SunEdison

The Rise and Fall of the World’s Largest Renewable Energy Company

Introduction

On April 21, 2016, SunEdison Inc. filed for bankruptcy. Although the company’s roots can be traced back over fifty years, within nine months SunEdison went from being worth almost $10 billion, with shares trading at $33.44 in July 2015, to only $400 million. At one point, SunEdison was the largest renewable asset developer in the world, hailed by leaders in both the private and public sector. Now the progressive giant has left creditors to pick up the pieces of a failed firm in an otherwise solvent industry, marred by lawsuits, inter-company agreements, failed acquisitions and an overwhelming $16.1 billion in liabilities. Over the course of this paper, we will examine the factors which led to SunEdison’s rapid decline and bankruptcy, the predictability of key events and related impact to stakeholders, as well as current developments in the ongoing Chapter 11 process.

Early History

SunEdison originally was formed in 1959 with the establishment of the Monsanto Electronic Material Company (MEMC), a division of the multinational Monsanto Corporation. Initially, its business pioneered and focused on the manufacturing of silicon-wafers for semiconductors in the burgeoning electronics industry. MEMC steadily grew throughout the 1970s but encountered increased competition from Japan in the 1980s that ultimately led to consistent operating losses. As a result, Monsanto decided to divest the business unit in the late 1980s, selling MEMC to Huls AG, the chemicals unit of German conglomerate VEBA. For the next several years, MEMC continued advancing polysilicon wafer technology, eventually filing an initial public offering on the NYSE in 1995, raising approximately $400 million for the purposes of financing aggressive growth with VEBA and Huls AG retaining a majority interest in the new public company.

Business conditions deteriorated significantly for MEMC during the cyclical downturn of the late 1990s with the firm recording large losses. After VEBA had been merged with VIAG to create one of the largest publicly-traded electric utilities companies in the world, MEMC was put up for sale in a push by management to divest non-core assets in 1999. Ironically, its first brush with bankruptcy saved MEMC as a corporation. A buyer for the firm did not emerge until mid-2001, two years after it had first been put up for sale, when it was announced that the company was on the verge of illiquidity. This attracted distressed buyers and allowed MEMC to narrowly escape default when Texas Pacific Group (TPG) bought out the
VEBA/VIAG stake for $6 in cash, a dollar for each legal entity, plus a $150 million line of credit.\textsuperscript{40} TPG would significantly restructure the business, restructuring debt, providing additional liquidity and executing a large-scale reduction in the workforce to turn the company around. Most importantly, with the appointment of Nabeel Gareeb as CEO in 2002 MEMC’s turnaround began to take hold. The company would return to profitability in 2003, just two quarters after Gareeb became CEO, and would reach $1 billion in sales by 2004\textsuperscript{47}. TPG reduced its then 90 percent stake in the business through a secondary offering in February of 2005 to 34 percent and later in 2007 to 0 percent, returning $4 billion in total to shareholders before taxes.\textsuperscript{40}

**Modern SunEdison**

Beginning in 2006, MEMC entered the solar energy market at a large scale by supplying polysilicon solar wafers to entities that were constructing solar energy plants. As large government subsidies sparked a frenzy in solar power ventures, the company began making long term agreements with solar developers, such as Suntech Power (China)\textsuperscript{48} and Gintech (Taiwan)\textsuperscript{49}, to supply solar-grade silicon wafers in addition to their electronic chip clients. MEMC continued to grow its solar wafer business over the next few years with similar contracts for Conergy (Germany)\textsuperscript{50} and Tainergy Tech (Taiwan).\textsuperscript{51}

