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Valuation of Scatec Solar ASA

A fundamental analysis of a high-growth company

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Abstract

This thesis aims at obtaining the fair value of Scatec Solar ASA by applying a three-stage weighted average cost of capital model, supported with a relative valuation approach. By thoroughly examining key aspects of the solar power industry as well as crucial company-specific factors, necessary assumptions are made in order to forecast future performance of the company and carry out the valuation.

On the back of substantial cost decreases recent years, the solar power industry has experienced a rapid growth in capacity and globalization. Further driven by governmental support mechanisms these trends are expected to continue, establishing solar power as a prominent contributor to the global energy supply in the future. With experience and a solid integrated structure and network, Scatec Solar is well positioned in this emerging industry. Currently holding a strong project funnel, containing new capacity both close to construction and in development, the company is set to continue its rapid growth going forward.

Implemented in the fundamental valuation these factors yield an estimated share price of NOK 53 for Scatec Solar ASA. Supported by the relative EV/EBITDA valuation, the analysis indicates a strong upside from the currently traded price of the stock. Although the results contain large amounts of uncertainty, revealed through analyses of sensitivity and risk factors, I conclude that Scatec Solar is currently undervalued and that a buy recommendation is appropriate.

Preface

This thesis completes my Master of Science in Economics & Business Administration at the Norwegian School of Economics. With a major in Financial Economics the purpose of this thesis has been to combine and utilize knowledge obtained through the variety of courses I have attended in my degree.

During the last years of my studies, a particular interest in the courses Corporate Finance, Investments, International Finance and Financial Modelling have provided me with a solid theoretical base and technical skills to carry out a complete company valuation. In addition, this thesis has thought me the importance of an exhaustive qualitative analysis both of strategic and industry/macroeconomic value drivers.

The motivation behind the topic of this thesis is based on the current focus on global warming, renewable energy and increased energy access to the world population. Through a valuation of Scatec Solar ASA my objective was to determine whether the financial markets have acknowledged the value of opportunities for the up-and-coming solar industry and especially in a Norwegian based company so seldom associated with solar power. Examining such a geographically diversified company in a global and extensive industry and has been both a challenging and interesting task.

Finally, I would like to express my gratitude towards my supervisor Xunhua Su for useful feedback and advice throughout the process and Scatec Solar CFO Mikkel Tørud for invaluable insight into the company operations and prospects.

Oslo, June 13 2016

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Table of Contents

1 Introduction

Climate change has been among the top priorities of world leaders and organizations for decades. In December 2015, 196 countries pledged to the Paris Agreement at the 21st Conference of Parties (CoP). A new legally-binding framework for an internationally coordinated effort to tackle climate change (Climatefocus, 2015). The agreement states a goal of limiting the global warming increase to 1.5 degrees Celsius and all parties are, for the first time, required to regularly report on their efforts and undergo international review. Contributing to roughly two-thirds of all anthropogenic greenhouse-gas emissions (IEA, 2015), the energy sector is at the centre of attention and the Paris Agreement indicate the end of business as usual for the industry. Responding to the outcome of COP21, Solar Power Europe president Oliver Schafer told PV Magazine (2015) that this “fast-tracks the energy transition” and that

“Solar is key to revising climate change and making good economic sense”

Oliver Schafer, President of Solar Power Europe

A transformation of the energy sector towards renewables is considered crucial to limit global warming. The International Energy Agency estimates that in order to fully implement the pledges of the Paris Agreement, a total investment of $13.5 trillion in energy efficiency and low-carbon technologies from 2015-2030 is required (IEA, 2015). Of this, investments in solar power capacity make up around $1.2 trillion.

In addition to a central role in addressing the worlds environmental issues, the future of solar energy is also supported by the United Nations sustainable development goal number 7 (SDG7) looking to: “Ensure access to affordable, reliable and sustainable energy for all.” (United Nations, 2016). These targets are crucial to drive economic growth and reducing extreme poverty as one in five people in the world still lacks access to modern electricity (World Bank, 2016).

In light of the abovementioned situation in the global economy and the solar power industry, this thesis will assess key drivers and characteristics of solar power in order to estimate the true value of Scatec Solar ASA. Both the general drivers presented in earlier paragraphs and industry-specific development will be examined.

The thesis is structured in the following manner. Chapter 2 present a brief introduction to the company, its current structure and value chain. While chapter 3 and 4 describe different available theoretical valuation methods and an argumentation of the most suitable approaches when valuing Scatec Solar. Further, the solar power industry, its competitive structure together with the company's strategical positioning are assessed in chapter 5 and 6. Chapter 7, 8 and 9 analyse Scatec Solar's financial statements, estimate driver assumptions and present the applied company cost of capital. Finally, the last chapters 10, 11 and 12 reveal the results of the fundamental and relative valuation and evaluate the results through a sensitivity analysis and an assessment of risk factors.

2 Scatec Solar

Scatec Solar ASA is a global integrated independent solar power producer. By offering development, construction, ownership as well as operation and maintenance, Scatec Solar is represented throughout the entire value chain for utility-scale solar power plants. Currently operating in the United States, Czech Republic, Rwanda, Honduras and South Africa the company has a combined production capacity of 383MW[1].

2.1 History

Scatec Solar was officially established in February 2007, but their operations started already in 2001 after the acquisition of Solarcompetence GmbH, a German project development company awarded the world's largest megawatt solar park in 2001. Following the official establishment, the company started expanding both geographically and across the value-chain in 2008. Entering both Italy and Czech Republic, Scatec Solar now offered both design and construction in addition to operation and maintenance. Of all new developed and constructed projects between 2008-2010, the company only retained full ownership of four power plants in Czech Republic with a total capacity of 20MW.

Going forward, as a now fully integrated independent power producer, Scatec Solar continued their geographical expansion by entering the United States and France. As part of the start-up of South Africa's government-backed Renewable Energy Independent Power Producer Procurement Program (REIPPP), the company also entered South Africa being one of the winners in the first bidding round. In 2011 they expanded their position in Africa further through entering several markets in the west. By 2013, two new concessions were won in the REIPP program in addition to new market entries into Japan, the United Kingdom, Rwanda and Jordan.

In October 2014 the company was listed on the Oslo Stock Exchange under the name Scatec Solar ASA and have since then continued their global growth by completing a new plant in Honduras.

[1]By 31.03.2016 – Q1 report 2016

2.2 Structure

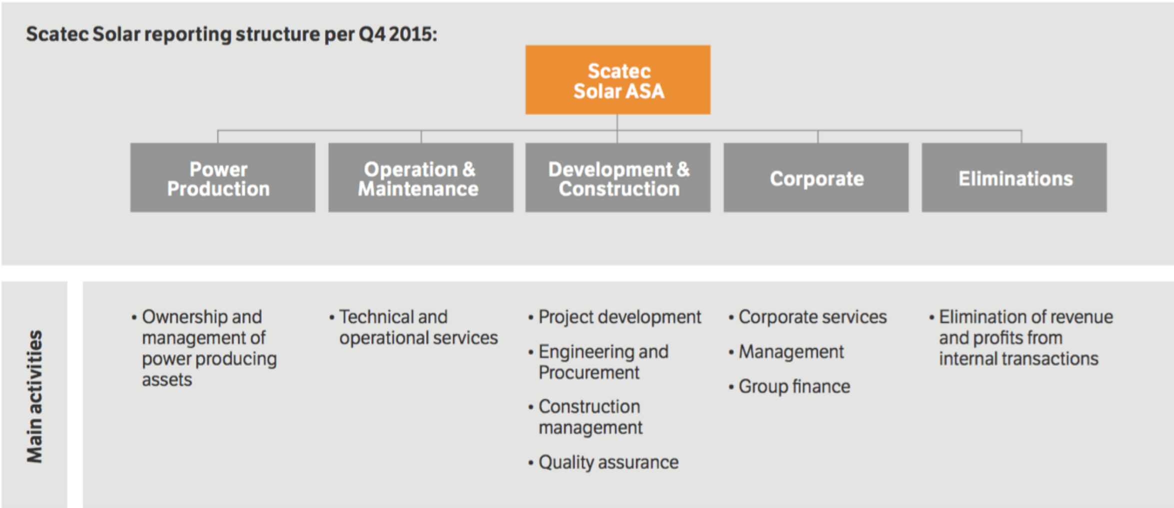

Figure 1: Company Structure, Source: Scatec Solar (2014)

Scatec Solar is divided up in three main business segments as shown in figure 1 above. Power Production covers management of the fully or partially owned power plants while Operation and Maintenance(O&M) covers all solar plants in addition to some third party plants in Italy, France and Germany. With commercial, technical, legal and financial competence the Development and Construction(D&M) segment brings new project opportunities to financial close and construction.

A simplified illustration of the complete structure of Scatec Solar and the main contracts running on each solar project is presented in figure 2. It shows how the core solar power generation is placed in a special purpose vehicles (SPVs) also referred to as project companies. These project companies are either fully owned by the company or partnered with an equity co-investor. Scatec Solar then provides D&C and O&M services to each SPV externally. Each SPV holds its own off-take agreements, land lease contracts and loan agreements which the group is not accountable for beyond their stake in the SPV.

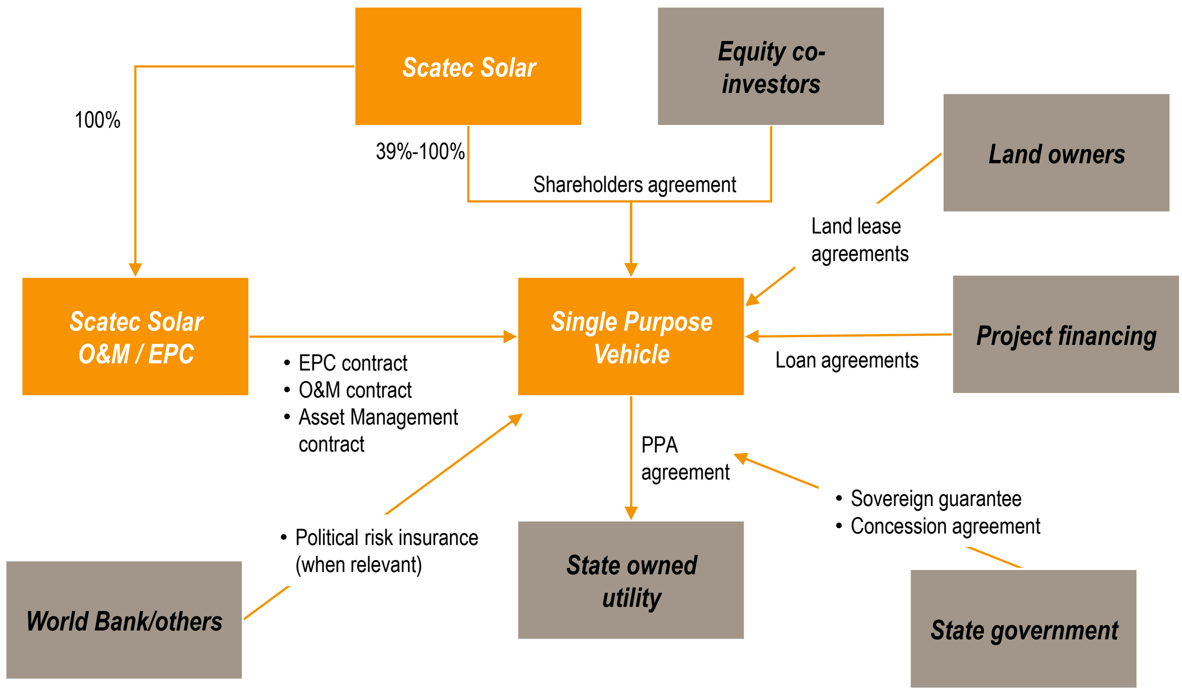

Figure 2: Simplified Structure Illustration, Source: Scatec Solar (2014))

2.3 Value Chain

As an integrated independent power producer, Scatec Solar operates in the last five of a total six steps from raw materials to an operating solar power plant illustrated in figure 3.

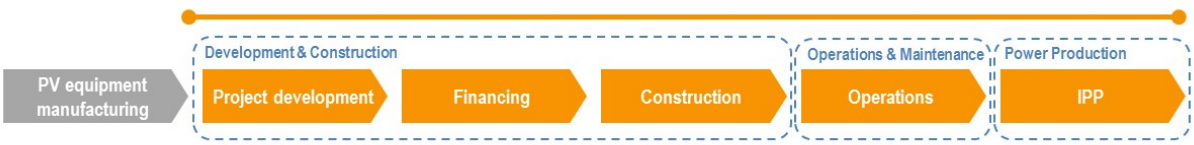

Figure 3: Solar Power Value Chain, Source: Scatec Solar (2014)

2.3.1 Project Development

After receiving manufactured PV equipment from external partners the first part in Scatec Solar's value chain is the project development. Identifying potential sites, getting permission, designing plants and securing grid connection is vital parts of this step. In addition, the company negotiates for power purchase agreements(PPA), attends tendering activities and secures feed in tariffs (FiTs). This step is exposed to great competition related to acquiring good land and winning tendering rounds among several contenders.

2.3.2 Financing

In order to to develop new projects, financing and preparation of commercial operations are crucial. This is done through structuring of debt and equity and by performing due diligence. Senior debt is the preferred source of funding accompanied with junior debt and equity, but other sources as subsidized loans, grants and tax credits may also be used.

2.3.3 Construction

The third step of the value chain is the last of the D&C segment and involves constructing and finalising the solar plants. These operations are done through EPC contracts covering activities like project management, monitoring, quality checks and cash flow management of the plants under construction. Scatec Solar promote value creation and facilitate transfer of know-how by working with local suppliers and contractors. (Scatec Solar, 2016).

2.3.4 Operations

In order to maximise the performance and availability of PV plants the company is active on monitoring, maintaining and repairing the plants. The company carries out O&M both on external and group-owned solar power plants.

2.3.5 Power Production (IPP)

The last step of the value chain is the final delivery of power to customers. Due to the PPAs and FiTs contracted in the first step, combined with low variation of solar irradiation, the power production delivers rather predictable returns.

3 Valuation Methods

When estimating the value of a company there are several approaches available. They differ in assumptions and complexity but often share some general characteristics. Aswath Damodaran (2012) at Stern Business School divide different valuation techniques into three general approaches; (i) discounted cash flow valuation, (ii) relative valuation and (iii) contingent claim valuation. In the following two chapters I will present a brief introduction to the different categories, their most applied techniques and suitability to different cases. Finally, I will finish off with a discussion of the most applicable techniques for this valuation thesis.

"In an efficient market, the market price is the best estimate of value. The purpose of any valuation model is then the justification of this value" Damodaran.

3.1 Discounted Cash Flow (DCF)

Based on the company's fundamentals and the present value rule the DCF-valuation states that the value of any asset is the present value of its expected future cash flows. The objective of a DCF-analysis is to obtain the company's intrinsic value; the value that would be attached to an asset by an all-knowing analyst with access to all information available right now and a perfect valuation model (Damodaran, 2011). Focusing on fundamentals, it should be less exposed to market moods and perceptions. Although it only represents one of three main valuation approaches it is the foundation on which the other two are built (Damodaran, 2012). Both relative and contingent claim valuation require an understanding of the fundamentals of the DCF.

Given its basis on fundamentals, the DCF approach is best applied for companies with positive cash flows that can be predicted with some reliability in the future. It also needs a proxy for risk in order to estimate appropriate discount rates. Some specific company characteristics challenges these ideal setting and make a DCF approach more difficult. Distressed firms, with negative cash flows might be valued at a negative value of equity, although the firm will survive in the long run. Highly cyclical firms on the other hand have cash flows who tend to follow the economy and will be very biased towards the analyst's economic outlook. It is however important to emphasize that these challenges do not make the appliance of the DCF framework impossible, it is rather a question of adaption and flexibility. Common for all DCF-models is that they require the most inputs and information of all valuation models.

A last important aspect when valuing a firm with a DCF-method is to assess the life cycle of the firm in question. Across the life cycle of a firm it will experience different growth levels, thus defining the current stage of the firm is essential when constructing the model. In general, a model could range from one to three different stages. When firms are considered to be in a steady state of their cycle only a one-stage, constant growth model is sufficient. Maturing firms yet to reach a steady state will require a two-stage approach with a higher growth rate in the first period and then find constant growth. Lastly, young and rapid growing firm will experience high growth levels and then a transition period before it finds its steady state.

With numerous existing DCF-models it is again necessary to categorise different approaches. Generally, models are split between valuing the entire business, just the equity stake or value the firm in pieces. Different estimation of cash flows and discount rates separate the three approaches described in the following.

3.1.1 The Weighted Average Cost of Capital Method (WACC)

As the most applied valuation method of an entire business the WACC discounts the free cash flow available to all investors. The discount rate is a value-weighted average of the required return from all investor capital and is further described in chapter 9:

$$Enterprise\ Value = \sum_{t=1}^{t=n} \frac{Free\ Cash\ Flow\ to\ Firm_t}{(1+WACC)^t}$$

The enterprise value represents the value of the underlying business of a firm while free cash flow to firm represents the cash generated before any payments to debt or equity holders are considered (Berk & DeMarzo, 2014):

$$Free\ Cash\ Flow\ to\ Firm = EBIT * (1 - t_c) + \ Depreciation - CAPEX - Incrase\ in\ NWC$$

The WACC- method requires stable debt levels as the capital structure of the firm is used when estimating the weighted average cost of capital in the model. According to Damodaran the WACC-model is best used when firms have either very high or very low leverage, or are in the process of changing their leverage (Damodaran, 2012). It eliminates the volatility induced by debt payments as it is independent of financing.

There are certain challenges with the WACC-model as well. Compared to Free cash flow to equity models discussed later, it may seem less intuitive given that cash flows to equity is a more real measure than the hypothetical cash flow to firm, “ass if there was no debt”-approach. Further, the focus on ignoring of debt, the model fails to reveal firms in distress on the brink of bankruptcy, which might require raising new equity to survive.

3.1.2 Free Cash Flow to Equity (FCFE)

While the WACC-model values a firm independent of capital structure, the free cash flow to equity (FCFE) model is based on the cash flows available to equity holders after meeting all financial obligations, including debt repayments, in addition to the outflows from the WACC-model. The FCFE is then discounted at the required rate of return from firm investors, the cost of capital:

$$Value\ of\ Equity = \sum_{t=1}^{t=n} \frac{Free\ Cash\ Flow\ to\ Equity_t}{(1+k_e)^t}$$

The value of equity represents the present value of a smoothed-out measure of what companies can return to their shareholders over time in terms of dividends and repurchases. An approach based on the original Dividend-Discount-model which will not be relevant due to its simplicity and low accuracy.

The strength of this approach to free cash flows is the direct computation of the equity value. An advantage when the company structure is complex and no adjustments are needed for other claims on free cash flow and thus it is viewed as a more transparent method for calculating a company’s benefit to shareholders (Berk & DeMarzo, 2014). Although the FCFE-model appear to be the most intuitive given its estimation of the real cash flows to investors, it does have some complicating aspects. In order to estimate future interest payments and repayments the debt capacity must be determined for the future. A troublesome estimation not necessary in the WACC approach. In addition, the model is sensitive to changes in the debt-to-equity ratio of the firm as changes will affect the risk of the equity and further the cost of capital.

3.1.3 Adjusted Present Value Method (APV)

Unlike the previous DCF-methods mentioned, the APV-model splits the value of a company in several parts. It starts with the unlevered value of the firm and then adds the value effect of debt, through estimating present values of tax-shields and cost of financial distress. The unlevered value of a company is the free cash flow from the WACC-method discounted by the unlevered cost of capital, a pre-tax WACC not considering tax shields of borrowing:

$$Value\ of\ Unlevered\ Firm = \sum_{t=1}^{t=n} \frac{Free\ Cash\ Flow\ to\ Firm_t}{(1 + r_u)^t}$$

The benefit of leverage is represented by the present value of all future tax-shields and depends on a company's debt levels, cost of debt and tax rate. Tax-shields on interest payments bear the same risk as debt and is thus discounted with the cost of debt:

$$Benefits\ of\ leverage = \sum_{t=1}^{t=\infty} \frac{tax\ rate * cost\ of\ debt * debt}{cost\ of\ debt} = tax\ rate * debt$$

Last step of the APV-method is the calculation of the cost of borrowing in terms of increased risk of bankruptcy and its costs. The present value of expected bankruptcy costs is determined by the probability of bankruptcy and its direct and indirect costs. Estimating such a probability bears large estimation errors, though. Damodaran recommends an approach based on the credit rating of the outstanding debt and its empirical estimated default probability (Damodaran, 2012).

All three steps combined estimate the levered value of the entire company:

$$Value\ of\ levered\ firm = Value\ of\ unlevered\ firm + PV(Tax\ Shields) - PV(Bankruptcy\ Costs)$$

The benefits of the APV approach is its suitability with firms who do not maintain a constant debt-equity ratio as it values the debt effects separately. It also offers more flexibility in its use of different discount rates for different components of value. However, dependent on future debt levels to estimate future tax shields and probability of default, the APV bears the same weaknesses as the FCFE-model. Predetermining these levels contains large uncertainty and complexity.

3.2 Relative Valuation – A Market Based Approach

Relative valuation value assets based on the pricing of comparable assets in the market. In order to compare assets, prices are standardized by converting them to multiples of earnings, book value, cash flows or revenues. Most frequently used multiples are industry-average price-to-earnings (P/E), price-to-book (P/B) and enterprise value-to-EBITDA (EV/EBITDA). Compared to the DCF-method's intrinsic value the multiple-approach is assuming that the market on average is right, but over- and undervalues specific companies. These errors are expected to be corrected over time. By comparing peer-companies within an industry by multiples, relative valuation seeks to identify these deviations in prices.

The benefits of the relative valuation method are its simplicity and low levels of required information compared to a DCF-method. Multiples are fairly easy to obtain and useful when there exists a large number of comparable firms traded on a correctly priced market. By using market prices multiples are also much more likely to reflect market perception and investor sentiment. However, its benefits are also its weaknesses. By subjectively choosing comparable firms analysts can confirm their bias towards a company's value. The fact that comparable firms still can differ in terms of risk and growth could also result in over- or undervaluation. Lastly, the assumption of correct market prices is sensitive to errors causing entire markets or industries to be incorrectly priced. An undervalued firm might not be undervalued, just less overvalued than the rest of the industry.

