, year-end	
Market cap (2009, year-end)	5.783.403.114
30% of Market cap (year-end, 2009)	1.735.020.934
Net debt (2009, year-end)	2.133.500.000
Total liabilities (2009,year-end)	5.966.000.000
Enterprise Value[162] (2009, year-end)	7.916.903.114
30% Enterprise value (2009, year-end)	2.375.070.934
Yahoo Finance (23/04/2010)	
Current market cap[163]	4.660.000.000

[162] Enterprise Value = Market capitalization + Net debt

30% of current market cap	1.398.000.000
Current Enterprise Value (with net debt 2009)	6.793.500.000
Asset-based Company value (Book values 2009)	
30% Company value on asset base[164](2009)	3.388.200.000
30% Total liabilities on asset base (2009)	1.789.800.000
Debt[165]	
Debt/Equity Ratio (Book)	53:47
Net debt (of Enterprise Value) 2009	26,95%
Net debt 2009 (of current Enterprise Value)[166]	31%
Debt/EBITDA[167]	10,99
Credit Default Risk[168]	Low
Share[169]	Medium
Comparison Premium[170] For add. Controlling rights	168.510.467
Equity 30% Price	1.566.510.467

[163] Quote from Yahoo Finance (23.04.2010); Quote from EDP Renovaveis Homepage as of 08/05/2010: 4,837 Billion Euro market cap

[164] Total assets: 11.294 Million Euro 2009, year-end (equity plus liabilities at book value)

[165] Since the Financial investor is liable for debt with his 30% share in the company, EDPR's debt financing must be considered in the PPA (Speechley, 2008,p.35), primarily the leverage factor (D/E and Debt/EBITDA ratio) and the overall debt risk. See also Ballwieser et al., 2005, p.97 ff.

[166] Currently in the crisis, debt/enterprise value increases and market value of equity drops, which may cause a big problem fort he whole industry. EDPR (wind power) is currently less affected than REC and other solar industry producers.

[167] EBITDA: 543 Million Euro (EDPR Annual Report 2009)

[168] Low because of high percentage of inter-company loans with EDP related companies, although the debt/EBITDA ratio is very high, which is presumed as "normal" for high growth companies.

[169] Fluctuations in share prices (End of year: 6,63 Euro, 23.04.2010: 5,34 Euro) are remarkable, but not as dramatic as REC's.

[170] Based on changes in market caps and enterprise values, reflecting the risk; Comparison of current market cap with market cap year-end 2009, which displays a time-frame of a Quarter; (30% Current market cap minus 30% Market cap year-end) divided by 2 results in the Comparison Premium for additional controlling rights (equivalent to a control premium).

Compare with	
Company Value minus debt 30%, asset based	1.598.400.000
Final 30% Equity Price	1.566.510.467
Equity 30%	1.566.510.467
Acquisition Fees (3%)	46.995.314
Goodwill[171]	0
Final Price	1.613.505.781
Investiture[172]	2.000.000.000
Investiture	2.000.000.000
Final Price	1.613.505.781
Cost of senior debt[173] (fixed 5%, 10 years)	496.857.045
Management Fee[174]	1.000.000
Final Cost	4.111.362.826

Expected Capital Return (ROIC)[175]: 12.5%
10 year holding period

Expected Capital Return (ROIC): 19,5%
15 year holding period

Since the investor plans to invest in subsidiaries in emerging markets exclusively, his ROIC will be higher than the projected one in the DCF-Analysis based on the whole company.

[171] Instead of a considerable amount of Goodwill, investitures of 2 Billion Euro within the following 5 years are planned. Future value creation out of DCF-results is not recognized by Goodwill but included in the amount of secured investitures for the upcoming years. Contribution in kind for the 2 Billion Euro investiture in form of shares by EDPR will be performed after the investment period of 10 years. The comparison premium, which results in an above market value price, will be marked as "Goodwill" and subject to Goodwill amortization. The goal is to keep Goodwill fairly small or even Null (Ballwieser et. al., 2005, Vorwort and p.98) in order to circumvent Impairment Tests.
[172] Includes Working capital requirements to expand the business (Speechley, 2008, p.108)
[173] 50% of acquisition price are debt-financed; 50% of future investiture of 2 Billion are debt-financed
[174] Costs for management tasks adopted
[175] Amount of investor's return on total investment including debt and interest (Speechley, 2008, p.304). See also ROIC in DCF-Analysis.

Debt Repayment Schedule

The debt repayment schedule is performed on a 10-year basis.

The amount of debt comprises 50% of the planned investiture of 2 Billion Euro (1 Billion Euro) and 50% of the Purchase Price, which is 806.752.890 Euro.

NOMINAL VALUE	TOTAL 10 YEARS
Interest payments	496.857.045
Debt payments	1.806.752.890
Total debt	2.303.609.935
Total equity	1.806.752.890
Total investment	4.110.362.825

Figure 34: EDPR acquisition: Total investment in nominal figures

For the detailed repayment schedule[176], please refer to the Appendix.

The total capital invested for a period of 10 years would add up to 4.110.362.825 Euro.

Acquisition and Investment Plan

With the 30% of EDPR shares the investor buys shareholder and controlling rights of EDP Renovaveis and its existing and future subsidiaries in emerging markets. The percentage of control in the selected subsidiaries will be higher than 30% because the investor acquires 30% of EDPR shares and attributes them exclusively to selected subsidiaries (countries). The remaining shareholder and controlling rights for other subsidiaries, which the investor does not make use of, will be waived to EDPR in return for a higher share and higher controlling rights in the subsidiaries for the time being. This is a flexible framework allowing the investor to invest in the countries he wants to and to switch to other countries upon short notice. The financing scheme is, hence, also very flexible. However, financial support, which has already been granted to one of the subsidiaries by the financial investor, cannot be withdrawn, because it is part of the financial long-term plans of the subsidiary and its growth, which has to be planned years ahead. The flexible scheme of financing and control allows the investor to focus on high growth markets with attractive returns on investment. The return on equity (30% share) and on investment (2 Billion Euro in sum) will be paid out on a yearly basis. While a waiver up to 5 years is possible in

[176] The debt repayment schedule serves as a rough orientation, for example the cost of equity is not considered in this calculation. Also, the interest rate is assumed with 5% for all ten years on average, leaving out a progression from 3% to 5% as suggested in the debt schedule of Rosenbaum & Pearl (2009, p. 217).

support of growth, the cumulated return must then be given to the investor without delay[177].

In terms of liabilities to EDPR's debt, the same holds true as for the shares in equity. The financial investor will be liable for the corresponding portion of debt of its shares in the subsidiaries. He has corresponding decision rights regarding the adoption of new debt and the use of equity in the subsidiaries. In general, in major decisions as the issuance of new shares of EDPR, he can exercise his controlling rights in relation with his 30% share in EDPR and the additional controlling rights acquired. The financial investor buys the controlling rights to influence EDPR's financial structure and investment decisions in a substantial way, because they affect the selected subsidiaries.

As for acquisition financing the price for the acquisition of 30% of the shares of EDPR will be paid immediately. The debt repayment schedule of the investor includes a payback scheme of 10 years in view of tax and depreciation advantages. The financing of up to 2.000 Million Euro, used in a 5-year time frame for selected subsidiaries, will be provided to progress in value-oriented growth. The basis for this investiture is the overall capex of the company EDPR in 2009, namely 1.846 Million Euro.

Strategy and Risk

The strategy aims at maximising the returns by investing in emerging markets and selected subsidiaries, while hedging risks by investing in various countries. The risk of bankruptcy does not appear to be high because of EDPR's support by its mother company EDP. The risk of refinancing inter-company loans, which might default at already attractive fixed rates, could be medium, whereas the risk of changes in country regulations is very high, wherein flexibility, hedging and long-term planning as well as lobbying must be pursued as a tactic.

Handling EDPR's partnership structures

The financial investor is aware of the fact, that EDPR is handling its scheme of equity partnerships on a project basis quite successfully and does not want to stop existing partnerships. In view of the future financial structures and opportunities the treatment of partnership contracts must be handled more selectively and the

[177] The method of investing in selected projects, e.g. wind parks, is very common in the Industry. The financial investor lifts this investment approach to a corporate level, wherein "shares" in a subsidiary equal a focused investment in a specific country and emerging market.

financial investor includes the controlling right to agree or disagree with a proposed partnership, if it interferes with his own (future) investment interests. This controlling right is not subject to the purchase price determination. A possible rejection of a partner by the financial investor must be handled case by case by EDPR together with the financial investor. The financial investor commits to offering an alternative investment scenario of equivalent value, either by taking the place of the potential equity investment partner himself or by a comparable attractive growth and investment opportunity. The value of a potential partnership must be determined on a five-year Growth and Investment Plan coherent to a roughly 5 year period of project development and construction.

Return on Total Investment

According to the DCF-Analysis, the financial investor expects a return on his invested capital (1.613.505.781 Euro plus 2.000.000.000 Euro) of 12,5% between 2014 and 2018 and a 30% enterprise value of 6.370.001 Euro by 2019 on the basis of a ten-year holding period. By all means, he wants to find ways to improve these figures.

6.4 Tax implications of the deals

Certainly, tax structuring is a very important integral part of an optimal transaction and financing structuring (Speechley, 2008, p.394 ff.) and, thus, must be taken into account in early acquisition planning. Overall, three key tax issues should be considered in tax planning prior to acquisitions: the tax deduction of the purchase price, tax loss carry forwards and interest deduction. Since tax structuring in such deals implies a high degree of complexity, which cannot be treated here, the following section merely picks some tax considerations from the financial investor's perspective, which could be an issue in the process of acquisition and thereafter.

Since the financial investor is located in Luxemburg[178] and finds himself confronted with various legal tax systems as Germany, Spain/Portugal and Norway, he must consider the respective consequences of a transaction in each case[179]. In this case

[178] It is assumed that both, the business location and the residence of the financial investor is Luxembourg.

[179] In this case study I do not assume acquisitions for tax-motivated reasons, although financial investors use this option quite frequently. The financial investor is keen on achieving a value-creating effect with his acquisition.

study share deals are the preferable structure targeted by the financial investor[180]. Yet, as a last resort, asset deal constructions might be considered in the 100% acquisition of Solon SE, in view of its current situation and its valuation results. For further information on acquisition planning, please refer to section 6.3.

6.4.1 Solon SE

In the case of a 100% acquisition of Solon SE by the financial investor (50% share), together with a strong strategic partner (50% share), tax relief in the form of tax incentives[181] and the maintenance of existing and prospective tax loss carry-forwards[182] should be attained in close cooperation with the German government in view of a survival of the company and a facilitation of its value-creating growth in the near future. The deal structure could involve a multijurisdictional[183] share deal with a share purchase vehicle located in Germany and a holding company in Luxembourg, the financial investor's headquarter, due to special tax benefits (Speechley, 2008, p. 70). Additional share purchase vehicles attributed to subsidiaries of Solon SE outside of Germany might be implemented by the strategic partner (e.g. a Chinese producer of solar modules), if this leads to a higher tax optimisation, in order to profit from tax structuring right from the start in the acquisition phase.

Another alternative would be the purchase of all or certain assets of Solon SE and the foundation of a new company, which leaves the partners with a 50-50 share in the new company holding the purchased Solon SE assets, under the premise of an integration of the new company as a separately listed subsidiary of the strategic partner.

As much as the German government might meet the acquirers' expectations of supportive tax regulations, it can only do so within its own realm of actions. The acquirers need more flexibility, because both partners most likely operate with various internationally dispersed companies and subsidiaries. Hence the evaluation

[180] Advantage of debt acquisition financing in Luxembourg: "If a company used debt to acquire shares and dividends, such shares would be tax-exempt (PWC, 2006, p. 288).

[181] Tax incentives are installed by law exclusively. Because of the current economic crisis, it can be presumed that tax laws will be reformed on a yearly basis, in order to support highly affected industry sectors.

[182] If the financial investor is allowed to keep tax loss carry-forwards, he can run his business operations on a tax-free basis for many years.

[183] A multijurisdictional buy-out generally assumes more than one target entity, since the target business has substantial operations in more than one jurisdiction (Speechley, 2008, p.70). In the case of Solon SE a single direct target holds other operating entities in different jurisdictions.

of the existing country-wide tax group systems on both partners' sides is very relevant to this deal structure.

In any case, the primary goal and perspective in such a critical situation as the one of Solon, must be the achievement of a low effective tax rate and tax exemptions (carry-forwards), at least for the upcoming years. Acquisition and transaction costs should be transferred to the target, if a deduction of these costs is possible according to the country's tax law. In an exit scenario, upon the sale of shares, the resulting capital gain is tax-exempt in Luxembourg[184].

6.4.2 REC Group

In the case of REC, the financial investor might consider the establishment of a holding company, which serves the purpose of both shareholder's taxation needs and expectations (50% REC and 50% Financial investor). The current REC Group construction should be reviewed. While it seems obvious that Norway must stay the centre and headquarter of operations, a way to link its subsidiaries to Luxembourg could end up as a tax advantage. By moving certain business functions to low-tax countries as Luxembourg, the relatively high effective tax rate could be reduced[185]. In particular, the foundation of an operative subsidiary (e.g. for administrative and financing operations) in Luxembourg could be interesting from a tax perspective.

The buyer should aim for a tax deductibility of acquisition and transaction costs in his tax design. The formation of a tax group system ("group relief system") in Norway might be a challenge with a 50:50 Joint Venture, because it requires a 90 percent share holding of one shareholder, foreign or domestic, in the respective corporations (PWC, 2006, p.372). In an exit scenario, upon the sale of shares, the resulting capital gain is tax-exempt in Luxembourg.

6.4.3 EDP Renovaveis

The tax situation of EDPR could be thought of as well organized, since EDPR holds many subsidiaries in Europe and abroad. In light of the high effective tax rates, it must be questioned, however, if EDPR really makes the necessary effort to reduce its effective tax rates in its headquarter Spain and its international business

[184] Holding Co Comparison (PWC, 2009): Subsidiary must be EU collective entity or non-EU fully taxable joint stock corporation for tax exemption.

[185] REC effective tax rates: 30% (2008), 32,6% (2007), 38,4% (2006), 87,0% (2005); no data for 2009 available in Annual Report 2009; Norwegian Corporate tax rate: 28% (2009)

locations[186], even more as it might hold the resources to take advantage of low effective tax rate constructions with a strong mother company operating in various international places. In acquisition planning the actual benefits of the existing tax grouping structures of EDPR should be revised and developed further throughout the share purchase. Presumably, since EDPR is headquartered in Spain, the Spanish legal tax system is applicable to the company.

Upon the sale of shares in an exit scenario, gradual mechanisms can be inquired and found, since the financial investor has a planned holding period of at least 10 years ahead of him and various subsidiaries with differing project periods and project closures. Luxembourg is not charging a tax rate for the disposal of foreign shares for shareholders with a minimum shareholding of 10%, which is a benefit in view of this exit scenario. The circumstance that the financial investor is practically investing in the subsidiaries of EDPR, which are or will be located in the US, Brazil, China and other emerging markets, might give rise to creative tax structuring over all.

[186] It is presumed that according to the principle of double taxation, EDPR is taxed according to Spanish law, because of its Spanish headquarter. Effective tax rates: 27,53% (2009), 30,38% (2008), Annual Report 2009; Spanish Corporate tax rate: 30% (2009); Portugese corporate tax rate: 25% (2009)

7. Conclusion on value measurement and creation in the specific context of an emerging business sector

7.1 Perspective on the industry

The field of Renewable Energies is in a turnover, a diversification and clearing process. Many of the small, young firms of the first generation will not be able to handle the speed of growth of the years to come accompanied by various challenges as financing and cost-reduction. Either they are lacking the budget or the favourable governmental conditions and allies (partners) to stay on top in the game. The three companies I chose for my valuation are already of considerable size, well-established in the market and yet, far from free of risk. Even for them, the next five to ten years will be a challenge of growing and consolidating in the right manner with a constant outweighing of investments and potential resources for them. On an industry-wide level, the big energy companies are trying to win this game over the small fast growing firms, their lobbying is strong, their resources are plenty and their hope for a come-back of the oil business is small. As the industry continues to be in a hurry to grow, they want to stay ahead by acquiring smaller companies through M&A activity or by contributing as financial investors on a project or corporate basis. But is this form of growth the answer to the market opportunities, risks and pitfalls?