The success of this transition into the solar industry led to the significant success of MEMC as a firm. Only a few companies worldwide were able to supply the black poly mineral to solar and electronic firms, and high barriers to entry for potential entrants including equipment costs of hundreds of millions and months/years of development prior to production barred the industry from competition.\textsuperscript{40} As the supply of polysilicon was not able to keep up with demand from both the electronics and solar industries, prices jumped tenfold and MEMC, as holder of 14 percent of the world’s polysilicon, benefitted greatly.\textsuperscript{40} The deals mentioned above provide evidence of this supplier power. The geographic diversity of the firms MEMC executed contracts with reflected not only the ability of MEMC to diversify its client base, betting on different producers of solar power, but also its ability to extract a premium from clients. MEMC reportedly received not only a 30-40 percent premium on contracts from Suntech and Gintech, but also received a 5 percent and 10 percent equity stake in the firms, respectively.\textsuperscript{40}

Building upon this success, MEMC attempted to move vertically into the sector at an aggressive pace. In July 2009, MEMC and Q-Cells (builder and operator of photovoltaic power plants) formed a joint venture to build a 50MW plant in Germany and sell it, upon completion, to an investment firm. This was the first time in SunEdison’s history that we can see an early form of the developer-holding-company and operator-yielding-company economic models begin to emerge.\textsuperscript{46}

Later in 2009, MEMC purchased SunEdison LLC, the largest solar energy provider in North America at the time, for $200 million (70 percent in cash and 30 percent in MEMC stock).\textsuperscript{52} SunEdison was founded in 2003 and had been engaged in the development of large
scale photovoltaic power plants, offering financing, operations, monitoring and construction of the power plants for a variety of commercial customers including government agencies, utilities and businesses. Interestingly, in its early days, SunEdison was the first business to offer residential customers financing options for rooftop solar energy systems instead of outright purchases, often seen as a major impediment to consumer adoption. The combined company would now more closely approximate a vertically integrated solar plant developer with the ability to both source the silicon wafers as well as finance, build, operate and maintain the plants (though this organizational structure would not last long).

The joint venture with Q Cells and the SunEdison purchase, orchestrated by the company’s newly appointed President and CEO Ahmad Chatila (Nabeel Gareeb relinquished his role in 2008 and Chatila began in February of 2009), marks the beginning of a fundamental shift for the company. With the arrival of Ahmad, SunEdison took on a new aggressive and acquisitive style, which saw it deepen its market penetration in North America with the addition of various solar development businesses, acquire advanced materials companies to reduce the cost of solar panels and even expand into other sectors of renewable energy with the purchase of First Wind in November of 2014. While Gareeb’s legacy was of turning the distressed firm into an almost cash cow, a powerful supplier of two high-growth, large market industries, Chatila envisioned his would be transforming this “boring” materials supplier into the leading renewable asset developer in the world. In retrospect, it is this hiring and strategy that is at the core of SunEdison’s rapid ascent and descent - they grew too fast, acquired too aggressively, and moved in too many directions while employing a management team that was too short-sighted and ambitious to believe the warning signs. Combined with low interest rates, financial engineering, a flood of hedge fund capital, and analyst support from Wall Street, the firm’s trajectory seemed all but destined for Chapter 11.

**HoldCo and YieldCo**

In March of 2013, MEMC officially changed it’s name to SunEdison, Inc. in an effort to reflect its repositioning to focus on solar energy development. After a relatively quiet year in 2013, the company exploded with 9 purchases in 2014, accelerating to 18 deals in 2015. During this time, acquisitions spanned the range from early stage battery technology ventures to solar energy system installers. SunEdison would also end up spinning off the old MEMC’s electronics-wafer manufacturing business (the company’s original focus), retaining the solar-wafer and solar-energy components, and using the proceeds from the IPO to continue to fuel growth. Most notably, the company made a relatively gigantic $2.4 billion acquisition of First Wind in January of 2015, yet another indicator of how CEO Ahmad Chatila’s reach extended beyond his grasp.