The most applied standardized measure when computing a multiple analysis is the EBITDA. Independent of capital structure and depreciation policies it is the best comparable measure of companies with different degrees of leverage and geographical operations.

3.3 Contingent Claim Valuation

This third and last valuation approach apply option pricing models in order to value assets with similar characteristics as options. The use of option pricing models in traditional valuation has developed from the fact that DCF-methods tend to undervalue assets with payoffs that are contingent on the occurrence of an event. An example is undeveloped natural resource reserves who is dependent on a certain level of a commodity price to be exploited. In order to value an asset as an option its payoffs must be a function of the value of an underlying asset. It is also dependent on the markets recognizing such options and integrate them in the market price.

The benefit of applying option models in valuation is how they make it possible to value previous non-valuable assets. Equity in deeply destressed firms or stock in small bio-tech companies are assets which are difficult or impossible to value with DCF-methods or multiples. These models provide fresh insight into the drivers of value where where some assets could increase their value with more risk or volatility (Damodaran, 2005).

Valuing long-term options on non-traded assets do have its limitations as well. Estimating the value and variance of the underlying assets when inputs are not available in the markets complicates the model and increases the estimation error. The assumptions made about constant variance and dividend yields are also much harder to defend given the long-term horizon.

4 Choice of Model and Method

The previous chapter introduced different approaches to valuation and highlighted their strengths, weaknesses and most suitable areas. Provided with these tools, the following chapter presents key characteristics of Scatec Solar and the industry which are decisive in the process of choosing the valuation approach for this thesis.

Solar power is an industry with great potential considering recent industry-specific trends and environmental aspects, which will be assessed later in this thesis. As an emerging industry in heavy development the market perception may not reflect the underlying fundamentals. A relative valuation method assuming the market prices are correct could bring large estimation errors. In general, relative valuation is viewed as a “shortcut” to the DCF-methods of valuation (Berk & DeMarzo, 2014). Thus, in order to estimate the best possible value of Scatec Solar an assessment of its intrinsic value looks to be the most reliable approach. In addition, there are several characteristics of the company which will require the flexibility of a DCF-model.

Reviewing Scatec Solar as a valuation case there are some important factors which need to be considered. As a publicly traded company on the Oslo Stock Exchange information on its operations, accounts and financial situation is free and available through quarterly and annual reports. Thus, company fundamentals needed to conduct a DCF-method are obtainable. However, the relatively short period from listing in late 2014 creates difficulties in obtaining historical data as reports only go back three years. The energy industry though, is widely covered by several institutions and even though solar power is an up and coming part of this industry its aspects are already well documented. Combined it provides a sustainable base of information needed to forecast future performance.

As mentioned in the previous chapter an important part of a DCF-analysis is assessing the company’s phase in the life cycle. Scatec Solar is a young firm in an emerging industry and experiences substantial growth, with an 87% increase in revenues in 2015. Given its stated target of reaching 1400-1600 MW capacity installed or under construction by year end 2018 (Scatec Solar, 2016), up from today’s capacity of 384 MW, the current growth levels will continue for at least 3 years. As the company matures a transition period is to be expected before the growth levels reach a steady state. Thus, a three-step DCF-model has to be applied when estimating future cash flows of the company. This high growth further complicates the model as the high capital expenditures needed create negative free cash flows. How to approach this problem will be further assessed when forecasting the future performance.

Choosing a DCF-method to value the company is not sufficient. Whether a direct equity valuation (FCFE), a complete firm valuation (WACC) or a more flexible sum of pieces' valuation (AOC) are best suited to the company must be considered. Given the stable high debt levels averaging at 70% over the last three years without any signs of future change in capital structure, both the FCFE and WACC approaches are well suited**.** However, the complex process of predetermining debt capacity and interest levels point towards the simpler WACC-model. Although the consolidation of partially owned project companies complicate the owner structure, there is not considered to be sufficient information available to conduct a thorough FCFEE analysis. Hence the DCF-method best suited is a complete firm valuation through a WACC-model.

While the relative valuation methods were considered too simplistic to constitute the foundation of this valuation, the approach still has useful aspects. Supporting the DCF-analysis with a relative valuation based on comparable companies enables the results to be tested up against market prices. Even though market values and intrinsic value are expected to differ it makes the valuation more robust having evaluated both aspects of a company's value.

Summing up the choice of valuation method and model, this valuation of Scatec Solar will be based on a fundamental analysis of the entire firm, forecasting free cash flow to all investors thorough a three-stage growth model. The estimated expected cash flows will be discounted by the weighted-average of all required return on investments, the WACC. Lastly, the results of the model will be compared to the market prices of the company's peers through a relative valuation. Considering the limitations and specific requirements of the contingent claim valuation method it will not be applied in this thesis.

5 The Solar Energy Industry

The solar energy industry stands out as one of the major participants in the energy revolution required in order to cope with the serious challenges of energy-related greenhouse-gas emissions. As an emerging technology, photovoltaic (PV) energy has experienced great development since the early years of Scatec Solar’s existence. Technology improvements, geographical expansion and extensive government policies and support mechanisms have driven the industry towards a competitive position in the global energy markets. This chapter provides an enlightenment of the recent developments, followed by a brief introduction to the critical policies and support mechanisms, and finishes off with an analysis of the industry outlook and its resilience towards conventional energy sources.

5.1 Recent Development

5.1.1 Module Price Decrease

Looking back over the last 5-10 years, the solar energy industry has experienced extensive growth and development on several areas. One of the most crucial areas being the reduction in costs, as the industry’s biggest drawback over the years has been the lack of ability to compete with conventional sources of energy. The price of PV modules has been reduced with 80% over the last six years and a complete PV system almost by two-thirds (IEA, 2014). Main drivers behind the decrease have been technology improvements, economies of scale in manufacturing and increased competition among producers. All three factors relate to a geographical shift in the module manufacturing from the U.S. and Europe to Asia, especially China (IEA, 2014). However, it is not country-specific factors providing the advantage, but supply-chain development and big investments in capacity. In addition to costing less, the modules have also increased its performance in converting sun to electricity over the last ten years. The efficiency of average commercial wafer-based silicon modules increased from about 12 % to 16 % (Fraunhofer, 2015), which represents a significant increase in total output.

The result of this development is a lower levelised cost of electricity (LCOE) for utility-scale PV Plants. The LCOE of a given technology is the ratio of lifetime costs to lifetime electricity generation, both of which are discounted back to a common year using a discount rate that reflects the average cost of capital (IRENA, 2015). It provides a comparable measure on the cost of different power generating technologies. Figure 4 presents different generating technologies' LCEO and illustrate how recent development in PV modules' cost and efficiency have made the Solar PV technology highly competitive.

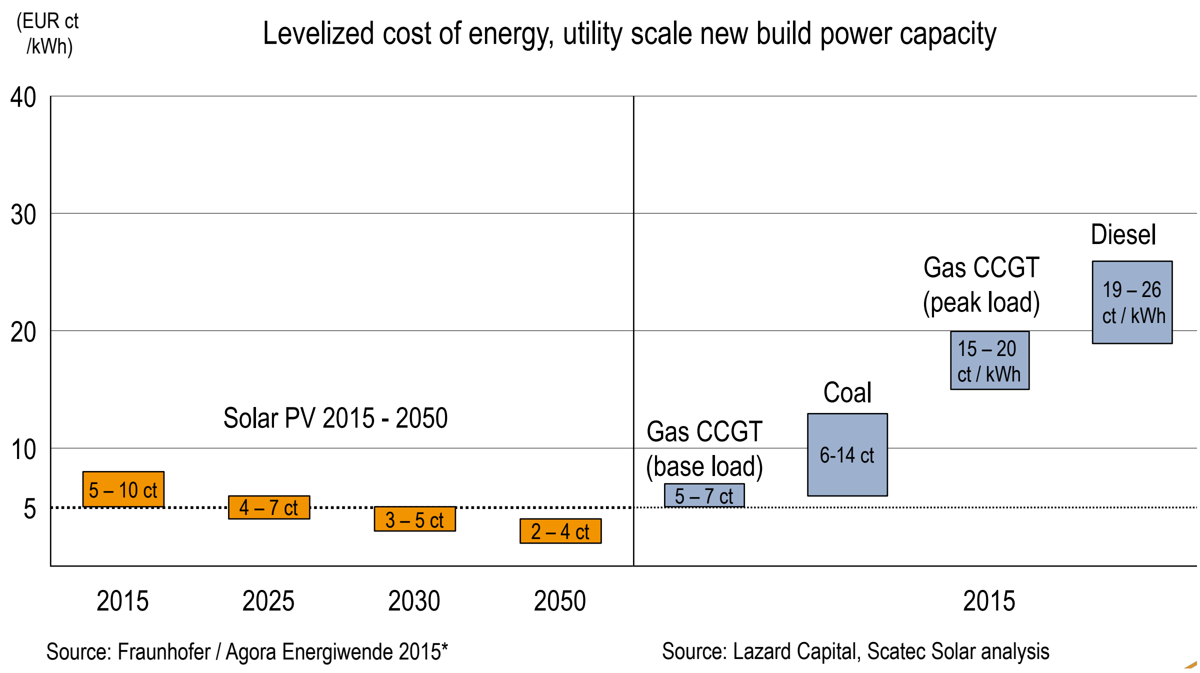

Figure 4: LCEO by Power Generating Technology, Source: Scatec Solar (2016)

5.1.2 Geographical Expansion and Cumulative Growth

It is not only in manufacturing and costs that the solar industry has seen extreme development the last ten years. The International Energy Agency (IEA) stated, in their technology roadmap from 2014, that as of 2013 the cumulative installed capacity had grown at an astonishing average rate of 49% per year. Following the solid 2013 with nearly 37 GW of added capacity, the solar power market eventually reached 40 GW for the first time in 2014. The growth experienced the last couple of years, presented in figure 5 is so massive that the new capacity added since 2010 beats the total of the previous four decades. Solar power now covers more than 1% of the world electricity demand. (SolarPower Europe, 2015).

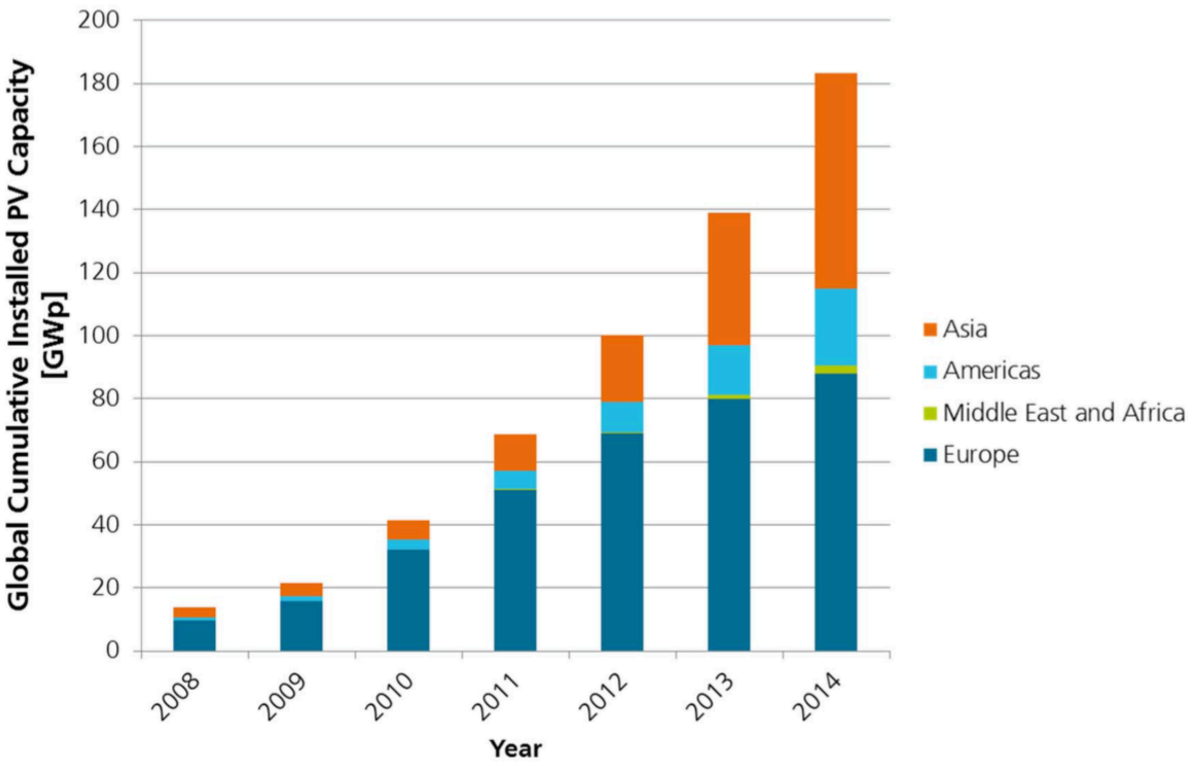

Figure 5: Recent Development in Installed Solar Capacity, Source: IEA (2014)

The foundation for this incredible growth in capacity is the industry's ability to expand globally. For several years the solar power market was centred around Europe, but after being the main driver for a decade, Europe saw their growth flatten out in 2013 and 2014. Mainly due to reduced financial incentives and political support in the leading countries Germany and the United Kingdom (SolarPowe Europe, 2015). The global growth did however not decline as Asia and America excelled and caught up with the levels of Europe. 2013 marked the first year since 2004 that more GW was installed in Asia than in Europe. With good political support and FiT based policies, China and Japan installed more individually, than the whole of Europe combined in 2015. This geographical shift of leading countries, although central, did not achieve these levels of new capacity alone. Behind the five largest countries mentioned, new markets are emerging all over the world and supplies additional capacity to sustain the high growth levels. Across continents, numerous countries delivered promising levels in 2014. Like the 900 MW installed in France, Korea and Australia and South Africa following close behind with 800 MW (SolarPower Europe, 2015). Finally, the rise of Canada, Taiwan, Thailand, The Netherlands and Chile shows that the solar power market is truly becoming a fully global industry.

The latest numbers from Bloomberg New Energy Finance (BNEF) indicate an installed 2015 capacity of 57 GW solar PV (PV Magazine, 2015), representing an annual increase of above 30 percent. China have now replaced Germany as the largest market with 43 GW total capacity. **Table 1** shows the US closing in on Japan while Europe is still solid thanks to the UK growing 4 GW. Additionally, the globalisation of the industry continues with emerging countries delivering significant contributions of growth.

	China	Japan	U.S	Europe	Other Asian Countries	India	Americas	Africa & Middle East
Installed GW 2015	15.0	10.0	9.8	8.5	2.5	2.0	1.5	1.0

Table 1: 2015 Installation Levels by Region, Source: PV Magazine (2015)

5.2 Policies and Support Mechanisms

Although the recent developments in the solar power market of lower costs and greater efficiency have made the industry more attractive to investors, financial incentives are still central in order to increase the investments in solar PV projects. Policies and support mechanisms are government actions aimed at meeting their national goals for renewable energy production. Below follows an introduction to the most common instruments used to close the gap between conventional power sources and solar PV power. These are both cash-flow generating mechanisms as well as assistance in entering the market.

5.2.1 Feed-in Tariffs (FiTs)

FiTs are contracts guaranteeing the power producers a fixed price, typically adjusted for inflation, tied to the cost of production (IFC, 2015). The length of these contracts are usually long-term, ranging from 10-25 years. In addition to the fixed price FiTs often include good off-take terms like better grid access and priority dispatch of output. The objective of the fixed price is to cover the premium cost of solar PV versus conventional production, and hence provide investors with a sufficient margin matching the risk level of the projects. In order to secure the tariff producers must sign a purchasing power agreement (PPA) with an off-taker, typically a utility, system operator etc. PPAs are covered later in this section.

The Feed-in Tariff is one of the most applied support mechanisms to the solar PV producers and has played a crucial part in the emerge of solar energy, particularly in the big regions

Europe, Japan and China. By eliminating price fluctuations on the electricity market and stabilizing long-term revenues, FiTs attract lenders and financing due to the high degree of certainty in modelling projects.

5.2.2 Reverse Auctions and Tenders

In the case of FiTs described above, developers are offered a predetermined tariff for their solar PV projects. Another way to distribute FiTs is to have the developers go through a bidding-contest where the best tendering offer settles the fixed price paid by the off-taker (IFC, 2015). These tenders or reverse auctions for new capacity secures a competitive determined price for the government or utility responsible for the project. The actual project site can both be pre-determined by the off-taker or proposed by the tendering developer. Specifics of the tender involve an announced number of MW and limitations regarding project size, site location and technologies. In addition, certain criteria must be fulfilled by the participants regarding financing and implementation of the project. The process of entering a tender is laborious and failing to succeed yields high non-refundable costs. A risk all developers must consider their exposure to.

In emerging markets like South Africa and India reverse auctions and tender programs have been a successful way to scale up installed capacity. The REIPPP program in South Africa consists of 33 large-scale solar PV projects of a total 1.5 GW initiated over three rounds. This competitive bidding process provides a platform on which incentives to new projects are being minimised to the lowest level required.

5.2.3 Tax Incentives

One of the most common tools used by governments to increase the investments in renewable energy is tax incentives. Tax credits for capital expenditure, reduced corporate income tax, accelerated depreciation, reduced Value-Added Tax (VAT) is just some of the many different incentives provided by different local authorities. One of the most effective examples in the industry is the Solar Investment Tax Credit (ITC) in the United States. Developers are given a 30 percent tax credit on the capital expenditures of their projects to offset against their tax liabilities. Many other countries have succeeded with tax incentives as well, but as it it attracts high transaction costs and requires substantial tax burdens it limits the number of investors to exploit it. In addition, many solar power countries have a low collection of corporate income tax which reduces the effects. In general, some fundamental differences between tax systems reveals that the success in the developed economies like the U.S may not be replicated in emerging markets.

5.2.4 Power Purchase Agreements (PPA)

A power purchase agreement is a legally binding agreement between a power seller and power purchaser (off-taker) (IFC, 2015). In the utility-scale PV industry the off-taker is usually a, wholly or partially government owned, power company. Although PPAs are not a support mechanism by definition most of the policies promoting solar power are usually based on them. Historically, regulators of this framework have been determining the PPAs in the industry. In addition to the PPAs, the electricity can also be sold through the open market as a “merchant” plant, but this method is rare due to the risk and premium costs of solar power. By defining the revenue stream of each project, the PPA is critical element of the project financing and defines all commercial terms between the parties.

5.3 Solar Power Market Outlook

The review of the developments in the solar power industry over the last decade reveals incredible progress. There are a wide range of elements behind this growth and this section examines these element’s future. What will continue to drive growth and what might diminish and will there appear new factors effecting further development.

5.3.1 Costs & Technology

Section **4.1.1** above reviewed the price decrease of PV modules**.** Figure 6 below illustrates the historical development since 1976 and reveals that the extensive price decrease from 2008 to 2013/14 mentioned earlier does not represent the long learning trend. This extraordinary plunge in prices was a result of shortage of the raw material polysilicon in 2008 combined with an overcapacity issue around 2013 pushing prices below full cost (Solarcentral, 2015). Despite deviations from the historical trend recent years, the International Energy Agency sees “considerable body of evidence that the costs of cells and modules will decline further as deployment and technology improves in the next two decades”. (IEA, 2014). Numerically modules are expected to reach between USD 0.3/W and USD 0.4/W by 2035.

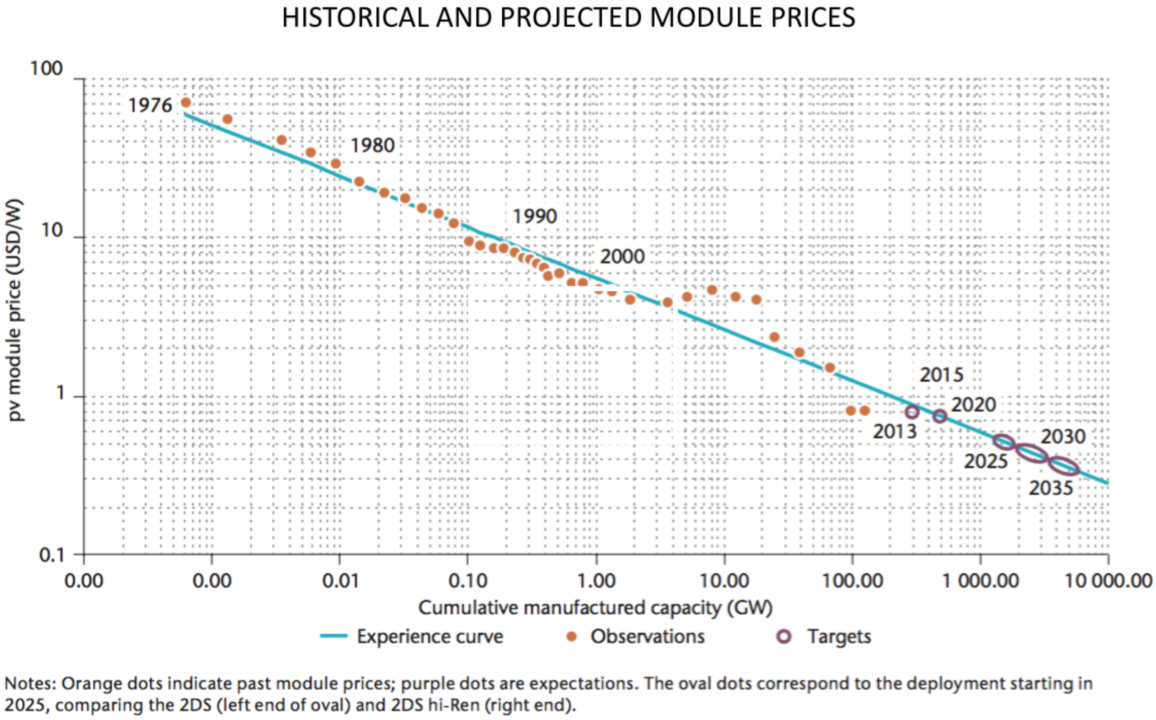

Figure 6: Historical and Projected Module Prices (Source: IEA, 2014)

The impacts of continued cost reductions in PV modules are illustrated in Figure 7 below. Capital expenditures (CAPEX) of utility-scale PV plants are expected to keep declining in line with the module cost reductions and projections expect a total reduction of 68% in the 10-year period presented. The figure illustrates how module costs make up a dominating share of total costs and both have and will be a driving force towards continued decline.

