CATÓLICA LISBON
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Equity Valuation of SolarCity

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Abstract

In this research note, a valuation exercise of SolarCity – a solar panel manufacturer and supplier – is presented.

SolarCity is a recently created company (2006), whose aim is to lower the cost of solar panels in order to allow people to follow a "greener" source of energy.

This company was founded by Peter and Lyndon River, with the financial and marketing push given by their cousin, Elon Musk, when he participated in the first round of financing.

SolarCity only operates in some states of the USA, being fully vertically integrated it is present from the manufacture until the maintenance of the already installed solar systems, which renders a huge advantage in relation to its competitors.

In the valuation exercise the DCF model was applied along with the WACC discount rate, which seemed the most appropriate model to value the company given the available information and its capital structure. A relative valuation was then constructed, along with an EVA model in order to compare and validate the results obtained in the DCF. A target price of $36.50 per share was thus reached for SolarCity.

Subsequently, a comparison with a major investment bank research note was performed in order to compare the methodology used and the final target price - JP Morgan Research note, performed on the 23rd February 2016.

In the end, a **Hold** recommendation criterion for the stock was reached. This does not consider the stock to be undervalued, because of the industry where it operates and the good growth perspectives.

Abstract (versão portuguesa)

Neste *Equity Research* é feita uma avaliação da empresa *SolarCity*, um construtor e fornecedor de painéis solares.

A empresa tem como principal objetivo produzir e vender painéis solares a baixo preço para que as pessoas tenham um maior incentivo e possam mudar para uma fonte de energia mais "verde".

A área de atividade da empresa cinge-se a 16 estados dos Estados Unidos da América, operando em todos os sectores da cadeia de valor, sendo esta integração uma grande vantagem da empresa em comparação com a sua competição.

Nesta avaliação, foi escolhido o DCF com WACC como taxa de desconto para a avaliação, sendo o mais apropriado para avaliar esta empresa, tendo em conta a informação disponível e a estrutura de capital. Foi também construído uma *relative valuation* e um modelo EVA de forma a poder ser feita a comparação e validação dos resultados obtidos com o DCF. Feito tudo isto, o *target price* obtido para a SolarCity foi de $36.50 por ação.

Foi também realizada uma comparação com um relatório de um banco de investimento – JP Morgan (JP Morgan Research note realizado a 23 de Fevereiro de 2016) – de forma a se perceber se existe alguma semelhança nos resultados obtidos e quais as diferenças obtidas e uma justificação para as mesmas.

No final, a recomendação a que se chegou foi de **Hold,** não considerando no entanto que as ações da empresa estejam subvalorizadas, tendo em conta a indústria em que opera e as perspetivas de crescimento.

Acknowledgments

In this dissertation, I have applied all the knowledge I learned during my Masters degree at Católica. This experience was the most intense 18 months of my life, with constant learning and moments of pressure where I attempted to stand out while surpassing all the challenges in my path. This project is without a doubt, the most demanding but grateful one I have had the pleasure of enduring.

Firstly, I want to give a special thanks to my advisor, Prof. José Tudela Martins, who was the person with the most patience and was always available to have me in his office to clarify all my doubts, whether they be during lunch time or even working hours. I am sure that without his feedback and help I could not have done this work.

Secondly, I want to mention my family and friends, who gave me their knowledge and support in the most difficult moments. Thank you for distracting me in the right amount, so that I could progress without suffering any burnout. The review and feedback they gave to this thesis was an essential help. I am thankful for all of you and for your support in this last challenge of my Masters.

In the third place, I want to thank my colleagues, who were important during the late nights at Católica. Through clarifying doubts and discussing multiple options to get to the results, you helped me. By helping me work with the new terminals when we had to explore it all together , you helped me.

Index

Contents

Initiation Report

HOLD

SCTY, SCTY US

Price: $30.28

Price target Dec16: $36.50

Renewable energy;

Green energy;

Electrical Equipment

JP Morgan Valuation

Date: 23/02/2016

EV ($ m): 4,122

Equity ($ m): 3,004

Dec16 price target: $28.89

Recommendation: Neutral

Target prices	
DCF	**37**
EVA	38
EV/Sales	26
EV/EBITDA	43
JP Morgan	**29**

Historical performance of the stock

SolarCity – Investment note

Leader Solar installer in the American Market; Failed loan plan; Good growth perspectives: Initiation at HOLD; Price target: $36.50

SolarCity is a solar energy provider based in San Mateo, California. It was founded in 2006 by brothers Peter and Lyndon River and with the important collaboration of their philanthropic entrepreneur cousin, Elon Musk. SolarCity has the objective of turning our World into a "greener" place.

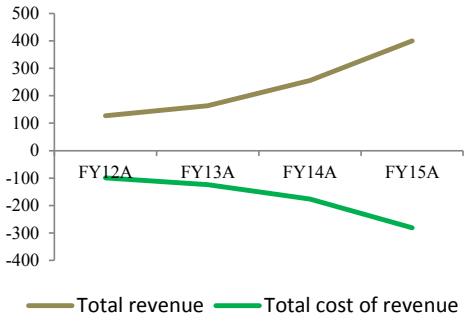
SolarCity has 3 types of deals available for its B2C customers, with personalized deals for their B2B market, allowing it to target a wide range of clients with different preferences and being the leading solar panel installer in the US Market.

From 2012, when the company had its IPO, until the present, it has been growing its customer base and consequently its financial results – with sales increasing 667% from FY12A to FY15A. The outperformance of the market has also been a frequent occurrence. However, the next years are going to be an important challenge for SolarCity, due vastly to the main events presented below in the analysis for the next years.

- **Growth of the industry.** According to the BMI report for the United States Renewable, the solar industry is expected to grow at an average annual rate of 7.3% until 2024, with an increased solar capacity generation of 38GW, against the 19GW registered in 2014. This allows us to anticipate a big opportunity for SolarCity in taking advantage of its lower cost/MW and consolidate its market leadership.

- **Evolution of SolarCity's cost per Watt.** Since 2012, the cost per Watt of SolarCity has already decreased $1.90, to $2.83, with the goal of $2.5 per Watt in 2017. This downward trend in the total cost of solar Watt, generates confidence in the future of the company.
- **Failure of the "MyPower" loan program.** In the beginning of this year the end of the MyPower Solar loan was announced. Firstly announced as "by far the best product out there" during its presentation on October 2014, this product turned out to be far from the expectations. The main question is if SolarCity is able to substitute this product by another or compensate with different conditions in the other loans offered. Until the end of the year the company is expected to unveil its new plans, however this initial failure is making investors nervous and hesitant about the future of the company.

Aside you can find the main drivers (Sales and CAPEX) of the model and the results obtained in the valuation exercise performed.



Currency: m $	FY16F	FY21F	FY25F	FY29F
Total revenue	504	1468	2946	4845
Total cost of revenue	-370	-344	-396	-651
Gross margin	**134**	**1124**	**2550**	**4194**

Sales

The historical performance of SolarCity has been of high growth of sales, with total revenue growing from $60m to $400m in 4 years. This is due to the innovative programs created by SolarCity, which lower the initial cost for the customer and allow monthly payments lower than with the National Grid Energy. For the forecasting periods the note takes into account the end of the MyPower program and the reduction on the ITC grant. However, the growth of the industry and the opportunities yet to be explored are kept in mind.

CAPEX

The CAPEX of the company is mainly composed by solar energy systems (leased and to be leased) which are the main activity of SolarCity. This CAPEX is necessary every year and has to grow in line with sales, since for the company to grow, it has to have sufficient assets to lease to customers.

Currency: m $	FY12A	FY13A	FY14A	FY15A
Solar energy systems	-449	-698	-1114	-1579
PPE	-4	-4	-53	-187
R&D	0	-2	-19	-65
Total CAPEX	**-453**	**-704**	**-1186**	**-1831**

The strategy followed in the forecasting periods was to keep the average weight of the historical CAPEX in sales, with a special treatment in the solar energy systems. In this case, this weight was being reduced every year due to economies of scale, better value chain and a decrease in the cost of solar energy systems due to incorporation of suppliers in the company. Please see **8. Capital Expenditures,** for a detailed analysis.

Currency: m $	FY16F	FY21F	FY25F	FY29F
Solar energy systems	-337	-1435	-1697	-1802
PPE	107	-88	-146	-136
R&D	-82	-165	-184	-303
Total CAPEX	**-312**	**-1688**	**-2026**	**-2241**

Choice of methods

The valuation exercise presented afterwards was constructed taking into account only the public information of the company. In order to reach a target price for SolarCity a DCF, EVA and relative valuation models were taken into account. Given the different assumptions, different results were obtained, as is possible to verify in this report.

WACC	
Market Risk Premium (Rm-Rf)	6%
Beta	2.16
Risk-free	2%
Cost of Equity	0.15
After-Tax Cost of Debt	6.60%
D/(D+E)	41%
WACC	**11.60%**

Given the different analysis performed and the risks and opportunities considered, a target price of $36.50 for SolarCity was reached.

Literature review

Valuation Approaches

Valuation is considered one of the most important financial outcomes amongst finance and business areas. For managers it is important to learn the basics and the concepts of valuation, while for financial advisors it is important to provide the best output to their clients and to generate profit from undervalued and overvalued companies. In fact, "rather than rely exclusively on finance specialists, managers want to know how to do it themselves" (Luehrman 1997), since in order to understand and to command the resource-allocation decisions, managers have to be aware of the value of the different assets they own or want to acquire (Luehrman, 1997). But in order to reach a fair value for a company or an asset, multiple ways (models) can be used.

The key answer that any person trying to choose the best model to apply has to bear in mind is that "every popular valuation approach is simply a different way of expressing the same underlying model" (Young et al., 1999). In other words, theoretically, for example, no difference should exist between a final value given by a Discounted Cash-Flow (DCF) model or an Economic Value Added (EVA) model, and it is possible to "get anywhere from anywhere" (Booth, 2007), although "there's no direct route or it is difficult to get there [to a model] from here [other model]" (Booth, 2007). The differences in the values obtained in different models are mostly related only with the different assumptions made.

It is possible to separate the valuation path in two: Equity valuation (direct method) or Firm Value valuation (indirect method). "Equity valuation approaches, estimate the value of a firm to equity holders, whereas enterprise value approaches value the whole enterprise, the equity and the debt" (Shrieves, R. and Wachowicz, J., 2001). In the former, the valuation is performed straight to the equity (direct method), while in the latest, the valuation is performed to the value of the firm as a whole, being the net debt subtracted in the end, in order to reach to the equity value of the firm (indirect method).

The choice between one model and the other will depend, as referred, on the tastes of the analyst performing the valuation, but most importantly on the asset or company being evaluated; its industry, its capital structure and its long-term perspectives. Despite the DCF with a Weighted-average cost of capital (WACC) discount rate being, in 1997, the most taught model in business

schools (Luehrman, 1997), some authors classify the Adjusted Present Value (APV) as the best model to use in valuation, mostly because it is "less prone to serious errors […] and it is exceptionally transparent" (Luehrman, 1997). However, with a target or optimal debt ratio "APV and CCF[1] add little, if anything, to a conventional WACC valuation" (Booth, 2007).

Since valuation is not an objective exercise (Damodaran, 2002), a ranking of the models cannot be applied, and there is no such thing as the "best model" (Booth, 2007).

Discounted Cash-Flows (DCF) Valuation

The DCF valuation "regards businesses as a series of risky cash flow stretching into the future […]" (Luehrman, 1997), discounting the forecasts to present value at the opportunity cost of funds. All of the ramifications of this model underlie behind the principle that future cash must be discounted at a rate which investors could get from investing in a product with the same risk associated.

In the 1970s, DCF emerged as "best practice for valuing corporate assets." (Luehrman, 1997), and despite of being constantly challenged with others supposed better and most efficient models, it has been and still is the most used model in Academia, mainly due to its easiness to explain and understand, since it is "the standard not because it performs best" (Luehrman, 1997). DCF relies in two propositions, according with Damodaran: i) the expected cash flows of the firm have to be positive sometime in the future, in order for that firm to have value; ii) a firm that generates cash flows earlier will have more value than a firm that generates the cash flows later in life (growth and higher cash flows later may influence this proposition). The formula shown below is the basis of the DCF valuation, and it is from this formula that other models or the DCF ramifications were created. It assumes the sum of all the discounted cash-flows of the firm to be equal to the value of the firm:

$$Value\ of\ the\ firm = \sum_{t=1}^{t=n} \frac{CFt}{(1+r)^t}$$

Where:

[1] Capital Cash Flow

CF_t is the Cash-Flow in period t

n is the length of life of the firm

r is the discount rate used (according to Luehrman, the standard DCF version uses the weighted-average cost of capital (WACC) as the discount rate).

The next section will be divided in the two different valuation paths previously mentioned, and a description of each model will be made.

Firm Valuation approach

Free Cash Flow to the Firm valuation (FCFF)

The Free Cash Flow to the Firm (FCFF) is constructed from the Earnings Before Income and Tax (EBIT) of the firm being evaluated, which can be obtained in the financial statements of the firm, being this one of the factors that makes this an easy model to compute. The FCFF is composed then by the earnings resulting from the company's operations after paying all its fixed asset needs (Capital Expenditure or CAPEX) and after the variations in the working capital, ignoring debt. The FCFF follows the formula below:

FCFF= EBIT x (1-T) + Depreciation – CAPEX – Net Working Capital

Where,

T=Corporate tax rate

According to Damodaran, this model discounts the residual cash flows mentioned above, at the weighted average cost of capital (WACC) – which is the cost of financing for the firm, according with the different sources of financing, weighted by their market value part. There are several formulas to reach the WACC of a specific company, the most common of which being:

$$WACC = K_e \, x \, \frac{E}{E+D} + \, K_d \, x \, (1-T) \, x \, \frac{D}{E+D}$$

Where,

K_e = cost of equity

K_d = Cost of debt

E= Market value of equity

D= Market value of debt

(1 - T) = captures the interest tax shield

WACC is not a commonly accepted discount rate amongst academia, as some argue that it only suits a static and simple capital structure (Luehrman, 1997), but due to its easiness to compute it has been one of the most used discount rates.

Before calculating the value of the firm, it is important to define a growth rate for the terminal value of the company, since this model considers the company to have an infinite life, being the terminal value computed as a perpetuity. This assumes the company has a stable growth rate, always lower than the GDP[2] of the economy in which it operates (Damodaran, 2006).

After this, it is possible to calculate the value of the firm, as shown below:

$$Value\ of\ the\ firm = \sum_{t=1}^{t=n} \frac{Free\ cash\ flow\ to\ the\ firm\ t}{(1+WACC)^t} + \frac{TV}{(1+WACC)^n}$$

Where,

$$WACC = ke\ x\ \frac{E}{E+D} + kd\ x\ \frac{D}{E+D}\ x\ (1-T)$$

TV = Terminal Value = $\frac{Cash\ flow\ to\ the\ firm\ n\ x\ (1+g)}{(WACC-g)}$

g = Terminal growth rate

After this computation to all the forecasting period of activity of the firm, the value of the firm is reached. In order to reach the Equity Value of the Firm, all the debt claims have to be subtracted.

[2] Gross Domestic Product

Adjusted Present Value (APV)

The APV model has similar objectives to the DCF with WACC, being essentially different in two aspects: i) the way of valuing the firm, considering it to be debt-free; ii) the discount rate used; but it follows the same process, also being used to value assets or firms that generate a stream of cash-flows in the future.

According to some authors, APV is a better version of DCF with WACC, working when WACC does and sometimes when it fails (Luehrman, 1997b). Luehrman continues saying that APV is better because it requires "fewer restrictive assumptions" and is "less prone to serious errors than WACC". Also, the APV not only analyzes how much the asset is worth but also from where the value originates (Luehrman, 1997b), which helps managers to understand its business.

The APV model derives from the teachings of Modigliani and Miller and it is the best model to use when the capital structure changes over the period analyzed (Koller et al., 2010), being less prone to misestimating the tax shields.

In this model, the valuation is divided in three stages:

1- Estimation of the value of the firm assuming it has no debt outstanding. This can be obtained by discounting the expected FCFF at the unlevered cost of equity[3]
2- Addition of the present value of interest tax shields obtained with the debt level of the company. If the tax shield is seen as a perpetuity, it follows the formula shown below:

$$Present\ Value\ of\ Tax\ Benefits = t\ x\ D$$

Where,

t= Firm's marginal tax rate (assumed constant along the period)

D= Market value of debt

[3] http://pages.stern.nyu.edu/~adamodar/New_Home_Page/valquestions/apv.htm

3- Subtraction of the bankruptcy costs, if the company fails to meet its obligations. This can be calculated by:

$$\text{PV of Expected Bankruptcy cost} = \text{Probability of Default x Bankruptcy cost}$$

The Probability of Default can be obtained by the bond ratings of the company's issued debt and its respective default rate.

In the end, putting together the three stages described above, one can reach the Enterprise Value of the firm being evaluated.

The difficult calculation of the probability of default and of the bankruptcy costs, especially in non-traded firms, is a big disadvantage of this model, despite of all the advantages previously mentioned. The APV model is also "the most difficult to implement" due to its non-linear variation with the capital structure and the fact that it is firm specific (Booth, 2007).

Capital Cash Flow Model (CCF)

Capital Cash Flow Model (CCF) is a model similar to FCFF, used to value risky Cash Flows, with the only difference relying in the calculation of the interest tax shields. The Cash flows in this model include "all of the cash available to capital providers, including the interest tax shields" (Ruback, 2000), as illustrated in the formula below:

$$Capital\ Cash\ Flow = Free\ Cash\ Flow + Interest\ tax\ shields$$

And due to this fact, the CCFs are discounted at a before-tax rate, such as the pre-tax Weighted Average Cost of Capital (pre-tax WACC), (Ruback, 2000), shown below:

$$Pre - tax\ WACC = \frac{D}{V}\ x\ K_d + \frac{E}{V} + K_e$$

In terms of advantages, (Ruback, 2000) refers the simplicity of the model when the capital structure of the firm changes over time, since the interest tax shields are considered already in the cash flows. Another advantage referred by the same author is the fact that there is no need to change the discount rate every time the capital structure changes, as in the DCF with WACC, since the "expected asset return depends on the riskiness of the asset and therefore does not

change when the capital structure changes", making the CCF easier to apply when there are changes in the level of debt or when there is a target specific amount of debt (Ruback, 2000).