Such high levels of acquisition activity, combined with the company’s aggressive solar energy development output, required a steady influx of fresh capital. To fuel their growth,
SunEdison turned to a recently popularized trend in the energy industry: the YieldCo. The company’s plan was to bifurcate its operations between the riskier development of solar power plants and the less risky operation of completed solar power plants - the corollary in the oil and gas industry would be that of an exploration and production company vs a Master Limited Partnership (MLP) in the pipeline business. To that end, SunEdison began by launching TerraForm Power in July of 2014. The company would be publicly traded, raising $565 million in an oversubscribed IPO of all of its Class A shares and a subsequent private stock sale. Terraform Power was intended to be the captive buyer for SunEdison’s completed power plant development projects in developed countries, primarily North America, UK, and Chile, with the IPO proceeds providing the initial capital for the first group of such transactions. Shareholders of Terraform Power would then receive dividends from these completed projects, while growth investors would invest in SunEdison projects. While Class A shareholders would hold 19.9 percent of the economic interest in the entity, they would hold only 2.8 percent of the voting interest of Terraform Power. SunEdison, the controlling shareholder with Class B shares, would hold an overwhelming 95.2 percent voting interest. SunEdison would subsequently create a similar entity for international development projects with TerraForm Global whose IPO priced on July 31, 2015, to a significantly less enthusiastic market (and remarkably, less than one year prior to SunEdison’s bankruptcy filing).

Investors flocked to these types of assets because of their perceived stability and high dividend payout ratios (yield company assets were operational, not development stage, with established long-term PPAs). As more investors piled in, asset prices rose as did the expectation of dividend growth. For such businesses, dividend growth comes primarily from asset growth, and asset growth comes from either acquisitions of existing businesses or development of new power projects, all of which require one thing: capital.

In addition to this reliance on capital, one small difference in the structure of the TerraForm YieldCos would have a major impact on later developments during the decline of SunEdison. The subsidiary entities were provided with their own, separate management team, independent of SunEdison, as well as a Board of Directors with a majority of independent directors (although a majority of 5 directors were either from SunEdison or a nominee of SunEdison). While perhaps seen as inconsequential at the time, this exception would create a dynamic that would accelerate the momentum of the decline of the firm.

**Vivint Acquisition**

On July 20, 2015, preceding the July 31 IPO of TerraForm Global, SunEdison announced that it was in talks to purchase Vivint Solar for $2.2 billion, one of the largest installers of residential rooftop solar panels in the United States. As part of the proposed transaction, TerraForm Power would be required to acquire all current and future Vivint development projects. Recall that TerraForm Power had, thus far, been the landing spot for
SunEdison’s large-scale, consolidated commercial solar energy systems, power from which was sold to utilities under long-term contracts. Critically, these projects were significantly less risky than the small-scale, distributed residential solar systems, Vivint’s main operating business.

To further complicate matters, SunEdison had IDR, or incentive distribution rights, which were designed to push an increasing share of TerraForm dividends up to SunEdison as those dividends grew. Under this structure, SunEdison’s share of TerraForm dividends peaked at 50 percent of distributions above 45.14 cents per share, thus creating huge incentive for SunEdison to grow the size of the assets in the TerraForm YieldCos as quickly as possible to benefit from the maximum cash allocation.\(^{11}\) This structure was unique to TerraForm Power and TerraForm Global amongst other YieldCos in existence, and is one of the key reasons for the eventual breakdown of the business as the IDR created a disconnect in the incentives of SunEdison and its captive buyers. Ultimately, this was likely one of the primary contributing factors that led SunEdison to seek aggressive dividend growth by investing outside of its core business in the purchase of First Wind and subsequent attempted purchase of Vivint Solar.