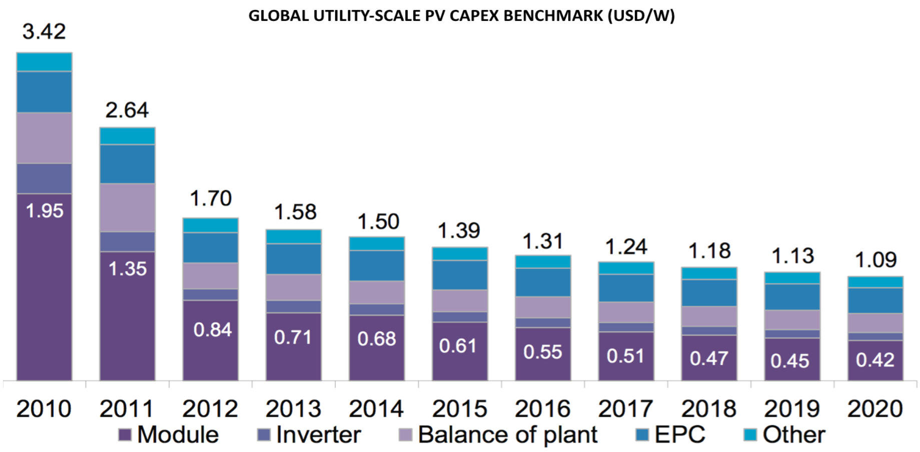

Figure 7: CAPEX Development for Utility-Scale Solar, Source: BNEF (2015)

Even though different "soft" costs, like financing and permitting, create differing CAPEX across markets/regions, the average level is expected to decrease and the interval between markets reduced.

Finally, as a consequence of falling module prices and lower capital expenditures together with improved performance and geographical expansion to more irradiated areas, the average PV LCOE will also continue to decrease as illustrated in figure 4 of chapter 5.1.1**.** A 25% decrease by 2025 and a total 60% by 2050 is expected.

5.3.2 Capacity

SolarPower Europe (the new European Photovoltaic Industry Association) operates with two scenarios in their Global Market Outlook for 2015-2019 (SolarPower Europe, 2015). Figure 8 presents a high scenario representing a favourable environment accompanied by willingly governments as political facilitators. And a low scenario of pessimistic behaviour where stagnant financial conditions characterises most markets. In addition, a medium scenario indicates the most probable market development forecast.

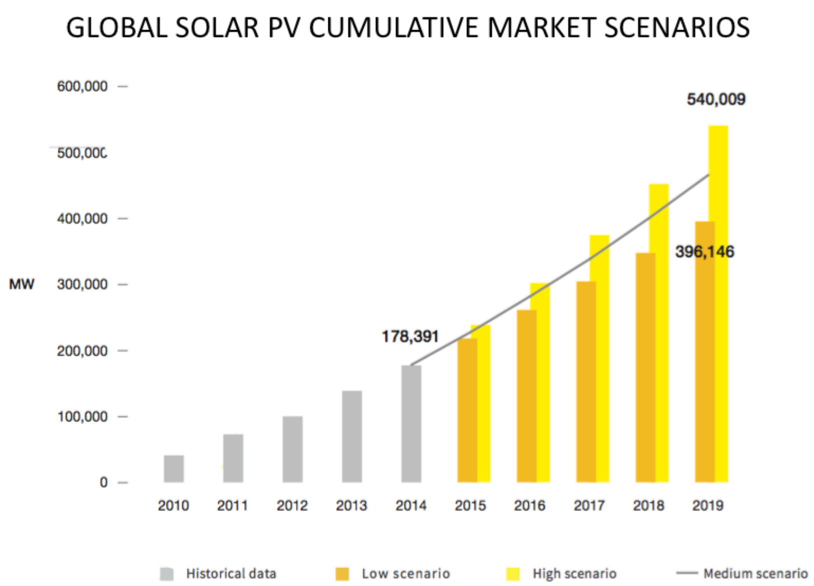

Figure 8: Global Installed Capacity Outlook, Source: Solar Europe (2015)

Predicted global added capacity in 2015 was set by SolarPower Europe (SPE) at above 50 GW, possibly close to 60 GW, matching the actual installation of 57 GW. The cumulative levels the next four years are expected to double in the low scenario or triple in the high scenario. This outlook is supported by several published forecasts covering the industry. Hence, the exceptional growth is predicted to continue. Regarding the distribution of new capacity across countries the majority of reliable forecasts are unanimously pointing out China as the leading country in the future.

Furthermore, the Berlin-based Apricum Cleantech Advisory assess each region in their five-year outlook (Apricum, 2015). With an overall prediction of a cumulative cumulative capacity at 604 GW in 2020 and annual capacity of 90 GW, their model roughly follows the medium scenario of SPE. In order to highlight the regions looking to drive future growth, the consultants focus on the change in annual added capacity from 2014 to the predicted 2020 levels as shown in figure 9**.** The figure reveals which regions will attract most interest from solar PV developers in the future.

CHANGE IN ANNUAL INSTALLATIONS FROM 2014 TO 2020 (GW)

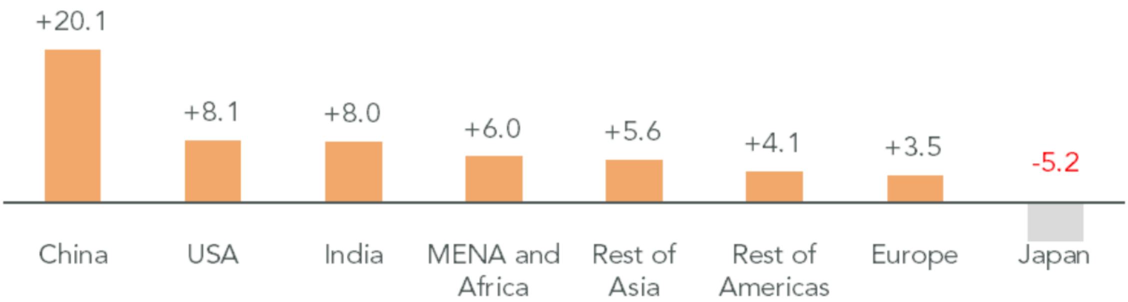

Figure 9: Expected Changes in Installed Capacity, Source: Apricum (2015)

In addition, their outlook contains a list of top five countries by cumulative capacity in 2020. Unsurprisingly, China ranks number one followed by USA, Japan, Germany and India. Focusing on added annual capacity, 70 percent of the increase from 42 to 92 GW in installations from 2014 to 2020 is represented by China, USA and India. More regionally Asia looks like the leading area for the years to come. While China is projected to keep on growing, India looks set to replace Japan as number two. Japan suffers from insufficient grid-capacity as a result of a boom in installations driven by lucrative FiT-programs. While India aims at reducing pollution and increase access to electricity by installing 100 GW by 2023. (Apricum, 2015)

Even though Asia represents the highest levels, regions worldwide show great potential. In America the booming US market is accompanied by Mexico who, with its strong irradiation, pursue a GW levels to meet a growing power demand. Further south Brazil represents a potential huge market with an increasing share of solar PV in its power auctions system. Other fast growing regions are the Middle East and Africa. The lack of energy and programs aiming at supplying the people with renewable electricity drives growth in Africa while the MENA region is experiencing high demand for PV due to tender rounds pushing prices down. Lastly, Europe will still contribute sufficient levels of growth in the future, although its share of worldwide capacity is falling. France looks to be the new driver, with goals to replace nuclear power with renewables.

Concluding, the outlook for new PV capacity looks promising. Big regions are predicted to sustain their growth levels and new emerging regions show promising signs of future markets.

5.3.3 Policies

Various support mechanisms have been one of the main fundamentals for the experienced growth in solar power recent years, making the industry more competitive to conventional sources of energy. As the industry develops and matures it becomes less dependent on these mechanisms, but the industry today is still represented by the fastest growing markets being fuelled by financial incentives. Illustrating the influence these mechanisms can have is the latest boom in U.S solar installations, pending the expiration of ITC policy initially set to happen at the end of 2016. As a consequence of developers expecting ITC to expire, pipelines was filled and the U.S solar market is now set to grow 119 percent in 2016 (SEIA, 2016). Although an extension of the policy where provided, the developer's behaviour reveal how critical these support mechanisms are for their operations. IEA claims in their roadmap (IEA, 2014) that, "Strong and stable frameworks are needed, along with support to minimize investors' risks and reduce capital costs. This fact demands an analysis of the sustainability of today's dominating support mechanisms.

5.3.3.1 FiTs & FiPs

As one of the main drivers behind recent growth in the industry, the outlook for the governments feed-in-tariff policies are very interesting. Although the FiTs still stimulate a great expansion of solar PV in many emerging markets, their role in the more mature markets is changing. As prices of modules decrease and markets mature, governments are lowering their FiT levels. Japan announced a 11% reduction in their solar FiTs due to falling the CAPEX in the industry and an observed trend of lower FiTs yielding lower CAPEX (PV Magazine, 2015). The National Development and Reform Commission (NDRC) in China also recognize the effects of falling costs and recently announced a slight cut of FiTs in order to adapt to the new market conditions (PV Magazine, 2015).

In addition to these newest adjustments in Asia, European markets has experienced a decline in FiTs for years. Germany long led the line in solar PV, but has recent years reduced their support system drastically due to high costs. Several EU countries has been exposed to fiscal strain from the financial crisis and hence they have been forced to alter their FiTs, Spain going as far as temporarily suspending them in 2012. Some exceptions exist, like France who adjusts their FiTs every 3 months to account for new developments and increases installations. But generally, the European solar PV market is the first mover into a more market-based development framework, less dependent on FiTs. **(**SolarPower Europe, 2015**)**

An option to the fixed contractual prices provided by the FiT is the feed-in-premiums (FiPs), which could be more applied in the future. By adding premiums to market prices of power the idea is to make solar energy more integrated in the electric system. Divided into fixed and sliding FiPs, prices are either set once or adjusted to the average market price perceived by all generating technologies.

5.3.3.2 Tax Incentives

As mentioned earlier tax incentives is an effective and much applied mechanism in solar markets. However, being difficult to exploit, it is mostly just common in the United States. Initially the tax credit in the U.S where due to expire in 2016, but the Congress now have extended the policy another five years. The investment tax credit stays at 30% throughout 2019, then drops to 26% in 2020 and 20% in 2022 and stabilizes at 10% for utility-scale projects after that, but are completely removed for residential installations (MIT, 2015). Similar to the FiTs, the tax credit policy is moving towards a more market-based development framework in the future.

5.4 Renewables vs Fossil Fuels

This last part of the Industry Outlook provides an update on the position of general renewable energy versus the conventional fossil fuelled energy sources. A relationship especially interesting considering the recent plunge in oil prices, initially expected to hurt the growing renewable energy industry. Contradicting the initial expectations, McKinsey (2015) provide four main reasons why the renewable sector is more resilient than ever.

Firstly, only a small share oil production is used for power generation compared to almost all renewables. As little as 5% of the global power production originate from oil, making the price of oil much less relevant than the price of electricity. Gas is however often linked to the price of oil and is a far bigger player in the global power production and represents the floor price of power. Although lower gas prices possibly could slow down the growth of renewables it is more likely to be a cleaner replacement the considerably worse polluter, coal, as a backup source of power.

Improving economics of renewables represent the second aspect. The fast-increasing competitiveness of renewables, illustrated by solar CAPEX cost earlier, combined with regulatory support, protect the industries of renewables. With economies of scale in production and declining "soft costs" this development it set to continue. Consequently, the prices of fossil fuels will continue to fluctuate, while the costs of renewables are only set to decrease. An attractive characteristic for governments and companies investing for the long-term.

Furthermore, the global dynamics of energy are changing. Historically, due to high costs, investments in renewables have been reserved for developed countries and oil-rich nations have preferred to burn cheap oil even though their irradiation levels were well-suited for solar. With developing countries accounting for a little less than 50% of global clean energy investment in 2014, a growth of 36% compared to the 3% of the developed world, a new structure is evolving. China, India and the largest Latin American countries lead the change with ambitious goals for renewables. Oil-giants Saudi Arabia, Egypt and Dubai have also shifted their focus more towards renewables and especially solar. Dubai's state utility recently signed a solar deal at a record low of six cents per kWh with a Saudi solar company, while

Egypt aims at a 20% renewable capacity at 2020. Combined, all these aspects reveal the globalization of renewable energy, as further mentioned in earlier sections, stating its position as a strong long-term solution in the energy sector.

Finally, improved technology and innovations enhance the competitiveness of renewable energy. Most important is the development in energy storage considering the intermittent aspect of renewables. Navigant Consulting expects a $70 billion market for energy storage over the next decade. The price of lithium batteries per capacity is already decreasing and will be further assessed later in the strategic analysis. In general, there are large resources allocated towards storage technologies by major American, European and Asian companies.

Summarized, these four aspects of the renewable energy sector reveals how the long-term transition of the energy sector is in motion. Although long-term is a key element, the increased resilience represents a fundamental element in the future of the sector.

5.5 Summary

Reviewing the recent developments and mapping out the future outlook for the solar power industry reveals an exciting and emerging industry. A combination of cost reductions, efficiency improvements and environmentally driven capacity expansions stands out as the main drivers of the industry. The enhanced resilience towards prices of conventional energy also represents a significant aspect supporting the renewable energy industry to exploit its potential. Further, as governmental support will be phased out eventually, the industry looks to be heading towards a sustainable marked-based framework which will lay the foundation for future growth.

6 Strategic analysis

Having addressed the solar industry development and outlook relevant for Scatec Solar's future operations, this chapter will focus on strategic elements that are critical when analysing future prospects of the company. The strategic analysis is split in two parts. First, the structure and level of competition in the industry will be assessed and secondly a more firm-specific analysis will be conducted to address the competitiveness of the company. Understanding the current and future structure of the industry and how Scatec Solar is positioned to cope with future competition is vital for the fundamental valuation. It provides important input to assumptions in the final estimations.

6.1 Porter's five forces

The structure-conduct-performance (SCP) framework states that the structure of an industry influences the conduct of the competitors, which in turn drives performance of the companies in the industry (Koller, Goedhart & Wessels 2015). The most influential work on SCP is Michael Porter's Competitive Strategy from 1980, and will be the basis for this analysis of the intensity of competition in the utility-scale solar PV industry. According to Porter, to be able to understand the industry competition and profitability, one must analyse the industry's underlying structure in terms of five forces (Porter, 2008). Competition for profits exceeds the existing industry rivals to include customers, suppliers, potential entrants and substitute products as illustrated in figure 10. Together these five forces set the industry structure which drives competition and profitability.

Figure 10: Illustration of Porter's 5 Forces, Source: Porter (2008)

6.1.1 The threat of new entrants

Through additional capacity and increased fight for market share, new entrants affect prices, costs and the need for capital expenditures. Entrants from other markets might also leverage its other business areas in order to shock the competition. In this way, the threat of new entry sets a roof on potential profits of an industry. Porter emphasize that it is not whether the entry actually occurs, but the threat of it that holds down profitability. How big the threat of new entrants is, depends on the height of the industry's entry barriers. The most relevant entry barriers of the utility-scale PV industry will be assessed in the following paragraphs.

A typical acknowledged entry barrier in the industry is the need for high capital requirements. The total costs (CAPEX) of a multi-megawatt European ground-mounted solar PV power plant averaged around 1.7 million USD per MW in 2014 while the operating and maintenance cost (OPEX) at the time was estimated to around 4,200 USD/MW per year (IFC, 2015). Adjusted for local taxes and transportations costs etc. these numbers works as a proxy for other markets. The data illustrates both substantial capital requirements and that the vast majority of investment occur in the early phases. Thus, new entrants must possess great financial resources and their lack of experience in the industry might increase the cost of additional capital with creditors.

Further barriers to entry are incumbency advantages like the cumulative experience in developing solar power plants. Large-scale plants usually have extensive permits and licencing requirements, determined at a regional or national level. The tedious process of acquiring key requirements like land leases, building permits, grid connection applications and operating licences might represent a barrier for new entrants given the lack of experience compared to existing market participants. In addition, participating in tender offers is a costly and tedious process which requires big investments from developers while risking not to be awarded the contract. Experience helps existing participants to better evaluate which tenders take part in and increases the probability of being awarded the tender.

On the contrary to these barriers of entry, the solar industry contains attractive government policies which may make entry easier. Both feed-in-tariffs and solar investment tax credits are such incentives that both attract new entrants and facilitate their establishment. However, these lucrative support mechanisms are being phased out by several governments as mentioned in the industry analysis and are clearly not sustainable in the long run.

6.1.2 The power of suppliers

Powerful suppliers can make an impact on the competitiveness of industry participants by increasing prices, limit quality or shift costs to their customers. All actions are methods in which suppliers can pressure the profits out of an industry if the participants are unable to pass on the costs to their customers.

For participants in the utility-scale solar market the most critical suppliers are the PV module and inverter manufacturers. These components make up 55% of the capital costs of a solar PV project (IFC, 2015), hence their power is potentially extensive. However, low entry barriers fragment the PV module market (Market Realist, 2015) and hinder suppliers in growing big and influential. Further, the modules are not particularly differentiated products and developers are not heavily dependent on any specific manufacturer. In addition to the low level of differentiation, the PV modules can be based on different technologies. Thus, a crystalline module manufacturer both competes against other crystalline modules and against substitutes like thin-film modules, increasing the competition and weakening the power towards their customers in the power plant industry.

Although the power of supplier does not look strong today, history reveals that things could change. In the period of 2005 to 2008 a shortage in the essential raw material polysilicon increased prices of modules and lowered the total supply (Solarcentral, 2015). An example of how many factors can influence the power of suppliers. In their prospectus, (Scatec Solar, 2014) Scatec Solar itself emphasizes that equipment may be in shortage from time to time.

6.1.3 The power of buyers

Along with the suppliers, customers of the industry are also able to capture value from participants. The power is often represented through negotiating leverage on participants, setting them up against each other in order to push down prices, requesting better quality or more service. Just like supplier power this squeezes the profitability out of the industry.

The buyers or off-takers in the utility-scale solar industry are usually state-owned utility companies. As the number of state-owned utility companies in most regions are low compared to the number of producers, their bargaining power is relatively high in terms of competition for solar power. The pressure is on the solar power producers to get contracts with the utility companies. Another aspect of the solar industry is the standardized product they deliver. All producers offer the same renewable energy and the off-takers can always look for equivalent offers, playing the producers against each other. Finally, the off-takers last source to bargaining power in the solar industry is the threat to integrate backwards. Given its attractive stabile and long-term revenues many investor-owned utilities (IOUs) may look to vertically integrate in order to capture profits. Further, the publicly-owned utilities (POUs) may consider entering the plant-development industry as a step in the pursuit of their renewable energy goals.

In terms of bargaining power, the buyers of power from utility-scale solar plants seem to have substantial power through the low levels of off-takers, standardized products and threat of backwards integration. All three aspects provide the utility companies with leverage when negotiating PPAs, pushing prices down and squeezing out the profits.

6.1.4 The threat of substitutes

A substitute performs the same or similar function as an industry's product by a different means (HBR, 2008). As the number of substitutes for a product grows, the elasticity of demand increases. With elastic demand comes price sensitivity which in turn pressure down prices. Thus, an industry who is not able to differentiate their products from its substitutes will experience both a fall in profitability and often reduced growth potential.

The substitutes of solar power are numerous. Both in terms of other renewable sources like wind power, hydro power and bio energy and the conventional sources of energy; coal, natural gas and nuclear power. The position of solar power twenty years ago illustrates how substitutes can put a ceiling on prices and hold back a product. Due to its high costs at the time, other conventional sources of energy were chosen. However, recent years' substantial decline in LCOE for solar power, driving the industry towards 16 percent of total electricity generation by 2050 (IEA, 2014), demonstrates how solar power has managed to outperform several of its substitutes. Further on, chapter 5.4 described how renewable energy in general has also managed to distance itself from its substitutes in conventional sources of energy. But the battle of becoming the number one renewable energy source still remains, and are pushing developers to continuously improve both efficiency and prices. Thus, the pressure from both renewable and conventional power will affect the profits of the solar industry for years to come.

6.1.5 The rivalry among existing competitors

Rivalry among existing competitors takes place in the most common ways. It pressures prices, drives innovation, advertising and service/product improvements. A high degree of rivalry pushes the industry towards "perfect" competition where prices equal marginal costs and profits vanish.

The most common utility-scale solar PV projects are typically part of environmental policy objectives (Nordea Markets, 2015). Awarded through tenders, the developers bid for the opportunity to construct the different projects. Through this process competition among the participants will push down the price, usually awarding the developer with the lowest electricity production costs with the contract. With attractive pre-determined FIT-schemes on its way out in most developed countries, the intensity in future tender rounds will only accelerate. Thus, the rivalry among developers in the industry is mainly concentrated around price competition. A significant factor affecting the intensity of the competition is the cost structure of the industry. A utility-scale solar power plant contains a high level of fixed costs represented by modules and equipment, while the operating costs are low, resulting in a low marginal cost. Facing tough competition in the tender rounds may pressure prices below developer's average costs, in order to win the contract, while still contributing to covering fixed costs. It is clear to see how this process affects the profitability of the industry and with the market maturing towards a more marked-based framework, it will continue to develop the industry.

6.1.6 Conclusion

Having gone through the five competitive forces of Porter, defining the industry structure, it is time to determine the long-run profit potential of the solar industry. The strength of the forces reveals how the economic value created by the industry is divided. Strongest of the five is the threat of substitutes. Competing both against other renewables and conventional energy, utility-scale solar will face intense competition for future energy demand. Furthermore, the rivalry among existing competitors is also strong as numerous developers enter tender rounds and cut margins as low as possible in order to win the contracts. The third and last strong competitive force in the industry is the power of buyers. The level of standardisation of power as a product is a disadvantage towards off-takers and the threat of backwards integration pressure the producers.

Concluding, the economic value generated in the utility-scale solar industry looks to be limited by its competing substitutes and bargained away by buyers. Intense rivalry prevents existing companies to retain too much value, while the threat of new entrants does not represent any particular constraint on profits. Neither does the fragmented power of suppliers. With the development of the industry moving towards less support mechanisms and more marked-based frameworks, prospects for profitability does not seem to be improving.