Equity Valuation approach

Dividend Discount Model (DDM)

The Dividend Discount Model (DDM) is probably one of the most intuitive valuation models, since it relates the value of a company with the cash flows an investor gets when becoming a stockholder of the company, and it is considered by several authors as the "simplest model for valuing equity" (Damodaran, 2002). It follows the basic methodology of discounting all the dividends paid by a company to investors at a discount rate, in this case at the cost of equity (Ke), as shown in the formula presented below:

$$Value\ of\ the\ equity\ per\ share = \sum_{t=1}^{t=n} \frac{Expected\ dividend\ per\ share\ t}{(1+Ke)^t}$$

In order to obtain the value of expected dividends, assumptions about future payout ratios and expected future growth rates have to be made (Damodaran, 2002).

Versions of the model were developed in order to account for different growth expectations, since the same payment of dividends every year seems to be an unrealistic expectation. The main version of the model is the Gordon Growth model, which can be used to value a firm that has a stable growth rate in the future – *steady-state.*

The evolution of the dividend policy, which started as total payment four centuries ago, to "symbolic liquidation" (Frankfurter, G. and Wood, B., 1997) nowadays, is one of the main facts that justifies that this model is outdated.

Free Cash Flow to the Equity (FCFE)

This model assumes that dividends are the only cash flow received by investors from the company. According to Damodaran (2006), in this model, potential dividends are discounted instead of actual dividends, as for example in the Dividend Discount Model (DDM) described

before. The FCFE is represented below, and it is essentially the cash flow left after all the reinvestment needs and debt amortizations (Damodaran, 2006):

$$FCFE = NI - (CAPEX - depreciation) - (Changes\ in\ non\ cash\ WC) + (net\ debt\ issued - debt\ repayments)$$

Where,

NI = Net Income

WC = Working Capital

The difference in methodology from the FCFF, besides the calculation of the cash flows, is the discount rate used. Instead of the WACC – since it is only the equity being evaluated – one must consider the cost of equity (K_e) as the discount rate, the equity value of the company being:

$$Value\ of\ the\ equity = \sum_{t=1}^{t=n} \frac{Expected\ Free\ cash\ flow\ to\ the\ equity\ t}{(1+Ke)^t} + \frac{TV}{(1+Ke)^n}$$

Where,

TV = Terminal Value = $\frac{Expected\ Free\ Cash\ flow\ to\ the\ equity\ n\ x\ (1+g)}{(Ke-g)}$

Considering the Expected FCFE carries two assumptions: i) the firm does not accumulate cash, since all the cash after meeting the entire firm's needs is delivered to stockholders; and ii) the expected growth in income includes only growth in income from operating assets (Damodaran, 2006). This model presents several variations, depending on the type of business being evaluated, such as the Constant Growth FCFE or the Two-stage FCFE[4].

Relative Valuation

In a relative valuation exercise, the intrinsic value of a company is not analyzed, but instead its value is compared to the values assessed by the market for similar or comparable peers (Damodaran, 2005). The most used relative valuation is the multiples valuation and it is mostly

[4] See **Appendix 1 – Variations of FCFE models**, for a detailed explanation.

used as a complement to a more complete analysis, such as a DCF valuation or when a stand-alone "quick and dirty" valuation is needed (Liu et al., 2007). As referred by Liu et al. (2007), this type of valuation is as simple as the industry multiple times the value driver of the company being analyzed.

The first step to performing a multiples valuation is to define a peer group for the firm being evaluated. Although it may seem simple, it can be problematic to define a set of comparable firms. According to Damodaran (2006), a comparable firm should be one which is similar in terms of fundamentals and not only of the same sector since this may induce in errors. According to the previous author, "there is no reason why a firm cannot be compared with another firm in a very different business, if the two firms have the same risk, growth and cash flow characteristics".

Analyzing Goedhart et al. (2006), they mention investors' different expectations as a reason for the difference verified in companies belonging to the same industry. In order to have the right peer group, expectations for growth and ROIC should be matched with the analyzed company. The purpose of defining a peer group is not to find a set of exactly similar companies to the one being valued, since this will turn out to be impossible (Damodaran, 2006), but only to define a group of companies of similar characteristics and can serve as a base group for the performance of the valuation.

The second step is to gather the market values for the comparable firms according to the multiple valuations being performed – being the most common price or value, since this is the final objective. These market values should then be standardized, since "absolute prices cannot be compared" (Damodaran, 2006). This is achieved by using a standardization factor which is a common variable such as earnings, cash flows, book values or revenues. With this standardization, the multiples for the peer group are created.

The final step before running the valuation is composed by adjustments to the multiples of the companies selected as a peer group, with the objective of eliminating outliers (Damodaran, 2006). Goedhart et al. (2005), refer as an example a company with a lot of cash (excess cash), that has to be subtracted from EBITDA, in order to make a right multiples valuation. "A

properly executed multiples analysis can make financial forecasts more accurate" (Goedhart et al., 2005).

The economic value added (EVA) model

The Economic Value Added (EVA) is the most widely used "excess return model", i.e., a model that measures the additional value created when an investment is realized. According to Damodaran (2006), both EVA and DCF are similar, being possible to write the value of a firm valued with a DCF in EVA terms. With this, it is possible to observe that the EVA model should be viewed as an extra model to validate DCF model's results (a complement model) and not as an alternative. The formula to calculate the EVA is showed below:

$$EVA = (Return\ on\ capital\ invested - cost\ of\ capital)\ x\ (capital\ invested)$$

The EVA model is connected to the DCF, in the way showed below:

$$NPV = \sum_{t=1}^{t=n} \frac{EVAt}{(1+Ke)^t}$$

According to Damodaran (2006), in an EVA model the value of the firm can be written as the sum between three different components: the capital invested, the net present value of the assets in place and the sum of the net present value of future projects, thus the value of the firm calculated in EVA terms is:

$$Value\ of\ the\ firm = \ Capital\ invested_{aip} + \sum_{t=1}^{t=\infty} \frac{EVA_{t,aip}}{(1+Ke)^t} + \sum_{t=1}^{t=\infty} \frac{EVA_{t,future\ projects}}{(1+Ke)^t}$$

Where,

aip = assets in place

With this, it is possible to obtain the value of the firm using the EVA model, and using only three basic inputs: return on capital earned on investments, cost of capital for those investments and the capital invested in them (Damodaran, 2006). Despite of just being needed these 3 components, the number of adjustments that firms make to operating income and book capital is typically 19

(Weaver, 2001, referred in Damodaran, 2006), and since its only needed few inputs, it should be given special attention to the calculation of each one.

Business Overview

"We call this better energy"[5]

SolarCity is an American solar energy services provider, based in San Mateo, California. In 2006, the two brothers, Peter and Lyndon River had an idea to change the perception of solar energy in people's mind. Solar energy was already an available source of power, both to households and companies, but was not as implemented as it is nowadays.

The two founders of SolarCity were two of the main personalities responsible for this change in the past 10 years, by selling solar panels with no upfront cost, and with monthly installments cheaper than the energy sold by utility companies. Elon Musk, Tesla founder and cousin of the founders gave the motivation and financial push to the constitution of the company, being now the Chairman of SolarCity.

The vision of SolarCity is to transform the way energy is delivered nowadays, through cheaper, but cleaner distributed solar energy. This objective started to be drawn in 2008, with the first Solar Lease agreement, which considerably lowered the energy payments made by the customers.

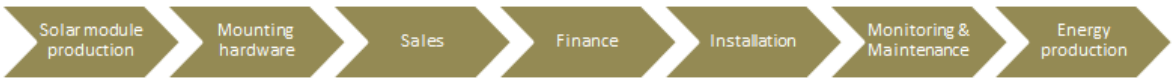
In 2012, SolarCity turned a public company being listed in the Nasdaq Composite index. Actually, the company has a total of 97.5M shares outstanding, having 63.8% of its capital in free float. Regarding ownership, the main shareholders of the company are Elon Musk with 22% of capital and Fidelity Management & Research Company with 12%[6].

In December 2013, SolarCity acquired Zep Solar, a designer and supplier of mounting solutions for photovoltaic panels, converging to the strategy of the company to be present in all the phases of construction, installation and maintenance of the solar panels. With this it lowers the energy production cost, thus lowering the electricity bill to the client, which is one of the main targets of SolarCity. Allied with this strategy, SolarCity made also the acquisition of Silevo, a designer and

[5] SolarCity slogan – Trademarked to SolarCity Corporation
[6] See **Appendix 2 – Shareholder structure**, to a more extensive list

manufacturer of high performance solar cells, in September 2014. With this acquisition, SolarCity achieved the total vertical integration, being the fourth to achieve this in the U.S[7].

Figure 1 – Vertical Integration of SolarCity



Source: SolarCity Investor Presentation – November 2015

In the third quarter of 2014, another milestone for the company was achieved, with the build-to-suit agreement made with the Research Foundation for the State University of New York, for the construction of a 1 million square foot manufacturing facility in Buffalo, New York. This facility, larger than Central Park, will have the capacity to produce at least 1GW of solar energy per year, expected to be fully operational in the beginning of 2017.

The company operates only in the U.S market, specifically in 15 different states and the District of Columbia.

Company's Model and Solar industry

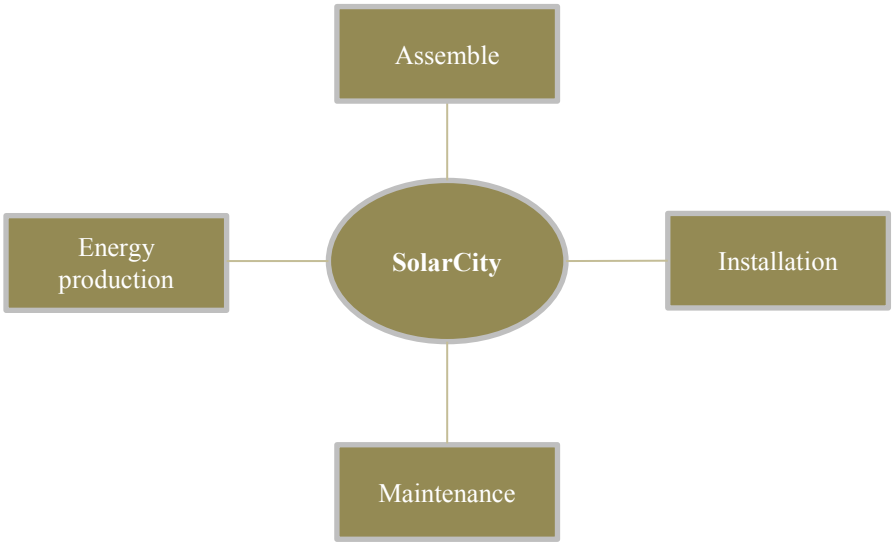
SolarCity has a particular way of operating, marking the main distinction from other solar panel companies. The sales' model of SolarCity is based on a strong sales and marketing activities, from door-to-door sales force to the solar ambassador program and its channel partner network. SolarCity bases a lot of its strategy in advertising and marketing, in order to be known in the industry as having a differentiated product, when compared to its competitors.

Amongst all the solar energy providers, the main competitors of SolarCity are: Vivint Solar Inc., Sungevity Inc., SunEdison LLC and Power Partners MasTec LLC.

The full integration renders SolarCity advantage in the way that the company controls the fixed and variable costs in all the stages, being able to have a better monitoring of its margins and to lower the electricity bill for its customers. Figure 2, illustrated next page shows the production chain of SolarCity.

[7] http://www.greentechmedia.com/articles/read/solarcity-just-acquired-silevo-and-became-a-solar-manufacturer

Figure 2- Production chain SolarCity



Source: Own analysis based on the shareholders management presentation of SolarCity

In 2008, SolarCity introduced the solar leasing program which allowed homeowners to have monthly payments much lower than what it was charged by utility companies to distribute energy, making solar energy more desirable.

Closing commercial contracts is also important for SolarCity, not only in terms of revenue but also as brand recognition. Walmart, eBay, Intel and the U.S. Military are some of the biggest clients of SolarCity. The already mentioned acquisitions turned possible to SolarCity to be present in all the stages of production and maintenance, allowing the vertical integration of the company.

What distinguish the strategy of SolarCity from the one of its competitors are the financing plans available to households, private firms and public entities. Actually, SolarCity offers to its customers, 3 types of deals (Solar Lease, Solar Power Purchase Agreements and Direct Purchase)[8], being able to target a wide range of clients with different preferences[9].

[8] MyPower loan plan was extinguished in the beginning of 2016.
[9] See **Appendix 3 – Basic types of deals offered by SolarCity** to more detail about each deal

It is important to note that in the first two contracts mentioned, the tax credit (30%) belongs to SolarCity, being the company able to monetize it, which is an important stream of revenues for renewable energy companies in the U.S.

An innovation introduced recently by SolarCity that can serve as a push to the sales of the company is the energy storage integration, resulting from a partnership with Tesla Motors, which will reduce the "intermittency" problem of solar energy (Tesla developed a battery to store solar energy).

Growth Opportunities

The fact that the company is present only in 16 American States gives a lot of opportunities to be explored. The first one is the expansion for the rest of the American States being this a top priority to the company, since North America is since the last years, trying to improve the clean energy usage with national programs and laws.

The second opportunity that arises is the residential American market. This opportunity is allied with the first one identified, and appears due to the low penetration rates analyzed and calculated by SolarCity in this segment. In figure 3 presented below, it is possible to see the penetration rates in the U.S. household segment calculated by SolarCity, given the objective of the company to 2018 in the current states where it operates (1 million customers).

Figure 3 – Penetration rates in single-family homes in the U.S.

Currency: $ m	Current States	Total U.S
Customer goal by mid-2018	1.0	1.0
Total single family housing units	41.3	92.2
Penetration of single-family homes	2.4%	1.1%

Source: SolarCity investors presentation – November 2015

According to SolarCity's information, the total addressable opportunity in SolarCity's current states exceeds 240 GW.

The third opportunity that arises is the internationalization of the company. There are still a lot of markets to explore, and the fact that utility energy is considered more expensive in other

countries than in the U.S. (8-17 cents/kWh) [10], such as Germany (31-41 cents/kWh)[11], allied with the cheap production costs already achieved by SolarCity, makes the internationalization desirable, however not being a top priority to the company for the near future.

Financial Analysis

SolarCity has been a distinguished company in the Solar Energy industry, when compared to its peers, investing in the last years in the construction of power plants, but also in the acquisition of companies with activities in all the stages of construction and distribution of solar panels, which makes SolarCity a leader in its segment. The figure below shows the key performance indicators (KPIs) of SolarCity in the last fiscal years, and it is possible to identify the constant growth in the company's activity.

Figure 4 – Historical performance of SolarCity

Source: Own analysis based on SolarCity's financial reports

In roughly 3 years, the number of customers increased 590%, and it is expected to maintain the same path in the future, due to the investments being made by the company and expected growth for this sector (7.3% annual average expected growth for the U.S. solar energy sector[12]).

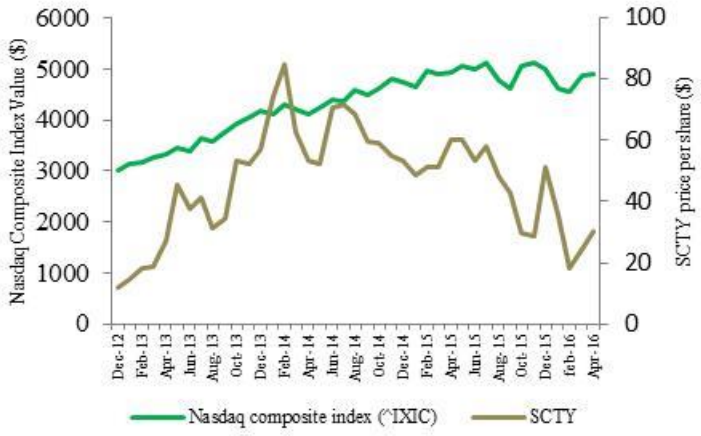
In terms of turnover, SolarCity has been experiencing a constant growth all over the period it has been publicly traded, increasing from $127M in FY12A to $400M in FY15A, meaning a 215% increase.

[10] http://energyusecalculator.com/global_electricity_prices.htm, data from 2012
[11] idem
[12] United States Renewables Report Q4 2015, Business Monitor International Ltd – September 2015

Regarding operational expenses, SolarCity has considerably large amounts when compared to the turnover of the company. The path followed by these accounts is the same as the turnover's, since the expenses with SG&A and R&D are directly related with revenue[13].

In December 2012, the IPO of SolarCity took place, being quoted in the Nasdaq Composite Index (Nasdaq). The performance of the Nasdaq and of the shares of SCTY is shown in figure 5, presented below. It is possible to observe the higher volatility of SolarCity's shares compared with the one of the index, carrying more uncertainty. The shares of SCTY reached its peak in February 2014, being traded at $84.96, and its minimum was verified only in the first day of trade ($11.93), which reveals the confidence of the investors in this company. The Nasdaq has been experiencing a constant growth path (with a small exception recently) from the end of 2012 onwards, growing 61%, while SCTY experienced a growth of 109% nowadays compared with the first day of trading, being traded at $24.58, being the recent decrease due to lower real results than it was expected by investors, but starting to recover.

Figure 5 – Nasdaq Composite Index and SolarCity's shares performance (Dec-12 to Apr-16)



Source: Thomson Reuters Eikon and own analysis

[13] See **Appendix 4 – SolarCity financial analysis** for a comparison analysis to a more detailed analysis

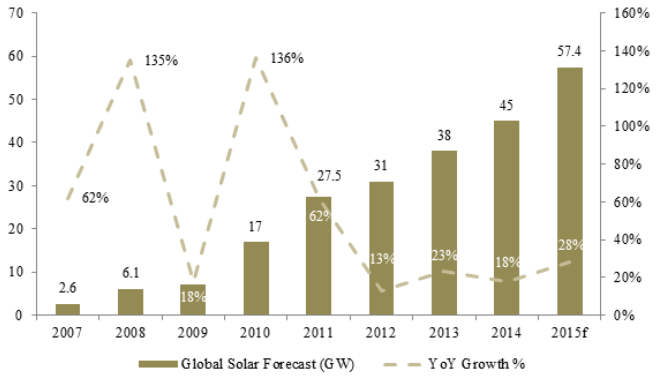
Industry overview

The energy sector is one of the most important sectors in the World and it has been experiencing changes in the previous years. The dependency of oil experienced in the last years, however still present, has been decreasing, especially in this new century. Politics and laws to improve a change in energy consumption, mainly driven by the fear of scarce resources and climate changes, have been invading our newspapers, televisions, homes and even the streets, with pro-green energy protests happening quite often. Disasters in the oil industry (BP's Deepwater Horizon oil rig in 2010), allied with a high volume of carbon emissions (Beijing's smog emissions levels in the end of 2015), especially in developing countries, have been playing an important role in the change of population's minds, that turned more to the need to conserve our country and our world to future generations.