The other important consideration with respect to Vivint was the deal structure, whereby the planned transfer of Vivint’s assets into TerraForm Power was done in the form of a take-or-pay arrangement for some 523MW or $922 million. Further, the deal would have required TerraForm Power to purchase up to 450MW a year from Vivint projects going forward.\(^{12}\) Such requirements were a draconian way of dealing with a related party and it generated obvious resistance from TerraForm Power’s independent management, board of directors and third-party shareholders, who were reluctant to continue taking on assets and debt at the pace that SunEdison expected. In fact, the CEO and CFO recommended to the Board that they reject SunEdison’s proposed terms from the Vivint deal. SunEdison dealt with the problem in November of 2015 by forcing out two independent directors as well as the CEO and CFO. In the end, it would be this breakdown in the relationship between SunEdison and its ‘captive’ YieldCos that would tip the scales and send the company spiralling into bankruptcy.

**Stock Collapses**

Prior to the Vivint Transaction, after the success of the TerraForm Power IPO, one which was 20x oversubscribed, SunEdison was able grow and expand freely. This invigorated SunEdison CEO Chatila and intensified his thirst for more deals and expansion. He began speaking with investment banks about creating a slew of YieldCos. In 2015, SunEdison-affiliated entities accounted for over half of all YieldCo funds raised. As SunEdison began picking up more and more projects, standards slipped. At one point, J.P. Morgan Chase & Co. pulled financing from future SunEdison projects due to unease with company’s deal-vetting practices.\(^{20}\)

The Vivint deal marked the beginning of the end for SunEdison. Upon the announcement of the deal (which used a combination of cash, equity and debt) on July 20, 2015, the company’s share price plummeted from over $30 per share in mid-July to approximately $10
per share in mid-August (refer to Figure 1 for historical share price). The Terraform Global IPO, which was supposed to fuel another engine of growth for SunEdison as a YieldCo of renewable-energy projects within emerging markets, flopped. After initially planning to offer 56.6 million shares at $19 to $21 per share, the IPO raised only $675 million with 45 million shares at $15 per share and a private placement of $67.5 million - well below what the company had hoped for on July 31, 2015. SunEdison once again was forced to wade into the capital markets on August 18, 2015 with an issuance of 650,000 shares of Convertible Preferred Stock at $1,000 per share with a steeper preferred dividend of 6.75 percent, adding to its large list of existing commitments.

![Figure 1. Historical share price, January 2014 - November 2016](image)

In October of 2015, the company officially announced that it was cutting 1000 jobs, or about 15 percent of its 7300 person workforce. Further, SunEdison, who had agreed in May to purchase Latin America Power from a private equity company for $700 million, was sued after the deal fell apart because they failed to make a $400 million cash payment due on September 30th. While media outlets reported sources had indicated that SunEdison lacked the cash for the payments, management insisted that the company was better than ever and that the reasoning for Latin America Power was due to breach of contract. Irrespective, these events are notable in that they were the company’s first outward indication of perhaps real liquidity trouble.

Despite management’s positive spin, at this point in time the market had clearly become concerned with the growing disconnect between the company’s cash generation ability versus its impending debt repayments. Add to that SunEdison’s appetite for acquisitions and it is clear why investors drove the stock price down by nearly 70 percent in one month. For some additional perspective on SunEdison’s aggressive approach, consider the following fact pattern. In the span of a few months in 2015, SunEdison publicly announced: (1) a plan to invest $15 billion in India by 2022, (2) purchased a $2 billion portfolio of wind energy assets from Invenergy, (3) agreed to purchase Latin America Power for $700 million, and (4) made the initial $2.2 billion offer to acquire Vivint Solar. More amazingly, after the market let them know
how they felt about the Vivint transaction, SunEdison dealmakers continued along agreeing to purchase a 1/3rd stake in Dominion Resources for $300. The speed of and focus on deal execution and entity creation draws startling similarities to another energy business from the past: Enron. Considering that SunEdison had not generated positive cash flow from operations since FY 2010, it is easy to understand why investors grew increasingly concerned at the stretched balance sheet.

