Valuation of Scatec Solar

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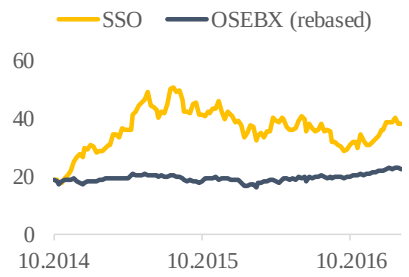
Executive Summary

Buy Hold Sell

Key data per 01.02.2017	
Target price	49.69
Current price	38.1
Company name	Scatec Solar ASA
Ticker	SSO-OS, NO: SSO
Sector	Utilities
Listed since	02.10.2014
Shares outstanding (m)	93.82
Current projects	322 MW
Backlog	731 MW
Pipeline	1,085 MW
Opportunities	2,008 MW

Financials (NOK 1,000)	
Market cap	3,574,398
NIBD	4,254,950
Enterprise value	7,829,348
Revenues (2016)	1,012,938
EBITDA (2016)	849,209
Net profit (2016)	70,487

Share price



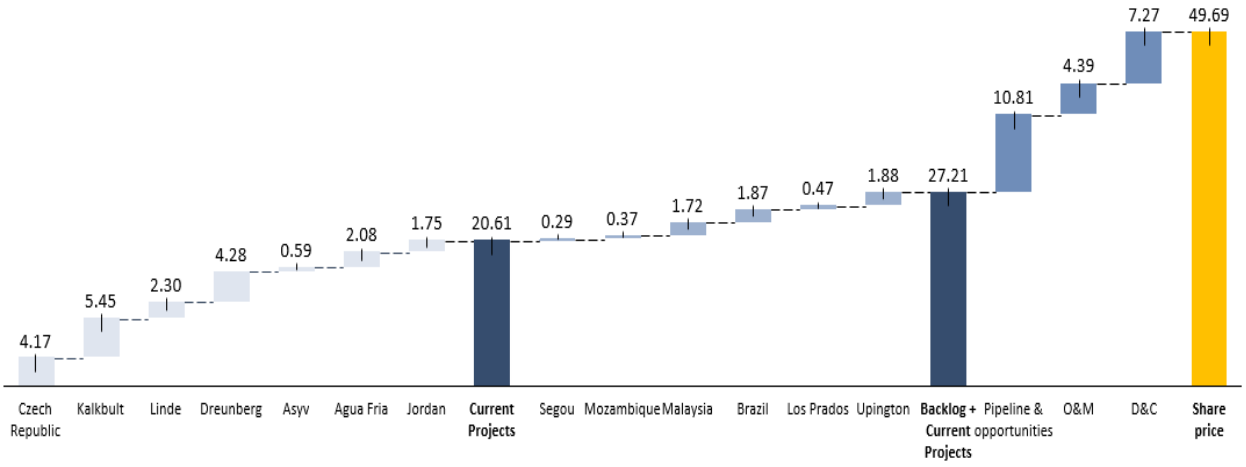
Scatec Solar
Improving our future™

Target price of NOK 49.69 implies an upside of 30.42%. Scatec's current share price indicates an inaccurate pricing relative to the value of pipeline and opportunities.

Scatec has experienced rapid growth since its listing in 2014 and is expected to triple installed capacity by 2019 (~7NOK/share). Focus on climate changes, population growth and lower construction costs will continue to drive demand growth.

Scatec's organizational structure build on SPV's, which yields a strong financial position. Along with important partners, Scatec has achieved a strong foothold in EMDE, allowing high-yield projects with low costs of capital. Scatec's self-funding through O&M and D&C strengthens its ability to invest in multiple projects simultaneously.

Decreasing LCOE improves the competitiveness of PV technology, requiring less subsidies. Auctions are preferred by authorities worldwide, which increase rivalry and pressure margins. Scatec is expected to benefit from cost reductions and remain highly profitable.



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1. Introduction

With recent focus on renewable energy, we wanted to exploit our knowledge by analyzing a complex renewable energy company. Recently there has been a tremendous focus on climate changes and the increasing importance of renewables. Therefore, our decision fell on Scatec Solar ASA, a newly listed company, and Norway's biggest fully integrated solar power company. The firms' diverse conduct of business in both emerging and developed countries leads to several challenging aspects we want to dig further into. Scatec Solar ASA's performance in the coming years can be vital for the development of Norwegian solar power and the climate. The renewable industry seems to be on the verge of a boom, and the profitability of Scatec is critical to ensure the firm's sustainability in a booming competitive industry.

Furthermore, we both study finance and economics and believe a sound valuation depend on several different financial and strategic aspects. Hence, it is important to put a variety of theories into practice to find a well-grounded market price of Scatec Solar.

We want to thank our considerate and patient supervisor Poul Kjær for his remarks and advice.

1.1. Research Objective

The purpose of this thesis is to determine the intrinsic value of Scatec Solar ASA through a fundamental analysis. We will discuss and use different theoretical models and create a sound basis for an investment decision. The intrinsic value expresses whether the current share price is accurately priced in the market, with the assumption that a diversified investor will invest if undervalued. Hence, our research question is:

What is the intrinsic value of Scatec Solar ASA as of 01.02.2017?

To be able to find the intrinsic value, we have to analyze Scatec Solar ASA (hereafter referred to as SSO) and its industry. Thus, we have defined a set of sub-questions:

- What characterize SSO and its industry?
- What are SSO's strengths and weaknesses and how does external environment affect SSO?
- How has SSO performed and what can we expect in the future?
- What is the appropriate cost of capital?
- Which valuation models yields the best estimation of SSO's share price?
- How robust is the estimated share price?

1.2. Delimitations and Assumptions

We assume the reader of this valuation to have an understanding of financial and economic theory. Thus, we will not describe all theory in detail. Theories will be briefly discussed in the respective section. See Appendix 1 for abbreviations and dictionary.

This valuation is based solely on public information. We conducted an interview with CFO Mikkel Tørud, and he emphasized that he would not share any information that could be considered as inside information. Further, we want to be as objective as possible and only consider information available at the cut-off date. Our analysis is mainly based on annual reports, quarterly reports, reports from major energy agencies and empirical theory.

Although SSO has three major segments, our analysis focus on the power producing segment. Operations & maintenance and development & construction only recognize internal revenues, which is not a part of consolidated financial statements. However, we treat these segments as important resources and values for SSO.

1.3. Evaluation of Sources

To validate our models and approach we have chosen three well-known books, Peterson & Plenborg (2012), Koller, Goedhart & Wessels. (2010), and Penman (2013). We chose to consistent use denominations from Peterson & Plenborg (2012) throughout the thesis. We have supplemented theory with reports published by renowned agencies and journal articles.

Reports by International Energy Agency, The International Renewable Energy Agency, International Monetary fund, and The United Nations among other sources are used to understand trends and expectations about the future. These agencies are very well informed and possess a vast amount of knowledge. We still read these reports with an objective and critical mindset, as they might be biased. For instance, IRENA may be biased towards the use of renewables and its future.

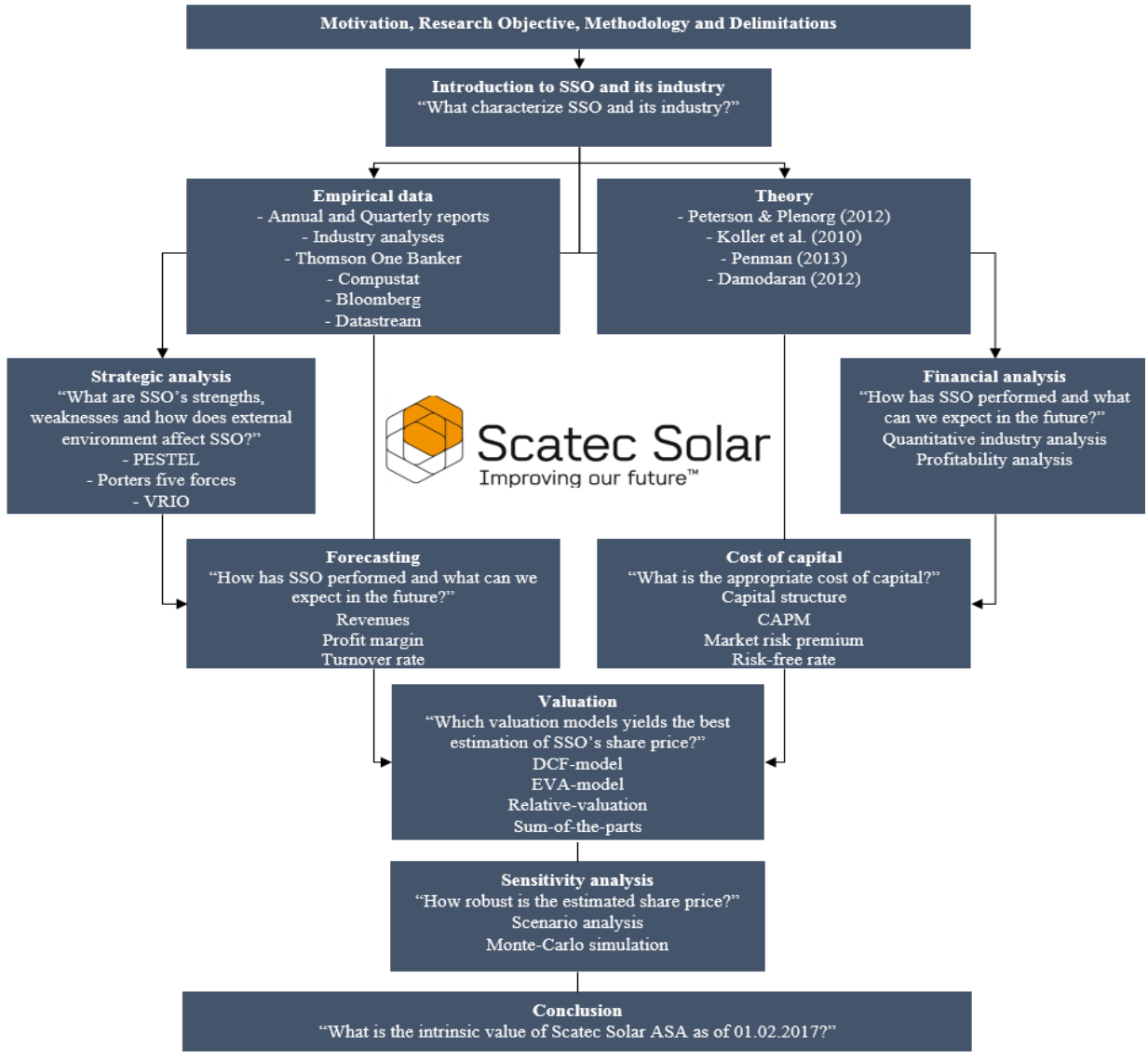
The financial statements of SSO are assumed to be correct and objective. We have collected data from Datastream, Compustat and Thomson One Banker for our peer analysis and quantitative industry analysis.

We conducted two interviews with industry professionals. The first interview is with Mikkel Tørud, CFO at SSO. The second interview is with Damien Berlioz, an investment manager in Norfund. Both interviews contributed with valuable insight into SSO and the industry in emerging markets.

1.4. Methodology

To answer the research question and sub-questions, we perform a set of different analyses, illustrated in Figure 1.1.

Figure 1.1 Valuation overview



Source: Own production

The strategic analysis consists of four different models: PESTEL, Porters five forces, VRIO and SWOT. These models are chosen as they are widely renowned and mentioned as useful tools by both Peterson & Plenborg (2012) and Koller et al. (2010). PESTEL is a framework to find macroeconomic trends and drivers that influence the industry and company in the future. Porter's five forces is an industry analysis with the purpose of identifying threats of entrants, competitors, suppliers, buyers and substitutes. VRIO considers how valuable, rare, imitable internal resources and capabilities are, and how the organization is prepared to benefit from these. These models help us identifying sources of continuous competitive advantages. To retrieve information necessary to make a sound analysis we have used reports from IEA, IRENA, IMF and UN.

These models are qualitative and rely on our critical thinking. They help us organize the vast amount of information available and support considering relevant factors. To complement the qualitative strategic analysis, we perform a quantitative industry analysis. We base the analysis on the methodology outlined in Penman (2013), consisting a fade analysis and a first-order autoregressive model. We apply the first-order regression as the previous period has explanatory power of the next, but not two periods.

To investigate SSO's historical performance, we conduct a profitability analysis, consisting of an index analysis, a common size analysis, and a decomposition of ROIC as both Peterson & Plenborg (2012) and Koller et al. (2010) suggests. We will compare key figures to a peer group consisting of four comparable companies.

We base our forecast on three key value drivers: sales growth, profit margin and the turnover ratio of invested capital. The revenues are modeled based on a projection of current projects, backlog, and pipeline. Further, we base the turnover rate and profit margin on the strategic analysis, quantitative analysis and profitability analysis.

To calculate the appropriate cost of capital we follow the principles outlined in Peterson & Plenborg (2012), Koller et al. (2010), Penman (2013) and Damodaran (2012). Empirical data is collected using Bloomberg Terminal and Damodaran (2017 and 2016). We will use a weighted average cost of capital as it considers a return to all shareholders and is not affected by capital changes in capital structure. WACC is the theoretical correct discount factor to use in our valuation models.

We use three different valuation techniques, the DCF-enterprise value method, EVA-model and the relative valuation approach. It is suggested to use these models by Peterson & Plenborg (2012) and Koller et al. (2010). Further, we use a sum-of-the-parts valuation to illustrate how each segment creates value. We will discuss the valuation methods further in the respective sections.

The sensitivity analysis inspects how sensitive the estimated share price is to key input factors. Furthermore, a scenario analysis supported by a Monte Carlo simulation will be conducted to test the robustness of our estimate.

2. Introduction

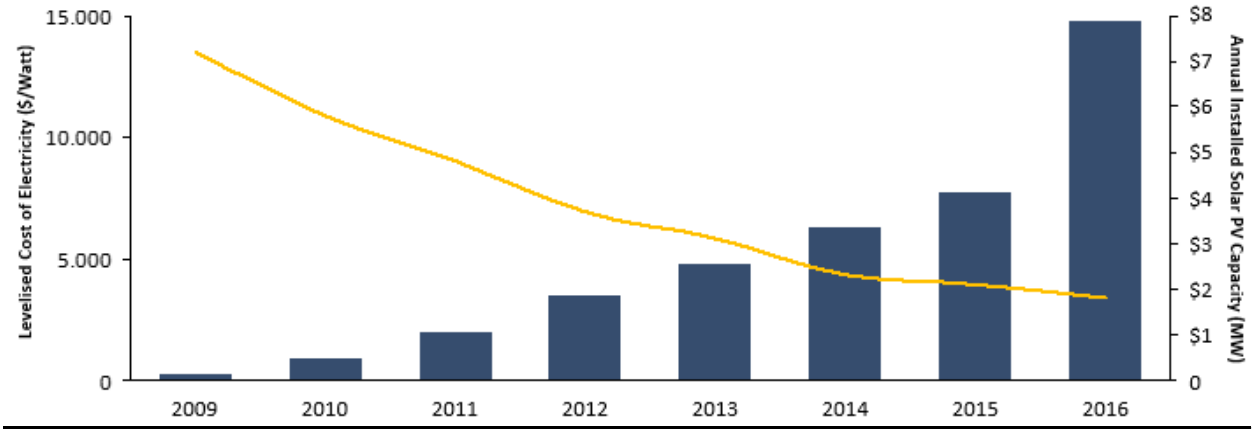
As our transition to greener technology advances, the number of challenges facing renewable firms across the globe arises as well. As firms, big and small, look to expand to new markets, so does the geographic scope of their operations. A vast portion of companies finds themselves drawn to the sunny fields of South-America and Africa. However, these unchartered lands provide drastic differences from the usual playing field of their operations, and the firms are now forced to adapt their strategies and technologies to these new complex environments.

2.1. The Solar Power Industry

Since 2011, renewable energy accounts for more than half of total power generation capacity added globally. In 2015, a record was achieved, with around 148 GW of renewable power added Support policies around the world are increasingly effective, driving a virtuous cycle with increased deployment, technology innovations, and cost reduction (IEA, 2016).

The increased focus on the renewable sector is mainly because world leaders and organizations pledged to the Paris Agreement in 2015, at the 21st Conference of Parties (COP21). The agreement aims to limit the increase of 1.5 Celsius and keeping the increase in global average temperature well below 2 Celsius on long term (European Commission, 2017b). The agreement signals a strong imperative for the world to transition to a sustainable energy future.

Figure 2.1 Total innstalled capacity and LCOE development



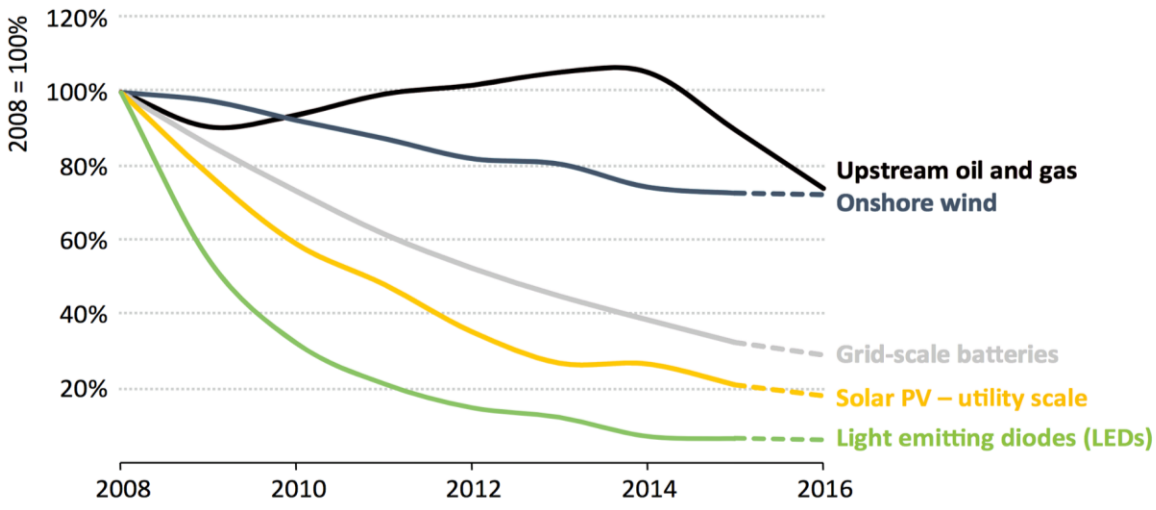
Source: IEA, 2016 / Own production

The goal within 2040, is that 60% of all new power generation capacity come from renewables and, by 2040, renewable energy should be competitive without any subsidies. Solar photovoltaics (PV) is expected to see its average costs drop 40-70% further within the same time-range. Several international retailers in the world (Apple, SAS, and IKEA) have turned to solar power, most recently Apple with their 20MW solar capacity installment at their location in Maiden inspiring companies like NovoNordisk and Novozymes to pursue similar strategies. Renewable Energy and the Renewable Energy Efficiency Portfolio Standard (REPS), along with the global trend of reduced solar panel costs has attracted significant attention to the solar market. Furthermore, the solar market has a well-established regulatory framework PURPA (The Public Regulatory Policy Act) ensuring qualified facilities the right to deliver power to an off-taker in perpetuity.

2.2. Development

Renewable technology has overtaken coal as the largest source of power generation, and with extensive growth and development the last ten years, solar power is one of the fastest growing energy sources (IEA, 2016). High costs have earlier been the most crucial problem in competing with other energy sources. This is no longer a problem after the price of photovoltaic (PV) module declined with over 90% the last eight years, and the price of a complete PV system is reduced by two-thirds from 2010 to 2015 (IRENA, 2016).

Figure 2.2 LCOE development for different energy sources



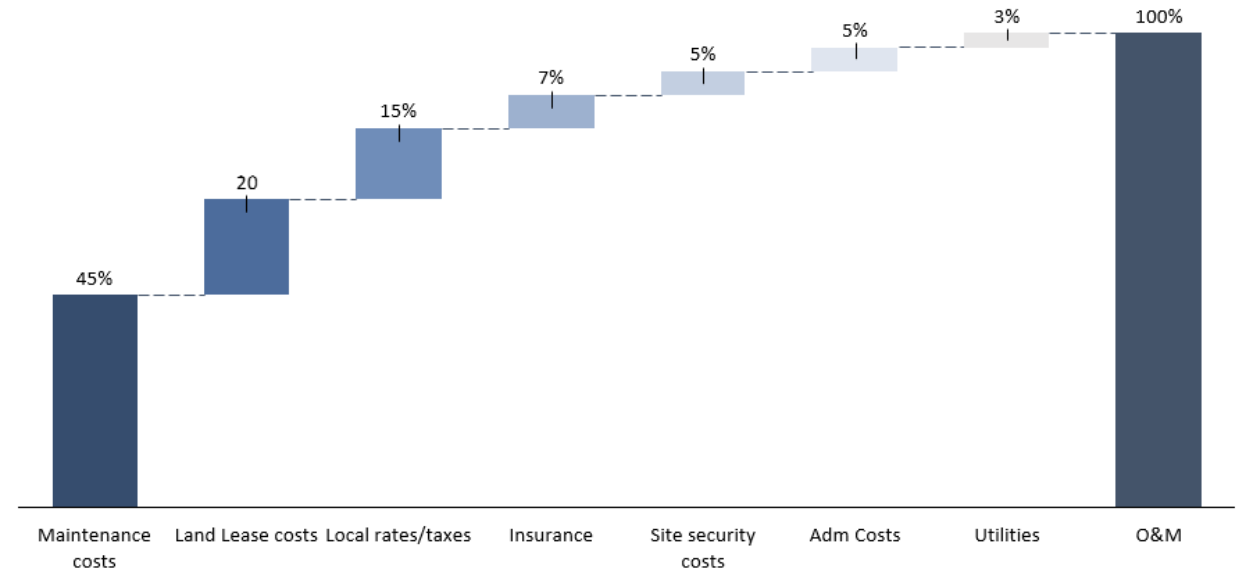
Source: IEA, 2016 / Own production

Levelised cost of electricity (LCOE) is an indicator of the average cost per unit of electricity generated by a power plant and expressed in dollars per kilowatt ($/kW). Implicit, LCOE illustrates minimum average price at which electricity must be sold for a project to "break-even".

$$\text{LCOE} = \frac{\sum_{t=1}^{n} \frac{I_t + M_t + F_t}{(1+r)^t}}{\sum_{t=1}^{n} \frac{E_t}{(1+r)^t}}$$

Annual costs are adjusted for inflation and discounted with a specific interest rate to account for time value of money (IEA, 2016). LCOE decreased by 59% from 2010 to 2015, mainly due to a decline in the total cost of a PV system. Although we have seen a significant price fall in installed cost and solar PV module, we experience that the O&M part of LCOE of solar PV in Economic Co-operation and Development (OECD) markets have increased significantly. O&M costs in OECD markets such as in the UK and Germany now accounts for 20-25 percent of the LCOE (IRENA, 2016).

Figure 2.3 Distribution of operation & maintenance costs



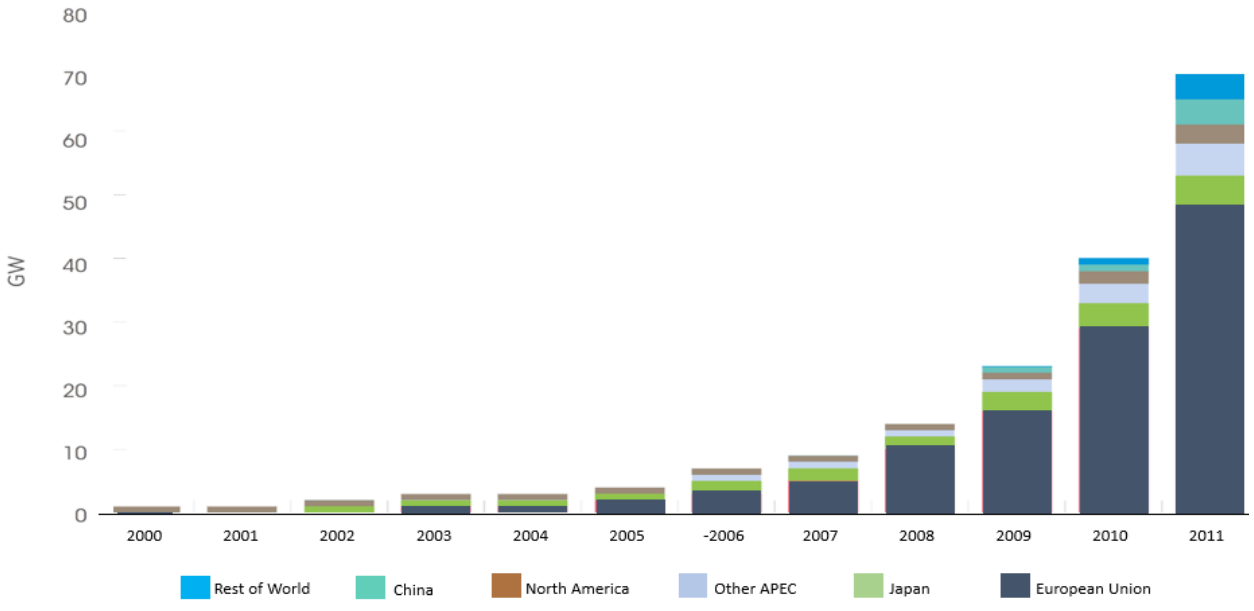
Source: IEA, 2016 / Own production

The extent of cost reduction relies on economies of scales in manufacturing, technology improvements, increased competition, and developers gaining from experience. Cost reduction relates to a geographical manufacturing change from traditional low-cost markets such as Germany and the US, to Asian countries (IEA, 2016). The fall in LCOE is also related to increased efficiency in converting the sun to electricity.

2.3. Market Situation

Cumulative global solar PV capacity installed had an estimated growth of 49 GW in 2015, resulting in a 25% higher installed capacity than the annual installations in 2014 (IEA, 2016). A solid increase of added capacity from 2013 which amounted to 36 GW. On a global basis, utility-scale projects amounted to over 60% of new additions, followed by commercial (23%), and residential applications (15%). With record installations levels for China (15 GW) and Japan (11 GW) in 2015, the two Asian countries represented more than 50% of the annual market (IRENA, 2016a). The US continue to remain the third-largest solar PV market globally, who also had record installations with 7.3 GW added, followed by UK's addition of 3.8 GW, and India with 2 GW added (IEA, 2016). The growth has been so significant, that the new capacity added over the last 5-7 years exceeds the five previous decades' total added solar PV capacity.

Figure 2.4 Global cumulative capacity

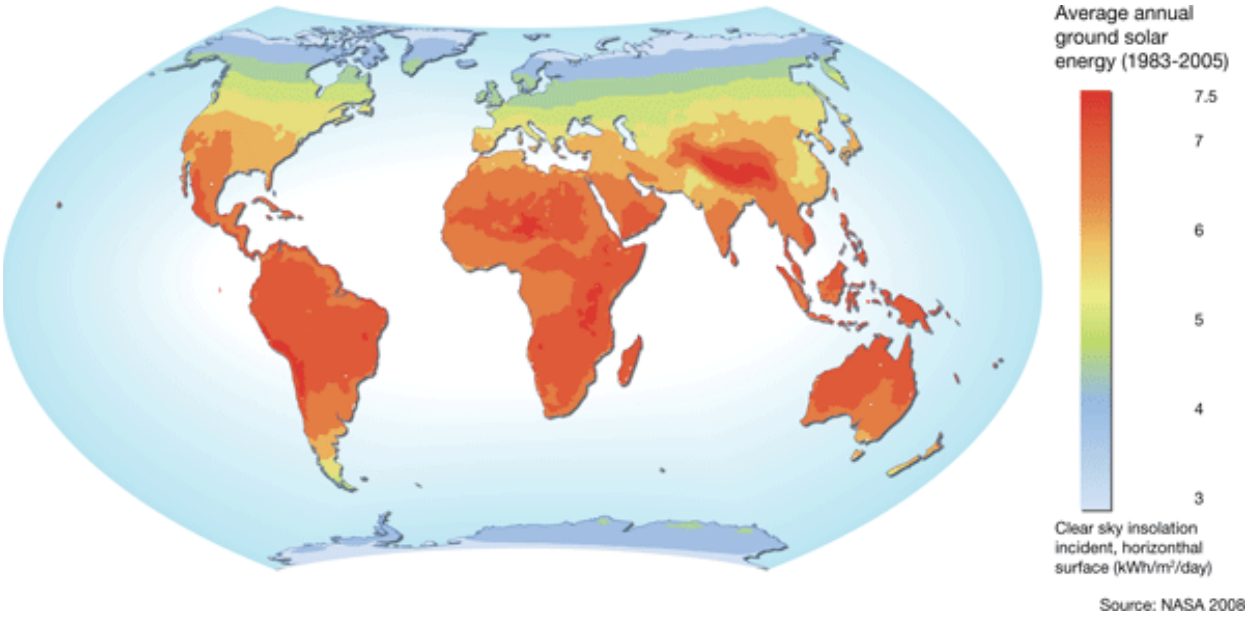


Source: IEA, 2016

Another reason for the extensive growth of the solar industry over the last decade is because of the industry's expansion from Europe to Asia, Middle East and Africa. For a long period, Europe was the main driver for the growth in the solar power industry. The growth stagnated due to lack of financial incentives in key countries like Germany and the United Kingdom, due to lower subsidies, and political support from the government.

The exposure of sun is not constant across the earth's surface and depends on variables like amount of clouds, time of year, time of day, pollution, and last but not least location. These factors dictate where it will be suitable and optimal to place a power plant. As Figure 2.5 shows, the average ground solar energy is highest close to the equator (Materials Technology, 2017).

Figure 2.5 solar irradiance levels



Source: Materials Technology, 2017

2.4. Support Mechanisms & Policies

According to a report from IEA in 2014, subsidies are expected to increase to USD 240 billion in 2035 from USD 90 billion in 2012 (IEA, 2014). Fossil-fuel consumption subsidies were expected to be 523 in 2011, which is almost six times more than the financial support allocated to renewable energy. Financial incentives are a necessity that will help the solar industry growth to accelerate, as the industry becomes more attractive to investors. Policy support has been extremely effective, resulting in increased deployment, technology innovations, and cost reduction, driving a virtuous cycle (IRENA, 2016). Below are some main support mechanisms used by governments to finance renewable energy development programs: tax incentives, feed-in-tariff, and tradable green certificates.

2.4.1. Tax Incentives

Many countries use tax reductions as an incentive to enhance renewable energy deployment. There are many different incentives provided by various local authorities. Tax credits can be applied to capital expenditures, production, increased depreciation, less income tax, and consumption segments of electricity generated by renewable energy sources (Abeler & Jäger, 2013). By applying tax credits on both installation and purchase of renewable equipment, the government can facilitate the entrance of renewable energy into the market. Moreover, a tax policy is also useful as an instrument to reduce fossil fuel consumption. A carbon tax imposed by a government provides an incentive to increase investments in renewable energy as carbon tax imposes a higher cost burden for burning fossil fuels. The Solar Investment Tax Credit (ITC)

2.4.2. Power Purchase Agreements

A Power purchase agreement is a contract ensuring a predetermined sales price for power (typically market price plus a margin) and defines all commercial terms between parties. PPAs typically range from 10-25 years where the developer is responsible for operation and maintenance of the power plant for the lifetime of the agreement (Seia, 2017). At the end of the PPA contract, the customer has an option to extend the contract, buy the solar energy system from the developer, or have the developer remove the system (IEA, 2016).

2.4.3. Feed-in-Tariff

A feed-in-tariff (FIT) is an energy supply policy to support the investment and development in renewable projects (Couture et al., 2010), and is one of the most applied support mechanisms to renewable energy generators. The fixed price feed-in-tariff based on the Contract for Difference (CfD) is a contract between a power producer and (typically) a government owned counterparty, which ensures the generator a fixed power price for a fixed period. The period is usually long-term ranging from 15-25 years, which secures long-term stable cash flows with no power price exposure for the first years of operations. Subsidies are based on the difference between market power price and the "strike price" for full volume generated, and often have inflation protection through linkages to the Consumer Price Index (CPI) (IEA, 2016). As the counterparty is usually a government-backed company, it reduces the political and commercial risks, as the contract will not be affected by political and regulatory changes, which attracts both lenders and investors.

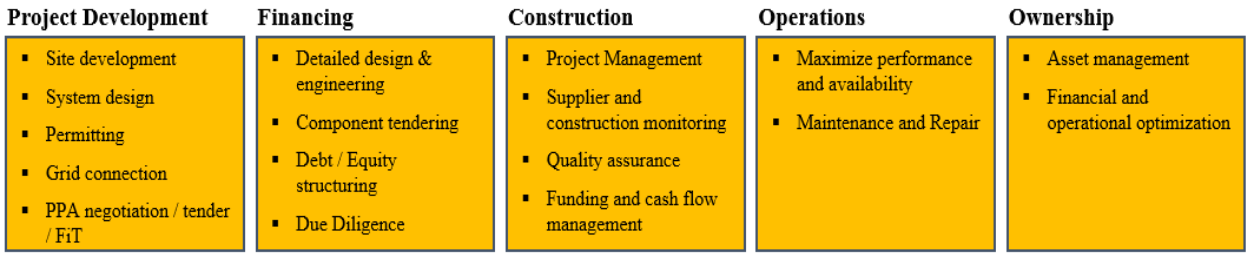
2.4.4. Auctions

Another way to distribute FITs or PPAs is through auctions. The auction sets the CfD strike price for technology based on the number of projects and requested capacity (MW). If the auction is "oversubscribed" with requested CfD funds higher than the allocated budget funds the auction price is lowered. The developer cannot be certain of receiving a CfD, as it depends on the competition in the auction. This will also affect the strike price that may be achieved by the developer. Not succeeding yields high cost and is a risk all developers are exposed to.

2.5. Scatec Solar ASA

SSO is an integrated solar power producer situated in Norway, with a global presence and operations on four continents. SSO develops, builds, owns, operates and maintains solar power plants. SSO currently has a capacity of 322 MW and a project backlog and pipeline of close to 1.8 GW under development (Scatec Solar ASA, 2017a)

Figure 2.6 Scatec Solar ASA's value chain



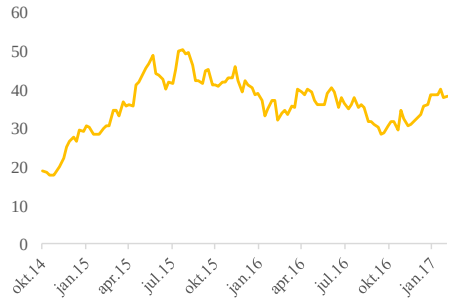
Source: Scatec Solar ASA, 2017a / Own production

2.5.1 History

SSO originated through an acquisition of German project development company Solarcompetence in 2007. SSO mainly focused on large scaled rooftop PV projects. In 2008 the company extended it services and entered the solar market in Italy and Czech Republic with their first installation in 2009. In 2010 SSO entered France, the US and they became the preferred bidder for project development in South Africa. SSO constructed their first project in South Africa in 2012, and got concession agreements for two more solar plants, which makes the total capacity in South Africa 190 MW. SSO expanded further in 2013 with market entry into Japan, the UK, Jordan and Rwanda. In 2014 SSO was listed on Oslo Stock Exchange and began construction of an 8.5 MW plant in Rwanda.