Focusing on the Solar sector, during the month of July 2015, news about the extra demand of solar energy, led by China, Japan and U.S were circulating in Bloomberg Channels[14]. Before, it was expected that "Global solar energy installed may reach 50 to 60 gigawatts this year [2015], compared with 44 to 48 gigawatts in 2014, on increased demand from the U.S. and Asia"[15]. These positive forecasts were lowered by several factors, being the main ones: the grid "connection and congestion issues in some provinces and delayed payments"[16] in China, the reduction and end of the Tax Credit the U.S. Government concedes when constructing a solar platform in residential and non-residential facilities, the reduction of the feed-in-tariffs[17] and removal of the "preliminary accreditation under the FIT scheme" in the U.K. Despite the negative effects mentioned, solar energy was expected to increase in 2015, as graph 1.1 shown next page, demonstrates, and to continue this path in the following years.

[14] "Solar energy extra demand builds manufacturing capacity: outlook", by James Evans
[15] "Solar energy demand surge is anticipated on China, U.S. policy", by James Evans
[16] http://www.renewableenergyworld.com/articles/2015/10/global-forecast-solar-installations-to-grow-by-25-30-percent-in-2015.html, Renewable energy world. com, 8th of December 2015
[17] See **Appendix 19 – Glossary** for an explanation. http://www.fitariffs.co.uk/FITs/

Graph 1.1 – Global solar forecast for 2015 *(Mercom Capital Group)*



Narrowing the search and the analysis to the renewable energy sector only in the U.S, it is possible to observe a positive feeling for the near future, related with the development and growth of this sub-sector. According to the BMI United States Renewables Report, it is expected a "strong growth to continue over the coming quarter [last quarter of 2015] and through 2024, with total non-hydropower renewables capacity to grow at an average annual rate of 3.7% between 2015 and 2024"[18]. The Obama administration has made several changes in the laws applied to the renewable energy sector and has implemented several boost measures, being the latest the Clean Power Plan, with the clear objective of reducing CO2 emissions from factories around the country[19], which is an important incentive for "green energy" development. The ITC[20] and PTC were two former measures applied that boosted the consumption of renewable energy, but the latest news regarding its end/reduction in late 2016 and the uncertainty still surrounding it, may affect the predictions previously stated[21]. In March 2015, the US Energy Information Administration (EIA) "announced renewables (wind and solar) will account for the majority of new power capacity additions in 2015 [in the U.S.]"[22]. Another important push given by the government, especially the Obama administration, is the amount of solar contracts awarded to

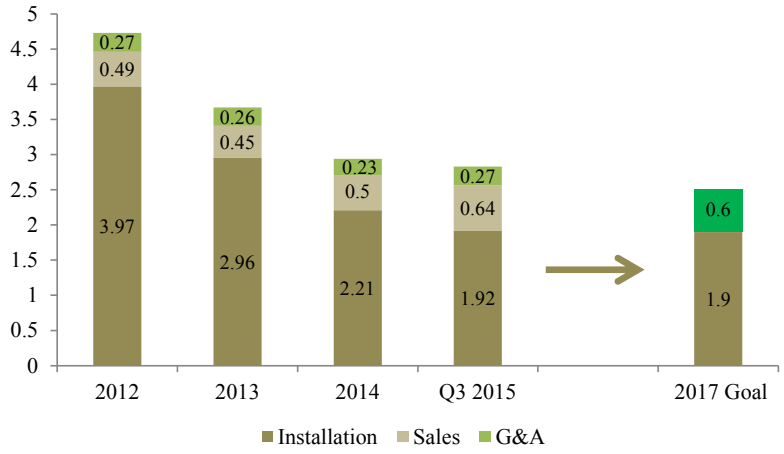
[18] BMI report
[19] Environmental Protection agency, "Carbon pollution emission guidelines for existing stationary sources: Electric Utility Generating Units; Final Rule", 23rd of October 2015.
[20] See **Appendix 19 - Glossary**
[21] The ITC is going to be reduced to 10% (non-residential systems) in 2017, and it is predicted to end during 2018.
[22] idem

utilities, under the "Renewable and Alternative Energy Power Production" (22 contracts were awarded solely in August 2013), which amounts to $7 billion[23].

With all this in mind, and having in account specialists' forecasts, until 2018, it is expected an average rate increase of 10.5% per year, representing 0.652% of the total electricity generation in the U.S.

"Solar to keep Shining"[24], is the mote for the next years. The policies referred above, despite the ITC uncertainty, allied with the decreasing installation cost are the main drivers for this affirmation. "Declining costs of solar modules has made solar power more cost competitive and demand has picked up"[25], the competition between firms, referring especially to the U.S., made the installation costs to be reduced, and this not only benefits the customer but also the growth in the usage of this type of energy. Installation costs for SCTY in 2012 amounted to $4.73, being reduced to $2.91 during the second quarter of 2015, and with the goal of 2017 settled in the $2.50, as shown in graph 1.2, illustrated below.

Graph 1.2 – Evolution of SolarCity's cost per Watt



Source: Investors presentation of SolarCity – November 2015

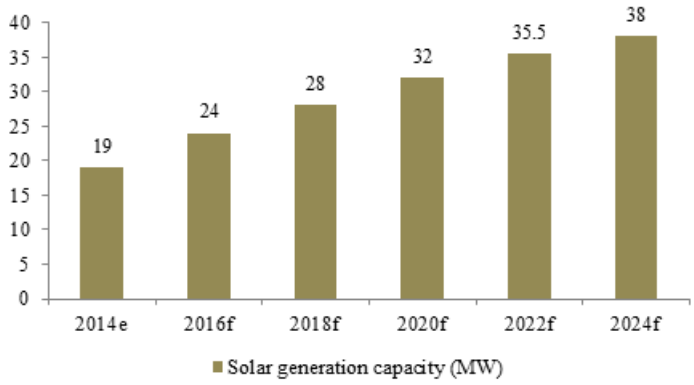
[23] A SWOT analysis was prepared for the renewable energy market, please see **Appendix 5 – SWOT analysis of the U.S. Renewable energy market**

[24] http://www.seia.org/policy/finance-tax/solar-investment-tax-credit, 7th of December 2015

[25] Idem

According to the BMI report, the average expected growth rate of Solar Energy in the U.S. for the period 2015-2024 is 7.3%, with a 19GW solar capacity in 2014 and a forecasted 38GW by 2024, as shown in the graph 1.3.[26], presented below.

Graph 1.3 – Solar generation capacity



Source: United States Renewables Report Q4 2015, Business Monitor International Ltd- September 2015

[26] United States Renewables Report Q4 2015, Business Monitor International Ltd- September 2015

Valuation

As explained before, SolarCity's way of operating is based on the quantity of solar panels leased and sold to clients (households, commercial, utility or public companies) and the amount of energy produced. In order to forecast the company's operations, the value of sales was forecasted, as was the percentage of the costs in relation to the sales, since these costs are an important driver of the company's profits. Due to the lack of available data, the cost per megawatt produced was not possible to obtain, being the value of the solar assets leased one of the most important drivers of the model built.

In the DCF model, the historical period starts in FY11A (FY10A was considered just as an illustration, not being used in computations due to the high variations verified – justified by the different model of the company at the time).

A note has to be made in relation to dividend policy. The company has no dividend policy incorporated until now, essentially due to its early stage. It was assumed in the model that the company would distribute dividends to the shareholders if the Retained Earnings account registered a value higher than $1b and if the company had enough cash to realize the payment. With this the company can increase the Return on Invested Capital, and not incur in excessive cash accumulation.

Inputs

1. Sales growth

To compute the future value of sales, previous data of the company was retrieved from the financial statements and databases available.

In order to predict the growth of sales from FY15A onwards, the already mentioned BMI report, played an important role in the understanding of the industry trends and future installed capacity.

SolarCity's sales are basically divided in two parts: "Operating leases and solar energy system incentives" and "Solar energy systems and components sales". The first encompasses all the lease agreements' revenue of the company (the main activity) and part of the revenue coming from the ITC monetization scheme; the former accounts for the parts the company sells to other

manufactures, the cash basis sales and MyPower sales[27], both accounting for a considerably small part of the total revenue. Below is a table with the historical performance of the company and the forecasts applied until FY29F.

Tables I and II – Historical and forecasted sales

Currency: m $	FY10A	FY11A	FY12A	FY13A	FY14A	FY15A	FY16F	FY17F	FY18F	FY19F
Revenue										
Operating leases and solar energy systems incentives	10	23	46	83	174	294	382	477	596	745
YoY growth %		*139%*	*99%*	*80%*	*110%*	*69%*	*30%*	*25%*	*25%*	*25%*
Solar energy systems and components sales	23	36	81	81	81	106	122	146	176	211
YoY growth %		*60%*	*122%*	*0%*	*1%*	*30%*	*15%*	*20%*	*20%*	*20%*
Total revenue	**32**	**60**	**127**	**164**	**255**	**400**	**504**	**623**	**772**	**956**
YoY growth %		*84%*	*113%*	*29%*	*56%*	*57%*	*26%*	*24%*	*24%*	*24%*

Currency: m $	FY20F	FY21F	FY22F	FY23F	FY24F	FY25F	FY26F	FY27F	FY28F	FY29F
Revenue										
Operating leases and solar energy systems incentives	932	1165	1397	1677	2012	2415	2898	3332	3666	4032
YoY growth %	*25%*	*25%*	*20%*	*20%*	*20%*	*20%*	*20%*	*15%*	*10%*	*10%*
Solar energy systems and components sales	253	304	349	401	462	531	611	672	739	813
YoY growth %	*20%*	*20%*	*15%*	*15%*	*15%*	*15%*	*15%*	*10%*	*10%*	*10%*
Total revenue	**1185**	**1468**	**1747**	**2078**	**2474**	**2946**	**3508**	**4004**	**4404**	**4845**
YoY growth %	*24%*	*24%*	*19%*	*19%*	*19%*	*19%*	*19%*	*14%*	*10%*	*10%*

Source: Own analysis and SolarCity annual reports

As one can see, the historical performance of sales has been of high growth (on average 68% since FY11A), due specially to the lower costs of the solar panels and of the services provided by SolarCity, the better technology which makes solar panels as desirable as the national grid energy, the initial phase of the company (created in 2006) and the higher awareness of reducing our carbon footprint.

In the first year of the forecasting scenario, a more conservative approach was taken, assuming a 26% growth of the total sales, with the lower portion of growth allocated to solar energy systems and component sales, due to the end of the MyPower program. In FY17F, the smaller growth rate in the operating leases (25%) is justified by the reduction of the ITC, which represents a lower stream of revenue to the company, not only caused by the lower credits to monetize but also because of the lower incentive for consumers to change to solar energy. The reduction in FY22F (19%) is due to the maturation of the company, which means a more stable but lower growth, with the final growth rate being fixed at 10%, with a stable reduction in growth in FY27F considered (14%).

[27] Extinguished in 2016 – explained in more detail in the **Company Overview** section

2. Cost of sales

The cost of SolarCity's sales is composed not only of all the expenses associated with the solar panels' manufacturing, assembly, distribution, and maintenance but also part of the amortization and depreciation of the solar systems owned by the firm.

Tables III and IV – Cost of sales structure of SolarCity

Currency: m $	FY10A	FY11A	FY12A	FY13A	FY14A	FY15A	FY16F	FY17F	FY18F	FY19F
Cost of revenue										
Operating leases and solar energy systems incentives	-3	-6	-15	-33	-93	-166	-247	-264	-275	-277
Solar energy systems and components sales	-27	-41	-85	-92	-84	-115	-123	-132	-138	-138
Total cost of revenue	**-30**	**-47**	**-99**	**-124**	**-176**	**-281**	**-370**	**-396**	**-413**	**-415**
YoY growth %		*56%*	*111%*	*25%*	*42%*	*59%*	*32%*	*7%*	*4%*	*1%*
Cost/sales		79%	78%	76%	69%	70%	73%	63%	53%	43%

Currency: m $	FY20F	FY21F	FY22F	FY23F	FY24F	FY25F	FY26F	FY27F	FY28F	FY29F
Cost of revenue										
Operating leases and solar energy systems incentives	-264	-229	-157	-186	-222	-264	-314	-359	-395	-434
Solar energy systems and components sales	-132	-115	-78	-93	-111	-132	-157	-179	-197	-217
Total cost of revenue	**-396**	**-344**	**-235**	**-279**	**-333**	**-396**	**-472**	**-538**	**-592**	**-651**
YoY growth %	*-5%*	*-13%*	*-32%*	*19%*	*19%*	*19%*	*19%*	*14%*	*10%*	*10%*
Cost/sales	33%	23%	13%	13%	13%	13%	13%	13%	13%	13%

Source: Own analysis and SolarCity annual reports

The cost of sales was 75% of the sales' value, on average, on the historical period, being considerably high, accounting for three quarters of the revenues of SolarCity. As this was a big issue for the company, seeing its margins being shortened due to this cost structure, measures to reduce were implemented. An example is a greater degree of specialization in the value chain. In FY15A, the last historical period available, the cost/sales ratio was 70%, meaning a 9% reduction from FY11A. In FY16F, the average of the period FY12A-FY15A was assumed, and the value of 73% was reached. From this point onwards, a yearly reduction of 10% per year was assumed until FY22F. These reductions were computed in alignment with the strategy of the company to reduce as much as possible the weight of these costs on its margin. From FY23F until the end of the forecasting period (FY29F), the ratio cost/sales was assumed to remain constant at 13%.

3. Operating expenses

The operating expenses of SolarCity are comprised of: Selling, General and Administrative expenses ("SG&A") and Research and development ("R&D")[28]. The SG&A are the main costs of the company, representing in the historical period, on average, 132% of the value of the sales, reaching a maximum of 176% in FY15A. As mentioned above in the cost of sales, the reduction of the SG&A costs are a priority to the company, due to weight in sales verified, which makes it impossible for the company to maintain a positive EBIT. Tables V and VI below, show the historical and forecasted values of these two captions.

Table V and VI – SG&A and R&D expenses

Currency: m $	FY10A	FY11A	FY12A	FY13A	FY14A	FY15A	FY16F	FY17F	FY18F	FY19F
SG&A expenses	n.a.	-74	-118	-187	-395	-702	-677	-714	-730	-760
R&D expenses	n.a.	0	0	-2	-19	-65	-82	-95	-110	-127
Total operating expenses	n.a.	**-74**	**-118**	**-189**	**-414**	**-767**	**-759**	**-809**	**-840**	**-887**
YoY growth %	n.a.		*61%*	*59%*	*119%*	*85%*	*-1%*	*7%*	*4%*	*6%*
SG&A/sales		*124%*	*93%*	*114%*	*155%*	*176%*	*135%*	*115%*	*95%*	*80%*
R&D/sales		*0%*	*0%*	*1%*	*8%*	*16%*	*16%*	*15%*	*14%*	*13%*
Operating expenses/sales	n.a.	*124%*	*93%*	*115%*	*162%*	*192%*	*151%*	*130%*	*109%*	*93%*

Currency: m $	FY20F	FY21F	FY22F	FY23F	FY24F	FY25F	FY26F	FY27F	FY28F	FY29F
SG&A expenses	-764	-730	-778	-822	-854	-1017	-1211	-1383	-1521	-1673
R&D expenses	-145	-165	-179	-171	-155	-184	-219	-250	-275	-303
Total operating expenses	**-909**	**-895**	**-957**	**-993**	**-1009**	**-1201**	**-1431**	**-1633**	**-1796**	**-1976**
YoY growth %	*3%*	*-2%*	*7%*	*4%*	*2%*	*19%*	*19%*	*14%*	*10%*	*10%*
SG&A/sales	*65%*	*55%*	*45%*	*40%*	*35%*	*35%*	*35%*	*35%*	*35%*	*35%*
R&D/sales	*12%*	*11%*	*10%*	*8%*	*6%*	*6%*	*6%*	*6%*	*6%*	*6%*
Operating expenses/sales	*77%*	*61%*	*55%*	*48%*	*41%*	*41%*	*41%*	*41%*	*41%*	*41%*

Source: Own analysis and SolarCity annual reports

According to management information, both of this type of expenses is expected to grow and vary in the same direction as sales. My rationale was to lower the weight of these expenses in sales, since it would not make sense to grow both captions at the same rate, making the company unprofitable both in the short and long-run. In FY16F, the average of the historical ratio SG&A/sales was assumed (135%) and the R&D expenses were kept at the same level (16% of sales), since they are entirely related with the acquisition of Silevo in FY13A, which makes it hard to predict its evolution. From FY17F onwards, as shown in the aforementioned tables, a

[28] A detail of the composition of both captions is presented in **Appendix 7 – Concepts used in the DCF valuation model**

reduction to each type of operating expenses per year was applied, with a final ratio of operating expenses to sales of 41% in FY29F.

4. Other expenses – net

The forecast exercise for the other expenses – net - is shown in the **Appendix 8 – Other captions of the DCF Valuation model**

5. Minority interest

For the minority interest, a growth at the inflation rate until FY29F was assumed. However, assuming the same inflation rate from FY20F-FY29F, due to lack of reliable forecasting data, an estimation error which will not have a major impact in the DCF model was acknowledged. A more detailed analysis is provided in **Appendix 8 – Other captions of the DCF Valuation model.**

6. Tax rate

The fact that SolarCity presents negative taxable income in all the historical period and in part of the forecasting period renders the effective tax rate always close to zero. In the United States, companies that report "negative income" can accumulate the tax credits to be used in the future (assumed 7 years in the model), if positive income is experienced during that period. In order to calculate this tax credit and actually paid taxes[29], the effective tax rate was forecasted based on the detail given by the financial reports of the company for the historical period (see **Appendix 9 – Effective tax rate**).

The model created to forecast the level of taxes paid by the company is presented in the next page in tables VII and VIII.