**The Decline**

Commitments made to finance the First Wind acquisition would come to haunt SunEdison shortly after that transaction closed. To finance part of the consideration paid, SunEdison had borrowed against its shares in TerraForm Power, whose share price had fallen steeply along with SunEdison and the wider energy market. This loan, termed the “Margin Loan” in bankruptcy documents, was scheduled to mature on January 29, 2017 and included provisions requiring cash collateralization and/or repayments if the value of TerraForm Power shares were to fall below a certain threshold. In September 2015, TerraForm Power shares fell below the set threshold, forcing SunEdison to either meet the required margin call or immediately repay the entire loan of approximately $431 million. This all came to a head when Highbridge Capital, the hedge fund who owned the loan, issued a margin call of $100 million due by the afternoon of November 20th 2015. With only $90 million in cash reserves at the time, SunEdison attempted to leverage its unique relationship with TerraForm Global to force an advance of $231 million in exchange of Indian power plants that SunEdison was developing.

Similar to the corporate governance requirements for asset dropdowns to TerraForm Power, this transaction had to be approved by a committee of TerraForm Global’s independent directors. Ultimately, the committee rejected the transaction on the grounds that the plants were not appropriate projects for TerraForm Global’s portfolio. Incidentally, this liquidity issue coincided with SunEdison’s efforts to require TerraForm Power’s participation in the Vivint Solar acquisition as previously discussed, and in a decisive turn of events, SunEdison completely replaced each of the YieldCos independent directors as well as their CEOs and CFOs. This left SunEdison in complete control of both YieldCos, allowing for the advance and transfer of Indian power assets to proceed. While SunEdison was eventually able to source the liquidity needed to meet the margin call, its abuse of its relationship with both TerraForm Global and TerraForm Power to force transactions did not go unnoticed by shareholders of either company, a revelation that would ultimately form the basis of David Tepper’s efforts to derail the proposed Vivint Solar acquisition.

In December of 2015, SunEdison revised the terms of its acquisition offer for Vivint Solar in an effort to appease investors. The revisions included reducing the amount of cash that SunEdison would pay by $2 per share, as well as reducing the overall consideration from $16.50 per share to approximately $12.35 per share. In addition, the $3.31 worth of convertible notes per
share to be paid to Vivint stockholders would now mature in 4 years instead of 5 years. While the share prices of both companies jumped upon announcement, the positive movement proved unsustainable as resistance to the deal remained strong from SunEdison of creating massive conflicts of interest for TerraForm Power by utilizing it as a dumping ground for bad acquisitions and overvalued renewable energy assets. Tepper pulled no punches in his comments:

“Disclosure of the precise details of this acquisition plan is long overdue, as well. So too, are the details surrounding the distinct possibility that TERP will be forced to accept a note from SUNE (which is of dubious credit quality and market value) due to a shortfall in the market value of the assets to be delivered in the first leg of the VSLR portfolio transaction relative to the $922 million purchase price (i.e., the "Advanced Amount" mandated under the Summary of the Note Terms in Exhibit E to the Purchase Agreement between SUNE and TERP). Given the erosion in the market value of comparable rooftop operators to VSLR (SunRun and SolarCity, for example) the face value of that note will likely need to be considerable (but of suspect worth given the obligor).”

In January 2016, as previously mentioned, Tepper and Appaloosa Management sued to block the transaction even under the revised terms. SunEdison had already significantly stressed TerraForm Power’s balance sheet earlier in the year when it bought $2 billion worth of mainland wind assets from Invenergy and dropped the assets and debt down to the YieldCo. The combination of the Invenergy assets and the proposed Vivint acquisition assets being pushed down to TerraForm led to a large ratings downgrade of TerraForm Power from Moody’s in December of 2015, even before the deal was finalized. As owners of common and notes in TerraForm Power, it is easy to see why Tepper and other shareholders were up in arms over SunEdison’s behavior. Despite all of this, SunEdison was able to price a $725 million second-lien secured term loan and engage in several debt-for-equity transactions in an attempt to stabilize the company’s balance sheet that was dangerously low on operating liquidity. A more detailed discussion of these financing packages follows later in the report.