6.2 SWOT-Analysis

Representing strength, weaknesses, opportunities and threats the SWOT-analysis was introduced by Albert Humphrey in the 1960s. It highlights internal and external elements which may affect the future performance of the company. The objective of this analysis is to evaluate Scatec Solar's positioning in the solar industry and examine potential drivers of growth as well as sources of risk in the operations going forward. Starting with strengths and weaknesses, internal elements within the company will be assessed, while the latter review of opportunities and threats looks at the external environment in which it operates.

6.2.1 Strengths

As stated in the analysis of Porter's five forces, the competition among existing utility-scale solar developers are intense, with many companies looking to gain profits in an emerging industry. In such market conditions a review of a company's strengths is useful in order to determine whether it holds any competitive advantages enabling them to maintain existing and/or increase future profit levels.

With its extensive experience in the solar power industry, dating back to 2001, Scatec Solar has developed a competitive advantage through its integrated business model. Through both its development and construction (D&C)- and operation and maintenance (O&M) divisions, in addition to their core power production activities, the company controls the entire downstream value chain. The benefits are numerous. Compared to competitors only focusing on ownership of projects, who are dependent on external D&C and O&M, Scatec Solar gains more control across the entire lifetime of a project. This is likely to result in lower costs, higher speed and improved execution (Nordea Markets, 2015). A competitive advantage potentially yielding premium margins.

In a more risk minimizing aspect Scatec also gain advantage through its geographical diversification of plants. With plants spread across the world from Europe to South Africa and the U.S, the company is less vulnerable for operational risk like varying irradiation levels and grid connection problems, and country risks in terms of political changes.

The analysis of Porter's Five Forces highlighted the large up-front investments required to build a solar power plant and the high capital requirements characterizing the industry. In order to grow in this industry, the access to financing is crucial. Scatec Solar is well positioned to meet these requirements through its solid track record of raising more than 800m EUR in non-recourse finance through its partnerships with global, regional and DFI[2] financiers (Scatec Solar, 2016). These multilateral development banks and institutions represents a robust project finance network. In addition, partnerships agreements with the Norwegian Investment Fund for Developing Countries (NORFUND) and IFC InfraVentures, part of the World Bank Group, have been signed to fund and develop solar projects in emerging countries. Some projects are already in operation while others are in development. The partnerships provide strength in access to cheaper long-term capital as the partners' interests go beyond return on equity. Furthermore, they represent a solid combined experience from successful investments in developing countries and an invaluable strong network in emerging markets. Backed by the Norwegian Government and the World Bank risks of dishonouring of contracts or other problems are also mitigated. In addition, the company partner with local suppliers and contractors, mitigating local risk and enables further project development in the region.

6.2.2 Weaknesses

In the same way that a company's strengths help it capture premium margins in a competitive industry, its weaknesses increase the probability losing its competitive position.

Reviewing Scatec Solar's activities, a potential weakness is their sizeable exposure to emerging countries associated with high risks. The OECD operates with a country risk classification where the risk composes of transfer and convertibility risk and cases of force majeure (OECD, 2016). Transfer and convertibility risk assesses the risk of the government imposing capital or exchange rate controls preventing the conversion of local to foreign currency or the transfer of funds to creditors outside the country. Cases of force majeure covers the event of wars, revolutions, floods etc.

[2] Development Finance Institution

Table 2 below presents each country in which Scatec Solar has projects in operation, under construction or in backlog. The countries are classified in OECD's categories from 0-7 through a two-step methodology. First a quantitative assessment of country credit risk based on payment experience, financial situation and economic situation. Then a qualitative assessment of the country risk to integrate political risk and other factors not accounted for in the first step.

	Czech Rep	**USA**	**Brazil**	**South Africa**	**Jordan**	**Honduras**	**Rwanda**	**Mali**
% of Production	1.1 %	11.3 %	8.8 %	57.6 %	5.6 %	11.5 %	0.8 %	3.2 %
Country Risk	-	-	4	4	5	6	6	7

Table 2: Classification of Country Risk, (Source: OECD, 2016)

The results reveals that Scatec Solar is definitely is operating in high risk countries with 80% of the considered current and future projects are classified between 4-6, representing a potential weakness of the company's future operations. This weakness is not expected to decline either, considering that two of the major projects in the pipeline are located in Egypt and Pakistan with a classification of 6 and 7 respectively. The high-income OECD countries Czech Republic and the U.S are not classified. Although these classifications consist of many risk factors that are mitigated by Scatec Solar's partners and good network, the risk still exists and could create serious implications for the company.

One particular part of this country risk should be highlighted. It concerns the PPAs agreed with state-owned utilities in these countries and the risk of default on payments. Illustrated by South Africa where 60 % of the company's revenues are being generated. Here, the off-taker, ESKOM, currently holds a Ba1 credit rating from Moody's (Moody's, 2016), representing substantial credit risk. Similar credit risk is connected to the off-takers in Rwanda (EWSA), Honduras (ENEE) and Mali (EDM). Although the payments are guaranteed by governments this does not necessarily eliminate the risks, as the majority of governments holds similar ratings.

6.2.3 Opportunities

The objective of this section is to highlight areas of potential improvement or new opportunities in Scatec Solar's activities. Identification of completely new or possible improvement of current revenues and margins, are useful inputs needed when predicting future performance later in this valuation.

As stated in chapter 5.3 the solar power industry faces great opportunities of growth across the globe and for Scatec Solar a strategic target is the emerging markets of Africa, MENAs and Americas. The power situation in these areas represents numerous opportunities, both in terms of renewable energy and general electricity-access.

Sub-Saharan Africa currently has the world's worst electricity access with more than 600 million people lacking access to energy. Studies from McKinsey & Company reveal a significant underdevelopment in the power sector in terms of energy access, installed capacity and overall consumption (McKinsey, 2015). However, they also emphasize the bright future of the region and its extraordinary opportunity. Power consumption levels are expected to increase four times by 2040 and to meet this demand, solar power will dominate with its enormous potential of around 8 terawatts of capacity. To support this extensive development, several programs have been initiated. Like the Power Africa program launched in 2013 the UN Sustainable Energy for All program making the Sub-Sharan Africa the centre of their energy revolution. Based on the extraordinary solar resources and the focus on supporting initiatives, the Sub-Sharan Africa is an area representing great opportunities for Scatec Solar.

In the Middle East and North Africa (MENA) the opportunities for solar power is driven by cost of power rather than improved electricity access. The region is largely powered by oil and natural gas, but the recent plunge in costs of solar PV has created a new demand for renewable energy (MESIA, 2015). In addition, the two resources operate based on opposite drivers. Increased demand of fossil fuels drive prices up, while increased consumption of solar prices falls due to economies of scale. These aspects combined with the high irradiation levels of the region have engaged several countries to focus on solar power as a means to satisfy rising electricity demand (Stratfor, 2016). Similar development is observed in the Americas, especially in Latin America which possess comparable high solar resources. In the large markets of Mexico, Brazil and Chile another factor creating great solar opportunities is the desire to obtain a reliable and cheap source of electricity for their industrial sites (Wang, 2014).

In addition to good growth opportunities in emerging markets there is also technological opportunities in the industry, highlighted in chapter 5.4. One particular development predicted as a strong influential element on the industry is the potential of battery storage in renewable energy. The fact that the output from renewable energy sources like wind and solar PV are weather-dependent has been highlighted as a limitation of its potential. The fluctuation in power generation from a solar PV plant over a 24-hour period create the need for other conventional power sources to stabilise the power supply, an expensive solution. Based on this the German Energy Agency (DENA) argue that storage can compensate for short-term fluctuations in electricity generation by absorbing excess electricity from wind and solar power plants and feed it into the system later (Hockenos, 2014). Figure 11 illustrates how storing generated solar power can improve the balance of supply and demand throughout the day.

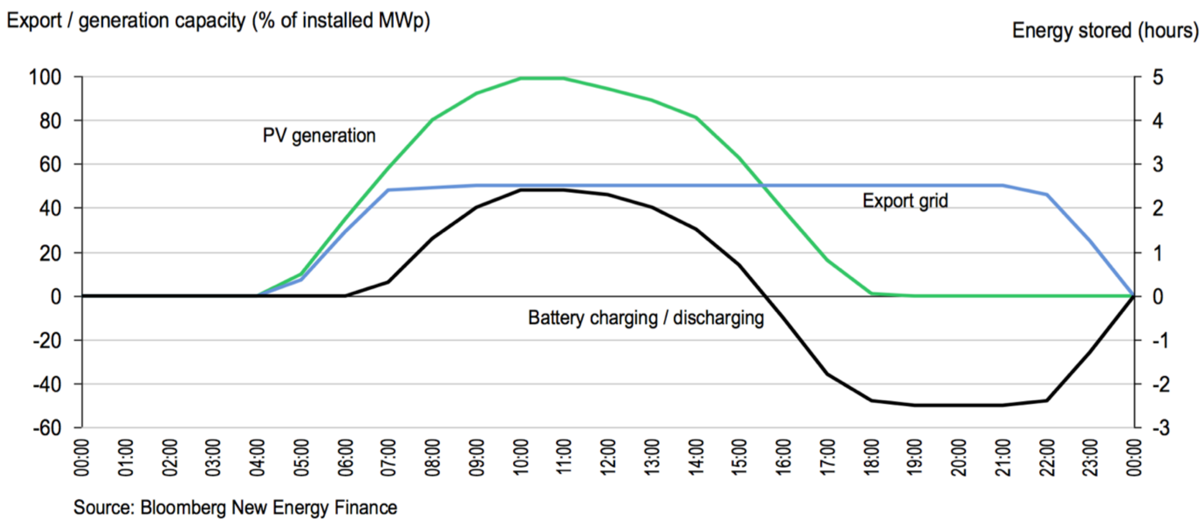

Figure 11: Benefits of Battery Storage, Source: Scatec Solar (2016)

This technology is already applied in some areas and the most preferred solution is storing energy in large-scale lithium batteries (Hockenos, 2015). Recent year's development in the costs of battery storage solutions, see figure 12**,** has increased the interest for the combination of a solar PV and battery storage. McKinsey (2015) further estimate that the cost of lithium batteries could go as low as $150 by 2020. Illustrating the growing interest, the state of California has established an energy storage standard requiring the state's IOUs to set up 1,3 GW of battery storage by 2020 (Finnigan, 2015). The halving of costs is hence building a new platform for further growth in the utility-scale solar industry. No longer set to be limited by fluctuating power generation, the development in energy storage represents new opportunities pushing solar power towards a stronger position in the worlds energy markets.

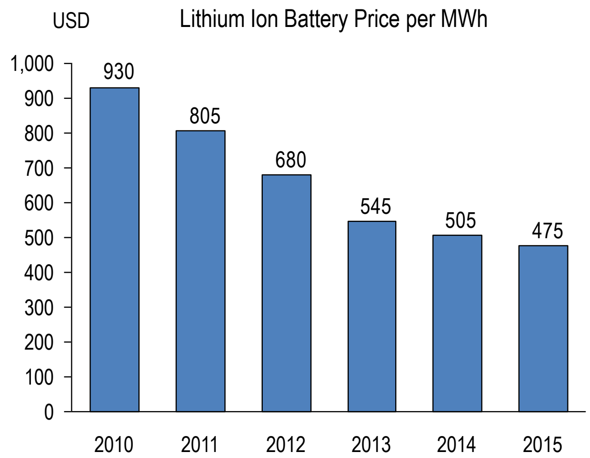

Figure 12: Development in Battery Prices, Source: Scatec Solar (2016)

6.2.4 Threats

Analysing potential threats for Scatec Solar, or the solar PV industry in general, is useful in order to identify potential negative impacts on the company's future performance and cash flow. Further, these threats must be assessed in terms of probability and degree of impact.

The support mechanisms provided by governments have, as mentioned before, been substantial for solar power in the development towards competiveness. Illustrating the influence these mechanisms can have is the latest boom in U.S solar installations, pending the expiration of ITC policy initially set to happen at the end of 2016 described in chapter 5. Although an extension of the policy where provided (see section 5.3.3), the developer's behaviour reveal how critical these support mechanisms are for their operations.

Given the solar industry's dependency on support mechanisms and policies demonstrated in earlier chapters, these tools also represent a potential threat for developers. The threats are most influential in the case of retroactive changes, affecting already operating plants or those under construction. Changes affecting future projects may also be considered threats, but their impact is not as substantial as for retroactive changes. An example of how big an impact such retroactive measures can cause is the Spanish solar giant Abengoa who are currently fighting to avoid bankruptcy (Wall Street Journal, 2016). The company's problems evolve from the Spanish government withdrawn of generous tariffs, starting in 2010 (Forbes, 2013). Although the impacts from this threat are substantial, retroactive changes to FiT schemes are rare (IFC, 2015) and would usually only become relevant in special scenarios. Changes in future support mechanisms could stir up the industry and create imbalances. Illustrating the influence such changes can have is the latest boom in U.S solar installations, pending the expiration of the ITC policy initially set to happen at the end of 2016. As a consequence of developers expecting ITC to expire, pipelines was filled and the U.S solar market is now set to grow 119 percent in 2016. Although an extension of the policy where provided (see chapter 5.3.3.2), the developer's behaviour reveal how critical these support mechanisms are for their operations and large the impact of changes could be.

6.2.5 Conclusion

This SWOT-analysis has revealed useful insight in the strategic position of Scatec Solar in today's market and the potential threats and opportunities it faces going forward. Through being an experienced "one-stop-shop" with its integrated business model and solid financial partnerships, the company is well positioned to keep on participating in the tremendous growth of solar power. However, the large proportion of operations in emerging markets with a high level of country risk makes the company vulnerable to non-operational factors. On the other side these risks are to some extent mitigated by solid partnership agreements and a strong network in emerging markets. Furthermore, the economic growth and goal of increased access to electricity for the world's population represent great opportunities for Scatec Solar going forward. Combined with the increased competitiveness and storage technology, these factors provide a basis for further growth. Lastly, the analysis covered the potential threats of future operations, highlighting the strong impacts of changes in support mechanisms in general and of retroactive measures specifically. It is important to consider these threats when forecasting future performance.

7 Financial Statement Analysis

Previous chapters have focused on solar power development and outlook and strategic aspects both on industry and company-specific level. Both areas are crucial elements when forecasting future performance of Scatec Solar and thus effect the expected free cash flows. This chapter will analyse the historical financial statements of the company and discuss important aspects providing a foundation for predicting future statements.

In the discussion of suitable valuation methods, one of the weaknesses of applying a DCF-method to value Scatec Solar was its short period as a listed company, providing limited historical data for analysis. Only three years of annual reports with consistent accounting principles are available. As a result, this financial statement analysis will not be too extensive. The main objective will be to highlight the most important and recurrent aspects of the financial statements affecting the company's future performance.

7.1 Historical Performance

Scatec Solar's income statements the last three years are presented in Table 3**.** Numbers from 2012 are available, but due to a strategic shift from selling D&C services to third-parties to becoming an integrated independent power producer (IPP) the non-consolidated numbers from the D&M segment in 2012 are not usable (Scatec Solar, 2014). However, based on notes I have been able to estimate the consolidated revenue from 2012 in order to provide a growth measure in 2013.

From its strategic shift in 2012 Scatec Solar has been experiencing rapid growth in installed capacity and power production, which has resulted in a volatile revenue growth. 2013 must be considered a year of transition were the primary focus was on constructing power plants. With 123 MW under construction and only an average of 58 MW in operation the year ended with a negative operational result, even though external revenues increased 50%. As new solar plants commenced operation in 2014 power production increased four times by year end, resulting in a tremendous revenue growth. Still adding new capacity combined with full year production at new plants, revenues continued to grow rapidly in 2015.

Consolidated Income Statement	2013	2014	2015
Revenues	115 928	455 098	867 714
Growth	*50.3 %*	*292.6 %*	*90.7 %*
Net gain/loss from sale of project assets D&C	3 904	17 393	14 112
Net income/loss from ass companies D&C	-3 191	-1 183	-865
Total revenues and other income	**116 642**	**471 311**	**880 962**
Growth	*51.8 %*	*304.1 %*	*86.9 %*
Personnel expenses	50 886	69 686	70 543
Other operating expenses	82 607	108 736	112 027
EBITDA	**-16 851**	**292 889**	**698 392**
Margin	*-14 %*	*62 %*	*79 %*
Depreciation, Amortisation & Impairment	57 836	101 859	175 609
EBIT	**-74 687**	**191 030**	**522 782**
Margin	*-64 %*	*41 %*	*59 %*

Table 3: Historical Operational Income Statement, (Source: Annual Reports)

Although revenues have been rapidly increasing, margins have been relatively more stable, when ignoring the transition year of 2013. Examining quarterly numbers reveals that the EBIT-margin has fluctuating around 50% over the last six quarters. A result of other operating expenses containing mostly O&M costs and less costs from development and construction.

Table 4 lists Scatec Solar's assets and each line items percentage of total assets. The overview reveals that solar power plants in operation or under construction amount to over half of the company's assets. An annual growth of 60-70% the last two years reflects the company's rapid expansion. Cash and equivalents are the second largest line-item as a result of the amount of cash restricted to solar projects. The amount of deferred tax assets also stands out and contains mostly tax loss carry forwards which will be reduced as the company stabilize their earnings. In general, all line-items have been fairly stable as a percentage of total assets over the last three years.

ASSETS	2013		2014		2015	
Non-current assets						
Deferred tax assets	313 644	*8.9 %*	402 011	*8.0 %*	340 670	*4.3 %*
PPL - in solar projects	1 857 294	*52.7 %*	3 049 193	*60.8 %*	5 196 298	*65.1 %*
PPL - other	8 715	*0.2 %*	13 231	*0.3 %*	19 891	*0.2 %*
Goodwill	20 566	*0.6 %*	22 169	*0.4 %*	23 595	*0.3 %*
Financial Assets	79 921	*2.3 %*	23 868	*0.5 %*	126 810	*1.6 %*
Investments in ass companies	6 321	*0.2 %*	25 841	*0.5 %*	-	*0.0 %*
Other non-current assets	31 397	*0.9 %*	214 401	*4.3 %*	136 543	*1.7 %*
Total non-current assets	**2 317 858**	*65.8 %*	**3 750 714**	*74.8 %*	**5 843 807**	*73.2 %*

Current assets						
Trade and other receivables	25 472	*0.7 %*	126 122	*2.5 %*	221 382	*2.8 %*
Other current assets	105 237	*3.0 %*	82 897	*1.7 %*	251 892	*3.2 %*
Financial assets	50 552	*1.4 %*	2 946	*0.1 %*	1 086	*0.0 %*
Cash and equivalents	1 025 362	*29.1 %*	1 049 106	*20.9 %*	1 639 029	*20.5 %*
In companies in operation	*380 935*	*10.8 %*	*527 980*	*10.5 %*	*643 495*	*8.1 %*
In companies under construction	-	*0.0 %*	*1 933*	*0.0 %*	*169 934*	*2.1 %*
Other restricted cash	*347 917*	*9.9 %*	*115 540*	*2.3 %*	*174 241*	*2.2 %*
Free cash	*296 509*	*8.4 %*	*403 653*	*8.1 %*	*651 359*	*8.2 %*
Non-current assets held for sale	-	*0.0 %*	-	*0.0 %*	26 427	*0.3 %*
Total current assets	**1 206 623**	*34.2 %*	**1 261 071**	*25.2 %*	**2 139 816**	*26.8 %*
TOTAL ASSETS	**3 524 481**	***100 %***	**5 011 785**	*100 %*	**7 983 623**	*100 %*

Table 4: Historical Assets, (Source: Annual Reports)

With PPE in solar projects being the dominant asset, table 5 shows that non-recourse financing dominates the company's liabilities. The high levels reflect the fact that solar plants are usually 75% debt financed. Although high debt levels, the characteristics of the non-recourse debt tied to each project company exclusively mitigate the risk of insolvency. Stable percentage levels over the last three years also illustrate a controlled growth in line with company financing principles. In addition, a three-year NOK 500 million green bond was issued in 2015 in order to finance increasing general corporate activities as the company will continue to grow in the future (Scatec Solar, 2015). Lastly, the drop in trade and other payables in 2014 is directly connected to the high construction activity in 2013 as the line-item is directly connected to the D&M activities.

Non-current liabilities	**2013**	***% TA***	**2014**	***% TA***	**2015**	***% TA***
Deferred tax liabilities	80 894	*2.3 %*	82 640	*1.6 %*	203 436	*2.5 %*
Non-recourse project financing	2 376 968	*67.4 %*	3 337 265	*66.6 %*	4 799 828	*60.1 %*
Bonds	-	*0.0 %*	-	*0.0 %*	492 917	*6.2 %*
Financial liabilities	-	*0.0 %*	14 886	*0.3 %*	-	*0.0 %*
Other non-current liabilities	*3 608*	*0.1 %*	*4 646*	*0.1 %*	*346 616*	*4.3 %*
Total non-current liabilities	**2 461 470**	***69.8 %***	**3 439 437**	***68.6 %***	**5 842 797**	***73.2 %***
Current liabilities	**2013**		**2014**		**2015**	
Trade and other payables	441 811	*12.5 %*	69 947	*1.4 %*	154 154	*1.9 %*
Income tax payable	91 881	*2.6 %*	41 543	*0.8 %*	23 508	*0.3 %*
Non-recourse project financing	21 572	*0.6 %*	112 786	*2.3 %*	166 789	*2.1 %*
Financial liabilities	16 298	*0.5 %*	25 773	*0.5 %*	6 184	*0.1 %*
Other current liabilities	92834	*2.6 %*	145717	*2.9 %*	364794	*4.6 %*
Total current liabilities	**664 396**	***18.9 %***	**395766**	***7.9 %***	**715429**	***9.0 %***
Total liabilities	**3 125 866**	***88.7 %***	**3 835 203**	***76.5 %***	**6 558 226**	***82.1 %***

Table 5: Historical Liabilities, (Source: Annual Reports)

Reviewing the total equity of Scatec Solar in table 6, some aspects and elements must be elaborated. The most apparent line-item is the paid in capital, which more than doubled due to the IPO in October 2014 with a net capital increase of NOK 475 millions. Secondly, the proportion of non-controlling interest in total equity is relatively high. The company creates an own special purposes vehicle (SPV) for every solar project and each SPV is financed with a proportion of debt, own equity and co-investors. Non-controlling interests represents these co-investors claim on the group's consolidated equity. After the IPO in 2014 non-controlling interests have been stable at approximately 45%. A final special line-item is the negative retained earnings. A consequence of high construction activity relative to power production in the early years of the company's existence. As completed power plants now have reached a sustainable power production to generate good profits, accumulated retained earnings will move towards positive numbers.