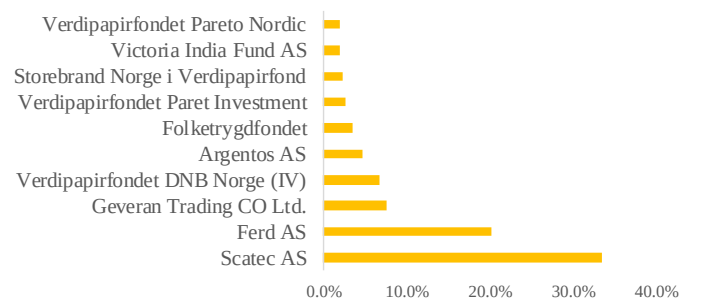
In 2015, SSO started their first solar investment in Latin America, the Agua Fria project in Honduras. SSO also commissioned a 104 MW power plant in Utah, USA. SSO built and started to operate three solar plants in Jordan in 2016. SSO sold their Utah plant in late December 2016. (Scatec Solar ASA, 2017b)

Figure 2.7 Stock price Scatec Solar ASA



Source: Datastream / Own production

Figure 2.8 Top ten shareholders

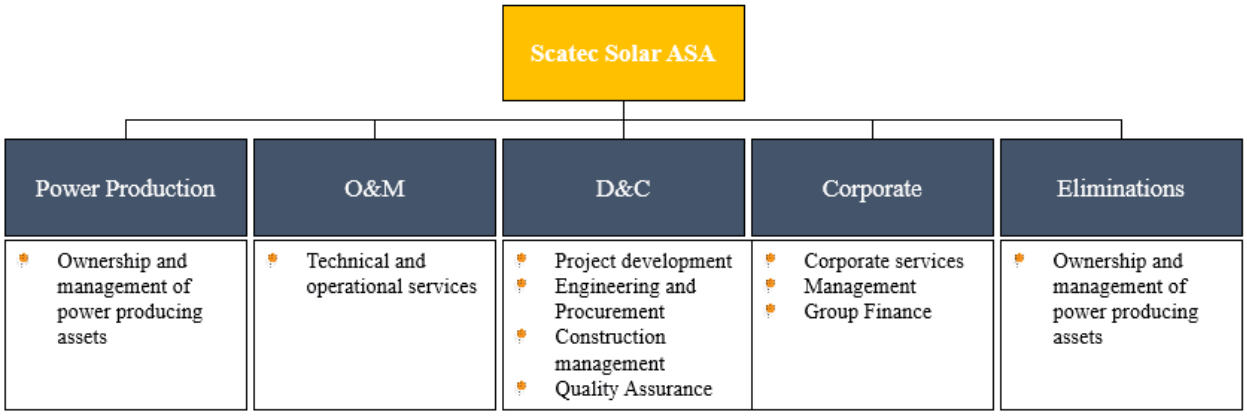


Source: Scatec Solar ASA, 2017 / Own production

2.5.2. SSO Today

SSO operates solar power plants in Czech Republic, South Africa, Rwanda, Honduras and Jordan. According to the Q4 2016 report, SSO produced 791 GWh of electricity in 2016, up from 466 GWh in 2015 (Scatec Solar ASA, 2017a). SSO has projects in backlog, which CEO, Raymond Carlsen claims has more than 90% probability of being realized in South Africa, Honduras, Brazil, Malaysia, Mozambique and Mali. SSO has projects in pipeline, which means that the probability of realization is above 50% in South Africa, Burkina Faso, Ivory Coast, Ghana, Senegal, Egypt, Pakistan and Kenya.

Figure 2.9: Scatec Solar reporting structure per 2016



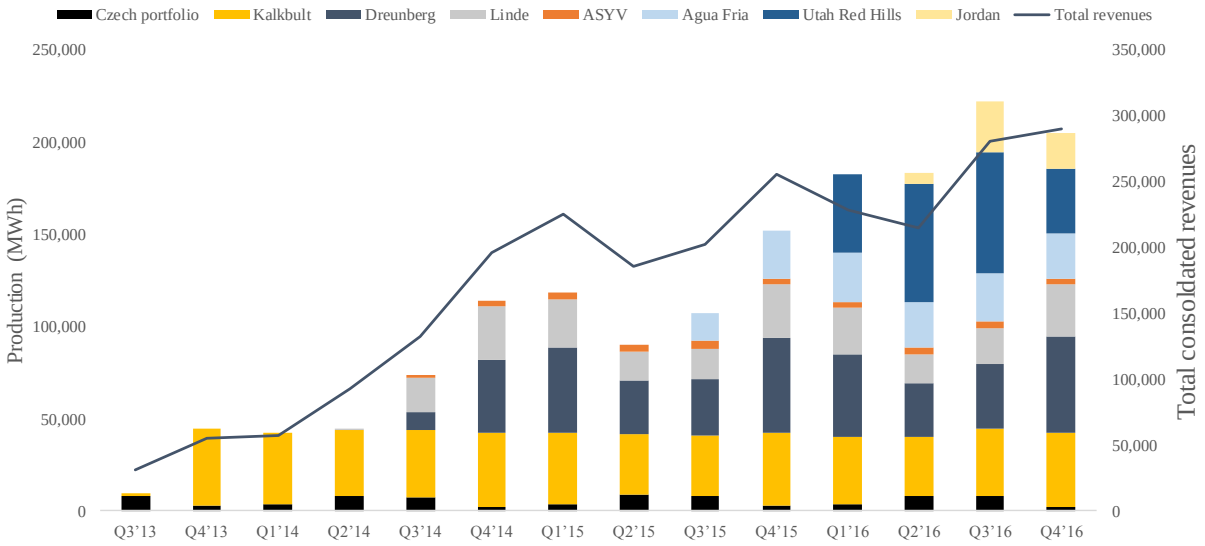
Source: Own production

SSO is an integrated solar power company which means that they build, owns, operates, and maintains the power plants. SSO reports on three operating business segments: Power Production, Operation & Maintenance and Development & Construction.

2.5.2.1. Power Production

The power production segment consists of the power plants that are producing electricity. Ownership and management of power plants fall under this segment. Revenues and costs that originate from the production of electricity are reported (Scatec Solar ASA, 2017a).

Figure 2.10 Total revenues and MWh



Source: Scatec Solar ASA, 2017a / Own production

2.5.2.2. Operation & Maintenance

The operation & maintenance segment comprises technical and operational services provided to solar power plants controlled by SSO. Operation & maintenance's customer portfolio is the operating plants and generates revenues based on fixed service fees with additional profit-sharing agreements based on plant performance (Scatec Solar ASA, 2017a).

2.5.2.3. Development & Construction

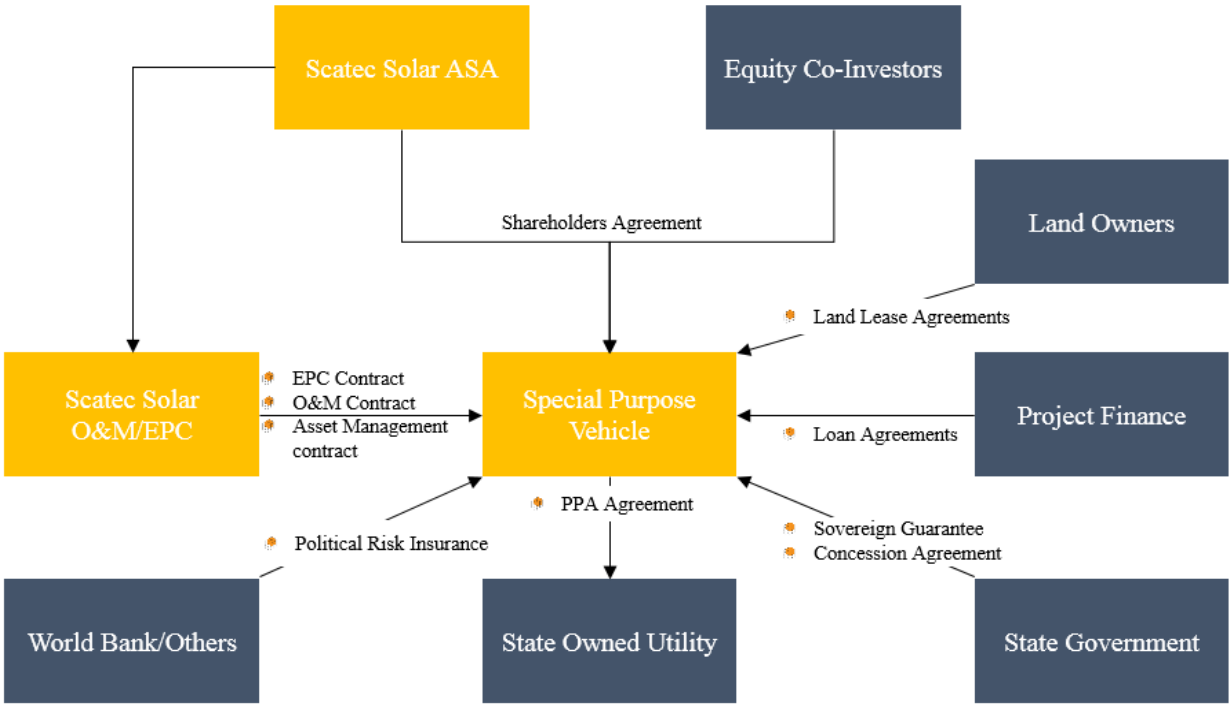
The development & construction segment comprises development activities in projects where SSO are involved. Revenues are recognized on percentage-of-completion of the construction contracts. Project development, engineering and procurement, construction management and quality assurance are all a part of this segment (Scatec Solar ASA, 2017a).

2.5.2.4 Special Purpose Vehicle

SSO organize their projects in Special Purpose Vehicles (SPVs), often referred to as project companies. SSO organize SPVs as single entities, with its own revenues, costs, assets and debt. The SPVs are partially owned by equity co-investors, ref. SSO's ownership in projects. As the SPVs are single entities, the group are not accountable beyond their equity stake (Scatec Solar ASA, 2016a). SPVs yields an opportunity for SSO to cooperate with relevant partners on each

project, without putting other projects in risk or being affected by other projects (Scatec Solar ASA, 2017b). See Figure 2.11 for further information on SPVs.

Figure 2.11 Organization structure

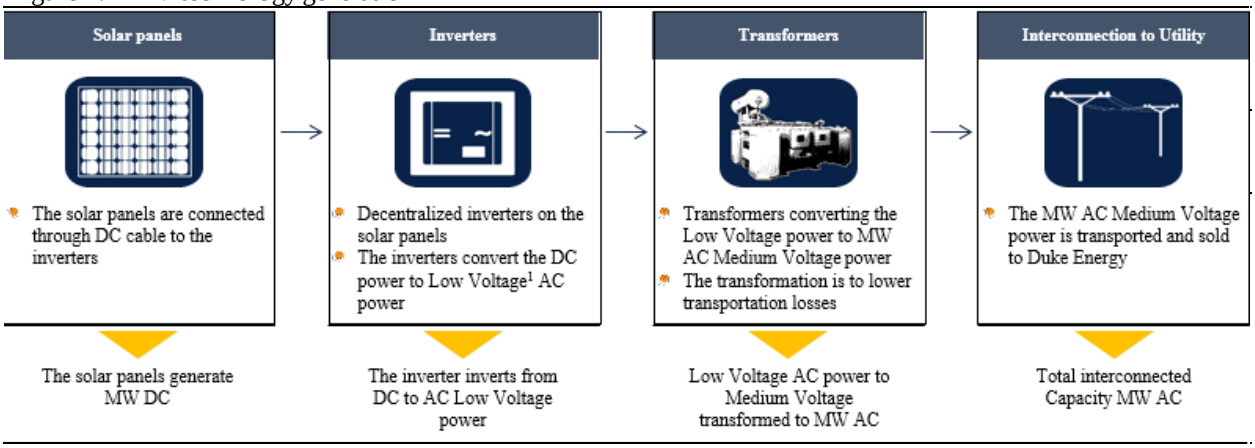


Source: Scatec Solar ASA (2017b) / Own production

2.5.3. From Planning to Execution

SSO initiates discussions with a utility provider and other stakeholders to help develop and finance projects. Hence, the parties involved signs an engagement agreement, regarding the opportunities. The agreement involves commercial terms, scope of work, terms and conditions, and additional clauses. As SSO either wins an auction or being assigned a contract, PPA or FIT they can plan the construction and development. Next is a period of negotiations and planning with different stakeholders, like investment funds or governments. Normally it takes 9-12 months to construct the plant before power production can start (Scatec Solar ASA, 2017b).

Figure 2.12 PV technology generation



Source: IEA, 2016 / Own production

2.5.4. Ownership Structure

SSO is listed on the Oslo Stock Index and has 93,816,230 shares outstanding per 01.02.2017. SSO only has one class of shares, which all carry same rights. Scatec AS is the largest shareholder with 20.8% equity stake in the company. SSO's dividend policy is to pay a dividend representing 50% of free cash distributed from the power production segment. In 2016, SSO distributed 134 million NOK from the project companies. (Scatec Solar ASA, 2017a)

Figure 2.13 Largest shareholders

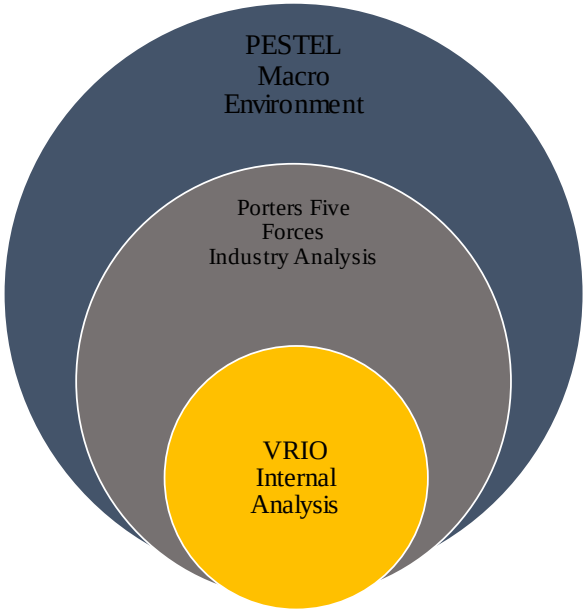
Investor	Number of shares	% of top 20	% of total shares	Country
Scatec AS	19,482,339	33.62%	20.77%	NOR
Ferd AS	11,711,182	20.21%	12.48%	NOR
Geveran Trading CO Ltd.	4,389,503	7.57%	4.68%	CYP
Verdipapirfondet DNB Norge (IV)	3,934,382	6.79%	4.19%	NOR
Argentos AS	2,755,760	4.76%	2.94%	NOR
Folketrygdfondet	2,068,477	3.57%	2.20%	NOR
Verdipapirfondet Paret Investment	1,535,000	2.65%	1.64%	NOR
Storebrand Norge i Verdipapirfond	1,300,330	2.24%	1.39%	NOR
Victoria India Fund AS	1,168,200	2.02%	1.25%	NOR
Verdipapirfondet Pareto Nordic	1,167,779	2.02%	1.24%	NOR
J.P.Morgan Chase Bank, N.A., London	1,167,441	2.01%	1.24%	SWE
SEB Prime Solutions Sissener Canop	1,150,000	1.98%	1.23%	LUX
Gothic Corporation	1,022,211	1.76%	1.09%	USA
Storebrand Verdi Verdipapirfond	1,008,066	1.74%	1.07%	NOR
J.P.Morgan Chase Bank N.A., London	935,637	1.61%	1.00%	GBR
Secururities Lending	779,501	1.35%	0.83%	SWE
Belito AS	677,609	1.17%	0.72%	NOR
UBS AG	623,081	1.08%	0.66%	GBR
Verdipapirfondet DNB SMB	542,456	0.94%	0.58%	NOR
Nordnet Livsforsikring AS	533,380	0.92%	0.57%	NOR
Total top 20	**57,952,334**	**100%**	**61.77%**	

Source: Scatec Solar ASA, 2017c/own production

3. Strategic Analysis of Scatec Solar

To understand the opportunities and challenges SSO face, it is important to do a sound analysis of the external environment, internal strengths, and weaknesses. In this paper, we conduct a PESTEL analysis of the macroeconomic environment and an industry analysis by using the porters five forces framework. The internal analysis conducts a VRIO analysis and sums up strengths, weaknesses, opportunities, and threats that SSO face.

Figure 3.1 Strategic Analysis



Source: Own production

3.1. PESTEL

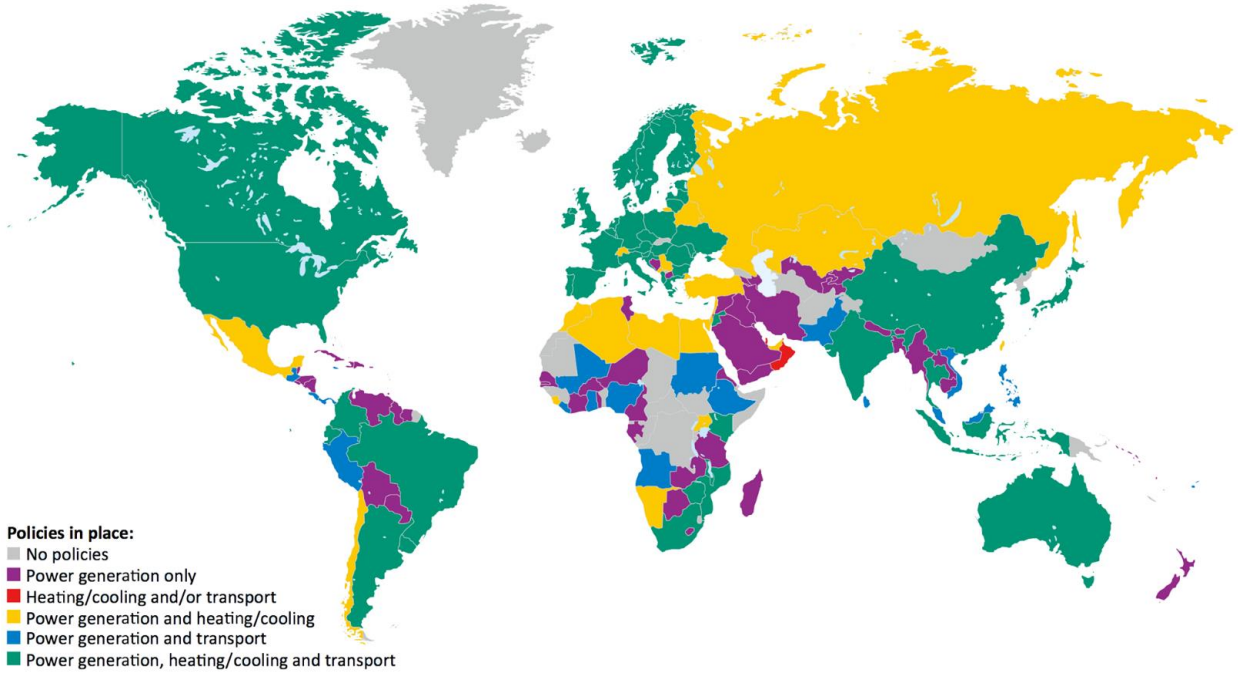
PESTEL is an acronym for Political, economic, social, technological, environmental and legal, and it tells which factors to consider when analyzing the macroeconomic factors that influence SSO. The PESTEL framework will help us pinpoint certain key drivers that influence SSO's future. SSO have operations around the globe, but as of today, most of them are in in EMDE and Latin America. Thus, PESTEL focus on these areas, as well as the renewables and PV industry.

3.1.1. Political Factors

The Paris agreement of 2015 (COP21) was an important step towards meeting the goal of limit the increase in global temperature to 2 degrees Celsius (IEA, 2016). Over 100 countries identified renewable energy as a priority and will be the leading supply of electricity in IEA's 450 scenario by primo 2020 and nearly 60% of all supply in 2040.

Increased focus and policy support of research, development, and deployment reduce cost and increase renewable investments. Initially, policies bridged the large cost gap with incentives and funding, which made investments in renewables possible. Today, policies target risk reduction of investments. Although feed-in tariffs have been, and still is a central incentive to increase investments in, no new schemes were launched in 2015 (IEA, 2016). Auctions are growing in popularity, and over 60 countries had some form of auction mechanism in 2015. Tax incentive schemes are also widely used, which may increase the level of renewable investments. Development of policies and support measures are critical for the pace renewables will grow, and essential for SSO's projects and profitability. Most countries have some policies in place, at least for power generation, see Figure 3.2.

Figure 3.2 Policies in place



Source: IEA, 2016

In EMDE countries, the political environment is often unstable, as the operations involve both high risk and concern. Political stability is a key driver for economic growth and is vital for planning new projects. Improving political stability leads to additional support policies, i.e., policy makers enable grid connections and the infrastructure necessary to build new plants. Support policies in Africa are bearing fruit and PV capacity in Africa amounted to 800MW in 2014 and 750MW was added in 2015. IRENA estimates that by 2030, the PV capacity may be as much as 70WG (Irena, 2016b). In Latin-America, over 300 policies for renewables are identified and found in virtually all countries (IRENA, 2016c). One major challenge in Latin America is to meet the capital demand at affordable costs.

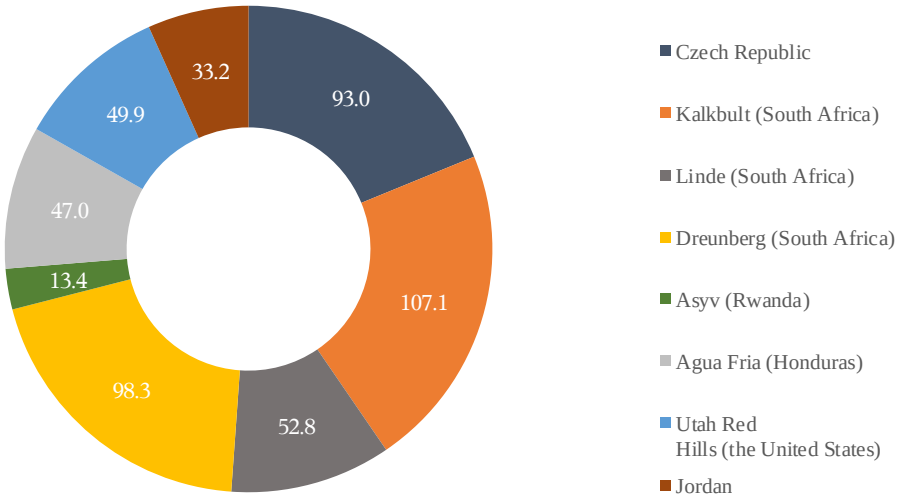
When countries and politicians recognize renewables and PV as a mean to produce energy and policy makers increase investments in renewables it opens up new possibilities for SSO. Recent news is that Iran has opened up for investments in renewables, summing to contracts of 1000 MW of capacity each year (Nordstrøm, 2017). Developments like these are of big interest for SSO, if not in Iran, and might happen somewhere else as well. The rise in demand for other sources of energy than fossil fuels will be a substantial growth driver for SSO.

3.1.2. Economic Factors

IMF estimates the economic growth in 2016 to be 3.1% and expect to accelerate to 3.4% and 3.6% in 2017 and 2018 respectively. Growth in EMDE is projected to grow more rapidly than advanced economies, facing growth of 4.1% in 2017 and 4.5% in 2018, which is vital for SSO's business model. Growth in advanced economies will grow at a slower pace of 1.9% and 2% in 2017 and 2018 (IMF, 2017). There is a lot of uncertainty regarding potential changes concerning the new administration in the United States, its global ramifications, and their implications for the global economy. Price fall in commodity prices led to higher debt levels, lower liquidity and especially EMDE countries are exposed. Low commodity prices have eroded fiscal buffers, and these countries are vulnerable to further external shocks (IMF, 2017). If EMDE countries are less dependent on a single commodity or resource and yield sustainable growth, they might be able to increase the level of investments. Regarding SSO, it might be highly profitable as they gain popularity and experience with a substantial project portfolio in such countries and economies.

SSO have operations in Honduras, South Africa, Czech Republic, Rwanda, Jordan, and have planned projects in Brazil, Mozambique, Mali, and Malaysia (Scatec Solar ASA, 2016a). Figure 3.3 illustrates the distribution of operating income attributable to SSO from power production. Most of the revenues adjusted for ownership in 2016 stems from South Africa followed by the Czech Republic.

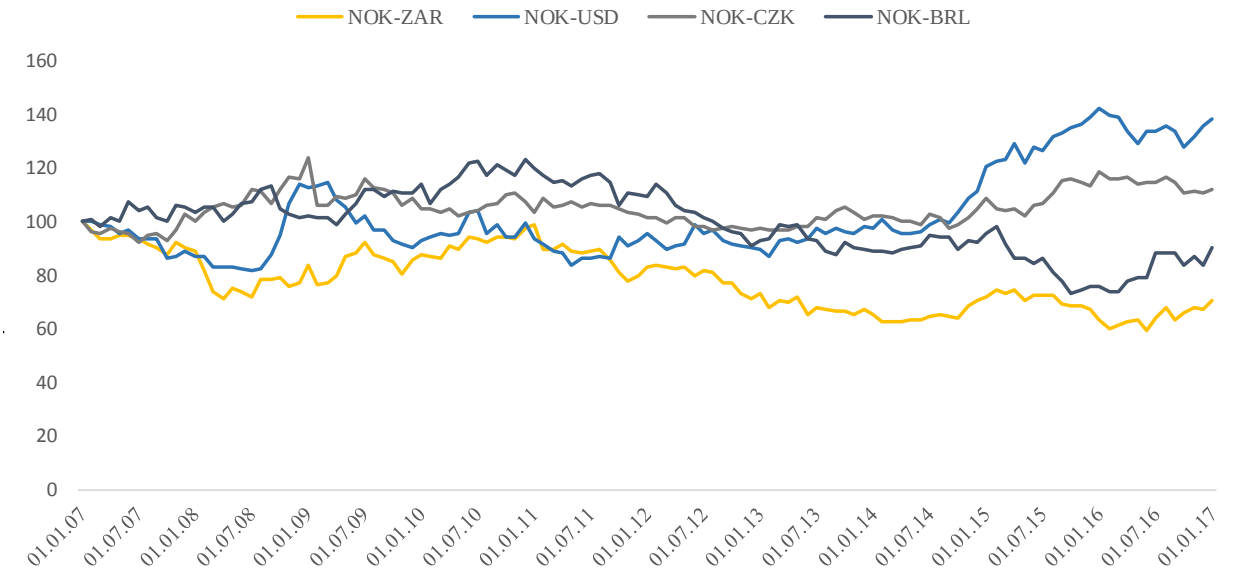
Figure 3.3 Distribution of operating revenues in 2016



Source: Scatec Solar ASA, 2017a / Own production

SSO is exposed to different currencies, making exchange rates important for future profitability. SSO report numbers in NOK, thus a strong NOK yield lower costs for O&M and D&C, while income from PP will be lower with a strong NOK. SSO is exposed to ZAR, CZK, USD, and BRL when Brazilian backlog projects realize. Current and planned PPAs are in USD because local currencies are volatile and translation to NOK may be difficult (Scatec Solar ASA, 2016a). Norway currently has very low-interest rates, and the NOK is historically weak against USD. The Norwegian economy is heavily affected by the oil price, which currently is as low as it was during the financial crisis in 2008. The Norwegian central bank estimates the key policy rate to remain low for at least two more years (Norges Bank, 2017). Based on these two key figures, we do not expect the Norwegian krone to appreciate in the nearest future.

Figure 3.4 NOK - foreign currency, normalized values



Source: Datastream / Own production

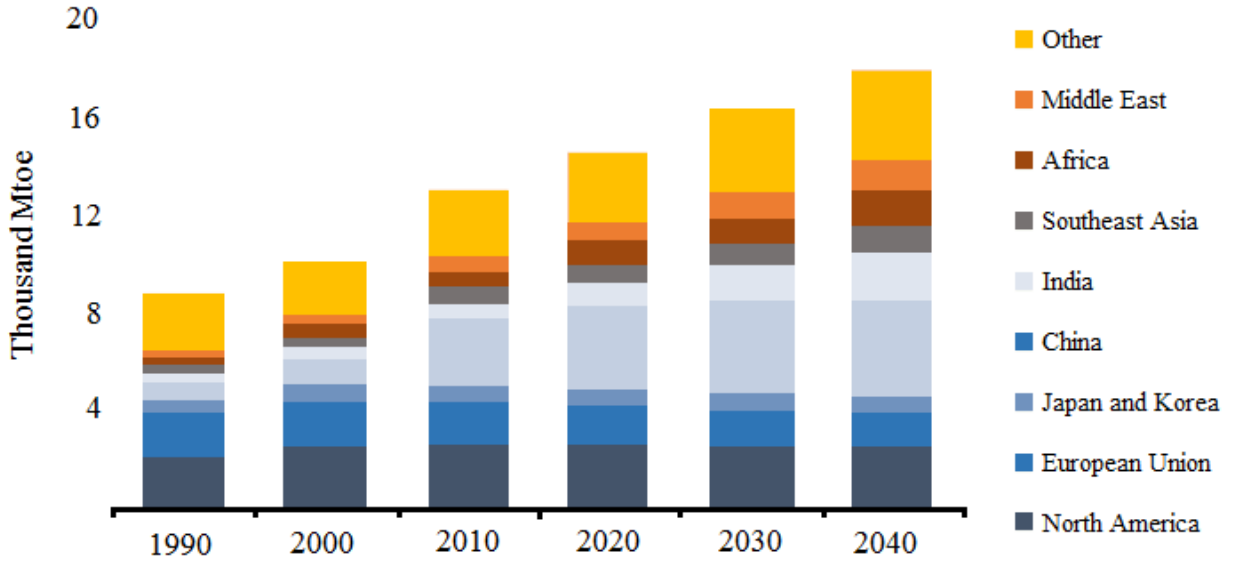
SSO's SPVs are heavily levered, and the profitability of each project depend on the interest rates for different projects. The company's financial expenses are high and yield higher(decreasing) expenses for rising(decreasing) interest rates. The leverage in each SPV's is non-recourse debt, lowering the financial risk for the group. SSO issued an unsecured green bond in 2015 which has an interest of 3-month NIBOR + 6.5% (Scatec Solar ASA, 2017a). The bond is also affected by changes in interest rates, and closely decided by the Norwegian key policy rate discussed above.

LCOE is mentioned as a benchmark for comparing different sources of energy. A low LCOE indicates that production cost of energy is low and attractive compared to others. The rapid decrease in costs for utility-scale solar PV increase the competitiveness of PV, and make it more attractive for investors. IRENA estimates a cost reduction of 57% between 2015 and 2025 (Irena, 2016b).

3.1.3. Social Factors

The world population reached 7.3 billion in 2015 and UN estimates a growth of 1.18% the next years reaching 8.5 billion in 2030 (United Nations, 2015). Due to population growth, demand for energy increase, and Africa is the fastest growing region. IRENA estimates that approximately 600 million Africans lack electricity and utility-scaled electricity for the grid (IRENA 2016b).

Figure 3.5 Global energy demand per region



Source: IEA, 2016 / Own production

We experience increased focus on the environment and the general view of global warming. The consumer attitude towards utilizing coal, oil or other fossil fuels to generate energy is important for the future of renewables. A transition towards renewables will incur if people demands a higher percentage of renewables in their energy mix. Thus, knowledge and attitude towards renewable energy sources and global warming are therefore essential for development. If people are more aware, understanding the issues at hand, and how renewables might help solve these, they might influence the future energy mix. In 2007 and 2008 Gallup conducted Polls in 127 countries asking if individuals knew about global warming and to what extent it was a result of human activities. The result was a median of 38% who have not heard about global warming. It ranges from 15% to 99%, and the percentage is lower in developed countries. Questioning human activity as the reason for global warming made percentage fluctuations. In Denmark, only 49% believed human activity that was the reason for global warming, and 90% had knowledge about global warming (Pelham,

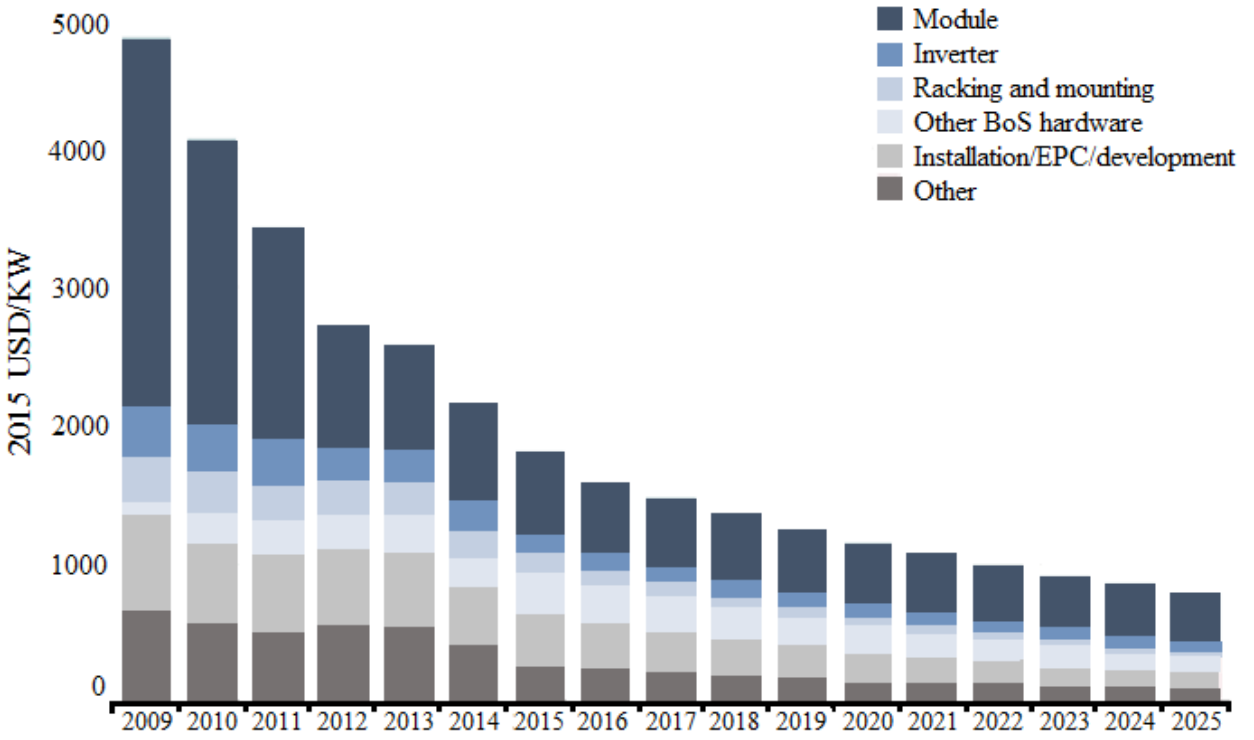
2009). A different US survey conducted in 2014 regarding various problems in the world people reported that only 24% answered they were worrying a great deal over climate changes, while 51% said a somewhat/not at all (Riffkin, 2014).

SSO have a strong position in emerging markets and gains vital knowledge about the African and Latin American energy market. The growing population's need for energy can be profitable for SSO as long as they win contracts, and continue the crucial work of improving the relationships between regions. People in Africa and Latin America might be skeptical of foreign companies coming to their country. An incentive for SSO is to open local offices to involve local labor as much as possible to ease the dialogue with the local people. Thus, SSO cannot stress enough the importance of a positive, social and economic impact on the local communities, and create awareness of solar energy. Establishing itself as a company that takes care of local people and communities, result in goodwill and acceptance in these regions, and encounter less hostility.

3.1.4. Technological Factors

When SSO builds a new power plant, the cost of the modules and the other components are crucial for the total cost. In the interview with Mikkel Tørud, he emphasized the importance of cost reductions for the industry and SSO (M. Tørud, personal interview, February 28, 2017). The cost of solar PV technology has declined a great deal recently, with 60% decline over the past five years. In addition, the IEA estimates a cost reduction of further 40-70% in 2040 from today's level (IEA, 2016). Lower prices lead to better margins and lower costs of building power plants. A lower total cost of building new plants may enable SSO to both invest in more projects and grow further. Projects in the pipeline and new projects that are not yet recognized may be even more profitable than projected.

Figure 3.6 Drop in total installation costs



Source: IRENA, 2016a / Own production

Another development in Solar PV market is the increase in effectiveness of PV cells. There are various technologies under development called “third generation PV-systems” (IRENA, 2016a). These technologies are still in a demonstration phase, and if successful, it might improve the amount of power the modules can generate. With improved output, power plants may be more profitable, which yields higher levels of investments in solar PV. For SSO it is particularly interesting with new technology if it utilizes solar irradiance more efficient. Connecting battery storage to the grid is an upcoming trend, which allows to "store" the electricity. This makes it possible to supply energy when demand is high, and when the sun is not shining. When questioning Mikkel Tørud's thoughts if this is critical regarding SSO, he replied that they do not consider this at the moment, mainly because SSO operates in emerging markets where the grid and electricity marked is not that advanced (M. Tørud, personal interview, February 28, 2017). In the US, the price varies throughout the day based on supply/demand. In general, $ per MW varies throughout the day. Therefore, it may be highly profitable to save some of the electricity for when demand is

high, yielding higher prices. SSO's earnings from power production relies on long-term PPA's, which reduce the chance of exploiting this technology. If technology improves greatly, it might be valuable for SSO to include battery storage in some projects as well.

3.1.5. Environmental Factors

Global warming and rising emissions of CO2 is a growing concern, and by increasing the amount of energy created by renewable resources, we can decrease the greenhouse gasses that we emit. The growing concern for the environment yield higher demand for SSO's products and knowledge. To be able to reach the goal of COP21, all countries have to scale down the use of coal, other fossil fuels, and increase the usage of renewables such as solar PV. The energy sector is the source of at least two-thirds of greenhouse emissions, so the possibilities are significant (IEA, 2016). In the main scenario in the renewable energy outlook 2016, IEA estimates an increase of 30% in global energy demand, so the need for renewable energy is higher than ever.

The location of the solar plant is crucial, and the solar irradiance level is the most important measure. The solar irradiance level varies across the planet and is affected by time of day, time of year, amount of clouds and pollution (Materials Technology, 2017). These differences govern where the best locations for a PV power plant is and will be important regarding how the future of the PV power industry will be. There are also the same restrictions to the other energy sources, so the change in external factors are essential for the development of the energy sector. For fossil fuels, there might be a scarcity in the future as we consume the existing oil, gas, and coal. Other climate changes may also change how effective hydropower and wind power is and might have an influence on future choices of energy mix.