It is at this point that SunEdison went into terminal decline as problems began cascading with one negative event contributing to the start of another. In January, Steve Tesoriere left the board, as did Paul Gaynor (former CEO of the recently acquired First Wind) and Francisco Perez Gundin, SunEdison’s COO. In February, third parties began losing confidence in the business as Hawaiian Electric canceled three SunEdison projects worth an estimated $350 million. SunEdison also began an aggressive asset disposition campaign, selling its Japanese solar unit and announcing plans to sell its Malaysian silicon wafer factory and close a polysilicon factory
in Texas. On March 2, the company suspended its quarterly dividend paid on Series A Convertible Preferred Stock, issued just recently in August of 2015. Further, in March the company delayed the issuance of its FY 2015 and Q4 financial report, causing the syndicate of banks who had previously agreed to loan SunEdison almost $2 billion for the Vivint acquisition to balk and state that they would walk away if the deal did not close by the 18th. This would prove to be irrelevant as Vivint canceled the deal on March 8th after claiming that SunEdison had failed to consummate the merger and thus breached the contract. Amazingly, while it was relatively clear to the market that SunEdison was unlikely to be able to pay for Vivint, it took almost 9 months from announcement of the deal to its ultimate cancellation. The market’s response was very positive on that news, as TerraForm Power shares jumped 9 percent and SunEdison’s shares jumped 20 percent (although they were trading below $2 per share at that point).

Despite the fact that SunEdison would not need to absorb an additional $2.2 billion worth of assets and debt from the Vivint purchase, it was too late to save the business. Not only was the company’s financial weakness exposed, but management’s handling of the Vivint situation and subsequent distress revealed incredibly poor judgement from executives, leading counterparties, lenders and customers to lose faith both in their ability to deal fairly and in their future operating ability. In short, as these events impaired SunEdison’s ability to close existing deals and generate new ones, forcing a liquidity crunch on SunEdison’s operations, filing for Chapter 11 became necessary to “restructure and rebuild the confidence that is the lifeblood of SunEdison’s deal-making engine.”

The company would continue to delay filing its FY 2015 financial statements, noting that it had a material weakness in internal controls on March 16, 2016. Shortly thereafter, on March 28, 2016, they received a subpoena from the Department of Justice for a variety of information on the terminated Vivint acquisition, the board of directors and intercompany transactions between TerraForm Power and TerraForm Global. Days later in early April, SunEdison received a notice of default from their first-lie credit facility lenders for failure to deliver financial statements by March 31, 2016, and TerraForm Global sued the company for breach of fiduciary duty, contract and unjust enrichment in connection with the $231 million payment Global made related to the development projects in India.

**Bankruptcy**

SunEdison ultimately filed for bankruptcy on April 21, 2016. As of the petition date, the company’s capital structure had the following components (pro-forma as of April 14, 2016):
SunEdison was relatively conservatively capitalized prior to 2013, after which company management (led by CEO Ahmad Chatila) began its acquisition spree and starting establishing the TerraForm YieldCos to ensure SunEdison could quickly move debt off its balance sheet and continue growing to maximize the value obtained through its IDRs.

Looking at the evolution of SunEdison’s capital structure over time, we can see that despite the increasing risk profile resulting from the business’ aggressive growth strategy, they were able to continue raising significant amounts of debt. The market was temporarily blind to this reality, but by the time many creditors and investors awoke it was already too late. When SunEdison’s secured second-lien term loan was issued in January of 2016, the business was under a significant amount of financial distress and would be bankrupt only three months later. This second-lien term loan was a disaster to all of the unsecured creditors who had in some cases lent to the company only months before, as it bumped them downward in the capital structure and potentially ‘out of the money’ by another $725 million.
Post-Petition Capital Structure Analysis