Equity	**2013**		**2014**		**2015**	
Share capital	1 624	*0.4 %*	2 345	*0.2 %*	2 345	*0.2 %*
Share premium	301 286	*75.6 %*	794 142	*67.5 %*	807 903	*56.7 %*
Total paid in capital	**302 910**	***76.0 %***	**796 487**	***67.7 %***	**810 248**	***56.8 %***
Retained earnings	-147 074	*-36.9 %*	-207 227	*-17.6 %*	-164 909	*-11.6 %*
Other reserves	-51 860	*-13.0 %*	40 511	*3.4 %*	161 803	*11.4 %*
Total other equity	**-198 934**	***-49.9 %***	**-166 716**	***-14.2 %***	**-3 106**	***-0.2 %***
Non-controlling interests	294 640	*73.9 %*	546 811	*46.5 %*	618 255	*43.4 %*
Total equity	**398 616**	*100.0 %*	**1 176 582**	*100.0 %*	**1 425 397**	*100.0 %*

Table 6: Historical Equity Levels, (Source: Annual Reports)

Having presented the historical financial statements of the company and commented on important factors and special aspects, the next section will focus on normalizing and reorganizing the financial statements to represent the core operations of the company.

7.2 Normalizing Financial Statements

The previous chapter described and commented on the historical performance of Scatec Solar in light of their current situation of transition and high growth. When normalizing financial statements, the objective is to identify and remove non-recurring items in order to derive the core operational income/costs and balance sheet sizes. In the following I will discuss different figures in the income statement and balance sheet both in a historical and future perspective.

7.2.1 Income Statement

The objective of examining the operating income statement is to eliminate potential non-recurrent items that should not be part of the further analysis and look for patterns in recent year's development that are useful in the following valuation.

7.2.1.1 Operating Expenses

Due to lack of historical data figure 13 illustrates the quarterly development in total operating expenses (OPEX) since 2014. The transition period of 2013 still affects levels in 2014, but as a new power plants produce at 100% capacity the total OPEX stabilize at around 30% of total sales in the 2015 quarters. Consequently, the EBITDA margin also increases through 2014 and settles at approximately 70% in the latest quarters. Furthermore, the personnel expenses averages at 40% of total OPEX in the same period, with minimal variation. The stable OPEX ratio illustrate the predictable costs of running a solar power plant, as the majority of expenditures are scheduled maintenance.

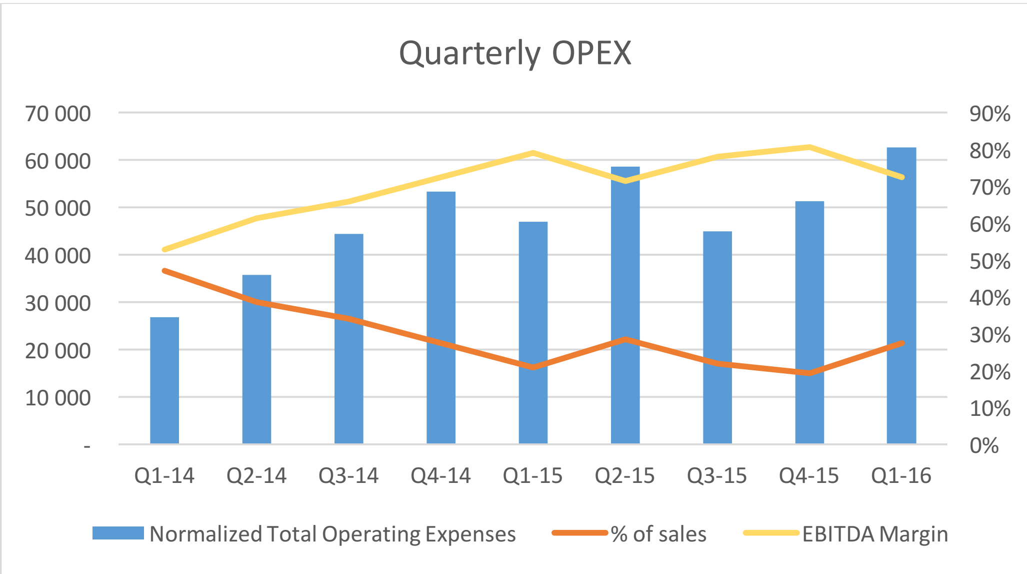

Figure 13: Historical Quarterly OPEX and EBITDA Margin, (Source: Quarterly Reports)

Depreciation, amortisation and impairment costs will be discussed in the section covering capital expenditures.

7.2.1.2 Other income adjustments

All last three years Scatec Solar has developed and constructed solar projects which then have been sold off, earning additional income to the standard revenues. In addition, there have been investments in associated companies accounted for by the equity method which also have affected the total revenue and other income. As all investments in these associated companies were sold off in 2015 (Scatec Solar, 2016), this source of other income will not be considered in the valuation. Regarding expected future profit or loss from sale of solar projects, there are no such projects under construction. All expected projects from the backlog and pipeline are also set to be operated by the company and consequently this line-item will be assumed to equal zero in the forecasting of other income. Furthermore, generated revenues will be forecasted on the basis of power production only, as O&M income are expected to be consolidated.

7.2.2 Capital Expenditures - CAPEX

In order to facilitate the rapid growth in installed capacity and solar power production, Scatec Solar has made substantial capital expenditures over the last three years. Capital expenditures consists practically entirely of investments in developing, constructing and maintaining property, plant and equipment (PPE) to solar projects. Consequently, the historical CAPEX have also been very volatile due to several projects being initiated simultaneously. With lumpy historical CAPEX, a normalization of these levels are necessary in order to forecast future investments. Preferred approaches to smooth predicted levels are averages of historical CAPEX or industry averages as a percentage of a base input (Damodaran, 2012). However, further growth is a specified objective from the management and CAPEX are not expected to reach any stable levels in the forthcoming years. Hence, a smoothing of CAPEX will not be suitable before the company reach a steady state.

Analysing historical CAPEX, there are no observable connection to the levels of revenues or power production neither on a quarterly and yearly basis. But looking at the development in accumulated quarterly investments and the MW in operation over the last 15 quarters reveals a significant, though not surprising, connection illustrated in figure 14.

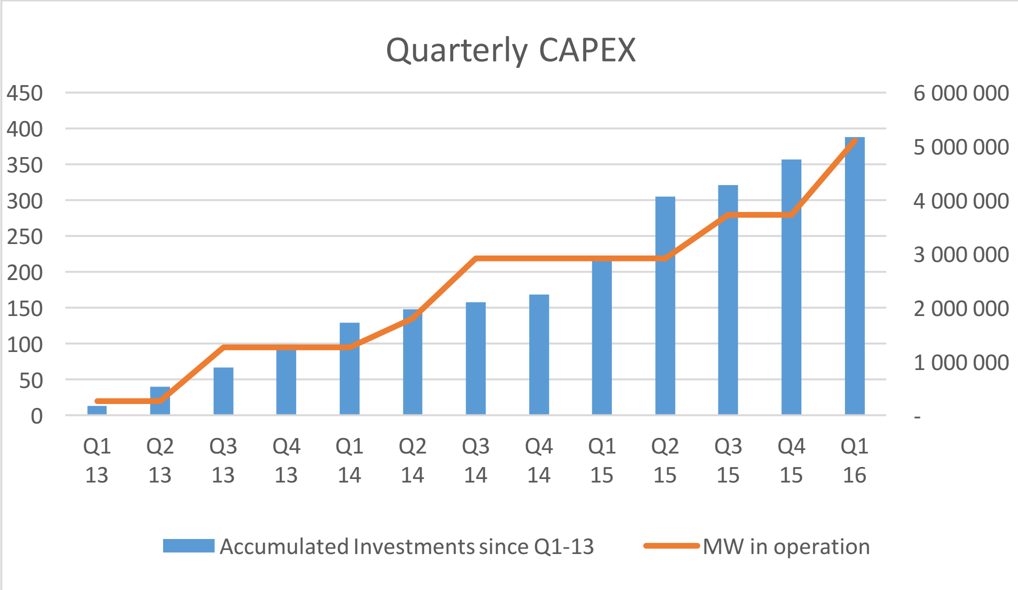

Figure 14: Accumulated Quarterly CAPEX and MW in Operation, (Source: Quarterly Reports)

In the forecasting of stage one, the first five years the CAPEX levels will be based on the stated and expected future installation levels of the company and a mix of historical and future NOK/MW investment costs. A numerical objective set by the management is 1400-1600 MW in operation and under construction by year end 2018 and will be further discussed in the in the forecasting of free cash flow. As the company is expected to reach more stable installation levels after 2020, the forecasting will move towards a more smoothed average CAPEX in the two last stages of the model.

Depreciation and impairment of existing PPE have been stable at 5.5 % of carrying amount at previous year-end. This ratio is expected to continue in the years to come. Lastly, for the record, there are no capital expenses reported as operating expenses in the annual reports from 2013-15. Nor have the company completed any acquisitions which could affect the levels of CAPEX.

7.2.3 Working Capital

Working capital is defined as the difference between current assets and current liabilities (Damodaran, 2012). For valuation purposes, interest bearing debt, excess cash and marketable securities are removed from current assets and liabilities in order to focus on the assets and liabilities related to the ongoing operations of the firm, the operating working capital. For Scatec Solar, which keep no inventory the net working capital equals:

$$NWC = Accounts\ Receivable + Operating\ Cash - Accounts\ Payable$$

Operating cash restricted to projects in operation or under construction make out the majority of operating current assets while current liabilities are equally shared between trade and other payables and other current liabilities. Trade and other payables are directly connected to the activity level of the D&C segment while other current liabilities are a mix of liabilities to related parties and different accrued expenses.

Changes in net operating working capital (NWC) effects the free cash flow to the firm as a growing NWC ties up more cash and produces reinvestment needs (Damodaran, 2012). Estimated historical NWC levels are fairly easy to obtain from historical annual reports and illustrated in figure 7. Predicting future changes, however, are more difficult because they are unstable and thus difficult to normalize. To obtain the best projected changes in NWC, they can either be tied to expected changes in revenues through a historical NWC-to-revenues ratio or be broken down in more detail, estimating each item separately. (Damodaran, 2012). Both approaches have pros and cons.

Considering how the various items in the company's net operating working capital are related to different activities and accounts, it makes sense to break down it down in more detail. This provides a better forecast of how much future cash will be tied up in the company. Although more detailed, the majority of the NWC items are still connected to the level of revenues. Both accounts naturally related to the sale of electricity, like the trade and other receivables, but also those more related to the general operations of the company. Each item's related ratio is presented in table 7.

NOK Thousand	**2013**	**2014**	**2015**	**Norm. Ratio**
Operating cash	380 935	529 913	813 429	
% of net PPE	*20 %*	*17 %*	*16 %*	**17 %**
Receivables	25 472	126 122	221 382	
% of revenues	*22 %*	*27 %*	*25 %*	**25 %**
Other current assets	91 172	74 366	187 949	
% of revenues	*79 %*	*16 %*	*21 %*	**20 %**
Operating current assets	**497 579**	**730 401**	**1 222 760**	

Payables	441 811	69 947	154 154	
% of investments in PPE	*34 %*	*8 %*	*6 %*	**7 %**
Incom tax payable	91 881	41 543	23 508	
% of revenues	*79 %*	*9 %*	*3 %*	**6 %**
Other current liabilities	92 834	145 717	168 113	
% of revenues	*80 %*	*31 %*	*19 %*	**26 %**
Operating current liabilities	**626 526**	**257 207**	**345 775**	
Net Operating WC	**-128 947**	**473 194**	**876 985**	

Table 7: Historical Net Operating Working Capital

Two accounts need a more specific ratio than the general consolidated revenues. The operating cash, which dominates the current assets, are cash tied up in all the different solar project companies, the SPVs. It is restricted to cover debt services, insurance reserves etc. Consequently, the levels of operating cash are more likely to follow the levels of net PPE rather than the consolidated revenues. Similarly, the trade and other payables are directly connected to the development and construction segment. As the company matures and lowers their investments in new projects, the trade and other payables will be reduced accordingly. As ratio of revenues, this development would not be taken into account and provides thus a more accurate forecast of reinvestments need in the future.

Table 7 also provides the historical ratios for the previous three years and a normalised ratio representing the expected levels going forward. The normalised ratio is mainly based on the two last years given the transition period of 2013 mentioned earlier.

7.2.4 Reformulated Balance Sheet

The last element of the financial statement analysis is a reformulation of the balance sheet into three categories of components; operating, non-operating and sources of financing. Reformulated, the balance sheet now more accurately reflects capital used for operations and how this capital is funded by investors. Resulting in a more precise view of the assets drive the core operations and further the enterprise value of the company. Reformulated balance sheets of the last three years are presented in table 8.

USES	**2013**	**2014**	**2015**
Operating cash	380 935	529 913	813 429
Receivables	25 472	126 122	221 382
Other current assets	91 172	74 366	187 949
Operating current assets	**497 579**	**730 401**	**1 222 760**
Payables	441 811	69 947	154 154
Incom tax payable	91 881	41 543	23 508
Other current liabilities	92 834	145 717	168 113
Operating current liabilities	**626 526**	**257 207**	**345 775**
Operating Working Capital	-128 947	473 194	876 985
Net PPE	1 866 009	3 062 424	5 216 189
Invested capital (exl goodwill)	**1 737 062**	**3 535 618**	**6 093 174**
Goodwill	20 566	22 169	23 595
Invested capital (incl goodwill)	**1 757 628**	**3 557 787**	**6 116 769**
Non-operating restr cash	347 918	115 540	174 241
Excess cash	296 509	403 653	651 359
Investments	6 321	25 841	-
Net financial assets	114 175	-13 845	148 139
Net non-operating assets	41 854	218 286	-342 811
TOTAL FUNDS INVESTED	**2 564 405**	**4 307 262**	**6 747 697**

SOURCES	**2013**	**2014**	**2015**
Deferred tax assets	-313 644	-402 011	-340 670
Deferred tax liabilities	80 894	82 640	203 436
Shareholder's equity	103 976	629 771	807 142
Equity & equivalents	**-128 774**	**310 400**	**669 908**
Non-recourse debt	2 398 540	3 450 051	4 966 617
Bonds	-	-	492 917
Non-controlling interests	294 640	546 811	618 255
Debt & equivalents	**2 693 180**	**3 996 862**	**6 077 789**
TOTAL FUNDS INVESTED	**2 564 406**	**4 307 262**	**6 747 697**

Table 8: Reformulated Balance Sheet

8 Driver Assumptions

After analysing the last three years of annual and quarterly financial statements and normalizing relevant accounts, this section will focus on analysing the main drivers of value for Scatec Solar. An assessment of future power production and prices combined with the components of the financial statement analysis will provide the foundation of the forecasted operating income. Along with an examination of the expected need for capital expenditures these three items make out the most influential components of the free cash flow to firm and hence the enterprise value. Historical data, the solar power industry analysis and the strategic analysis will be the main inputs to this analysis.

8.1 Power Production

Although Scatec Solar consists of three different operating segments, power production is the dominating segment both in terms of external revenues and EBIT-margins due to consolidated numbers. Figure 15 illustrates how the quarterly development in operational income has followed the increase in power production. Considering the company's phase in the life cycle, no steady growth in production are expected. Instead, based on a multi-stage DCF-model, the predicted power production levels will be divided into three steps. The first five years will focus on the company's projects under construction and in the backlog, while the next five years will assess the company's pipeline and development towards more stable power production.

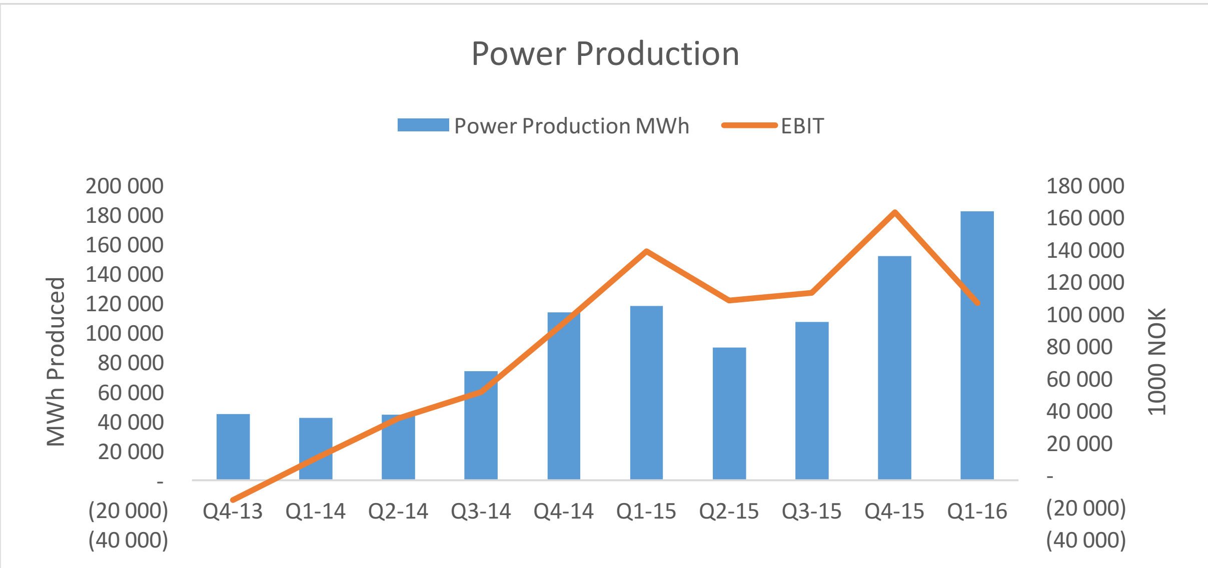

Figure 15: Historical Quarterly Power Production and EBIT, (Source, Quarterly Reports)

The analysis of the solar energy industry in chapter 5 presented both historical and expected future development of the installed capacity of solar PV. Considering Scatec Solar's growth in power production presented in figure 15 it is reasonable to say that the company has participated and contributed to this extraordinary expansion in the industry recent years. Based on the outlook for new added capacity in the industry, there no signs of this rapid growth maturing any time the next 5-10 years and the opportunities available for Scatec Solar are numerous.

8.1.1 2016 – 2020: Further growth

Given the nature of the utility-scale solar power sector, were operating plants are expected to produce power at a stable level for around 20 years, the most interesting aspect is the capacity of existing plants and that of the expected new projects. Expected new projects are based on the backlog and pipeline distributed by the company. The backlog is defined as projects with a secured off-take agreement estimated to have a 90% probability of realisation (Scatec Solar, 2016). Projects in the pipeline have a likelihood of more than 50% to reach financial close and realisation. By analysing existing plant's recent performance and the potential of projects in the backlog and pipeline, a reasonable prediction of production the next five years can be made.

At the end of the first quarter 2016, Scatec Solar had seven operational power plants with a combined capacity of 383 MW listed in table 9**,** with their corresponding historical and stated performance by the company.

Plants	Country	MW	2014	2015	Stated Production
Czech	Czech	20	20 686	22 364	20 500
Kalkbult	South Africa	75	150 528	143 788	150 000
Dreunberg	South Africa	75	-	157 708	178 000
Linde	South Africa	40	-	87 554	94 000
ASYV	Rwanda	9	-	13 817	15 500
Agua Fria	Honduras	60	-	-	103 000
Utha Red Hills	United States	104	-	-	210 000

Table 9: Historical and Stated Production by Plant, (Source: Annual and Quarterly Reports)

The table presents only a complete full year performance. Although quarterly performance exists, they are not representable for a whole year due to many plants being affected by varying irradiation levels throughout the year. The stated production levels are obtained from the company's presentation of project key figures and represent the expected production. The largest differences between actual and expected performance in 2015 were related to the operations in South Africa which experienced deviations from expected irradiation based on historical weather data. Future levels in South Africa are assumed to return to expected levels. Plants in Honduras and The U.S initiated operation in Q3 2015 and Q1 2016 respectively. Based on quarterly production levels so far and expected season adjustments both plants appear to be performing in line with expected production.

The existing plants are expected to operate at their stated levels for the next five years. In addition, an assessment of the projects under construction and in the backlog is necessary to predict the total expected production. Table 10 presents the current backlog at march 2016 with reported capacity and production levels.

Under Construction	**Country**	**MW**	**Capacity**	**Expected Start of Construction**	**Expected Start of Operation**
Oryx	Jordan	10	25 000	Q1 - 2015	Q2 - 2016
EJRE	Jordan	22	52 333	Q2 - 2015	Q3 - 2016
GLAE	Jordan	11	26 167	Q2 - 2016	Q3 - 2016
Backlog					
Los Prados	Honduras	53	110 000	Q2 - 2016	Q1 - 2017
Segou	Mali	33	60 000	Q3 - 2016	Q3 - 2017
Piaui	Brazil	78	164 000	Q4 - 2016	Q4 - 2017
Upington	South Africa	258	645 000	Q1 - 2017	Q1 - 2018

Table 10: Under Construction and Backlog Project Details, (Source: Annual and Quarterly Reports)

Of the projects under construction in Jordan the Oryx plant is mechanically complete and commercial operation is expected in May. The remaining EJRE and GLAE projects in Jordan were at 47% and 63% of completion respectively at the end of March 2016. For all projects in backlog the management expects financial close and start of construction by the end of the year or early 2017 (Scatec Solar, 2016).

When all projects above are in operation by 2018, the total installed capacity will reach 848 MW. Although more than a doubling of today's measure, the company' latest target is 1400-1600 MW installed or under construction by the end of 2018. Thus, the power production in the next five-year period are expected to exceed the existing and upcoming capacity covered so far. For further input on future production levels the project pipeline presented in table 11 is assessed.