3.1.6. Legal Factors

SSO is in a highly regulated industry, and there are numerous different laws to comply with and many stakeholders. The Los Prados project in Honduras is delayed due to an interregional discussion about whether or not new capacity is to be added to the grid. In Brazil and other countries, they are covenanted to use local suppliers, even though the local developers may not be able to deliver what is needed. SSO have to comply with these regulations as violating these covenants may disrupt the reputation of the company. All contracts are mainly long-term. Thus,

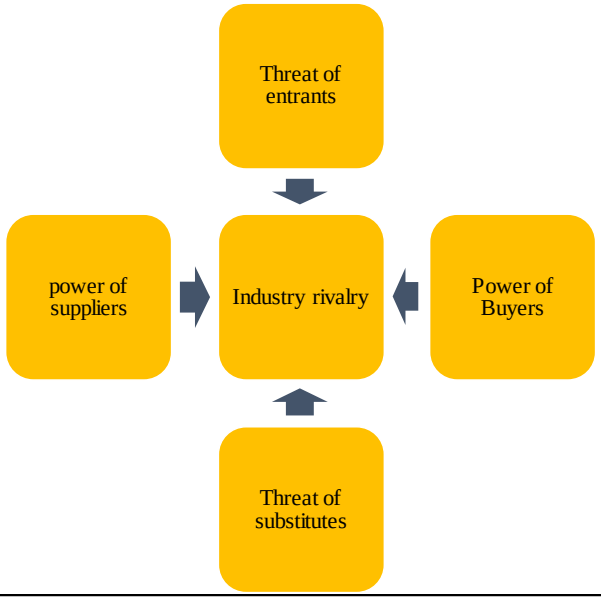
the relationship between SSO and the authorities is critical. Changes in these regulations can have severe consequences for SSO, as it may lead to extra costs or other implications.

Companies and countries can regulate how much of their energy should be fossil and how much should be renewables. Regulations towards using more renewables could yield high profits for SSO and lead to significant investments in solar power. Emission trading schemes are put into action in the European Union, Japan, China and the US among others (IEA, 2016). Regarding EU, there is a cap for how much of certain greenhouse gasses companies can emit. Contracts can be traded between companies and bring flexibility to ensure lower emissions, where the cost of reducing emissions are lower than buying contracts (European Commission, 2017a). There is also emission trading system put in place for countries like the UNFCCC emission trading system set by the Kyoto Protocol (United Nation Framework Convention on Climate Change, 2017). Although this could increase revenues in the future, SSO has disclosed that it is not a profitable part of their business yet (Scatec Solar, 2016a).

3.2. Porters Five Forces

To analyze and locate SSO's position in the industry and competitive environment, we use Porters Five Forces framework. Understanding the competitive forces reveals the roots of current profitability. In addition, Porters Five Forces creates a framework for anticipating factors that influence competition over time (Porter, 2008).

Figure 3.7 Porters five forces



Source: Porter, 2008 / Own production

3.2.1. Threat of Entrants

The threat of entrants is medium/high for the solar industry. LCOE is declining, meaning that the solar power industry is more profitable than ever. High margins and lower cost yield good investments for numerous different types of investors, ranging from PE funds to pension funds. Although there are several possible entrants, there are not many firms that can be a fully integrated company and control their value chain as SSO. The entrance barriers are high due to investment in the solar plants can be substantial. Thus, access to capital is essential for potential entrants, and it might be easier for incumbents in certain countries. SSO and other incumbents have the opportunity to take advantage of scale economies, allowing them to secure auctions due to both lower operating and construction costs. Incumbents also have the possibility to use their existing

portfolio and reputation to get new contracts. For instance, SSO has gained preferred bidder status in South Africa, making it difficult for possible entrants.

SSO and other incumbents have knowledge that a potential entrant might not possess. The knowledge might range from where to place the solar parks to how many workers needed to what kind of system is the best one, also incumbents knows the regulatory sides. They also have the connections to suppliers, and they know how to proceed in certain situations. The knowledge and reputation may also ease the talk with regulator organs and big institutions. Being recognized as a serious partner and a company that delivers great projects makes the talk more efficient with such organs. An example is the IFC, which is crucial for project funding and overall support in emerging markets. IFC is a major partner for the Mali project and assists with guarantees and communications with the government. CFO Mikkel Tørud said in the interview that these partners were of great help and crucial for securing their project in EMDEs due to their power and strong position in these countries (M. Tørud, personal interview, February 28, 2017). For entrants, it might not be easy getting these big institutions as partners, so it may be hard to compete without their backup.

3.2.2. Power of Suppliers

Powerful suppliers capture value for themselves by charging higher prices, limit quality or service or selling to rivals (Porter, 2008). This is not the case in the solar power industry, and as mentioned earlier, the cost of the PV technology and modules are expected to decrease further the coming years. Production of these modules is foremost in China, pushing prices down. Mikkel Tørud explained in the interview that they as well as many others buy their modules from China (M. Tørud, personal interview, February 28, 2017). The suppliers have little or no power of their customers, and supply exceeds demand for these modules. To our knowledge, the quality of Chinese parts is as good as the parts from America.

The PV technology producers need companies with utility-sized projects to purchase their modules. The technology is specific for the use and cannot be used to anything else. If one producer has a product with an advantage, other competitors can copy these specifications immediately, and

the competition is fierce (IRENA, 2016a). Thus, lower PV module costs are vital for SSO and other solar power companies

3.2.3. Power of Buyers

SSO's customers are large utilities or state-owned utilities. SSO wins contracts either by auctions or by other sorts of offerings. These customers possess much power over the project and can dictate the process. Powerful customers can play different industry participants against each other and can capture more value. They are powerful if they have negotiating leverage relative to industry participants (Porter, 2008). This is the case in the solar power industry, and they are flexible to choose the preferred developers for each project and can choose the one with the lowest cost, best output, or by other preferences they might have.

Because state-owned utilities often are the customers they might have a different agenda than a privately held company, they can consider other things than simply economic profit. As discussed in the PESTEL analysis, new FITs distributed in 2015 equaled zero and auctions are gaining popularity. It seems like the customers might be more price sensitive and consider the market more mature. This could yield fewer incentives and put pressure on SSO and its competitors.

3.2.4. Threat of Substitutes

A substitute is described as performing the same or a similar function as an industry's product by a different means (Porter, 2008). For SSO and the solar power industry, there are many substitutes. There are many energy sources, both fossil and renewables. The closest substitute is the Concentrating Solar Power technology, which also utilizes the sun, but with different technology. A far more popular substitute is on- and offshore wind and hydropower. These are very popular and widely used. There are also fossil energy sources like oil, gas, and coal. Historically all these sources of energy have been cheaper and more efficient than the PV technology, as discussed LCOE is a measurement of total cost/energy output. Thus, a lower LCOE compared to other energy sources shows that PV is now a competitive technology.

The best energy source depends on regional and local differences. As discussed the PV technology demands good solar irradiance levels, which is best close to equator. Hydropower fits best in countries with lots of rivers and water, and wind power applies best where the wind is strong. IEA

conclude that investments in oil and gas will be at reduced pace, but not stop completely (IEA, 2016). Half of the consumption of coal is in China, and it is estimated to decline by 13% to 2040. Today the coal market experience low prices due to over-supply but is estimated to rebalance by early 2020's (IEA, 2016). These fluctuations in the different energy markets can also increase the attractiveness of investing in solar power, as it gives more attractive returns for investors.

The difference in technology and suitability in various locations result in a different threat of substitutes. When governments consider diverse projects, they may not mind if the energy derives from solar or wind power, but might care if it is renewable or fossil. Thus, if fossil or wind power is cheaper, it can be a possible substitute. LCOE is expected to decline further, which makes solar power more attractive than its substitutes. Many of SSO's peers also control wind– and hydropower projects in their portfolio. A weakness for SSO is that they are solely dependent on one technology. The future will determine if PV technology wins against other renewables or not.

3.2.5. Industry rivalry

The Solar industry is very fragmented, and numerous firms currently develop, constructs and operate solar plants. There is no single leader in the solar power industry, although there are some companies that have extensive project portfolio. Exit barriers in the renewable industry are relatively high due to the size of investments. Still, it is common to sell project assets, and some companies specialize in buying existing projects instead of developing them. The company's country of origin is also a part of the competition as it helps bridge relationships between countries. For instance, Norwegian Prime Minister Erna Solberg attended the opening of the Rwanda plant (Norfund, 2014). Having politicians or other persons support to acquire contracts may create uneven terms of competition. Being a Norwegian company may benefit SSO as Norway has an excellent reputation and status internationally. Investing in renewable and solar projects can impact a country's image. Thus, the right partner is of big interest for these countries.

The solar power industry operates with high fixed costs and low marginal costs, pressuring prices, and lowering the FiTs and PPAs. The pressure on margins are increasing but for the moment the PPAs in existence is profitable, and SSO still assumes a 15% IRR on future investments (Scatec Solar ASA, 2016a). When rivals compete on the same dimension and aim to meet the same needs

or compete on the same attributes, the result is a zero-sum competition (Porter, 2008) For the solar power industry this might be the future, but as for the moment it does not seems like it is there yet.

The increased industry rivalry might also be positive for the solar industry, as it is gaining popularity as a mean of creating electricity the more knowledge people get about the technology. The future of solar power relies on contracts to further be initiated, and the importance of winning contracts cannot be stressed enough. This is the main competitive area in the industry while operating with the lowest costs and capital financing is upmost importance.

3.3. VRIO Analysis

To analyze SSO's internal strengths and weaknesses, we will use the VRIO-framework. VRIO is an acronym for the words Value, Rarity, Imitability, and Organization. For a resource to have continuously competitive advantages, it must be valuable, rare, not imitable and the organization must be ready to take advantage of them (Barney, 1991). Resource is defined as all assets, capabilities, organizational processes, firm attributes, information, and knowledge controlled by a firm that enables the firm to conceive of and implement strategies that improve efficiency and effectiveness (Barney, 1991). We will analyze three valuable firm resources and identify if these gives SSO continuous competitive advantages.

Figure 3.8 VRIO-analysis

Resource	Valuable	Rare	Imitability	Organization	Continous competetive advantage
Integrated value chain	Yes	Yes	Yes	Yes	No
Special purpose vehicle	Yes	No	Yes	Yes	No
Long term contracts	Yes	No	Yes	Yes	No
Local incentives and initiatives	Yes	Partially	Partially	Yes	Yes
Powerful partners	Yes	Partially	No	Yes	Yes

Source: Own production

3.3.1. Integrated Value Chain

One of SSO's great advantage is its fully integrated value chain. They are a part of D&C, O&M, and production. This helps SSO to achieve higher returns than others and let SSO finance its project by developing them itself. For instance, if SSO were to build the Malaysian projects, they would own 49% of the cash flows from operations, but 100% of the income from constructing it, making SSO to some degree self-funded.

This is crucial for SSO, as it leaves them with the opportunity to invest and reinvest in new project faster than if it did not construct the plants. Not many companies are as integrated as SSO, making it a rare resource. It is imitable for other companies, but it is not easy to start construction and operate power plants if they do not have any previous experience. By being in all parts of the value chain, they have different types of risk, and not all other firms may want to be a part of the construction but rather take over completed projects.

Well-positioned in all parts of their value chain, the entire organization builds on its three segments. The self-funding of projects is the most important part of the D&C segment. Due to the local presence, the O&M segment performs very well and contribute to revenues as well.

3.3.2. Special Purpose Vehicle

SPVs are an important part of SSO's business model. It is important for lowering the financial risk due to the use of non-recourse debt. It is valuable for SSO as the SPVs are individual entities and individually financed with different partners involved. This ensures that SSO can initiate contracts for several projects without jeopardizing other projects. For the non-recourse debt, SSO only guarantees the assets and cash flows of the SPVs (Scatec Solar ASA, 2017a). This is a common way to finance projects in the energy sector, so it is not a rare resource (Norges Bank Investment Management, 2015). For entrants and incumbents that are not currently using SPVs can (re)structure their business. Thus, SPVs are not a source of competitive advantage but is still a valuable resource for SSO.

3.3.3. Long Term Contracts

SSO sell the electricity they produce on long-term contracts, and it makes the cash flow predictable and secure. The FITs and PPAs have great value as the payment is secured unless the counterparty stops paying, which is not likely (D. Berlioz, March 7, 2017). The long-term contracts are not a rare resource, as it is a common way of selling electricity. It will not be a source of continuous competitive advantage as it is easy to imitate, making it a non-rare source. Other companies will have the possibility to participate in the same auctions and bid for the same contracts.

As mentioned above, the long-term contracts make cash flow predictable and are important for lowering the operating risk for SSO. The contracts are also used as collateral for the SPV's if SSO forfeits on their debt.

3.3.4. Knowledge and Experience

SSO started out as a company delivering rooftop PV solutions. Since then SSO has been a part of a rapid growing industry and changed focus to utility-sized power plants. The knowledge SSO has gained through many years is essential for securing new contracts and take advantage of the opportunities they get. The experience they have from earlier project is helpful when considering new project, as they learn what will work and what is not. Their experience is also valuable when discussing or dealing with other stakeholders as they gain reputation as a serious partner, but also by learning how to proceed.

The knowledge and experience SSO currently possess is mentioned as valuable for the future SSO, but is not rare and inimitable, as other companies invest far more in R&D than SSO, and hold larger portfolios than SSO. As PV technology becomes more attractive for investors, other may get the same amount and even more knowledge and experience than SSO. SSO is well positioned and ready to utilize the experience in new projects and keep costs as low as possible while increasing the effectiveness.

3.3.5. Local Initiatives and Presence

A core part of SSO's business model is the local sustainability projects and their local presence. SSO believes contribution to local communities, which themselves are a part of, supports the organization (Scatec Solar, 2016a). SSO always establish local offices and employs local labor at their plants. SSO gains acceptance and reputation from the locals by encouraging an open dialogue. Taking care of the local communities and taking actions to improve the community make SSO preferred as a result of good reputation. Many emerging countries in Africa and Latin America may not be positive to a foreign company building power plants in their countries so that a local presence may ease the process. Thus it is a valuable resource for SSO.

The organization builds on having a local presence and take part of SSO's business model. They continue to set up local offices when new projects are to commence. This is imitable and not rare as many other companies contribute the same way. The continuing focus on setting up local offices are important as it gives SSO a head start compared to entrants that might want to copy the business model.

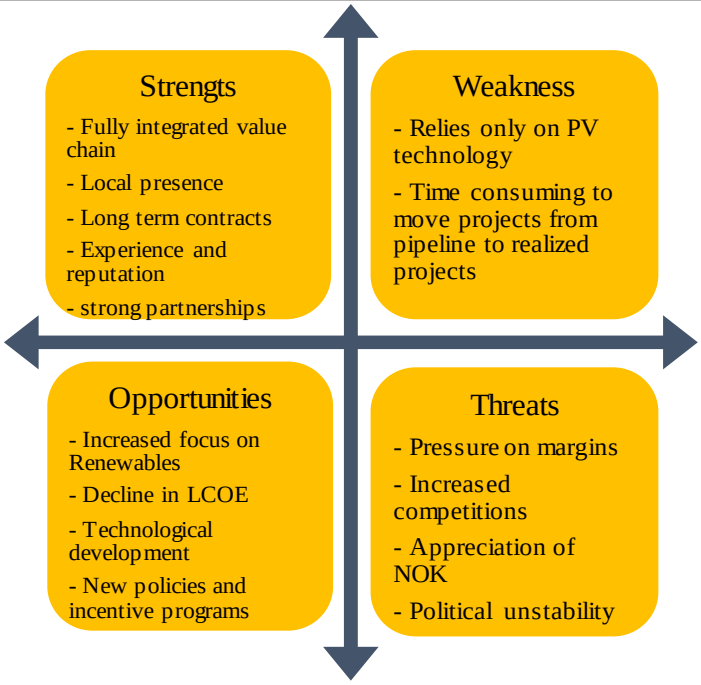
3.3.6. Powerful Partners

During the interview with Mikkel Tørud, he pointed out the importance of powerful partners for a close and good relationship. These partners contribute with both capital, knowledge, and bargaining power when dealing with governments or other stakeholders in EMDE. Moreover, he mentioned that partners like IFC, Norfund and KLP are investing in these countries in other means than just through SSO. For instance, Tørud told us that IFC-funded and helped out with the building of the railroad in Mali, so if the government does not hold their part of the PPA with SSO, they had leverage through their investment in the railroad (M. Tørud, personal interview, February 28, 2017).

These sort of powerful partners are not easy to imitate as relationship building demands time, and the company needs to prove worthy of such partnerships. Access is a scarce resource, supported by the IEA (2016). Having these partners is valuable for SSO as it reduces risk and gets the capital needed for new projects. With such influential partners, SSO expects their PPA contracts fulfilled and get their payments on time.

3.4. SWOT

Figure 3.9 SWOT-analysis



Source: Own production

4. Quantitative Industry Analysis

History tells us that high profitability tends to decline over time (Penman, 2013). It is hard, if not impossible to sustain high growth and profitability over time. According to Penman (2013), All drivers exhibit mean reversion, meaning the value drivers become similar to average over time. Low levels tend to be higher, and opposite. To identify the development and determine the long-term levels for key value drivers we will perform a quantitative industry analysis based on the SIC code for SSO. The Sic code is 4911 which is defined as "electric services: establishments engaged in the generation, transmission and/or distribution of electric energy for sale" (Siccode.com, 2017).

We extracted data using Compustat database and found key financials for 372 companies spread across the globe. Due to SSO's short lifespan and the rapid industry development in recent years, we chose to use numbers from 2006 to 2016. We use the methodology in Nissim and Penman (2001), and use fade diagrams to identify the long-run levels. We use the data collected to quantify mean reversion with an autoregression model.

We will trim our collected data to be able to use it in the analysis. If we cannot trace company performance for five subsequent periods, we will remove it from our sample. Some companies are established, and some will cease to exist during the period. Thus the averages may be biased estimates of going concerns (Nissim & Penman, 2001) We will also remove extreme outliers, as some items are very high, for instance, one company has a growth rate of 4803%. Due to the fact that we base our calculation for profit margin and turnover rate on analytical income statements and balance sheets, we will have to reorganize the data we collect from Compustat.

To derive the invested capital, we had to identify net interest bearing debt and total equity. Total debt is calculated as the sum of current debt plus long-term debt. We derived the financial assets by summing cash and cash equivalents and investments in associated companies. Operating assets is simply total assets minus financial assets. NIBD is total debt minus financial assets. Compustat gives total equity as total common equity, which includes common stock outstanding, capital surplus, retained earnings and treasury stock adjustments (WRDS, 2017).

To be able to calculate Profit margin we have to estimate NOPAT. We find core net income by removing cumulative translation adjustments and preferred dividends from net income. To find NOPAT, we have to find the net financial expenses after tax. We assume here the same tax rate as for SSO on 30% for all firms, recognizing this is not the correct tax rate for all companies. We find NOPAT by adding the net financial expenses to core net income and adjusting for non-operating income.

4.1. Fade Diagrams and Autoregressive Model

Fade diagrams are made by forming five portfolios by ranking ratios from highest to lowest, then track the median values for five years at a time. Due to the fairly short time interval of 11 years of data, we will form portfolios each year from 2006 to 2012. This gives us seven portfolios, the same amount Nissim and Penman (2001) base their results on. The fade diagrams are based on the mean of those median observations. The data used to plot the fade diagrams can be found in Appendix 3-5.

A first order autoregressive model is used to find persistence and mean reversion of sales growth, profit margin and turnover ratio. SSO is not a mature company, which may cause the analysis to be inappropriate. However, it might give an indication of the long-term levels as SSO matures.

$$x_{\tau-\alpha} = \omega(x_{\tau-\alpha}) + \varepsilon_t$$

x_t is the time series of the value driver, α is the long-run average, ω is the persistence of deviation from α and ε is the independent and identically distributed random variables with zero mean and variance σ^2. We estimate the expected future value at date t as:

$$E[x_\tau|x_t] = \alpha + \omega(x_{\tau-1} - \alpha) + \varepsilon_\tau$$

We calculate the residuals for each firm for all years by first finding the values for $x_t - \alpha$ and x_{t-1}-α. The next step is to subtract $x_t - \alpha$ by x_{t-1}-α to find the residual for each observation.

$$u_{i\tau}(\bar{\alpha}, \bar{\omega}) = (x_{i\tau} - \bar{a}) - (x_{i\tau-1} - \bar{a}) \times \bar{\omega}$$

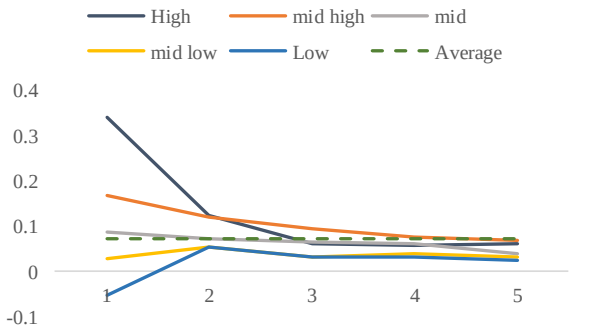
To find the values for ω and α we minimize the sum of squared residual error.

$$SSR(\bar{\alpha}, \bar{\omega}) = \sum_{i=1}^{I} \sum_{\tau=t-T}^{t} (u_{i\tau}(\bar{\alpha}\ \bar{\omega})^2$$

See Appendix 25 for an example of how we used panels to find mean reversion and persistence.

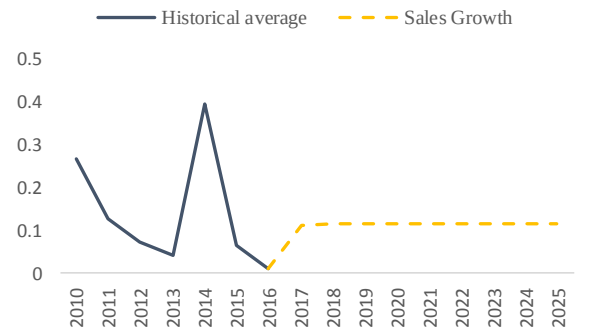
4.1.1. Sales Growth

Figure 4.1 Fade diagram - sales growth



Source: Compustat / Own production

Figure 4.2 Forecasted sales growth

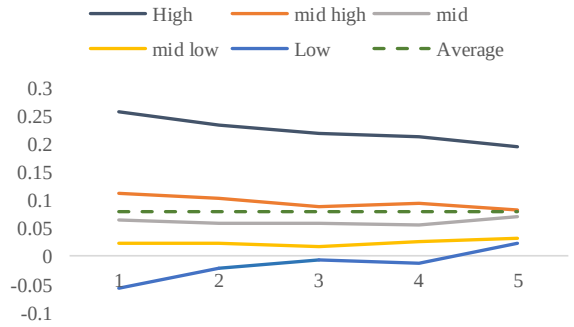


Source: Compustat / Own production

Sales growth show strong mean reversion as Figure 4.1 indicates. The autoregressive model estimates a long-term level of sales growth of 11.5% with a low persistence of 0.0321. As the demand for energy increase, it is expected that revenues grow in the energy industry. As discussed in the strategic analysis the demand is consistently growing and is not expected to stop. As we base our results on the regression of going concerns, the long-run level of sales growth is appropriate for a growing industry.

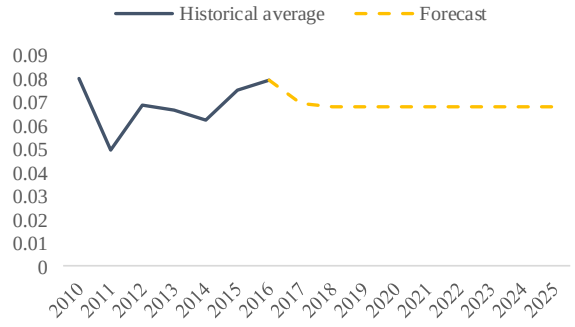
4.1.2. Profit Margin

Figure 4.3 Fade diagram - profit margin



Source: Compustat / Own production

Figure 4.4 Forecasted profit margin

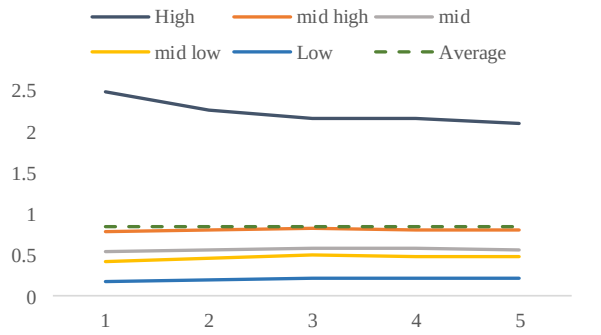


Source: Compustat / Own production

The fade diagram for profit margin shows mean reversion for four of the groups. The highest group converge with higher persistence and is consistently higher than the others. The peer group consists of firms that are diversified and relies on other businesses and technologies than just PV. Some of the peers might be mature companies that are late in their business cycle. Thus, the companies might have different prerequisites and have varying profit margins. SSO, which have historically high profit margins, belongs to the high performing group. SSO are in an industry with high margins, although we recognize that these margins may be weakened in the future as the fade diagram suggest. The autoregressive model suggests a long-run level of 6.7% with a persistence of 0.17. As mentioned above we assume SSO belongs to the top group and therefore will have a higher persistence and profit margin than the autoregressive model suggests. As discussed in the strategic analysis the margins are expected to be lower in the future, but not as low as the results from the autoregressive model. Thus, as the industry matures, we expect profit margin to decrease.

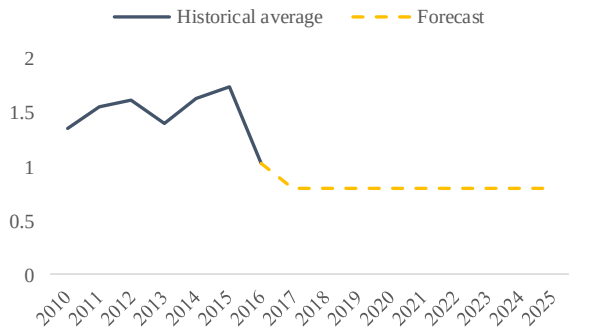
4.1.3. Turnover Ratio

Figure 4.5 Fade diagram - turnover ratio



Source: Compustat / Own production

Figure 4.6 Forecasted turnover ratio



Source: Compustat / Own production

Turnover rate does not show any noteworthy mean reversion. For turnover ratio as for profit margin, there is one group which is higher than the others. For turnover ratio SSO belongs to the lowest two groups. This might indicate that we can expect a higher turnover ratio for SSO in the future. The autoregressive model suggests a long-run average of 0.791 with a persistence of 0.02. The low persistence and high turnover ratio do not seem to be applicable for SSO, as we do not expect the turnover ratio to increase from 0.18 to 0.791 in the immediate future. Although, we recognize that turnover ratio is estimated to be higher and thus, expect the turnover ratio in the future to be higher. As discussed in the strategic analysis, we expect the total installation costs to decrease and effectiveness of PV technology to increase.

5. Reformulation of Financial Statements

To understand the company better, we start by analyzing SSO's financial statements. The financial statements provide vital information of a company, and the reformulation is important to get a comprehensive overview of financial performance. In order to extract this information, accounts need to be adjusted. We use consolidated Financial Statements for the past three years, and Petersen & Plenborg (2012), Koller et al. (2010) and Penman (2013) for the reformulation procedure of income statement and balance sheet. All three books distinguish the financial statements into two categories: financing and operating activities. The financial statements collected from SSO's annual and quarterly reports can be found in Appendix 6-8.

5.1. Dirty Surplus Items

Dirty-surplus items occur when income items are reported directly over equity. It is important to have a clean-surplus statement, i.e. an equity statement that has no income or costs other than net income from the income statement. The equity is divided into transactions with shareholders and comprehensive income. Transactions with shareholders do not create value but are observed as money distribution instrument (Penman 2013). Value-creating items are the change in a company's equity for a given accounting period, and are collected in comprehensive income (Peterson & Plenborg, 2012). The bottom line is adjusted for dirty surplus in the comprehensive income statement.

5.2. Reformulation of the Income Statement

Reformulation of the income statement helps us identify value creation by separating operating income from net financial expenses. The purpose of dividing these items are because investors consider net operating profit as a key performance measure to value creation, regardless of financing. Lenders consider operating profit as the primary source to support firms with debt (Petersen & Plenborg, 2012). Based on adjustments, we calculate EBITDA, EBIT, and NOPAT margins that are unaffected by activities that are non-operating.

We find the following items important for our analysis:

- SSO's income statement is reported by nature, not by function, meaning that the amount of depreciation, amortization and impairment is already deducted from other expense items in the income statement.
- Personnel expense is an operating item, but we have to deduct share-based payments and pension costs as these are non-operating items. The logical reason for this is that pension liabilities are interest-bearing, thus discounted to present value, and share-based payment is a financing decision, see Figure 5.1 and 5.2

Figure 5.1 Personell expense

NOK 1000	2014	2015	2016
Salaries	-70,193	-80,171	
Payroll tax	-7,404	-9,141	
Other personell costs	-6,386	-7,271	
Capitalised to PP&E (project assets)	25,440	45,106	
Total personell expenses	**-58,543**	**-51,477**	**-70,024**

Source: Scatec Solar ASA annual reports 2014 - 2015 / Scatec Solar ASA, 2017a / Own production

- Income tax is directly related to operations, as it is dependent and a direct consequence of daily production (Petersen & Plenborg, 2012).
- In SSO's annual report, ref. Note 19, we find IPO costs to be a non-recurring activity. Thus, we remove the post from other operating expenses and add to financial expenses (SSO, 2016a).
- Net income/(loss) from associated companies is defined as an operating activity because investments support the operational part of the business (SSO, 2016a).

Figure 5.2 Interest and other financial expenses

NOK 1000	2014	2015	2016
Pension costs	-2,162	-4,310	-5,200
Share-based payment	-8,982	-14,756	-10,975
Ipo cost	-15,056	0	0
Rental and lease interest	0	-150	-153
Interest expenses	-190,802	-395,541	-496,317
Forward exchange contracts	-46,744	-2,954	0
Other financial expenses	-11,011	-9,559	-8,484
Total financial expenses	**-274,757**	**-427,270**	**-521,129**

Source: Scatec Solar ASA annual reports 2014 - 2015 / Scatec Solar ASA, 2017a / Own production

- Although Mikkel Tørud explained that selling projects assets is a part of SSO's business model, it is impossible to forecast (M. Tørud, personal interview, February 28, 2017). Thus, net gain/(loss) from sale of project assets is allocated to financial income as it is a non-recurring activity, and excluded in the income statement for valuation purposes.

Figure 5.3 Analytical Income Statement

NOK 1000	2014	2015	2016
Revenues	455,098	867,714	1,012,938
Income from associated companies	-1,183	-865	-3,394
Total revenues and other income	**453,915**	**866,849**	**1,009,544**
Personnel expenses	-58,543	-51,477	-70,024
other operating expenses	-93,680	-112,027	-165,716
EBITDA	**301,692**	**703,345**	**773,804**
Depreciation, amortisation and impairment	-101,859	-175,609	-270,083
Rental and lease payments	0	5,911	6,011
Lease depreciation	0.00	-5,760.68	-5,858.14
Adjusted EBIT	**199,833**	**527,886**	**503,874**
Tax on operating profit	-37,103	-201,811	-144,747
NOPAT	**162,730**	**326,075**	**359,127**
Net gain from sale of project assets	17,393	14,112	75,405
Interest and other financial income	54,799	64,402	50,796
Interest and other financial expenses	-274,757	-427,270	-521,129
Net foregin exchange gain/loss	62,310	40,514	-10,052
Net financial expenses before tax	**-140,255**	**-308,242**	**-404,980**
tax on financial expenses	26,041	117,841	116,338
Net financial expenses after tax	**-114,214**	**-190,401**	**-288,642**
Net profit/loss for the period	**48,516**	**135,674**	**70,485**

Source: Scatec Solar ASA annual reports 2014 - 2015 / Scatec Solar ASA, 2017a / Own production

5.3. Capitalizing Operational Lease

Capitalizing operational lease is important as companies that use operating leases will achieve higher ROICs, creating misperceptions of their true performance. In our adjustment, we have used leasing rental expense, an estimated lifetime of assets, and cost of secured debt (Koller, et. al 2010).

The IFRS 16 was issued in 2016 and applies to annual reporting periods beginning on or after 1th of January 2019 (Deloitte, 2017). IFRS 16 requires the lessees to recognize assets and liabilities for all leases and will dictate how SSO will have to measure, present and disclose their leases. SSO has not yet completed the analysis of the impact of IFRS 16 (Scatec Solar ASA, 2017a).

We adjust NOPAT upward by removing the implicit interest in rental expense, while the value of capitalized operating leases is added to book assets to long-term debt, and corresponding adjustments increase both sources and uses of invested capital (Koller et. al, 2010). Rental and lease interests (ref. Note 17) are removed from operating profit and we calculate the implicit rental and lease interest expense by multiplying the value of operating leases by the cost of secured debt. Further, we find lease depreciation, which is the remaining rental expense. Depreciation remains as an operating expense as depreciation is not related to capital structure.

The cost of debt is estimated by using AA-rated yields (Appendix 27) because the operating lease is secured by the underlying asset, thus less risky than the unsecured debt of the company (Koller et at. 2010). The asset life is calculated by dividing PP&E by annual depreciation.

$$Rental\ Expense = Asset\ Value_{t-1}\left(k_d + \frac{1}{Asset\ Life}\right)$$

To estimate the asset's value, we rearrange the equation above as:

$$Asset\ Value_{t-1} = \frac{Rental\ Expense}{k_d + \frac{1}{Asset\ Life}}$$

figure 5.4 Operating lease calculations

Nok1000	2014	2015	2016
Risk-free rate	1.74%	-	-
AA bond spread	0.80%	-	-
Cost of debt (Rd)	**2.54%**	-	-
Asset life	29.94	29.59	18.73
Rental and lease payments	-	-5,911	-6,011
Asset value	99,806	76,274	
Rental and lease depreciation	-	-5,761	-5,858
Rental and lease interest	-	-150	-153

Source: Scatec Solar ASA annual reports 2014 - 2015 / Scatec Solar ASA, 2017a / Own production

5.4. Reformulation of the Balance Sheet

When reformulating SSO's balance sheet, we separate financing activities from operating activities. The financing activities should be market to market and generate a fair risk-adjusted return (Penman, 2013). Hence, in the valuation model we use operating activities, and consequently exclude financing activities, as they do not provide any future value for shareholders. We isolate invested capital which represents the amount a firm has invested in its operating activities, that better reflects the value of the firm (Petersen & Plenborg, 2012).

As for the income statement, we had to discuss the nature of different items to distinguish between operating and financing activities. We find the following items relevant to our analysis:

- Deferred tax assets are allocated as an operating item and arise from tax loss carry forwards or assets that are recognized at a lower value in the balance sheet than for tax purposes (Petersen & Plenborg, 2012).
- Deferred tax liabilities arise due to temporary differences between book- and tax values (Peterson & Plenborg, 2012), and relate to intangible and tangible assets, thus we allocate the item as an operating liability.
- As mentioned in the income statement, investments in associated companies are allocated to operating assets because it is a recurring activity, which is aligned with SSO's business model.
- We classify non-other assets held for sale as a financial item as it only occurs in 2014.

- Both current and non-current financial assets are allocated as a financing item because SSO uses derivative financial instruments during construction to hedge financial risk and apply hedge accounting, ref. Note 10. Derivatives not fulfilling the criteria for hedge accounting are recognized in the consolidated statement of financial position at fair value, while a change in the fair value of the derivative financial instruments are recognized in the consolidated statement of profit or loss as financial income/expense as the forward exchange derivative contracts expired at the end of 2015, ref. note 9 (SSO, 2016a). Effective portion of cash flow hedges are recognized in other comprehensive income until the transaction occur.
- Cash and Cash Equivalents is defined as excess cash, which does not affect the underlying operations, hence financial assets are treated as financing activities ref. note 7.
- Accounts payable, deferred tax liabilities, and income tax payables are operating liabilities that are considered as interest free loans (Koller et. al 2010), thus we subtract the items from operating assets, meaning that the need for financing is reduced.
- Both current and non-current financial liabilities are non-operating, hence a financial item.
- Current non-recourse and non-current-non-recourse project financing is a loan where the bank recovers the financing solely through project assets and cash flows generated by the projects. Thus, the item is allocated as a financing activity ref. note 6 (SSO, 2016a).
- It is important to note that SSO had operating lease commitments of NOK 408bn the next 4 years. We adjust for capitalizing of operating leases as it influences several financial ratios, however the company's valuation does not change.