[29] Definition in **Appendix 9 – Effective tax rate**

Tables VII and VIII – Deferred tax asset

Taxable income $m	FY10A	FY11A	FY12A	FY13A	FY14A	FY15A	FY16F	FY17F	FY18F	FY19F
EBT	-5.4	-73.6	-113.7	-176.6	-402.0	-765.5	-838.7	-856.5	-820.4	-743.5
Computed taxes	0.0	-0.1	0.0	24.8	26.7	-3.3	33.7	110.5	105.9	95.9
Actually paid taxes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Deferred Tax Asset	**0.0**	**0.1**	**0.1**	**24.9**	**51.7**	**55.0**	**88.7**	**199.1**	**304.9**	**376.1**

Taxable income $m	FY20F	FY21F	FY22F	FY23F	FY24F	FY25F	FY26F	FY27F	FY28F	FY29F
EBT	-588.3	-245.3	74.1	316.9	633.8	850.4	1094.2	1309.0	1482.5	1673.4
Computed taxes	75.9	31.7	-9.6	-40.9	-81.8	-109.7	-141.2	-168.9	-191.3	-215.9
Actually paid taxes	0.0	0.0	0.0	0.0	0.0	38.5	141.2	168.9	191.3	215.9
Deferred Tax Asset	**425.2**	**453.6**	**410.3**	**258.9**	**71.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Source: Own analysis and SolarCity annual reports

The computed taxes are the value of taxes the company would have to pay with the same level of EBT registered if it was positive[30]. This computed tax accumulates to the previous year's if EBT is still negative, being used to calculate the deferred tax asset.

The deferred tax asset grows until FY21F, starting to decrease in FY22F, when the company registers positive EBT for the first time, being able to amortize the value of taxes paid with the accumulated credit until then. In FY25F, the company runs out of tax credit and has to pay taxes for the first time ($38.5m).

7. Working Capital

The methodology used to calculate the working capital of SolarCity was in the first place to collect all the current operating items registered in the assets and liabilities part of the Balance Sheet (receivables, payables and inventories). After putting all the historical values of these captions together, a forecast was performed, by calculating the Days Sales Outstanding (DSO), Days Payables Outstanding (DPO) and Days Inventory Held (DIH). The DSO was calculated over total revenue, while both the DPO and DIH were calculated over the total cost of revenue.

In order to be able to forecast the values of the captions, it was assumed that the values of DSO, DPO and DIH would stay at the average level of the previous four years of the historical period (from Dec12A until Dec15A). With this assumption it is possible to forecast the values of each caption selected until the end of the forecasting period (Dec29F). The table next page shows the captions assumed has working capital and its historical values.

[30] The calculation computed was only the effective tax rate (presented in **Appendix 9 – Effective tax rate**) times the absolute value of EBT.

Table IX – Historical Working Capital of SolarCity

Currency: m$	Dec11A	Dec12A	Dec13A	Dec14A	Dec15A
Accounts receivable	24	42	43	53	46
Days Sales Outstanding (DSO)	*149*	*121*	*96*	*75*	*42*
Rebates receivable - net	14	18	20	30	12
Days Sales Outstanding (DSO)	*84*	*50*	*45*	*43*	*11*
Inventories	143	87	111	217	343
Days inventory held (DIH)	*1105*	*320*	*327*	*449*	*446*
Customer notes receivable, net of current portion (MyPower)	0	0	0	35	488
Days Sales Outstanding (DSO)	*0*	*0*	*0*	*49*	*446*
Deferred income tax asset	4	6	10	13	0
Days Sales Outstanding (DSO)				*19*	*0*
Accounts payable	163	63	122	238	365
Days Payable Outstanding (DPO)	*1259*	*231*	*356*	*492*	*474*
Accrued compensation	9	15	22	50	65
Days Payable Outstanding (DPO)	*69*	*54*	*63*	*104*	*84*
Accrued expenses	16	28	20	27	110
Days Payable Outstanding (DPO)	*122*	*103*	*58*	*57*	*143*
Accrued warranty	2	4	8	9	23
Days Payable Outstanding (DPO)	*19*	*15*	*22*	*18*	*30*
Accrued professional service fees	0	0	4	7	10
Days Payable Outstanding (DPO)	*0*	*0*	*12*	*14*	*13*
Current portion of deferred revenue	14	32	60	86	103
Days Payable Outstanding (DPO)	*105*	*117*	*176*	*178*	*134*
Customer deposits	14	8	9	11	6
Days Payable Outstanding (DPO)	*108*	*29*	*26*	*22*	*8*
Total Working Capital	**-32**	**3**	**-59**	**-80**	**206**
Changes in Working Capital		**35**	**-62**	**-21**	**287**

Source: Own analysis and SolarCity annual reports

The calculation of the Total Working Capital is simply the difference between the captions of the current assets and current liabilities included in the table above, while the changes in working capital was computed by doing the difference of the value of one year by the previous year's. The Tables X and XI below, present the forecasting period of the Total WC and its changes.[31]

Table X and XI – Estimated Working Capital of SolarCity

Currency: m$	Dec23F	Dec24F	Dec25F	Dec26F	Dec27F	Dec28F	Dec29F
Total Working Capital	**1003**	**891**	**911**	**1020**	**1116**	**1193**	**1278**
Changes in Working Capital	**-87**	**-111**	**20**	**109**	**96**	**77**	**85**

Currency: m$	Dec16F	Dec17F	Dec18F	Dec19F	Dec20F	Dec21F	Dec22F
Total Working Capital	**219**	**343**	**480**	**609**	**754**	**929**	**1090**
Changes in Working Capital	**12**	**124**	**138**	**129**	**144**	**175**	**161**

Source: Own analysis and SolarCity annual reports

As one can see, the total working capital of SolarCity is always positive in the forecasting period, which means that the current assets of the company are greater than the current liabilities. This is normal when taking into account the activity of the company, which does not receive all its

[31] See **Appendix 10 – Working capital** to find the complete tables

payments in cash at the moment of purchase or leasing, but records a lot of receivables (especially in the MyPower program – which was assumed to stay at a constant level from FY17F onwards until the end of the program, with payments of the already signed contracts having yet to be made) and has to have a considerably high level of inventory. This can be a problem for the company, since, on average, it has to pay to suppliers quicker than it receives from its customers.

8. Capital Expenditures

The Capital Expenditures ("CAPEX") of SolarCity are essentially related with Property, Plant and Equipment ("PPE"), Research and Development ("R&D") and Solar energy systems leased or to be leased.

In what PPE is concerned, the forecast was made based on the ratio PPE-net/sales, calculated for the historical period and assumed in FY16F as the average of the previous 4 years. From FY17F onwards, the ratio was assumed to keep at a constant level (31%) and the PPE investment was calculated based on it.

The R&D expenses were simply assumed as the cost analyzed previously in the point of **Operating Expenses**.

Finally, regarding the investment in solar systems leased and to be leased, the value of solar systems already leased to customers was isolated from the solar systems under construction and those to be leased to customers. The forecast was thus based solely on those already leased, the remainder of the captions dependent on those.

The rational used in the forecast was to evaluate the weight that the already leased solar systems have on the sales of the company, since the solar panels leased and to be leased constitute the main activity of the company. The accumulated depreciation, initial direct costs, solar systems under construction and solar systems to be leased were all forecasted based on their weight in the solar systems already leased to customers.[32]

[32] See **Appendix 11 – Capital Expenditures** to a more detailed analysis.

Tables XII and XIII showed below present all the investments considered as Capital Expenditures together, despite the fact that in the DCF model they are presented in separate lines as presented in the table.

Table XII and XIII– Total Capital Expenditures of SolarCity

Currency: m $	FY11A	FY12A	FY13A	FY14A	FY15A	FY16F	FY17F	FY18F	FY19F
(-) Solar energy systems, leased and to be leased		-449	-698	-1114	-1579	-337	-829	-959	-1104
(-) Capital Expenditures (PPE)		-4	-4	-53	-187	107	-37	-46	-57
(-) R&D	0	0	-2	-19	-65	-82	-95	-110	-127
Total CAPEX	**0**	**-453**	**-704**	**-1186**	**-1831**	**-312**	**-961**	**-1115**	**-1287**

Currency: m $	FY20F	FY21F	FY22F	FY23F	FY24F	FY25F	FY26F	FY27F	FY28F	FY29F
(-) Solar energy systems, leased and to be leased	-1263	-1435	-1239	-1342	-1439	-1697	-1828	-1585	-1428	-1802
(-) Capital Expenditures (PPE)	-71	-88	-86	-103	-122	-146	-174	-153	-124	-136
(-) R&D	-145	-165	-179	-171	-155	-184	-219	-250	-275	-303
Total CAPEX	**-1479**	**-1688**	**-1504**	**-1616**	**-1716**	**-2026**	**-2221**	**-1988**	**-1827**	**-2241**

Source: Own analysis and SolarCity annual reports

9. Depreciation and amortization

The values reached in the forecast period for D&A are presented below, in tables XIV and XV. Please find the complete forecast exercise for depreciation and amortization in **Appendix 12 – Depreciation and amortization.**

Table XIV and XV – Total depreciation and amortization of SolarCity

Currency: m $	Dec10A	Dec11A	Dec12A	Dec13A	Dec14A	Dec15A	Dec16F	Dec17F	Dec18F	Dec19F
Accumulated amortization	n.a.	0	0	3	28	62	42	52	64	80
Accumulated amortization/other intangibles	n.a.	*0%*	*0%*	*3%*	*12%*	*31%*	*15%*	*15%*	*15%*	*15%*
Accumulated D&A	n.a.	8	13	19	31	54	75	92	115	142
Accumulated D&A/PPE	n.a.	*55%*	*64%*	*74%*	*38%*	*18%*	*48%*	*48%*	*48%*	*48%*
Depreciation Solar energy systems	n.a.	18	44	86	159	275	215	252	296	346
Depreciation/solar energy systems leased to customer	n.a.	*4%*	*4%*	*5%*	*6%*	*7%*	*5%*	*5%*	*5%*	*5%*
Total depreciation and amortization	**n.a.**	**26**	**57**	**109**	**217**	**391**	**331**	**397**	**475**	**568**

Currency: m $	Dec20F	Dec21F	Dec22F	Dec23F	Dec24F	Dec25F	Dec26F	Dec27F	Dec28F	Dec29F
Accumulated amortization	99	122	145	173	206	245	292	333	367	403
Accumulated amortization/other intangibles	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*
Accumulated D&A	176	218	259	308	367	437	520	594	653	719
Accumulated D&A/PPE	*48%*	*48%*	*48%*	*48%*	*48%*	*48%*	*48%*	*48%*	*48%*	*48%*
Depreciation Solar energy systems	404	469	525	586	652	729	812	885	950	1032
Depreciation/solar energy systems leased to customer	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*
Total depreciation and amortization	**678**	**809**	**930**	**1068**	**1225**	**1411**	**1625**	**1812**	**1970**	**2154**

Source: own analysis and SolarCity annual reports

10. Discount rate

SolarCity has issued considerable values of debt over its periods of activity. The Debt/(Debt+Equity)[33] ratio is 22% as of Dec15A, being 20% as of Dec14A, 10% as of Dec13A and 56% as of Dec12A. With this in mind, it was concluded that the best discount rate to be used was the WACC, due to the stability of last year's capital structure (company started to be quoted in FY12A, thus only considering FY14A and FY15A to this decision).

For the forecasting period, it was assumed that the market capitalization of the company would follow the same trend as the market value of debt, being the ratio constant all over the period analyzed.

In order to be able to reach a value for the WACC discount rate, the market-risk premium, the levered Beta, the risk-free rate and the cost of debt had to be calculated. Having done so, it was possible to calculate the cost of equity and after-tax cost of debt needed in the WACC's formula

10.1 Market-risk premium

The Market-risk premium was simply obtained from Damodaran's database[34], which comprises the market risk-premium for a set of 144 countries. Only the United States risk-premium was considered, due to the majority of the company's operations being in this country. According to Damodaran, and based on his approach, the Market-Risk premium of the USA is 6%, which reflects the Equity-Risk premium of 6% and the null country-risk premium given to the USA by the author.

10.2 Levered Beta

Beta is a measure of the volatility, or systematic risk, of a stock or a portfolio in comparison to the market. It describes how the expected return of a stock or portfolio is correlated to the return of the financial market as a whole. As of this, the Beta can be seen as a combination of volatility and correlation.

[33] Please refer **Appendix 13 – Closing price and market value of debt,** to a detail of the data and the analysis
[34] http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html

In order to compute the beta of SolarCity, daily, weekly and monthly historical prices of the stock and its index (Nasdaq Composite Index) were retrieved from the Thomson Reuters Eikon terminal. The beta was then estimated by regressing the stock returns (variations in the stock's price) against market returns (variations in the index's quote). The data used was the historical prices for the last 3 years, since the company only went public in the end of 2012, and the volatility associated with the first months of trading is considerably higher, the first 3 months were ignored. In the end, the beta chosen was the one calculated with the weekly returns, since it was the regression with higher R-squared (higher explanative power), and amounted to 2.157.

10.3 Risk-free rate

The risk-free rate accounts for the return an investor would obtain from putting money in an investment considered to have no risk associated. The risk-free rate considered in the model was the USA 10 year government bond, which was retrieved from Thomson Reuters Eikon, and equal to 2.183%.

10.4 Capital structure

As mentioned in the beginning of this section, the capital structure of SolarCity in the last two periods was 22% as of Dec15A and 20% as of Dec14A. The company states in its last annual report that in order to have capacity to grow, a higher level of financing has to be obtained, thus increasing the level of debt in the capital structure[35]. Knowing this, the capital structure of the peer group was evaluated and an average of 41% was reached. This weight was assumed to be the target capital structure of SolarCity, i.e. the capital structure that optimizes the company's stock price. This target capital structure was assumed in the model to be reached during the period of FY22F, when the company starts to stabilize.

10.5 WACC

The WACC was then calculated with all the aforementioned variables. The table next page shows the calculation method, and the WACC obtained for SolarCity, which is 11.60%.

[35] "Our current financing sources may be inadequate to support the anticipated growth in our business plans", SCTY 4th quarter of 2015 report.

Table XVI – WACC calculation details

WACC	
Market Risk Premium (Rm-Rf)	6%
Multiplied by: Beta	2.16
Adjusted Market Risk Premium	0.13
Add: Rf	2%
Add: Size Premium	0%
Cost of Equity	0.15
Multiplied by: E/(D+P+E)	59%
Cost of Equity Portion	0.09
After-Tax Cost of Debt	6.60%
Multiplied by: D/(D+P+E)	41%
Cost of Debt Portion	0.03
Cost of Preferred	0
Multiplied by: P/(D+P+E)	0
Cost of Preferred Portion	0
WACC	**11.60%**

Source: own analysis

The Tax Rate mentioned in "After-Tax cost of debt" in the table corresponds to the effective tax rate in FY15A, which has the calculation method explained in **6. Tax Rate** of this chapter. The level of tax rate considered was 13%, which is the tax rate forecasted to the estimation period.

11. DCF results

After having all the required parameters calculated, it was possible to estimate SolarCity's Free Cash Flows, with the methodology explained in the Literature Review, for the estimation window considered in the model. Tables XVII and XVIII, showed next page, illustrate the Free Cash-Flow calculations.

Table XVII and XVIII – DCF results for SolarCity

Currency: m$	FY14A	FY15A	FY16F	FY17F	FY18F	FY19F	FY20F	FY21F
EBIT	**-336**	-648	-626	-581	-480	-346	-121	229
(-) Tax on EBIT	0	0	0	0	0	0	0	0
NOPLAT	**-336**	**-648**	**-626**	**-581**	**-480**	**-346**	**-121**	**229**
(+) Depreciation and Amortization	217.3	391	331	397	475	568	678	809
(+) non-cash charges	-16.9	342	-146	97	121	150	186	230
(-) Investment in Working Capital	-21.4	287	12	124	138	129	144	175
(-) Solar energy systems, leased and to be leased	-1114	-1579	-337	-829	-959	-1104	-1263	-1435
(-) Capital Expenditures	-53.1	-187	107	-37	-46	-57	-71	-88
(-) R&D	-19.2	-65	-82	-95	-110	-127	-145	-165
Free Cash Flow from Operations	**-1343**	**-1459**	**-740**	**-925**	**-862**	**-787**	**-592**	**-244**
Cash flow from non-operation activities								
Free Cash Flow to the Firm	**-1343**	**-1459**	**-740**	**-925**	**-862**	**-787**	**-592**	**-244**
Discounted Free Cash Flow to the Firm			**-740**	**-829**	**-692**	**-566**	**-381**	**-141**

Currency: m$	FY22F	FY23F	FY24F	FY25F	FY26F	FY27F	FY28F	FY29F
EBIT	555	806	1133	1349	1606	1833	2016	2218
(-) Tax on EBIT	0	0	0	-38	-141	-169	-191	-216
NOPLAT	**555**	**806**	**1133**	**1310**	**1465**	**1664**	**1825**	**2002**
(+) Depreciation and Amortization	930	1068	1225	1411	1625	1812	1970	2100
(+) non-cash charges	226	269	321	383	457	402	325	358
(-) Investment in Working Capital	161	-87	-111	20	109	96	77	85
(-) Solar energy systems, leased and to be leased	-1239	-1342	-1439	-1697	-1828	-1585	-1428	-1802
(-) Capital Expenditures	-86	-103	-122	-146	-174	-153	-124	-136
(-) R&D	-179	-171	-155	-184	-219	-250	-275	-303
Free Cash Flow from Operations	**368**	**440**	**852**	**1098**	**1435**	**1986**	**2370**	**2304**
Cash flow from non-operation activities								
Free Cash Flow to the Firm	**368**	**440**	**852**	**1098**	**1435**	**1986**	**2370**	**2304**
Discounted Free Cash Flow to the Firm	**190**	**204**	**354**	**409**	**479**	**594**	**635**	**553**

Source: own analysis

After calculating all the Free Cash-Flows of SolarCity for the estimation window, from FY16F to FY29F, the WACC rate previously calculated was applied in order to discount each other. Summing this discounted FCF we reach the Enterprise Value of the firm as of Dec16F.

The next step was to estimate the Terminal Value of the company, or the value that the company is going to generate after the last estimation period. For this, it was assumed a perpetuity growth rate, or terminal growth rate, that was computed by summing the average of the inflation rate and the GDP growth rate of the United States in the years from FY16F to FY20F, since this was the

last year of available data[36]. The sum of these two rates equals 4.46%, which represents the maximum value that the perpetuity growth rate could assume. Given this, and having in account the recent changes and challenges of the company mentioned before, however compensated with the good perspectives for the industry, a conservative growth rate of 3% was assumed.