Pipeline	MW	Target Construction Start
Mozambique	40	2016
Kenya	44	2017
West Africa	17	2017
Egypt	341	2016
Pakistan	150	2017
Americas (Mexico)	30	2017
South Africa	430	2018
Total Pipeline	1056	

Table 11: Pipeline Projects' Details

There is less information available for the company's project pipeline, and consequently much more uncertainty when predicting future production. Projects are yet to secure power purchase agreements and support agreements at this stage, which are critical elements of reaching realisation. Based on the theoretical expected realisation, 50% of the pipeline MWs will be installed, a total of 528 MW. To provide a more accurate expected outcome of the pipeline, an assessment of each pipeline project is needed.

The pipeline projects closest to securing off-take agreements and financial close are, based on company information, the East African projects, Egypt and Pakistan. Mozambique and Kenya have financing processes on track and are close to completing negotiation of PPAs. In Egypt and Pakistan, participation in large projects are secured and agreements on development are already signed. Thus, PPAs and tariffs are expected to be secured as processes proceed.

Summing up the current operations, expected additions from projects under construction and from backlog, combined with the most qualified pipeline projects table 12 presents the predicted MW capacity of Scatec Solar, the next five years. The table only focus on how the abovementioned projects gradually will enter into operation through the backlog and construction phase. Additional projects will not be assessed in this section. By 2020 the company is expected to have 1423 MW installed, in line with their stated goal of 1400-1600 MW in operation or under construction by 2018. The rapid growth is also justified by the expected overall installed capacity growth in the industry covered in chapter 5.

MW Capacity	2016	2017	2018	2019	2020
In operation	426	512	848	932	1423
Under construction	164	420	425	491	
In backlog	683	491	150		

Table 12: Stage 1 Expected Capacity Levels

Having predicted the total installed MW capacity in operation each of the next five years, one more step remain in order to reach the complete power production levels needed in the valuation. For projects in operation, under construction and in the backlog an expected level of power production is obtainable. The pipeline projects however, only register the MW capacity. In theory, for every MW installed, a plant will produce 24 MWh each day given 24-hour production. In practice, the solar power plants only produce when the sun is shining. Thus, to estimate the MWh power production from the stated MW, a *capacity factor* is used. The capacity factor measures the ratio of actual power output over potential output at full operation (IFC, 2015):

$$Capacity\ Factor\ (CF) = \frac{Energy\ Generated\ per\ Annum\ (MWh)}{24 * 365 * Installed\ Capacity (MW)}$$

Rewriting this expression yields the expected generated power per annum given the CF and installed MW:

$$Energy\ Generated\ per\ Annum\ (MWh) = CF * 8760 * Installed\ Capacity (MW)$$

The capacity factor is mainly affected by two factors, the geographical location of the plant and the tracking system of the PV modules. Geographical location affects the seasonal changes in irradiation and weather conditions, while different tracking systems maximise the annual irradiation as modules follow the sun as it moves across the sky. In lack of sufficient information about the pipeline projects the conversion ratios will be based on the ratios of existing plants. Table 13 presents all CFs of the covered power plants and reveals that all plants, except the European ones, have a ratio between 20-30%. Consequently, the pipeline projects are expected to perform at ratios equal to existing plants in similar geographical areas. With the ratios set, the expected level of generated power per year is also presented in table 13.

	Czech	Kalkbult	Dreun-berg	Linde	ASYV	Agua Fria	Utah Red Hills	Oryx	EJRE
MW	20	75	75	40	9	60	104	10	22
CF	12 %	23 %	27 %	27 %	21 %	20 %	23 %	29 %	27 %
GWh p.a	20.5	150	178	94	15.5	103	210	25	52.33
	GLAE	**Los Prados**	**Segou**	**Piaui**	**Upington**	**Mozam-bique**	**Kenya**	**Egypt**	**Pakistan**
MW	11	53	33	78	258	40	44	341	150
CF	27 %	24 %	21 %	24 %	29 %	27 %	25 %	27 %	25 %
GWh p.a	26.167	110	60	164	645	94.61	96.36	806.53	328.5

Table 13: Capacity Factor by Plant

All needed inputs are now estimated and the predicted total power production of all solar power plants for the coming five-year period are listed in table 14 below. A more detailed table is presented in Appendix 2**.** The table reveals a substantial increase in production levels in line with the large growth ambitions of the company.

MWh	2015	2016E	2017E	2018E	2019E	2020E
Total	466 278	829 000	1 004 500	1 853 500	2 044 468	3 179 501
MW operation	279	426	512	848	932	1423

Table 14: Stage 1 Predicted Power Production

8.1.2 2021 – 2025: Stabilizing Growth

Expecting an increase of total annual power produced from 466 GWh in 2015 to 3180 GWh in 2020, Scatec Solar will most likely enter a more mature phase, with more focus on optimizing and maintaining their existing plants. There will still be new capacity installed, but relatively to the MW in operation additions will be small. The objective of the following section is to forecast the performance of the second-stage in the DCF-model.

The first stage of the power production forecasting focused specially on the expected solar projects presented by the company. For the second stage a more general approach is required, as the information on future projects are only referred to as possibilities. These possibilities are projects yet to reach 50 % likelihood and enter the pipeline, but were a feasibility study and business case have been made (Scatec Solar Q1, 2016). All opportunities of new capacity are connected the emerging markets of Americas, Africa and MENA[3]. One of

[3] Middle East & North Africa

the promising areas mentioned in the market analysis, but also an area associated with high country risks in terms of political stability and grid capacity. Processes in these areas are complex and time-consuming. In the first quarter of 2016, the company claimed 2426 MW of project opportunities available.

Based on the assessment of the projects opportunities' characteristics, the expected fraction of added MW from the company's stated possible capacity by 2025 are assumed to be in the area of 25 %. For simplicity, a smoothed increase year-on-year from 2021 is further assumed. The added MW are presented in table 15.

	Total opportunities	**Expected by 2025**	**2021E**	**2022E**	**2023E**	**2024E**	**2025E**
Africa, Americas, MENA	2426	600	120	240	360	480	600
Total MWh			3 442 301	3 705 101	3 967 901	4 230 701	4 493 501

Table 15: Stage 2 Predicted Installed Capacity

The table also presents the total MWh produced by the entire company after adding the new capacity. When converting the added MW to MWh of extra production a general conversion ratio of 25% has been used, a fair estimate covering all the three regions.

8.1.2.1 2026 - : Steady State

The third and final stage of the DCF-model is where the company has reached a steady state of production. New installed capacity at this stage will be aimed at maintaining current levels of MW.

8.2 Power Prices – Purchase Power Agreements

As mentioned above, the power production segment dominates the consolidated income statement, contributing to roughly 98% of total consolidated revenues the last two years. In addition to the power production analysed above, the price of power obtained through 20-25-year PPAs make up the two driving components of total consolidated revenues. Each power plant operates with independent PPAs who all are adjusted for inflation. Hence, this section will assess the existing running PPAs and the expected levels of PPAs for future solar power projects. The analysis will be based on historical revenues, company information on future projects and market outlook for future PPA levels.

8.2.1 Running PPAs

Each of the company's seven operating solar plants have 20-25-yearlong running PPAs. Table 16 presents a general price per MWh for for each PPA based on company-distributed information on expected revenues and production. In addition, 2015 revenues and NOK/MWh are presented for plants in full-year operation. With some exceptions, the price per MWh matches the expected levels. The differences at the Agua Fria plants are due to an expected additional incentive tariff, not yet running, while the higher prices in Rwanda are related to the strengthening of the USD/NOK FX rate. In addition, the Utah Red Hills plant will sell their power to merchant market in 2016 as the PPA does not start running before 2017 which means substantially lower revenues the first year. The price presented in table 16 is the fixed PPA price. Average merchant price for Q1 2016 was 16.4 USD/MWh (Scatec Solar Q1, 2016) and will be used for all revenues of 2016.

PPA prices are presented in NOK thousand, but are originally running in different currencies listed in the table. As a consequence, the company is exposed to currency risk when income from subsidiaries are translated back to the consolidated financial statements. The general policy of the company is not to hedge this currency exposure (Scatec Solar, 2016), thus the reported income from international subsidiaries will fluctuate with the exchange rates.

1000 NOK	FX	Revenues 2015	1000 NOK/ MWh	Expected Revenues*	Expected Power Production*	1000 NOK/ MWh*
Czech	CZK	87 200	3.90	78 000	20 500	3.80
Kalkbult	ZAR	283 900	1.97	280 000	150 000	1.87
Dreunberg	ZAR	268 900	1.71	304 000	178 000	1.71
Linde	ZAR	145 400	1.66	155 000	94 000	1.65
ASYV	USD	28 600	2.07	23 000	15 500	1.48
Agua Fria	USD			135 000	103 000	1.31
Red Hills	USD			110 000	210 000	0.52

Table 16: Historical and Expected Revenues and PPA-levels, (Source: Annual and Quarterly Reports)

When forecasting the future revenues of existing plants, the expected revenues presented by the company will be used as they are assumed to be the expected revenue roughly adjusted for currency fluctuations. Furthermore, the spread of exposure across several currencies are expected to even out the gains and losses from currency translations. Where no NOK measures are available, an estimate of NOK/USD at 8.2 will be used. The only adjustments needed are related to inflation. Each running project-PPA has individual inflation adjustments. Some are fixed yearly adjustments and others follow the operating country's CPI. A list of the different adjustments is presented in table 17**.**

Plant	Yearly Inflation Adjustment
Czech	2.0 %
Kalkbult	South African CPI
Dreunberg	19% of S.A CPI%
Linde	18% of S.A CPI%
ASYV	1.5 %
Agua Fria	1.5 %
Utah Red Hills	No adjustments

Table 17: Inflation Adjustment Agreements, (Source: Annual and Quarterly Reports)

8.2.2 Backlog & Pipeline PPAs

In addition to the distributed information on expected revenues for plants in operation, the company has also revealed their expectations for the projects under construction and in backlog. The available information is presented in table 18. Regarding the inflation adjustments, there are no information regarding the Los Prados or Piaui plants, but denominated in USD and operating in the same area as the Agua Fria plant, they are assumed to be adjusted equally.

1000 NOK	FX	Expected Revenues*	Inflation Adjustment	1000 NOK/ MWh
Oryx	USD	33 000	No	1.32
EJRE	USD	66 667	No	1.27
GLAE	USD	33 333	No	1.27
Los Prados	USD	128 000	1.5%	1.16
Piaui*	USD/BRL	115 000	1.5%	0.70
Segou	EUR	76 000	1.5%	1.27
Upington	ZAR	387 000	20% of CPI	0.60

Table 18: Expected Revenues Projects Under Construction and Backlog, (Source: Annual and Quarterly Reports)

All distributed revenues are denominated in NOK, except the project in Piaui, Brazil, which only has USD-denominated revenues available.

The remaining projects, in the company's pipeline discussed in the power production section, do not have any information on prices or revenues available. In order to obtain realistic prices for these projects, existing projects, recently issued PPAs and different FiT-schemes in the markets will be assessed.

Two of the four different projects in the pipeline, Pakistan and Egypt, are part of large state-driven renewable energy initiatives. In Egypt the official total target of installed solar PV over the next years is 2300 MW and the associated FiT-scheme is set at 14.34$.cent/kWh for capacity exceeding 50MW (EgyptERA, 2014). As a participant in this initiative, the PPA of Scatec Solar's Egyptian projects will generate revenues of around USD 143/MWh. In Pakistan the Alternative Energy Development Board (AEDB) have introduced a framework and FiTs for solar PV as one of many initiatives to cope with the country's severe energy crisis. The levelised tariff for the 25-year PPA granted by the NEPRA[4], which Scatec seek to secure, is 10.725$.cent/kWh (IFC, 2016).

In Kenya there has existed FiTs for solar-generated electricity for several years and the last regulation was made with the Energy Solar Photovoltaic Systems Regulations in 2012. For utility-scale, grid connected solar plants with a capacity between 10-40MW a standardized FiT of $0.12/kWh applies (PV Magazine, 2015). Although this level has been under criticism of being too low to attract investors (PV-Tech, 2014), it will be the base of the revenue-forecast of the Kenya project.

The last project Mozambique is carried out in a less developed solar PV market. It is one of the first PV initiatives in the Electricidade de Moçambique's (EDM) new energy strategy, aiming at more diversified energy supply mix and environmental awareness and sustainability (ERM, 2016). With such a young market for solar PV, there exists no established FiT-schemes yet. However, the ministry of energy did launch a FiT for for biomass, small hydro, solar and wind in 2014. The rates varied between $0.13-$0.41/kWh depending on technology, but have not been implemented and are still pending (Climatescope, 2015). Based on these inputs, the USD/MWh is set at USD 130 for the expected Mozambique project. A summary of all expected PPA-levels and assumed inflation adjustments for the pipeline-projects are presented in table 19.

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[4] National Electric Power Regulatory Authority.

	FX	Expected Revenues	Inflation Adjustment	FiT Scheme	1000 NOK/ MWh
Mozambique	USD	130 559	1.5%	USD 130	1.07
Kenya	USD	94 818	1.5%	USD 120	0.98
Egypt	USD	945 741	1.5%	USD 143	1.17
Pakistan	USD	288 226	1.5%	USD 107	0.88

Table 19: Expected Revenues Pipeline Projects, (Source: Annual and Quarterly Reports)

8.2.3 Future PPAs

There exists little obtainable and specific information regarding the project opportunities in Africa, Americas and MENAs considered in the second-step of the power production forecasting. As a consequence, a general price per MWh will be used to estimate future revenues. Several aspects must be considered when setting this rate. The solar power market outlook in chapter 5 indicated that the attractive FiT-schemes will be moderated or disappear as the industry are maturing, indicating that the price level per MWh is set to be lower in the future. This is supported by the strategic analysis in chapter 6, ascertaining strong competitiveness in the industry which in turn will push down prices. On the other hand, the strategy of Scatec Solar is clearly aimed at the emerging markets were solar PV will be growing for many years before maturing. Furthermore, the company operates with strict requirements in terms of return on investments and will not push down their prices to win new projects at any cost. The sum of all aspects is a price lower than today's average, but not necessarily lower than the minimum running rate. Future PPAs will be expected to average at a rate of 1000 NOK/MWh. This rate is expected to be adjusted for inflation yearly at the same rate as previous projects in the emerging markets of Africa, Americas and MENAs.

8.3 Capital Expenditure – Investments in PPE

In the financial statement analysis, the high levels of investments in property plant and equipment (PPE) over the last three years were described. The strong correlation between installed capacity and accumulated investments were also illustrated. In light of this observations the investments in PPE is expected to follow the same three-stage model as in the power production section. The next five years of continuing high growth will be accompanied by large investments in PPE while the following five years of stabilizing growth will be reflected in more moderate investments and finally a third-stage steady state where investments will equal depreciation.

In addition to the information on power production and revenues, the company also distribute data on expected total capital expenditure for each project under construction or in the backlog. The only assumptions needed on these investments are the timing of when they occur. For the projects in the pipeline there are no obtainable information on expected total expenditures. In order to estimate these measures, the expected cost per MW installed will be used. Historical price levels and expected development in technology and costs in the market will be considered when estimating the future cost ratio.

Table 20 shows the total expenditures on recent and upcoming projects with their corresponding price per MW capacity. Ignoring the unusually high costs of the Jordan-projects, the CAPEX per MW installed averages at NOK 14.7 million (USD 1.7m) for the latest six projects. The price level for future projects in the pipeline are expected to follow these historical levels to a large extent. There have, however, been an observable development in the industry's costs lately, covered in the solar market analysis in chapter 5**.** The falling trend in costs are expected to continue and will affect the total CAPEX of future projects. Figure 7 from Bloomberg New Energy Finance in section 5.3.1 predicts a price per MW of USD 1.09 million in 2020, not necessarily a cost representative for Scatec Solar's projects, but the yearly general decrease of around 4 percent from 2015 to 2020 are expected to also be reflected in the company's future capital expenditures.

NOK Thousand	**MW**	**CAPEX**	**1000 NOK/MW**
Recent projects			
Red Hills	104	NOK 1 598 000	NOK 15 365
Agua Fria	60	NOK 1 020 000	NOK 17 000
Under Construction			
Oryx	10	NOK 300 000	NOK 30 000
EJRE	22	NOK 580 000	NOK 26 364
GLAE	11	NOK 290 000	NOK 26 364
Backlog			
Los Prados	53	NOK 870 000	NOK 16 415
Segou	33	NOK 490 000	NOK 14 848
Piaui	78	NOK 925 000	NOK 11 859
Upington	258	NOK 3 300 000	NOK 12 791

Table 20: Historical and Future CAPEX Levels by Plant

The last assumption regarding the capital expenditures are related to how projects expenditures are spread over more than one fiscal year as they follow the construction process. All investments are seldom made within the same year that the plants start operation, thus an assessment on when different project investments will occur are necessary.

Investments in all three projects in Jordan have already, to a large extent, been made. At year-end 2015 the Oryx plant had reach 66% percentage-of-completion (PoC), while the EJRE and GLAE project PoC were 24% and 33% respectively. For simplicity, the remaining investments in these projects are assumed to follow the PoC. The projects in the backlog are divided by quarters, splitting the Los Prados investment in ¾ occurring in 2016 and ¼ in 2017 etc. Timing of the construction process for the pipeline-process are less specific, so the general assumption is that these investments will be split equally between two years to smooth the investments slightly. The result is presented in table 21 which lists the total expected CAPEX for each of the next five years. In year 2020 additional investments will be made connected to the next five-year period discussed in the next paragraph.

NOK Thousand	**2016**	**2017**	**2018**	**2019**	**2020**
MW in operation	426	512	848	932	1 423
Expected NOK/MW for pipeline	14 713	13 927	13 253	12 691	12 242
CAPEX	1 865 850	4 184 924	3 504 997	3 075 420	2 302 726

Table 21: Stage 1 Expected CAPEX Levels

After five years of high growth and large investments in PPE, the activity is expected to mature over the next five-year period, as mentioned above. New projects opportunities in Africa, Americas and MENA will still contribute to additional investments but at a smaller and more stable scale of 120 MW per year. Forecasting the capex levels in this period contains more uncertainty, but are still expected to follow the technology and costs development in the PV module industry. Figure 4 in the solar industry analysis indicate that module prices are expected to keep decreasing from 2020 towards 2025. Further, there are no signs from the strategic analysis of the bargaining power towards the suppliers getting any stronger either. Thus, based on this, the cost per MW installed is expected be further reduced in the second-stage. Not to the same extent as in the high growth phase, but at a 2 % yearly decline. The result of this development is presented in table 22 along with the total yearly capex and MW in operation. In 2025 and onwards, the capex is expected to equal the total depreciation on existing projects, as the company seek to maintain their current operations.

NOK Thousand	2021	2022	2023	2024	2025
MW in operation	1 543	1 663	1 783	1 903	2 023
Expected NOK/MW	11 997	11 757	11 522	11 292	11 292
CAPEX	1 410 889	1 382 672	1 355 018	1 338 984	834 336

Table 22: Stage 2 Expected CAPEX Levels

8.4 Conclusion Driver Assumptions

Combining the normalised financial statements from chapter 7 and the assumptions on value drivers analysed above, provides a forecast of Scatec Solar's future revenues, operational expenses, investments levels and net operating capital for the first two stages of the DCF-model, which are presented in table 23.

NOK Thousand	2016E	2017E	2018E	2019E	2020E
Total Revenues	841 514	1 108 550	1 432 933	2 020 288	2 260 587
Total OPEX	324 697	419 710	591 747	662 131	1 038 074
CAPEX	1 865 850	4 184 924	3 504 997	3 075 420	2 302 726
Depreciation	286 890	373 733	504 614	609 627	695 930
NWC	1 168 677	1 696 414	2 468 268	3 039 642	3 679 772

NOK Thousand	2021E	2022E	2023E	2024E	2025E
Total Revenues	3 877 097	4 212 653	4 550 909	4 892 018	5 236 145
Total OPEX	1 135 611	1 233 896	1 332 972	1 432 884	1 533 679
CAPEX	1 410 889	1 382 672	1 355 018	1 338 984	834 336
Depreciation	752 168	775 223	796 484	816 032	834 336
NWC	4 058 646	4 216 226	4 365 401	4 505 819	4 674 783

Table 23: Summarized Assumptions Stage 1 and 2

9 The Cost of Capital

The forecasted future cash flows to firm described in chapter 3 are free cash flow available to *all* investors, independent of funding. In order to value the company, the enterprise DCF-model discounts these cash flows at the cost of capital, representing the investors required return. As Scatec Solar is funded with both equity and debt, there are investors and lenders who require a different return on their investments, either through an equity risk premium or default risk premium respectively. In order to adjusts for the different required returns, the EDCF-model discounts free cash flow at a weighted average of the cost of equity and the cost of debt, the WACC:

$$\boldsymbol{WACC = \frac{D}{V}k_d(1 - T_m) + \frac{E}{V}k_e}$$

Considering that Scatec Solar does not have any other securities, such as preferred stock, we can apply the WACC in its simplest form. In the proceedings of this chapter estimation of each component will be presented: cost of equity, cost of debt and target capital structure respectively.

9.1 Cost of equity

The required return on equity is based on the risk-level of the investment, defined by the difference between expected and actual returns. The difference in return are grouped in two categories, diversifiable and non-diversifiable risk (Damodaran, 2012). Diversifiable risk is defined as firm-specific and can be eliminated by holding a sufficient number of securities (Brealey, Myers & Allan, 2014) while non-diversifiable risk affects all investments and are referred to as market risk.

The majority of all risk and return models compute risk from the distribution of actual returns around the expected return and measure it from a well-diversified marginal investor's perspective. However, they differ in their measure of non-diversifiable and market risk and the most applied model by practitioners is the Capital Asset Pricing Model (CAPM).

Assumptions of the CAPM are that all investors are risk averse, can lend and borrow at the same rate and have access to the same information. Further there are no transaction costs, enabling costless diversification, and exists a risk-free asset. By holding different combinations of the well-diversified market portfolio and the risk-free asset all investors adjusts for their preference of risk. Resulting in the following estimation of cost of equity (Brealey, Myers & Allan, 2014):

$$\boldsymbol{CAPM = r_f + \beta(r_m - r_f)}$$

The estimation is based on the risk-free asset $\boldsymbol{r_f}$, the market premium $\boldsymbol{(r_m - r_f)}$ and the beta representing the company's non-diversifiable risk.