Figure 5.5 Analytical balance sheet

NOK 1000	2014	2015	2016
Non current operating assets			
Property, plant and equipment – in solar projects	3,049,193	5,196,298	5,059,802
Property, plant and equipment – other	13,231	19,891	21,465
Capitalized operational lease	99,806	76,274	0
Total adjusted PPE	**3,162,230**	**5,292,463**	**5,081,267**
Deferred tax assets	402,011	340,670	327,456
Goodwill	22,169	23,595	22,289
Other non-current assets	214,401	136,543	141,789
Investments in associated companies	25841	0	0
Total non-current operating assets	**3,826,652**	**5,793,271**	**5,572,801**
Current operating assets			
Trade and other receivables	126,122	221,382	231,484
Other current assets	82,897	251,892	114,104
Total current operating assets	**209,019**	**473,274**	**345,588**
Non-interest bearing debt			
Deferred tax liabilities	82,640	203,436	127,508
Trade and other payables	69,947	154,154	29,346
Income tax payable	41,543	23,508	10,680
Other current liabilities	145,717	364,794	183,166
Total non-interest bearing debt	**339,847**	**745,892**	**350,700**
Invested capital	**3,695,824**	**5,520,653**	**5,567,689**

Source: Scatec Solar ASA annual reports 2014 - 2015 / Scatec Solar ASA, 2017a / Own production

Figure 5.6 Analytical balance sheet

NOK 1000	2014	2015	2016
Equity			
Total equity	**1,176,582**	**1,425,397**	**1,312,739**
Interest bearing debt			
Non-recourse project financing	3,337,265	4,799,828	4,304,098
Bonds	0	492,917	495,417
Financial liabilities	14,886	0	7,330
Other non-current liabilities	4,646	346,616	318,798
Non-recourse project financing	112,786	166,789	279,473
Financial liabilities	25,773	6,184	6,584
Capitalized operational lease	99,806	76,274	0
Total interest bearing debt	**3,595,162**	**5,888,608**	**5,411,700**
Interest bearing assets			
Financial assets	23,868	126,810	18,237
Financial assets	2,946	1,086	1,289
Cash and cash equivalents	1,049,106	1,639,029	1,137,224
Non-current assets held for sale	0	26,427	0
Total interest bearing assets	**1,075,920**	**1,793,352**	**1,156,750**
Net interest bearing debt	**2,519,242**	**4,095,256**	**4,254,950**
Invsted capital	**3,695,824**	**5,520,653**	**5,567,689**

Source: Scatec Solar ASA annual reports 2014 - 2015 / Scatec Solar ASA, 2017a / Own production

6. Profitability Analysis

To be able to forecast the future of SSO it is important to analyze the historical performance through a profitability analysis. Profitability is important for the company's growth potential, economic strength, and can help SSO maintain a good relationship with different stakeholders. Sound profitability strengthens SSO position in the marked, allowing them to develop new projects, and being a trusted partner for years to come.

To analyze the historical performance of SSO, we perform an index analysis, common size analysis, an analysis of key drivers of return on invested capital (ROIC). The analyses build on the analytical income statement and balance sheet of the yearly and quarterly numbers from Q1 2014 to present, see Appendix 10 and 11. We chose to use quarterly numbers alongside annual numbers because of rapid growth and limited data of operation and financial statements. The index analysis is helpful in finding trends and development over time but fails to tell anything about the relative sizes of the posts (Peterson & Plenborg, 2012). Thus, common size analysis will supplement the index analysis.

The quarterly reports do not include as many notes as the annual reports, making it difficult to find numbers for all items in the income statement. To be able to account for pension costs and share-based payments we assume they are distributed evenly throughout the year. We subtract pension costs and share-based payments from personnel expenses in the income statement to retrieve the operational part of personnel expenses. Thus, share-based payments and pension cost are allocated to other financial expenses. We encountered the same issue with operating lease costs, and not accounted for in the quarterly reports. Thus, we distributed them evenly throughout the quarters. We report rental lease payments and lease depreciation separately, and the remaining items in this paragraph are discussed and included in the calculations of 'personnel expenses' and 'interest and other financial expenses', see Appendix 9.

Goodwill sums to 0.4% of invested capital in the last seven quarters and amounts to a tiny fraction of invested capital. Although it is suggested by Koller et al. (2010) to calculate ROIC with and without goodwill, it makes no difference in our analysis of SSO.

6.1 Peers

We analyze SSO's historical performance relative to a set of close peers. To find a viable benchmark we have used data for four competitors in the Solar industry. All the firms in the peer group are in the solar business and all use PV technology. It is not straightforward to find peers for SSO as they are in all parts of the value chain except for the production of the modules. We collect data from peers from Thomson One database and reformulate the financial statements according to Koller et al. (2010). We do not perform an in-depth reformulation, as it will be too time-consuming and not contribute with further value. Koller et al. (2010) cover both GAAP and IFRS, and we have to apply both for our peer valuation. We reformulate the financial statements to collect NOPAT, invested capital, profit-margin, turnover rate and ROIC. For peers financial, see Appendix 20-24.

6.1.1. Abengoa Solar

Abengoa is a Spanish company that focuses their business on three activities: Engineering & Construction, Concession-type infrastructures and industrial production (Abengoa Solar, 2017). The concession-type infrastructures are power production from long term contracts such as FITs or PPAs. Abengoa uses both PV and CSP technology and sees itself as a pioneer due to substantial investments in R&D. Abengoa has a portfolio of 1603 MW, 360MW under construction and another 320MW in pre-construction (Abengoa Solar, 2017).

6.1.2. First Solar

First Solar develops, finances, engineers, constructs and operates PV power plants. They have substantial knowledge of the solar power value chain and invest a lot in R&D to help reduce LCOE and increase efficiency (First Solar, 2017). First Solar has global presence with operations on all continents.

6.1.3. Etrion Corporation

Etrion Corporation is an independent power producer situated in Switzerland. Etrion Develops, builds and operates solar power plants and currently has 109MW of installed capacity and 17MW under construction.

6.1.4. Canadian Solar

Canadian Solar was founded in 2001 and has been in the industry since. They are larger than the other peers and has a project pipeline of 20.4 GW. Canadian Solar produces PV modules as well as solar projects and is also geographically diversified with projects across the globe (Canadian Solar, 2017).

6.2. Index Analysis

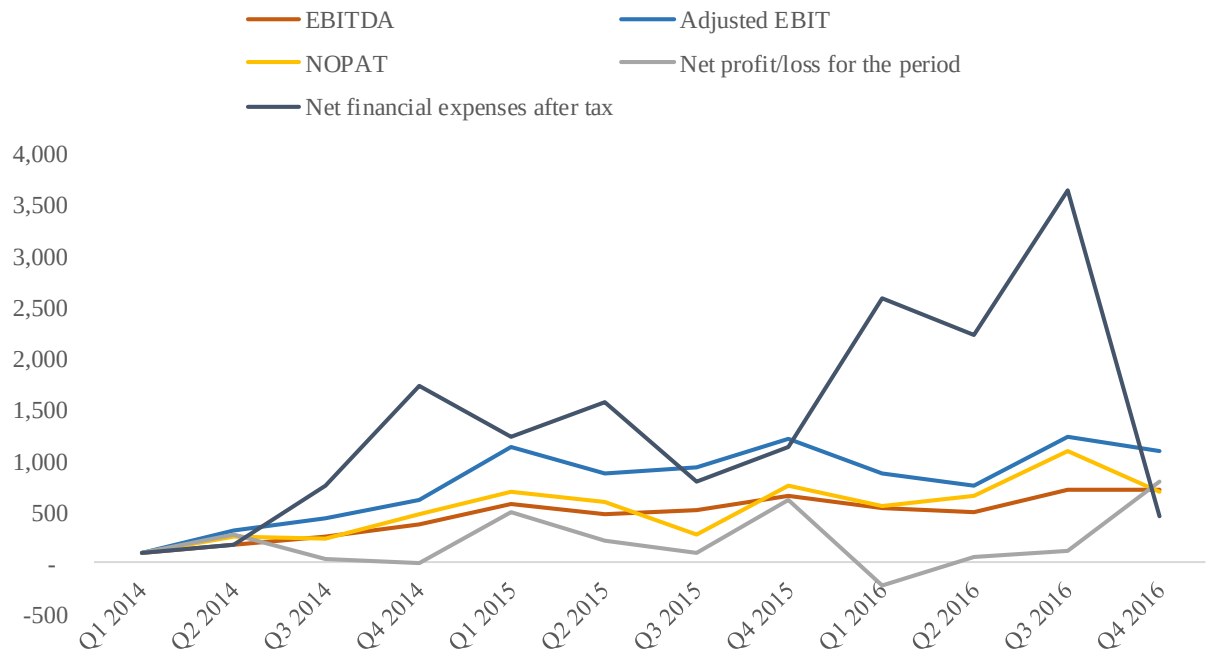
Index analysis is a valuable tool to identify trends in various accounting items. The index analysis shows the development of all accounting items over time with the first observation as the base score.

6.2.1. Income Statement

- The Index analysis of the analytical income statement illustrates that revenues are 411% higher in Q4 2016 than Q1 2014, with a CAGR of 30.5%. SSO have experienced a rapid growth in the project portfolio since the listing in 2014. In addition, the increase in revenues is stable, except for small setbacks in Q2 2015, Q1- and Q2 2016.
- Personnel expenses and other operating expenses have increased, but not as significant as revenues, resulting in an EBITDA growth of 602%.
- Depreciation, amortization, and impairment are 340% higher in Q4 2016 than in Q1 2014, as investments in PPE.
- Adjusted EBIT is 992% higher in Q4 2016 than in Q1 2014. Correlative with adjusted EBIT, NOPAT was 590% higher with a CAGR of 30.2%. Both EBIT and NOPAT have minor setbacks, but increase steadily, and rise to higher levels after setbacks throughout the period.

- Net profit fluctuates over time, due to changes in financial expenses during the period. SSO finance most of their projects with debt. Q1 2016 yield negative profit due to high financial expenses in the period. We see a growing trend in net profit from the first year, but not as much as NOPAT, EBIT, and EBITDA. Realized net profit had a CAGR of 13.3% and was 684% higher in Q4 2016 than in Q1 2014.

Figure 6.1 Index analysis of the income statement



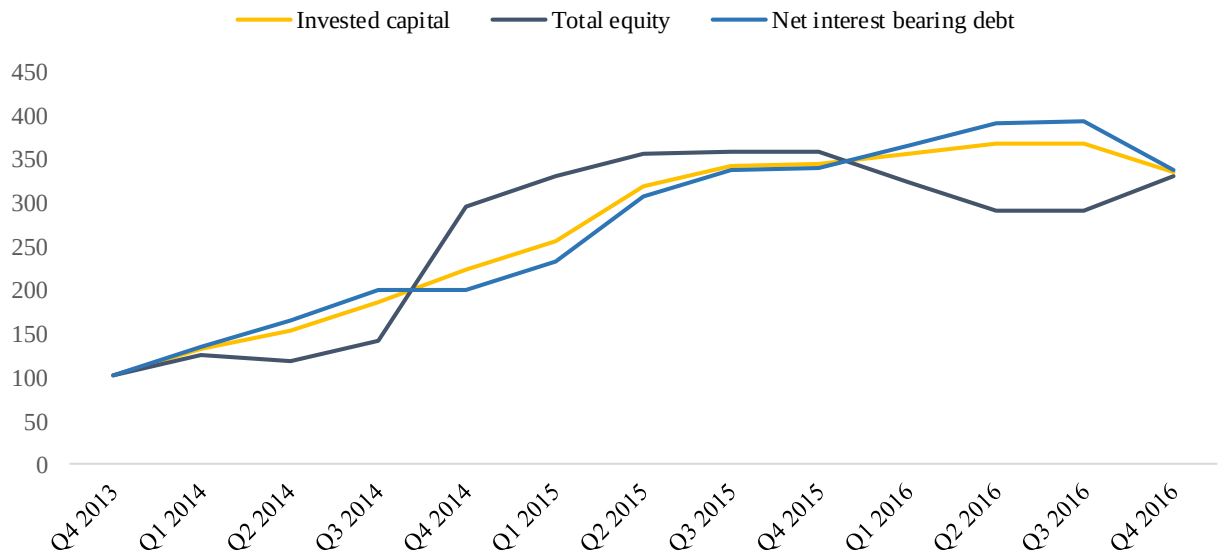
Source: Scatec Solar ASA quarterly reports 2014-2016 / Own production

6.2.2. Balance Sheet

- Total non-current operating assets is 149% higher in Q4 2016 than Q4 2013 and is driven by an increase in PPE. Other non-current have increased with 352% since Q4 2013.
- Trade and other receivables increased by 809% over the time leading to an increase of 164% increase in total current operating assets.
- Invested capital increased by 235% during the period, reflecting a stable growth over the period, with a minor decrease in Q4 2016, due to the sale of the Utah plant.
- Due to the IPO issue in 2014, total equity increased 229% from Q4 2013 to Q4 2016.

- Net interest bearing debt increased to 237%, about the development in non-recourse project financing. Although other non-current liabilities increased significant, it only constitutes a small effect due to its small size, while the level of investments in new projects is the main driver.

Figure 6.2 Index analysis of the balance sheet



Source: Scatec Solar ASA quarterly reports 2014-2016 / Own production

6.3. Common Size Analysis

The common size analysis scales each line item as a percentage of revenues, giving an essential understanding of the size relative to revenues. We estimate the common size analysis of the balance sheet against the invested capital.

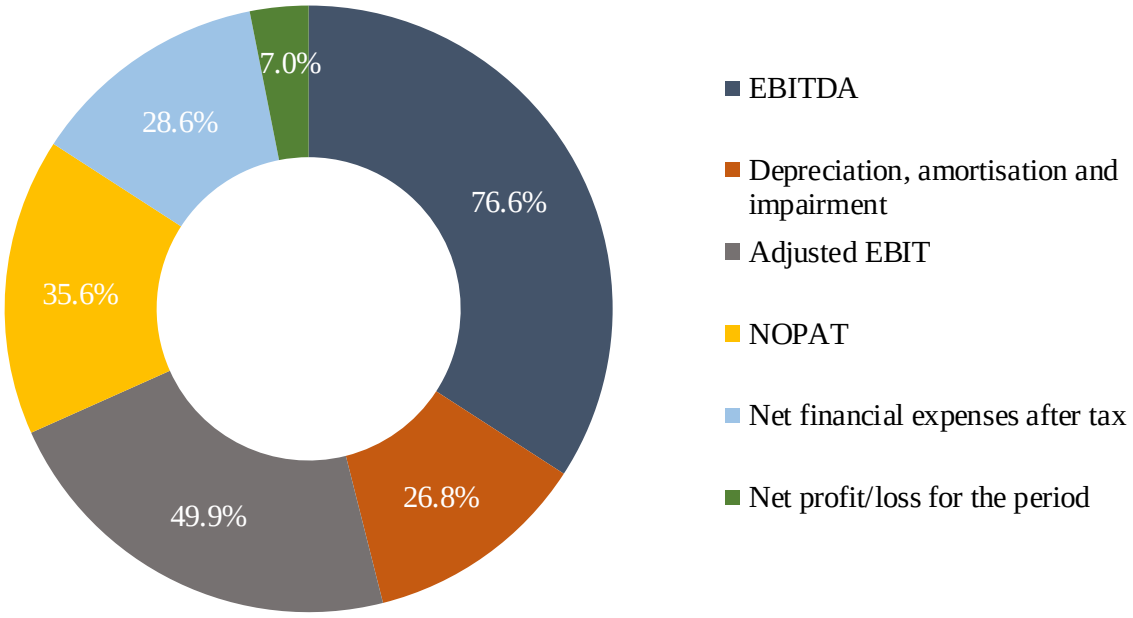
6.3.1. Income Statement

- SSO's EBITDA margin improves from 2014 to 2016. Because of increased revenues and low personnel- and other operating expenses, which constitutes 5.1% and 17.5% of revenues respectively in Q4 2016.
- Depreciation, amortization and impairment amount to 28.9% of earnings, thus a significant cost driver for SSO. The index analysis showed an increase in depreciation, amortization, and impairment. Depreciation, amortization, and impairment are higher in Q4 2016 than

any other period except for Q1 2014. SSO is a capital-intensive firm with substantial investments in their projects, so a relatively high depreciation, amortization and impairment cost is to expect.

- Adjusted EBIT- and NOPAT margins are both high with an average of 49,4% and 35% respectively.
- Net financial expense has been as high as 48.1% (Q3 2016) averaging 24.2% from Q1 2014. In 2016 SSO wrote down NOK 241.337 of non-recourse debt, leading to higher financial expenses, ref. note 4 (Scatec Solar ASA, 2016a)
- Average net profit margin is 10.9% and is positive for all periods except for Q3 2015. SSO reported a net profit margin of 26.5% in Q4 2016, with positive growth for the last three quarters.

Figure 6.3 Key figures from the common size analysis of income statement

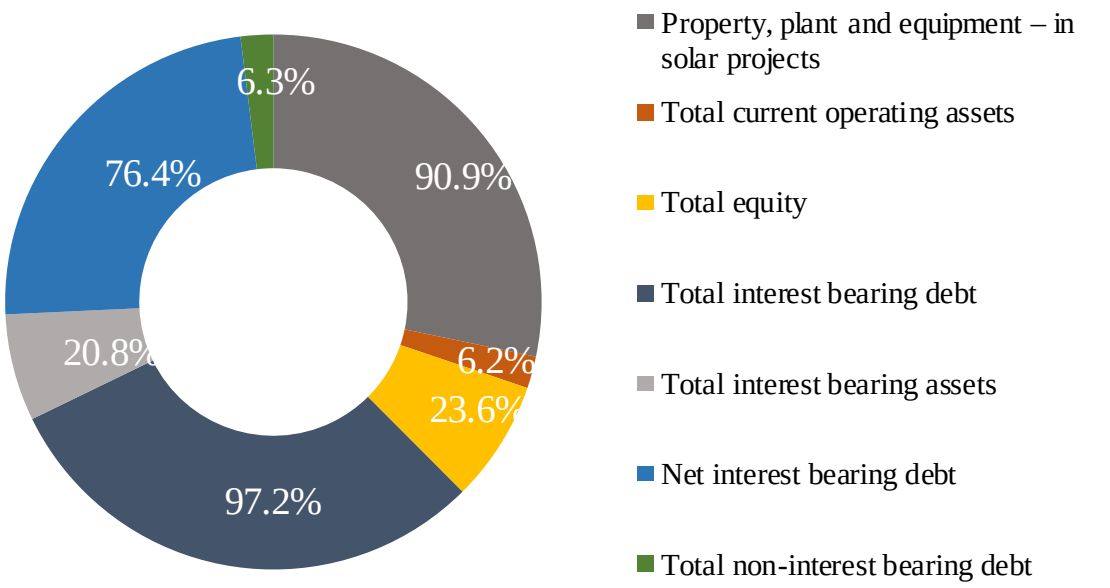


Source: Scatec Solar ASA quarterly reports 2014 - 2016 / Own production

6.3.2. Balance Sheet

- The index analysis represented an increase in trade and other receivables, and the common size analysis determined that the relative size of receivables to invested capital rose from 1.5% to 4.2%. The receivable turnover ratio is 4.37 in 2016, which means that days accounts receivable in hand is 83.4 days, which is not critical as SSO's revenues depend on PPAs and FITs.
- Property, plant, and equipment in solar projects account for 90.9% of invested capital, which SSO expect with a capital intensive industry.
- Total equity as a percentage of invested capital fluctuate between 18.3% and 31.8% and was 23.6% in Q4 2016.
- The index analysis illustrates small differences in cash and cash equivalents where the common size analysis shows that cash and cash equivalents are 20.4% of invested capital in Q4 2016. Cash is tied up in financing the projects and also excess cash, ref. note 6 (Scatec Solar ASA, 2016a)
- Net-interest bearing debt accounts for 76.4% of invested capital, which shows that Scatec Solar is a heavily levered company, the non-recourse financing is the most important driver for NIBD accounting for 77.3% of invested capital. In addition, SSO issued a 500 million green bond in 2015 which accounts for 8.9% of invested capital in Q4 2016. As discussed, the non-recourse debt is only guaranteed by the SPVs assets and cash flow, ref note 2 (Scatec Solar ASA, 2016a), reducing financial risk for SSO.

Figure 6.4 Key figures from the common size analysis of balance sheet



Source: Scatec Solar ASA quarterly reports 2013 - 2016 / Own production

6.4. Analysis of ROIC and its Key Drivers

ROIC is the return on invested capital and is the overall measure of operating profitability. The ROIC is a better measure than ROE and ROA because it can be directly compared with WACC, while ROE can be compared with re and ROA with ra. The company generates value if ROIC is higher than WACC (Peterson & Plenborg, 2012 p. 94). ROIC is a measure of how much value the company generates per krone invested. If SSO's ROIC is 10%, they generate a return of 10 øre (cents) per krone invested.

6.4.1. ROIC

Koller et. al (2010) recommend using average invested capital numbers for calculating ROIC.

$$ROIC_t = \frac{NOPAT}{Invested\ Capital_{t-1} + Invested\ Capital_t}$$

Figure 6.5 illustrate the development of the quarterly ROIC. Both quarterly and yearly calculations of ROIC illustrates increasing ROIC which indicates better operating profitability. ROIC was 6.5% in 2016, up from 4.4% in 2014. It is helpful to decompose ROIC to find the driver of growth. ROIC's two drivers of growth are the turnover rate of invested capital (TO) and profit margin (PM).

$$ROIC = PM \times TO$$

Figure 6.5 ROIC and NOPAT SSO

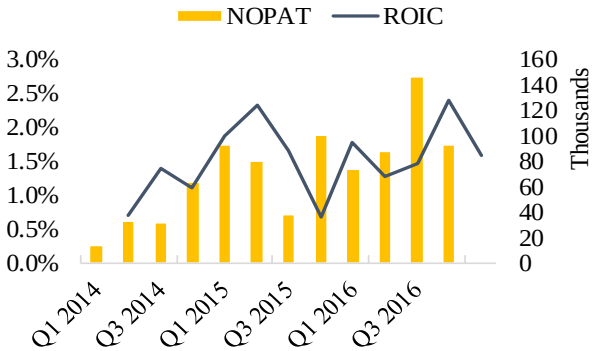
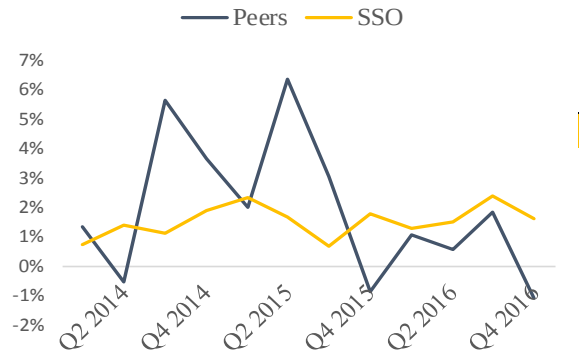


Figure 6.6 ROIC comparison peers vs SSO



Source: Scatec Solar ASA quarterly reports 2013 - 2016 / Thomson One Banker / Own production

SSO's peer group outperform SSO in 2014 and the two-three months in 2015. SSO has a higher ROIC in 2016 than its peers. This indicates that SSO is a formidable competitor to established competitors and manage to have higher return to stakeholders

6.4.2. Profit Margin

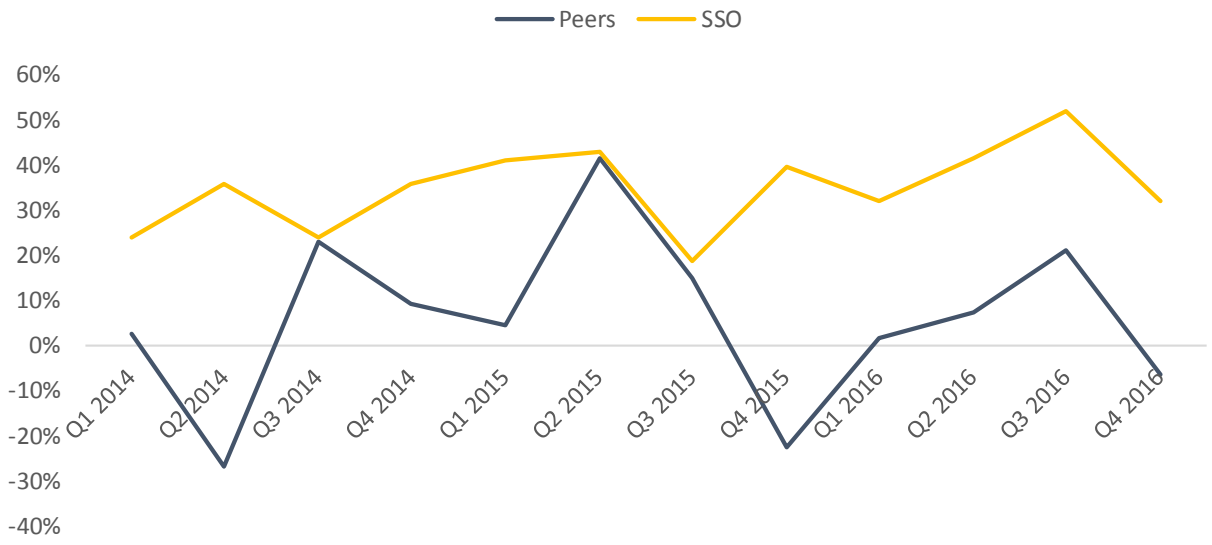
Profit margin describes the relationship between income and expenses and the company's ability to maximize profitability (Koller et. Al, 2010). Ceteris Paribus, an increase in profit margin leads to higher ROIC.

$$PM = \frac{NOPAT}{Net\ Revenues}$$

SSO's profit margin for the quarterly numbers fluctuates, with an average of 35%. The profit margin for annual numbers are stable and was 35.6% in 2016. In 2016, the PM indicates that for each krone of revenues, SSO generates 35.6 øre (cents). SSO operates with a high PM, which

indicates low costs in their daily energy production. SSO's peers have lower profit margin throughout the period but share some of the same development in certain periods, for instance in Q3 2015.

Figure 6.7 Profit margin peers vs SSO



Source: Scatec Solar ASA quarterly reports / Thomson One Banker / Own production

6.4.3. Turnover Rate of Invested Capital

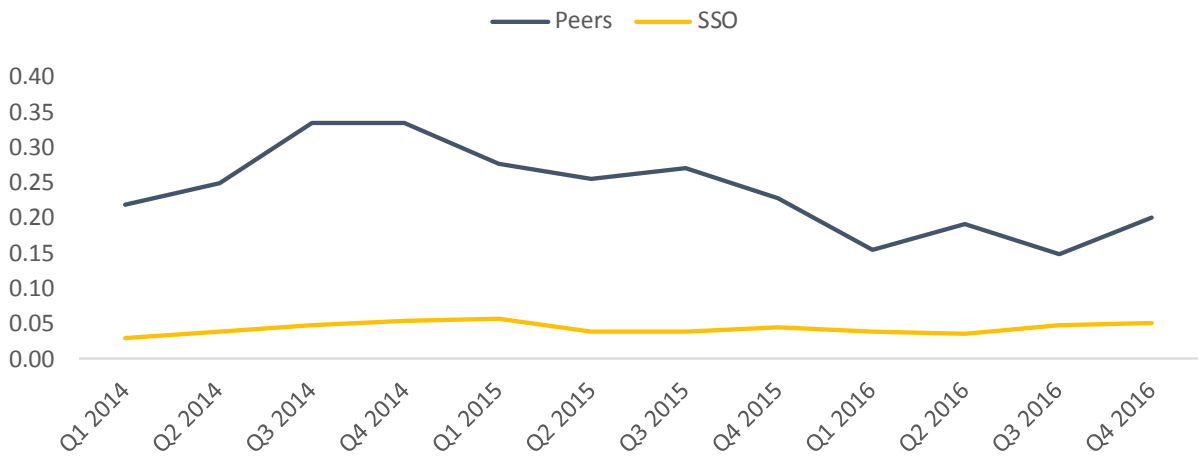
Turnover rate of invested capital is an expression of a company's ability to utilize invested capital (Peterson & Plenborg, 2012). It increases throughout the quarters from 0.03 in Q1 2014 to 0.06 in Q4 2016. The yearly turnover rose from 0,12 in 2014 to 0,18 in 2016. The increase in the turnover rate may come from more efficient utilization of assets and SSO generates more revenue per krone of invested capital.

$$TO = \frac{Net\ Revenue}{Invested\ Capital_{t-1} + Invested\ Capital_t}$$

Invested capital is heavily influenced by PPE as it accounts for 90.9% in Q4 2016. SSO is investing in projects with long-term contracts which explains the low turnover rate. A turnover rate of 0.18 means that invested capital is tied up in 2027 days or 5 years and 202 days. The time horizon of the projects and PPA contracts vary between 20-25 years, so it is an acceptable turnover rate. SSO

has a lower turnover rate than its peers, but the difference is declining. SSO's turnover rate is improving throughout the period, while its peers have lower TO at the end of the period than in the beginning.

Figure 6.8 Turnover ratio peers vs SSO



Source: Scatec Solar ASA quarterly reports / Thomson One Banker / Own production

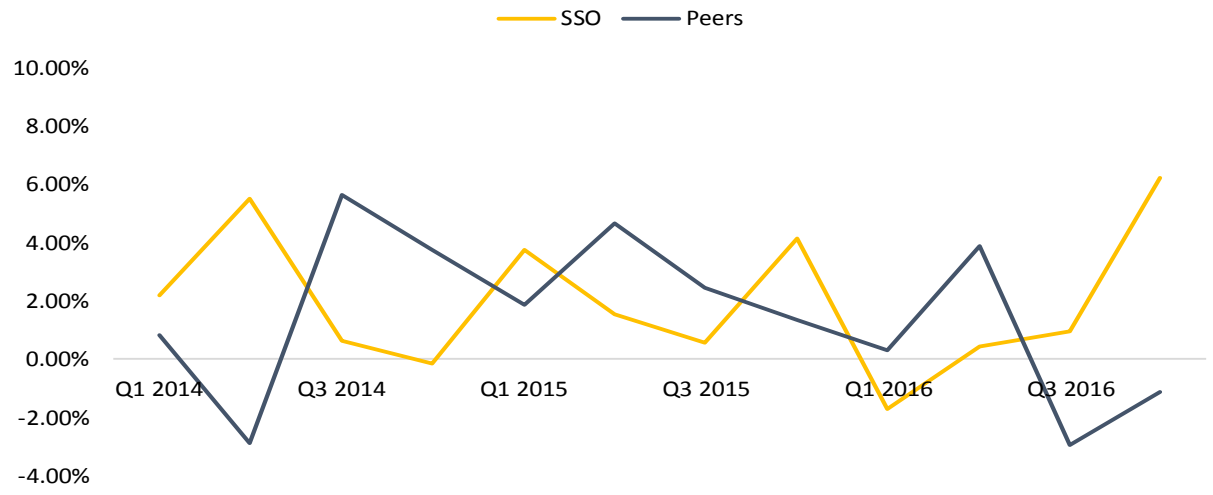
6.5. ROE

Return on equity is as mentioned above a less preferable ratio to measure profitability, but is widely used, and therefore included. ROE is affected by capital structure, thus one of the reasons to why ROIC is a better measure. ROE measures the equity owners return on investment, and explain how much SSO generates per krone of equity invested (Peterson & Plenborg, 2012). As mentioned, ROE is affected by financial gearing and also the net borrowing cost.

$$ROE = ROIC + (ROIC - NBC) \times \frac{NIBD}{BVE}$$

SSO's and its peers' ROE is fluctuating throughout the time horizon of the analysis. There is no consistency in the development, but they seem to be opposite of each other. SSO's ROE is higher than the peer group in Q3 and Q4 2016. SSO's ROE is higher at the end of the analysis, and it is increasing in 2016 due to higher ROIC and declining NBC, see Figure 6.9

Figure 6.9 ROE peers vs SSO



Source: Scatec Solar ASA quarterly reports / Thomson One Banker / Own production

6.5.1. Financial Leverage

Financial leverage is based on book values of Equity and net-interest bearing debt.

$$Financial\ leverage = \frac{NIBD}{BVE}$$

Both SSO and its peers have considerable amounts of debt. SSO's NIBD is increasing aligned with project portfolio, due to substantial non-recourse financing for the solar projects. NIBD increased in 2015 when SSO issued the 500 million green bond. As Figure 6.10 shows, the financial leverage is rising from 3.3 in Q1 2014 to 3.72 in Q4 2016. The quarterly numbers represented high and rising financial leverage except for the setback in 2014 because of the IPO issue. The peer groups' financial leverage peaks in Q4 2015 and drops after and remains lower than SSO. Apart from these two spikes, SSO does not have any substantial different financial leverage than its peers.

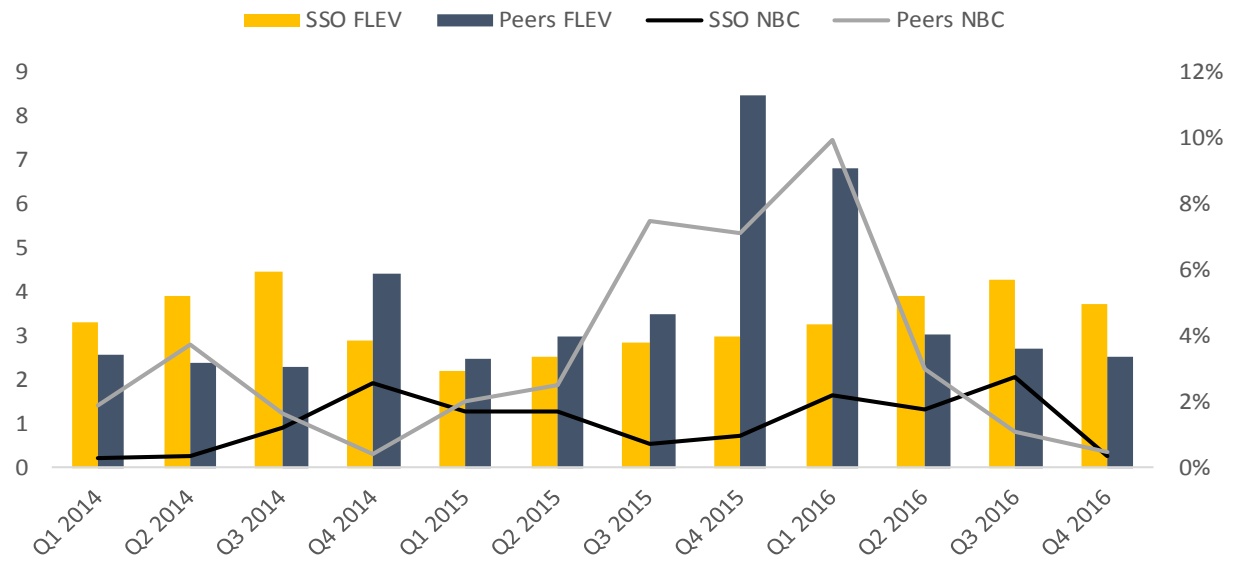
6.5.2. Net Borrowing Cost After Tax

Net borrowing cost after tax is affected by different deposit and lending rates and influenced by gains/losses on currency and other financial income and expenses (Peterson & Plenborg, 2012). Ceteris Paribus, a higher NBC results in a lower ROE. If NBC is greater than ROIC taking on more debt is destroying value, and the difference between ROIC and NBC is referred to as the interest margin or spread.

$$NBC = \frac{Net\ financial\ expenses\ after\ tax}{NIBD}$$

Figure 6.10 illustrates that SSO's NBC is lower than its peers except for Q4 2014. In 2016, SSO reports losses instead of gains on currency exchange for both Q1 and Q3, which is a flaw with the NBC (Peterson & Plenborg, 2012).

Figure 6.10 Financial leverage and NBC peers vs SSO



Source: Scatec Solar ASA quarterly reports / Thomson One Banker / Own production

6.6. Summary

SSO operates in an industry categorized as capital intensive, yielding high profit margins, low personnel cost, high depreciation, and high financial expenses. 90.9% of invested capital is in solar projects while net interest bearing debt accounts for 76.4% of invested capital as of 31th of December 2016. The financial leverage of 3.24 is higher compared to peers and depicts a heavily levered company. The non-recourse debt accounts for 101% of NIBD and is secured through the SPVs assets and cash flows, lowering the financial risk for SSO. ROIC, along with the turnover rate of invested capital increases during the period. If recent development continues, we will experience higher levels of return on invested capital and value creation in the future.

7. Estimation of Cost of Capital

In section 1.4, we mentioned that we use the EVA-model and DCF-enterprise value approach to find the value of SSO. EVA model is specified as $invested\ capital + \sum_{i=1}^{n} \frac{EVA}{(1+WACC)}$ and DCF model is specified as $\sum_{i=1}^{n} \frac{FCFF_t}{(1+WACC)^t}$. The discount factor for both models is the weighted average cost of capital. WACC is a weighted average of debt and equity cost of capital, where lenders and investors require different returns on their investments. Because debt generally is less risky than equity, WACC is less than equity cost of capital (Peter DeMaro, 2014). We assume a relatively stable capital structure, as the company has both equity and debt. We calculate the required return on capital as:

$$WACC = \frac{E}{(EV)}(r_e) + \frac{D}{(EV)}(r_d) \times (1 - Tax)$$

In the following sections, we will go through all components: capital structure, cost of equity, cost of debt and tax rate. We apply WACC in its simplest form as SSO does not operate with other securities, such as preferred stock. Historical data is downloaded using Bloomberg terminal.