Subsequently, the net debt of the company was discounted from the Enterprise Value in order to reach the Equity Value of SolarCity. Bearing in mind that the company incorporates minority interests in the consolidated accounts (SolarCity's accounts), the value of the minority interest as of Dec15A was also discounted from the Enterprise Value, reaching an Equity Value of $3.5b.

Table XIX presented below, illustrates the calculations performed in order to reach the Equity Value and Value per share of SolarCity.

Table XIX – Equity Value calculations for SolarCity value per share

Terminal Value ($ m)	**6617**
%Terminal Value	99%
SUM Discounted FCF ($m)	67
%Discounted Cash Flow	1%
Value of the Company ($ m)	6684
Net Debt ($ m)	2277
Minority interest ($ m)	-865
Equity Value ($ m)	3542
#shares (000)	97
Value per share ($)	**36.5**

Source: own analysis

As it is possible to see, the value of net debt deducted equals $2.227b, which is the sum of Convertible Senior notes, long-term debt, financing obligations and new debt, minus the value of cash and equivalents, as of Dec16F. In order to reach the Value per Share, the Equity Value of $3.5b was divided by the number of shares outstanding (97m), which was assumed to remain constant. Given all of this, a price of $36.50 per share was obtained in the end.

[36] The tables and calculations of the inflation and GDP growth rate are presented in **Appendix 14 – Macroeconomic data.**

At the time of this Research, the price per share of SolarCity was $30.28, which makes the target price calculated, 21% higher than the current price. According to the recommendation criteria previously defined[37], this target price is equal to a hold recommendation of SolarCity's stocks.

Relative Valuation

In order to complement the valuation models computed, a relative valuation with multiples was performed. The multiples chosen in this valuation were: EV/Sales and EV/EBITDA.

The relative valuation is mostly divided in two different parts: the choice of the companies to include in the peer group, and the valuation per se, where the multiples calculated with the peer group are applied to our company in order to reach an Equity Value for the company.

Peer Group

The peer group of SolarCity was defined based on 4 criteria: industry where the company operates; the company must have headquarters in the United States; the total assets of the company must be higher than 1; and the beta of the company must not be null. With these 4 restrictions in mind, a number of 33 companies were found[38].

Financial information was then retrieved from Thomson Reuters Eikon for each of the 33 companies, such as market capitalization, beta, total debt, total equity, total assets and return-on-assets (ROA).

With the financial information gathered, a second degree of selection was performed, ranking the 33 companies in order of the least differences in the financial information mentioned above, compared to SolarCity's financial information. The top 10 companies in this rank, shown in table XX next page, were then selected as the peer group of the company[39].

[37] In **Appendix 15 – recommendation criteria**, the recommendation criteria table is presented.
[38] A detailed explanation of the peer group selection is provided in **Appendix 16 – Peer group selection criteria**
[39] idem

Table XX – SolarCity's peer group

Company name	Total Assets ($ m)	ROA	Industry name
Tesla Motors Inc	8092.46	-12.77%	Automobiles & Auto Parts
SunPower Corp	4856.993	-6.72%	Renewable Energy
SunEdison Inc	11500	-14.09%	Renewable Energy
Sunrun Inc	1935.632	-9.66%	Renewable Energy
TerraForm Power Inc	3679.071	-3.79%	Electric Utilities & IPPs
Chart Industries Inc	1201.976	-15.35%	Machinery, Tools, Heavy Vehicles, Trains & Ships
Nextera Energy Partners LP	6092	1.53%	Electric Utilities & IPPs
Cree Inc	2954.4	-2.03%	Semiconductors & Semiconductor Equipment
ITC Holdings Corp	7582.122	3.33%	Electric Utilities & IPPs
8Point3 Energy Partners LP	1017.633	-5.23%	Electric Utilities & IPPs

Source: Own analysis

Multiples Valuation

With the peer group presented above chosen, the multiple (EV/EBITDA and EV/Sales) of each company was weighted by each company's market capitalization, in order to reach the multiple to apply to SolarCity's financials, reach its Equity Value, and consequently its price per share.

In order to do this, the EV/EBITDA obtained from the peer group was multiplied by SCTY's EBITDA and the EV/Sales by SCTY's revenues. A note should be made in regards to SolarCity's EBITDA, since it is negative until FY18A the EBITDA considered was the one predicted to occur in FY21A, when the company starts to be in steady-state. The Enterprise Value correspondent to FY21A was then discounted by the discount factor, being actualized to FY16A. After this, the net debt of SolarCity was subtracted by the Enterprise Value obtained in each of the valuations in order to reach the Equity Value, which divided by the number of shares outstanding, resulted in the price per share. Table XXI below illustrates the results obtained in the relative valuations performed.

Table XXI – Relative Valuation (multiples) results

Multiple	EV/Sales	EV/EBITDA
Peer group weighted average	11.9	10.8
SolarCity financials ($ m)	399.6	1037.8
Share price ($)	26	43

Source: own analysis

The results obtained in this relative valuation, go in accordance with the result obtained in the DCF model, being the EV/Sales $9 lower and the EV/EBITDA $6 higher.

Sensitivity analysis

A valuation exercise has a high degree of uncertainty, not only in the assumptions made but also in the time-frame used or the short-term variations of the markets, which can result in considerable variations in the predicted stock price. Having this in account, it was performed a sensitivity analysis, which allows to have the knowledge about how much the estimated stock price would be affected by variations in the inputs considered in the first place.

In a first approach, it was considered variations in the markets' derived variables; such has the beta considered and consequently the WACC discount rate, and the terminal growth rate. In order to do this, two different variations were considered. In the case of the terminal growth rate, variations between -1% and +1% were considered, and in the case of the beta, it was analyzed what would happen if other betas were considered. The variations applied to the beta were also a sensitivity analysis to the WACC. The results of these variations are presented in tables XXII and XXIII, shown below and next page.

Table XXII – Sensitivity analysis performed to the beta of SolarCity

Sensitivity analysis - Beta				
	Beta	WACC	Equity Value ($ m)	Price/share ($)
Base case	**2.16**	**11.60%**	**3542**	**36.50**
Weekly Reuters	2.53	12.92%	1538	15.85
Damodaran	1.17	8.14%	14750	152.02
Capital IQ	1.36	8.79%	11502	118.55
Daily Nasdaq	1.61	9.66%	8227	84.79
Monthly Nasdaq	2.30	12.12%	2670	27.51
Weekly SP500	2.48	12.75%	1762	18.16
Weekly Dow Jones	2.54	12.94%	1508	15.54
Weekly Solre	1.13	7.98%	15686	161.67

Source: own analysis

Table XXIII – Sensitivity analysis performed to the terminal growth rate of SolarCity

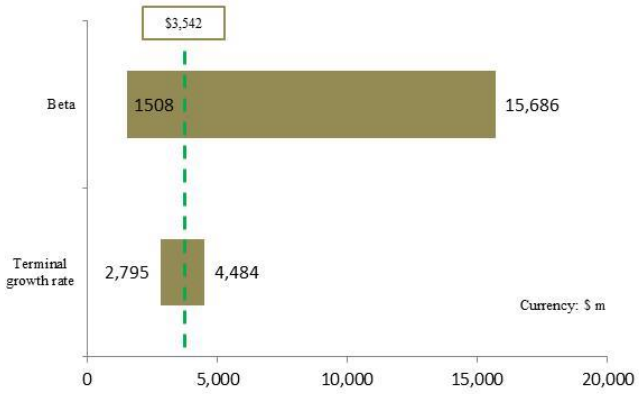
Sensitivity analysis - terminal growth rate		
Change (%)	Equity Value ($ m)	Price/share ($)
-1.00%	2795.03	28.81
-0.50%	3147.77	32.44
0.00%	**3541.52**	**36.50**
+ 0.5%	3983.85	41.06
+ 1%	4484.34	46.22

Source: own analysis

As one can see by the tables presented, when the beta increases, the WACC also increases and the value of the company decreases, since it is viewed as a more risky investment when compared to the market; and when the terminal growth rate increases, the value of the company increases, which were both the expected results to obtain.

The graph presented below shows a representation of the minimum and maximum values obtained in the sensitivity analysis to these two variables, in relation to the actual value of the company.

Graph 1.4 – Sensitivity analysis to Beta and terminal growth rate



Source: own analysis

In a second phase, a sensitivity analysis was performed to operational and financing variables, such as the cost of debt and capital structure of SolarCity, to evaluate how much a variation in these two inputs would affect the final price of the firm. The tables presented next page (Tables XXIV and XXV) illustrate the results obtained with this exercise.

Tables XXIV and XXV – Sensitivity analysis to operational and financing items of SolarCity

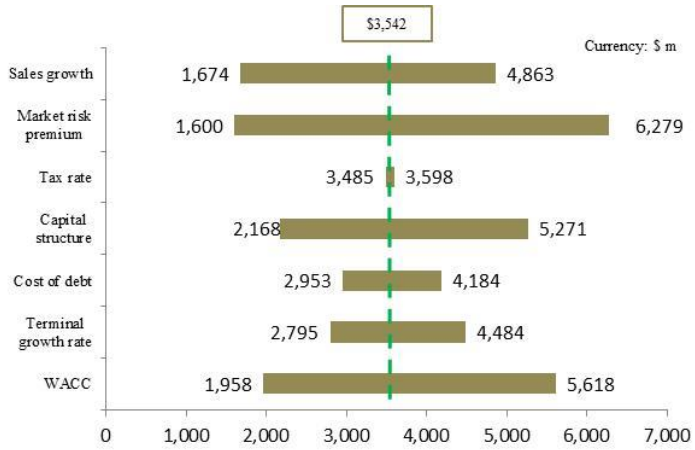
Sensitivity analysis to cost of debt		
Change (%)	EV ($m)	P/share ($)
-1.0%	4184	43.12
-0.5%	3855	39.73
0.0%	**3542**	**36.50**
+0.5%	3242	33.42
+1%	2953	30.43

Sensitivity analysis to D/(E+D)		
Change (%)	EV ($m)	P/share ($)
-10%	2168	22.34
-5%	2817	29.03
0%	**3542**	**36.50**
+5%	4355	44.88
+10%	5271	54.33

Source: Own analysis

Sensitivity analysis was also performed to other variables of the company, such as the sales growth, the level of tax rate or the market risk premium, but due to not material results, the small probability of a short-term change or the impossibility to isolate the effect, the results were not included in this written analysis, being the tables with the results available in **Appendix 17 – DCF sensitivity analysis**. The graph below presents all the variables evaluated in this analysis in relation to the equity value of SolarCity.

Graph 1.5 Operation and financial sensitivity analysis



Source: Own analysis

Economic value added model (EVA model)

The economic value added model was built as a validation for the DCF model results, due to its similarity and validation power. Some of the inputs computed in the DCF model valuation were used to the EVA model, in order to calculate the invested capital of SolarCity, the return on

invested capital (ROIC) and the economic profit, which are the three main inputs of the EVA model.

As this being a results validation model, a small explanation of the steps performed is going to be shown below, however with a small level of detail. The methodology followed is explained in the **Literature review** of this document.

In the first place it was selected the captions that are part of the invested capital of SolarCity, which are the entire Balance Sheet Equity and all the interest bearing debt (Convertible senior notes, Long-term debt and solar-asset backed notes, the new debt issued and the financing obligation)

In a second step, the NOPLAT used in the DCF model including the minority interests, was used in this model, in order to reach the annual value of the ROIC and then of the economic profit[40]. For the ROIC it was assumed the formula described below,

$$ROIC_t = \frac{NOPLAT_t}{Invested\ capital_{t-1}}$$

And for the economic profit,

$$Economic\ profit_t = \ invested\ capital_{t-1} * (ROIC_t - WACC_t)$$

The invested capital was always assumed to be the previous year's in order to be assumed to be the initial period's investment of the company. Tables XXVI and XXVII presented next page, show the EVA calculations performed.

[40] In the literature review, this economic profit is the same as the Economic Value Added of the Assets in Place ($EVA_{t,aip}$)

Tables XXVI and XXVII – EVA model inputs

Currency: m$	FY14A	FY15A	FY16F	FY17F	FY18F	FY19F	FY20F	FY21F
Total equity	1342	1735	1147	1038	984	1026	1242	1821
Convertible senior notes	796	895	909	909	909	679	113	113
Long-term Debt and Solar-asset backed n	595	1438	1374	1374	1224	1224	1066	1066
New debt	0	0	100	900	1900	2900	4600	4600
Financing obligation, net of current porti	73	69	0	0	0	0	0	0
Invested Capital	**2807**	**4136**	**3530**	**4221**	**5017**	**5828**	**7021**	**7600**
NOPLAT	-16	63	93	150	267	418	662	1030
ROIC	**-1%**	**2%**	**2%**	**4%**	**6%**	**8%**	**11%**	**15%**
Economic profit	**-184**	**-263**	**-387**	**-260**	**-223**	**-164**	**-15**	**216**
Discounted economic profit		**-263**	**-387**	**-233**	**-179**	**-118**	**-9**	**125**

Currency: m$	FY22F	FY23F	FY24F	FY25F	FY26F	FY27F	FY28F	FY29F
Total equity	2739	3121	3640	4358	5239	5529	5994	6648
Convertible senior notes	113	113	113	113	113	113	113	113
Long-term Debt and Solar-asset backed n	1066	1066	1066	905	905	905	905	905
New debt	4600	4600	4600	4600	4600	4600	4600	4600
Financing obligation, net of current porti	0	0	0	0	0	0	0	0
Invested Capital	**8518**	**8899**	**9418**	**9976**	**10857**	**11148**	**11612**	**12566**
NOPLAT	1376	1647	1993	2191	2368	2588	2771	2971
ROIC	**18%**	**19%**	**22%**	**23%**	**24%**	**24%**	**25%**	**26%**
Economic profit	**494**	**658**	**961**	**1099**	**1210**	**1328**	**1478**	**1624**
Discounted economic profit	**256**	**305**	**399**	**409**	**404**	**397**	**396**	**390**

Source: own analysis

With the economic profit calculated to each year of historical and forecasting period, the discounted economic profit was obtained by simply discount the economic profit by the WACC discount rate (assumed to be the same as the DCF model).

From Dec23F onwards it was assumed the company was going to distribute dividends to its shareholders since the two conditions mentioned in the beginning of this **Valuation Section** were met, thus increasing its Returned on Invested Capital. However, trying to maintain a stable pattern, since investors do not like uncertainty (a decrease in the dividends payable might mean a decrease in investors' confidence levels). The total dividends distributed over the 7 years until the end of the forecasting period amounts to $9.2b.

In the end, a terminal value was calculated, assuming the same methodology as of the DCF model (perpetuity) and the same growth rate (3%), in order to be possible to comparable both model's results. Table XXVIII represented below shows the final output calculated with the EVA model.

Table XXVIII – Equity Value calculations for SolarCity value per share using the EVA model

Terminal Value ($ m)	4664
%Terminal Value	*68%*
Sum discounted economic profit ($ m)	**2153.5**
%Discounted economic profit	*32%*
Value of the company ($ m)	**6817.3**
Net debt ($ m)	***2277***
Minority interest ($ m)	***-865***
Equity Value ($ m)	3675
Value per share ($)	**38**

Source: own analysis

Net debt ($2.277b) and minority interest ($865m) were subtracted from the calculated Enterprise Value of the company ($6.8b) in order to reach only the Equity value of SolarCity. Given this, a value of $3.675b was obtained for the equity part of the company, which results in a value per share of $38.

Using the same recommendation criteria mentioned before, and given the fact that the shares of SolarCity are traded at $30.28 as of today, our target price is 25% higher than the price of the shares of SolarCity today, which results in a recommendation of Hold as the DCF model.

The similarity of the results obtained with the EVA model and the DCF model, validates the same results and increases the confidence in the output shown. A sensitivity analysis was performed to some of the variables of the EVA model and is shown in **Appendix 18 – EVA sensitivity analysis.**

Comparison with JP Morgan valuation model

In this section a comparison between the analyst's valuation and JP Morgan's is performed.

JP Morgan uses the retained value approach to value SolarCity, which differs from the models used by the analyst in this report. With this in mind, this chapter is going to be divided in two parts: i) summary of the approach taken by JP Morgan; ii) comparison of the values obtained in the analyst's model and JP Morgan's.

Retained Value

In this approach, the future cash flows of the company are calculated and subctracted by the payment to financial suppliers and all the operational and maintenance costs, being discounted at a fixed discount rate. With this, it is possible to conclude that this approach is basically the net present value of the future cash-flows of the company.

This approach is used by JP Morgan due especially to the lease contracts, which are the main operation of SolarCity, and which require fixed monthly payments, thus being possible to identify the cash-flows of the company.

The main advantages of this approach are the accuracy of the results, since being the activity of the company mainly composed of operational leases of solar systems it is possible to reach the value of all the contracts the company has in place, and calculate the revenue coming from that contracts; with the disadvantages of the model being the hardness to compute all the necessary calculations and the considerably high number of assumptions that has to be made (for example the number of customers who are going to renew its solar contract), in order to reach a final value for the company, increasing the probability of incurring in an error.

Comparison of results

The forecasts performed by JP Morgan were only realized until FY17F, which is a considerably lower amount than the forecasts performed by the analyst. This happens due to the different models used, which, in the case of JP Morgan does not require the company to be in steady-state.

In order to have the same set of data to compare, it was only considered the analyst's data until FY17F also.

Total revenues

Currency: m $	FY14A	FY15A	FY16F	FY17F	CAGR
JP Morgan	255	400	588	958	39.2%
Analyst	255	400	504	623	25.0%

Source: JP Morgan SolarCity research note – February 2016 and own analysis

In what total revenue is respected, the investment bank assumed higher growth rates, especially in FY17F. The Cumulative Annual Growth Rate (CAGR) is considerably higher in JP Morgan's model (39.2%) than in the analyst's model (25%). The main similarities are verified in FY16F, since their research note has already in account the end of MyPower program, which made the bank to reduce their previsions in comparison to their initiation report and FY15A mid-year report. Another negative point appointed was the fact that SolarCity did not reach their customers-goal to the end of FY15A, which caused more uncertainty to investors regarding their next goals.