For many years, investors of Renewable Companies have relied on “The Growth Story” (Damodaran, 2004, p.198), promising them high returns by way of an increase of value of their stockholdings. Dividends were usually postponed for the sake of growth. And indeed, the value of many stocks grew until 2008. Currently, however, the values of some dropped and of others increased, and we do not know, who will recover and who won’t, in the short- and in the long-term. To my mind, the current situation in the industry reveals the risk of growth investing painfully. The “capital gains” were used up for capital-intensive, and not always capital-effective, growth, whereas market caps and share prices lost their ground as an effect of the crisis and economic predictions, which point to project financing difficulties and to high competition in cost-efficiency and product quality.

Speaking of economic challenges, this is not a stable industry, but a shaky road of ups and downs. Hence, the ROICs can vary widely from year-to-year, which is a very important message to potential investors. But how can he stabilize the situation? At this point, three challenges are key to the industry: First of all, to conquer the markets internationally, second of all, to maintain cost and R&D leadership and third

of all, to benefit from an excellent network of political lobbyists, informants and business partners. On top, at least this holds true for the next years to come, companies must have the intelligence to hedge their capital and financing structure against the risks of capital market instability these days. They need business and finance experts, who can react very flexibly to changing market conditions.

Decisive value-creating economic factors in the years to come

1. Flexibility in production and sales as a consequence of legal requirements/conditions (subsidies) and increased competition; strength in the acquisition of new clients (Solar industry)
2. Ability of switching to new markets and target groups on short notice
3. R&D is a major factor of survival and of attractiveness to investors[187]
4. Permanent reduction of production costs, in the wind power market due to grid parity
5. Strategic and business alliances: network contributes to the necessary manoeuvrability in a highly international market[188]
6. Efficient and flexible use of resources in this high-growth industry: the challenge is to secure the supply in times of growth, yet to be flexible enough to rededicate resources to other projects/ countries, also with changing time-frames, without a major loss[189]

In sum, the Industry of Renewable Energies will remain very capital-intensive in terms of PPE, intangibles (patents etc.) and project work, which need to be financed in advance.

Every part of the value chain is dependent on local government's laws and amendments, defining the market potential for project developers of solar plants and wind power parks as well as producers of modules, wind mills and their suppliers.

The risk factors for the Renewable Energy Industry, which basically correspond with the risk factors of the Solar Industry mentioned in section 5.1.1., could be summarized as the following:

[187] Koller et al. (2005, p.20) found a strong positive correlation between shareholder returns and investments in R&D.

[188] The manoeuvrability should also have an effect on the access and use of resources with the goal of a higher cost-efficiency.

[189] Efficiency does not only mean cost-reduction, but to enable the needed supply at the right place at the right time

Risk factors in the Renewable Energies industry

1. A sandwich position in the value chain causes less flexibility
2. Fast and low priced supply on demand versus scarce availability and contracts
3. Adherence to changing/falling market prices in face of a given cost structure
4. Yearly call for cost reduction of production and product efficiency (Solar industry)
5. Achievement of Grid parity on time
6. Changing conditions for subsidies granted by local governments
7. Many competitors of varying strengths in the market

In the end, having studied the industry, I realized that none of the fast growing companies had a plan B (or C or D) upon facing the financial crisis. Companies were preoccupied with growth and spoiled by subsidies, which turned out to be their pitfall. I strongly believe that it is exactly this competence, which will be decisive in determining the survival of companies in a less stable, more restless and heated economy.

If long-term investors in Renewable Energy firms have bet on the wrong horse, meaning, the wrong company, will show in the near future. It amazed me, for how long companies can operate on the mere premise of pushing growth and reinvesting "capital gains", without satisfying their investors. The crisis years 2008 to 2010 reveal, that this notion was built on a phantom assumption of a young industry, with the urge to grow to stay ahead of others. Today, many shares lost their value and it is more of a lottery, if investors will regain the value of their stockholdings. A friend of mine once said, that the market is not only capital-intensive, but capitally "doped" referring to the subsidies, which companies and especially investors have been living off quite nicely in the last decade. However, this time can also offer a great chance for big bargains to financial investors. The market caps of many Renewable Energy companies are quite low and if the investor picks the right company and the right investment strategy, he can acquire his share cheaply and profit tremendously, as we have seen in the sections on Acquisition Planning and on valuation with the DCF-Analysis.

7.2 Learnings out of this study

I want to open my initial argument concerning "the investor's intent" for discussion and ask: "Is growth investing value investing?" If growth investing should not create value, we should rather leave it then take it.

As it seems, this young industry runs on speed: speed in terms of conquering the markets ahead of the others, speed in terms of following-up new technological advances resulting in less time to position one's company on the market with more and more competitors around. In this scenario growth becomes a driver of its own more than a value driver.

In this study, we have looked at the growth rates of the Renewable Energy Industry in the historical perspective and noted, that Revenue as well as EBIT growth rates were impressively high up to 2008 year-end, especially in the solar sector, but also in the wind power sector, which shows revenue growth and stable to growing EBITs. Further we could monitor, that the approach and adherence of companies to performance efficiency factors as EBITDA/Revenue or Profit/Revenue is very diverse. This is only partly founded in the fact, that there are different interests of businesses depending on the corporate structure, the business segment(s) and the countries they are operating in. One gets the impression that each company has its own profile and footprint in its way of progressing, when you take a deeper look at performance efficiency factors, as we did in the wind power sector.

In all endeavours, growth remains the target and it was achieved by most of the companies under valuation with a solid capital structure from around 30% up to 50% of debt/equity ratios.

Furthermore, we screened the stock markets and Betas and realized that this industry is cyclical to the market and highly sensitive to macroeconomic factors as the last financial crisis of 2007 demonstrated. Judging from the data on Betas, we could see that the solar producers' rates are medium to very high, whereas the rates of the wind power sector circle around one. The conclusion, that the wind power sector might be less risk-prone to effects in the market in general might only hold true for the moment, since the effects of the crisis have not entirely hit the wind power sector yet[190]. Small to medium-size European wind power generators, which do not have a strong international profile, are likely to feel the effects of severe cuts on subsidies, if these materialize.

[190] Besides, we studied Wind Power companies, which are subsidiaries to big energy incumbents.

The mere focus on growth left many companies unprepared for the effects of the crisis starting in 4th quarter 2008. In fact, in the solar industry, many companies described their risk factors in their Annual Reports very well, but none of them had a plan B or C to switch on, when the price of modules fell drastically. Overall, some were supported better than others by their networks and additional businesses and/or their technological and cost advantages, which made the differences in the end.

Speaking of growth, I want to recall the initial research question, which was raised in view of the value drivers Growth and ROIC: "How do economic indicators, multiples and value drivers such as ROIC and Growth rate "behave" in the young, fast growing industry "Renewable Energies", at what point and to what extent can value creation be expected in future?"

We learnt from our historical data, that, whereas growth has been quite strong in the solar sector in the recent decade, the ROIC was subject to volatility on a yearly basis. In some years, the companies would earn their Cost of Capital (WACC after-tax compared to ROIC), in others they would not. In the wind power sector, the situation of "value destruction" is even worse, since EDPR and its competitors show very low ROICs, at least for the time being. As I wanted to make sure, I am on the right track I compared my data on EDPR's ROIC (2008: 1,54%) with Thomson Reuters' (2008: 2,42%)[191], which revealed only minor differences. Also, I checked Bloomberg's ROIC calculations for EDPR, EDF EN and Iberdrola Renovables and withdrew figures from 2,86% to 6,28%[192], higher, but still far from satisfactory and possibly also far from earning the WACC. I also calculated the ROICs of Acciona and Gamesa for the year 2008 and 2009 and came to a similar conclusion[193], even though it must be noted that these companies operate in diverse business segments, not only wind power generation and project development. In general, as I predicted in my assumptions and the DCF-Analyses, ROICs will remain low and volatile in the next five years, until the companies have secured their market leadership and their international market flexibility, which will most likely form the basis for sustainable ROICs.

What about the investor, who wants to see value-creating ROICs even more than growth rates? In my quest for the investor's best interest, I decided to compare

[191] Differences in value can spring from differing modes of calculating the Invested Capital.
[192] ROIC, Bloomberg as of 26/04/2010: EDF EN (2,86%); Iberdrola Renovables (6,28%) and EDPR (5,73%).
[193] ROIC: Acciona (2008; 3,5%); Acciona (2009; 1,9%); Gamesa (2008: 6,4%); Gamesa (2009; 5,23%).

returns on equity of the recent years with ROICs. When you take the historical ROICs I calculated for REC and Solon and compare them to Thomson Reuters data on returns on equity (please refer to the Appendix), you will find it amazing. The investors could really dwell from a wonderful time of attractive returns on their equity up to 2008 year-end, despite the volatility of ROICs to surpass the companies' WACCs. This time seems to have come to an end, however. The industry is more challenged today to use their invested capital effectively, which is not only in the interest of the investor, but also a necessity to survive against competitors, to meet grid parity and the expectations of the "hidden investor", the governments. I cannot help but assuming, that the high WACCs in the solar industry have also been pushed by high costs of equity, looking at the returns on equity retrospectively, since the cost of debt has been quite low in the recent years.

In any case, we concluded earlier, that many companies have a long-term policy in order not to pay dividends, but to reinvest the "capital gain" on shares in growth. This circumstance adds even more to the assumption, that growth is the industry target but not a value driver.

""Lead steers" want a company that is beating its Cost of Capital"[194]. Does this mean that our conglomerate investor really becomes ONLY a "Growth Investor" in the end? Indeed, as projections of the DCF-Analyses show, the value of the assets does lie in the future, in the case of REC in the very far future, which puts the investment at risk. However, the ROICs could improve tremendously upon time and I think that is, what will happen, when the industry consolidates. As companies realize more and more, that they need to work on their ROICs, some will manage and some will simply fade away or will be acquired by others. Truthfully, my projected long-term ROIC-scenarios are even more than optimistic but at the same token, I am convinced that the companies, who will win the market with the economic measures mentioned in "Perspective on the industry", will be successful in improving their ROIC, possibly to their own surprise. As soon as they gain the ability to use their invested capital effectively, their growth rates will have an amplifying and not a slowing effect on their ROIC. As soon as they gained their position in international, especially emerging markets, they will dwell from an endlessly open market to Renewable Energy sources. The need of Alternative Energy will not end by 2020, it will go on and the ones, who manage to remain in the market (2009-2018), will ripe the fruits.

[194] Please refer to http://www.fool.com/investing/beginning/return-on-invested-capital-declining-roic.aspx

Decisive value-creating figures in the industry for the years to come[195]

1. ROIC: a must
2. Growth[196]: stable, cool-headed growth
3. Capital Structure: stable, not more than 50% debt-to-equity ratio
4. Reduction of risks (economy, company-specific)
5. Business segments and markets, which improve ROIC
6. Improvement of sustainability of cash flows
7. Profitability to contest with competitors (solar producers)
8. Increase of NOPLAT in relation to revenues (company-specific)[197]

Now, has the sector Renewable Energies been permanently overvalued? I think this question must be raised and my answer is yes to it, if we consider the simple relation of ROIC to WACC and the returns on equity, which were "reinvested"[198].
We know that today, companies in this sector have lost on their market caps and hence shareholders on their extrinsic shareholder values. As a consequence, they must search for their value intrinsically, possibly somewhere in the far future at the high risk of their companies' sustainability.
At last, one could make objections to my DCF-Analyses that, as many others, it does overrate the growth factor way too much and that it is planned too optimistically in terms of the companies' recovery on ROICs up to historical peak values. Also, one could raise the argument, why I see the value of the companies in the future starting with 2014, in the case of REC even way later. The later is not so much a result of a second crisis assumed, but of the international positioning in the market and when it takes place. It will take time for the companies to win the race. In my valuation, I referred to the current situations and included remedies, an investor could take, to improve e.g. REC's position and enterprise value based on expected cash flows in the near future. The long-term projections must be seen in this light. Considering the time frame of more than 10 years of long-term investing to create the highest, most attractive returns, a financial investor might show some impatience

[195] The growth driver formula puts the importance of a high ROIC for value creation upfront, with growth as the value driver to this effect. In order to do justice to the historical performance of this industry, one must say, that this formula is overly restrictive for companies, which are growing fast. However, after a time frame of about 7 years in the market, the ROIC should be at least equal to the WACC (Koller et al., 2005, p.135).
[196] The ROIC increases with revenues (and NOPLAT) growth rates, not with revenue volumes as such.
[197] Companies have different multiples for valid economic reasons.
[198] I have to admit that I am uncertain about future estimations of industry WACCs. Since WACC drives value, it should be included in these considerations. My assumption is, that WACCs will range inbetween 6% to 10% after tax, much like today.

upon viewing these results. In the ideal case, he finds ways of how he would improve his investment and achieve attractive returns, respectively an attractive price for its sale based on satisfying ROIC-performance and sustainable cash flows, by the end of the 10 year investment period. In my opinion, forecasts of such a time-length are a sort of mind game, since they are based on future expected cash flows. As Damodaran states (2006, p.16), the comparative analysis of companies is a priceless tool to measure the market, and indispensable in combination with a DCF-Analysis. The DCF-Analysis, on the contrary, falls short when it comes to predictions of cash flows of more than five years, especially in a heated industry as Renewable Energies. In the present valuations, the DCF-Model could not come to its full effects, because we faced volatile and fluctuating indicators and ratios in the midst of a volatile economy. This circumstance enhances the fact, that the historical, growth-centred performance of the companies cannot be used as an indicator of future company and industry performance at all. The high default risk of companies and the influence of governments on their success and failure add to this problem. However, whereas the inputs in a DCF-Model are a challenge in this industry in present times, the rationale behind the model holds a great benefit in store for its user. The underlying assumptions and logic of the person, who sets up the DCF-Analysis, play out very well in the results. Consequently, the DCF-Analysis is a very good tool to gain understanding of the company-specific interrelations of various input variables driving the company's performance ratios.

Hence one should make an effort to take advantage of this model in planning various scenarios. As I mentioned further above, a company's competence to be flexible in switching from a plan A to a plan B or even C implies such scenario planning. This holds true for any industry sector in volatile times and, in a special way, for fast-paced, high growth industry sectors such as the Renewable Energy Industry.

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List of tables/figures/charts/diagrams

Appendix

China's new king of solar

Suntech's Shi Zhengrong built one of the world's biggest solar-power companies. Now, with economies slowing, he faces the challenge of a lifetime.

By Bill Powell, senior writer
February 11, 2009: 2:33 PM ET

(Fortune Magazine) -- On a chilly Saturday afternoon in mid-January, Shi Zhengrong, casually dressed and smiling as if he didn't have a care in the world, walked into the stunning new building that is now the headquarters of Suntech Power Holdings, the company he founded and built from scratch just eight years ago.

Back then, in 2001, he had received $6 million in startup money from the government of Wuxi in China's Jiangsu province - the site of the multimillion-dollar headquarters. The local Communist Party officials who backed Shi have learned yet another lesson in the benefits of capitalism. By bankrolling this son of Jiangsu, the government quickly got its money back, with plenty of interest, when Suntech (STP) went public in late 2005, raising $400 million on the New York Stock Exchange. But beyond that, it created what could be the new epicenter of an industry about to catch fire.

Few could have known it at the time, but luring Shi back from Australia, where he had gone as a graduate student in 1988, was an event that changed the course of an industry's history - and not just any industry, but one that may be among the most critical of the 21st century: solar energy.

Not only did Shi create one of the world's fastest-growing companies - surging from nothing to more than $1.3 billion in revenue, profits of $171 million, and 4,300 employees in the blink of an eye - but by basing all of Suntech's manufacturing in China, he also started to shift the balance of power in the solar industry. It has never been the same since.