7.1. Cost of Equity

The most commonly used model to estimate the cost of equity is the capital asset pricing model (Koller et al., 2010). CAPM comprises three factors: risk-free rate, beta and market risk premium. We will include a small firm premium in our estimation of cost of equity. Thus, we calculate cost of equity as:

$$r_e = r_f + \beta(r_m - r_f) + small\ firm\ premium$$

7.1.1. Risk-free Rate

The risk-free rate is the return an investor can expect without any risk (Peterson & Plenborg, 2012). The optimal would be a zero-beta portfolio, which is too costly and unpractical for anyone to construct. Due to the restriction of not having a zero-beta portfolio, government bonds are often used as a proxy (Peterson & Plenborg, 2012) To define an appropriate benchmark, the risk-free rate is assumed to be equal to the 10Y NOK government bond. This is the most applied risk-free

rate in the Norwegian market and matches the required conditions (PWC, 2016). Thus, the risk-free rate is 1.74%.

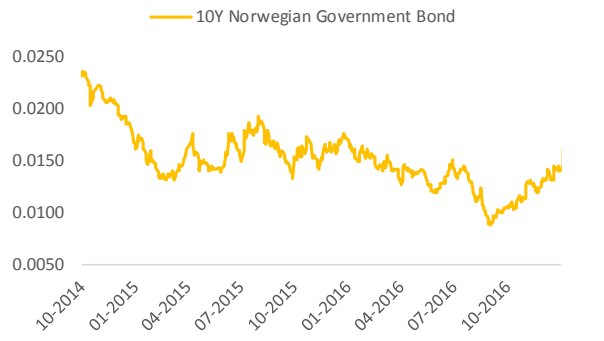
7.1.2. Estimation of Beta – Systematic Risk

Beta represents the stocks incremental risk of a company to a diversified investor, where risk is defined as the extent to which the stock covaries with the aggregate stock market (Koller et al., 2010). beta estimates are often based on historical returns, where a higher beta means higher required return of the investor (Peterson & Plenborg, 2012). By standardizing the covariance measure we get an expression for the beta of an asset (Damodaran, 2012):

$$\beta = \frac{\text{Cov}\,(r_i, r_m)}{Var(r_m)}$$

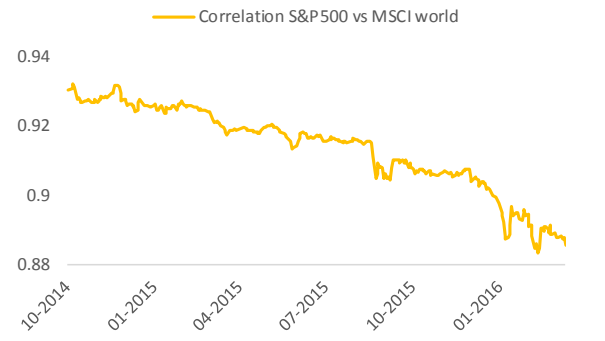
SSO is listed on Oslo Stock Exchange (OSE), thus an appropriate proxy for market portfolio returns. A weakness of measuring beta against a local index as OSEBX is that it is heavily affected by the petroleum industry and a few companies like Statoil and Hydro. Thus, we cannot solely rely on this index for our estimation (Koller et al., 2010). To avoid measuring the company's sensitivity to the oil industry, other international indexes are used as well. SSO operates in five countries (plus four potentials from backlog). Thus, we should include international indexes as well. STOXX Europe 600 Index is the European equivalent that consists of 600 companies from 18 European countries (STOXX.com, 2017). 9.2 % of SSO's revenues are generated in Europe, excluding Norway, making STOXX 600 a good proxy for market return. Morgan Stanley Capital Index's All Country World Index includes major equity markets worldwide and can be used as a proxy for global market returns. MSCI world index capture sources of equity return in 46 countries and measures the full equity opportunity set with no gaps or overlaps (MSCI.com, 2017). Koller et al., (2010) argue that MSCI is 95.8 % correlated with S&P. Hence, we choose to exclude the S&P 500 index from our analysis. This is also supported by our regressions in Figure 7.2 and a correlation table in Appendix 29.

Figure 7.1 10Y Norwegian government bond



Source: Bloomberg / Own production

Figure 7.2 Correlation S&P 500 vs MSCI



Source: Bloomberg / Own production

We use excess returns instead of raw returns as recommended in Christensen & Feltham (2009), and apply daily observations to eliminate serial correlation. We remove non-trading days from the sample, to avoid variation from day-trading and non-trading days, which leads to systematic biases (Koller et al., 2010). Our measurement period includes 329 data points over a 3-year interval, which does not satisfy Koller et al.'s (2010) proxy for measurements. The reason why we only use a 3 -year interval instead of 5-year or a 10-year interval is because SSO was first listed on OSEBX in 2014. We find excess returns for all indexes and SSO, and estimate a rolling beta (252 working days per period) over the period to search for any patterns or systematic changes in a stock's risk (Koller et al., 2010).

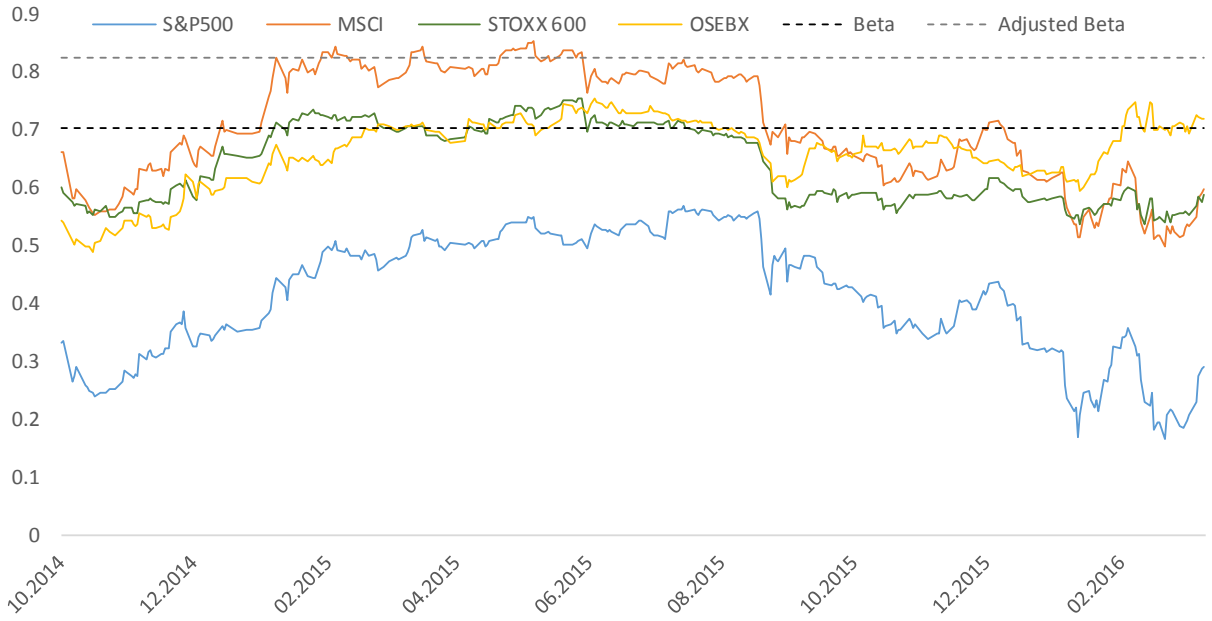
We assume structural breaks in the beta estimate in 2014 and 2015, and use a simple average of all betas in the 3-year time period, which results in a regression beta of 0.67. We adjust the beta using simple smoothing, as Marshall Blume discovered that surviving companies increase in size and become more diversified, which converges beta towards the mean of all betas, 1 (Blume, 1975). This approach makes our estimation more accurate as we estimate based on a "forecast" and not only on past observations.

$$Adjusted\ beta = regression\ beta\ x\ (0.67) + 1.00\ x\ (0.33) = \mathbf{0.78}$$

Estimated beta is 0.67, and adjusted beta equals 0.78. $\beta < 1$ means that SSO has lower systematic risk compared to the marked. One reason might be that SSO produces and sell power on long term contracts (20-25 years). Thus, less sensitive to marked movements as solar production and power

sale does not get affected as much as the rest of the market. In addition, this theory is supported by the regression of SSO on STOXX 600 Europe, where the regression provides a low R-squared of 10%, which means that only 10% of the risk is market-based, while 90% is firm specific.

Figure 7.3 Rolling beta SSO vs Indexes



Source: Bloomberg / Own production

From Figure 7.3 we see SSO's systematic risk towards S&P 500, MSCI world, STOXX 600 Europe and OSEBX. As mentioned above, we see that adjusted beta (0.83) is closer to 1 than the regression beta (0.67), aligned with Blume's theory. The most stable beta is regressed against the Norwegian OSEBX, not surprisingly since two to three companies often determine the OSEBX. The rolling beta for STOXX 600 Europe is stable between 0.54 and 0.76 throughout the period. The interval indicates a noisy estimation of beta, which is a common weakness of beta regressions (Damodaran, 2012). We assume structural breaks in the beta estimate in 2014 and 2015. Beta shows a slight upward trend to begin with, followed by a cyclical falling trend.

Figure 7.4 Rolling beta SSO vs indexes

Index	Minimum	Maximum	Average
OSEBX	0.49	0.75	0.66
STOXX 600	0.54	0.76	0.64
MSCI	0.50	0.85	0.70
Beta			0.67
Adjusted Beta			0.78

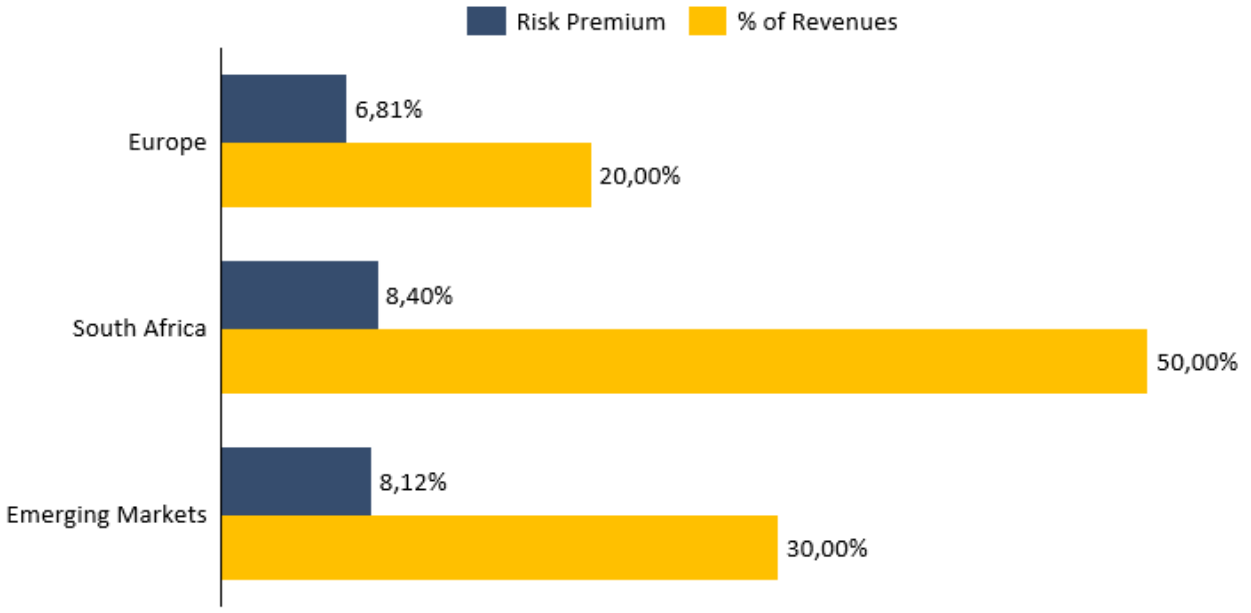
Source: Bloomberg / Own production

7.1.3. Market Risk Premium

The marked risk premium ($r_m - r_f$ is defined as the premium above the risk-free rate a rational investor would require to bear risk (Koller et al., 2010). Through financial theory, we find two different ways to estimate the market risk premium: ex-post and ex-ante. Ex-post is based on historical returns of the excess market portfolio for a long period of time. The historical method is considered to be broadly used, but has its limitations, as it is sensitive to how far back we go, the cyclical change, and risk aversion of investors (Koller et al., 2010). The ex-ante method estimates the market risk premium through an implied equity premium. Expected return of stocks are estimated by computing an internal rate of return, assuming stocks are correctly priced in the market, thus representing current market risk premium. Choice of approach should derive from valuation purpose and market views. If the assumption of correct market pricing holds, implied equity premium is favored (Damodaran, 2012).

Each investor will have their own definition of an appropriate risk premium and depends on which source one refer to (PWC, 2016). The method we use is an estimate of risk premium from a consensus of analysts, where we use risk premium per country. PWC has estimated market risk premium based on consensus of analysts on Norwegian markets, estimated to 5,4% (PWC, 2016). Damodaran use the ex-post method, and in January 2017, Damoradan (2017) estimated Norwegian risk premium to 5.69%.

Figure 7.5 Market risk premium per region



Source: Damodaran 2017 / Own production

Market risk premium should not solely be based on the Norwegian premium, as SSO have 100% of their operations abroad (Scatec Solar ASA, 2017a). To estimate the international market risk premium, we use a weighted average of market premiums in the countries where SSO has the highest revenues. Hence, Norwegian market risk premium will not be included in the analysis. Europe, emerging markets, and South Africa will account for 20%, 30%, and 50% of the analysis respectively. Damodaran's list over countries risk premiums are used to estimate different market risk premiums (Damodaran, 2017). Thus, risk premium equals:

$$20\% \times 6.81\% + 30\% \times 8.12\% + 50\% \times 8.40\% = \mathbf{8.00}\%$$

7.1.4. Small Firm Premium

As a final adjustment to cost of equity, we decided to add a small firm premium for SSO because companies that are small often yield higher risk. The future cash flows of small companies often depend largely on key persons, individual projects, and customers. Therefore, it is common practice to adjust for these factors by adding a small stock premium (PWC 2016). PWC (2016) argue that Norwegian small cap companies should add a 1% risk premium. As aforementioned, SSO only operates internationally, and thus, we will use Damodaran's (2016) risk premium for

small market cap firms in emerging markets. Based on median values, a small stock premium should not be added for companies above NOK 5bn, while companies with market cap between NOK 2-5bn in emerging markets yield a 3-3.5% premium (Damodaran, 2016). As SSO has very good terms related to SPVs, long-term PPAs, and we already weighted risk from emerging markets in the market risk premium, we decide to use a premium of 3%.

7.1.5. Summary of Cost of Equity

With all components the estimated cost of equity is:

$$r_e = 1.74\% + 0.78 \times 8.00 + 3\% = 10.98\%$$

7.2. After-tax Cost of Debt

Debtholders required rate of return is defined as after-tax cost of debt. Interest expenses are tax deductible, thus the cost of debt is measured after-tax (Peterson & Plenborg, 2012).

$$r_d = \left(r_f + risk\ premium\right) \times (1 - Tax)$$

As SSO does not have a public credit rating, we need to look at historical long-term loans, using interest rates or estimate a synthetic rating for the company to arrive at a default spread and thereafter estimate cost of debt. In addition, the cost of debt has to be estimated in the same currency as the cost of equity (Damodaran, 2017).

First, we use the historical method to estimate cost of debt, using the interest rates from the non-recourse project financing debt. This structure offers isolation of operational and financial risk related to each individual project and limits SSO's exposure to the equity invested (Scatec Solar ASA, 2017a). We also include the senior unsecured green bond from the Norwegian government, that carries an interest of NIBOR + 6.5%, which we use as interest rate. Thus, interest rates yield the latest spread from the lenders illustrated in Figure 7.6.

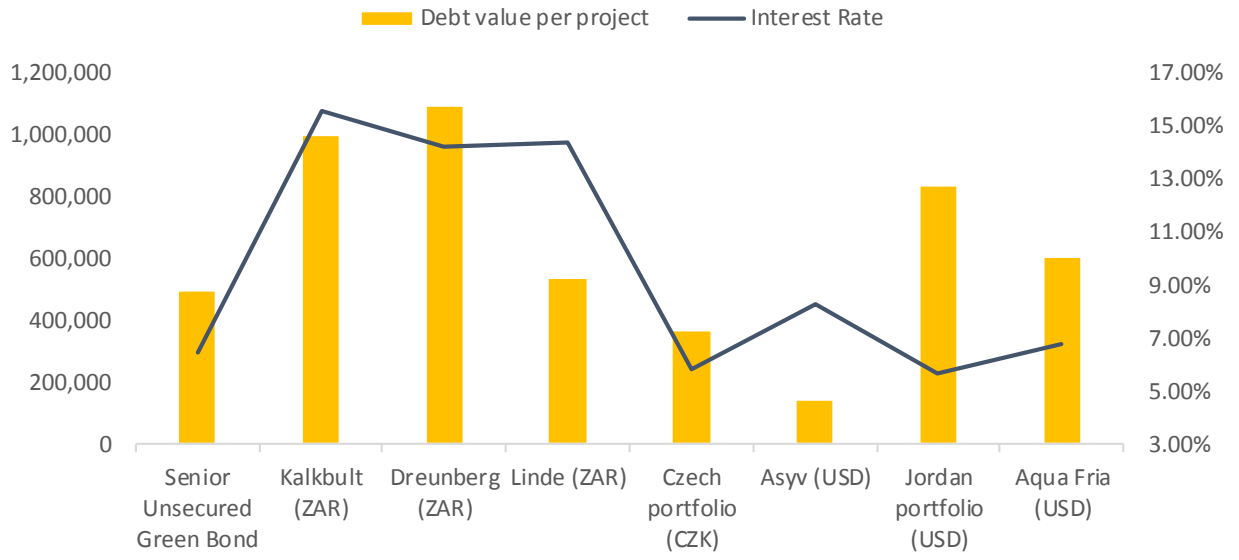
Figure 7.6 Total long term debt

NOK thousand	Interest rate	Maturity date	Value 2016	Weighting	Average
Green Bond	6.50%	01-11-18	500,000	10.28%	0.67%
Kalkbult	12.30%	31-12-28	916,024	18.83%	2.32%
Dreunberg	11.50%	31-12-29	1,021,370	21.00%	2.42%
Linde	11.52%	30-06-29	511,792	10.52%	1.21%
Czech	5.53%	27-10-28	68,293	1.40%	0.08%
Czech	5.69%	23-03-29	201,336	4.14%	0.24%
Czech	5.53%	23-02-29	60,641	1.25%	0.07%
Czech	5.28%	11-05-29	84,595	1.74%	0.09%
Rwanda	8.08%	11-01-30	173,326	3.56%	0.29%
Oryx	5.80%	31-12-36	156,086	3.21%	0.19%
Anwar al ardh	6.03%	31-12-36	341,815	7.03%	0.42%
Anwar al Amal	5.79%	31-12-36	176,708	3.63%	0.21%
Aqua Fria	6.31%	31-12-36	651,514	13.40%	0.85%
Total			**4,863,500**	**100.00%**	**9.04%**

Source: Scatec Solar ASA, 2017a / Own production

As the debt value varies among different projects, we chose to use a weighting to estimate the average interest rate by multiplying the weight times the interest rate. Based on this method, cost of debt is 9.04%.

Figure 7.7 Debt and interest per project



Source: Scatec Solar ASA, 2017a / Own production

Second, we estimate a synthetic credit rating for SSO by using an average interest coverage ratio from 2014 to 2016. In its simplest form, we use the interest coverage ratio, which is given by EBIT/Interest Expenses (Damodaran, 2017). Further, we compare the interest coverage ratio to Damodaran's rating lists for companies with market cap below 5bn. SSO's interest coverage ratio over the 3-year period is 1.335, yielding a CCC-rating. Damodaran's rating table can be found in Appendix 27. As above-mentioned, we use the 10-year Norwegian government bond as risk-free rate.

We add the spread suggested by Damodaran (2017) to the risk-free rate, yielding an after-tax cost of debt of:

Figure 7.8 Synthetic credit rating

Synthetic Rating	
3-year average interest coverage ratio	**1.33459**
Synthethic rating (Damodaran)	**CCC**
Spread (CCC)	**6.50%**
10-year Norwegian Government Bond	**1.74%**
Cost of Debt (rD)	**8.24%**

Source: Damodaran, 2017 / Own production

$$r_d = (r_f + risk\ premium) = (1.74\% + 6.5\%) = \mathbf{8.24}\%$$

Rapid growth in the solar industry yield lower financing costs in the future. As discussed in the strategic analysis, access to capital is an issue at the moment and is expected to be better in the future. Basing the company's rating solely on an interest coverage ratio will not be the most realistic approach as over 90% of our debt is non-recourse financing with long-term maturity over 10 years. Thus, the historical borrowing approach (9.04%) yields the best estimate for SSO's cost of debt.

7.3. Target Capital Structure

Before we can estimate WACC, we have to find the target capital structure. This should be based on market values and not book values as book values are sunk costs (Koller et, al., 2010). We estimate market value of equity by multiplying shares outstanding by the share price at 01.02.2017.

The non-recourse project financing debt is stable and non-traded, allowing us to use book values as a proxy for current market value of debt. This allows us to estimate both E/EV and D/EV-ratios, which we assume represents the future expected levels for SSO. Debt accounts for 52% of enterprise value and Equity for 48%.

Figure 7.9. Capital structure

Liabilities		**Shareholder Equity**	
Total interest bearing debt	5,411,700.00	Share Price	38.1
Total interest bearing assets	1,156,750.00	Outstanding Shares	103,196.23
Net interest bearing debt	4,254,950.00	Equity	3,931,776.44
D/ EV	**52%**	**E/ EV**	**48%**

Source: Scatec Solar ASA, 2017a / Own production

7.4. Summary of WACC

With all components accounted for, we can now calculate WACC as

$$\text{WACC} = \frac{\text{E}}{\text{DV}} \times r_e + \frac{D}{EV} \times r_d \times (1 - Tax) = 0.48 \times 10.98\% + 0.52 \times 9.04\% \times (1 - 30\%) = \mathbf{8.55}\%$$

8. Forecast

In this section, we prepare forecasts of revenue growth, profit margin and turnover rate of invested capital in accordance with Penman (2013). These values are fundamental for our valuation models. We forecast revenues by model current projects, backlog, and pipeline. The timing of projects and probability of completion are important factors to consider. Both the EVA and DCF model relies on NOPAT and invested capital, making PM and TO significant value drivers. Peterson & Plenborg (2010) suggest using different accounting items as a percentage of revenues in the forecast. Penman (2013) suggest forecasting sales growth, profit margin and turnover ratio as these will determine ROIC and growth in invested capital, which further leads to economic value added and free cash flows. Hence, forecasting additional accounting items in the income statement and balance sheet does not contribute with more value, as it will only depend on additional assumptions which often relies on margins to revenues. The quantitative analysis discussed in chapter 4 gives an indication on how these drivers evolve over time. We base our forecast on the quantitative-, strategic- and profitability analysis.

8.1. Revenue Growth

As discussed, SSO has three major segments. The external revenues which are recognized in the consolidated income statements originate in the PP segment. In 2016 SSO had NOK 2.3 million of external revenues from O&M on the Jordanian plants, this income was external due to a delay in the takeover of the plants (Scatec Solar ASA, 2017a). In 2017 and beyond, we only recognize internal revenues in the O&M and D&C segment and expect new projects to only yield internal revenues.

All project revenues and costs are denominated in USD, ZAR and CZK. Once a solar power plant is grid connected, the general policy of the group is not to hedge foreign currency exposure based on long-term cash flows from the power plants. (Scatec Solar ASA, 2016a). In our analysis we assume currency translations to be stable and not affect cash flows.

We base our revenue forecast on SSO's expected power production (see Figure 8.1.), income, and project timing allows us to forecast revenues.

Figure 8.1 Backlog and project portfolio overview

		In operation	Backlog	Total
Capacity	MW	322	731	1,053
Annual production	MWh	640,000	1,500,000	2,140,000
Annual revenues	MNOK	1,100	1,200	2,300
Total capex	MNOK	5,599	9,200	14,799
Total equity	MNOK	1,576	1,850	3,426

Source: Scatec Solar ASA, 2017b / Own production

8.1.1. Current Projects

In 2017, SSO yield lower capacity than in 2016 due to the sale of the Utah plant. The Jordanian plants will operate at 100%, which will be the first year of full production from these plants (Scatec Solar, 2017b). See Figure 8.2 for production per plant in 2016, excluded the Utah plant.

Figure 8.2 Production per plant 2016

Project	Ownership	Q1	Q2	Q3	Q4	Total	Share of Production
Czech portfolio	100%	3,077	7,965	8,128	2,157	21,327	3.7%
Kalkbult, SA	39%	37,143	31,963	36,392	40,030	145,528	25.0%
Dreunberg, SA	39%	44,209	28,849	35,050	52,158	160,266	27.5%
Linde, SA	39%	25,327	15,749	19,201	28,170	88,447	15.2%
ASYV, Rwanda	57%	3,338	3,522	3,964	3,345	14,169	2.4%
Agua Fria, Honduras	40%	26,438	24,591	25,847	24,072	100,948	17.3%
Jordan	70%	0	5,852	27,487	18,752	52,091	8.9%
Total		**182,200**	**182,731**	**221,521**	**204,369**	**582,776**	**100.0%**

Source: Scatec Solar ASA, 2017a / Own production

To forecast revenues for 2017, we assume the same share of total production per project as in 2016. As Jordanian plants were not operational in Q1 2015, we choose to add 25% extra MWh of production in 2017. We estimate NOK/MWh for all projects in 2016 and expect no change of NOK/MWh in 2017.

The contracts are either inflation adjusted or based on a predetermined rate. Historically, some of the countries where SSO operates have experienced very high levels of inflation, thus, adjusted to

some predetermined level instead of inflation (Scatec Solar ASA, 2016a). We adjust revenues accordingly, see Figure 8.3 for description.

Figure 8.3 Key features current projects

	Ownership	Currency	Revenues	Total production	NOK/MWh	Price djustments
Current projects						
Czech portfolio	100%	CZK	93	21327	4.36	2% per year
Kalkbult, SA	39%	ZAR	274.6	145528	1.89	100% adjusted for S.A.CPI
Dreunberg, SA	39%	ZAR	135.4	160266	0.84	19% adjusted for S.A.CPI
Linde, SA	39%	ZAR	252	88447	2.85	18% adjusted for S.A. CPI
ASYV, Rwanda	57%	USD	31.1	14169	2.19	1.5% per year
Agua Fria, Honduras	40%	USD	117.5	100948	1.16	1.5% per year
Jordan	70%	USD	56.2	52091	1.08	None

Source: Scatec Solar ASA annual reports 2014-2015 / Scatec Solar ASA, 2017a /Scatec Solar ASA 2017b / Own production

SSO's current projects have long-term PPAs and FITs signed, and they are not sure if these contracts will be extended or renegotiated (Scatec Solar ASA, 2016a). In the long run, we assume contracts get renegotiated or replaced with new contracts.

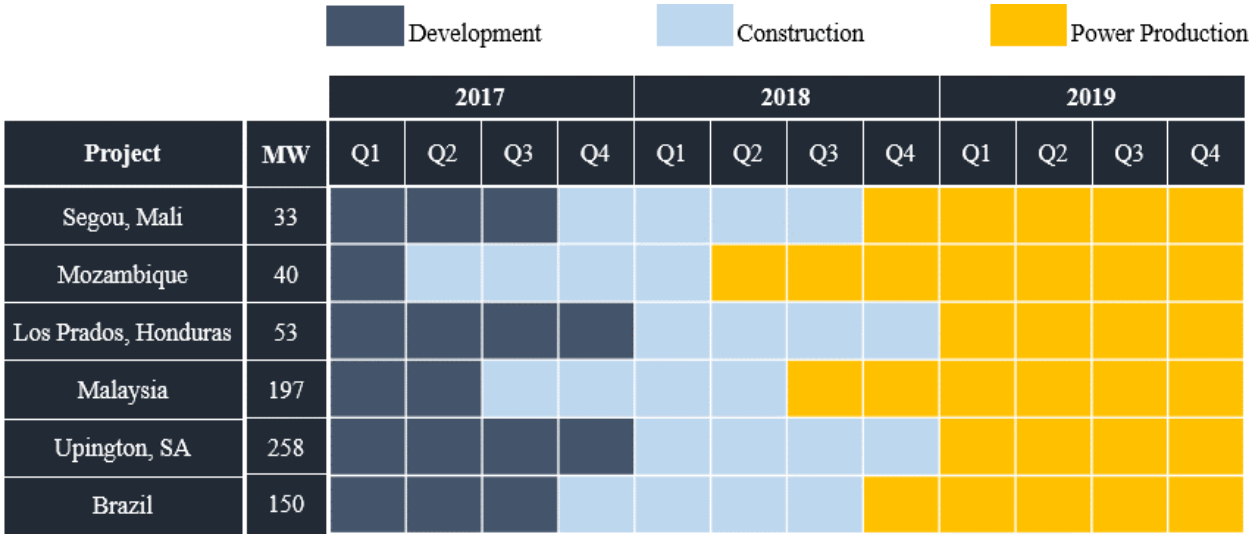
8.1.2. Project Backlog

SSO current backlog consists of projects situated in Mali, Mozambique, Honduras, South Africa, Malaysia, Brazil, and amount to a capacity of 731 MW. SSO expect all project backlog to be in operation or under construction by the end of 2018 (Scatec Solar, 2017b).

- Honduras project is delayed due to interregional agreements concerning adding capacity to the grid. CEO Raymond Carlsen, announced they expect an agreement soon, and go on with the final simulations and procure final permit (Scatec Solar, 2017b). Financial close is pending, and due to the issues SSO currently faces in the region we believe construction begins in Q1 2018.
- In Malaysia, SSO has three projects that will be commenced simultaneously. All projects are financially closed, and pending final permits. Construction is set to 9-12 months and is expected to start construction during 2017.
- The projects in Brazil are financially closed, with construction pending and estimated to begin in 2017. CFO, Mikkel Tørud, confirmed that they did not see any issues in Brazil and that SSO has fewer covenants on the utilization of local products than other projects in the region (M. Tørud, personal interview, February 28, 2017)

- Mozambique plant is ready for construction and only needs financial close. Norfund, KLP and a local utility company are the co-owners of this project which expect construction start in Q2 2017 (Scatec Solar 2017b).
- The project in Mali has been more time-consuming than anticipated according to CEO, Raymond Carlsen. Part of the reason is pending guarantees and confirmation by other partners on the project (Scatec Solar, 2017b). The project is ready for construction, hence financial close and guarantees from IFC are needed.
- SSO is still the preferred bidder for the South Africa project of 258MW. Tørud announce that dialogues have been conducted, and realization of projects are close (Scatec Solar, 2017b).

Figure: 8.4 Timeline overview of project backlog



Source: Scatec Solar ASA (2017a&b) / Own production

SSO has not released information about expected revenues from the individual projects in backlog, only the accumulated revenue from all projects. Due to the different timing of projects and different startup time for operations, we distribute the revenues to the projects based on the capacity of each project. In 2019, all backlog projects are in operation, and the revenues are NOK 1200m, as SSO have forecasted. Starting in 2020, these revenues grow with the inflation adjustments. We expect the inflation adjustment policy to be the same for the backlog projects to be the same as they are

for the current projects if not other is stated. Price per MW and price adjustment are illustrated in Figure 8.5 below.

Figure 8.5 Key figures backlog

Project	Capacity	Ownership	Currency	% of capacity	NOK/MW	Annual revenues	Price adjustments
Segou, Mali	33	50.0%	USD	4.5%	1.642	54.17	1.5% per year
Mozambique	40	52.5%	USD	5.5%	1.642	65.66	1.5% per year
Los Prados, Hondura	53	50.0%	USD	7.3%	1.642	87.00	1.5% per year
Malaysia	197	49.0%	USD	26.9%	1.642	323.39	1.5% per year
Upington, South Afric	258	42.0%	ZAR	35.3%	1.642	423.53	20% adjusted for S.A CPI
Brazil	150	70.0%	BRL	20.5%	1.642	246.24	1.5% per year
Total	731			100.0%		1200	

Source: Scatec Solar 2017a / Scatec Solar 2017b / Own production

8.1.3. Pipeline and Opportunities

The quantitative analysis estimates a mean reversion towards a long-term growth level of 11.5%. As projects move from pipeline to production, revenue growth may fluctuate as we can see from current growth based on backlog projects. We assume that these differences are evened out in the long run. Pipeline projects have not yet any PPA's or other agreements, so it is challenging to project any revenues from these projects. These might have substantial possibilities, for instance, if the Egypt projects were to close, it might add 340MW of capacity, the same amount as today's operations. Hence, we model pipeline earnings until 2026, with the first project included in the 2020 portfolio. As SSO estimates pipeline projects to have 50% probability of being realized, we assume the same probability in our analysis. With no specified probability, SSO also has business cases and opportunities for an additional 2008 MW. We assume 20% for these projects. Thus, adjusting for these assumptions, pipeline, business cases and opportunities accounts for 944 MW.

SSO does not disclose any expectations they might have concerning construction start for pipeline projects. We assume no projects to be commenced before 2019, with production start in 2020. As discussed in the strategic analysis, we expect that the PV industry and SSO's project portfolio will grow. We do not however, want to be too optimistic in our forecast. Thus, we assume 20% of the adjusted pipeline and opportunities to start production each year. Further, the commenced projects will be replaced by new once, keeping the pipeline and opportunities stable over time.

Figure 8.6 Key figures pipeline and opportunities

	MW	Probability	MW adjusted	Realized each year	NOK/MW in 2020	Price adjustments
Pipeline	1085	50%	543	109	1.642	1.5%
Opportunities	2008	20%	402	80	1.642	1.5%
Total	3093		944	189		

Source: Scatec solar ASA, 2017a / Own production

8.1.4. Explicit Forecast of Revenues

Based on the assumptions discussed above we are now able to forecast the revenues for 2017-2026. As mentioned, the quantitative analysis suggested a long-run level of 11.5% with low persistence, suggesting a significant increase in revenues. The analysis of revenues is based on our strategic analysis and assumptions from SSO with relevant information about backlog, pipeline and opportunities, see Figure 8.7 and 8.8 for forecasted revenues. For further calculations see Appendix 30-34.

Figure 8.7 Forecasted revenues 2017-2021

Nok 1000	SSO shareholding	2017E	2018E	2019E	2020E	2021E
Czech Republic	100%	104,175	106,258	108,383	110,551	112,762
Kalkbult	39%	319,787	337,375	355,931	375,507	396,160
Linde	39%	150,402	151,974	153,562	155,167	156,789
Dreunberg	39%	279,755	282,524	285,321	288,146	290,999
Asyv	43%	34,666	35,186	35,714	36,250	36,793
Agua Fria	40%	130,973	132,938	134,932	136,956	139,010
Jordan	59%	77,148	77,148	77,148	77,148	77,148
Segou	50%	-	13,543	54,172	54,985	55,810
Mozambique	53%	-	49,248	65,663	66,648	67,648
Malaysia	49%	-	161,696	323,393	328,244	333,167
Brazil	70%	-	61,560	246,238	249,932	253,681
Los Prados	50%	-	-	87,004	88,309	89,634
Upington	42%	-	-	423,529	428,188	432,898
Pipeline + opportunities	55%	-	-	-	310,260	629,828
Segment overhead	100%	1,801	2,373	3,958	4,556	5,173
Total revenues		1,098,707	1,411,823	2,354,950	2,710,847	3,077,499

Source: Scatec Solar ASA, 2017a / Scatec Solar ASA, 2017b / Own production

Figure 8.8 Forecasted revenues 2022 - 2026

Nok 1000	SSO shareholding	2022E	2023E	2024E	2025E	2026E
Czech Republic	100%	115,017	117,317	119,664	122,057	124,498
Kalkbult	39%	417,949	440,936	465,188	490,773	517,765
Linde	39%	158,427	160,083	161,755	163,446	165,154
Dreunberg	39%	293,879	296,789	299,727	302,694	305,691
Asyv	43%	37,345	37,905	38,474	39,051	39,637
Agua Fria	40%	141,095	143,212	145,360	147,540	149,753
Jordan	59%	77,148	77,148	77,148	77,148	77,148
Segou	50%	56,647	57,497	58,359	59,234	60,123
Mozambique	53%	68,663	69,693	70,738	71,799	72,876
Malaysia	49%	338,165	343,237	348,386	353,611	358,916
Brazil	70%	257,486	261,348	265,268	269,247	273,286
Los Prados	50%	90,978	92,343	93,728	95,134	96,561
Upington	42%	437,660	442,474	447,342	452,262	457,237
Pipeline + opportunities	55%	958,913	1,297,728	1,646,493	2,005,428	2,374,761
Segment overhead	100%	5,808	6,461	7,135	7,828	8,542
Total revenues		3,455,180	3,844,172	4,244,764	4,657,255	5,081,949

Source: Scatec Solar ASA, 2017a / Scatec Solar ASA, 2017b / Own production

8.1.4. Terminal Period

The long-run average from the quantitative industry analysis is not theoretically viable as growth in the terminal period. A growth rate of 11.5% for all future is unrealistic large compared to the global economy. Theoretically, a terminal growth rate higher than GDP growth will make the company unrealistically large (Koller et al., 2010). IEA (2016), who refer to IMF, the World Bank, and their own analysis, estimate annual real growth in global GDP of 3.4% in 2014-2040. However, to remain conservative in our valuation we add another estimate of long term GDP from McKinsey&Company, who estimates a GDP growth of 2.1% in the period 2014-2064 as of January 2015 (McKinsey Global Institute, 2015). Hence, we use an average of these two estimates in our valuation of SSO, yielding a terminal growth of 2.75%. The terminal period is set to start in 2026E.