However, JP Morgan increased revenues, since the industry is growing despite the not so positive laws of the US government; SolarCity is the market leader in solar panels installed and the access of the company to lower cost of capital[41].

Total cost of revenues and operating expenses

Currency: m $	FY14A	FY15A	FY16F	FY17F
Cost of revenue				
JP Morgan	-176	-281	-433	-642
Analyst	-176	-281	-370	-396
Operating expenses				
JP Morgan	-414	-767	-1035	-1237
Analyst	-414	-767	-759	-809

Source: JP Morgan SolarCity research note – February 2016 and own analysis

As expected having in account the difference in total revenue, the cost of revenue and operating expenses forecasted in JP Morgan's model is considerably higher than the forecasted values

[41] SolarCity Equity Research, JP Morgan – Coster, Paul and Strouse, Mark. 23rd February 2016

constructed. In order to support its operations and higher number of sales, the company has to spend more in the maintenance, installation and support of the solar systems, which increases both type of costs.

Solar Systems leased and to be leased

Currency: m $	Dec14A	Dec15A	Dec16F	Dec17F
JP Morgan	2797	4376	7930	12092
Analyst	2797	4376	4712	5542

Source: JP Morgan SolarCity research note – February 2016 and own analysis

Evaluating the asset with more weight in the balance sheet of SolarCity, and the main asset for the operations of the company, it is possible to identify considerable higher values in JP Morgan's model. This is related again with the assumption of higher total revenue in the two periods forecasted which require the company to have more solar systems in order to increase its number of leases, otherwise being impossible to increase its customer base.

Total liabilities and total equity

Currency: m $	Dec14A	Dec15A	Dec16F	Dec17F
Total liabilities				
JP Morgan	3244	5553	7278	9322
Analyst	3244	5553	6317	7807
Total Equity				
JP Morgan	1342	1735	3298	5243
Analyst	1342	1735	1147	1038

Source: JP Morgan SolarCity research note – February 2016 and own analysis

In terms of total liabilities, JP Morgan considers a higher value of debt issue in the two periods forecasts. Analyzing their report, the long- term lease pass-through financing, increases to $1b in Dec16F, and $2.3b in Dec17F, being this the main driver for the increase in the total liabilities. The other drivers are the increase in accounts payable and deferred revenue, due to the normal course of the business (assumed to be of high growth). In my DCF model, the lease pass-through financing, which includes the revolver line, was reduced to zero in Dec16F, being the needed debt issued through "new debt".

Regarding total equity, in Dec17F JP Morgan's assumes a value 5x higher than the one predicted in the DCF model. This is mainly related with the increase in minority interests, which I assumed

to be in the Equity part of the Balance Sheet. JP Morgan assumes a considerably higher increase in the minority interests, which in the DCF model was assumed to grow at the inflation rate, due to the impossibility to evaluate those participations separately and to understand how they would vary in relation with a variation in the total revenue. JP Morgan also assumes a share issue in both years, ending Dec17F with ~104m shares.

Discount rate

The discount rate applied in JP Morgan's model is of 10%, not being possible to have the basis of calculation and the assumptions made. This discount rate is smaller than the one assumed in the DCF, which equaled 11.60%.

In the end, a target price of $29 was reached in the JP Morgan model, after discounting the net debt ($1.17b), which is a smaller price than the DCF model, $37, however with the same recommendation criteria (Neutral/Hold), mainly driven by the higher market price of SolarCity's stock at this time than in the research note of JP Morgan ($19.08 vs. $30.28).

Conclusion

Within this research note, the first possible conclusion is the relative power of an Equity Valuation, since a great part of the value obtained depends on assumptions and forecasts made, which may vary depending of the analyst performing it or the model used. This relative value of an equity research is something that everyone has to bear in mind when reading a valuation, whether it is performed by a student or a professional of the sector.

In what SolarCity is concerned, the company is part of an astonishing growing industry, with endless possibilities. This is due to the now generalized idea among the populous that we have to preserve our planet, the first step of which is to stop using fossil fuels and revert to renewable energies. Since the turn of the century, the research for ways of utilizing and harnessing renewable energy increased exponentially. With this in mind, allied with the partnership with Tesla to develop solar accumulators, SolarCity developed a business model capable of prospering in the short to medium future. However, attention has to be given to the competitors, to regulation which is unpredictable (opposed to what it should be) and to new entries.

To my valuation exercise, the DCF model was the main model built in this thesis, with the EVA model and relative valuation playing secondary roles, supporting and challenging the results obtained with the DCF. The results obtained in the secondary models did not vary much from the ones obtained with the DCF, which supports the main model. In terms of basis for the assumptions, reports from the industry, expectations about new regulations and changes in the existent ones and reports of the company were the main sources of information. Regarding the events that defined our forecasting periods, the main ones were the reduction of the ITC to 10% by the end of this year, the end of the MyPower loan program in the beginning of this year, and the expected high growth in the Solar Energy industry in the foreseeable future. Subsequently, a slight halt of company growth in FY22F was assumed, entering its steady-state in what total revenue growth is respected. With all of this, a target price of $36.50 was obtained in the DCF model, $38 in the EVA model and $26 and $43 in the relative valuation approach, which considered EV/sales and EV/EBITDA, respectively, as the multiples to support the main model.

A sensitivity analysis was performed to the main variables of both the DCF and EVA, with the main variables being in the case of the DCF the beta, the cost of debt and the capital structure. All

the variables analyzed resulted in expected variations in the price of the stock, with the share price ranging from $15.54 to $161.67.

To conclude, a note should be made in what relates to the data used, which was only public data, sometimes turning the research process harder, given the impossibility to obtain a value per watt of energy deployed or the total number of contracts of the company in each segment. However, I believe this valuation carries a high degree of accuracy.

SolarCity is a company to follow, comprised of a promising future ahead, not only because of its business model, but for the inherent values within its mission, whose ultimate goal is turning our planet into a better place.

Appendix Section

Appendix 1 – Variations of FCFE models

Regarding the FCFE model, there are several variations of it, having in account the type of business being evaluated:

- Constant Growth FCFE is suitable to companies experiencing a constant growth rate, being the value of equity a function of the "expected FCFE in the next period, the stable growth rate and the required rate of return" (Damodaran, 2006).
- Two-stage FCFE, suited for a recently founded company that in the early stage experiences high growth and after this it reaches a steady-state stage, growing at a stable rate.
- Three-stage FCFE model, follows the same path as the model presented before, but instead of only having a high growth stage in the beginning, it is suitable for companies that present a decrease of growth before reaching the steady-state.

Besides the models presented above, more variations of the FCFE can exist, depending on the company being evaluated and stages it experiences. The three models presented above were the three models presented and explained by Damodaran, being possible to group the later two in only one group called *multi-stage* models.

Appendix 2 – Shareholder structure

Table XXIX – Shareholder structure of SolarCity

#	Investor Name	% Outstanding	Position (000)
1	Musk (Elon R)	22%	21846
2	Fidelity Management & Research Company	12%	11917
3	SRS Investment Management, LLC	9%	8500
4	Fisher (John H N)	6%	5760
5	The Vanguard Group, Inc.	4%	3885
6	Morgan Stanley & Co. LLC	3%	3394
7	Rive (Lyndon R)	2%	2291
8	Rive (Peter J)	2%	2267
9	BlackRock Institutional Trust Company, N.A.	2%	2118
10	DBL Equity Fund - BAEF II, L.P.	2%	2024
11	JP Morgan Asset Management	2%	1807
12	Morgan Stanley Investment Management Inc. (US)	2%	1763
13	Bank of America Merrill Lynch (US)	2%	1543
14	Canyon Capital Advisors LLC	1%	1311
15	Deutsche Asset Management Americas	1%	1210
	Others	27%	25865

Source: Thomson Reuters Eikon database – 14th of April 2016

It is important to state that the two co-founders of the company, Lyndon and Peter Rive have still together 5% of the company.

Appendix 3 – Basic types of deals offered by SolarCity

Actually, SolarCity offers the following type of deals to its customers:

- **Solar Lease:** It is a simple lease made between the customer and SolarCity, at a low, fixed monthly payment, which is usually less than the monthly utility bill. SolarCity secures the maintenance and insurance of the equipment, and most important it guarantees a minimum production or it pays the difference, which gives security to the client. At the end, customer can upgrade to a new system, extend the lease of the current system, or it can have the system removed free of charge.
- **Solar Power Purchase Agreements (Solar PPA):** in this type of contract, the ownership of the equipment still belongs to SolarCity, as maintenance and insurance of the panels. Customer will have the equipment installed at a $0 payment, and it will pay only for the electricity produced, which is usually a lower amount that what was paid in the utility electricity bill. The length of this contract is usually 20 years.
- **Direct Purchase:** The customer makes an upfront payment to SolarCity and the company just installs and secures the maintenance of the equipment, being this a regular purchase of solar panels. In this deal, it is the customer who receives the benefits of the Tax Credit. This type of deals is less common with SolarCity, representing a smaller portion of the company's revenues.

- **MyPower Loan Agreement** (Discontinued in the beginning of 2016)**:** Combines the benefits of the contracts mentioned above with the financing directly through SolarCity. This is a low-interest loan that allows the customer to finance the cost of the solar power system over 30 years. In these contracts, maintenance and operation is secured by SolarCity, but the equipment belongs to the customer, which in the end of the loan makes the energy the equipment produces totally free for the customer. This agreement was created also for the company to be able to operate in districts that have laws "less-favorable to third-party owned systems"[42].

[42] SCTY annual report 2014

It is important to state that the former deals are usually only offered to households, being the contracts established with commercial and public firms slightly different, depending also on the size and type of the firm (SMB, Government, Commercial, Schools and Home Builders).

Appendix 4 – SolarCity financial analysis

Comparison with Damodaran's Turnover growth database

As mentioned in the main text, SolarCity registered a 215% in turnover in the last 4 years.

Comparing this growth with Damodaran's computation for the Green and Renewable Energy sector[43], which is equal to 28.92% in the last 5 years, it is possible to observe the dominance of SolarCity amongst its competitors, however for a better comparison, it has to be analyzed the sector of electrical equipment, since it is in this industry that Damodaran allocates SolarCity. Electrical Equipment registers a growth in revenues in the last 5 years of 29.39%, which compared to SolarCity's growth, is significantly lower[44].

Table XXX – Historical return on equity of SolarCity

	FY12A	FY13A	FY14A	FY15A
ROE	-34%	-7%	-4%	-5%

Source: Own analysis based on the financial reports of SolarCity

The figure above shows the Return on Equity (ROE) of SolarCity in the historical period. This has been negative in all the periods and ranging from -34% to -4%, being substantially lower than the ROE calculated by Damodaran for both the industry of green and renewable energy and the industry of electrical equipment[45], which are -0.17% and 11.62%, respectively. This can be justified by the recent foundation of the company, which required a high investment, needing more time to be profitable and to repay to shareholders.

[43] http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/histgr.html, accessed on the 28th of December 2015

[44] The difference in periods (4 and 5 years) is acknowledged, but due to the recent IPO of SolarCity it was considered only the 4 years period, with this not influencing the comparison results in a significant way

[45] http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/roe.html, accessed on the 28th of December 2015

Table XXXI – Historical operating margins of SolarCity

%	FY12A	FY13A	FY14A	FY15A
Gross margin	22%	24%	31%	30%
EBITDA margin	-27%	-25%	-46%	-64%
EBIT margin	-72%	-91%	-132%	-162%
Effective tax rate	0%	-14%	-7%	0.4%
Net income margin	-78%	-34%	-22%	-15%

Source: Annual reports of SolarCity

Figure 6, represented above shows the operational performance of SolarCity in the historical period. It is possible to observe that SolarCity has been able to increase its Gross Margin from FY12A to the current period, from 22% to 30%. The EBITDA margin has been decreasing along the period, reaching -162% in FY15A, being important to note that only EBIT was presented in the financial accounts of the firm, being EBITDA calculated with the Depreciation and Amortization costs presented in the Cash-Flow Statement of SolarCity. In the last 4 years, SolarCity's Net Income grew at a CAGR of 10.68%.

Appendix 5 – SWOT analysis of the U.S. Renewable energy market

Table XXXII - SWOT analysis of the U.S. Renewable energy market

Strengths	**Weaknesses**
• High levels of investment, from banks, private equity firms and large corporations • State aid and subsidies • "Renewable portfolio standards"[46]	• Uncertainty regarding ITC and PTC as referred above in the text • Limited contribution of renewable energy to the total power utilized in the U.S.
Opportunities	**Threats**
• Smart grid installation, to incorporate the renewable energy produced, in the National Energy System distribution. • Clean Power Program • Cost-competitiveness in the market	• Low oil prices, which make the change to renewable energy less desirable from economic terms. • Public opposition in some construction works provokes delays. • "Intermittency"[47], is still a problem despite the technological evolution already in plan. • Low costs may increase competition from local dealers

The strengths identified were in some way mentioned earlier in the text. The High levels of investment are present in the joint-venture between SolarCity and the Research Foundation for the State University of New York or in the financing agreement between Sunrun and Ivestec Inc and Investec Bank, amounting to a total of $195 million "to support growth in the company's US residential solar business"[48]. The weaknesses are relevant but limited to the uncertainty of the

[46] These standards are a way of encouraging energy companies to adopt green technology and renewable energy.
[47] Intermittency is the fails occurred while using solar energy. It has been a major problem of this system since its implementation, and although it has been reduced, it is still considerable in some regions of the U.S. United States Renewables Report Q4 2015, Business Monitor International Ltd- September 2015
[48] United States Renewables Report Q4 2015, Business Monitor International Ltd- September 2015

ITC and PTC schemes and the still limited contribution of this sub-sector to the total energy production (in 2013, solar energy was responsible for only 0.223% of the total electricity generation in the country). Regarding opportunities, the construction of a smart grid to allow a better distribution of the renewable energy produced is the main opportunity identified for the renewables sector, together with the cost-competiveness that will make installation costs to be driven down (analyzed further in the text). The low oil prices that reduces the incentives, especially of big companies to make a change to this type of energy and the intermittency still verified in the usage of energy produced by these sources (SolarCity is creating the power batteries in a partnership with Tesla, as mentioned already, in order to eliminate this weakness) are the two main threats to the growth of this sub-sector in the U.S.

Appendix 6 – Historical and forecasted balance sheet and income statement of SolarCity

Table XXXIII– Balance sheet of SolarCity for the historical and forecasted periods

Currency: m$	Dec11A	Dec12A	Dec13A	Dec14A	Dec15A	Dec16F	Dec17F	Dec18F	Dec19F
Cash and equivalents	50	160	577	504	383	106	193	325	442
short-term investments	0	0	0	138	11	11	11	11	11
Restricted cash	2	8	19	21	40	45	56	69	86
Total receivables	24	42	43	53	46	115	143	177	219
Inventories	143	87	111	217	343	391	418	436	439
Deferred income tax asset	4	6	10	13	0	89	199	305	376
Prepaid expenses and other current assets	18	12	27	56	80	85	105	130	161
Total current assets	**242**	**314**	**788**	**1002**	**902**	**842**	**1124**	**1453**	**1734**
Solar energy systems, leased and to be leased - net	536	984	1683	2797	4376	4712	5542	6501	7604
Property, plant and equipment - net	14	19	22	75	262	156	193	239	295
Build-to-suit lease asset under construction	0	0	0	26	285	471	554	650	760
Other intangibles - net	0	0	129	224	201	273	338	419	519
Goodwill	0	0	149	316	316	316	316	316	316
Customer notes receivable, net of current portion (MyPower)	0	0	0	35	488	342	342	342	342
Other assets	22	25	39	111	457	353	436	540	669
Total assets	**813**	**1342**	**2810**	**4586**	**7287**	**7464**	**8845**	**10459**	**12239**
Accounts payable	163	63	122	238	365	394	421	439	442
Accrued compensation	9	15	22	50	65	78	83	87	87
Accrued expenses	16	28	20	27	110	92	98	102	103
Accrued warranty	2	4	8	9	23	21	23	24	24
Accrued professional service fees	0	0	4	7	10	10	11	11	11
Others	3	5	19	59	62	69	85	105	130
Accrued and other current liabilities	31	52	72	152	270	269	299	329	356
Customer deposits	14	8	9	11	6	22	23	24	24
Deferred revenue (current portion)	14	32	60	86	103	153	164	171	172
Other current liabilities	26	58	76	80	449	201	249	309	382
Dividends payable	0	0	0	0	0	0	0	0	0
Total Current liabilities	**247**	**213**	**338**	**567**	**1193**	**1039**	**1157**	**1272**	**1376**
Deferred revenue, net of current portion	101	204	410	557	1010	1952	2391	2929	3587
Convertible senior notes	0	0	230	796	895	909	909	909	679
Long-term Debt and Solar-asset backed notes, net of current portion	15	84	288	595	1438	1374	1374	1224	1224
Long-term deferred tax liability	4	6	9	13	1	1	2	2	2
Financing obligation, net of current portion	62	141	79	73	69	0	0	0	0
Deferred U.S. Treasury grant income, net of current portion	132	287	412	397	382	382	382	382	382
Other liabilities	36	114	193	244	564	560	693	858	1063
New debt	0	0	0	0	0	100	900	1900	2900
Total liabilities	**597**	**1048**	**1960**	**3244**	**5553**	**6317**	**7807**	**9475**	**11214**
Commitments and contigencies									
Convertible redeemable preferred stock	131	0	0	0	0	0	0	0	0
Additional paid in capital	10	330	820	1004	1195	719	719	719	719
Common Stock	0	0	0	0	0	0	0	0	0
Minority interest	123	110	232	597	856	865	881	900	921
Retained Earnings	-55	-47	-147	-202	-258	-317	-437	-562	-635
Net income	8	-99	-56	-56	-58	-120	-125	-73	21
Total Equity	**216**	**293**	**849**	**1342**	**1735**	**1147**	**1038**	**984**	**1026**
Total Liabilities and Equity	**813**	**1341**	**2810**	**4586**	**7287**	**7464**	**8845**	**10459**	**12239**

Table XXXIV– Balance sheet of SolarCity for the historical and forecasted periods (cont.)