Like so many businessmen of his generation, Shi sprinted through the economic open-door policy begun by the late Deng Xiaoping in December 1978. By the time he was 32, he had already lived a life that his parents could not imagine. He had been among the first wave of bright young students to take advantage of the opening of China.

After becoming proficient in English, Shi - born in the smallest county in China, a small island in the Yangtze River, and the son of dirt-poor peasant farmers - was selected to pursue graduate studies abroad. He thought he was bound for the U.S. and tried to learn all he could about the country: "The culture, the geography - I even tried to learn an American accent," he says now.

But at the last minute, in May 1988, his academic advisor at the Shanghai Institute of Optics surprised him. All the slots for the U.S. had been filled; Shi would go to Australia instead, to the University of New South Wales in Sydney, and pursue a Ph.D. in electrical engineering. Says Shi: "I didn't even know where Australia was."

That unanticipated twist changed everything for Shi. "Who knows what might have happened if I had gone to the U.S.? I might still be walking the street," he jokes. At the university he met Martin Green, a preeminent scientist in the field of solar energy. Green was impressed with Shi's candlepower and work ethic. He had completed his Ph.D. in just 2 1/2 years - the fastest in his field in the history of the university - and proved himself to be "one of the brighter graduate students I've had, without question," Green says.

The professor had developed the world's highest-efficiency silicon solar cells, and in 1995 he and a colleague formed a company, Pacific Solar. Green invited Shi to join the venture, and once he arrived, the team developed the technology that dramatically reduced the cost to produce solar energy by significantly reducing the amount of silicon needed in solar cells.

Opportunity in China

Curious and restless - the Australian startup was up and running after five years and "I needed a new goal" - Shi met some officials from Wuxi, a city 70 miles west of Shanghai. The Chinese government would give him $6 million if he would return and start a solar energy company. "The Wuxi investment committee said to me, 'We want sons like you to come back and be bosses here."'

Shi accepted. Like a handful of other Chinese entrepreneurs (such as Peng Xiaofeng of LDK Solar (LDK)), he understood that China offered the opportunity to drive down production costs of solar panels and modules. A decade ago the industry was dominated by Sharp, Siemens, and BP Solar - huge companies with relatively high-cost production bases. In those days, he recalls, people asked him skeptically, How can you possibly compete with BP Solar (BP) or Siemens (SI)? "I wouldn't say anything [in response]," he says, "but I was always thinking to myself, 'Well, why couldn't I?"'

No reason, it turned out. He believed he could sell solar panels at a cost of $3 per watt, well below the standard industry price then of $4.50 per watt or higher. It wasn't just China's cheap labor that had attracted him, but the relatively inexpensive land and material costs available as well. In 2003, just a year after Suntech started production at a factory Shi himself had designed, he sold panels at $2.80 per watt. "And we still had 20% profit margins," Shi says.

The rise wasn't always smooth, and Shi was required to have more than technical skills to make Suntech succeed. Sharp elbows helped too. When the company showed it could be profitable early on, board members appointed by the government suddenly became very interested. Shi and the government-appointed chairman clashed in late 2003 over how rapidly to expand the business and on the amount Shi was spending on the equipment needed to do so. "For some reason he didn't seem to trust me," says Shi.

Shi went to the other board members and persuaded them in 2004 to ease the chairman out. "That's when I realized that [having a] controlling position in the company was critical. I didn't want this kind of complexity again." So he "borrowed a lot of money," got a capital injection from Goldman Sachs, and bought out the rest of the state-sponsored shareholders in 2005 for $100 million. "From that point onward I felt free," he says.

Climate change by then had become a global cause celèbre, and governments around the world began boosting subsidies for renewable energy. Suntech's stock hit an all-time high of $85 in late 2007. Its biggest markets for the solar panels and modules it makes are in Europe; Germany is the largest.

Shi believes the U.S. market for solar under President Obama will take off starting in 2010, when subsidies for solar energy are likely to increase as part of a stimulus plan to revive the overall economy. But the year until then, Shi himself acknowledges, will be unlike anything Suntech has confronted to date.

The deepening global economic crisis has changed the dynamics of Shi's industry abruptly. Rapid growth is now yesterday's story; significant overcapacity is today's. The global financial crisis has hurt the ability of solar customers in Europe and elsewhere to get project financing - the critical component in building more solar capacity. Only recently, Shi says, has there been a sign of thawing in the financial markets that might let some planned projects go forward in Europe.

The global slump has also crushed the prices of natural gas and coal, which compete with solar to generate electricity. As a result, Suntech's stock - like all those in the sector - has also been crushed. It closed on Jan. 21 at just $9.31 per share, wiping out some $4 billion of Shi's net worth.

Dealing with overcapacity

The rapid success of Chinese solar companies such as Suntech has spawned lots of imitators. And that's why the market is now plagued by overcapacity. A new report from research company iSuppli says 11.1 gigawatts of panels will be produced in 2009, up 62% from 7.7 gigawatts in 2008. However, iSuppli says just 4.2 gigawatts are expected to be installed in 2009, up from 3.8 gigawatts in 2008.

Shi has responded by significantly scaling back planned capacity increases in 2009. Suntech had originally hoped to raise production from its current one gigawatt to 1.4 gigawatts by the end of 2009, and two gigawatts by the end of next year. Now, Shi says, expansion plans are on hold until the financial crisis passes and the market improves.

That's part of the reason that Suntech fired 800 employees at the end of 2008 - the first layoffs in the company's short lifetime. Shi believes that the scale Suntech has already achieved will enable the company to withstand what will be an industrywide shakeout - with smaller producers of cells and panels falling by the wayside.

This is, obviously, the greatest turbulence Shi has felt in what has been a charmed career as a CEO. Yet, he says, the most important thing the company can do is focus on what it did before the crisis began wreaking havoc on the global economy. And that is to relentlessly pursue what is the Holy Grail for the solar industry, what insiders call "grid parity."

What is grid parity? It means getting the cost of producing solar energy down to the point where there is no difference between it and competing fossil fuels like natural gas or coal. For Suntech that means about 14 cents per kilowatt-hour. Currently, Suntech's cost is about 35 cents, yet Shi says that by 2012 his production line will reach his target.

How, exactly? For one thing, the scale that the solar industry has reached gives it new pricing power over suppliers. Explains Shi: "We were a parasitic industry relative to the semiconductor industry, which was the main user of silicon." Now that's no longer true: The solar industry uses more silicon than the chipmakers. Also, the world economic slump has driven silicon prices down sharply.

But far more important, analysts say, is increasing conversion efficiency - the amount of electricity derived from the silicon used. The rule of thumb is that every 1% increase in efficiency results in a 6% cost reduction. And in the past year, Suntech has cut costs by about 20%. In time, he says confidently, "solar will be cheaper than coal or gas."

Not all industry analysts are as sanguine. "Obviously the efficiency gains get harder the more efficient you get," says Pavel Molchanov, an alternative-energy analyst at Raymond James & Co. "Shi has made impressive gains so far, but grid parity by 2012 is pretty ambitious - though plausible."

Shi is undeterred. Despite the current slump, he sees both politics and economics going his way. He believes that by 2010 there will be demand from "utility-sized projects in the U.S. - gigawatt-sized projects" - which will again drive scale-induced production cost savings for Suntech. This is, in part, because he believes President Obama's desire to stimulate demand for clean energy is very real. If anything, he says, the economic crisis may eventually drive more spending on alternative-energy projects than there otherwise might have been in the U.S. and in Europe.

Shi acknowledges that for now his industry is not propelled by economics alone. Climate change is a scientific consensus, he says, and governments the world over recognize the need to move to what Shi calls the "post-carbon future." But even if they didn't, he insists that the day beckons when his industry will grow, thanks to hardheaded private-sector economic decisions, not government subsidies. By the end of 2012, he predicts, the need for subsidies will begin to evaporate. "I've always been a goal-driven person," he says, "and by then - by around 2012 - we'll have achieved grid parity. That's what this company will achieve."

Coming from someone else, that prediction might sound overly optimistic, to put it mildly. Coming from a guy who went from zero to more than $1 billion in revenue in just over half a decade, however, it sounds pretty close to rational. Remember, people said that Shi Zhengrong couldn't compete against giants like Sharp and BP Solar. Is it wise to doubt him now? □

Greek Crisis and Euro's Drop Snare Clean-Energy Stocks

By Ben Sills and Mark Scott - May 20, 2010

As Europe grapples with the fallout from Greece's economic woes, at least one unexpected corner of the economy is suffering: renewable energy companies.

That's because few wind, solar, and other green power installations would be profitable without subsidies, and as governments across Europe curb spending in response to the Greek crisis, those funds are being cut back, Bloomberg Businessweek reports in its May 24 issue.

"The uncertainty in Europe is a further burden in a market that is still challenging," said Kathleen McGinty, a former adviser to President Bill Clinton's administration who now helps manage $800 million in clean-energy investments as a partner at private equity firm Element Partners in Radnor, Pennsylvania.

The aid to renewable energy, paid by consumers in their power bills, is being slashed by governments that want to cut costs for businesses to boost economic growth and generate tax revenue as bond investors scrutinize their plans to rein in budget deficits as much as three times the European Union limit.

German lawmakers on May 6 reduced subsidies to new solar plants by as much as 16 percent. Italian solar industry groups expect support for new generators to be scaled back by as much as a quarter in June.

In Spain, producers have offered reductions of up to 30 percent on subsidies for new solar cell installations. The government may also cut its backing for existing plants, which had been built with an expectation of guaranteed prices for 25 years, a spokesman in the industry ministry said last month.

Euro Decline

Across the continent, "the risk to subsidies is increasing," Barclays Capital Analyst Vishal Shah said. "It's going to be painful."

For companies based outside of Europe, the pain is compounded by the decline in the euro whose value has been undermined by the Greek crisis. Profits for North American companies selling their products into Europe declined as the currency fell 14 percent against the dollar this year.

Canadian Solar Inc., a panel maker based in Kitchener, Ontario, took a $20 million charge for foreign-exchange losses in the first quarter and may see earnings fall 84

percent if the euro averages $1.25 this year, Barclays estimates. The currency traded at $1.23 yesterday.

Currency Losses

Profits for Baoding, China-based solar-cell maker Yingli Green Energy Holding Co. would fall 42 percent with the euro at $1.25, while Chinese rival Suntech Power Holdings Co. would see a 79 percent drop, according to the Barclays analysis.

“The falling euro has been difficult to manage,” said Jerry Stokes, Suntech’s vice-president of strategy and business development. “Having suppliers in Europe, though, helps manage our costs.”

The troubles are taking a toll on stocks. Canadian Solar is down 49 percent since April 1, and Suntech is off by 32 percent. The 88-company WilderHill New Energy Global Innovation Index has fallen by 19 percent since then, compared with a 12 percent decline for the MSCI World index. Canadian Solar fell as much as 7.3 percent before rebounding to gain 29 cents to $12.29 today.

Spanish wind turbine-maker Gamesa Corp. Tecnologica SA, which is laying off a 10th of its workers after sales slumped 43 percent in the first quarter, has seen its shares tumble 24 percent since April 1. The company aims to weather the trouble as it expands overseas.

‘Delay Our Plans’

Potential cuts in renewable prices “could delay our plans in Spain, but we would allocate our production capacity elsewhere, particularly to China and the U.S.,” said Jose Luis Blanco, director of offshore wind at Gamesa. “Other markets are becoming more important to us than Spain.”

Gamesa secured an exclusive 10-year deal to supply Cannon Power Group with turbines for at least 1,000 megawatts of wind farms in Baja California, Mexico, the company said May 18. The stock fell 3 percent today to close at 7.75 euros.

American Superconductor Corp., the wind-turbine component manufacturer that has around half its costs in euros and most of its sales in China, boosted its gross margin by around 1.5 percentage points in the first quarter after switching its contracts to renminbi from euros last year. The company is also adding staff at its Klagenfurt, Austria, research center because the euro’s decline makes it cheaper to run European operations.

“We expected the renminbi to strengthen over time,” Chief Executive Officer Greg Yurek said in a May 14 interview. “Foreign exchange rates have really benefited us.”

Euro Protection

First Solar Inc., the world's largest maker of thin-film solar power modules, was also protected from the euro's decline after buying insurance for its European sales. Profits may be trimmed 9 percent by an average exchange euro rate of $1.25 this year, Shah said.

Uncertainty about future subsidies is making it harder for renewable companies to secure funding. Renovalia Energy SA and Grupo T-Solar Global SA, Spanish solar companies aiming to expand overseas, have delayed initial public offerings that together aimed to raise more than 430 million euros ($527 million).

Solar Opportunities SL, a Madrid-based investment company, has put off a 130 million-euro purchase of a solar plant in northern Spain until the government sorts out its support level for the industry.

For long-term investments such as renewable energy, said Solar Opportunities Chief Executive Officer Paul Turney, "business needs certainty."

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Definition	Calculation
Working Capital in DCF	Operating cash plus Inventories plus Accounts receivable plus Other current assets minus other Current liabilities
Working Capital in Thesis	Current assets minus Current liabilities
Weighted Average Cost of Capital in Thesis	Equity (E) divided by Enterprise Value (V) multiplied with Cost of Equity c(e) plus Debt (D) divided by Enterprise Value (V) multiplied with the Cost of Debt c(d) and with (1 minus taxes on Cost of Debt (T))
Invested Capital in DCF	Net Property Plant and Equipment plus Other Invested Capital
Other Invested Capital in DCF	Working Capital plus Other operating assets minus On-going operating provisions plus Operating leases minus Other operating liabilities minus Tax Creditor c/f
Invested Capital in Thesis	Total Assets minus Inventory minus Receivables minus Other current assets
Operating Result in Thesis	EBIT minus Taxes

Operating Result in DCF	**NOPLAT = Adjusted EBITA minus/plus Taxes on EBITA minus/plus Change in Deferred Taxes**
Return on Invested Capital in Thesis	**(EBIT minus Taxes) divided by Invested Capital**
Return on Invested Capital in DCF	**NOPLAT divided by Invested Capital**
Enterprise Value (Market) in Thesis	**Market cap plus Net debt**
Enterprise Value (Book) in Thesis	**Total assets = Equity plus Total liabilities**

Price-to-Book and Price-to-Sales Ratios 2009

EDPR 2009*				
Total Assets	Enterprise Value		Ratio	
12.294,0		**7.917,00**		**64,40%**
		2009		
Book Value:	Market cap		Price-to-Book Ratio	
3.992		**5.790**		**1,45**
				1,45
Sales	Market cap		Price-to-Sales Ratio	
648,2		**5.790**		**8,93**
		7.917,00	EV/Sales	
				12,21

Share price/(Total Assets-Intangible Assets -Liabilities)	
Market cap	**5.790,000**
Total Assets	11.294,000
Intangible Assets	1.336,000
Liabilities	5.966,000
Ratio	**1,45**

* Thomson Reuters 2008: EDPR Price-to-Book Ratio (0,9); EDPR Price-to-Sales Ratio (8,2)

Iberdrola Renovables 2009			
Total Assets	Enterprise Value		Ratio
21.537,0	**17.760,52**		**82,47%**
		2009	
Book Value:	Market cap		Price-to-Book Ratio
7.882	**14.024**		**1,78**
			1,78
Sales	Market cap		Price-to-Sales Ratio
2.009,10	**14.024**		**6,98**
	17.760,52		EV/Sales
			8,84

Share price/(Total Assets-Intangible Assets -Liabilities)

Market cap	**14.024,000**
Total Assets	21.537,034
Intangible Assets	4.382,618
Liabilities	9.272,775
Ratio	**1,78**

EDF EN 2009

Total Assets	Enterprise Value	Ratio
6.125,1	**5.290,08**	**86,37%**

	2009	
Book Value:	Market cap	Price-to-Book Ratio
1.437	**2.552**	**1,78**
		1,78
Sales	Market cap	Price-to-Sales Ratio
1.173,00	**2.552**	**2,18**
	5.290,80	EV/Sales
		4,51

Share price/(Total Assets-Intangible Assets -Liabilities)

Market cap	**2.552,488**
Total Assets	6.125,117
Intangible Assets	135,463
Liabilities	4.552,649
Ratio	**1,78**

EDPR

ROIC compare with **WACC**

	2007	2008	2009	2010*
ROIC	1,06%	1,84%	1,54%	5,73%
WACC				10,89%
Return on Equity**		2,92%		
Return on Invested Capital**		2,42%		

**Thomson Reuters

EDF EN

ROIC compare with **WACC**

	2007	2008	2009	2010*
* Thomson Reuters 2008: EI	3,38%	3,24%	3,35%	2,86%
WACC				6,74%

IBERDROLA RENOV.