8.2. Profit Margin

The fade analysis illustrates that SSO belongs in the top group with significantly higher profit margins compared to its peers. The quantitative industry analysis suggested approximately 7% profit margin, and as discussed, we do not expect that low values for SSO. In addition to low operating costs, the profitability analysis captures depreciation, amortization, and impairment as the most significant cost items. In the future, higher depreciation might lead to decreasing profit

margins, but the total cost of investments is expected to decrease as well. As the solar power industry matures, incentive programs might decrease, which leads to lower margins. In the strategic analyses, we mentioned that auctions are widely used and contribute to lower prices, increased competition, and we see no reason for this trend to stop. Thus, we assume profit margin to decrease, but not as fast and significant as the quantitative industry analyses indicate.

Profit margin in the short term yield no changes due to current PPAs, so we apply average values from the profitability analysis. After backlog and pipeline projects start to produce electricity, we expect profit margin to decrease, due to lower PPAs. We expect that lower PPAs are offset by an increase in PV efficiency and durability, leading to lower re-investments and maintenance.

8.3. Turnover Rate of Invested Capital

The long-term levels of TO suggested by the quantitative industry analysis is significantly higher than SSO currently display. As the PV technology develops further, both effectiveness and prices of modules will be better. The turnover ratio might increase as the projects are cheaper and more efficient, which yields higher revenue per invested krone. The strategic analysis supports higher turnover ratio in the future as the solar industry is expected to have a positive development. Hence, we expect a higher turnover ratio, but to remain conservative we do not expect as high levels as the quantitative analysis suggested.

Figure 8.9 Forecasted SG, PM and TO.

	Historical values			Explicit forecast									
Year	**2014**	**2015**	**2016**	**2017E**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**	**2024E**	**2025E**	**2026E**
SG		91%	16%	9%	28%	67%	15%	14%	12%	11%	10%	10%	9%
PM	36%	38%	36%	35%	35%	35%	35%	35%	32%	27%	27%	27%	27%
TO	0.12x	0.16x	0.18x	0.25x	0.25x	0.30x	0.30x	0.30x	0.48x	0.52x	0.54x	0.58x	0.58x

Source: Own production

8.4. Non-Controlling Interests

As SSO does not own all projects 100%, they have to distribute net profit attributable to different stakeholders. Due to lack of information in the notes, we use average ownership of all current and backlog projects for the forecast. We assume the ownership of realized backlog projects to be equal to the ownership share SSO project. We also assume that new projects have the same ownership structures. Figure 8.8 and 8.9 depicts the different ownership shares in the different projects and average ownership is 55%.

9. Valuation

There are numerous different valuation methods, and they can be classified into four groups: present value approach, relative valuation, liquidation approach and contingent claim method. As discussed in section 1.4 we will perform a valuation of SSO based on EVA-model, DCF-model and multiples. In addition, we perform a sum-of-the-parts-valuation to support the other models. In the following sections, each model will be described and conclude with a share price.

9.1. EVA-Model

The EVA model estimates the enterprise value by adding the present value of the economic value added to the initial invested capital (Peterson & Plenborg, 2012). To find the market value of equity, we have to subtract NIBD from enterprise value.

$$EVA = (ROIC - WACC) \times Invested\ capital$$

$$Enterprise\ Value = Invested\ capital_0 + \sum_{t=1}^{n} \frac{EVA_t}{(1+WACC)^t} + \frac{EVA_{n+1}}{WACC - g} \times \frac{1}{(1+WACC)^n}$$

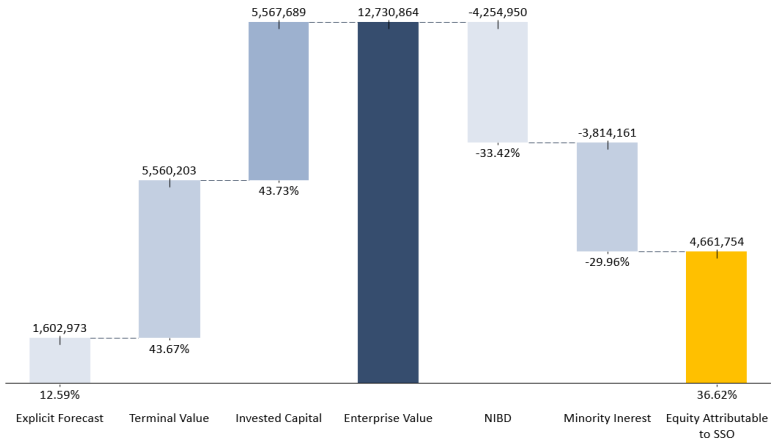
The EVA-model tells us whether the company is traded above or below book value. The EVA-model has invested capital as a starting point, and only excess returns are added (Peterson & Plenborg, 2012). Thus, if EVA is zero, terminal value has 0% explanatory power. One benefit of the EVA model is that we examine the company's performance on a year-by-year basis. Another strength with the EVA-model is that the terminal period usually accounts for a smaller part of enterprise value compared with the DCF approach.

Figure 9.1 sums up the valuation and concludes with a share price of NOK 49.69. The EVA-model yield positive values throughout the forecast period, except for 2017. A share price of 49.69 indicates an upside of 30.42% relative to the closing price 01.02.2017.

Figure 9.1 EVA-model

	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Revenues	1,098,707	1,411,823	2,354,950	2,710,847	3,077,499	3,455,180	3,844,172	4,244,764	4,657,255	5,081,949
Nopat	383,518	492,816	822,026	946,257	1,077,124	1,091,693	1,056,925	1,140,648	1,247,466	1,360,498
Invested capital	5,567,689	4,383,064	5,632,178	7,828,823	9,011,972	10,258,328	7,206,818	7,384,597	7,850,092	8,019,639
WACC	8.55%	8.55%	8.55%	8.55%	8.55%	8.55%	8.55%	8.55%	8.55%	8.55%
Cost of capital	476,037	374,752	481,551	669,364	770,524	877,087	616,183	631,383	671,183	685,679
EVA	-92,519	118,064	340,475	276,893	306,601	214,606	440,742	509,265	576,283	674,819
PV	-85,232	100,197	266,193	199,431	203,434	131,179	248,185	264,183	275,402	

IC beginning	5,567,689
PV explicit forecast	1,602,973
Growth rate	2.75%
PV Terminal period	5,560,203
Estimated EV	12,730,864
NIBD	4,254,950
MV equity	8,475,914
Minority interests	3,814,161
Equity att: SSO	4,661,754
Shares outstanding	93,816.23
Share price	**49.69**



Source: Peterson & Plengorg, 2012 / own production

9.2. Discounted Cash Flow Model – Enterprise Value Approach

The DCF-approach is the most popular value approach among practitioners (Peterson & Plenborg, 2012). EVA and DCF yield identical results as long as it relies on the same assumptions, and the two models have complementary benefits (Koller et al., 2010). As Koller et al., (2010) suggests, we apply both DCF and EVA allowing us to perform a robustness test of the estimated share price.

The enterprise value approach determines the value by discount all future free cash flows with the weighted average cost of capital. The free cash flows are the cash flow generated by the operations of the firm minus the reinvestments in the business. Penman (2013) define free cash flow as NOPAT – change in invested capital.

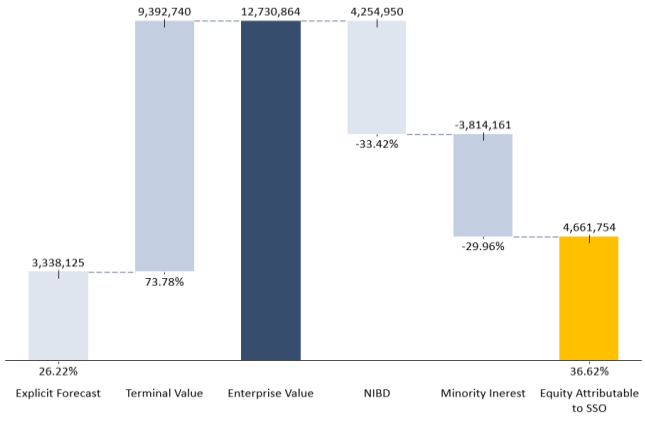
$$Enterprise\ value = \sum_{t=1}^{n} \frac{FCFF_t}{(1+WACC)^t} + \frac{FCFF_{n+1}}{WACC - g} \times \frac{1}{(1+WACC)^n}$$

To obtain the market value of Equity, we have to subtract NIBD from enterprise value. The DCF-enterprise value approach works best when the company maintains a relatively stable capital structure, but it can still yield accurate results if not. It is recommended to calculate the enterprise value first, then subtract the net interest bearing debt opposed to estimating the equity value directly (Koller et al., 2010).

Figure 9.2 DCF-model

	2016	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E
NOPAT	359,127	383,518	492,816	822,026	946,257	1,077,124	1,091,693	1,056,925	1,140,648	1,247,466	1,360,498
Invested Capital	5,567,689	4,383,064	5,632,178	7,828,823	9,011,972	10,258,328	7,206,818	7,384,597	7,850,092	8,019,639	8,240,179
Change in IC		-1,184,625	1,249,114	2,196,645	1,183,148	1,246,357	-3,051,510	177,779	465,495	169,547	220,540
FCFF		1,568,143	-756,299	-1,374,618	-236,891	-169,232	4,143,203	879,147	675,153	1,077,919	1,139,958
WACC		8.55%	8.55%	8.55%	8.55%	8.55%	8.55%	8.55%	8.55%	8.55%	8.55%
Prestent value, FCFF		1,444,627	-641,850	-1,074,713	-170,620	-112,288	2,532,546	495,054	350,238	515,131	

PV explicit forecast	3,338,125
Terminal growth	2.75%
PV terminal period	9,392,740
Estimated EV	12,730,864
NIBD	4,254,950
MV equity	8,475,914
Minority interests	3,814,161
Equity att: SSO	4,661,754
Shares outstanding	93,816
Share price	**49.69**



Source: Peterson & Plenborg, 2012 / own production

As expected, the DCF-model yields the same share price as the EVA model. As Figure 9.2 shows, the terminal value accounts for a substantially larger share than in the EVA-model. SSO's has negative FCFF in 2018-2021, related to substantial levels of investments.

9.3. Relative Valuation

The relative valuation method is the second most popular valuation method among practitioners (Peterson & Plenborg, 2012). The relative valuation is a fairly simple exercise which not necessary yields an accurate value. For the relative valuation to be applicable the companies should use the same accounting standards, the risk profile should be fairly similar and the capital structure should be the same, if not too much noise is introduced to the valuation. However, a multiple reflects the opinions of investors and can give some insights to what the analyst's personal expectations are (Peterson & Plenborg, 2012). Below is a list of the most well-known multiples. Price/earnings

- Price/Book
- EV/EBITDA
- EV/EBIT
- EV/Revenue
- EV/NOPAT

To perform a relative valuation of SSO, we use the same peers as in the profitability analyses as well as a set of new companies. All of the companies are in the solar industry and has a global presence. The reason to do a relative valuation is to see how SSO is priced compared to its peers, based on easily accessible data. We recognize caveats with a multiple analysis, so we interpret the results with care. In a perfect relative valuation, all firms should have the same tax rate, depreciation rate, and margins, but these requirements are seldom met (Peterson & Plenborg, 2012). The financial data is collected from Thomson one, including data for SSO applied in this section. We use one-year forecasts as suggested in Koller et al. (2012) in the multiple analysis.

We will perform a relative valuation of SSO based on these multiples.

- EV/EBITDA
- EV/Revenues
- Price/Book

We considered using Price/earnings, but SSO's P/E in 2016 was 1031, which is not applicable to compare to others. We chose multiples based on the credential given in Peterson & Plenborg

(2012). EV/EBITDA is chosen as it is unaffected by capital structure, differences in depreciation and tax rates, and is a good measure of cash flow from operations. EV/revenues is unaffected by capital structure and accounting policies. Lastly, we use Price/book because classifications of assets and liabilities are irrelevant (Peterson & Plenborg, 2012).

Figure 9.3 Relative valuation

Peers	Market cap	Net sales	shares out	Enterprise value	EV/EBITDA	EV/Revenues	Price/Book
Sunpower Corporation	915.6	2,559.6	133.7	3,819.6	10.5	9.5	2.3
Capital Stage AG	595.6	112.8	75.5	1,424.7	14.0	12.6	2.3
Engie	29,060.9	66,639.0	2,397.8	51,102.9	9.1	5.1	1.5
Abengoa Solar SA	383.7	5,755.5	935.9	9,235.7	8.7	1.6	6.2
Etrion	93.5	20.1	334.1	352.1	18.3	17.5	11.0
First Solar Inc.	6,715.6	3,579.0	104.0	5,099.5	6.5	1.4	1.2
Canadian Solar	1,620.8	3,467.6	56.0	3,067.7	8.3	8.6	2.0
EDF	20,390.6	71,203.0	2,271.8	61,244.6	7.3	6.4	3.2
Tongling Suntech Co. Ltd.	4,276.0	214.0	158.4	4,400.1	16.4	20.6	10.0
Enlight renewable energy Ldt.	225.6	155.6	321.4	1,341.3	13.6	8.6	1.5
TransAlta Renewables Inc.	3,212.2	259.0	224.0	4,274.2	28.9	16.5	1.6
Mean	**6,135.5**	**13,996.8**	**637.5**	**13,214.8**	**12.9**	**9.9**	**3.9**
Median	**1,620.8**	**2,559.6**	**224.0**	**4,274.2**	**10.5**	**8.6**	**2.3**
Scatec Solar	3,611.9	1,012.9	93.8	8,180.4	9.7	8.1	5.3
Share price based on mean multiples					67.7	58.4	28.3
Average share price							**51.5**

Source: Thomson one banker / own production

EV/EBITDA and EV/revenues implies that SSO is underpriced compared to its peers, while Price/book suggest the opposite. The average of the three multiples suggests a share price of NOK 51.5, which is fairly close to the share price estimated in the EVA and DCF-model. Thus, the relative valuation validates the finding in both valuation-models, that SSO is currently underpriced.

9.4. Sum-Of-The-Parts Valuation

To illustrate the contribution of different segments to SSO's share price, we perform a sum-of-the-parts valuation. We find EVA per project and segment, based on the same key drivers as in the EVA-valuation. Thus, the profit margin, turnover ratio, WACC, and terminal growth rate remains the same for all segments. We recognize this as simplified assumptions, and it might not be correct for all projects as lack of data and information does not justify any further investigation. As the SOTP-valuation is mostly for illustrative purposes, we feel it serve its purpose to see how value is created in the organization.

9.4.1. Power Production

Power production will be modeled using the forecast of revenues, with the same timing and revenues per project as in the other models. The EV is adjusted to the ownership share of each project. For complete calculations, see Appendix 14-18.

Figure 9.4 Power production EV estimation - total values

Project	Ownership	Revenues	NOPAT	Invested capital	EVA ex terminal	Enterprise value
Czech Republic	100%	1,140,682	356,520	3,058,512	95,017	588,217
Kalkbult	39%	4,117,371	1,273,025	10,703,068	357,913	767,589
Linde	39%	1,576,759	494,293	4,264,178	129,706	324,301
Dreunberg	39%	2,925,525	917,272	7,915,691	240,480	602,501
Asyv	43%	371,021	116,144	999,292	30,705	83,235
Agua Fria	40%	1,401,769	438,809	3,775,459	116,007	292,532
Jordan	59%	771,480	242,645	2,106,146	62,569	246,209
Backlog						
Segou	50%	470,370	143,829	1,146,123	45,835	41,312
Mozambique	53%	602,977	185,829	1,520,567	55,821	52,696
Malaysia	49%	2,888,814	886,911	7,165,399	274,270	241,957
Brazil	70%	2,138,045	653,767	5,209,649	208,342	262,895
Los Prados	50%	733,692	223,385	1,753,739	73,440	66,276
Upington	42%	3,521,592	1,073,310	8,438,336	351,833	264,721
Pipeline + opportunities	55%	9,223,411	2,604,166	18,214,141	1,046,857	1,523,950
Estimated EV	**5,358,393**					

Source: Scatec Solar Asa, 2017a / Scatec Solar ASA 2017b / own production

9.4.2. Operations & Maintenance

To find the enterprise value of O&M we first have to model the estimated income. Revenues in the O&M segment is internal and is affected by total capacity. Higher capacity requires more maintenance which yields higher revenues. We calculated NOK/MW of capacity for 2016 and assumes this remains constant. The capacity is decided as the aggregated MW of the projects, based on the forecasted development in the project portfolio.

Figure 9.5 Operations & maintenance EV estimation

	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Capacity MW	322	742	1,053	1,242	1,431	1,620	1,809	1,998	2,187	2,376
Revenues per	193	193	193	193	193	193	193	193	193	193
Revenues	62,200	143,330	203,406	239,914	276,423	312,932	349,440	385,949	422,458	458,966
Nopat	22,392	51,599	73,226	86,369	99,512	102,003	99,570	107,571	117,410	125,166
Invested capital	248,800	573,322	678,019	799,714	921,410	652,713	671,270	713,758	727,458	790,325
EVA	1,120	2,580	15,255	17,994	20,732	46,196	42,177	46,545	55,213	57,593
PV	1,031	2,190	11,927	12,960	13,756	28,237	23,750	24,145	26,386	474,539
Estimated EV	**618,921**									

Source: Scatec Solar ASA, 2017a / own production

9.4.3. Development & Construction

To find the value added by development & construction we first have to define how revenues originate. Based on estimates of capex for the backlog projects, we find the revenue per MW capacity added. As we operate with a SSO ownership of 55%, we will only receive 45% of the revenues, as 55% of the cost is attributable to SSO.

Figure 9.6 Development & construction EV estimation

	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Capacity MW	322	742	1,053	1,242	1,431	1,620	1,809	1,998	2,187	2,376
MW added	0	420	311	189	189	189	189	189	189	189
Revenues per MW	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500
Revenues	0	2,362,500	1,749,375	1,063,125	1,063,125	1,063,125	1,063,125	1,063,125	1,063,125	1,063,125
NOPAT	0	751,275	556,301	338,074	338,074	301,883	258,278	251,662	250,743	250,591
Invested capital	0	9,450,000	5,831,250	3,543,750	3,543,750	2,217,467	2,042,247	1,966,099	1,830,666	1,830,666
EVA	0	-56,700	57,729	35,083	35,083	112,290	83,666	83,560	94,221	94,069
PV	0	-48,120	45,134	25,268	23,278	68,638	47,113	43,347	45,028	775,088
Estimated EV	**1,024,774**									

Source: Scatec Solar ASA, 2017a / own production

9.4.4. Summary of SOTP

The last adjustment is subtracting NIBD adjusted for ownership from aggregated EVA of all projects and segments.

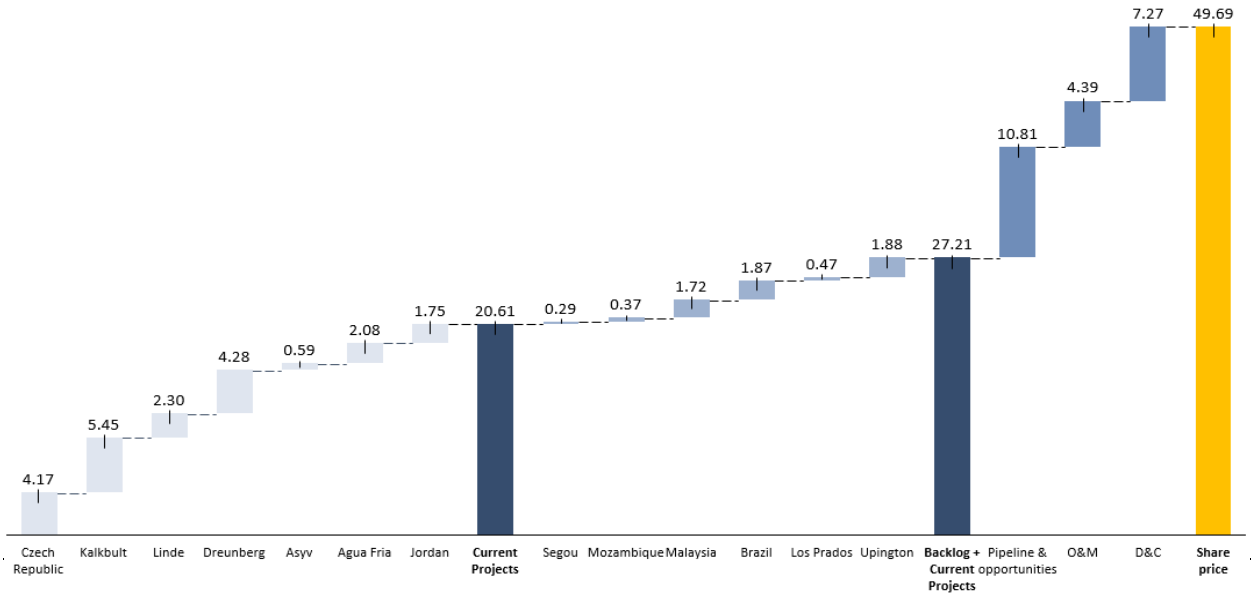
Figure 9.7 SOTP calculations

	PP	O&M	D&C	Estimated EV	NIBD	Equity att: SSO	Share price
Sum	5,358,393	618,921	1,024,774	7,002,088	2,340,223	4,661,865	49.69

Source: own production

Share price per project and segment is the relative contribution to total EV of the share price, see Appendix 19 for calculations. Figure 9.8 illustrates how each project and segment contribute to SSO's share price.

Figure 9.8 SOTP valuation



Source: Own production

10. Sensitivity and Scenario Analysis

The valuation deeply relies on forecasted values. Hence, we perform both a sensitivity- and scenario analysis to understand how significant changes in projections impact our estimated value.

10.1. Sensitivity Analysis

We want to interpret the influence relevant value drivers have on our valuation. Thus, a sensitivity analysis of changes in key drivers should always be included in a valuation (Petersen & Plenborg, 2012). Important key drivers are WACC, terminal growth rate, backlog, pipeline, profit margin and turnover ratio. We will conduct an analysis of share price sensitivity towards the different key drivers.

Illustrated in the Figure 10.1, we see how the estimated share price vary by a change in both terminal growth rate and WACC. Changes in WACC yields significant larger changes than the changes caused by the terminal growth. The terminal period's portion of the share price is only 43.7% and yield a low sensitivity compared to a DCF-model, which is as expected as mentioned in the valuation section. The share price spread of 38% illustrated with the square in Figure 10.1, implies that it is sensitive to realistic changes in both variables.

Figure 10.1 Sensitivity of terminal growth rate & WACC

WACC \ Terminal Growth Rate	49.69	2.00%	2.10%	2.20%	2.40%	2.60%	2.75%	2.90%	3.10%	3.30%	3.50%	3.70%
10.15%		29.02	29.22	29.43	29.87	30.33	30.69	31.06	31.59	32.14	32.73	33.36
9.65%		33.52	33.78	34.05	34.61	35.19	35.66	36.14	36.82	37.54	38.31	39.13
9.15%		38.68	39.02	39.36	40.07	40.82	41.42	42.05	42.93	43.88	44.89	45.97
8.95%		40.96	41.33	41.71	42.50	43.33	44.00	44.69	45.68	46.73	47.86	49.08
8.75%		43.38	43.79	44.21	45.08	46.01	46.75	47.52	48.62	49.80	51.07	52.44
8.55%		45.96	46.41	46.87	47.84	48.87	**49.69**	50.56	51.78	53.11	54.53	56.08
8.35%		48.70	49.19	49.71	50.78	51.93	52.85	53.82	55.19	56.68	58.28	60.03
8.15%		51.62	52.17	52.74	53.94	55.22	56.25	57.33	58.87	60.55	62.36	64.34
7.95%		54.75	55.36	55.99	57.33	58.76	59.91	61.12	62.86	64.75	66.81	69.06
7.75%		58.10	58.78	59.48	60.97	62.58	63.87	65.24	67.20	69.34	71.68	74.25
7.55%		61.69	62.45	63.24	64.91	66.71	68.17	69.71	71.93	74.36	77.04	79.98

Source: Own production

As mentioned above, we can see from the calculations in the sensitivity matrix (Figure 10.1) that changes in WACC have significant impact on the share price, which alone yields a spread of 27% or NOK 11.5. As a result of WACC's impact on the sensitivity, we look closer at two underlying

assumptions of CAPM: required cost of equity and beta. If we do not include an adjustment for our beta, WACC would drop to 8.40% from 8.55% in the terminal period, resulting in a share price of 52 NOK, an upside of 4.7%. Using a conservative approach with 3.78% instead of 3% (Damodaran, 2016) when estimating small cap premium, yields higher required cost of equity. Hence, the share price would equal 44.7 NOK, yielding a downside of 10.1% from the base case (49.69 NOK). Using PWC's (2016) small cap premium of 1 %, implies a much more optimistic approach, yielding a WACC of 7.59%. In this case, the share price would equal 67 NOK, a 34.9% higher share price than in the base case. We also look closer into required cost of debt. With an optimistic approach of cost of debt, we could apply Nordea's (2016) credit rating of SSO (BBB), which yields a WACC of 7.9% in the terminal period, resulting a share price of 60.8 NOK (22% upside), indicating that required return on debt has severe influence on the share price.

We emphasize the importance of a sound analysis before estimating WACC due to a high impact on estimated share price when changing underlying assumptions in the WACC. Further, we investigate how sensitive the stock price is to the other key drivers: business cases & opportunities, pipeline, profit margin, and turnover ratio.

Figure 10.2 Sensitivity of business cases & opportunities and pipeline

Pipeline \ Business Cases & Opportunities	5.00%	8.0%	11.0%	14.0%	17.0%	20.0%	23.0%	26.0%	29.0%	32.0%	35.0%
25.00%	37.53	38.80	40.07	41.34	42.71	43.98	45.25	46.52	47.79	49.06	50.32
30.00%	38.70	39.96	41.23	42.50	43.77	45.04	46.31	47.68	48.95	50.22	51.49
35.00%	39.86	41.13	42.40	43.66	44.93	46.20	47.47	48.74	50.01	51.28	52.65
40.00%	41.02	42.29	43.56	44.83	46.10	47.36	48.63	49.90	51.17	52.44	53.71
45.00%	42.18	43.45	44.72	45.99	47.26	48.53	49.80	51.06	52.33	53.60	54.87
50.00%	43.35	44.62	45.88	47.15	48.42	**49.69**	50.96	52.23	53.50	54.76	56.03
55.00%	44.40	45.67	47.05	48.32	49.58	50.85	52.12	53.39	54.66	55.93	57.20
60.00%	45.57	46.84	48.10	49.37	50.64	52.02	53.28	54.55	55.82	57.09	58.36
65.00%	46.73	48.00	49.27	50.54	51.80	53.07	54.34	55.61	56.99	58.25	59.52
70.00%	47.89	49.16	50.43	51.70	52.97	54.24	55.51	56.77	58.04	59.31	60.58
75.00%	49.06	50.32	51.59	52.86	54.13	55.40	56.67	57.94	59.21	60.47	61.74

Source: Own production

Figure 10.2 illustrates how sensitive the stock price is to the probability of realizing projects. As stated in chapter 8, SSO estimates a probability of 50% for pipeline and 20% of business cases & opportunities to be realized. The most realistic range yields an upside of 9.8% and a downside of 10% from our base case. The share price spread of 22% implies that SSO is considerably sensitive

to realistic changes in both variables. We discuss different scenarios regarding backlog and pipeline in detail in section 10.2.

Figure 10.3 illustrates the sensitivity of the share price concerning changes in profit margin and turnover ratio in steady state. As we do not yield constant profit margin and turnover ratio in our forecast, we decide only to estimate how sensitive the share price is regarding changes in the terminal period.

Figure 10.3 Sensitivity of profit margin and turnover ratio in steady state

		Profit Margin										
	49.69	20.00%	21.0%	22.0%	23.0%	24.0%	26.8%	28.0%	29.0%	30.0%	31.0%	32.0%
Turnover Ratio	0.530	29.90	32.35	34.81	37.26	39.72	46.52	49.54	51.99	54.45	56.90	59.36
	0.540	30.57	33.02	35.48	37.93	40.39	47.19	50.21	52.66	55.12	57.57	60.03
	0.550	31.22	33.67	36.13	38.58	41.04	47.84	50.86	53.31	55.77	58.22	60.68
	0.560	31.84	34.30	36.75	39.21	41.66	48.46	51.48	53.94	56.39	58.85	61.30
	0.570	32.44	34.90	37.35	39.81	42.26	49.07	52.08	54.54	56.99	59.45	61.90
	0.581	33.07	35.52	37.98	40.43	42.89	**49.69**	52.71	55.16	57.62	60.07	62.53
	0.590	33.59	36.04	38.50	40.95	43.41	50.21	53.23	55.68	58.14	60.59	63.05
	0.600	34.13	36.59	39.04	41.50	43.95	50.75	53.77	56.23	58.68	61.13	63.59
	0.610	34.66	37.11	39.57	42.02	44.48	51.28	54.30	56.75	59.21	61.66	64.12
	0.620	35.17	37.62	40.08	42.53	44.99	51.79	54.80	57.26	59.71	62.17	64.62
	0.630	35.66	38.11	40.57	43.02	45.48	52.28	55.30	57.75	60.21	62.66	65.12

Source: Own production

Within the realistic range, the analysis yields an upside of 13% and 21% downside from our base case. The share price spread of 43% implies that SSO's share price is sensitive to realistic changes in these two key drivers. As mentioned in the forecast section, a profit margin of roughly 7% will not be sustainable in the long term, and we can see from Figure 10.3 that a 4% change in profit margin yields large changes in share price.

To sum up, the sensitivity analyses demonstrates the relevance of good predictions for our key drivers. The study highlight how changes can have a significant impact on our estimated share price, which again emphasizes the importance of basing the model on sound analysis.

10.2. Scenario Analysis

Although we are confident in our valuation, we want to provide a substantial analysis through two different scenarios; conservative and optimistic. Figure 10.4 illustrates the spread between the base

case and the different scenarios. All else equal, the scenarios are based on how much we add into backlog from pipeline & opportunities per year and revenues per MW.

Figure 10.4 Scenario Analysis

Case	Conservative	**Base Case**	Optimistic
Scenario 1:			
Pipeline & Opportunities addition per year	10%	**20%**	30%
Spread from base case	39.65	**49.69**	59.63
Share Price NOK	-20%	-	20%
Scenario 2:			
Revenues per MW	1.40	**1.64**	1.64
Share Price NOK	44.2	**49.69**	46.69
Spread from base case	-11%	-	-

Source: Own production

10.2.1. Conservative Case

In this case, we assume that only 10% of pipeline & opportunities get realized throughout estimation period, compared to our assumption of 20%, described in our forecast section. This result in -20% lower share price than our base case. In scenario 2, we expect higher competition, which may yield a lower probability of securing contracts. Competitiveness push margins down, hence revenue per MW will decrease, and the share price spread equal -11%.

10.2.2. Optimistic Case

The bullish case assumes that 30% of pipeline & opportunities get realized each year throughout the forecasting period. In the industry analysis, we argue that solar power production will grow rapidly and yields large cost-reduction potential in the coming years. Thus, realizing 10% more than our base-case yields a 28% higher share price. As mentioned earlier, we expect industry rivalry to increase, making it unrealistic that the revenues per MW should improve. Hence we keep revenues per MW at 1.6.

10.3. Monte Carlo Simulation

To determine if our estimates are reliable, we perform a Monte Carlo simulation. This is a powerful tool for uncertainty and risk analysis and will work as a verification for our estimated share price (Petersen & Plenborg, 2012). The sensitivity analysis investigates the impact of changes in one or two different key drivers at the same time. Monte Carlo simulation yields a sound verification as

it allows us to compute different input variables and inherent probability distributions thousands of times, each round with new random sampled data (Brandimarte, 2014). Before we run the simulation on our EVA model, we need to determine which drivers that are most critical.

10.3.1. Input Variables

First, we need to determine a set of variables before running the simulation. The most significant drivers regarding SSO's stock price will be a part of the Monte Carlo simulation. Hence, we include terminal growth rate, WACC, turnover rate, profit margin, and business cases & opportunities.

Second, the choice of distribution- method is necessary. Normal distribution is most common, and Brandimarte (2014) use standard deviation based on historical data as a range of random variables. As discussed in the strategic analysis, the solar power industry has changed drastically over the last ten years. Even though the solar industry yields lower capital demand in the future and project higher growth in the future, we do not expect the industry to have similar growth in the terminal period. Also, the cost of PV modules has dropped rapidly and will continue to drop further according to consensus and our strategic analysis. Hence, it is difficult to argue a reason for whether profit margin will decline significantly or not. Instead of relying solely on historical standard deviations in an immature industry as solar power, we choose to apply a triangular distribution. The advantage of this distribution method when calculating random samples is that it allows us to choose between minimum, most likely, and maximum variables. (Brandimarte, 2014).

Last, as our estimated stock price is sensitive to all our key drivers, we need to determine maximum and minimum values to all our key drivers. For all key drivers except WACC and PM, we use a range of ±10%, for each random variable in the forecasting horizon and terminal period. Aligned with our discussions, we do not believe PM to increase significantly, and will only yield an upside of 4% and a downside of 12% in our simulation. Furthermore, due to WACC's sensitivity, we only apply a range of ± 2%.

10.3.2. Simulation Results

We used the Excel add-in program Oracle Crystal Ball to perform this simulation. Further, we base our simulation on 100,000 simulations of our model. Find full summary in Appendix 35-41. Mean

share price is NOK 48.53, representing only NOK 1 deviation from our base case of NOK 49.69. It is important to remember that the mean can be misleading as the average formula does not take outliers into consideration. Furthermore, the share price spread is illustrated in Figure 10.5 with minimum and maximum values of 20.88 and 86.83 respectively. This may indicate a high meanas a result of outliers, which is slightly supported by the skewness.

Figure 10.5 Monte Carlo summary

Monte Carlo Statistics	Forecast Values
Simulations	100,000
Base Case	46.69
Mean	48.53
Median	48.12
Standard Deviation	16.23
Variance	262.44
Skewedness	0.23
Kurtosis	2.9
Minimum	20.88
Maximum	86.83
Range	65.95

Source: Own production

To account for extreme values, it is suggested to consider the median value (Brandimarte, 2014). The median is close to our base case and equals 48.12, indicating our assumptions to be reasonable. Our simulation yields a standard deviation of 16%. To examine if this is valid or not, we look closer at Damodaran's (2017) estimates of equity standard deviation in renewables energy. Although Damodaran indicates a slightly higher standard deviation of 24% for renewables, we have earlier argued that SSO operates with low risk due to SPVs and project finance debt, which will yield lower risk for equity holders. Hence we find the simulated standard deviation valid. Moreover, we want to estimate the probability of a share price higher than the price at the cut-off date (NOK 38.1) based on our analysis. The simulation yields a theoretical probability of 86.5% for the share price being above NOK 38.1. In addition, we find the probability of the stock price to be within the range from NOK [33-55] to be 72.5% likely, indicating we are within the realistic range. See Appendix 38.

Monte Carlo simulation provides us with a valuable insight of our valuation. We found median and mean to be significantly close to our base case result, and the equity standard deviation to be likely to the renewable industry. Hence, we are confident in that our simulation yields well-grounded estimates for the share price.

10.4. Summary of Sensitivity

The present value models, EVA and DCF, yield the same results and estimate a share price of NOK 49.69. The relative valuation provided different results averaging at NOK 51.5. As the scenario and sensitivity analysis illustrates, we find that estimated share price is highly sensitive to changes in key drivers. The sensitivity analysis implies prices between NOK 39.21 and 58.87, while the scenario analysis yields a share price range between NOK 39 to 59 for conservative and optimistic scenarios, respectively. The Monte Carlo analysis proved that our estimates are reasonable and that the estimated share price is within the realistic range.

11. Conclusion

The ulterior motive of this thesis is to answer the research question: "What is the intrinsic value of Scatec Solar ASA as of 01.02.2017?". To estimate the intrinsic value, we have conducted a fundamental analysis of SSO and its industry to identify important value drivers and trends. We have considered both strategic and financial aspects of the industry and SSO.