Currency: m$	Dec20F	Dec21F	Dec22F	Dec23F	Dec24F	Dec25F	Dec26F	Dec27F	Dec28F	Dec29F
Cash and equivalents	895	692	1013	1893	2418	2590	3114	3844	3994	4046
short-term investments	11	11	11	11	11	11	11	11	11	11
Restricted cash	106	131	156	186	221	264	314	358	394	434
Total receivables	271	336	400	476	567	675	803	917	1009	1110
Inventories	418	363	248	295	351	418	498	568	625	688
Deferred income tax asset	425	454	410	259	71	0	0	0	0	0
Prepaid expenses and other current assets	200	247	294	350	417	496	591	675	742	816
Total current assets	**2327**	**2235**	**2533**	**3470**	**4056**	**4454**	**5332**	**6374**	**6775**	**7105**
Solar energy systems, leased and to be leased - net	8867	10302	11541	12883	14322	16018	17846	19431	20858	22661
Property, plant and equipment - net	366	454	540	642	765	910	1084	1237	1361	1497
Build-to-suit lease asset under construction	887	1030	1154	1288	1432	1602	1785	1943	2086	2266
Other intangibles - net	642	796	947	1127	1342	1598	1903	2172	2389	2628
Goodwill	316	316	316	316	316	316	316	316	316	316
Customer notes receivable, net of current portion (MyPower)	342	342	342	342	342	342	342	342	342	342
Other assets	829	1028	1223	1455	1732	2062	2456	2803	3083	3391
Total assets	**14576**	**16503**	**18595**	**21524**	**24306**	**27302**	**31064**	**34617**	**37210**	**40206**
Accounts payable	422	366	250	297	354	422	502	573	630	693
Accrued compensation	83	72	49	59	70	83	99	113	124	137
Accrued expenses	98	85	58	69	82	98	117	133	147	161
Accrued warranty	23	20	14	16	19	23	27	31	34	38
Accrued professional service fees	11	9	6	7	9	11	13	14	16	17
Others	161	200	238	283	337	402	478	546	600	660
Accrued and other current liabilities	376	387	365	435	518	616	734	838	921	1014
Customer deposits	23	20	14	16	19	23	27	31	34	38
Deferred revenue (current portion)	164	143	97	116	138	164	195	223	245	270
Other current liabilities	474	587	699	831	990	1178	1403	1602	1762	1938
Dividends payable	0	0	0	800	1000	1000	1000	1800	1800	1800
Total Current liabilities	**1459**	**1503**	**1425**	**1696**	**2018**	**2403**	**2862**	**3267**	**3593**	**3953**
Deferred revenue, net of current portion	4395	5383	6325	7432	8733	10261	12057	13564	14921	16413
Convertible senior notes	113	113	113	113	113	113	113	113	113	113
Long-term Debt and Solar-asset backed notes, net of current portion	1066	1066	1066	1066	1066	905	905	905	905	905
Long-term deferred tax liability	2	2	3	3	3	3	4	4	4	5
Financing obligation, net of current portion	0	0	0	0	0	0	0	0	0	0
Deferred U.S. Treasury grant income, net of current portion	382	382	382	382	382	382	382	382	382	382
Other liabilities	1317	1632	1942	2311	2751	3275	3901	4452	4897	5387
New debt	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600
Total liabilities	**13334**	**14682**	**15856**	**18403**	**20666**	**22944**	**25825**	**29088**	**31216**	**33558**
Commitments and contigencies										
Convertible redeemable preferred stock	0	0	0	0	0	0	0	0	0	0
Additional paid in capital	719	719	719	719	719	719	719	719	719	719
Common Stock	0	0	0	0	0	0	0	0	0	0
Minority interest	943	966	989	1013	1037	1062	1087	1114	1140	1168
Retained Earnings	-614	-420	137	231	389	884	1577	1633	1897	2335
Net income	195	556	895	1158	1495	1693	1856	2064	2238	2427
Total Equity	**1242**	**1821**	**2739**	**3121**	**3640**	**4358**	**5239**	**5529**	**5994**	**6648**
Total Liabilities and Equity	**14576**	**16503**	**18595**	**21524**	**24306**	**27302**	**31064**	**34617**	**37210**	**40206**

Source: Annual reports and own analysis

Table XXXV and XXXVI – Income statement of SolarCity for the historical and forecasted periods

Currency: m$	FY10A	FY11A	FY12A	FY13A	FY14A	FY15A	FY16F	FY17F	FY18F	FY19F
Revenue										
Operating leases and solar energy systems incentives	10	23	46	83	174	294	382	477	596	745
Solar energy systems and components sales	23	36	81	81	81	106	122	146	176	211
Total revenue	**32**	**60**	**127**	**164**	**255**	**400**	**504**	**623**	**772**	**956**
Cost of revenue										
Operating leases and solar energy systems incentives	-3	-6	-15	-33	-93	-166	-247	-264	-275	-277
Solar energy systems and components sales	-27	-41	-85	-92	-84	-115	-123	-132	-138	-138
Total cost of revenue	**-30**	**-47**	**-99**	**-124**	**-176**	**-281**	**-370**	**-396**	**-413**	**-415**
Gross profit	2	12	27	39	79	119	134	228	359	541
Operating expenses										
SG&A expenses		-74	-118	-187	-395	-702	-677	-714	-730	-760
Research and development	0	0	0	-2	-19	-65	-82	-95	-110	-127
Total operating expenses	**0**	**-74**	**-118**	**-189**	**-414**	**-767**	**-759**	**-809**	**-840**	**-887**
Operating Income (EBIT)	**2**	**-61**	**-91**	**-149**	**-336**	**-648**	**-626**	**-581**	**-480**	**-346**
EBITDA		**-35**	**-34**	**-41**	**-118**	**-256**	**-294**	**-184**	**-6**	**221**
Interest expense - net	-5	-9	-20	-26	-56	-92	-181	-241	-306	-364
Other expense - net	-3	-3	-3	-1	-11	-26	-32	-34	-34	-33
Loss before income taxes (EBT)	-5	-74	-114	-177	-402	-765	-839	-856	-820	-743
Income tax benefit (provision)	0	0	0	25	27	-3	0	0	0	0
Net loss	**-5**	**-74**	**-114**	**-152**	**-375**	**-769**	**-839**	**-856**	**-820**	**-743**
Minority interest	8	117	14	96	319	710	718	731	747	765
Net Income to parent	3	44	-99	-56	-56	-58	-120	-125	-73	21

Currency: m$	FY20F	FY21F	FY22F	FY23F	FY24F	FY25F	FY26F	FY27F	FY28F	FY29F
Revenue										
Operating leases and solar energy systems incentives	932	1165	1397	1677	2012	2415	2898	3332	3666	4032
Solar energy systems and components sales	253	304	349	401	462	531	611	672	739	813
Total revenue	**1185**	**1468**	**1747**	**2078**	**2474**	**2946**	**3508**	**4004**	**4404**	**4845**
Cost of revenue										
Operating leases and solar energy systems incentives	-264	-229	-157	-186	-222	-264	-314	-359	-395	-434
Solar energy systems and components sales	-132	-115	-78	-93	-111	-132	-157	-179	-197	-217
Total cost of revenue	**-396**	**-344**	**-235**	**-279**	**-333**	**-396**	**-472**	**-538**	**-592**	**-651**
Gross profit	788	1124	1512	1799	2141	2550	3037	3466	3812	4194
Operating expenses										
SG&A expenses	-764	-730	-778	-822	-854	-1017	-1211	-1383	-1521	-1673
Research and development	-145	-165	-179	-171	-155	-184	-219	-250	-275	-303
Total operating expenses	**-909**	**-895**	**-957**	**-993**	**-1009**	**-1201**	**-1431**	**-1633**	**-1796**	**-1976**
Operating Income (EBIT)	**-121**	**229**	**555**	**806**	**1133**	**1349**	**1606**	**1833**	**2016**	**2218**
EBITDA	**557**	**1038**	**1485**	**1874**	**2357**	**2760**	**3231**	**3645**	**3986**	**4372**
Interest expense - net	-438	-438	-438	-438	-438	-426	-426	-426	-426	-426
Other expense - net	-29	-36	-43	-51	-61	-72	-86	-98	-108	-119
Loss before income taxes (EBT)	-588	-245	74	317	634	850	1094	1309	1483	1673
Income tax benefit (provision)	0	0	0	0	0	-38	-141	-169	-191	-216
Net loss	**-588**	**-245**	**74**	**317**	**634**	**812**	**953**	**1140**	**1291**	**1457**
Minority interest	783	802	821	841	861	881	903	924	946	969
Net Income to parent	195	556	895	1158	1495	1693	1856	2064	2238	2427

Source: Annual reports and own analysis

Appendix 7 – Concepts used in the DCF valuation model

Composition of the SG&A and R&D costs of SolarCity: The SG&A expenses are composed essentially by: advertising, promotional and other marketing related expenses, travel and professional services, personnel costs (salaries, bonuses, benefits, sales commissions and stock-based compensations), and allocated corporate overhead costs related with facilities, information technology, asset management, travel and professional services. In the R&D expenses, SolarCity has included also all the personnel costs of the staff allocated to it and all the overhead costs related to facilities and information technology, travel and professional services.

Appendix 8 – Other captions of the DCF Valuation model

4. Other Expenses

Other expenses consist of: franchise taxes, losses on the extinguishment of long-term debt, change in the fair value of interest rate swaps and accrued costs related with the contingent consideration of the Silevo acquisition. The tables XXXVII and XXXVIII presented below show the evolution of this caption. The rational applied was the same that was applied in the R&D costs above. In FY16F it was assumed the same ratio other expenses/sales as in FY15A (6%), and then a reduction of the ratio per year was applied (1%/year) from FY17F until FY20F, keeping from FY20F onwards, the ratio constant at 2% of sales.

Table XXXVII and XXXVIII – Other expenses of SolarCity

Currency: m $	FY10A	FY11A	FY12A	FY13A	FY14A	FY15A	FY16F	FY17F	FY18F	FY19F
Other expense - net	-3	-3	-3	-1	-11	-26	-32	-34	-34	-33
Other expenses/sales		*5%*	*2%*	*1%*	*4%*	*6%*	*6%*	*5%*	*4%*	*3%*

Currency: m $	FY20F	FY21F	FY22F	FY23F	FY24F	FY25F	FY26F	FY27F	FY28F	FY29F
Other expense - net	-29	-36	-43	-51	-61	-72	-86	-98	-108	-119
Other expenses/sales	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*

Source: annual reports and own analysis

5. Minority interest

According to the financial report of the company, the "noncontrolling interests and redeemable noncontrolling interests [minority interests] represents the joint venture and three investor's allocable share in the results of a limited partnership operated by one of our acquired subsidiaries in China". Due to the impossibility of computing a financial model to the subsidiaries and partnerships, and since that doing a forecast of these income based on the sales of SolarCity seemed unrealistic it was assumed a growth at the inflation rate until FY29F, however assuming the same inflation rate from FY20F-FY29F, due to lack of reliable forecasting data, acknowledging an estimation error which will not have a major impact in the DCF model. Below (tables XXXIX and XXXX) it is possible to identify the trend in the minority interest caption in the historical and forecasting period.

Tables XXXIX and XL – Minority interest of SolarCity

Currency: m $	FY10A	FY11A	FY12A	FY13A	FY14A	FY15A	FY16F	FY17F	FY18F	FY19F
Minority interest	8.5	117.2	14.4	96.0	319.2	710.5	718.3	731.2	747.3	764.5

Currency: m $	FY20F	FY21F	FY22F	FY23F	FY24F	FY25F	FY26F	FY27F	FY28F	FY29F
Minority interest	782.9	801.6	820.9	840.6	860.8	881.4	902.6	924.2	946.4	969.1

Source: annual reports and own analysis

Appendix 9 – Effective tax rate

Actually paid taxes: The actually paid taxes are the amounts that the company should pay of taxes minus the accumulated tax credit earned in the previous 7 years. If the accumulated tax credit is higher than the amount owed in taxes in that year, the company will not pay taxes; otherwise it will pay only the difference between both amounts. If the accumulated tax credit is zero, the actually paid taxes is just the effective tax rate multiplied by the taxable income

Tables XLI, XLII and XLIII – Effective tax rate calculation

Currency: 000$	FY10A	FY11A	FY12A	FY13A	FY14A	FY15E	FY16F
Tax benefit at federal statutory rate	-34%	-34%	-34%	-34%	-34%	-35%	-34%
State income taxes(net of federal benefit)	-6%	-5%	-1%	-1%	-2%	-6%	-3%
Foreign income and withholding taxes	0%	0%	0%	1%	0%	0%	0%
Noncontrolling interests and redeemable noncontrolling interests adjustments	11%	19%	-32%	-17%	5%	28%	1%
Investment in certain financing funds	6%	6%	36%	36%	16%	0%	19%
Stock-based compensation	1%	1%	2%	2%	2%	1%	2%
ASC 810 prepaid tax expense	0%	0%	0%	-1%	-5%	-19%	-5%
Purchase accounting adjsutment	0%	0%	21%	0%	0%	0%	4%
Other	2%	1%	1%	-4%	1%	0%	0%
Tax credits	0%	0%	0%	-2%	-1%	-2%	-1%
Change in valuation allowance	20%	10%	7%	5%	10%	34%	13%
Effective tax rate	**0.1%**	**0.1%**	**0.0%**	**-14.0%**	**-6.7%**	**0.4%**	**-4.0%**

Currency: 000$	FY17F	FY18F	FY19F	FY20F	FY21F	FY22F	FY23F
Tax benefit at federal statutory rate	-34%	-34%	-34%	-34%	-34%	-34%	-34%
State income taxes(net of federal benefit)	-3%	-3%	-3%	-3%	-3%	-3%	-3%
Foreign income and withholding taxes	0%	0%	0%	0%	0%	0%	0%
Noncontrolling interests and redeemable noncontrolling interests adjustments	1%	1%	1%	1%	1%	1%	1%
Investment in certain financing funds	10%	10%	10%	10%	10%	10%	10%
Stock-based compensation	2%	2%	2%	2%	2%	2%	2%
ASC 810 prepaid tax expense	-5%	-5%	-5%	-5%	-5%	-5%	-5%
Purchase accounting adjsutment	4%	4%	4%	4%	4%	4%	4%
Other	0%	0%	0%	0%	0%	0%	0%
Tax credits	-1%	-1%	-1%	-1%	-1%	-1%	-1%
Change in valuation allowance	13%	13%	13%	13%	13%	13%	13%
Effective tax rate	**-12.9%**	**-12.9%**	**-12.9%**	**-12.9%**	**-12.9%**	**-12.9%**	**-12.9%**

Currency: 000$	FY24F	FY25F	FY26F	FY27F	FY28F	FY29F
Tax benefit at federal statutory rate	-34%	-34%	-34%	-34%	-34%	-34%
State income taxes(net of federal benefit)	-3%	-3%	-3%	-3%	-3%	-3%
Foreign income and withholding taxes	0%	0%	0%	0%	0%	0%
Noncontrolling interests and redeemable noncontrolling interests adjustments	1%	1%	1%	1%	1%	1%
Investment in certain financing funds	10%	10%	10%	10%	10%	10%
Stock-based compensation	2%	2%	2%	2%	2%	2%
ASC 810 prepaid tax expense	-5%	-5%	-5%	-5%	-5%	-5%
Purchase accounting adjsutment	4%	4%	4%	4%	4%	4%
Other	0%	0%	0%	0%	0%	0%
Tax credits	-1%	-1%	-1%	-1%	-1%	-1%
Change in valuation allowance	13%	13%	13%	13%	13%	13%
Effective tax rate	**-12.9%**	**-12.9%**	**-12.9%**	**-12.9%**	**-12.9%**	**-12.9%**

Source: Annual reports and own analysis

Appendix 10 – Working Capital

Tables XLIV and XLV– Working capital captions

Currency: m$	Dec16F	Dec17F	Dec18F	Dec19F	Dec20F	Dec21F	Dec22F
Accounts receivable	115	143	177	219	271	336	400
Days Sales Outstanding (DSO)	*84*	*84*	*84*	*84*	*84*	*84*	*84*
Rebates receivable - net	51	63	79	97	121	150	178
Days Sales Outstanding (DSO)	*37*	*37*	*37*	*37*	*37*	*37*	*37*
Inventories	391	418	436	439	418	363	248
Days inventory held (DIH)	*385*	*385*	*385*	*385*	*385*	*385*	*385*
Customer notes receivable, net of current portion (MyPower)	342	342	342	342	342	342	342
Days Sales Outstanding (DSO)	*248*	*248*	*248*	*248*	*248*	*248*	*248*
Deferred income tax asset	89	199	305	376	425	454	410
Days Sales Outstanding (DSO)	*64*	*117*	*144*	*144*	*131*	*113*	*86*
Accounts payable	394	421	439	442	422	366	250
Days Payable Outstanding (DPO)	*389*	*389*	*389*	*389*	*389*	*389*	*389*
Accrued compensation	78	83	87	87	83	72	49
Days Payable Outstanding (DPO)	*77*	*77*	*77*	*77*	*77*	*77*	*77*
Accrued expenses	92	98	102	103	98	85	58
Days Payable Outstanding (DPO)	*90*	*90*	*90*	*90*	*90*	*90*	*90*
Accrued warranty	21	23	24	24	23	20	14
Days Payable Outstanding (DPO)	*21*	*21*	*21*	*21*	*21*	*21*	*21*
Accrued professional service fees	10	11	11	11	11	9	6
Days Payable Outstanding (DPO)	*10*	*10*	*10*	*10*	*10*	*10*	*10*
Current portion of deferred revenue	153	164	171	172	164	143	97
Days Payable Outstanding (DPO)	*151*	*151*	*151*	*151*	*151*	*151*	*151*
Customer deposits	22	23	24	24	23	20	14
Days Payable Outstanding (DPO)	*21*	*21*	*21*	*21*	*21*	*21*	*21*
Total Working Capital	**219**	**343**	**480**	**609**	**754**	**929**	**1090**
Changes in Working Capital	**12**	**124**	**138**	**129**	**144**	**175**	**161**