ROIC compare with **WACC**

	2007	2008	2009	2010*
ROIC	1,52%	2,64%	2,37%	6,28%
WACC				11,29%

* Data 2010 from Bloomberg (26/04/2010)

EDPR
Growth rate of capacities installed (in gross MW) **in Million**

	2004	2005	2006	2007	2008	2009
EDPR		951	2.127	3.640	5.052	6.227
Growth rate EDPR			123,66%	**71,13%**	**38,79%**	**23,26%**
EDPR Europe	530	953	1.568	2.150	2.894	3.355
EDPR Europe Wind					2.477	2.853
Growth Rate EDPR Europe		79,81%	64,53%	**37,12%**	**34,61%**	**15,93%**
EDPR North America/US		372	559	1.490	2.158	2.859
Growth Rate EDPR North America			50,27%	**166,55%**	**44,83%**	**32,48%**

2009	
* Thomson Reuters 2008: EDPR Price	**739**
Pipeline	**20.152**
Prospects	**9.419**
Project Total	**30.310**

640 MW in Europe
99 MW in US

Goal
2012

10.500 MW
(Gross Capacity)

EDF Energies Nouvelles
Growth rate of capacities installed (in gross MW) **in Million**

	2007	2008	2009
EDF EN	**1.443**	**2.275**	**2.945,4**
Growth rate EDF EN gross		**57,66%**	**29,47%**
	1.035	**1.565**	**2.257,0**
Growth rate EDF EN net		**51,21%**	**44,22%**
EDF EN Wind Energy	**1.218**	**2.031**	**2.650**
Growth rate Wind gross		**66,75%**	**30,48%**
	871	**1.388**	**2.033**
Growth rate Wind net		**63,28%**	**46,47%**

Goal 2012

at least 4.200 MW net

	Gross MW				
	Under construction	**Authorized**	**Advanced Development Phase**	**Preliminary Development Phase**	**Total**
EDF EN Wind business	**713**	**1.002**	**5.782**	**7.076**	**14.573,0**
EDF EN Solar business	**139**	**174**	**2.597**		**2.910**

IBERDROLA RENOVABLES
Growth rate of capacities installed (in gross MW) **in Million**

	2007	2008	2009
IBERDROLA Renovables	**7.098**	**9.302**	**10.752,0**
Growth rate		**31,05%**	**15,59%**

2009		
Under construction	**937 MW**	**446 in US**
Pipeline	**58,4 GW**	**43% in US**

Goal 2012	
18.000 MW (Gross capacity)	**constructions of 2.000 MW annually secured for the consecutive 7 years (Presentation 2008)**

Target 2010	**12.500 MW**

	in Million		
Performance efficiency EDPR	**2007**	**2008**	**2009**
EBIT - taxes	70	162,12	161,56
Taxes Spain	32,50%	30,00%	30,00%
EBIT - taxes / revenue	22,25%	30,45%	24,92%
Net profit / revenue	2,03%	21,07%	18,17%
EBITDA / revenue	73%	82,25%	83,69%
EBITDA/adjusted gross profit		75,3%	74,9%
Revenue	315,8	532,4	648,2
Revenue Growth		68,59%	21,75%
EBITDA	**229,7**	**437,9**	**542,5**
EBITDA Growth		**90,64%**	**23,89%**
EBIT	**104,1**	**231,6**	**230,8**
*** Thomson Reuters 2008: EDPR Price-to-Book Ratio (0,9); E**	4,0	104,4	114,3
Net income (minorities incl.)	**6,4**	**112**	**117,8**
Working Capital	**2007**	**2008**	**2009**
Current Assets	731,967	732,320	1.105,356
Current Liabilities	929,282	780,760	1.245,510
Working Capital Total	-197,315	-48,4	-140,2

Performance Efficiency IBERDROLA Renovables	in Million 2007	2008	2009
EBIT - taxes	234,17	496,75	479,99
Taxes Spain	32,50%	30,00%	30,00%
EBIT - taxes / revenue	24,57%	24,47%	23,89%
Net profit / revenue	13,51%	19,57%	18,76%
EBITDA / revenue	59,18%	58,39%	65,96%
Revenue	**953,0**	**2.030,3**	**2.009,1**
Revenue Growth		113,04%	-1,04%
EBITDA	**563,9**	**1.185,5**	**1.325,3**
EBITDA Growth		**110,23%**	**11,79%**
EBIT	**346,9**	**709,6**	**685,7**
Net Profit ("Net income", Group share)	117,5	390,2	371,1
Net Profit (minorities incl.)	**128,8**	**397,4**	**376,9**
Working Capital	**2007**	**2008**	**2009**
Current Assets	2.721,592	2.143,511	1.833,760
Current Liabilities	2.906,186	2.781,609	2.441,904
Working Capital Total	-184,594	-638,1	-608,1

	in Million		
Performance Efficiency EDF EN	**2007**	**2008**	**2009**
EBIT - taxes	63,67	110,34	153,41
Taxes France	33,33%	33,33%	33,33%
EBIT - taxes / revenue	11,35%	10,87%	13,08%
Net profit / revenue	9,57%	7,68%	8,91%
EBITDA / revenue	23,94%	22,34%	28,49%
Revenue	561	1.015	1.173
Revenue Growth		80,93%	15,57%
EBITDA	**134,3**	**226,8**	**334,2**
EBITDA growth		**68,88%**	**47,35%**
EBIT ("Operating income")	**95,5**	**165,5**	**230,1**
Net Profit ("Net income, Group share")	51,4	70,6	97,9
Net income (minorities incl.)	53,7	77,935	104,526
Working Capital	**2007**	**2008**	**2009**
Current Assets	867,6	1.695,6	2.006,1
Current Liabilities	816,2	1.701,7	1.859,2
Working Capital Total	51,4	-6,1	146,9

CAPITAL STRUCTURE		in Millions		
EDPR	**2007**	**2008**	**2009**	
Equity-to-Assets ratio	**29,0%**	**54,0%**	**47,0%**	
Net debt	**2.414**	**1.069**	**2.134**	
Enterprise Value	**NA**	**5.469**	**7.924**	
EBITDA	230	438	543	
Net debt/EBITDA	10,5	2,4	3,9	
Market cap (23.04.2010)			4.660	
Net Debt/Enterprise			**26,93%**	
Market cap, year-end	**NA**	**4.400**	**5.790**	
Total Assets	**7.040**	**9.397**	**11.294**	
LOANS				
Bank Loans and Other		560	542	According to EDPR
Loans with EDP Group Related Companies		902	2.132	Results 2009
*** Thomson Reuters 2008: EDPR Price-to-Book Ratio (0,9); ED**		**1.462**	**2.673**	**increase 83%**

	in Millions		
EDF EN	**2007**	**2008**	**2009**
Equity-to-Assets ratio	**31,8%**	**32,7%**	**25,7%**
Equity	**757**	**1.474**	**1.572**
Total Assets	**2.383**	**4.513**	**6.125**
Net debt	**646**	**1.314**	**2.738**
Enterprise Value			**5.568**
EBITDA	134	227	334
Net debt/EBITDA	4,8	5,8	8,2
Market cap (23.04.2010)			2.830
Net Debt/Enterprise			**49,17%**
Market cap, year-end			**2.552**

	in Millions		
IBERDROLA RENOVABLES	**2007**	**2008**	**2009**
Equity-to-Assets ratio	**61,8%**	**55,3%**	**53,0%**
Equity	**10.918**	**11.188**	**11.418**
Total Assets	**17.655**	**20.216**	**21.537**
Net debt	**3.191**	**3.233**	**3.737**
Enterprise Value			**17.760**
	(average debt)		
EBITDA	564	1.186	1.325
Nebt debt/EBITDA	5,7	2,7	2,8
Market cap (23.04.2010)			12.720
Nebt debt/Enterprise Value			**21,04%**
Market cap, year-end			**14.024**

CAPEX	in Million Euro		
	2007	2008	2009
EDPR	**1.721**	**2.091**	**1.846**
Europe		43%	55%
Europe		**893**	**1.014**
US		57%	45%
US		**1.198**	**826**
CAPEX/EBITDA	**7,5**	**4,8**	**3,4**
EBITDA	**229,7**	**437,9**	**542,5**

CAPEX	in Million Euro		
	2007	2008	2009
EDF EN	**523**	**1.070**	**1.319**
CAPEX/EBITDA	**3,9**	**4,7**	**3,9**
*** Thomson Reuters 2008: EDPR Price-to-Bc**	**134,3**	**226,8**	**334,2**

CAPEX	in Million Euro		
	2007	2008	2009
IBERDROLA Renovables	**1.076**	**3.593**	**2.000**
CAPEX/EBITDA	**1,9**	**1,9**	**1,5**
EBITDA	**563,9**	**1.885,5**	**1.325,3**

Companies	in Billion market cap*	Ratio of daughter to mother	in Millions, year-end Enterprise Value 2009**
EDP	**13,15**	35,44%	**27.492,400**
EDP Renovaveis	**4,66**		**7.916,903**
EDF	**74,94**	3,78%	
EDF Energies Nouvelles	**2,83**		**5.289,595**
IBERDROLA	**33,07**	38,46%	
Iberdrola Renovables	**12,72**		**17.760,519**

* Thomson Reuters 2008: EDPR Price-to-Book Ratio (0,9); EDPR Price-to-Sales Ratio (8,2)

*Source: Yahoo Finance (23.04.2010)
EDP-Goal with financial investor could be a 50% market cap ratio of daughter to mother
**Enterprise value = market cap + net debt

Industry Name	*Number of Firms*	*Average Beta*	*Market D/E Ratio*	*Tax Rate*	*Unlevered Beta*	*Cash/Firm Value*	*Unlevered Beta corrected for =ash*
Advertising	30	1.43	126.31%	18.90%	0.71	18.50%	0.87
Aerospace/Defense	66	1.27	27.21%	24.10%	1.06	11.65%	1.20
Air Transport	44	1.15	78.21%	23.00%	0.72	16.66%	0.86
Apparel	53	1.14	44.32%	17.21%	0.83	10.44%	0.93
Auto & Truck	20	1.49	183.75%	24.36%	0.62	17.82%	0.76
Auto Parts	54	1.56	94.19%	19.61%	0.89	19.54%	1.10
Bank	477	0.71	91.52%	25.91%	0.43	9.32%	0.47
Bank (Canadian)	8	0.86	10.36%	15.08%	0.79	4.60%	0.83
Bank (Midwest)	39	0.91	68.98%	26.81%	0.60	9.10%	0.66
Beverage	41	0.95	19.02%	16.46%	0.82	3.25%	0.85
Biotechnology	108	1.25	9.98%	3.59%	1.14	10.62%	1.27
Building Materials	52	1.39	103.11%	18.44%	0.76	5.88%	0.80
Cable TV	25	1.56	88.77%	22.97%	0.92	2.80%	0.95
Canadian Energy	12	1.22	35.70%	27.82%	0.97	1.82%	0.99
Chemical (Basic)	19	1.26	29.11%	19.29%	1.02	7.52%	1.10
Chemical (Diversified)	33	1.21	26.70%	25.47%	1.01	7.86%	1.10
Chemical (Specialty)	88	1.18	35.74%	18.99%	0.92	5.81%	0.98
Coal	18	1.98	48.02%	10.52%	1.39	3.13%	1.43
Computer Software/Svcs	322	1.22	7.77%	12.65%	1.15	13.87%	1.33
Computers/Peripherals	125	1.29	18.36%	9.90%	1.11	19.90%	1.39
Diversified Co.	113	1.25	160.98%	20.23%	0.55	9.62%	0.60
Drug	342	1.16	14.51%	5.96%	1.02	10.70%	1.14
E-Commerce	54	1.50	11.43%	13.09%	1.36	22.76%	1.76
Educational Services	34	0.84	2.22%	20.80%	0.82	7.63%	0.89
Electric Util. (Central)	24	0.82	107.83%	33.02%	0.48	2.36%	0.49
Electric Utility (East)	26	0.74	73.30%	32.09%	0.50	1.36%	0.50
Electric Utility (West)	16	0.79	90.70%	30.47%	0.48	2.81%	0.50
Electrical Equipment	83	1.37	23.53%	14.23%	1.14	9.31%	1.26
Electronics	173	1.31	45.62%	11.87%	0.94	24.12%	1.23
Entertainment	84	1.66	79.23%	17.17%	1.00	7.87%	1.09
Entertainment Tech	33	1.45	11.54%	13.67%	1.31	43.50%	2.33
Environmental	79	1.11	49.86%	15.45%	0.78	2.26%	0.80
Financial Svcs. (Div.)	296	1.27	261.38%	17.93%	0.40	9.97%	0.45
Food Processing	109	0.80	35.15%	21.67%	0.63	3.31%	0.65
Food Wholesalers	18	0.73	59.50%	27.39%	0.51	5.66%	0.54
Foreign Electronics	10	1.18	42.29%	37.04%	0.94	33.20%	1.40
Furn/Home Furnishings	34	1.29	65.75%	23.99%	0.86	8.42%	0.94
Grocery	14	0.84	13.91%	32.96%	0.77	1.19%	0.78

Healthcare Information	29	1.05	19.87%	16.47%	0.90	13.72%	1.04
Heavy Construction	14	1.48	9.49%	34.26%	1.40	19.62%	1.74
Homebuilding	32	1.36	162.15%	6.13%	0.54	17.07%	0.65
Hotel/Gaming	68	1.70	142.62%	17.97%	0.78	6.66%	0.84
Household Products	26	1.08	23.21%	29.87%	0.93	2.36%	0.95
Human Resources	31	1.44	18.42%	29.77%	1.28	20.47%	1.61
Industrial Services	167	1.20	43.98%	19.26%	0.88	10.12%	0.98
Information Services	34	1.22	21.88%	20.44%	1.04	16.64%	1.24
Insurance (Life)	35	1.17	21.71%	25.86%	1.01	20.42%	1.27
Insurance (Prop/Cas.)	78	0.91	1.89%	20.26%	0.90	2.22%	0.92
Internet	208	1.41	4.07%	7.50%	1.36	18.01%	1.66
Investment Co.	17	0.83	14.84%	0.00%	0.72	20.10%	0.90
Investment Co.(Foreign)	16	1.31	5.16%	2.11%	1.24	8.72%	1.36
Machinery	124	1.39	55.77%	22.71%	0.97	10.40%	1.08
Manuf. Housing/RV	18	1.32	50.13%	14.98%	0.92	32.93%	1.38
Maritime	56	1.30	185.73%	7.08%	0.48	7.94%	0.52
Medical Services	160	1.10	54.66%	18.36%	0.76	15.06%	0.90
Medical Supplies	252	1.17	13.28%	12.51%	1.05	7.61%	1.13
Metal Fabricating	35	1.56	25.44%	20.43%	1.29	16.61%	1.55
Metals & Mining (Div.)	78	1.69	21.94%	9.29%	1.41	5.10%	1.48
Natural Gas (Div.)	34	1.20	58.57%	24.19%	0.83	2.26%	0.85
Natural Gas Utility	25	0.69	85.33%	24.52%	0.42	2.20%	0.43
Newspaper	16	1.16	86.43%	23.53%	0.70	2.94%	0.72
Office Equip/Supplies	26	1.11	60.35%	22.76%	0.76	9.73%	0.84
Oil/Gas Distribution	19	0.89	81.95%	9.48%	0.51	2.27%	0.53
Oilfield Svcs/Equip.	112	1.56	42.35%	22.07%	1.17	7.56%	1.27
Packaging & Container	33	1.27	84.83%	24.65%	0.77	5.19%	0.81
Paper/Forest Products	38	1.20	118.10%	13.66%	0.60	6.15%	0.64
Petroleum (Integrated)	25	1.34	14.67%	33.79%	1.22	6.00%	1.30
Petroleum (Producing)	188	1.24	37.57%	13.98%	0.94	2.85%	0.97
Pharmacy Services	19	0.94	23.50%	21.13%	0.79	2.38%	0.81
Power	66	1.63	107.88%	6.25%	0.81	14.62%	0.95
Precious Metals	75	1.41	11.77%	5.94%	1.27	7.13%	1.37
Precision Instrument	90	1.47	22.65%	14.38%	1.23	22.69%	1.59
Property Management	17	1.38	282.91%	19.27%	0.42	9.70%	0.46
Publishing	27	1.24	137.13%	20.73%	0.59	3.74%	0.62
R.E.I.T.	144	1.35	53.19%	1.21%	0.88	4.13%	0.92
Railroad	15	1.25	41.53%	30.62%	0.97	2.38%	0.99
Recreation	64	1.41	62.58%	19.12%	0.94	7.32%	1.01