9.1.1 Risk-free rate

An asset is determined to be risk free if the expected return can be known with certainty, with other words actual return equals expected returns (Damodaran, 2012). For this to hold two conditions must hold; (i) there is no default risk and (ii) there is no reinvestment risk. In order to achieve no default risk, government securities are the only option, as no private security are too big to fail, last seen during the financial crisis in 2008. Although the aftermath of this crisis has revealed that not all governments are default-free either, (e.g. Greece) they represent the closest match to a default free security. The second condition highlights the importance of matching the maturity of the investment and the maturity of the risk-free asset. Given the implications of the second condition, due to the long time horizon of a DCF-valuation, a practical compromise is to match the duration of the cash flows from the risk free asset and the cash flows from the DCF-analysis (Damodaran, 2012).

The currency in which the free cash flows from the analysis are estimated should determine the choice of which government rate to use. Thus, the 10-year Norwegian Government zero-coupon rate is selected to represent the risk-free rate. The security matches the required conditions and is also the most applied risk-free rate in the Norwegian market (PWC, 2015). In order to match the data used in all cost of capital estimations, the 10-year rate at the 19th of May 2016 is used.

Figure 16 illustrate the development in the 10 year Norwegian Government Bond since 2007 and reveals that the Norwegian risk free rate has followed the general development across world markets since the financial crisis. The 10-year rate is also closely connected to the Norwegian key interest rate, who has been lowered several times recent years, and are predicted to stay at low levels for several years to come (Norges Bank, 2015). Consequently, the 10-year rate is expected to remain stable at low levels and works as a good proxy for the risk-free rate going forward.

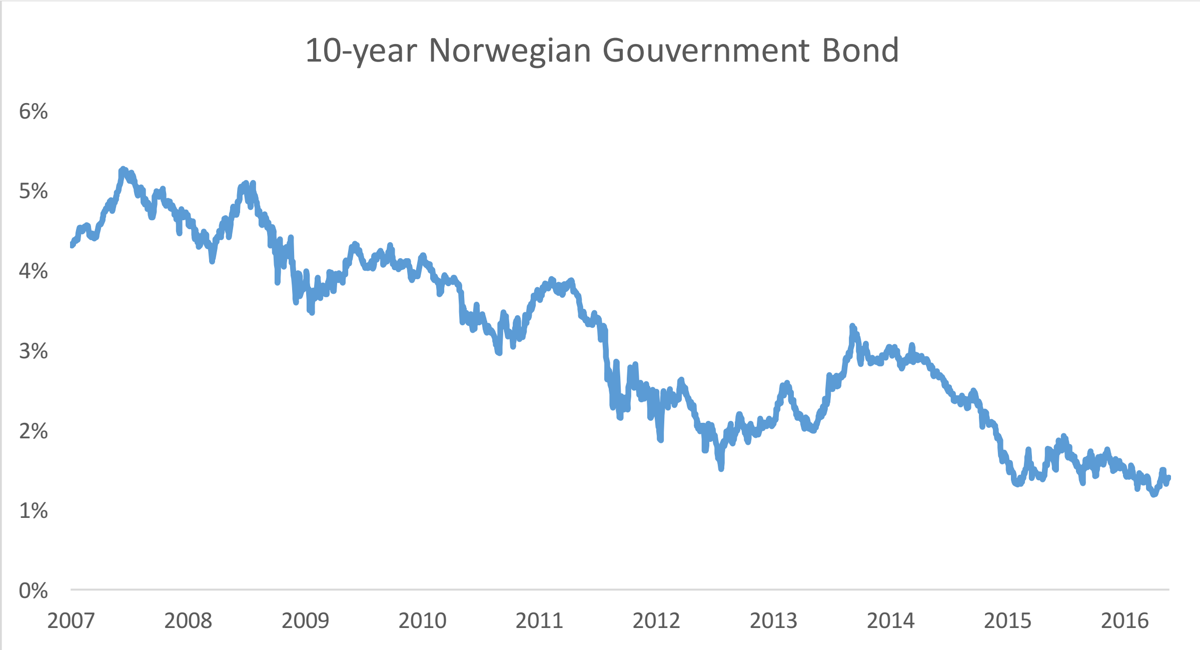

Figure 16: Historical Development in 10-year Norwegian Government Bond, Source: Norges Bank (2016)

9.1.2 Beta

The beta represents a core component in the company's cost of equity and measures the company's risk relative to the market. In other words, it represents the added risk to the market portfolio. This non-diversifiable risk is measured by how much the returns of the asset covary with the returns of the market portfolio. By standardizing the covariance measure we get an expression for the beta of an asset (Damodaran, 2012):

$$\beta = \frac{\textit{Covariance of asset with market portfolio}}{\textit{Variance of market portfolio}}$$

The beta of the market equals 1 as does the average risky asset. Assets with betas larger than 1 are riskier than average, meaning that they tend to move more than the market, while betas below 1 are less risky than the market. When estimating the beta of a company, several aspects must be addressed and there are several methods to obtain the beta for the CAPM. This analysis will use two different approaches. The historical market approach and the bottom-up approach recommended by Aswath Damodaran which builds on the first method.

9.1.2.1 Historical Market Beta

The historical market beta is found through a regression of returns on the company stock against returns on a market index. Three decisions are important when obtaining a regression beta. The length of estimation period, the return interval and the choice of market index. Given that Scatec Solar only have been listed since October 2014, the estimation period is limited to one year and seven months roughly. Consequently, weekly returns are the chosen interval, in order to exceed the minimum recommended 60 observations (Koller, Goedhart & Wessels 2015). Using weekly returns could lead to systematic biases, especially if the stock is rarely traded and many observations equal zero. This is not the case for Scatec Solar so weekly returns should yield biased results.

In CAPM theory, the market portfolio consists of all traded and untraded assets. In reality this market portfolio is unobservable and a proxy is necessary (Koller, Goedhart & Wessels 2015). When selecting a proxy, the characteristics of the company's shareholders must be considered. The objective is to find a proxy representing the majority of the equity investors. A standard practice is to use the market index on which the stock trades, yielding a reasonable measure of risk for domestic investors. If a company has several international investors however, an international index would be more appropriate. An additional issue with local market indices is their tendency to be heavily dependent on a certain industry or company, resulting in betas unlikely to reflect the true market risk. All mentioned complications are relevant when estimating the beta of Scatec Solar.

Listed on the Oslo Stock Exchange (OSE), the standard market portfolio proxy for Scatec Solar investors would be the OSEBX. Considering that all the top five largest investors are Norwegian companies and that they combined represent 43 % of the total outstanding shares, using a domestic index are justifiable. Although a good fit for the majority of investors, the OSEBX suffer from the domination of the oil industry. As a consequence, estimating the beta of Scatec Solar relative to the OSEBX could result in simply obtaining the company's sensitivity to the oil industry. To examine this effect, the beta will be estimated both relative to the OSEBX and the S&P 500 to obtain a more international risk measure.

The results of the regression betas are presented in table 24**.** Both betas are lower than one, a result in line with the general perception of the power industry being less risky than the market. The relatively low beta towards the OSEBX could represent the effect of the index being very dependent on the oil industry and that the S&P 500 beta, that is closer to the average beta, would be a better measure of risk. Both betas also have a low R-squared of around 0.10, meaning that only around 10% of the risk in Scatec Solar comes from market sources, while 90% are firm-specific. Lastly, the standard errors provide confidence intervals for the true value of the betas. The wide range of these intervals indicate a noisy estimation of the betas relative to both indices, a well-known weakness of regression betas (Damodaran, 2012). Koller, Goedhart & Wessels (2015) emphasize that the objective not necessarily is the historical beta, but rather an estimate of the future beta, found through use of judgement not purely mechanical approaches. Thus, in order to obtain a more robust estimation of beta, the historical market approach is improved with the bottom-up method.

	S&P 500		**OSEBX**	
Beta	0.90		0.63	
Standard Error	0.28		0.21	
R2	0.11		0.10	
95% - interval	0.34	1.46	0.21	1.05

Table 24: Regression Results

9.1.2.2 Bottom-up Betas

The bottom-up method of obtaining betas are built on regression betas, but lowers the standard errors by averaging regression betas for several comparable firms. This because stocks tend to move towards industry averages. Regression betas of the peers are unlevered to remove the financial leverage effect of the companies. An unlevered beta is estimated by:

$$\textit{Unlevered Beta} = \frac{\textit{Regression Beta}}{1 + (1 - \textit{tax rate}) * {}^{D}/_{E}}$$

In the next step, the average unlevered beta is estimated and represents the industry average or business beta. Lastly, the levered beta of Scatec Solar by the bottom-up method is estimated by using the leverage ratio and the business beta. All required data are obtained from Yahoo Finance[5] and the results are presented in table 25**.**

[5] Weekly data 02/10/14 – 16/05/16

	Scatec Solar	Innergex	Etrion	Algonquin	Capital Power
Regression Beta	**0.90**	**0.75**	**1.01**	**0.75**	**0.79**
Market Cap	3 420 000	1 570 000	614 730	2 920 000	1 750 000
Net Debt	4 641 386	2 401 950	566 490	2 020 880	1 497 000
Leverage ratio	1.36	1.53	0.92	0.69	0.86
Tax rate	27 %	26.5 %	26.5 %	26.5 %	26.5 %
Unlevered Beta	**0.45**	**0.35**	**0.60**	**0.50**	**0.49**
Average	0.48				
Median	0.49				
Scatec Levered Beta	**0.95**				
Adjusted	**0.97**				

Table 25: Bottom-up Beta Calculations

The adjustment of the levered beta is referred to as the Bloomberg-method and pushes all estimated betas towards one by weighting the levered beta and 1 with 0.66 and 0.33 respectively. This method is based on empirical evidence suggesting that betas tend to move towards the average beta of 1, over time.

9.1.3 Market risk premium

The market risk premium represent the average required premium above the risk-free rate for an investment carrying average risk. Financial theory present two different ways to estimate the market risk premium. The first looks backwords on average historical returns from the stock market less the historical risk-free rate for a long period of time. Although this approach is broadly used by practitioners it does have limitations. The historical risk premium is sensitive to time period used due to the changing risk aversion among investors and cyclical changes. In addition, the choice of averaging methodology will affect the result as arithmetical averages always will exceed geometrical, when returns are volatile (Koller, Goedhart & Wessels 2015). The second approach to estimate the premium is through the implied equity premium. Assuming the market is correctly priced, the estimate is based on current market prices and the underlying performance and presents the current market risk premium. Damodaran (2012) argue that the choice of approach should be made based on market views and valuation mission. Given the assumption that the market is right on the aggregate combined with a market-neutral valuation, the implied equity premium method is recommended. Thus, given these arguments the implied equity premium will be used in estimating the market premium.

Referring to the discussion of the suitable market proxy for Scatec Solar in the previous section, both the Norwegian and US market risk premium are relevant. Based on a yearly survey among investors the implied MRP have been unchanged at 5.4% the two last years (PwC, 2015), while the implied premium of the US market was 5.16% in 2015 (Damodaran Online, 2015). However, due to the company peers being international companies, the US MRP will be used in the computation of the equity cost of capital.

9.1.4 Small Firm Premium

One final adjustment to the cost of equity is the small firm premium. The added premium represents the higher risk and ownership costs of smaller businesses. From a survey of Norwegian investors (PwC, 2015) the estimated average small firm premium of firms with market cap between NOK 2 – 5 billion were 1%. With a market cap of NOK 3.4 billion, Scatec Solar is entitled to such a premium.

9.2 Cost of debt

The cost of debt represents the required return of lenders and consists of three elements; the risk-free rate, a default risk and a tax-advantage on debt. Estimating the cost of debt for a company mainly focus around determining the company's default risk and convert it to a default spread or premium. There are many ways to approach this default risk. By looking at the company's recent borrowing history, the interest levels reveal the latest spread charged by lenders. Another method is to estimate a synthetic rating based on the company's interest coverage ratio. Comparing the ratio to other rated companies yields an estimate of the company's rating and associated spread.

Scatec Solar's outstanding debt consists in general of two different components. The non-recourse loans financing each SPV and their operating power plants and the newly issued NOK 500 million senior unsecured green bond. Considering that there is no credit rating available for the company my first approach to estimate the cost of debt will be the through the recent borrowing history. Table 26 lists the value of all long-term debt and their corresponding value-weighted historical costs. Based on the recent borrowing history, Scatec Solar's cost of debt is 8.7 %.

Type of debt	Maturity	Interest rate	Value 2015	Weight	Average
Non-recourse financial liabilities					
Kalkbult	31/12/28	12.30 %	916 024	16.8 %	2.1 %
Dreunberg	31/12/29	11.50 %	1 021 370	18.7 %	2.1 %
Linde	30/06/29	11.52 %	511 792	9.4 %	1.1 %
Czech	27/10/28	5.53 %	68 293	1.2 %	0.1 %
Czech	23/03/29	5.69 %	201 336	3.7 %	0.2 %
Czech	23/02/29	5.53 %	60 641	1.1 %	0.1 %
Czech	11/05/29	5.28 %	84 595	1.5 %	0.1 %
Rwanda	11/01/30	8.08 %	173 326	3.2 %	0.3 %
Utah	31/12/36	5.15 %	603 117	11.0 %	0.6 %
Oryx	31/12/36	5.80 %	156 086	2.9 %	0.2 %
Anwar al ardh	31/12/35	6.03 %	341 815	6.3 %	0.4 %
Anwar al Amal	31/12/36	5.79 %	176 708	3.2 %	0.2 %
Aqua Fria	31/12/35	6.31 %	651 614	11.9 %	0.8 %
Senior Unsecured Green Bond	01/11/18	7.59 %	500 000	9.1 %	0.7 %
Total long-term debt			**5 466 717**	**100.0 %**	**8.7 %**

Table 26: Recent Borrowing History Calculation

In lack of a credit rating I have chosen to compare my results from the company's borrowing history with a synthetic rating. Due to a negative interest coverage ratio in 2013 as a result of a transition period, have chosen to base my synthetic rating on the two-year average ratio. The ratio is compared to Damodaran's listing of ratios and ratings available in the Appendix 3 and is given a B- rating. Considering the long maturity of the majority debt the 10-year Norwegian treasury is used as the risk-free rate and adding the default spread yields a cost of debt of 8.97% as shown in Table 27.

Synthetic Rating	
Two-year Average Interest Coverage	1.7
Synthetic rating by Damodaran	B-
Spread added for B-	7.50 %
10-year Norwegian Treasury Bond	1.47 %
Cost of Debt	**8.97 %**

Table 27: Synthetic Cost of Debt Calculation

With 90% of the total long-term debt being non-recourse financing with maturities exceeding 10 years the recent borrowing rates looks to be the best estimate for the company's cost of debt, a measure supported by the synthetic rating approach. However, it is worth to mention that the latest financing of new solar plants has been lower than the weighted average, which is being dominated by large loans on the oldest plants. Given the development of the industry towards a substantial role in the world power market, the cost of financing is set to decrease, a trend possibly already observed in the company's borrowing history. On the other hand, the recently issued green bond has a calculated YTM of 8.3% which indicates that the default spread of the company is currently well illustrated through their recent borrowing history.

9.2.1 Tax

A third and essential element of the cost of debt is the advantage from tax-deductible interest payments. The estimated free cash flows are independent of source of financing and leaves out the interest payments and tax-shields which then have to be incorporated through an after-tax cost of debt. An important condition of benefiting from tax-shields is to have taxable profits.

Which tax rate used to estimate the tax-shield is not completely clear. There are several rates available. Considering that interest expenses saves the company taxes on the last dollar of income, the most applicable rate is the marginal tax rate (Damodaran, 2012). The fact that Scatec Solar operates in countries across the world does further complicate things, as each country has its own tax rate. With revenues generated globally there are two different approaches available. Either assume that all income generated eventually will be gather in the home country of the company and taxed at its marginal rate or calculate the revenue-weighted average of all relevant tax rates. Based on the first approach the marginal tax rate would be the Norwegian 27% rate, while table 28 illustrates the average rate of 27.47%. A drawback of the average rate is the revenue-weights which will change over time. Currently the South African rate represents almost 80 % of the average rate. As the company continue to expand to new areas these weights will change, making the average rate inconsistent and ineligible to the horizon of this valuation. Thus, the applied tax rate in computing the after-tax cost of debt will be the Norwegian marginal tax rate of 27%.

	Norway	**South Africa**	**Czech**	**Honduras**	**Rwanda**	**US**	**Germany**	**Italy**
External revenue	2585	698122	87273	47696	28631	12787	792	3940
of total revenue	0.3 %	79.2 %	9.9 %	5.4 %	3.2 %	1.5 %	0.1 %	0.4 %
Marginal tax rates	27 %	28 %	19 %	30 %	30 %	40 %	29.65 %	31.40 %
Average marginal rate	**27.47 %**							

Table 28: Average Marginal Tax Rate Calculations

9.3 Target Capital Structure

The last step in the calculation of the WACC is to weight the estimated cost of after-tax debt and capital. In this process it is important to estimate weights based on market values as book values represents sunk costs and are no longer relevant (Koller, Goedhart & Wessels 2015). The market value of equity is simply the market capitalisation, but the market value of debt is usually more difficult to obtain due to the fact that few firms have all of their debt publicly traded on the market. This is the case for Scatec Solar who only have a small fraction of the its debt traded. The stability of the non-traded, non-recourse debt however, enables the use of book values as the approximate current market value.

Rather than current weights, the cost of capital should rely on target weights representing the expected level throughout the life of the company. It eliminates the risk that the current structure could be reflecting a short-term deviation in the stock price. No such signs are noticed for Scatec Solar and todays levels, presented in table 29**,** represent the expected future structure of new solar projects.

Total Interest-bearing debt	5 466 717	Share price	37
Excess cash	-651 359	Outstanding shares	93 816
Net Debt	4 815 358	Equity	3 471 201
Weight	**58.11 %**	**Weight**	**41.89 %**

Table 29: Target Capital Structure, (Source: Annual Report 2015)

9.4 Results

Cost of Equity		**WACC**	
Risk-free rate	1.41 %	Cost of Debt	8.70 %
Market Premium	5.14 %	Cost of Equity	7.39 %
Beta	0.97	Tax Rate	27 %
Small Firm Premium	1 %	Debt Ratio	58.11 %
		Equity Ratio	41.89 %
CAPM	**7.39 %**	**WACC**	**6.79 %**

Table 30: Cost of Capital Calculation

10 Free Cash Flow to Firm – Valuation

Through the process of this fundamental valuation of Scatec Solar, both a strategic analysis and a thorough assessment of the industry development have provided key inputs to the assumptions of key value drivers of the company. Further, an analysis of recent years' financial statements and future strategic targets have made the basis for the normalisation required in order to estimate the expected cash flows of Scatec Solar's operations. Lastly, the company's weighted average cost of capital has been calculated to provide the discount rate of the DCF-model. This section will present the forecasting operational income and free cash flow to firm and carry out the final valuation of the Scatec Solar stock price using a free cash flow to firm DCF-model introduced in chapter 4.

Table 31 and 32 reveals the final free cash flow to firm (FCFF) for the two first stages of the DCF-model, computed as described in chapter 4. For full operational income statement see appendix 1. The free cash flows presented emphasizes the need for a multi-stage DCF-model. Scatec Solar is still expanding their position in an emerging industry characterised by large upfront investments. The result is negative cash flows to the firm in the first five years of high growth, as investment needs in CAPEX and operating working capital exceeds the gross cash flow from operations. As the company establishes and the growth matures, previous investments will generate solid gross cash flows exceeding new investments.

NOK Thousand	**2016**	**2017**	**2018**	**2019**	**2020**
EBIT	496 963	639 490	923 927	988 828	1 810 093
Tax	134 180	172 662	249 460	266 984	488 725
Depreciation	286 890	373 733	504 614	609 627	695 930
Gross Cash Flow	649 673	840 561	1 179 081	1 331 472	2 017 298
Change in Operating WC	-291 692	-527 737	-1 299 591	-571 374	-1 211 504
Investments in PPE	-1 865 850	-4 184 924	-3 504 997	-3 075 420	-2 302 726
Free Cash Flow to Firm	**-1 507 869**	**-3 872 100**	**-3 625 507**	**-2 315 323**	**-1 496 932**

Table 31: Stage 1 Free Cash Flow to Firm

NOK Thousand	2021	2022	2023	2024	2025
EBIT	1 989 319	2 203 534	2 421 453	2 643 102	2 868 130
Tax	537 116	594 954	653 792	713 638	774 395
Depreciation	752 168	775 223	796 484	816 032	834 336
Gross Cash Flow	2 204 370	2 383 803	2 564 145	2 745 497	2 928 070
Change in Operating WC	-378 874	-536 454	-149 175	-289 593	-168 964
Investments in PPE	-1 410 889	-1 382 672	-1 355 018	-1 338 984	-834 336
Free Cash Flow to Firm	**414 607**	**464 677**	**1 059 951**	**1 116 920**	**1 924 771**

Table 32: Stage 2 Free Cash Flow to Firm

Provided with the forecasted FCFFF the next step in the valuation process is to estimate a terminal value for the final third stage of the model and estimate the present value of all forecasted cash flows using the WACC. The assumed third-stage long-term growth rate is 2.02% and represents the value-weighted yearly inflation adjustments based on each solar plants part of total revenues. Table 33 presents the estimated terminal value and enterprise value, the sum of all discounted FCFFs. Moving towards the final estimated share price the net debt obligations and value of non-controlling interests are deducted to reach the total shareholder equity.