Currency: m$	Dec23F	Dec24F	Dec25F	Dec26F	Dec27F	Dec28F	Dec29F
Accounts receivable	476	567	675	803	917	1009	1110
Days Sales Outstanding (DSO)	*84*	*84*	*84*	*84*	*84*	*84*	*84*
Rebates receivable - net	212	252	300	357	408	449	493
Days Sales Outstanding (DSO)	*37*	*37*	*37*	*37*	*37*	*37*	*37*
Inventories	295	351	418	498	568	625	688
Days inventory held (DIH)	*385*	*385*	*385*	*385*	*385*	*385*	*385*
Customer notes receivable, net of current portion (MyPower)	342	342	342	342	342	342	342
Days Sales Outstanding (DSO)	*248*	*248*	*248*	*248*	*248*	*248*	*248*
Deferred income tax asset	259	71	0	0	0	0	0
Days Sales Outstanding (DSO)	*45*	*11*	*0*	*0*	*0*	*0*	*0*
Accounts payable	297	354	422	502	573	630	693
Days Payable Outstanding (DPO)	*389*	*389*	*389*	*389*	*389*	*389*	*389*
Accrued compensation	59	70	83	99	113	124	137
Days Payable Outstanding (DPO)	*77*	*77*	*77*	*77*	*77*	*77*	*77*
Accrued expenses	69	82	98	117	133	147	161
Days Payable Outstanding (DPO)	*90*	*90*	*90*	*90*	*90*	*90*	*90*
Accrued warranty	16	19	23	27	31	34	38
Days Payable Outstanding (DPO)	*21*	*21*	*21*	*21*	*21*	*21*	*21*
Accrued professional service fees	7	9	11	13	14	16	17
Days Payable Outstanding (DPO)	*10*	*10*	*10*	*10*	*10*	*10*	*10*
Current portion of deferred revenue	116	138	164	195	223	245	270
Days Payable Outstanding (DPO)	*151*	*151*	*151*	*151*	*151*	*151*	*151*
Customer deposits	16	19	23	27	31	34	38
Days Payable Outstanding (DPO)	*21*	*21*	*21*	*21*	*21*	*21*	*21*
Total Working Capital	**1003**	**891**	**911**	**1020**	**1116**	**1193**	**1278**
Changes in Working Capital	**-87**	**-111**	**20**	**109**	**96**	**77**	**85**

Source: annual reports and own analysis

Appendix 11 – Capital Expenditures

Tables XLVI, XLVII and XLVIII – Detail of the investment in Solar systems leased and to be leased

Solar Energy Systems, leased and to be leased - net	Dec11A	Dec12A	Dec13A	Dec14A	Dec15E	Dec16F
Solar energy systems leased to customers	441	878	1514	2389	3619	4027
(+) Initial direct costs related to customer solar energy system lease acquisition costs	24	54	94	208	384	299
	465	**932**	**1608**	**2596**	**4003**	**4326**
(-) Accumulated depreciation	-18	-44	-86	-159	-275	-215
	447	**888**	**1522**	**2437**	**3728**	**4112**
(+) Solar energy systems under construction	58	44	53	131	358	298
(+) Solar energy systems to be leased to customers	30	52	108	229	290	302
Solar energy systems, leased and to be leased - net	**536**	**984**	**1683**	**2797**	**4376**	**4712**

Solar Energy Systems, leased and to be leased - net	Dec17F	Dec18F	Dec19F	Dec20F	Dec21F	Dec22F	Dec23F
Solar energy systems leased to customers	4736	5556	6499	7578	8805	9863	11010
(+) Initial direct costs related to customer solar energy system lease acquisition costs	352	413	483	563	654	732	818
	5088	**5968**	**6982**	**8141**	**9459**	**10596**	**11828**
(-) Accumulated depreciation	-252	-296	-346	-404	-469	-525	-586
	4836	**5672**	**6635**	**7737**	**8990**	**10070**	**11241**
(+) Solar energy systems under construction	351	411	481	561	652	730	815
(+) Solar energy systems to be leased to customers	356	417	488	569	661	740	826
Solar energy systems, leased and to be leased - net	**5542**	**6501**	**7604**	**8867**	**10302**	**11541**	**12883**

Solar Energy Systems, leased and to be leased - net	Dec24F	Dec25F	Dec26F	Dec27F	Dec28F	Dec29F
Solar energy systems leased to customers	12240	13690	15252	16606	17827	19367
(+) Initial direct costs related to customer solar energy system lease acquisition costs	909	1016	1132	1233	1324	1438
	13149	**14706**	**16385**	**17839**	**19150**	**20805**
(-) Accumulated depreciation	-652	-729	-812	-885	-950	-1032
	12497	**13977**	**15572**	**16955**	**18201**	**19773**
(+) Solar energy systems under construction	906	1013	1129	1229	1320	1434
(+) Solar energy systems to be leased to customers	919	1028	1145	1247	1338	1454
Solar energy systems, leased and to be leased - net	**14322**	**16018**	**17846**	**19431**	**20858**	**22661**

Tables XLIX, L and LI – Weights used for the forecast calculation of Solar energy systems, leased and to be leased investment

	Dec11A	Dec12A	Dec13A	Dec14A	Dec15E	Dec16F
Accumulated amortization/other intangibles	0%	0%	3%	12%	31%	15%
Accumulated D&A/PPE	55%	64%	74%	38%	18%	48%
Depreciation/solar energy systems leased to customers	4%	4%	5%	6%	7%	5%
Solar energy systems leased to customers/sales	741%	692%	924%	937%	906%	800%
Initial direct costs/solar energy systems leased to customers	5%	6%	6%	9%	11%	7%
Systems under contruction/solar energy systems leased to customers	13%	5%	4%	5%	10%	7%
Solar systems to be leased/solar energy systems leased	7%	6%	7%	10%	8%	8%

	Dec17F	Dec18F	Dec19F	Dec20F	Dec21F	Dec22F	Dec23F
Accumulated amortization/other intangibles	15%	15%	15%	15%	15%	15%	15%
Accumulated D&A/PPE	48%	48%	48%	48%	48%	48%	48%
Depreciation/solar energy systems leased to customers	5%	5%	5%	5%	5%	5%	5%
Solar energy systems leased to customers/sales	760%	720%	680%	640%	600%	565%	530%
Initial direct costs/solar energy systems leased to customers	7%	7%	7%	7%	7%	7%	7%
Systems under contruction/solar energy systems leased to customers	7%	7%	7%	7%	7%	7%	7%
Solar systems to be leased/solar energy systems leased	8%	8%	8%	8%	8%	8%	8%

	Dec24F	Dec25F	Dec26F	Dec27F	Dec28F	Dec29F
Accumulated amortization/other intangibles	15%	15%	15%	15%	15%	15%
Accumulated D&A/PPE	48%	48%	48%	48%	48%	48%
Depreciation/solar energy systems leased to customers	5%	5%	5%	5%	5%	5%
Solar energy systems leased to customers/sales	495%	465%	435%	415%	405%	400%
Initial direct costs/solar energy systems leased to customers	7%	7%	7%	7%	7%	7%
Systems under contruction/solar energy systems leased to customers	7%	7%	7%	7%	7%	7%
Solar systems to be leased/solar energy systems leased	8%	8%	8%	8%	8%	8%

The weights based on sales, were first computed in the historical period for the solar systems already leased. For the rest of the captions, weights based on the systems already leased were computed, in the historical period. For FY16F it was assumed the average of the previous 4 years. For all the captions it was assumed the weight to stay at the average level, with the exception of the main caption (solar systems already leased). For this, it was assumed a reduction in the ratio of the sales, since the company would not need to hold such a high percentage along all the years of activity. It did not seem reasonable for the company to hold 906% of sales in assets and be able to grow with such a high investment, since the company is able to specialize and create efficiencies that will allow to hold a lower percentage of assets (however, still growing as sales grow). In the last period of the forecasting period (Dec29F), Solar energy systems are 400% of the sales of the company.

Appendix 12 – Depreciation and amortization

For the total depreciation and amortization of SolarCity, this study considered: Goodwill and other intangibles, Property, Plant and Equipment and the Solar Energy Systems leased and to be leased. In order to calculate the value of the depreciation and amortization it was considered its percentage over the total value of the assets. So, in the first place, to calculate the depreciation of PPE, the historical weight of the depreciation over the PPE in the four previous years was considered, and the average for FY16F (48 %) was assumed. This value was then kept constant until the end of the forecasting period.

For the Goodwill and intangible assets, the process was the same, resulting in an average historical amortization of 15%, which was assumed constant until the end of the forecasting period.

For the Solar Systems, the weight of the depreciation was computed in relation to the Solar Systems already leased to customers, as explained in point **8. Capital Expenditures**, with an average value of 5%.

After applying this rational, the values presented in table XIV and XV, were concluded.

Table LII and LIII – Total depreciation and amortization of SolarCity

Currency: m $	Dec10A	Dec11A	Dec12A	Dec13A	Dec14A	Dec15A	Dec16F	Dec17F	Dec18F	Dec19F
Accumulated amortization	n.a.	0	0	3	28	62	42	52	64	80
Accumulated amortization/other intangibles	n.a.	*0%*	*0%*	*3%*	*12%*	*31%*	*15%*	*15%*	*15%*	*15%*
Accumulated D&A	n.a.	8	13	19	31	54	75	92	115	142
Accumulated D&A/PPE	n.a.	*55%*	*64%*	*74%*	*38%*	*18%*	*48%*	*48%*	*48%*	*48%*
Depreciation Solar energy systems	n.a.	18	44	86	159	275	215	252	296	346
Depreciation/solar energy systems leased to customer	n.a.	*4%*	*4%*	*5%*	*6%*	*7%*	*5%*	*5%*	*5%*	*5%*
Total depreciation and amortization	**n.a.**	**26**	**57**	**109**	**217**	**391**	**331**	**397**	**475**	**568**

Currency: m $	Dec20F	Dec21F	Dec22F	Dec23F	Dec24F	Dec25F	Dec26F	Dec27F	Dec28F	Dec29F
Accumulated amortization	99	122	145	173	206	245	292	333	367	403
Accumulated amortization/other intangibles	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*
Accumulated D&A	176	218	259	308	367	437	520	594	653	719
Accumulated D&A/PPE	*48%*	*48%*	*48%*	*48%*	*48%*	*48%*	*48%*	*48%*	*48%*	*48%*
Depreciation Solar energy systems	404	469	525	586	652	729	812	885	950	1032
Depreciation/solar energy systems leased to customer	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*
Total depreciation and amortization	**678**	**809**	**930**	**1068**	**1225**	**1411**	**1625**	**1812**	**1970**	**2154**

Source: own analysis and SolarCity annual reports

Appendix 13 – Closing price data and Debt Value

In Debt/(Debt+Equity), , Equity was calculated based on the market capitalization of the company in end of the period, and debt as market value. Please find below the data used.

Tables LIV and LV – Calculation of market capitalization

Closing price

Annual data	Close price
Dec15E	51.02
Dec14A	53.48
Dec13A	56.82
Dec12A	11.93

Number of shares

Units: #000	FY10A	FY11A	FY12A	FY13A	FY14A	FY15E
Basic	8584	9978	14240	79782	93334	97027

Market capitalization

Currency: 000$	Dec11A	Dec12A	Dec13A	Dec14A	Dec15A
Market cap	n.a.	169885.4	4533212	4991496	4950339

Table LVI – Calculation of market value of debt

Currency: 000$	Dec11A	Dec12A	Dec13A	Dec14A	Dec15A
Loan - revolver Line 1 year	0	0	161	161	161
Loan - Delay Draw Term Loan	0	0	0	125	125
Other Loan - Project Finance	0	0	0	58	58
SCTY 2.7500 01-Nov-18 CVT	0	0	275	248	221
SCTY 1.6250 01-Nov-19 CVT	0	0	0	581	362
Notes	0	0	0	0	435
Working capital facility	11	10	0	0	0
Vehicles and other loans	3	8	0	0	0
Inventory purchase	0	59	0	0	0
Financing obligation	62	141	79	73	69
Total	**76**	**217**	**514**	**1246**	**1430**

Appendix 14 – Macroeconomic data

Tables LVII and LVIII - GDP and Inflation rate

Inflation rate, average consumer prices (Annual percent change)	2008	2009	2010	2011	2012	2013	2014	2015
USA	4%	0%	2%	3%	2%	2%	2%	0%
World	6%	3%	4%	5%	4%	4%	4%	3%
Inflation rate, end of period consumer prices (Annual percent change)	2008	2009	2010	2011	2012	2013	2014	2015
USA	1%	2%	2%	3%	2%	1%	1%	1%
World	5%	3%	5%	5%	4%	4%	3%	4%
Real GDP growth (Annual percent change)	2008	2009	2010	2011	2012	2013	2014	2015
USA	0%	-3%	3%	2%	2%	2%	2%	3%
World	3%	0%	5%	4%	3%	3%	3%	3%
Nominal GDP (Billions of U.S. dollars)	2008	2009	2010	2011	2012	2013	2014	2015
USA	14718.58	14418.73	14964.4	15517.93	16155.25	16663.15	17348.08	17968.2
World	63014.31	59682.89	65338.93	72422.52	73777.26	75467.07	77269.17	73506.82

Inflation rate, average consumer prices (Annual percent change)	2016	2017	2018	2019	2020	Average
USA	1%	2%	2%	2%	2%	**2.0%**
World	3%	4%	4%	4%	4%	**3.5%**
Inflation rate, end of period consumer prices (Annual percent change)	2016	2017	2018	2019	2020	Average
USA	1%	2%	2%	2%	2%	**2.1%**
World	4%	4%	3%	4%	4%	**3.5%**
Real GDP growth (Annual percent change)	2016	2017	2018	2019	2020	Average
USA	3%	3%	3%	2%	2%	**2.5%**
World	4%	4%	4%	4%	4%	**3.9%**
Nominal GDP (Billions of U.S. dollars)	2016	2017	2018	2019	2020	Average
USA	18697.92	19555.87	20493.25	21404.19	22294.11	**20489.07**
World	76321.32	80719.6	85436.68	90575.15	96193.5	**85849.25**

Source: IMF World Economic Outlook October 2015

Appendix 15 – Recommendation criteria

Table LIX – Recommendation criteria

Rating	Scale
Strong buy	>60%
Buy	>30% and <60%
Hold	>-7.5% and <30%
Sell	<-15% and >-7.5%
Strong sell	<-15%

Source: own analysis

Appendix 16 – Peer group selection criteria

In order to reach a peer group for SolarCity, four criteria were applied in the first place to narrow the number of possible firms. The first criterion applied was related with the industry where the company operates. In order to not narrow too much the peer group to only renewable energy companies, and since in some databases SCTY does not appear only has a renewable energy company, the industries considered were: automobiles & auto parts, electric utilities & IPPs, machinery, tools and heavy machinery, oil & gas, semiconductors & semiconductor equipment, Residential & Commercial REITs, Homebuilding & Construction Supplies and Software & IT Services. In a second degree, companies should all have the headquarters in the United States of America, being this a criteria to narrow by geography, since almost the entire operations of SCTY are in the USA and it would not make sense to have companies from other countries included in the analysis. The third criteria is related with Total Assets, restricting this to a value higher than 1, which will eliminate companies with no assets registered or companies to which the databases could not access. The final criterion applied in the first stage was the value of the beta of each company, which could not be null. After applying these three restrictions, a number of 33 companies were found.

The second degree of selection in the peer group was to apply the absolute difference between the total assets of each company and the total assets of SCTY being computed, followed by the difference between the absolute ROA of each company and the absolute ROA of SCTY.

This was performed for each of the 33 companies, and in the end a ranking system was applied, being the number 1 attributed to the company with the smallest difference against SCTY in each of the criteria. Given the ranking for the two measures, it was then summed both and a second

ranking applied, being the number 1, the company with the lowest sum in both the criteria, and the 10 companies with the lowest sum were selected as the peer group of SolarCity.

Appendix 17 – DCF sensitivity analysis

Tables LX and LXI– Sensitivity analysis to market risk premium and tax rate level

Sensitivity analysis to market risk premium		
Change (%)	EV ($m)	P/share ($)
-1.0%	6279	64.71
-0.5%	4786	49.33
0.0%	**3542**	**36.50**
+0.5%	2493	25.69
+1.0%	1600	16.49

Sensitivity analysis to tax rate		
Change (%)	EV ($m)	P/share ($)
-1.0%	3598	37.08
-0.5%	3570	36.79
0.0%	**3542**	**36.50**
+0.5%	3513	36.21
+1.0%	3485	35.92

Sensitivity analysis to Sales growth		
Change (%)	EV ($m)	P/share ($)
-2%	4863	50.12
-1%	4266	43.96
***0%**	**3542**	**36.50**
1%	2684	27.66
2%	1674	17.25

Source: own analysis
**The variation of was performed in every year of the forecasting period*

Appendix 18 – EVA sensitivity analysis

Table LXII, LXIII, LXIV, LXV, LXVI and LXVII – Sensitivity analysis performed in the EVA Model

Sensitivity analysis to Total Equity		
Change (%)	EV ($m)	P/share ($)
-200	3917	40.37
-100	3796	39.12
*0	3675	**37.88**
+100	3554	36.63
+200	3433	35.38

Sensitivity analysis to New debt		
Change (%)	EV ($m)	P/share ($)
-1000	4884	50.34
-500	4280	44.11
*0	3675	**37.88**
+500	3070	31.64
+1000	2466	25.41

Sensitivity analysis to growth rate		
Change (%)	EV ($m)	P/share ($)
-1.0%	3149	32.45
-0.5%	3397	35.02
0.0%	**3675**	**37.88**
+0.5%	3987	41.09
+1.0%	4339	44.72

Sensitivity analysis to ROIC		
Change (%)	EV ($m)	P/share ($)
-2%	2017	20.79
-1%	2846	29.33
*0%	3675	**37.88**
+1%	4504	46.42
+2%	5333	54.96

Sensitivity analysis to economic profit		
Change (%)	EV ($m)	P/share ($)
-200	1591	16.39
-100	2633	27.13
*0	3675	**37.88**
+100	4717	48.62
+200	5759	59.36

Sensitivity analysis to WACC		
Change (%)	EV ($m)	P/share ($)
-1%	6160	63.49
-0.5%	4833	49.81
0.0%	**3675**	**37.88**
+0.5%	2656	27.38
+1%	1755	18.09

Source: own analysis

*The variation mentioned was considered in every year

Appendix 19 – Glossary

Feed-in tariff: Payment made for all the electricity produced and for energy exported to the National grid. These payments are available to all the population. These tariffs were introduced in the UK with the objective of boosting renewables' production to a total of 15% of the total energy produced.

ITC (Income tax credit): The ITC is a 30 percent tax credit for solar systems on residential and commercial properties. http://www.seia.org/policy/finance-tax/solar-investment-tax-credit

PTC: Production Tax Credit. Associated more with wind renewable energy

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