Reinsurance	11	0.91	11.37%	8.87%	0.82	17.91%	1.00
Restaurant	68	1.26	24.97%	20.10%	1.05	3.28%	1.09
Retail (Special Lines)	155	1.26	26.07%	23.08%	1.05	14.13%	1.22
Retail Automotive	16	1.31	66.88%	34.23%	0.91	2.13%	0.93
Retail Building Supply	8	1.01	26.35%	28.12%	0.85	1.09%	0.86
Retail Store	38	1.01	30.29%	25.68%	0.82	4.79%	0.86
Securities Brokerage	32	1.37	462.27%	22.16%	0.30	19.25%	0.37
Semiconductor	122	1.81	13.32%	10.48%	1.62	23.52%	2.11
Semiconductor Equip	16	1.78	13.62%	22.03%	1.61	27.00%	2.20
Shoe	19	1.23	3.66%	30.35%	1.20	13.98%	1.39
Steel (General)	20	1.71	32.18%	29.15%	1.39	9.06%	1.53
Steel (Integrated)	14	1.96	64.96%	29.90%	1.34	12.42%	1.54
Telecom. Equipment	110	1.49	12.71%	12.08%	1.34	28.43%	1.87
Telecom. Services	140	1.43	51.32%	15.90%	1.00	5.73%	1.06
Thrift	234	0.66	9.71%	17.04%	0.61	11.49%	0.69
Tobacco	12	0.71	8.84%	20.25%	0.67	3.10%	0.69
Toiletries/Cosmetics	23	0.95	38.50%	23.28%	0.74	7.15%	0.79
Trucking	33	1.17	126.80%	33.19%	0.63	4.98%	0.66
Utility (Foreign)	5	1.23	62.82%	15.01%	0.80	5.51%	0.85
Water Utility	16	0.86	82.79%	35.46%	0.56	0.87%	0.57
Wireless Networking	57	1.54	36.37%	14.08%	1.17	8.39%	1.28
Public/Private Equity	10	2.08	391.15%	6.70%	0.45	7.49%	0.48
Funeral Services	6	1.41	67.25%	33.26%	0.97	4.84%	1.02
Grand Total	**6870**	**1.19**	**48.81%**	**16.67%**	**0.84**	**9.28%**	**0.93**

Industry	Number of firms	Beta	Market D/E	Tax rate	Unlevered Beta	Cash/Fir Value
Advertising	38	1,02	69,06%	30,60%	0,69	14,66%
Aerospace and Defense	27	1,02	36,89%	20,49%	0,79	16,04%
Agricultural Products	33	0,82	63,38%	15,71%	0,53	11,13%
Air Freight and Logistics	21	0,93	52,97%	22,44%	0,66	8,98%
Airlines	17	1,00	106,95%	17,47%	0,53	24,77%
Airport Services	12	0,92	73,63%	21,49%	0,58	9,57%
Alternative Carriers	20	0,84	120,87%	101,54%	0,86	7,68%
Aluminum	9	1,22	36,87%	27,42%	0,96	10,89%
Apparel Retail	20	1,29	3,69%	24,54%	1,26	5,19%
Apparel, Accessories and Luxury Goods	50	1,12	39,73%	27,79%	0,87	6,77%
Application Software	118	0,94	3,84%	21,68%	0,91	8,93%
Asset Management and Custody Banks	63	0,86	71,28%	14,66%	0,54	29,00%
Auto Parts and Equipment	33	1,24	139,02%	20,19%	0,59	15,83%
Automobile Manufacturers	14	1,02	142,76%	24,92%	0,49	9,89%
Automotive Retail	14	1,07	190,16%	15,49%	0,41	8,45%
Biotechnology	84	1,10	11,49%	3,02%	0,99	9,53%
Brewers	18	1,22	68,11%	21,75%	0,80	3,31%
Broadcasting	23	0,87	43,38%	23,77%	0,66	6,27%
Building Products	58	0,98	80,51%	21,26%	0,60	6,14%
Cable and Satellite	6	0,87	77,66%	60,97%	0,67	0,98%
Casinos and Gaming	30	0,95	56,24%	21,72%	0,66	8,98%
Catalog Retail	9	0,98	28,29%	21,30%	0,80	7,68%
Coal and Consumable Fuels	11	1,09	41,59%	9,77%	0,80	14,05%
Commercial Printing	10	0,78	33,61%	21,08%	0,61	33,10%
Commodity Chemicals	30	1,07	50,82%	20,85%	0,76	6,35%
Communications Equipment	50	1,14	21,55%	15,32%	0,96	16,26%
Computer and Electronics Retail	10	1,20	60,19%	13,67%	0,79	17,60%
Computer Hardware	12	1,28	59,96%	20,48%	0,86	17,25%
Computer Storage and Peripherals	15	1,24	3,99%	7,39%	1,19	24,02%
Construction and Engineering	120	1,25	184,89%	26,53%	0,53	11,89%

Construction and Farm Machinery and Heavy Tru	33	1,34	112,39%	24,99%	0,73	5,63%
Construction Materials	33	1,02	116,59%	23,50%	0,54	6,24%
Consumer Electronics	12	1,35	247,57%	20,81%	0,46	21,35%
Consumer Finance	14	0,82	253,66%	18,38%	0,27	2,26%
Data Processing and Outsourced Services	14	1,20	20,97%	16,92%	1,02	27,94%
Department Stores	12	0,95	118,38%	25,73%	0,50	9,26%
Distillers and Vintners	20	0,81	50,25%	19,90%	0,58	3,11%
Distributors	27	0,77	195,29%	19,47%	0,30	15,63%
Diversified Banks	90	1,05	NA	20,36%	NA	7,25%
Diversified Capital Markets	10	1,26	1824,09%	10,51%	0,07	31,39%
Diversified Chemicals	7	0,91	54,59%	25,76%	0,65	6,37%
Diversified Metals and Mining	48	1,68	43,50%	15,62%	1,23	6,65%
Diversified Real Estate Activities	40	1,18	410,60%	13,72%	0,26	3,99%
Diversified REITs	13	0,73	227,91%	2,11%	0,22	3,87%
Diversified Support Services	37	0,87	49,21%	23,85%	0,63	6,95%
Education Services	6	0,75	70,08%	17,75%	0,47	3,17%
Electric Utilities	35	0,89	77,41%	18,51%	0,55	4,74%
Electrical Components and Equipment	72	1,21	48,89%	18,98%	0,87	9,67%
Electronic Components	12	1,26	50,31%	17,48%	0,89	14,02%
Electronic Equipment and Instruments	69	1,04	36,87%	20,79%	0,81	11,84%
Electronic Manufacturing Services	8	1,04	115,65%	12,05%	0,52	11,85%
Environmental and Facilities Services	34	1,02	66,47%	19,77%	0,67	8,75%
Fertilizers and Agricultural Chemicals	11	1,16	17,79%	14,13%	1,01	3,62%
Food Distributors	6	0,74	49,86%	23,74%	0,53	9,36%
Food Retail	20	0,74	76,89%	24,33%	0,47	9,36%
Footwear	3	1,27	2,53%	29,97%	1,25	9,29%
Forest Products	16	1,06	213,02%	18,05%	0,39	9,25%
Gas Utilities	8	0,64	58,48%	25,20%	0,45	6,39%
General Merchandise Stores	3	0,47	53,73%	38,33%	0,35	6,71%
Gold	26	1,22	14,31%	12,33%	1,09	17,44%
Health Care Technology	14	0,84	188,06%	30,74%	0,37	13,96%
Healthcare Distributors	15	0,91	63,31%	17,60%	0,60	2,41%

Healthcare Equipment	56	0,97	49,64%	31,74%	0,73	4,09%
Healthcare Facilities	20	1,06	102,86%	65,32%	0,78	7,21%
Healthcare Services	16	0,74	45,81%	15,98%	0,53	1,51%
Healthcare Supplies	18	0,78	9,38%	15,57%	0,73	7,53%
Heavy Electrical Equipment	10	1,77	12,71%	14,54%	1,60	12,03%
Highways and Railtracks	16	0,82	174,33%	28,28%	0,36	3,79%
Home Entertainment Software	13	1,19	10,47%	10,75%	1,09	14,24%
Home Furnishing Retail	8	0,99	37,78%	22,26%	0,77	8,42%
Home Furnishings	16	1,29	65,14%	21,67%	0,86	8,13%
Home Improvement Retail	15	0,91	74,40%	26,69%	0,59	11,69%
Homebuilding	26	1,18	170,94%	20,49%	0,50	9,16%
Hotels, Resorts and Cruise Lines	42	0,90	70,79%	20,41%	0,58	12,97%
Household Appliances	17	1,03	71,56%	25,53%	0,67	8,57%
Household Products	6	0,62	26,44%	19,78%	0,51	1,98%
Housewares and Specialties	14	0,83	84,53%	16,31%	0,48	4,32%
Human Resource and Employment Services	35	1,05	43,47%	24,76%	0,79	8,33%
Hypermarkets and Super Centers	3	0,68	130,06%	28,53%	0,35	8,59%
Independent Power Producers and Energy Trade	33	1,14	53,68%	14,43%	0,78	8,20%
Industrial Conglomerates	22	1,27	52,16%	18,72%	0,89	11,52%
Industrial Gases	3	0,74	52,15%	18,87%	0,52	4,33%
Industrial Machinery	169	1,22	39,73%	24,27%	0,94	10,02%
Industrial REITs	2	0,70	204,95%	0,00%	0,23	1,91%
Insurance Brokers	8	0,88	23,81%	25,89%	0,75	16,50%
Integrated Oil and Gas	14	1,00	20,53%	35,03%	0,88	5,96%
Integrated Telecommunication Services	30	0,76	90,31%	18,60%	0,44	4,97%
Internet Retail	11	1,06	13,23%	27,24%	0,97	9,79%
Internet Software and Services	80	1,11	40,20%	17,47%	0,83	15,31%
Investment Banking and Brokerage	52	1,01	373,82%	20,44%	0,25	7,25%
IT Consulting and Other Services	117	1,07	46,74%	28,16%	0,80	10,20%
Leisure Facilities	20	0,75	184,06%	12,82%	0,29	9,44%
Leisure Products	28	0,90	81,62%	22,77%	0,55	8,43%
Life and Health Insurance	21	1,15	142,87%	15,60%	0,52	46,28%

Life Sciences Tools and Services	27	0,89	30,09%	16,73%	0,71	8,34%
Marine	43	1,45	93,39%	13,15%	0,80	8,86%
Marine Ports and Services	15	1,42	35,18%	18,57%	1,11	5,65%
Metal and Glass Containers	14	0,87	116,28%	26,44%	0,47	4,58%
Motorcycle Manufacturers	4	0,86	134,75%	8,48%	0,39	5,82%
Movies and Entertainment	64	0,78	53,81%	14,56%	0,53	9,73%
Multi-line Insurance	30	0,96	81,91%	18,90%	0,57	29,57%
Multi-Sector Holdings	19	1,16	15,21%	9,67%	1,02	4,27%
Multi-Utilities	19	0,65	58,43%	23,66%	0,45	6,45%
Office Electronics	4	0,94	74,25%	7,65%	0,56	4,74%
Office REITs	13	0,94	134,90%	0,19%	0,40	3,06%
Office Services and Supplies	27	1,05	34,02%	22,85%	0,83	8,02%
Oil and Gas Drilling	9	1,65	173,63%	14,15%	0,66	8,81%
Oil and Gas Equipment and Services	54	1,44	56,34%	24,66%	1,01	14,84%
Oil and Gas Exploration and Production	78	1,17	31,57%	17,52%	0,93	15,09%
Oil and Gas Refining and Marketing	16	1,17	65,27%	13,98%	0,75	6,48%
Oil and Gas Storage and Transportation	20	1,39	155,31%	40,22%	0,72	12,41%
Other Diversified Financial Services	15	1,12	NA	13,36%	NA	6,86%
Packaged Foods and Meats	105	0,79	33,23%	21,02%	0,62	3,92%
Paper Packaging	15	1,06	194,95%	18,47%	0,41	12,69%
Paper Products	25	0,92	122,44%	14,11%	0,45	5,49%
Personal Products	26	0,68	16,51%	16,92%	0,60	3,95%
Pharmaceuticals	68	0,88	15,68%	12,67%	0,78	4,19%
Photographic Products	3	0,80	59,74%	17,13%	0,54	11,93%
Precious Metals and Minerals	14	1,52	20,82%	17,28%	1,30	13,56%
Property and Casualty Insurance	14	0,83	22,64%	22,49%	0,71	11,33%
Publishing	71	1,07	82,38%	30,41%	0,68	4,53%
Railroads	7	0,74	170,43%	18,90%	0,31	10,16%
Real Estate Development	25	0,93	303,90%	12,21%	0,25	4,10%
Real Estate Investment Trusts (REITs)	1	0,96	551,55%	0,00%	0,15	31,85%
Real Estate Operating Companies	110	0,94	379,35%	11,71%	0,22	7,63%
Real Estate Services	10	0,79	64,44%	12,39%	0,51	10,55%

Regional Banks	80	0,74	818,65%	18,23%	0,10	3,76%
Reinsurance	7	0,67	67,19%	42,14%	0,48	28,67%
Research and Consulting Services	44	1,04	28,82%	26,84%	0,86	7,15%
Residential REITs	2	0,11	135,03%	40,08%	0,06	1,03%
Restaurants	24	0,95	186,69%	23,89%	0,39	7,13%
Retail REITs	7	0,78	78,35%	8,42%	0,45	0,83%
Security and Alarm Services	7	0,79	66,70%	24,66%	0,52	11,29%
Semiconductor Equipment	8	1,60	15,22%	14,48%	1,42	22,82%
Semiconductors	26	1,35	44,20%	12,12%	0,97	19,69%
Soft Drinks	7	0,57	49,80%	31,56%	0,43	5,53%
Specialized Consumer Services	5	0,70	80,77%	26,28%	0,44	9,07%
Specialized Finance	30	0,82	316,65%	18,92%	0,23	3,53%
Specialized REITs	3	0,66	184,24%	0,00%	0,23	2,36%
Specialty Chemicals	43	1,00	47,70%	29,79%	0,75	7,10%
Specialty Stores	19	1,07	47,47%	20,35%	0,77	6,58%
Steel	29	1,59	95,03%	21,43%	0,91	9,50%
Systems Software	27	0,87	31,27%	18,46%	0,69	9,93%
Technology Distributors	21	0,77	48,94%	21,72%	0,56	13,44%
Textiles	23	0,83	227,35%	29,16%	0,32	6,76%
Thrifts and Mortgage Finance	9	1,22	NA	24,59%	NA	4,91%
Tires and Rubber	5	1,37	147,21%	32,84%	0,69	4,79%
Tobacco	4	0,58	53,27%	24,63%	0,41	1,28%
Trading Companies and Distributors	49	1,19	158,87%	25,88%	0,55	6,62%
Trucking	16	0,93	142,43%	17,08%	0,43	6,97%
Water Utilities	12	0,60	137,38%	39,13%	0,33	11,11%
Wireless Telecommunication Services	11	1,00	45,26%	25,30%	0,75	1,67%
Grand Total	**4167**	**1,04**	**85,33%**	**20,93%**	**0,80**	**9,70%**