The high value of non-controlling interests stems from the divided ownership of the different project companies (SPVs) owning each solar plant. In the consolidated financial statements all SPVs are registered ass fully owned subsidiaries, while the co-investors share of these subsidiaries are presented as non-controlling interests in the equity statement. There are different ways of adjusting for these claims on the total equity. Considering the lack of sufficient information to value each private subsidiary separately, an average non-controlling share is estimated and deducted from total equity. Scatec Solar has different shares of ownership across all operating plants. Some are fully owned while other ownerships are as low as 40%. The average co-investor ownership across all projects in operation, under construction and in backlog are 43 %. Considering that this measure both covers existing plants and future projects it is assumed to reflect the ratio representative for the entire time-period of the DCF-model. In addition, it is nearly identical to the book-value ratio of non-controlling interests over total equity. The value of non-controlling interests is estimated:

$$\boldsymbol{Non-controlling\ Interests = (EV - Net\ Debt) * Average\ non-controlling\ ownership}$$

NOK Thousand	2016	2017	2018	…	2025
Free Cash Flow to Firm	-1 507 869	-3 872 100	-3 625 507	…	1 924 771
Terminal Value				…	41 144 077
Total	-1 507 869	-3 872 100	-3 625 507	…	43 068 848
Discount Factor	*0.937*	*0.877*	*0.822*	…	*0.520*
Enterprise Value	**13 561 245**				
Net Debt	-4 815 358				
Minority Interests	-3 735 743				
Shareholder Equity	**5 010 144**				
Outstanding Shares	93 816				
Share Price	**53**				

Table 33: Calculation of Final Price per Share

Adjusted for net debt and non-controlling interests the remaining value represent the total shareholder equity. Dividing this measure by the number of outstanding share reveals the result of the valuation. Conducting a fundamental analysis of Scatec Solar through a three-stage FCFF DCF-analysis yields a price per share of NOK 53. A result in line with the median analyst estimate of NOK 56 per share (Dagens Næringsliv, 2016) stating that the company is undervalued at the current share price of NOK 40 (June 9, 2016).

Analysing the final results of the valuation, some aspects are important to highlight. Firstly, due to the high investments to facilitate growth, all of the enterprise value is created in the two last stages of the model. The further forward positive cash flows appear in the model; the more uncertainty are attached to the final measure. Consequently, small adjustments to the inputs of the model will have substantial impact on the result. To assess this uncertainty in the result a sensitivity analysis will be performed in chapter 12**.**

The second important aspect of this valuation case is also connected to the negative cash flows of the first stage. Negative cash flows from operations symbolise that the company are dependent on new cash to finance further operations as current cash from operations not are sufficient. Considering the scale of the investments, Scatec Solar’s current free cash holding are not enough to cover these either. In other words, the company is dependent on considerable financing in order to carry out their current growth prospects. This is once again related to the project financing of the solar projects. The current structure of these SPVs and future SPVs connected to the projects under construction and in backlog consists approximately of 75% debt and 25% equity split between Scatec Solar and co-investors. In the strategic analysis a highlighted strength of Scatec Solar was their solid track record of raising non-recourse financing for new projects through multilateral development banks and strong partnerships agreements with NORFUND and IFC, providing long-term capital. Considering these strengths, the company is assumed to be capable of raising the required funds to carry out their growth strategy.

11 The Market Based Approach

Having carried out a fundamental valuation analysing the intrinsic value of Scatec Solar, the following section seeks to increase the robustness of the result by comparing the intrinsic value to market values, as discussed in chapter 4**.** The market price measured through a relative valuation are more likely to reflect the current market perception of investors and would thus provide useful input to evaluate the results from the fundamental valuation. In order to compute a relative valuation two components must be determined. Firstly, market prices have to be standardized into multiples and secondly comparable company peers must be found.

There are several multiples available in relative valuation but the most commonly used measures are earnings multiples (Damodaran, 2012). Further, considering the free cash flow to firm DCF-approach, the firm value earnings multiple enterprise value to EBITDA is chosen. This measure both eliminates differences in depreciation methods and level of financial leverage across the peers. In addition, as multiples cannot have a negative value the EV/EBITDA multiple also suits a wider number of peers than other earnings multiples, like the price-earnings ratio, given that fever firms have negative EBITDA than negative earnings. Based on this the multiple is most widely used in capital intensive firms (Damodaran, 2012) and is thus a good fit for the utility-scale solar industry.

Obtaining comparable companies to Scatec Solar is not straight forward. As an integrated independent solar power producer (IPP) the company operates across several segments and there are not many other companies offering a similar range of services. Nevertheless, the most comparable companies available is assumed to be Algonquin Power & Utilities, Innergex Renewable Energy, Etrion Corporation and Capital Power Corporation. Etrion Corporation is the only pure solar PV company, while Innergex and Capital power also operates in other renewable energy-industries. All three companies develop, own and operate the solar plants like Scatec Solar. The fourth and last company, Algonquin, does not develop plants but is a pure renewable power producer.

The relative valuation analysis is based on current trading multiples of the companies obtained from Yahoo Finance (2016) and presented in table 34**.** Compared to its peers Scatec Solar is trading at low levels both below the average and median EV/EBITDA. This result supports the fundamental valuation stating that the company is undervalued. Estimating the implied share price from the average trading EV/EBITDA of peers yields a share price of NOK 48 for Scatec Solar, in line with the results of the DCF-valuation.

	Scatec Market	**Innergex**	**Etrion SEK**	**Algonquin**	**Capital Power**
EV	NOK 7 970 000	CAD 3 970 000	SEK 1 170 000	CAD 4 970 000	CAD 3 260 000
EBITDA	NOK 672 430	CAD 188 790	SEK 29 320	CAD 366 560	CAD 421 000
EV/EBITDA	**11.85**	**21.03**	**39.90**	**13.56**	**7.74**
Average	**18.82**				
Median	13.56				
EV	**12 653 472**				
Net Debt	-4 815 358				
Minority Interests	-3 347 994				
Shareholder Equity	4 490 119				
Outstanding Shares	93 816				
Share Price	**48**				

Table 34: Valuation by EV/EBITDA Multiples

11.1 Valuation Summary

Summing up, the two valuation approaches yields similar results. Both intrinsic values and market prices indicate that the Scatec Solar stock is currently undervalued. However, both estimates contain considerable amounts of uncertainty. Especially in the results of the market based approach considering the weakness of few directly comparable firms. With only one of four peers operating as a pure independent solar power producer, the market prices used must be analysed with some caution as they are not likely to completely reflect the market perception of utility-scale solar power. Hence, in the final conclusion of the results, the fundamental analysis of the company will be given more weight than the relative valuation.

12 Sensitivity Analysis & Risk Factors

As described in chapter 3 and commented in the results of the fundamental valuation, the estimation of a company's intrinsic value requires several assumptions of both the industry and company future performance and development. In order to assess the level of impact these assumptions have on the estimated sharpe price of Scatec Solar, a sensitivity analysis will be conducted. The impact will be measured by the changes in the estimated stock price given different levels of two key variables in the valuation model. Furthermore, this chapter will highlight key risk factors that could affect the future development of Scatec Solar and consequently its value.

12.1 Sensitivity

The two first key variables addressed are the weighted average cost of capital (WACC) and the long-term growth level expected in the third and final stage. Secondly, the effect on share price of changing the assumptions regarding the expected installed capacity and power prices of the second stage in the model will be assessed.

12.1.1 Cost of Capital & Terminal Growth Rate

The evaluation of the estimated enterprise value in the valuation section highlighted the domination of the terminal value in this final figure. Given the estimated stock price' dependence on this dominating measure its sensitivity to changes in the WACC and growth rate are assessed in table 35.

		WACC				
		6.40 %	**6.60 %**	**6.76 %**	**7 %**	**7.20 %**
Long-term Growth	**1.60 %**	56.0	48.3	42.7	34.9	28.9
	1.80 %	62.1	53.8	47.8	39.4	33.1
	2.02 %	69.4	60.4	53.8	44.8	38.0
	2.20 %	76.0	66.3	59.3	49.6	42.4
	2.40 %	83.9	73.5	65.8	55.4	47.6

Table 35: Stock Price Sensitivity to WACC and Long-term Growth Rate

The table illustrate how important the assumptions of the long-term growth rate are to the final stock price, ranging from below NOK 40 to above NOK 60 per share. Representing only the weighted average inflation adjustments to running PPAs the chosen long-term growth rate must be considered a fairly conservative measure. However, a reduction of 0.4

percentage points on this measure would still yield a stock price matching the current market price. Consequently, this analysis highlights the large upside potential of the company with just small adjustments to future growth.

Analysing the impact of the cost of capital is also interesting considering that there are aspects in both the market and the company which could affect the future cost of capital. Historically low interest levels have characterised the world markets ever since the financial crisis and affects both the interest levels and the CAPM estimates. In addition, a young and rapid growing industry like solar PV might attract higher premiums on debt and capital as there still are a lot of uncertainty, especially leading to higher cost of debt. Both these abnormalities are expected to stay stable for a long time, though, but the results of the sensitivity analysis reveals how a lower WACC would bump the estimated share price significantly. Likewise, higher risk-free rates could make large negative impacts as well. Noticeably, a 0.4 percentage points increase in the WACC would still just bring the expected share price down to current market price levels. Thus, there would still be upside potential to the stock despite an increase in the WACC. Matching the results of the long-term growth sensitivity.

12.1.2 Stabilizing Growth Stage Assumptions

The necessity of a sensitivity analysis increase by the level of uncertainty connected to the assumptions. Following behind the third-stage terminal value assessed in the previous section, is the growth stabilizing second stage of the DCF-model. Compared to the relatively certain, company distributed inputs in the first growth stage, the second stage is more build on crucial assumptions regarding new capacity and power prices. As a consequence, this section will analyse the changes in estimated share price given other inputs of added capacity in the 2021-2025 period and its associated power prices.

		MW added 2021-2020				
	53.8	**400**	**500**	**600**	**700**	**800**
1000 NOK/MWh	**0.8**	30.4	37.1	43.8	50.5	57.2
	0.9	33.8	41.3	48.8	56.4	63.9
	1.0	37.1	45.5	53.8	62.2	70.6
	1.2	43.8	53.8	63.9	73.9	84.0
	1.4	50.5	62.2	73.9	85.6	97.4

Table 36: Stock Price Sensitivity to Changes in Stage 2 Inputs

Table 36 presents the results of changing the installed capacity and power prices. Assessing the sensitivity to the level of added capacity, the company is not dependent on reaching 600 MW in the period in order to still exceed current market prices. A reduction of a 100 MW would still provide upside while an instalment of only 400 MW would match current prices. Not surprisingly, more capacity installed than assumed would provide a substantial increase in estimated share price towards NOK 70 per share. In light of the very optimistic outlook for solar power presented in the industry analysis, and the strong independent power producer structure of Scatec Solar, the expected added capacity of 600 MW is also a fairly conservative assumption like the long-term growth levels of the third stage. A sensitivity analysis provides insight in the potential value increase of more added capacity.

Future price levels of PPAs and FiTs for new projects have been discussed both in the industry analysis and in the driver assumptions. Indicators point towards prices below todays levels, but it is very uncertain how low they will go. Within the range of 600 NOK/MWh the estimated stock price moves from NOK 40 to 70 per share and illustrate the large impact of this assumption. Although uncertain, the future price level is very likely in the range of 800 to 1200 NOK/MWh for this new capacity. Consequently, the estimated stock price would be in the interval of NOK 45 to NOK 60 per share, representing a very likely upside potential considering the price assumption.

12.1.3 Conclusion Sensitivity

Summing up, there are interesting findings from both sensitivity analyses. The results reveal how sensitive the final estimated stock price is to changes in the key variables and consequently the level of uncertainty in the final results. However, a common feature of both analyses is the strong probability of upside. Even with lower levels of the critical assumptions used in the original valuation, the final stock price still exceeds the current market price in the majority of the different assumption levels. In addition, the current assumptions must be regarded as fairly conservative measures. Concluding, the final results of the fundamental valuation does contain large uncertainty, but there is considerably less uncertainty connected to the stated upside potential of the company stock price.

12.2 Risk Factors

The sensitivity analysis revealed the substantial impact of changes in assumptions and inputs of the DCF-model. In order to further evaluate the results, this section focus on an assessment of critical operational and financial risk factors facing Scatec Solar both today and in the future development of the business.

12.2.1 Country Risk

The SWOT-analysis of chapter 6.2 highlighted the weakness of Scatec Solar's large share of operations in high-risk countries. Of total expected revenues in year 2025, around 96% is generated from countries classified as 4 or higher in the OECD country risk categories. There are several ways to account for country risk. Bekaert and Hodrick (2013) distinguish between two approaches, a discount rate adjustment or adjusting expected cash flows. Due to the geographical spread of operations, estimating adjusted cash flows for every country is an extensive task and increases the estimation error considerably. Similar issues arise when incorporating numerous different country premiums into the cost of capital. Thus, the country risk exposure has not been considered neither when computing expected cash flows or in the calculation of cost of capital. The risk is still relevant nevertheless and must be emphasized when evaluating the results. Although the general operation of a solar plant is predictable for long time periods, the impact of violated PPAs, transfer and convertibility issues or force majeure could cause detrimental effects on the company value.

12.2.2 Component availability

Further risks which may affect future operations and value of Scatec Solar is the supply of solar equipment. The company value chain does not include its own PV-module production or other required equipment. As documented in the strategic analysis, history have illustrated how shortage among suppliers can affect price and thus the profitability of the company. With several components making up the required equipment for a utility-scale solar plant there are many factors that could affect the availability of components and total CAPEX of future projects. The scenario of shortage in component availability would affect the profitability of new projects and halter the targeted growth of the company and consequently affect the estimated value.

12.2.3 Project Availability

With the estimated value of Scatec Solar being highly dependent on future growth in installed capacity as described in chapter 8, the expected availability of new projects is a crucial factor. The company provide an informative presentation of future projects, divided in backlog, pipeline and opportunities. With 90% chance of realization the backlog projects are considered approximately risk-free. The pipeline and opportunity projects on the other hand, contain much more uncertainty, from 50% chance of realisation and lower. Of all expected installed capacity in 2025, these two categories make up 58%. Failing to carry out these investments will have severe effects on the company value and represent a significant risk factor in future operations of the firm. The project availability is to a large extent dependent on governmental initiatives and the competitiveness of solar power. As covered in the industry analysis both aspects are set to continue its recent development and Scatec Solar is positioned to hold their position as a rapidly growing firm in this environment. Consequently, the risk of falling project availability is not considered too strong.

12.2.4 Financial Risks

Lastly, the final estimated value and future operations of Scatec Solar are exposed to financial risks covering interest rate risk, currency risk and credit risk. The currency risk represents the most exposed area financial risks. Due to large non-controlling interests in the project companies, these do not hedge NOK-positions versus their operating cash flow currency as mentioned in chapter 8.2. Consequently, a large depreciation of the NOK against *all* exposed currencies would have a serious impact on the cash flows to equity holders. The number of different currencies are however expected to mitigate this risk exposure, hence the focus on NOK revenues in the valuation. Further, the company's interest rate risk is connected to a few non-recourse loans not running on fixed interest payments in South Africa. This risk is hedged through derivatives swapping flouting to fixed rates. In addition, the NOK 500 million group financing bond runs at an unhedged floating NIBOR + 6.5% rate. Finally, the credit risk mainly arises from the third-party risk covered in the country risk section. Summing up the financial risks with potential impact on the future performance and value of Scatec Solar, the currency risk stands out as the most influential risk as the two latter risks are more hedged. In the worst case scenario, a significant weakening of the NOK combined with raising interest rates and defaulting third-parties could bring severe financial issues for Scatec Solar.

13 Conclusion

Through this thesis my objective has been to study and estimate the fair value per share of Scatec Solar ASA. The basis for the calculations of equity value has been the weighted average cost of capital method. To support the estimated fundamental value of the WACC, a relative valuation, based on multiples, have further been applied. However only limited to a EV/EBITDA approach due to a low number of directly comparable firms. Additionally, in order to make the best possible assumptions carrying out the valuation, I have assessed recent and future development in the solar power industry and its competitive structure. Followed by an analysis of Scatec Solar's current strategic position and future prospects, and a review of the company's historical and expected performance. Combined, these analyses provide the foundation of the company's forecasted future performance and fundamental value.

Analysing recent years' development and future outlook for the solar power industry reveals Scatec Solar is operating in a rapidly growing industry with several attractive aspects and opportunities. First and foremost, decreasing levels of capital expenditures per MW installed are continuing to increase the competitiveness of solar against other, both renewable and conventional, energy sources. Increased competitiveness has further globalized the industry and opened up new possibilities for independent solar power producers, especially in emerging markets. The result is in an incredible growth in total installed MW capacity, expected to continue for years to come. Additionally, government policies provide necessary support mechanisms in terms of feed-in-tariffs and tax incentives to developers and producers, improving the bankability of their projects. Lastly, a review of the general renewable energy industry's resilience towards prices on fossil fuelled conventional energy support the solar energy industry as a the long-term sustainable and promising sector.

The competitive structure in which Scatec Solar operates is characterized by a strong rivalry among existing competitors as they all seek to take part in the development of the industry. A numerous amount of both renewable and conventional substitutes for solar power further increase this rivalry. Additionally, the large number of developers, increase the power of the off-takers, usually state-owned utilities. Consequently, they pressure producers on price and lowers the margins. On the other hand, a fragmented suppliers market and relatively low threats of new entrants do not put any considerable constraints on profits.

A long experience in the solar industry and its integrated “one-stop-shop” business model give Scatec Solar a strong strategic position in the industry. Combined with a focus on the growing emerging markets it provides a solid foundation for their targeted continued growth. Furthermore, economic growth and increased global access to electricity initiatives represents a promising outlook for clean energy and along with improved energy storage technologies they represent great opportunities for Scatec Solar. However, a highlighted weakness of their operations is the extensive exposure to high-risk countries. This vulnerability to non-operational factors could potentially be crucial to the company’s cash flows. Lastly, history also reveals the large impact of retroactive or failing support mechanisms.

Summed up, Scatec Solar is a growing company well positioned to continue its development in an emerging and prosperous industry. The results of the fundamental valuation, yielding a ~30% upside from the current share price, do however indicate that the financial market does not share the optimism to the same extent. A relative valuation approach supports the intrinsic value, but is further less emphasized due to the limitations mentioned. With such a significant estimated upside, it is important to highlight the numerous assumptions on which the results depend. Especially regarding the assumed financing of the extensive growth of the next five years. The sensitivity analysis illustrates the substantial impacts of small changes in key variables in cost of capital, PPA levels and growth. On the other hand, it also reveals that with even lower critical assumptions the model would still yield a premium over the current share price. In an additional effort to evaluate my results, different operational and financial risk factors have been determined. As a high growth company several risks may be more emphasized by investors than in the applied model. Compared to the median target price of analysts, my results do however look to be on point. Further considering the relatively conservative assumptions of the analysis, a target price of NOK 53 per share is my final conclusion, stating that the Scatec Solar share currently holds a large upside potential.

14 References

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15 Appendix

15.1 Appendix 1

Consolidated Income Statement	**2016E**	**2017E**	**2018E**	**2019E**	**2020E**
Total revenues and other income	1 079 024	1 365 091	1 916 000	2 111 670	3 345 637
Growth	*22 %*	*27 %*	*40 %*	*10 %*	*58 %*
Personnel expenses	122 118	154 493	216 842	238 987	378 640
Other operating expenses	193 931	245 345	344 359	379 527	601 305
EBITDA	**762 975**	**965 253**	**1 354 799**	**1 493 157**	**2 365 692**
Margin	*71 %*	*71 %*	*71 %*	*71 %*	*71 %*
Depreciation, Amortisation & Impairment	286 890	373 733	504 614	609 627	695 930
EBIT	**476 085**	**591 519**	**850 185**	**883 530**	**1 669 762**
Margin	*44 %*	*43 %*	*44 %*	*42 %*	*50 %*

Consolidated Income Statement	**2021E**	**2022E**	**2023E**	**2024E**	**2025E**
Revenues	3 608 437	3 871 237	4 134 037	4 396 837	4 659 637
Growth	*8 %*	*7 %*	*7 %*	*6 %*	*6 %*
Personnel expenses	408 382	438 124	467 866	497 608	527 351
Other operating expenses	648 538	695 770	743 003	790 236	837 468
EBITDA	**2 551 517**	**2 737 343**	**2 923 168**	**3 108 993**	**3 294 818**
Margin	*71 %*	*71 %*	*71 %*	*71 %*	*71 %*
Depreciation, Amortisation & Impairment	752 168	775 223	796 484	816 032	834 336
EBIT	**1 799 350**	**1 962 120**	**2 126 684**	**2 292 961**	**2 460 483**
Margin	*50 %*	*51 %*	*51 %*	*52 %*	*53 %*

15.2 Appendix 2

	MW	2015	2016E	2017E	2018E	2019E	2020E
Czech	20	22 364	20 500	20 500	20 500	20 500	20 500
Kalkbult	75	143 788	150 000	150 000	150 000	150 000	150 000
Dreunberg	75	157 708	178 000	178 000	178 000	178 000	178 000
Linde	40	87 554	94 000	94 000	94 000	94 000	94 000
ASYV	9	13 817	15 500	15 500	15 500	15 500	15 500
Agua Fria	60	41 047	103 000	103 000	103 000	103 000	103 000
Utha Red Hills	104		210 000	210 000	210 000	210 000	210 000
Oryx	10		18750	25 000	25 000	25 000	25 000
EJRE	22		26167	52 333	52 333	52 333	52 333
GLAE	11		13084	26 167	26 167	26 167	26 167
Los Prados	53			100 000	110 000	110 000	110 000
Segou	33			30 000	60 000	60 000	60 000
Piaui	78				164 000	164 000	164 000
Upington	258				645 000	645 000	645 000
Mozambique	40					94 608	94 608
Kenya	44					96 360	96 360
Egypt	341						806 533
Pakistan	150						328 500
Africa, Americas and MENA	600						
Total		466278	829000	1004500	1853500	2044468	3179501
In operation		279	426	512	848	932	1423

15.3 Appendix 3

For smaller non-financial service companies with market cap < $ 5 billion

If interest coverage ratio is

greater than	≤ to	Rating is	Spread is
12.5	100000	Aaa/AAA	0.75%
9.5	12.499999	Aa2/AA	1.00%
7.5	9.499999	A1/A+	1.10%
6	7.499999	A2/A	1.25%
4.5	5.999999	A3/A-	1.75%
4	4.499999	Baa2/BBB	2.25%
3.5	3.9999999	Ba1/BB+	3.25%
3	3.499999	Ba2/BB	4.25%
2.5	2.999999	B1/B+	5.50%
2	2.499999	B2/B	6.50%
1.5	1.999999	B3/B-	7.50%
1.25	1.499999	Caa/CCC	9.00%
0.8	1.249999	Ca2/CC	12.00%
0.5	0.799999	C2/C	16.00%
-100000	0.499999	D2/D	20.00%