Our analysis distinguishes solar industry as a capital intensive industry with great potential. LCOE declined by 59% between 2010-2015 and is expected to decrease 57% the next ten years. We believe SSO to benefit from cost reductions and remain highly profitable. Lower CAPEX per MW installed yields higher competitiveness against other renewables and conventional energy sources. The geographic scope of operations widens, allowing independent solar power producers to operate in emerging markets, increasing industry rivalry. However, our analysis implies that government policies continue to provide support mechanisms to solar developers and producers, yielding lower risk, thus increasing access to capital.

Increased focus on the renewable sector is mainly due to COP21, which agreed to limit the global average temperature increase well below 2 Celsius on long-term. As the energy sector is the source of at least two-thirds of greenhouse emissions, the transition to renewables is of utmost importance reaching these goals. Based on UN's estimated population growth, resource utilization and renewable energy accounting for over 50% of total new power generation capacity, we believe solar energy demand is set to increase significantly.

The analysis provides necessary insights to produce valid forecasts for our key drivers; profit margin, sales growth, turnover rate and WACC. The strategic- and quantitative analysis indicated pressure on profit margin and higher turnover ratio as the industry matures. As a soundness check for our estimated share price, we compare our results from EVA and DCF with both multiples and sum of the parts valuation. In addition, we performed several sensitivity analyses and two different scenarios. The results indicate that changes in our forecasted key drivers have a significant impact on the estimated share price.

SSO has experienced rapid growth since its listing in 2014 and is expected to triple installed capacity by 2019. SSO has achieved a strong foothold in EMDE, allowing high-yield projects with

low costs of capital. This is a result of project SPVs making it possible for projects to develop on their premises independently. Each project has powerful partners with crucial expertise and knowledge, yielding an advantage for SSO regarding communication with relevant stakeholders. Future projects will not be affected by the other projects and vice versa. Thus, SSO is exposed to less operational- and financial risk. Moreover, SSO's self-funding through O&M and D&C strengthens its ability to invest in multiple projects simultaneously.

The analysis resulted in a share price of NOK 49.69, yielding an upside of 30.42% compared to the closing price 01.02.2017. Thus, the conclusion of our analysis is a buy recommendation. The sensitivity analyses suggest robust findings, which is supported by 100,000 Monte Carlo simulations, indicating 86.2% probability of observing a share price above NOK 38.1. The estimated share price is a product of a thorough analysis, based on reports from renowned agencies and empirical theory. Hence, the analysis has a theoretical fundament supplemented with knowledge and expertise from industry experts.

12. Thesis in Perspective

It has not been possible to address all aspects of the valuation in our thesis. Thus, this section will briefly discuss what could have been interesting to consider further.

Writing our thesis has given us extensive in-depth knowledge about the renewable energy industry. Solar power is a capital-intensive industry, making construction costs utmost important. SSO does not disclose detailed financial data of their project companies. Hence, our valuation is a product of what we consider as relevant assumptions. An interesting approach could be to look at a more detailed analysis of the project portfolio. Gaining access to financial statements and PPAs for each project would contribute with significant value. To possess more information of SSO's projections of risk and other factors for their projects would enable us to forecast more accurate. In addition, it would allow a thorough examination of how different segments like O&M and D&C create value separately.

We could investigate some of the utility scale challenges renewable sources face in emerging markets. Further, it would be highly interesting to identify what set of guarantees and financial instruments the World Bank, IFC and other partners provide to secure lenders and equity providers when funding projects. Credit risk is a critical problem in emerging markets and links to political risk and non-cost reflective tariffs. Thus, it would allow in-depth analysis of the credit risk SSO are exposed to, making it feasible to estimate an accurate cost of capital. Access to contracts, PPAs, FITs, capacity constraints, and covenants would contribute with essential information. A higher level of insights into these contracts would make our analysis more accurate and sound.

Moreover, Mikkel Tørud explained how SSO was penalized by the market in 2015 by not meeting deadlines for different projects to be in operation. As a result, SSO hold back much more information regarding new projects compared to earlier years, making it difficult to project backlog, pipeline, and opportunities.

Even though we rely solely on available public information, we have confidence in the results of our analysis. However, we recognize that if we could have investigated all individual characteristics mentioned above, it would yield a more robust analysis.

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14. APPENDIX

Table of Contents

Appendix 1. Dictionary and abbreviations

PP = Power production

O&M = Operation & maintenance

D&C = Development & Maintenance

Backlog = Planned projects with 90% probability of realization.

Pipeline = Planned projects with 50% probability of realization

Business cases & opportunities = planned projects with unknown probability of realization.

EMDE = Emerging markets and developing economies

FIT = Feed-in-tariffs

PPA = Power Purchase Agreements

IEA = Internation Energy Agency

450 Scenario = IEA's scenario to reach the 2-degree Celsius target of COP21

ZAR = South African Rand

BRL = Brazilian Real

CZK = Czech Koruna

NOK = Norwegian Krone

IRENA = International Renewable Energy Agency

SPV = Special Purpose Vehicle

SSO = Scatec Solar ASA

IPP = independent power producer

PV = Photovoltaics

CSP = Concentrated solar power

LCOE = Levelized cost of electricity

FLEV = Financial Leverage

TO = Turnover rate of invested capital

PM = Profit margin

ROIC = Return on invested capital

NBC = Net bearing cost

NIBD = Net interest bearing cost

BE = Book value of equity

IPO = Initial public offering

IC = Invested capital

ROE = Return on Equity

NOPAT = Net operating profit after tax

PPE = Property, plant and equipment

MW = Megawatt

KW = Kilowatt

GW = Gigawatt

MSCI world = Morgan Stanley Capital Index's All Country World Index

S&P500 = Standard and Poor's 500 index

OSEBX = Oslo Stock Exchange

SOXX600 = Eurostoxx 600 Europe equity index

WACC = Weighted average cost of capital

DCF = Discounted cash flow model

EVA = Economic value added

COP21 = 21st conference of parties in Paris

CAPM = Capital asset pricing model

SOTP = Sum-of-the-parts valuation

ITC = Investment tax credits

Steady state = Long term levels of margins and growth, often referred to as the terminal period.

Appendix 2. Finacials per segment 2016

NOK 1000	PP	O&M	D&C	Corporate	Eliminations	Total
External revenues	1010.6	2.3	0	0	0	1012.9
Internal revenues	0	59.9	599	9.8	-668.8	0
Net gain/(loss) from sale of project assets	0	0	8.3	0	67.1	75.4
Net income/(loss) from associates	0	0	-3.4	0	0	-3.4
Total revenues and other income	1010.6	62.2	603.9	9.8	-601.7	1084.9
Cost of sales	0	0	-539.6	0	539.6	0
Gross profit	1010.6	62.2	64.4	9.8	-62.1	0.10849
Operating expenses	-157.3	-30.6	-76.6	-57.2	69.7	-251.9
EBITDA	853.4	31.6	-12.2	-47.4	7.7	833
Depreciation, amortisation and impairment	-352	-2.3	-10.4	-0.8	95.4	-270.1
Operating profit (EBIT)	501.4	29.3	-22.7	-48.1	103.1	563

Appendix 3. Input for fade diagrams – sales growth

	t1	t2	t3	t4	t5
High	0.34	0.12	0.06	0.06	0.06
mid high	0.17	0.12	0.09	0.07	0.07
mid	0.08	0.07	0.06	0.06	0.04
mid low	0.03	0.05	0.03	0.04	0.03
Low	-0.06	0.05	0.03	0.03	0.02
Average	0.07	0.07	0.07	0.07	0.07

Appendix 4. Input for fade diagrams – profit margin

	t1	t2	t3	t4	t5
High	0.26	0.23	0.22	0.21	0.19
mid high	0.11	0.10	0.09	0.09	0.08
mid	0.06	0.06	0.06	0.05	0.07
mid low	0.02	0.02	0.02	0.03	0.03
Low	-0.06	-0.02	-0.01	-0.01	0.02
Average	0.08	0.08	0.08	0.08	0.08

Appendix 5. Input for fade diagrams – turnover ratio

	t1	t2	t3	t4	t5
High	2.47	2.25	2.16	2.15	2.10
mid high	0.77	0.79	0.81	0.80	0.79
mid	0.54	0.56	0.58	0.57	0.55
mid low	0.42	0.45	0.48	0.47	0.47
Low	0.17	0.20	0.20	0.20	0.20
Average	0.85	0.85	0.85	0.85	0.85

Appendix 6. Consolidated income statement

NOK THOUSAND	2014	2015	2016
Revenues	455,098	867,714	1,012,938
Net gain/(loss) from sale of project assets	17,393	14,112	75,405
Net income/(loss) from associated compa	-1,183	-865	-3,394
Total revenues and other income	471,308	880,961	1,084,942
Personnel expenses	-69,686	-70,543	-86,199
Other operating expenses	-108,736	-112,027	-165,716
Depreciation, amortisation and impairmen	-101,859	-175,609	-270,083
Operating profit	**191,027**	**522,782**	**562,954**
Interest and other financial income	54,799	64,402	50,796
Interest and other financial expenses	-248,557	-408,054	-504,801
Net foreign exchange gain/(losses)	62,310	40,514	-10,052
Net financial expenses	-131,448	-303,138	-464,057
Profit/(loss) before income tax	59,579	219,644	98,897
Income tax (expense)/benefit	-11,062	-83,970	-28,410
Profit/(loss) for the period	**48,517**	**135,674**	**70,487**
Profit/(loss) attributable to:			
Equity holders of the parent	-17,923	67,651	3,502
Non-controlling interests	66,440	68,023	66,985

Appendix 7. Consolidated balance sheet

NOK THOUSAND	2014	2015	2016
Revenues	455,098	867,714	1,012,938
Net gain/(loss) from sale of project assets	17,393	14,112	75,405
Net income/(loss) from associated companies	-1,183	-865	-3,394
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Non-controlling interests	66,440	68,023	66,985

End of year	2014	2015	2016
NOK THOUSAND			
EQUITY AND LIABILITIES			
Equity			
Share capital	2,345	2,345	2,345
Share premium	794,142	807,903	819,053
Total paid in capital	**796,487**	**810,248**	**821,398**
Retained earnings	-202,227	-164,909	-221,977
Other reserves	40,511	161,803	85,309
Total other equity	-166,716	-3,106	-136,668
Non-controlling interests	546,811	618,255	628,009
Total equity	**1,176,582**	**1,425,397**	**1,312,739**
Non-current liabilities			
Deferred tax liabilities	82,640	203,436	127,508
Non-recourse project financing	3,337,265	4,799,828	4,304,098
Bonds	0	492,917	495,417
Financial liabilities	14,886	0	7,330
Other non-current liabilities	4,646	346,616	318,798
Total non-current liabilities	**3,439,437**	**5,842,797**	**5,253,151**
Current liabilities			
Trade and other payables	69,947	154,154	29,346
Income tax payable	41,543	23,508	10,680
Non-recourse project financing	112,786	166,789	279,473
Financial liabilities	25,773	6,184	6,584
Other current liabilities	145,717	364,794	183,166
Total current liabilities	**395,766**	**715,429**	**509,249**
Total liabilities	**3,835,203**	**6,558,226**	**5,762,400**
TOTAL EQUITY AND LIABILITIES	**5,011,785**	**7,983,623**	**7,075,139**

Appendix 8. Changes in Equity 2016

NOK 1000	Share capital	Share premium	Retained earnings	Foreign currency translation	Hedging reserves	Total	Non controlling interests
At 1 January 2016	2,345	807,903	-164,909	127,460	34,343	807,142	618,255
Profit for the period	0	0	3,502	0	0	3,502	66,986
Other comprehensive income	0	175	3,703	-43,749	-32,745	-72,616	-4,541
Total comprehensive income	0	175	7,205	-43,749	-32,745	-69,114	62,445
Share-based payment	0	10,975	0	0	0	10,975	0
Dividend distribution	0	0	-61,196	0	0	-61,196	-173,698
Capital increase from NCI [1)2)]	0	0	-13,381	0	0	-13,381	121,007
Distribution to NCI loan	0	0	10,304	0	0	10,304	0
At 31 December 2016	**2,345**	**819,053**	**-221,977**	**83,711**	**1,598**	**684,730**	**628,009**

Appendix 9. Personell expenses & Interest and other financial expenses quarterly

NOK 1000	Q1 2014	Q2 2014	Q3 2014	Q4 2014	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Personell expenses	-13834	-16443	-20078	-19331	-18457	-15116	-18000	-18970	-23296	-23673	-20506	-18724
Pension costs	-540.5	-540.5	-540.5	-540.5	-1077.5	-1077.5	-1077.5	-1077.5	-1300	-1300	-1300	-1300
Share-based payment	-2245.5	-2245.5	-2245.5	-2245.5	-3689	-3689	-3689	-3689	-2743.75	-2743.75	-2743.75	-2743.75
Total personell expenses	**-11048**	**-13657**	**-17292**	**-16545**	**-13690.5**	**-10349.5**	**-13233.5**	**-14203.5**	**-19252.25**	**-19629.3**	**-16462.25**	**-14680.25**

Interest and other financial expenses

NOK 1000	Q1 2014	Q2 2014	Q3 2014	Q4 2014	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Pension costs	-540.5	-540.5	-540.5	-540.5	-1077.5	-1077.5	-1077.5	-1077.5	-1300	-1300	-1300	-1300
Share-based payment	-2245.5	-2245.5	-2245.5	-2245.5	-3689	-3689	-3689	-3689	-2743.75	-2743.75	-2743.75	-2743.75
Ipo cost	0	0	-7000	-8000	0	0	0	0	0	0	0	0
Rental and lease interest	-	0	0	0	-37.57892	-37.57892	-37.57892	-37.57892	-38.214662	-38.21466	-38.214662	-38.214662
Interest expenses	-27053	-28058	-49040	-86651	-95779	-94334	-98396	-107024	-116230	-117174	-129243	-133670
Forward exchange contracts	-27700	-7561	-10729	-755	-2954	0	0	0	0	0	0	0
Other financial expenses	-2441	-460	-5524	-2585	-2375	-975	-2140	-4069	-2504	-2104	-1829	-2047
Total financial expenses	**-59980**	**-38865**	**-75079**	**-100777**	**-105912**	**-100113**	**-105340**	**-115897**	**-122816**	**-123360**	**-135154**	**-139798.96**

Appendix 10. Quarterly income statements – reformulated

NOK 1000	Q1 2014	Q2 2014	Q3 2014	Q4 2014	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Revenues	56,708	92,739	130,550	175,100	225,358	184,895	202,361	255,100	228,238	214,377	280,735	289,588
Income from associated cor	-109	-140	-1,944	1,010	-587	-188	-90	-	-584	-2,418	-116	-242
Total revenues and other	**56,599**	**92,599**	**128,606**	**176,110**	**224,771**	**184,707**	**202,271**	**255,100**	**227,654**	**211,959**	**280,619**	**289,346**
Personnel expenses	-11048	-13657	-17292	-16545	-13690.5	-10349.5	-13233.5	-14203.5	-19252.3	-19629.3	-16462.25	-14680.3
other operating expenses	-13,660	-23,077	-29,933	-42,067	-28,583	-25,935	-25,098	-32,411	-39,383	-37,138	-38,425	-50,767
EBITDA	**31,891**	**55,865**	**81,381**	**117,498**	**182,498**	**148,423**	**163,940**	**208,486**	**169,019**	**155,192**	**225,732**	**223,899**
Depreciation, amortisation a	-19,050	-16,705	-27,417	-38,687	-38,946	-38,100	-46,100	-52,463	-58,611	-59,600	-68,138	-83,734
Rental and lease payments	0	0	0	0	1,478	1,478	1,478	1,478	1,503	1,503	1,503	1,503
Lease depreciation	0	0	0	0	-1,440	-1,440	-1,440	-1,440	-1,465	-1,465	-1,465	-1,465
Adjusted EBIT	**12,841**	**39,160**	**53,964**	**78,811**	**143,589**	**110,360**	**117,877**	**156,060**	**110,446**	**95,630**	**157,632**	**140,203**
Tax on operating profit	671	-6,106	-22,798	-15,869	-50,812	-30,860	-80,181	-55,050	-37,131	-7,379	-11,327	-46,997
NOPAT	**13,512**	**33,054**	**31,166**	**62,942**	**92,777**	**79,500**	**37,697**	**101,010**	**73,315**	**88,250**	**146,305**	**93,206**
Net gain from sale of projec	18	-1,121	243	18,254	-	2,585	-16	11,543	207	1,411	-	73,787
Interest and other financial i	23,520	8,306	8,341	14,633	12,921	15,755	18,510	17,216	12,070	15,840	8,776	14,110
Interest and other financial e	-59980	-38865	-75079	-100777	-105912	-100113	-105340	-115897	-122816	-123360	-135154	-139799
Net foregin exchange gain/l	32,903	23,838	18,411	-12,842	22,171	1,016	-4,858	22,185	-34,480	16,466	-19,202	27,164
Net financial expenses be	**-3,539**	**-7,842**	**-48,084**	**-80,732**	**-70,820**	**-80,757**	**-91,704**	**-64,953**	**-145,019**	**-89,643**	**-145,580**	**-24,738**
tax on financial expenses	-185	1,223	20,314	16,255	25,061	22,582	62,378	22,912	48,754	6,917	10,461	8,292
Net financial expenses af	**-3,724**	**-6,619**	**-27,770**	**-64,477**	**-45,759**	**-58,175**	**-29,327**	**-42,041**	**-96,265**	**-82,725**	**-135,119**	**-16,446**
Net profit/loss for the pe	**9,788**	**26,435**	**3,396**	**-1,534**	**47,018**	**21,325**	**8,370**	**58,969**	**-22,950**	**5,525**	**11,186**	**76,760**

Appendix 11. Quarterly balance sheets – reformulated

End of Period	Q4 2013	Q1 2014	Q2 2014	Q3 2014	Q4 2014	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
NOK 1000													
Non current operating assets													
Property, plant and equipment – in solar projects	1,857,294	2,221,363	2,550,882	2,611,051	3,049,193	3,888,301	4,935,952	5,240,486	5,196,298	5,468,194	5,807,401	5,794,317	5,059,802
Property, plant and equipment – other	8,715	8,917	10,189	10,199	13,231	13,340	18,460	18,627	19,891	19,085	20,282	19,187	21,465
Capitalized operational lease	0	99,806	99,806	99,806	99,806	76,274	76,274	76,274	76,274	0	0	0	0
Total adjusted PPE	1,866,009	2,330,086	2,660,877	2,721,056	3,162,230	3,977,915	5,030,686	5,335,387	5,292,463	5,487,279	5,827,683	5,813,504	5,081,267
Deferred tax assets	313,644	332,915	359,886	363,621	402,011	400,029	368,668	357,172	340,670	348,752	361,617	375,430	327,456
Goodwill	20,566	20,252	20,616	19,918	22,169	21,350	21,564	23,364	23,595	23,094	22,815	22,044	22,289
Other non-current assets	31,397	62,985	70,452	129,652	214,401	209,411	245,189	251,956	136,543	139,558	137,203	126,352	141,789
Investments in associated companies	6,321	6,130	17,251	18,414	25,841	55,708	55,218	0	0	0	0	0	0
Total non-current operating assets	**2,237,937**	**2,752,368**	**3,129,082**	**3,252,661**	**3,826,652**	**4,664,413**	**5,721,325**	**5,967,879**	**5,793,271**	**5,998,683**	**6,349,318**	**6,337,330**	**5,572,801**
Current operating assets													
Trade and other receivables	25,472	21,830	58,818	84,747	126,122	157,102	117,043	126,482	221,382	191,690	182,433	222,934	231,484
Other current assets	105,237	150,624	97,205	105,358	82,897	94,965	121,850	115,260	251,892	273,064	156,846	99,435	114,104
Total current operating assets	**130,709**	**172,454**	**156,023**	**190,105**	**209,019**	**252,067**	**238,893**	**241,742**	**473,274**	**464,754**	**339,279**	**322,369**	**345,588**
Non-interest bearing debt													
Deferred tax liabilities	80,894	84,478	96,875	92,490	82,640	74,467	81,516	75,809	203,436	170,651	180,011	176,299	127,508
Trade and other payables	441,811	446,122	354,503	71,073	69,947	407,512	415,552	232,167	154,154	22,245	39,898	20,002	29,346
Income tax payable	91,881	92,858	87,545	92,306	41,543	50,018	9,351	10,313	23,508	6,907	4,590	6,951	10,680
Other current liabilities	92,834	112,975	203,688	125,334	145,717	136,056	156,493	204,371	192,936	373,532	381,815	345,015	183,166
Total non-interest bearing debt	**707,420**	**736,433**	**742,611**	**381,203**	**339,847**	**668,053**	**662,912**	**522,660**	**574,034**	**573,335**	**606,314**	**548,267**	**350,700**
Invested capital	**1,661,226**	**2,188,389**	**2,542,494**	**3,061,563**	**3,695,824**	**4,248,427**	**5,297,306**	**5,686,961**	**5,692,511**	**5,890,102**	**6,082,283**	**6,111,432**	**5,567,689**

End of Period	Q4 2013	Q1 2014	Q2 2014	Q3 2014	Q4 2014	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
NOK 1000													
Equity													
Total equity	**398,616**	**495,986**	**465,752**	**560,364**	**1,176,582**	**1,309,666**	**1,415,931**	**1,430,160**	**1,425,397**	**1,287,269**	**1,158,978**	**1,158,702**	**1,312,739**
Interest bearing debt													
Non-recourse project financing	2,376,968	2,381,379	2,494,347	2,974,602	3,337,265	3,823,208	4,563,663	4,846,732	5,060,328	4,677,331	4,681,875	4,579,937	4,304,098
Bonds	0	0	0	0	0	0	0	0	492,917	493,542	494,167	494,792	495,417
Financial liabilities	0	496	4,650	4,131	14,886	23,374	0	0	0	12,231	3,848	12,773	7,330
Other non-current liabilities	3,608	41	42	40	4,646	91,283	92,614	95,995	253,399	418,309	460,633	418,902	318,798
Non-recourse project financing	21,572	269,417	447,825	77,550	112,786	195,887	127,521	207,087	171,364	256,218	221,888	302,769	279,473
Financial liabilities	16,298	12,669	18,100	65,183	25,773	30,054	74,485	102,316	6,184	7,354	5,436	21,195	6,584
Capitalized operational lease	0	99806.093	99806.093	99806.093	99806.093	76273.987	76273.987	76273.987	76273.987	0	0	0	0
Total interest bearing debt	**2,418,446**	**2,763,808**	**3,064,770**	**3,221,312**	**3,595,162**	**4,240,080**	**4,934,557**	**5,328,404**	**6,060,466**	**5,864,985**	**5,867,847**	**5,830,368**	**5,411,700**
Interest bearing assets													
Financial assets	79,921	93,822	50,803	48,662	23,868	7,204	50,483	44,447	126,810	44,529	32,578	7,513	18,237
Financial assets	50,552	6,292	17,895	5,353	2,946	42	160	87	1,086	472	3,788	1,322	1,289
Cash and cash equivalents	1,025,362	971,292	919,329	666,098	1,049,106	1,294,072	1,002,539	963,022	1,639,029	1,217,151	908,176	868,803	1,137,224
Non-current assets held for sale	0	0	0	0	0	0	0	64,047	26,427	0	0	0	0
Total interest bearing assets	**1,155,835**	**1,071,406**	**988,027**	**720,113**	**1,075,920**	**1,301,318**	**1,053,182**	**1,071,603**	**1,793,352**	**1,262,152**	**944,542**	**877,638**	**1,156,750**
Net interest bearing debt	**1,262,611**	**1,692,402**	**2,076,743**	**2,501,199**	**2,519,242**	**2,938,762**	**3,881,375**	**4,256,801**	**4,267,114**	**4,602,833**	**4,923,305**	**4,952,730**	**4,254,950**
Invsted capital	**1,661,227**	**2,188,388**	**2,542,495**	**3,061,563**	**3,695,824**	**4,248,428**	**5,297,306**	**5,686,961**	**5,692,511**	**5,890,102**	**6,082,283**	**6,111,432**	**5,567,689**

Appendix 12. Quarterly production MWh

	Capacity	ownership	Q3'13	Q4'13	Q1'14	Q2'14	Q3'14	Q4'14	Q1'15	Q2'15	Q3'15	Q4'15	Q1'16	Q2'16	Q3'16	Q4'16
Czech portfolio	20	100%	8,057	2,634	3,701	8,130	7,045	1,810	3,628	8,257	7,962	2,517	3,077	7,965	8,128	2,157
Kalkbult	75	39%	1,588	42,051	38,240	35,341	36,453	40,494	38,708	33,172	32,436	39,472	37,143	31,963	36,392	40,030
Dreunberg	75	39%	0	0	0	0	9,610	39,570	46,052	28,719	31,028	51,909	44,209	28,849	35,050	52,158
Linde	40	39%	0	0	0	867	19,024	28,523	25,943	16,341	16,424	28,846	25,327	15,749	19,201	28,170
ASYV	9	43%	0	0	0	0	1,604	3,415	3,534	3,197	3,878	3,208	3,338	3,522	3,964	3,345
Agua Fria	60	40%	0	0	0	0	0	0	0	0	15,424	25,623	26,438	24,591	25,847	24,072
Utah Red Hills	104	100%	0	0	0	0	0	0	0	0	0	0	42,668	64,240	65,451	35,685
Jordan	43	59%	0	0	0	0	0	0	0	0	0	0	0	5,852	27,487	18,752
MWh produced	426		9,645	44,686	41,941	44,338	73,736	113,812	117,865	89,686	107,152	151,575	182,200	182,731	221,521	204,369
- net to SSO	252		8,677	19,034	18,997	22,251	33,119	45,627	48,322	40,110	46,954	61.034	99.36	118.681	137.569	107.089

Appendix 13. Example of the autoregressive calculation

T

Row Labels	2008	2009	2010	2011	2012	2013	2014	2015
ENGIE SA	0.7931271	0.8841115	0.9224402	0.94577145	0.969100787	1.1467242	0.9592099	0.9795904

T-1

Row Labels	2007	2008	2009	2010	2011	2012	2013	2014
ENGIE SA	1.3197933	0.7931271	0.8841115	0.92244024	0.945771445	0.9691008	1.1467242	0.9592099

x(T)-a

Row Labels	2008	2009	2010	2011	2012	2013	2014	2015
ENGIE SA	0.0023958	0.0933803	0.131709	0.15504017	0.178369508	0.3559929	0.1684786	0.1888591

(x(T-1)-a)*w

Row Labels	2007	2008	2009	2010	2011	2012	2013	2014
ENGIE SA	0.0121818	5.516E-05	0.0021501	0.00303263	0.003569841	0.004107	0.0081968	0.0038793

Residual = (x(t)-a) - (x(t-1)-a)*w

Row Labels	2008	2009	2010	2011	2012	2013	2014	2015
ENGIE SA	-0.009786	0.0933251	0.1295589	0.15200753	0.174799667	0.3518859	0.1602818	0.1849799

residual ^ 2

Row Labels	2008	2009	2010	2011	2012	2013	2014	2015
ENGIE SA	9.577E-05	0.0087096	0.0167855	0.02310629	0.030554924	0.1238237	0.0256902	0.0342175

a	w	SSR
0.791	0.023	= sum residual^2

Appendix 14. Revenue forecast power production

Nok 1000	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Czech Republic	104,175	106,258	108,383	110,551	112,762	115,017	117,317	119,664	122,057	124,498
Kalkbult	319,787	337,375	355,931	375,507	396,160	417,949	440,936	465,188	490,773	517,765
Linde	150,402	151,974	153,562	155,167	156,789	158,427	160,083	161,755	163,446	165,154
Dreunberg	279,755	282,524	285,321	288,146	290,999	293,879	296,789	299,727	302,694	305,691
Asyv	34,666	35,186	35,714	36,250	36,793	37,345	37,905	38,474	39,051	39,637
Agua Fria	130,973	132,938	134,932	136,956	139,010	141,095	143,212	145,360	147,540	149,753
Jordan	77,148	77,148	77,148	77,148	77,148	77,148	77,148	77,148	77,148	77,148
Baclog										
Segou		13,543	54,172	54,985	55,810	56,647	57,497	58,359	59,234	60,123
Mozambique		49,248	65,663	66,648	67,648	68,663	69,693	70,738	71,799	72,876
Malaysia		161,696	323,393	328,244	333,167	338,165	343,237	348,386	353,611	358,916
Brazil		61,560	246,238	249,932	253,681	257,486	261,348	265,268	269,247	273,286
Los Prados			87,004	88,309	89,634	90,978	92,343	93,728	95,134	96,561
Upington			423,529	428,188	432,898	437,660	442,474	447,342	452,262	457,237
Pipeline + opportunities				310,260	629,828	958,913	1,297,728	1,646,493	2,005,428	2,374,761
SUM	**1,096,906**	**1,409,450**	**2,350,991**	**2,706,290**	**3,072,326**	**3,449,372**	**3,837,710**	**4,237,629**	**4,649,427**	**5,073,407**

Appendix 15. NOPAT forecast power production

Nok 1000	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Czech Republic	36,461	37,190	37,934	38,693	39,467	36,341	32,256	32,156	32,694	33,330
Kalkbult	111,925	118,081	124,576	131,428	138,656	132,054	121,232	125,005	131,456	138,612
Linde	52,641	53,191	53,747	54,308	54,876	50,056	44,013	43,467	43,780	44,214
Dreunberg	97,914	98,883	99,862	100,851	101,849	92,854	81,600	80,542	81,078	81,837
Asyv	12,133	12,315	12,500	12,687	12,878	11,800	10,422	10,339	10,460	10,611
Agua Fria	45,841	46,528	47,226	47,935	48,654	44,580	39,375	39,061	39,519	40,091
Jordan	27,002	27,002	27,002	27,002	27,002	24,376	21,211	20,731	20,664	20,653
Baclog										
Segou	0	4,740	18,960	19,245	19,533	17,898	15,808	15,682	15,866	16,096
Mozambique	0	17,237	22,982	23,327	23,677	21,695	19,162	19,009	19,232	19,510
Malaysia	0	56,594	113,187	114,885	116,609	106,846	94,370	93,618	94,716	96,086
Brazil	0	21,546	86,183	87,476	88,788	81,355	71,856	71,283	72,119	73,162
Los Prados	0	0	30,451	30,908	31,372	28,745	25,389	25,187	25,482	25,851
Upington	0	0	148,235	149,866	151,514	138,282	121,655	120,209	121,140	122,408
Pipeline + opportunities	0	0	0	108,591	220,440	302,977	356,800	442,444	537,163	635,752
SUM	**383,917**	**493,308**	**822,847**	**947,202**	**1,075,314**	**1,089,858**	**1,055,149**	**1,138,731**	**1,245,370**	**1,358,211**

Appendix 16. Invested capital forecast power production

Nok 1000	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Czech Republic	416,698	425,032	361,277	368,503	375,873	239,903	225,365	221,301	210,178	214,382
Kalkbult	1,279,148	1,349,501	1,186,437	1,251,691	1,320,534	871,758	847,032	860,299	845,095	891,575
Linde	601,610	607,897	511,874	517,223	522,628	330,447	307,516	299,144	281,448	284,389
Dreunberg	1,119,019	1,130,097	951,071	960,486	969,995	612,974	570,127	554,303	521,230	526,390
Asyv	138,664	140,744	119,046	120,832	122,644	77,895	72,816	71,152	67,245	68,253
Agua Fria	523,893	531,751	449,773	456,519	463,367	294,297	275,108	268,823	254,059	257,870
Jordan	308,592	308,592	257,160	257,160	257,160	160,915	148,200	142,674	132,846	132,846
Baclog										
Segou	0	54,172	180,575	183,283	186,032	118,154	110,450	107,927	102,000	103,530
Mozambique	0	196,990	218,878	222,161	225,494	143,217	133,879	130,820	123,636	125,491
Malaysia	0	646,785	1,077,975	1,094,145	1,110,557	705,344	659,353	644,290	608,907	618,041
Brazil	0	246,238	820,793	833,105	845,602	537,064	502,046	490,576	463,635	470,589
Los Prados	0	0	290,014	294,364	298,779	189,763	177,389	173,337	163,818	166,275
Upington	0	0	1,411,765	1,427,294	1,442,994	912,872	849,987	827,295	778,781	787,347
Pipeline + opportunities	0	0	0	1,034,200	2,099,425	2,000,101	2,492,917	3,044,956	3,453,281	4,089,260
SUM	**4,387,624**	**5,637,800**	**7,836,638**	**9,020,967**	**10,241,086**	**7,194,705**	**7,372,184**	**7,836,897**	**8,006,159**	**8,736,239**

Appendix 17. EVA forecast power production

Nok 1000	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Czech Republic	833	850	7,045	7,186	7,330	15,829	12,987	13,235	14,723	15,000
Kalkbult	2,558	2,699	23,136	24,408	25,750	57,519	48,811	51,449	59,200	62,382
Linde	1,203	1,216	9,982	10,086	10,191	21,803	17,721	17,890	19,716	19,898
Dreunberg	2,238	2,260	18,546	18,729	18,915	40,444	32,854	33,149	36,513	36,831
Asyv	277	281	2,321	2,356	2,392	5,140	4,196	4,255	4,711	4,776
Agua Fria	1,048	1,064	8,771	8,902	9,036	19,418	15,853	16,077	17,797	18,043
Jordan	617	617	5,015	5,015	5,015	10,617	8,540	8,532	9,306	9,295
Baclog										
Segou	0	108	3,521	3,574	3,628	7,796	6,365	6,454	7,145	7,244
Mozambique	0	394	4,268	4,332	4,397	9,450	7,715	7,824	8,661	8,780
Malaysia	0	1,294	21,021	21,336	21,656	46,539	37,996	38,531	42,655	43,243
Brazil	0	492	16,005	16,246	16,489	35,436	28,931	29,338	32,478	32,926
Los Prados	0	0	5,655	5,740	5,826	12,521	10,222	10,366	11,476	11,634
Upington	0	0	27,529	27,832	28,138	60,232	48,981	49,475	54,555	55,090
Pipeline + opportunities	0	0	0	20,167	40,939	131,968	143,656	182,100	241,907	286,120
SUM	**8,775**	**11,276**	**152,814**	**175,909**	**199,701**	**474,711**	**424,827**	**468,676**	**560,843**	**611,263**

Appendix 18. Present value forecast power production

Nok 1000	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Czech Republic	768	721	5,508	5,176	4,863	9,675	7,313	6,866	7,036	123,593
Kalkbult	2,357	2,291	18,088	17,580	17,086	35,159	27,486	26,689	28,291	514,002
Linde	1,108	1,032	7,804	7,264	6,762	13,327	9,979	9,280	9,422	163,953
Dreunberg	2,062	1,918	14,500	13,490	12,550	24,722	18,500	17,196	17,449	303,469
Asyv	255	239	1,815	1,697	1,587	3,142	2,363	2,207	2,251	39,349
Agua Fria	965	903	6,857	6,412	5,995	11,869	8,927	8,340	8,505	148,665
Jordan	569	524	3,921	3,612	3,327	6,490	4,809	4,426	4,447	76,587
Baclog										
Segou	0	92	2,753	2,574	2,407	4,765	3,584	3,348	3,415	59,686
Mozambique	0	334	3,337	3,120	2,918	5,776	4,344	4,058	4,139	72,347
Malaysia	0	1,098	16,434	15,367	14,369	28,447	21,396	19,988	20,384	356,307
Brazil	0	418	12,514	11,701	10,941	21,660	16,291	15,219	15,521	271,300
Los Prados	0	0	4,421	4,134	3,866	7,653	5,756	5,378	5,484	95,859
Upington	0	0	21,523	20,046	18,670	36,817	27,582	25,666	26,071	453,914
Pipeline + opportunities	0	0	0	14,525	27,164	80,666	80,894	94,465	115,606	2,357,500
SUM	**8,084**	**9,569**	**119,474**	**126,698**	**132,505**	**290,169**	**239,223**	**243,128**	**268,023**	**5,036,529**

Appendix 19. Segment's share of total EV

Current projects	EV	/1000	Share of EV
Czech Republic	588,217	588.2	8%
Kalkbult	767,589	767.6	11%
Linde	324,301	324.3	5%
Dreunberg	602,501	602.5	9%
Asyv	83,235	83.2	1%
Agua Fria	292,532	292.5	4%
Jordan	246,209	246.2	4%
Segou	41,312	41.3	1%
Mozambique	52,696	52.7	1%
Malaysia	241,957	242.0	3%
Brazil	262,895	262.9	4%
Los Prados	66,276	66.3	1%
Upington	264,721	264.7	4%
Pipeline + opportunities	1,523,950	1,524.0	22%
O&M	618,921	618.9	9%
D&C	1,024,774	1,024.8	15%
Total EV	7,002,088	7,002.1	100%
NIBD	-2,340,223	-2,340.2	
Equity	4,661,865	4,661.9	