WACC Calculations: Estimations of Company WACCs for 2009 and 2010

Cost of equity	
Risk free rate	4%
Company Betas	Source: Bloomberg
Market return	Estimation based on industry assessment
Cost of debt	
Interest rate	Estimation based on market environment (source: Yahoo Finance)
Tax rate	Marginal tax rate of the specific country
Amount of Equity	
Number of shares	as of 31/12/2008 and 31/12/2009
Share price	as of 31/12/2008 and 31/12/2009, in Euro
Value	Market value of total ordinary shares
Amount of Debt	
Book Value	Total liabilitities as of 31/12/2008 and 31/12/2009
Adjustment Factor	1
Value	Market value of traded debt
Total Capital	Company value
E + D	as of 31/12/2008 and 31/12/2009
Book	Book equity and Book debt
Market/Book	Market cap and Book debt
Cost of Debt	Interest rate x (1-Marginal tax rate)
in this calculation	

SOLON
Figures of 2008 for WACC estimation 2009

Cost of Equity			Amount of Equity			
	Riskfree rate	4,00%	E		Shares	12.530,196
	Beta Solon*	1,247			Price	14,35
	Market return	12%			Value	179.808,313
	Cost of Equity	13,98%	Shareholder's Equity		Book	375.735
Cost of Debt			Amount of Debt			
	Rate	5,00%	D		Book value	527.321
	Taxrate	29%			Adjustment	1
	Cost of Debt	3,53%			Value	527.321
			Total Capital			707.129
			E + D			
WACC		6,18%				

because of SOLON's leverage effect
pre-tax WACCs: Components: 7,67% and Systems: 11,15%

	2008	Book	Market/Book
Equity		41,60%	25,43%
Debt		58,40%	74,57%

*Bloomberg (26/04/2010); range: 05.01.07-26.12.08

SOLON

Figures of 2009 for WACC estimation 2010

share price as of 17/03/2010 — 5,62 Euro

Cost of Equity			Amount of Equity		in thousands
	Riskfree rate	4,00%	E	Shares	12.530,196
	Beta Solon*	1,800		Price*	7,17
	Market return	12%		Value	89.841,505
	Cost of Equity	18,40%			
Cost of Debt			Amount of Debt		
	Rate**	10,00%	D	Book value	532.331
	Taxrate	29%		Adjustment	1
	Cost of Debt***	7,06%		Value	532.331
			Total Capital E + D		622.173
WACC		8,69%			

Bloomberg 2010 (12/03/2010)	
Beta	1,369
Cost of Equity	15,34%
Cost of Debt	1,52%
WACC	4,48%

2009	Book	Market/Book
Equity	17,17%	14,44%
Debt	82,83%	85,56%

Bloomberg (12/03/2010)	
Equity	21,39%
Debt	78,61%

*Bloomberg: 1,434 (21/12/2009); range: 21.12.07-18.12.09
*Bloomberg: 1,369 (12/03/2010); range: 14.03.08-05.03.10
*Bloomberg: 1,433 (26/04/2010); range: 04.01.08-25.12.09; I took my own estimate
**high, because of Solon's financial situation; year-end data has deteriorated drastically in 2010
***Would change with entrance of financial investor

REC
Figures of 2008 for WACC estimation 2009

			number of shares before equity raise		494.300,000
			number of shares after equity raise in third quarter of 2009		664.768,000
Cost of Equity			Amount of Equity		in thousands
	Riskfree rate*	4,00%	E	Shares	494.300,000
	Beta REC*	1,255		Price	8,05
	Market return	12%		Value	3.979.115,000
	Cost of Equity	14,04%	Sh. Equity	Book	2.062.596,909
Cost of Debt			Amount of Debt		
	Rate	5,00%	D	Book value	1.710.852,711
	Taxrate	28%		Adjustment	1
	Cost of Debt	3,60%		Value	1.710.852,711
			Total Capital E + D		5.689.967,711
WACC		10,90%			

WACC with equity raise in the third quarter: 11,51%
but also debt structure changes over the year

	2008	Book	Market/Book
*Bloomberg (26/04/2010): range: 05.01.07-26.12.08	Equity	54,66%	69,93%
conversion factor: 0,124912	Debt	45,34%	30,07%

REC
Figures of 2009 for WACC estimation 2010

number of shares after Mai 2010 814.363,000
number of shares before Mai 2010 664.768,000

Cost of Equity			Amount of Equity		in thousands
	Riskfree rate	4,00%	E	Shares	664.768,000
	Beta REC*	1,247		Price***	5,59
	Market return**	12%		Value	3.716.053,120
	Cost of Equity	13,98%			
Cost of Debt			Amount of Debt		
	Rate****	5,00%	D	Book value	2.151.734,112
	Taxrate	28%		Adjustment	1
	Cost of Debt	3,60%		Value	2.151.734,112
			Total Capital E + D		5.867.787,232

WACC 10,17%

plus share increase up to 814.363
WACC of 10,65%
I take an estimate of 10,46%

Bloomberg 2010 (12/03/2010)

Beta	1,189
Cost of Equity	15,64%
Cost of Debt	2,04%
WACC	12%

*Bloomberg: 1,215 (21/12/2009); range: 21.12.07-18.12.09
*Bloomberg: 1,189 (12/03/2010); range: 14.03.08-03.05.10
*Bloomberg: 1,247 (26/04/2010); range: 02.01.09-25.12.09
conversion factor: 0,124912

2009	Book	Market/Book
Equity	49,54%	63,33%
Debt	50,46%	36,67%
after equity raise:		
Equity		55,83%
Debt		44,17%

EDPR **Figures of 2008 for WACC estimation 2009**

Cost of Equity			Amount of Equity		in thousands
	Riskfree rate	4,00%	E	Shares	872.308,162
	Beta EDPR*	1,157		Price	5,00
	Market return	14%		Value	4.364.157,734
	Cost of Equity	15,57%	Total Equity		5.190.110,000
Cost of Debt			Amount of Debt		
	Rate	5,00%	D	Book value	4.206.446,000
	Taxrate	30%		Adjustment	1
	Cost of Debt	3,50%		Value	4.206.446,000
			Total Capital		8.570.603,734
			E + D		
WACC		9,65%			

2008	Book	Market/Book
Equity	55,23%	50,92%
Debt	44,77%	49,08%

*Bloomberg: (26/04/2010); range: 06/06/08-26/12/08

EDPR **Figures of 2009 for WACC estimation 2010**

Cost of Equity			Amount of Equity		in thousands
	Riskfree rate	4,00%	E	Shares	872.308,162
	Beta EDPR*	1,009		Price	6,63
	Market return	16%		Value	5.783.403,114
	Cost of Equity	16,11%			
Cost of Debt			Amount of Debt		
	Rate	5,00%	D	Book value	5.966.000,000
	Taxrate	30%		Adjustment	1
	Cost of Debt	3,50%		Value	5.966.000,000
			Total Capital E + D		11.749.403,114
WACC		9,71%			

Bloomberg	12.03.2010	26.04.2010
Beta	1,002	1,009
Cost of Equity	11,58%	13,64%
Cost of Debt	3,43%	3,28%
WACC	9,41%	10,89%

2009	Book	Market/Book
Equity	47,18%	49,22%
Debt	52,83%	50,78%

*Bloomberg: 1,215 (21/12/2009); range: 21.12.07-18.12.09
*Bloomberg: 1,009 (26/04/2010); range: 06.06.08-25.12.09
*Bloomberg: 1,002 (12/03/2010); range: 06.06.08-05.03.10

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EURO

Value of Operations: DCF approach

Year	Free Cash Flow	Discount Factor	PV of FCF
2009	29.953	0,942	28.210
2010	(505.460)	0,866	(437.980)
2011	(161.895)	0,788	(127.529)
2012	(49.124)	0,703	(34.551)
2013	155.897	0,628	97.898
2014	0	0,561	0
2015	0	0,501	0
2016	0	0,447	0
2017	0	0,406	0
2018	0	0,369	0
2019	0	0,342	0
2020	0	0,317	0
2021	0	0,293	0
2022	0	0,272	0
2023	0	0,251	0
Cont. Value	2.472.297	0,628	1.552.528
Operating Value			1.078.577
Continuing value % Operating value			143,9%
Mid -Year Adjustment Factor			0,930
Operating Value (Adjusted)			**1.003.031**

Value of Operations: Economic Profit

Year	Economic Profit	Discount Factor	PV of EP
2009	(129.381)	0,942	(121.851)
2010	(75.188)	0,866	(65.150)
2011	(46.983)	0,788	(37.009)
2012	(50.871)	0,703	(35.779)
2013	44.046	0,628	27.659
2014	0	0,561	0
2015	0	0,501	0
2016	0	0,447	0
2017	0	0,406	0
2018	0	0,369	0
2019	0	0,342	0
2020	0	0,317	0
2021	0	0,293	0
2022	0	0,272	0
2023	0	0,251	0
Cont. Value	1.149.830	0,628	722.059
Present Value of Economic Profit			489.929
Invested Capital (incl. goodwill)			588.648
Operating Value			1.078.577
Mid -Year Adjustment Factor			0,930
Operating Value (Adjusted)			**1.003.031**

Value of Equity

Operating Value	1.003.031
Excess Mkt Securities	0
Financial Investments	196.531
Excess Pension Assets	30
Enterprise Value	1.199.592
Debt	(383.345)
Capitalized Operating Leases	(4.476)
Retirement Related Liability	0
Preferred Stock	0
Minority Interest	0
Long-Term Operating Provision	(13.345)
Restructuring Provision	0
Future Stock Options	0
Stock options	0
Equity Value	798.426
No. shares (thousands)	12.530
Value per Share	63,72
2008 (Xetra) -High	69,57
2008 (Xetra) -Low	10,77
Value Difference - High	-8,4%
Value Difference - Low	491,6%

Comparison of key ratios

		Averages		
From:	2006	2009	2014	2019
To:	2008	2013	2018	2023
Revenue growth (CAG)	53,4%	20,4%	9,5%	7,0%
Adjusted EBITA growth (CAG)	-41,2%	61,0%	18,4%	14,2%
NOPLAT growth (CAG)	-56,6%	66,0%	18,7%	14,2%
Invested capital growth (CAG)	25,9%	17,6%	4,1%	8,4%
Adj. EBIT/Revenues	3,6%	-5,1%	16,2%	23,0%
Revenues/Invested Capital (pre-Goodwill)	2,7	1,3	2,0	2,1
ROIC (after tax, pre-Goodwill)	14,4%	0,9%	25,9%	39,3%
ROIC (after tax, including Goodwill)	12,1%	0,9%	24,5%	37,4%
Average Economic Profit	-2.567	-51.675	186.020	597.220
Cash Tax Rate	20,0%	11,7%	20,0%	20,0%
WACC	12,3%	9,8%	11,2%	8,0%

Evaluation of entry and exit multiples

	2008	2014
Operating Value	1.003.031	2.472.297
Excess Mkt Securities	0	
Financial Investments	196.531	
Enterprise Value	1.199.562	2.472.297
Revenue	815.095	2.472.297
Adjusted EBITA	23.103	370.844
NOPLAT	15.705	296.676
Enterprise / Revenue	1,5	1,0
Enterprise / Adjusted EBITA	51,9	6,7
Enterprise / NOPLAT	76,4	8,3

SOLON SE - Future 5 -10
EURO

Value of Operations: DCF approach

Year	Free Cash Flow	Discount Factor	PV of FCF
2009	29.953	0,942	28.210
2010	(505.460)	0,866	(437.980)
2011	(161.895)	0,788	(127.529)
2012	(49.124)	0,703	(34.551)
2013	155.897	0,628	97.898
2014	282.994	0,561	158.671
2015	58.781	0,501	29.427
2016	606.548	0,447	271.113
2017	89.651	0,406	36.429
2018	391.913	0,369	144.773
2019	0	0,342	0
2020	0	0,317	0
2021	0	0,293	0
2022	0	0,272	0
2023	0	0,251	0
Cont. Value	7.127.334	0,369	2.632.853
Operating Value			2.799.315
Continuing value % Operating value			94,1%
Mid -Year Adjustment Factor			0,930
Operating Value (Adjusted)			**2.603.246**

Value of Operations: Economic Profit

Year	Economic Profit	Discount Factor	PV of EP
2009	(129.381)	0,942	(121.851)
2010	(75.188)	0,866	(65.150)
2011	(46.983)	0,788	(37.009)
2012	(50.871)	0,703	(35.779)
2013	44.046	0,628	27.659
2014	137.980	0,561	77.363
2015	195.673	0,501	97.957
2016	53.202	0,447	23.780
2017	231.255	0,406	93.969
2018	311.992	0,369	115.251
2019	0	0,342	0
2020	0	0,317	0
2021	0	0,293	0
2022	0	0,272	0
2023	0	0,251	0
Cont. Value	5.507.486	0,369	2.034.478
Present Value of Economic Profit			2.210.667
Invested Capital (incl. goodwill)			588.648
Operating Value			2.799.315
Mid -Year Adjustment Factor			0,930
Operating Value (Adjusted)			**2.603.246**

Value of Equity

Operating Value	2.603.246
Excess Mkt Securities	0
Financial Investments	196.531
Excess Pension Assets	30
Enterprise Value	2.799.807
Debt	(383.345)
Capitalized Operating Leases	(4.476)
Retirement Related Liability	0
Preferred Stock	0
Minority Interest	0
Long-Term Operating Provision	(13.345)
Restructuring Provision	0
Future Stock Options	0
Stock options	0
Equity Value	2.398.641
No. shares (thousands)	12.530
Value per Share	191,43
2008 (Xetra) -High	69,57
2008 (Xetra) -Low	10,77
Value Difference - High	175,2%
Value Difference - Low	1677,4%

Comparison of key ratios

		Averages		
From:	2006	2009	2014	2019
To:	2008	2013	2018	2023
Revenue growth (CAG)	53,4%	20,4%	9,5%	7,0%
Adjusted EBITA growth (CAG)	-41,2%	61,0%	18,4%	14,2%
NOPLAT growth (CAG)	-56,6%	66,0%	18,7%	14,2%
Invested capital growth (CAG)	25,9%	17,6%	4,1%	8,4%
Adj. EBIT/Revenues	3,6%	-5,1%	16,2%	23,0%
Revenues/Invested Capital (pre-Goodwill)	2,7	1,3	2,0	2,1
ROIC (after tax, pre-Goodwill)	14,4%	0,9%	25,9%	39,3%
ROIC (after tax, including Goodwill)	12,1%	0,9%	24,5%	37,4%
Average Economic Profit	-2.567	-51.675	186.020	597.220
Cash Tax Rate	20,0%	11,7%	20,0%	20,0%
WACC	12,3%	9,8%	11,2%	8,0%

Evaluation of entry and exit multiples

	2008	2019
Operating Value	2.603.246	7.127.334
Excess Mkt Securities	0	
Financial Investments	196.531	
Enterprise Value	2.799.777	7.127.334
Revenue	815.095	3.563.667
Adjusted EBITA	23.103	712.733
NOPLAT	15.705	570.187
Enterprise / Revenue	3,4	2,0
Enterprise / Adjusted EBITA	121,2	10,0
Enterprise / NOPLAT	178,3	12,5

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EURO

Value of Operations: DCF approach

Year	Free Cash Flow	Discount Factor	PV of FCF
2009	29.953	0,942	28.210
2010	(505.460)	0,866	(437.980)
2011	(161.895)	0,788	(127.529)
2012	(49.124)	0,703	(34.551)
2013	155.897	0,628	97.898
2014	282.994	0,561	158.671
2015	58.781	0,501	29.427
2016	606.548	0,447	271.113
2017	89.651	0,406	36.429
2018	391.913	0,369	144.773
2019	308.202	0,342	105.417
2020	449.022	0,317	142.207
2021	675.206	0,293	198.000
2022	761.467	0,272	206.755
2023	799.540	0,251	201.011
Cont. Value	11.912.064	0,251	2.994.800
Operating Value			4.014.651
Continuing value % Operating value			74,6%
Mid -Year Adjustment Factor			0,930
Operating Value (Adjusted)			**3.733.457**

Value of Operations: Economic Profit

Year	Economic Profit	Discount Factor	PV of EP
2009	(129.381)	0,942	(121.851)
2010	(75.188)	0,866	(65.150)
2011	(46.983)	0,788	(37.009)
2012	(50.871)	0,703	(35.779)
2013	44.046	0,628	27.659
2014	137.980	0,561	77.363
2015	195.673	0,501	97.957
2016	53.202	0,447	23.780
2017	231.255	0,406	93.969
2018	311.992	0,369	115.251
2019	440.599	0,342	150.702
2020	476.659	0,317	150.959
2021	658.406	0,293	193.073
2022	687.726	0,272	186.733
2023	722.712	0,251	181.696
Cont. Value	9.493.100	0,251	2.386.650
Present Value of Economic Profit			3.426.003
Invested Capital (incl. goodwill)			588.648
Operating Value			4.014.651
Mid -Year Adjustment Factor			0,930
Operating Value (Adjusted)			**3.733.457**

Value of Equity

Operating Value	3.733.457
Excess Mkt Securities	0
Financial Investments	196.531
Excess Pension Assets	30
Enterprise Value	3.930.018
Debt	(383.345)
Capitalized Operating Leases	(4.476)
Retirement Related Liability	0
Preferred Stock	0
Minority Interest	0
Long-Term Operating Provision	(13.345)
Restructuring Provision	0
Future Stock Options	0
Stock options	0
Equity Value	3.528.852
No. shares (thousands)	12.530
Value per Share	281,63
2008 (Xetra) -High	69,57
2008 (Xetra) -Low	10,77
Value Difference - High	304,8%
Value Difference - Low	2514,9%

Comparison of key ratios

		Averages		
From:	2006	2009	2014	2019
To:	2008	2013	2018	2023
Revenue growth (CAG)	53,4%	20,4%	9,5%	7,0%
Adjusted EBITA growth (CAG)	-41,2%	61,0%	18,4%	14,2%
NOPLAT growth (CAG)	-56,6%	66,0%	18,7%	14,2%
Invested capital growth (CAG)	25,9%	17,6%	4,1%	8,4%
Adj. EBIT/Revenues	3,6%	-5,1%	16,2%	23,0%
Revenues/Invested Capital (pre-Goodwill)	2,7	1,3	2,0	2,1
ROIC (after tax, pre-Goodwill)	14,4%	0,9%	25,9%	39,3%
ROIC (after tax, including Goodwill)	12,1%	0,9%	24,5%	37,4%
Average Economic Profit	-2.567	-51.675	186.020	597.220
Cash Tax Rate	20,0%	11,7%	20,0%	20,0%
WACC	12,3%	9,8%	11,2%	8,0%

Evaluation of entry and exit multiples

	2008	2024
Operating Value	3.733.457	11.912.064
Excess Mkt Securities	0	
Financial Investments	196.531	
Enterprise Value	3.929.988	11.912.064
Revenue	815.095	4.764.826
Adjusted EBITA	23.103	1.191.206
NOPLAT	15.705	952.965
Enterprise / Revenue	4,8	2,5
Enterprise / Adjusted EBITA	170,1	10,0
Enterprise / NOPLAT	250,2	12,5

REC Group - Future 5 -10
EURO

Value of Operations: DCF approach

Year	Free Cash Flow	Discount Factor	PV of FCF
2009	(1.727.961)	0,902	(1.558.125)
2010	(1.008.189)	0,816	(823.011)
2011	(628.170)	0,742	(466.174)
2012	452.459	0,675	305.251
2013	732.106	0,625	457.328
2014	0	0,584	0
2015	0	0,536	0
2016	0	0,491	0
2017	0	0,451	0
2018	0	0,414	0
2019	0	0,383	0
2020	0	0,355	0
2021	0	0,328	0
2022	0	0,304	0
2023	0	0,281	0
Cont. Value	15.289.731	0,625	9.551.116
Operating Value			7.466.386
Continuing value % Operating value			127,9%
Mid -Year Adjustment Factor			0,877
Operating Value (Adjusted)			**6.544.385**

Value of Operations: Economic Profit

Year	Economic Profit	Discount Factor	PV of EP
2009	(494.779)	0,902	(446.149)
2010	(530.751)	0,816	(433.266)
2011	(239.076)	0,742	(177.422)
2012	(138.015)	0,675	(93.112)
2013	204.718	0,625	127.883
2014	0	0,584	0
2015	0	0,536	0
2016	0	0,491	0
2017	0	0,451	0
2018	0	0,414	0
2019	0	0,383	0
2020	0	0,355	0
2021	0	0,328	0
2022	0	0,304	0
2023	0	0,281	0
Cont. Value	9.605.580	0,625	6.000.368
Present Value of Economic Profit			4.978.302
Invested Capital (incl. goodwill)			2.488.084
Operating Value			7.466.386
Mid -Year Adjustment Factor			0,877
Operating Value (Adjusted)			**6.544.385**

Value of Equity

Operating Value	6.544.385
Excess Mkt Securities	352.380
Financial Investments	266.084
Excess Pension Assets	30
Enterprise Value	7.162.879
Debt	(823.838)
Capitalized Operating Leases	0
Retirement Related Liability	(19.539)
Preferred Stock	0
Minority Interest	(39)
Long-Term Operating Provision	(18.628)
Restructuring Provision	0
Future Stock Options	0
Stock options	0
Equity Value	6.300.835
No. shares (thousands)	494.300
Value per Share	12,75
2008 (Oslo Stock Exchange) -High	34,10
2008 (Oslo Stock Exchange) -Low	5,31
Value Difference - High	-62,6%
Value Difference - Low	140,1%

Comparison of key ratios

		Averages		
From:	2006	2009	2014	2019
To:	2008	2013	2018	2023
Revenue growth (CAG)	37,5%	24,9%	5,9%	7,0%
Adjusted EBITA growth (CAG)	-20,0%	26,3%	8,7%	7,0%
NOPLAT growth (CAG)	23,6%	16,3%	12,3%	7,0%
Invested capital growth (CAG)	45,4%	18,0%	12,7%	4,2%
Adj. EBIT/Revenues	24,6%	8,0%	31,0%	38,0%
Revenues/Invested Capital (pre-Goodwill)	0,6	0,5	0,6	0,5
ROIC (after tax, pre-Goodwill)	18,0%	2,6%	14,7%	14,6%
ROIC (after tax, including Goodwill)	16,6%	2,5%	14,1%	14,5%
Average Economic Profit	28.568	-239.581	351.454	735.066
Cash Tax Rate	13,6%	17,8%	18,0%	18,0%
WACC	9,1%	9,9%	8,6%	8,0%

Evaluation of entry and exit multiples

	2008	2014
Operating Value	6.544.385	15.289.731
Excess Mkt Securities	352.380	
Financial Investments	266.084	
Enterprise Value	7.162.849	15.289.731
Revenue	1.023.130	3.729.203
Adjusted EBITA	297.558	1.305.221
NOPLAT	312.286	1.070.281
Enterprise / Revenue	7,0	4,1
Enterprise / Adjusted EBITA	24,1	11,7
Enterprise / NOPLAT	22,9	14,3

REC Group - Future 5 -10
EURO

Value of Operations: DCF approach

Year	Free Cash Flow	Discount Factor	PV of FCF
2009	(1.727.961)	0,902	(1.558.125)
2010	(1.008.189)	0,816	(823.011)
2011	(628.170)	0,742	(466.174)
2012	452.459	0,675	305.251
2013	732.106	0,625	457.328
2014	771.460	0,584	450.385
2015	294.745	0,536	157.867
2016	(781.652)	0,491	(384.088)
2017	(968.771)	0,451	(436.729)
2018	1.034.872	0,414	428.007
2019	0	0,383	0
2020	0	0,355	0
2021	0	0,328	0
2022	0	0,304	0
2023	0	0,281	0
Cont. Value	16.317.506	0,414	6.748.672
Operating Value			4.879.383
Continuing value % Operating value			138,3%
Mid -Year Adjustment Factor			0,877
Operating Value (Adjusted)			**4.276.843**

Value of Operations: Economic Profit

Year	Economic Profit	Discount Factor	PV of EP
2009	(494.779)	0,902	(446.149)
2010	(530.751)	0,816	(433.266)
2011	(239.076)	0,742	(177.422)
2012	(138.015)	0,675	(93.112)
2013	204.718	0,625	127.883
2014	672.391	0,584	392.547
2015	745.870	0,536	399.491
2016	(113.796)	0,491	(55.917)
2017	180.607	0,451	81.419
2018	272.198	0,414	112.577
2019	0	0,383	0
2020	0	0,355	0
2021	0	0,328	0
2022	0	0,304	0
2023	0	0,281	0
Cont. Value	6.004.205	0,414	2.483.248
Present Value of Economic Profit			2.391.299
Invested Capital (incl. goodwill)			2.488.084
Operating Value			4.879.383
Mid -Year Adjustment Factor			0,877
Operating Value (Adjusted)			**4.276.843**

Value of Equity

Operating Value	4.276.843
Excess Mkt Securities	352.380
Financial Investments	266.084
Excess Pension Assets	30
Enterprise Value	4.895.337
Debt	(823.838)
Capitalized Operating Leases	0
Retirement Related Liability	(19.539)
Preferred Stock	0
Minority Interest	(39)
Long-Term Operating Provision	(18.628)
Restructuring Provision	0
Future Stock Options	0
Stock options	0
Equity Value	4.033.293
No. shares (thousands)	494.300
Value per Share	8,16
2008 (Oslo Stock Exchange) -High	34,10
2008 (Oslo Stock Exchange) -Low	5,31
Value Difference - High	-76,1%
Value Difference - Low	53,7%

Comparison of key ratios

		Averages		
From:	2006	2009	2014	2019
To:	2008	2013	2018	2023
Revenue growth (CAG)	37,5%	24,9%	5,9%	7,0%
Adjusted EBITA growth (CAG)	-20,0%	26,3%	8,7%	7,0%
NOPLAT growth (CAG)	23,6%	16,3%	12,3%	7,0%
Invested capital growth (CAG)	45,4%	18,0%	12,7%	4,2%
Adj. EBIT/Revenues	24,6%	8,0%	31,0%	38,0%
Revenues/Invested Capital (pre-Goodwill)	0,6	0,5	0,6	0,5
ROIC (after tax, pre-Goodwill)	18,0%	2,6%	14,7%	14,6%
ROIC (after tax, including Goodwill)	16,6%	2,5%	14,1%	14,5%
Average Economic Profit	28.568	-239.581	351.454	735.066
Cash Tax Rate	13,6%	17,8%	18,0%	18,0%
WACC	9,1%	9,9%	8,6%	8,0%

Evaluation of entry and exit multiples

	2008	2019
Operating Value	4.276.843	16.317.506
Excess Mkt Securities	352.380	
Financial Investments	266.084	
Enterprise Value	4.895.307	16.317.506
Revenue	1.023.130	4.548.434
Adjusted EBITA	297.558	1.591.952
NOPLAT	312.286	1.305.401
Enterprise / Revenue	4,8	3,6
Enterprise / Adjusted EBITA	16,5	10,3
Enterprise / NOPLAT	15,7	12,5

REC Group - Future 5 -10
EURO

Value of Operations: DCF approach

Year	Free Cash Flow	Discount Factor	PV of FCF
2009	(1.727.961)	0,902	(1.558.125)
2010	(1.008.189)	0,816	(823.011)
2011	(628.170)	0,742	(466.174)
2012	452.459	0,675	305.251
2013	732.106	0,625	457.328
2014	771.460	0,584	450.385
2015	294.745	0,536	157.867
2016	(781.652)	0,491	(384.088)
2017	(968.771)	0,451	(436.729)
2018	1.034.872	0,414	428.007
2019	738.914	0,383	282.966
2020	858.289	0,355	304.334
2021	1.465.210	0,328	481.053
2022	1.691.608	0,304	514.244
2023	1.063.782	0,281	299.432
Cont. Value	21.817.434	0,281	6.141.146
Operating Value			6.153.887
Continuing value % Operating value			99,8%
Mid -Year Adjustment Factor			0,877
Operating Value (Adjusted)			**5.393.963**

Value of Operations: Economic Profit

Year	Economic Profit	Discount Factor	PV of EP
2009	(494.779)	0,902	(446.149)
2010	(530.751)	0,816	(433.266)
2011	(239.076)	0,742	(177.422)
2012	(138.015)	0,675	(93.112)
2013	204.718	0,625	127.883
2014	672.391	0,584	392.547
2015	745.870	0,536	399.491
2016	(113.796)	0,491	(55.917)
2017	180.607	0,451	81.419
2018	272.198	0,414	112.577
2019	480.336	0,383	183.944
2020	565.558	0,355	200.537
2021	591.142	0,328	194.082
2022	1.341.609	0,304	407.845
2023	696.683	0,281	196.102
Cont. Value	9.148.970	0,281	2.575.242
Present Value of Economic Profit			3.665.803
Invested Capital (incl. goodwill)			2.488.084
Operating Value			6.153.887
Mid -Year Adjustment Factor			0,877
Operating Value (Adjusted)			**5.393.963**

Value of Equity

Operating Value	5.393.963
Excess Mkt Securities	352.380
Financial Investments	266.084
Excess Pension Assets	30
Enterprise Value	6.012.456
Debt	(823.838)
Capitalized Operating Leases	0
Retirement Related Liability	(19.539)
Preferred Stock	0
Minority Interest	(39)
Long-Term Operating Provision	(18.628)
Restructuring Provision	0
Future Stock Options	0
Stock options	0
Equity Value	5.150.412
No. shares (thousands)	494.300
Value per Share	10,42
2008 (Oslo Stock Exchange) -High	34,10
2008 (Oslo Stock Exchange) -Low	5,31
Value Difference - High	-69,4%
Value Difference - Low	96,2%

Comparison of key ratios

		Averages		
From:	2006	2009	2014	2019
To:	2008	2013	2018	2023
Revenue growth (CAG)	37,5%	24,9%	5,9%	7,0%
Adjusted EBITA growth (CAG)	-20,0%	26,3%	8,7%	7,0%
NOPLAT growth (CAG)	23,6%	16,3%	12,3%	7,0%
Invested capital growth (CAG)	45,4%	18,0%	12,7%	4,2%
Adj. EBIT/Revenues	24,6%	8,0%	31,0%	38,0%
Revenues/Invested Capital (pre-Goodwill)	0,6	0,5	0,6	0,5
ROIC (after tax, pre-Goodwill)	18,0%	2,6%	14,7%	14,6%
ROIC (after tax, including Goodwill)	16,6%	2,5%	14,1%	14,5%
Average Economic Profit	28.568	-239.581	351.454	735.066
Cash Tax Rate	13,6%	17,8%	18,0%	18,0%
WACC	9,1%	9,9%	8,6%	8,0%

Evaluation of entry and exit multiples

	2008	2024
Operating Value	5.393.963	21.817.434
Excess Mkt Securities	352.380	
Financial Investments	266.084	
Enterprise Value	6.012.426	21.817.434
Revenue	1.023.130	6.081.515
Adjusted EBITA	297.558	2.128.530
NOPLAT	312.286	1.745.395
Enterprise / Revenue	5,9	3,6
Enterprise / Adjusted EBITA	20,2	10,3
Enterprise / NOPLAT	19,3	12,5