Appendix 20. Canadian Solar key financials

	Q4 2016	Q3 2016	Q2 2016	Q1 2016	Q4 2015	Q3 2015	Q2 2015	Q1 2015	Q4 2014	Q3 2014	Q2 2014	Q1 2014	Q4 2013
Revenues	668	657	806	721	1,120	850	637	861	956	914	624	466	
net income	-13	16	40	23	62	30	18	61	76	104	56	4	
NOPAT	-30	27	28	26	71	35	28	60	85	119	59	9	
NIBD	1,336	1,493	1,549	1,402	1,508	849	450	165	494	256	451	367	787
Equity	899	938	930	908	833	779	797	754	732	666	573	516	412
Invested Capital	2,235	2,432	2,479	2,309	2,341	1,628	1,247	919	1,226	922	1,024	884	1,199
financial leverage	1.49	1.59	1.67	1.54	1.81	1.09	0.57	0.22	0.67	0.39	0.79	0.71	1.91
PM	-4.54%	4.10%	3.46%	3.64%	6.31%	4.16%	4.45%	6.93%	8.91%	12.96%	9.44%	1.86%	
TO	0.29x	0.27x	0.34x	0.31x	0.56x	0.59x	0.59x	0.80x	0.89x	0.94x	0.65x	0.45x	
ROIC	-1.30%	1.10%	1.16%	1.13%	3.56%	2.46%	2.61%	5.56%	7.94%	12.18%	6.18%	0.83%	
ROE	-1.48%	1.66%	4.34%	2.49%	7.48%	3.90%	2.24%	8.13%	10.35%	15.66%	9.73%	0.73%	

Appendix 21. Abengoa Solar key financials

	Q4 2016	Q3 2016	Q2 2016	Q1 2016	Q4 2015	Q3 2015	Q2 2015	Q1 2015	Q4 2014	Q3 2014	Q2 2014	Q1 2014	Q4 2013
Revenues			496.3	719.0	883.0	1,482.1	1,831.6	1,558.8	1,913.6	1,831.5	1,821.5	1,541.6	
net income			-3,349.0	-340.0	-1,019.6	-266.0	41.0	31.2	25.3	31.2	35.8	32.6	
NOPAT			-1,884.5	6.1	-970.2	5.6	2,023.2	452.5	181.2	974.7	-555.1	176.6	
NIBD			8032.58	8512	7387.14	6769.31	7324.58	7252.18	6743.59	9752	10274.3	9040	7950.05
Equity			-2910.8	214	598.714	2616.11	3603.12	3031.57	2792.86	2724	2663.64	1864	2267.35
Invested capital			5121.77	8726	7985.85	9385.43	10927.7	10283.8	9536.45	12476	12937.9	10904	10217.4
financial leverage			-2.8	20.0	12.3	2.6	2.0	2.4	2.4	3.6	3.9	4.8	3.5
PM				0.9%	-109.9%	0.4%	110.5%	29.0%	9.5%	53.2%	-30.5%	11.5%	
TO				0.09x	0.10x	0.15x	0.17x	0.16x	0.17x	0.14x	0.15x	0.15x	
ROIC			0.00%	0.07%	-11.17%	0.05%	19.08%	4.57%	1.65%	7.67%	-4.66%	1.67%	
ROE			115.1%	-158.9%	-170.3%	-10.17%	1.14%	1.03%	0.91%	1.15%	1.34%	1.75%	

Appendix 22. First Solar key financials

	Q4 2016	Q3 2016	Q2 2016	Q1 2016	Q4 2015	Q3 2015	Q2 2015	Q1 2015	Q4 2014	Q3 2014	Q2 2014	Q1 2014	Q4 2013
Revenues	480	688	934	848	942	1,271	896	469	1,008	890	544	950	
net income	-696	154	13	171	164	349	94	-61	193	90	5	112	
NOPAT	-40	143	25	137	170	351	97	-77	189	83	4	111	
NIBD	-1,468	-1,111	-1,205	-1,398	-1,418	-1,301	-1,231	-1,029	-1,609	-568	-803	-808	-992
Equity	5,213	5,946	5,805	5,739	5,548	5,389	5,041	4,987	4,991	4,793	4,668	4,633	4,419
Invested capital	3,744	4,835	4,599	4,341	4,130	4,088	3,811	3,958	3,382	4,225	3,865	3,825	3,428
financial leverage	-0.3	-0.2	-0.2	-0.2	-0.3	-0.2	-0.2	-0.2	-0.3	-0.1	-0.2	-0.2	-0.2
PM	-8.23%	20.85%	2.66%	16.18%	18.02%	27.64%	10.80%	-16.42%	18.73%	9.32%	0.76%	11.70%	
TO	0.11x	0.15x	0.21x	0.20x	0.23x	0.32x	0.23x	0.13x	0.26x	0.22x	0.14x	0.26x	
ROIC	-0.92%	3.04%	0.56%	3.24%	4.13%	8.90%	2.49%	-2.10%	4.96%	2.05%	0.11%	3.06%	
ROE	-0.76%	2.41%	0.43%	2.39%	3.06%	6.52%	1.92%	-1.54%	3.78%	1.73%	0.09%	2.40%	

Appendix 23. Etrion Corporation key financials

	Q4 2016	Q3 2016	Q2 2016	Q1 2016	Q4 2015	Q3 2015	Q2 2015	Q1 2015	Q4 2014	Q3 2014	Q2 2014	Q1 2014	Q4 2013
Net Sales or Revenues		17	17	10	7	16	17	10	6	17	18	8	
net income		-61	2	-8	-1	-3	-9	-2	-8	1	-1	-8	
NOPAT		7	3	-1	0	4	7	0	0	3	-16	-1	
NIBD		544	500	484	501	491	486	450	489	380	351	335	376
Equity		-51	37	36	6	46	51	61	33	71	69	69	-11
Invested capital		493	537	519	508	537	537	511	522	451	419	404	365
financial leverage			13.4	6.0	20.0	10.6	9.6	7.4	14.8	5.4	5.1	4.9	-33.2
PM		38.12%	15.53%	-14.55%	-5.78%	28.21%	40.18%	-0.61%	-0.19%	16.62%	-87.43%	-13.89%	
TO		0.03x	0.03x	0.02x	0.01x	0.03x	0.03x	0.02x	0.01x	0.04x	0.04x	0.02x	
ROIC		1.27%	0.49%	-0.28%	-0.08%	0.84%	1.31%	-0.01%	0.00%	0.65%	-3.77%	-0.30%	
ROE		-12.87%	6.90%	-4.05%	-6.40%	9.66%	13.51%	-0.10%	-0.04%	4.02%	-22.61%	-1.69%	

Appendix 24. Peers average financials, input for profitability

	Q4 2016	Q3 2016	Q2 2016	Q1 2016	Q4 2015	Q3 2015	Q2 2015	Q1 2015	Q4 2014	Q3 2014	Q2 2014	Q1 2014
Financial leverage	2.56	2.39	2.30	4.40	2.46	2.98	3.50	8.47	6.83	3.02	2.70	2.50
NBC	1.86%	3.75%	1.66%	0.43%	2.01%	2.51%	7.49%	7.14%	9.96%	2.99%	0.35%	2.29%
PM	-6.39%	21.02%	7.21%	1.53%	-22.83%	15.09%	41.47%	4.73%	9.23%	23.03%	-26.93%	2.78%
TO	0.20x	0.15x	0.19x	0.15x	0.23x	0.27x	0.26x	0.28x	0.34x	0.34x	0.25x	0.22x
ROIC	-1.11%	1.80%	0.55%	1.04%	-0.89%	3.06%	6.37%	2.00%	3.64%	5.64%	-0.54%	1.32%
ROE	0.80%	-2.86%	5.64%	3.75%	1.88%	4.70%	2.48%	-41.54%	-39.51%	31.68%	-2.93%	-1.12%

Appendix 25. Example of the autoregressive model calculation.

T

Row Labels	2008	2009	2010	2011	2012	2013	2014	2015
ENGIE SA	0.7931271	0.8841115	0.9224402	0.94577145	0.969100787	1.1467242	0.9592099	0.9795904

T-1

Row Labels	2007	2008	2009	2010	2011	2012	2013	2014
ENGIE SA	1.3197933	0.7931271	0.8841115	0.92244024	0.945771445	0.9691008	1.1467242	0.9592099

x(T)-a

Row Labels	2008	2009	2010	2011	2012	2013	2014	2015
ENGIE SA	0.0023958	0.0933803	0.131709	0.15504017	0.178369508	0.3559929	0.1684786	0.1888591

(x(T-1)-a)*w

Row Labels	2007	2008	2009	2010	2011	2012	2013	2014
ENGIE SA	0.0121818	5.516E-05	0.0021501	0.00303263	0.003569841	0.004107	0.0081968	0.0038793

Residual = (x(t)-a) - (x(t-1)-a)*w

Row Labels	2008	2009	2010	2011	2012	2013	2014	2015
ENGIE SA	-0.009786	0.0933251	0.1295589	0.15200753	0.174799667	0.3518859	0.1602818	0.1849799

residual ^ 2

Row Labels	2008	2009	2010	2011	2012	2013	2014	2015
ENGIE SA	9.577E-05	0.0087096	0.0167855	0.02310629	0.030554924	0.1238237	0.0256902	0.0342175

a	w	SSR
	0.791	0.023 = sum residual^2

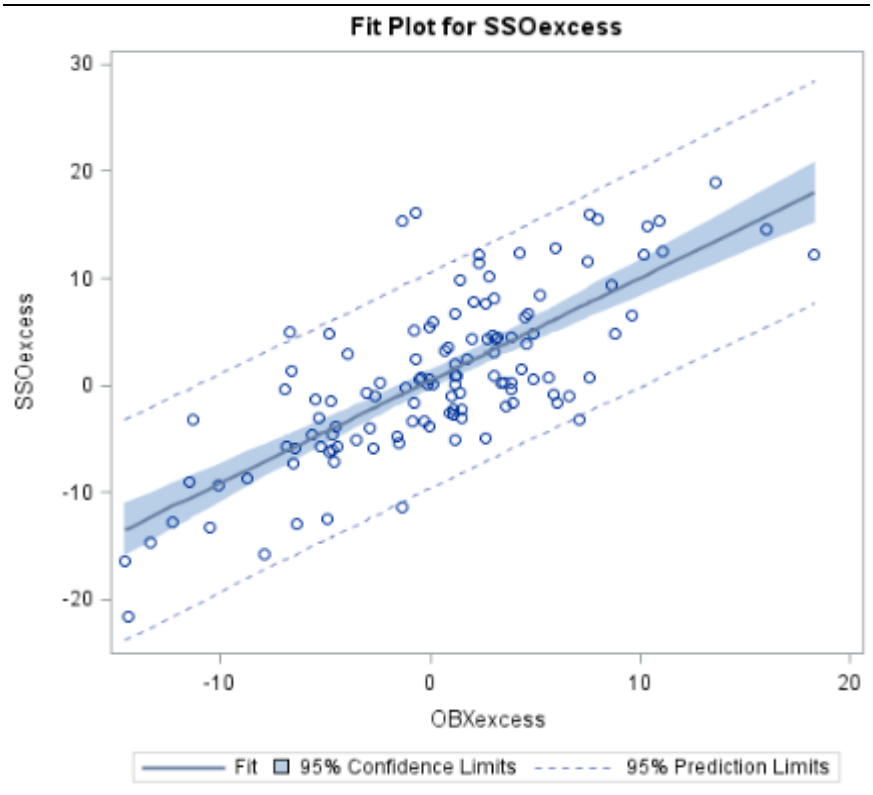
Appendix 26. South African inflation

2013	2014	2015	2016	2017	2018	2019	2020	2021
5.75%	6.07%	4.59%	6.40%	6.04%	5.50%	5.50%	5.50%	5.50%

Appendix 27. Table for cost of debt for small firms.

If interest coverage ratio is			
greater than	≤ to	Rating is	Spread is
-100000	0.499999	D2/D	14.00%
0.5	0.799999	C2/C	10.50%
0.8	1.249999	Ca2/CC	8.00%
1.25	1.499999	Caa/CCC	6.50%
1.5	1.999999	B3/B-	5.50%
2	2.499999	B2/B	4.50%
2.5	2.999999	B1/B+	3.75%
3	3.499999	Ba2/BB	3.00%
3.5	3.9999999	Ba1/BB+	2.50%
4	4.499999	Baa2/BBB	1.60%
4.5	5.999999	A3/A-	1.25%
6	7.499999	A2/A	1.10%
7.5	9.499999	A1/A+	1.00%
9.5	12.499999	Aa2/AA	0.80%
12.5	100000	Aaa/AAA	0.60%

Appendix 28. Beta calculations in SAS, SSO vs OSEBX.



Appendix 29. Correlation between SSO, S&P500, MSCI world, STOXX 600 Europe, OSEBX

Pearson Correlation Coefficients, N = 123 Prob > |r| under H0: Rho=0					
	S_P_500	MSCI_WORLD	STOXX_EUROPE	SCATEC_SOLAR	OBX
S_P_500 S&P 500	1.00000	0.87340 <.0001	0.37731 <.0001	0.19194 0.0334	0.86984 <.0001
MSCI_WORLD MSCI WORLD	0.87340 <.0001	1.00000	0.65303 <.0001	0.25465 0.0045	0.90281 <.0001
STOXX_EUROPE STOXX EUROPE	0.37731 <.0001	0.65303 <.0001	1.00000	0.68273 <.0001	0.58841 <.0001
SCATEC_SOLAR SCATEC SOLAR	0.19194 0.0334	0.25465 0.0045	0.68273 <.0001	1.00000	0.26801 0.0027
OBX OBX	0.86984 <.0001	0.90281 <.0001	0.58841 <.0001	0.26801 0.0027	1.00000

Appendix 30. Project portfolio financials 2016

NOK Million	Czech Republic	Kalkbult	Linde	Dreunberg	Asyv	Agua Fria	Jordan	Utah Red Hills	Segment overhead	Total segment
SSO shareholding	100%	39%	39%	39%	43%	40%	59%	100%		
Revenues	93.0	274.6	135.4	252.0	31.1	117.5	56.2	49.9	1.7	1011.4
OPEX	-9.3	-32.5	-16.7	-27.5	-6.0	-17.2	-8.0	-23.5	-16.7	-157.4
EBITDA	83.7	242.1	118.7	224.5	25.1	100.3	48.2	26.4	-15.0	854.0
Production	21,327	145,528	88,447	160,266	14,169	100,948	52,091			582,776
% of total ex utah	3.7%	25%	15%	28%	2%	17%	8.9%			100%
revenues per	0.00436	0.00189	0.00153	0.00157	0.00219	0.00116	0.00108		0.00168	
EBTIDA - margin	90%	88%	88%	89%	81%	85%	86%		-8.823529412	

Appendix 31. Project portfolio revenue forecast 2017.

NOK 1000	Czech Republic	Kalkbult	Linde	Dreunberg	Asyv	Agua Fria	Jordan	Segment overhead	Total segment
SSO shareholding	100%	39%	39%	39%	43%	40%	59%		
Production based on % of production 2016	23,421.1	159,817.7	97,131.8	176,002.9	15,560.3	110,860.3	71,507.4		640,000.0
Revenues based on estimates	102,131.9	301,563.6	148,695.2	276,744.4	34,153.8	129,037.6	77,148.0	1,800.6	1,071,275.0
Inflation adjustment	2.0%	6.0%	1.1%	1.1%	1.5%	1.5%	0.0%		
revenues after inflation	104,174.5	319,787.0	150,402.5	279,754.7	34,666.1	130,973.1	77,148.0	1,800.6	1,098,706.5

Appendix 32. Project portfolio revenue forecast 2018

Estimates 2018	Czech Republic	Kalkbult	Linde	Dreunberg	Asyv	Agua Fria	Jordan	Segou	Mozambique	Malaysia	Brazil	Overhead	Total segment
SSO shareholding	100%	39%	39%	39%	43%	40%	59%	50%	52.5%	49%	70%		
inflation adjustments	2.00%	5.50%	1.05%	0.99%	1.50%	1.50%	0.00%	0.00%	0.00%	0.00%	0.00%		
Revenues adjusted	106,257.99	337,375.32	151,974.19	282,524.24	35,186.07	132,937.73	77,148.00	13,543.09	49,247.61	161,696.31	61,559.51	2373.046548	1,411,823.10

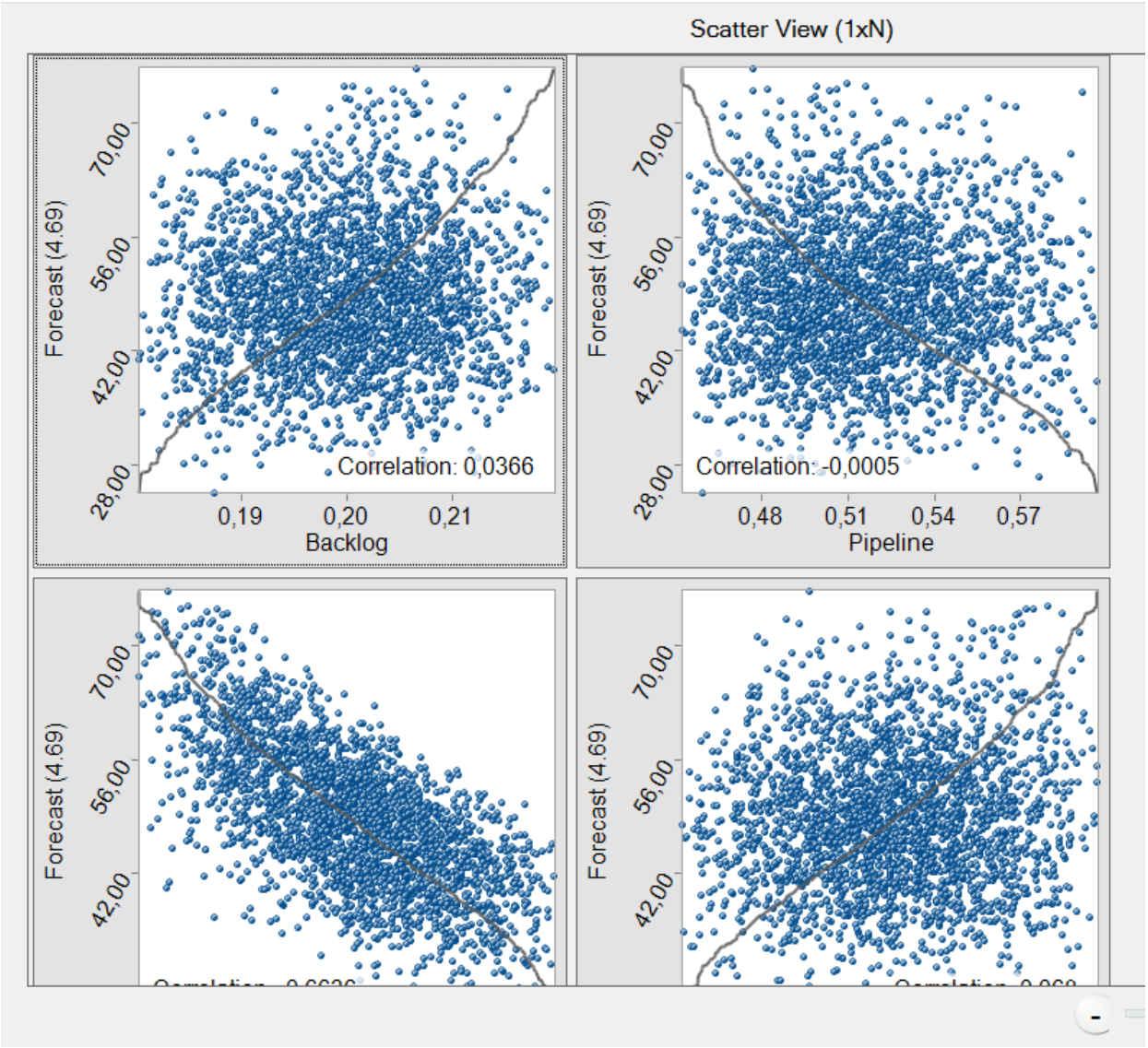
Appendix 33. Project portfolio revenue forecast 2019

Estimate 2019	Czech Republic	Kalkbult	Linde	Dreunberg	Asyv	Agua Fria	Jordan	Segou	Mozambique	Malaysia	Brazil	Los Prados	Upington	Overhead	Total segment
SSO shareholding	100.0%	39.0%	39.0%	39.0%	43.0%	40.0%	59.0%	50.0%	52.5%	49.0%	70.0%	50.0%	42.0%		
inflation adjusments	2.0%	5.5%	1.0%	1.0%	1.5%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
Revenues adjusted	108,383	355,931	153,562	285,321	35,714	134,932	77,148	54,172	65,663	323,393	246,238	87,004	423,529	3,958	2,354,950

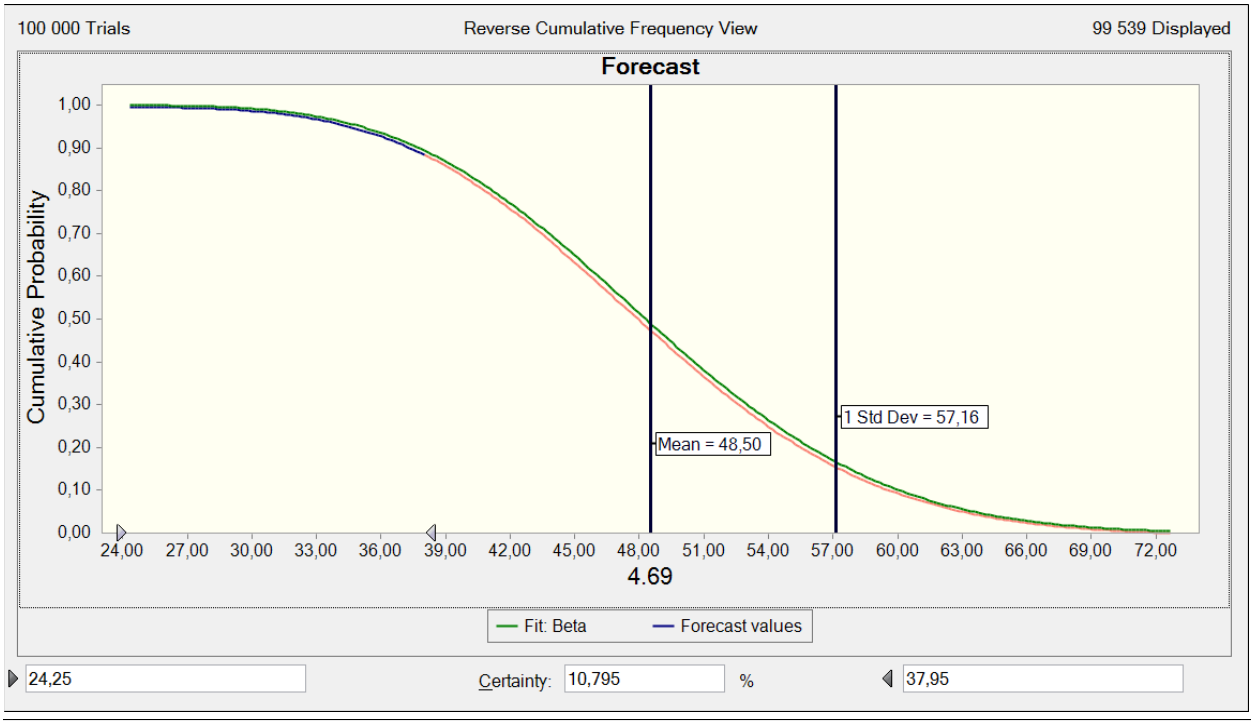
Appendix 34. Project portfolio revenue 2020

Estimate 2020	Czech Republic	Kalkbult	Linde	Dreunberg	Asyv	Agua Fria	Jordan	Segou	Mozambique	Malaysia	Brazil	Los Prados	Upington	Segment overhead	Total segment
SSO shareholding	100.0%	39.0%	39.0%	39.0%	43.0%	40.0%	59.0%	50.0%	52.5%	49.0%	70.0%	50.0%	42.0%		
inflation adjustments	2.0%	5.5%	1.0%	1.0%	1.5%	1.5%	0.0%	1.5%	1.5%	1.5%	1.5%	1.5%	1.1%		
revnues adjusted	110,551	375,507	155,167	288,146	36,250	136,956	77,148	54,985	66,648	328,244	249,932	88,309	428,188	4,034	2,400,064

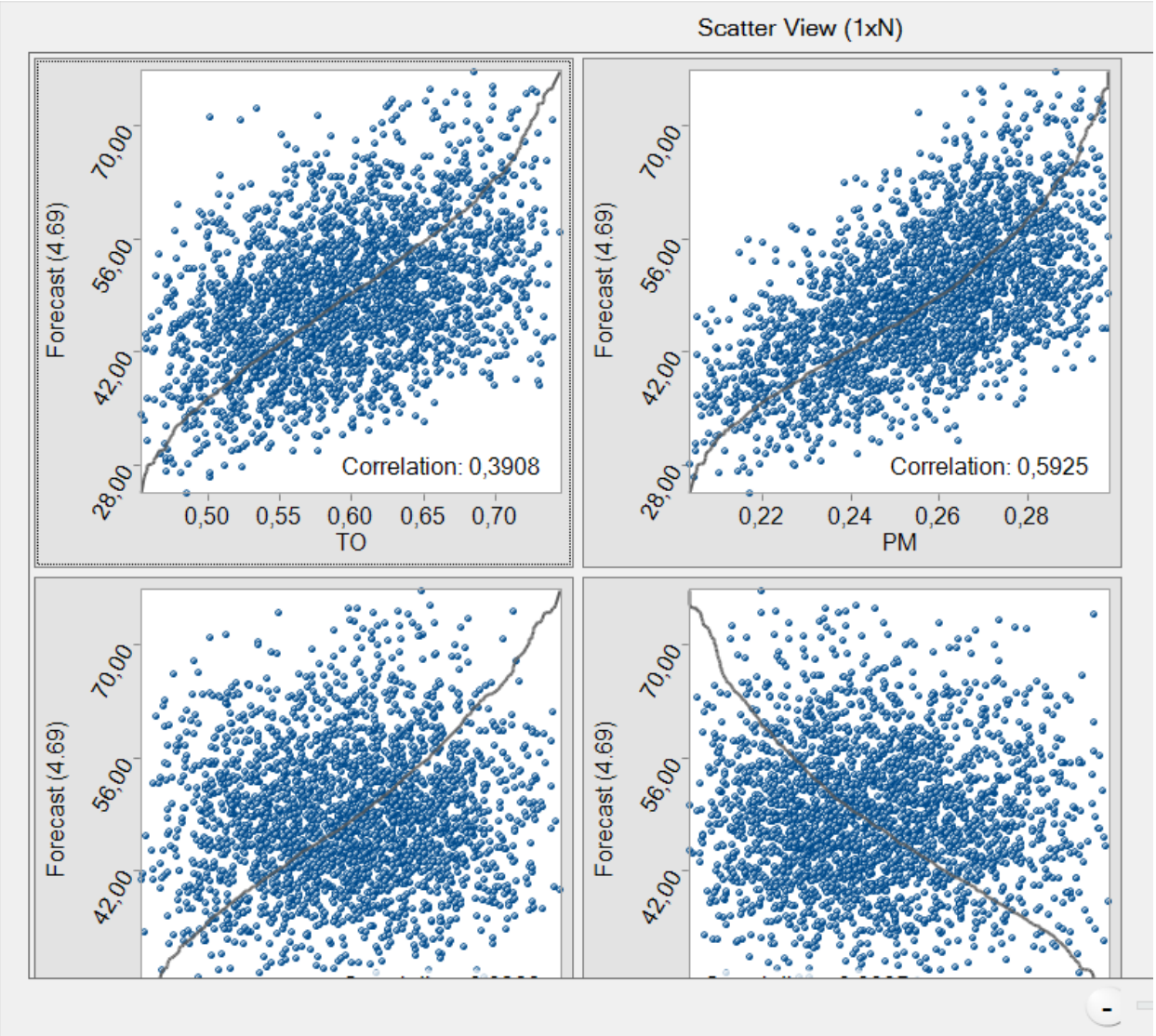
Appendix 35. Scatter plot of observations of backlog and pipeline



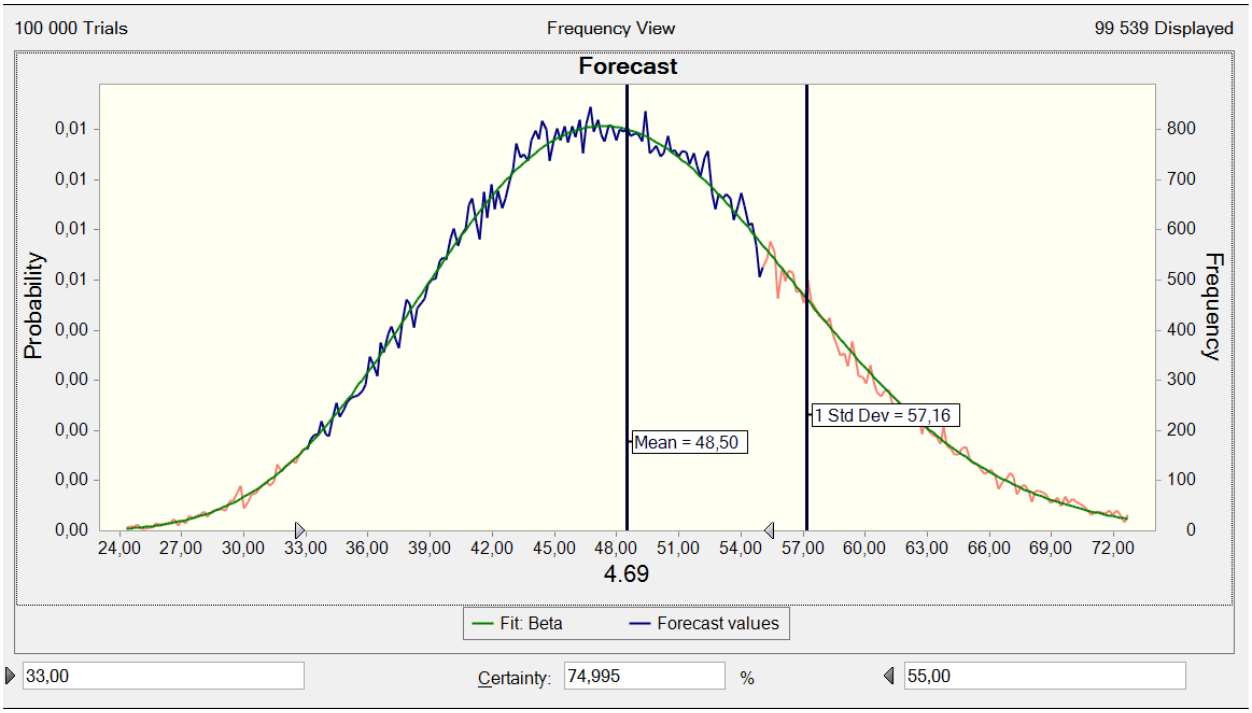
Appendix 36. Reverse cumulative probability of share price



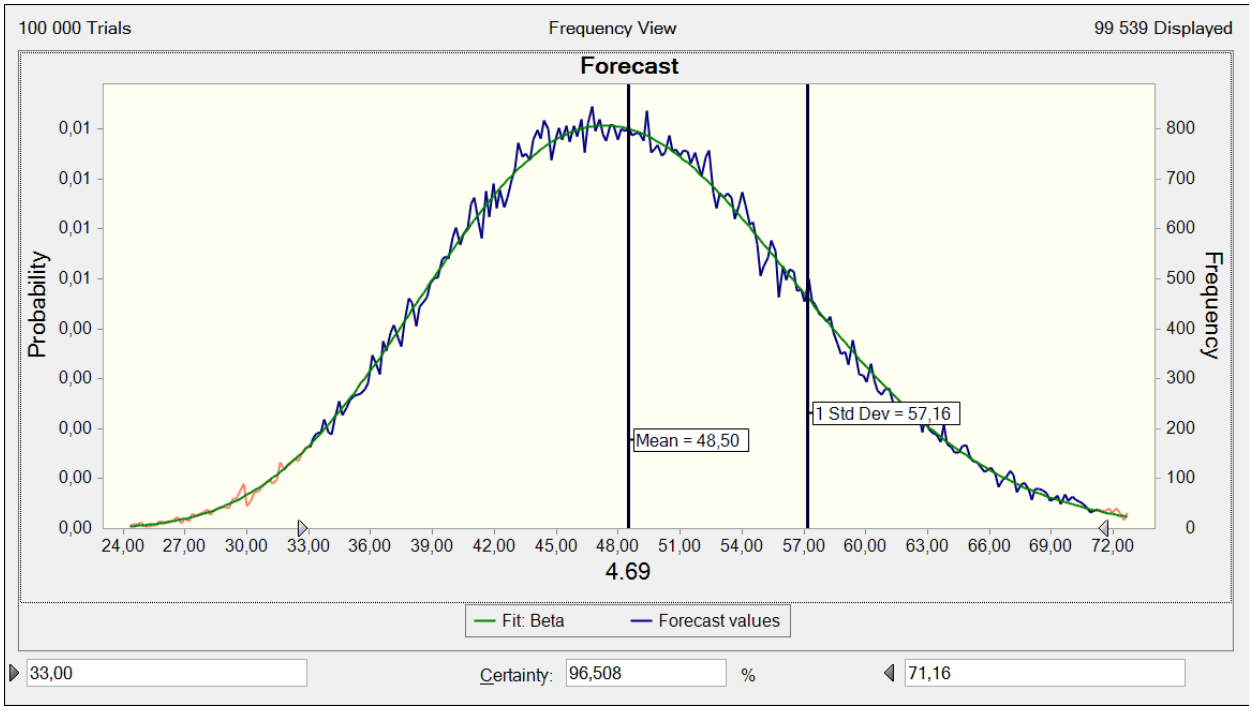
Appendix 37. Scatter plot of observations of turnover ratio and profit margin



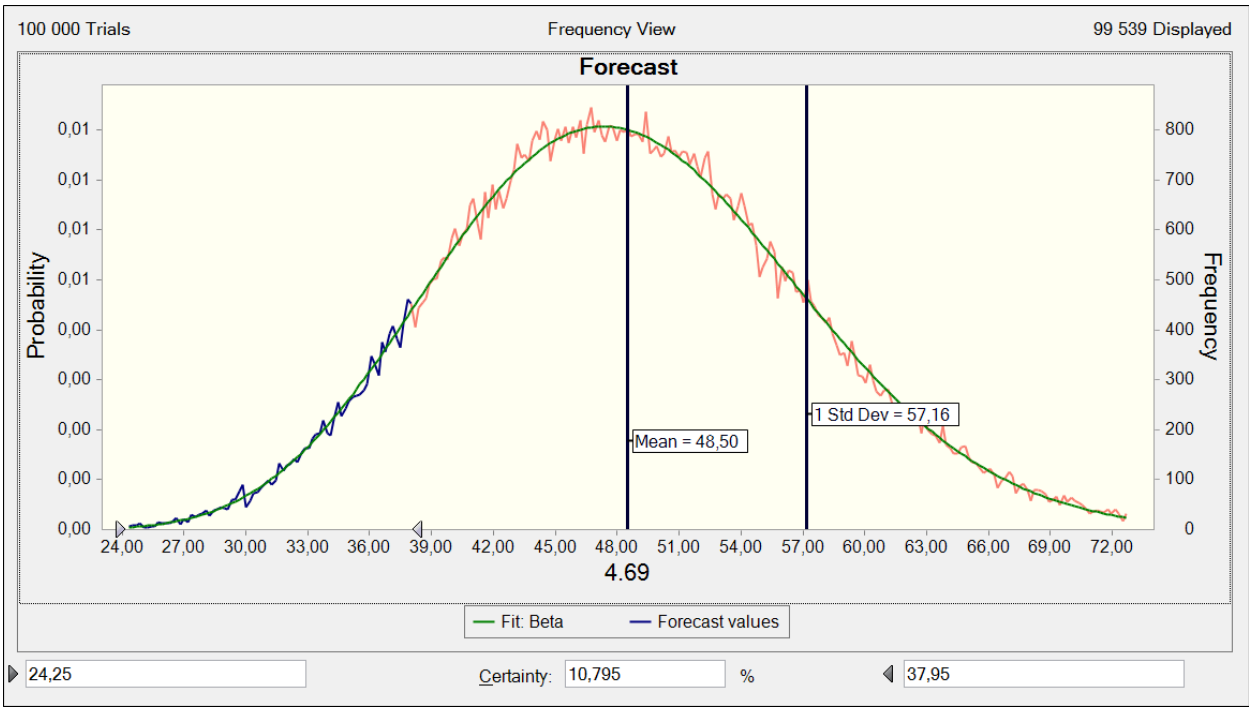
Appendix 38. Probability distribution of the share price



Appendix 39. Probability distribution of the share price



Appendix 40. Probability distribution of the share price



Appendix 41. Correlation able Monte Carlo

Assumptions	Contribution to Variance	Rank Correlation
WACC	46,3%	-0,66
PM	37,0%	0,59
TO	16,1%	0,39
Terminal growth	0,5%	0,07
Backlog	0,1%	0,04
Pipeline	0,0%	0,00