EDPR - Future 5 -10
EURO

Value of Operations: DCF approach

Year	Free Cash Flow	Discount Factor	PV of FCF
2009	(1.403.261)	0,912	(1.279.764)
2010	333.878	0,831	277.545
2011	494.205	0,763	376.900
2012	476.289	0,700	333.244
2013	626.326	0,642	402.037
2014	0	0,594	0
2015	0	0,550	0
2016	0	0,510	0
2017	0	0,472	0
2018	0	0,437	0
2019	0	0,405	0
2020	0	0,375	0
2021	0	0,347	0
2022	0	0,321	0
2023	0	0,297	0
Cont. Value	8.219.271	0,642	5.275.929
Operating Value			5.385.891
Continuing value % Operating value			98,0%
Mid -Year Adjustment Factor			0,885
Operating Value (Adjusted)			**4.766.560**

Value of Operations: Economic Profit

Year	Economic Profit	Discount Factor	PV of EP
2009	(483.418)	0,912	(440.874)
2010	(589.351)	0,831	(489.914)
2011	(448.336)	0,763	(341.918)
2012	(274.641)	0,700	(192.158)
2013	168	0,642	108
2014	0	0,594	0
2015	0	0,550	0
2016	0	0,510	0
2017	0	0,472	0
2018	0	0,437	0
2019	0	0,405	0
2020	0	0,375	0
2021	0	0,347	0
2022	0	0,321	0
2023	0	0,297	0
Cont. Value	229.301	0,642	147.187
Present Value of Economic Profit			(1.317.569)
Invested Capital (incl. goodwill)			6.703.460
Operating Value			5.385.891
Mid -Year Adjustment Factor			0,885
Operating Value (Adjusted)			**4.766.560**

Value of Equity

Operating Value	4.766.560
Excess Mkt Securities	36.759
Financial Investments	194.823
Excess Pension Assets	30
Enterprise Value	4.998.172
Debt	(1.462.273)
Capitalized Operating Leases	0
Retirement Related Liability	(1.162)
Preferred Stock	0
Minority Interest	(82.751)
Long-Term Operating Provision	0
Restructuring Provision	0
Future Stock Options	0
Stock options	0
Equity Value	3.451.986
No. shares (thousands)	872.308
Value per Share	3,96
IPO 2008 -High	8,00
2008 year-end -Low	6,63
Value Difference - High	-50,5%
Value Difference - Low	-40,3%

Comparison of key ratios

		Averages		
From:	2007	2009	2014	2019
To:	2008	2013	2018	2023
Revenue growth (CAG)	68,6%	24,3%	23,9%	13,0%
Adjusted EBITA growth (CAG)		32,5%	14,3%	13,0%
NOPLAT growth (CAG)		33,7%	15,7%	13,0%
Invested capital growth (CAG)		3,6%	3,4%	9,5%
Adj. EBIT/Revenues	21,8%	44,2%	40,0%	40,0%
Revenues/Invested Capital (pre-Goodwill)	0,1	0,2	0,6	0,8
ROIC (after tax, pre-Goodwill)	4,2%	6,3%	18,6%	27,1%
ROIC (after tax, including Goodwill)	3,2%	4,6%	12,5%	19,5%
Average Economic Profit	-39.493	-359.116	373.152	1.313.184
Cash Tax Rate	28,2%	27,6%	20,0%	20,0%
WACC	10,0%	9,3%	8,0%	8,0%

Evaluation of entry and exit multiples

	2008	2014
Operating Value	4.766.560	8.219.271
Excess Mkt Securities	36.759	
Financial Investments	194.823	
Enterprise Value	4.998.142	8.219.271
Revenue	532.400	2.054.818
Adjusted EBITA	231.600	821.927
NOPLAT	166.302	657.542
Enterprise / Revenue	9,4	4,0
Enterprise / Adjusted EBITA	21,6	10,0
Enterprise / NOPLAT	30,1	12,5

EDPR - Future 5 -10
EURO

Value of Operations: DCF approach

Year	Free Cash Flow	Discount Factor	PV of FCF
2009	(1.403.261)	0,912	(1.279.764)
2010	333.878	0,831	277.545
2011	494.205	0,763	376.900
2012	476.289	0,700	333.244
2013	626.326	0,642	402.037
2014	910.468	0,594	541.136
2015	894.532	0,550	492.282
2016	160.547	0,510	81.808
2017	978.865	0,472	461.842
2018	723.116	0,437	315.904
2019	0	0,405	0
2020	0	0,375	0
2021	0	0,347	0
2022	0	0,321	0
2023	0	0,297	0
Cont. Value	21.233.336	0,437	9.276.093
Operating Value			11.279.028
Continuing value % Operating value			82,2%
Mid -Year Adjustment Factor			0,885
Operating Value (Adjusted)			**9.982.036**

Value of Operations: Economic Profit

Year	Economic Profit	Discount Factor	PV of EP
2009	(483.418)	0,912	(440.874)
2010	(589.351)	0,831	(489.914)
2011	(448.336)	0,763	(341.918)
2012	(274.641)	0,700	(192.158)
2013	168	0,642	108
2014	18.344	0,594	10.903
2015	170.086	0,550	93.603
2016	336.335	0,510	171.382
2017	557.488	0,472	263.031
2018	783.507	0,437	342.287
2019	0	0,405	0
2020	0	0,375	0
2021	0	0,347	0
2022	0	0,321	0
2023	0	0,297	0
Cont. Value	11.809.422	0,437	5.159.119
Present Value of Economic Profit			4.575.568
Invested Capital (incl. goodwill)			6.703.460
Operating Value			11.279.028
Mid -Year Adjustment Factor			0,885
Operating Value (Adjusted)			**9.982.036**

Value of Equity

Operating Value	9.982.036
Excess Mkt Securities	36.759
Financial Investments	194.823
Excess Pension Assets	30
Enterprise Value	10.213.648
Debt	(1.462.273)
Capitalized Operating Leases	0
Retirement Related Liability	(1.162)
Preferred Stock	0
Minority Interest	(82.751)
Long-Term Operating Provision	0
Restructuring Provision	0
Future Stock Options	0
Stock options	0
Equity Value	8.667.462
No. shares (thousands)	872.308
Value per Share	9,94
IPO 2008 -High	8,00
2008 year-end -Low	6,63
Value Difference - High	24,2%
Value Difference - Low	49,9%

Comparison of key ratios

		Averages		
From:	2007	2009	2014	2019
To:	2008	2013	2018	2023
Revenue growth (CAG)	68,6%	24,3%	23,9%	13,0%
Adjusted EBITA growth (CAG)		32,5%	14,3%	13,0%
NOPLAT growth (CAG)		33,7%	15,7%	13,0%
Invested capital growth (CAG)		3,6%	3,4%	9,5%
Adj. EBIT/Revenues	21,8%	44,2%	40,0%	40,0%
Revenues/Invested Capital (pre-Goodwill)	0,1	0,2	0,6	0,8
ROIC (after tax, pre-Goodwill)	4,2%	6,3%	18,6%	27,1%
ROIC (after tax, including Goodwill)	3,2%	4,6%	12,5%	19,5%
Average Economic Profit	-39.493	-359.116	373.152	1.313.184
Cash Tax Rate	28,2%	27,6%	20,0%	20,0%
WACC	10,0%	9,3%	8,0%	8,0%

Evaluation of entry and exit multiples

	2008	2019
Operating Value	9.982.036	21.233.336
Excess Mkt Securities	36.759	
Financial Investments	194.823	
Enterprise Value	10.213.618	21.233.336
Revenue	532.400	5.308.334
Adjusted EBITA	231.600	2.123.334
NOPLAT	166.302	1.698.667
Enterprise / Revenue	19,2	4,0
Enterprise / Adjusted EBITA	44,1	10,0
Enterprise / NOPLAT	61,4	12,5

EDPR - Future 5 -10
EURO

Value of Operations: DCF approach

Year	Free Cash Flow	Discount Factor	PV of FCF
2009	(1.403.261)	0,912	(1.279.764)
2010	333.878	0,831	277.545
2011	494.205	0,763	376.900
2012	476.289	0,700	333.244
2013	626.326	0,642	402.037
2014	910.468	0,594	541.136
2015	894.532	0,550	492.282
2016	160.547	0,510	81.808
2017	978.865	0,472	461.842
2018	723.116	0,437	315.904
2019	1.121.747	0,405	453.751
2020	818.342	0,375	306.503
2021	956.093	0,347	331.570
2022	1.358.500	0,321	436.226
2023	1.414.350	0,297	420.518
Cont. Value	37.375.927	0,297	11.112.712
Operating Value			15.064.216
Continuing value % Operating value			73,8%
Mid -Year Adjustment Factor			0,885
Operating Value (Adjusted)			**13.331.959**

Value of Operations: Economic Profit

Year	Economic Profit	Discount Factor	PV of EP
2009	(483.418)	0,912	(440.874)
2010	(589.351)	0,831	(489.914)
2011	(448.336)	0,763	(341.918)
2012	(274.641)	0,700	(192.158)
2013	168	0,642	108
2014	18.344	0,594	10.903
2015	170.086	0,550	93.603
2016	336.335	0,510	171.382
2017	557.488	0,472	263.031
2018	783.507	0,437	342.287
2019	944.754	0,405	382.157
2020	1.153.400	0,375	431.996
2021	1.355.610	0,347	470.122
2022	1.477.027	0,321	474.286
2023	1.635.130	0,297	486.161
Cont. Value	22.533.039	0,297	6.699.585
Present Value of Economic Profit			8.360.756
Invested Capital (incl. goodwill)			6.703.460
Operating Value			15.064.216
Mid -Year Adjustment Factor			0,885
Operating Value (Adjusted)			**13.331.959**

Value of Equity

Operating Value	13.331.959
Excess Mkt Securities	36.759
Financial Investments	194.823
Excess Pension Assets	30
Enterprise Value	13.563.571
Debt	(1.462.273)
Capitalized Operating Leases	0
Retirement Related Liability	(1.162)
Preferred Stock	0
Minority Interest	(82.751)
Long-Term Operating Provision	0
Restructuring Provision	0
Future Stock Options	0
Stock options	0
Equity Value	12.017.385
No. shares (thousands)	872.308
Value per Share	13,78
IPO 2008 -High	8,00
2008 year-end -Low	6,63
Value Difference - High	72,2%
Value Difference - Low	107,8%

Comparison of key ratios

		Averages		
From:	2007	2009	2014	2019
To:	2008	2013	2018	2023
Revenue growth (CAG)	68,6%	24,3%	23,9%	13,0%
Adjusted EBITA growth (CAG)		32,5%	14,3%	13,0%
NOPLAT growth (CAG)		33,7%	15,7%	13,0%
Invested capital growth (CAG)		3,6%	3,4%	9,5%
Adj. EBIT/Revenues	21,8%	44,2%	40,0%	40,0%
Revenues/Invested Capital (pre-Goodwill)	0,1	0,2	0,6	0,8
ROIC (after tax, pre-Goodwill)	4,2%	6,3%	18,6%	27,1%
ROIC (after tax, including Goodwill)	3,2%	4,6%	12,5%	19,5%
Average Economic Profit	-39.493	-359.116	373.152	1.313.184
Cash Tax Rate	28,2%	27,6%	20,0%	20,0%
WACC	10,0%	9,3%	8,0%	8,0%

Evaluation of entry and exit multiples

	2008	2024
Operating Value	13.331.959	37.375.927
Excess Mkt Securities	36.759	
Financial Investments	194.823	
Enterprise Value	13.563.541	37.375.927
Revenue	532.400	9.343.982
Adjusted EBITA	231.600	3.737.593
NOPLAT	166.302	2.990.074
Enterprise / Revenue	25,5	4,0
Enterprise / Adjusted EBITA	58,6	10,0
Enterprise / NOPLAT	81,6	12,5

REC Group Cash Flows and debt repayment

	1	2	3	4	5
FCF (bef. WACC)	-1.727.961.000	-1.008.189.000	-628.170.000	452.459.000	732.106.000
Initial debt	586.862.901	528.176.611	469.490.321	410.804.031	352.117.741
Interest	29.343.145	26.408.831	23.474.516	20.540.202	17.605.887
Interest rate	5,00%	5,00%	5,00%	5,00%	5,00%
Debt repayment	58.686.290	58.686.290	58.686.290	58.686.290	58.686.290
Total repayment	88.029.435	85.095.121	82.160.806	79.226.492	76.292.177
Remaining debt	528.176.611	469.490.321	410.804.031	352.117.741	293.431.451
Discount factor	0,902	0,816	0,742	0,675	0,625
PV of residual CF	-1.638.023.372	-892.119.842	-527.065.458	251.931.943	409.883.639

	6	7	8	9	10
FCF (bef. WACC)	771.460.000	294.745.000	-781.652.000	-986.771.000	1.034.872.000
Initial debt	293.431.451	234.745.161	176.058.871	117.372.581	58.686.291
Interest	14.671.573	11.737.258	8.802.944	5.868.629	2.934.315
Interest rate	5,00%	5,00%	5,00%	5,00%	5,00%
Debt repayment	58.686.290	58.686.290	58.686.290	58.686.290	58.686.290
Total repayment	73.357.863	70.423.548	67.489.234	64.554.919	61.620.605
Remaining debt	234.745.161	176.058.871	117.372.581	58.686.291	1
Discount factor	0,584	0,536	0,491	0,451	0,414
PV of residual CF	407.691.648	120.236.298	-416.928.346	-474.147.989	402.926.078

NOMINAL VALUE	**TOTAL 10 YEARS**
Interest payments	161.387.300
Debt payments	586.862.900
Total debt	748.250.200
Total equity	586.862.901
Total investment	1.335.113.101

EDPR Cash Flows and debt repayment

	1	2	3	4	5
FCF (before factor)	-1.403.261.000	333.878.000	494.205.000	476.289.000	626.326.000
Initial debt	1.806.752.890	1.626.077.601	1.445.402.312	1.264.727.023	1.084.051.734
Interest	90.337.645	81.303.880	72.270.116	63.236.351	54.202.587
Interest rate	5,00%	5,00%	5,00%	5,00%	5,00%
Debt repayment	180.675.289	180.675.289	180.675.289	180.675.289	180.675.289
Total repayment	271.012.934	261.979.169	252.945.405	243.911.640	234.877.876
Remaining debt	1.626.077.601	1.445.402.312	1.264.727.023	1.084.051.734	903.376.445
Discount factor	0,912	0,831	0,763	0,700	0,642
PV Residual CF	-1.526.937.827	59.747.929	184.081.071	162.664.152	251.309.696

	6	7	8	9	10
FCF (before factor)	910.468.000	894.532.000	160.547.000	978.865.000	723.119.000
Initial debt	903.376.445	722.701.156	542.025.867	361.350.578	180.675.289
Interest	45.168.822	36.135.058	27.101.293	18.067.529	9.033.764
Interest rate	5,00%	5,00%	5,00%	5,00%	5,00%
Debt repayment	180.675.289	180.675.289	180.675.289	180.675.289	180.675.289
Total repayment	225.844.111	216.810.347	207.776.582	198.742.818	189.709.053
Remaining debt	722.701.156	542.025.867	361.350.578	180.675.289	0
Discount factor	0,594	0,550	0,510	0,472	0,437
PV Residual CF	406.666.590	372.746.909	-24.087.087	368.217.670	233.100.147

NOMINAL VALUE	**TOTAL 10 YEARS**
Interest payments	496.857.045
Debt payments	1.806.752.890
Total debt	2.303.609.935
Total equity	1.806.752.890
Total investment	4.110.362.825

RETURNS on Equity - SOLAR SECTOR

SOLON SE	2003	2004	2005	2006	2007	2008	2009
Solon SE	n.a.	5,9%	10,2%	12,4%	6,1%	8,2%	n.a.
Thomson Reuters	-193,4%	19,7%	13,3%	14,9%	15,6%	8,9%	-111,8%

REC	2003	2004	2005	2006	2007	2008	2009
Thomson Reuters	n.a.	-8,6%	0,3%	7,7%	11,9%	21,7%	-14,1%

Solarworld	2003	2004	2005	2006	2007	2008	2009
Solarworld AG	-5,0%	14,6%	23,9%	21,9%	16,4%	17,7%	6,8%

Information is withdrawn from Thomson Reuters and/or from Annual Reports of the Companies