Unsecured Convertible Notes and Secured first-lien Credit Facility:

SunEdison’s need to raise capital arose from a change of strategy. It’s leaders wanted to transition the business from a leading semiconductor company to a leading renewable-energy development company. What emerged from this goal was the pursuit of the YieldCo model, which required that SunEdison begin raising capital in preparation of the eventual IPO of TerraForm Power in mid-2014.6

To that end, the first issuance of consequence was the convertible senior unsecured notes due in 2018 and 2021. On December 20, 2013, SunEdison issued $600 million at 2 percent due in 2018 and another $600 million at 2.75 percent due in 2021. As detailed previously, over the next year and a half, SunEdison would acquire 12 businesses, piling on billions of additional debt in the process. On May 12, 2015, just days after the close of another acquisition, SunEdison and the 2018/2021 creditors entered into an exchange agreement comprised of $300 million of the 2018 notes and $300 million of the 2021 notes for 41 million shares of common stock and 63 million in cash.16 The creditors did this for one of two reasons: (1) the stock had appreciated almost 150 percent since their notes were issued, so conversion made sense, or (2) they went against conventional wisdom and saw a business that had failed to generate positive operating cash flow in 4 consecutive years, and thus it also made sense to try and convert to equity and sell out while the market was still liquid.

Following shortly after the $1.2 billion issuance of unsecured notes, SunEdison established a first-lien credit facility on February 28, 2014. The credit facility was guaranteed by certain domestic subsidiaries of the company and secured by first priority on the majority of all present and future SunEdison and guarantor assets, including a pledge of capital stock. It would be the first and only secured debt issued to SunEdison until January of 2016 when the company issued second-lien term loans, at which point the business was teetering on the edge of bankruptcy.16

SunEdison would issue more convertible notes in June of 2014 ($600 million due 2020), January of 2015 ($460 million due 2022, $350 million of which was for the First Wind acquisition) and May of 2015 ($450 million due 2023/25). With each issuance, the interest rate increased marginally, however, the notes remained unsecured. It is important to remember that looking back just three years earlier, from the July of 2015 (the peak share price) to July of 2012, SunEdison’s stock had appreciated an astounding 1300 percent. Despite weak fundamentals and rapidly increasing financial risk, the market continued to love the company and lenders followed suit.
Exchangeable Notes:

SunEdison’s need for capital continued to grow as it took on a more diverse set of projects. While the company had originally focused on solar energy assets, it made a big step into the broader renewables space in November of 2014 when it announced that it would acquire First Wind Holdings for $2.4 billion, for which SunEdison was responsible for $1.5 billion requiring a significant capital raise.

That capital would include a combination of $410 million of margin term loans (discussed above), $350 million of unsecured convertible notes (discussed above) and $336 million of Senior Exchangeable Notes, the latter of which closed on January 29, 2015, the date of acquisition closing. In connection with these exchangeable notes, indentures provided the option for Class B common stock from TerraForm Power to be provided in lieu of principal repayment. With TerraForm Power shares essentially pledged as collateral (to be converted and transferred as Class A shares), these notes were fully guaranteed by SunEdison and pari passu with the existing convertible senior notes.

On December 29, 2015, one month before payment was due on the exchangeable notes, SunEdison entered into a purchase and sale agreement with certain holders of the notes exchanging TerraForm Power shares for $121 million of principal owed under the Exchangeable Notes. These holders included D.E Shaw Group, Madison Dearborn Capital Partners IV, L.P. and Northwestern University. Further, these holders agreed to receive renewable energy project transfers from TerraForm Power in lieu of cash for the remaining outstanding $215 million balance owed.16

Convertible Notes Exchanged:

Only nine days later on January 7, 2016, SunEdison entered into another exchange arrangement, this time with certain holders of all issuances of convertible notes (specifically including the 2018 Convertible Senior Notes, the 2020 Convertible Senior Notes, the 2021 Convertible Senior Notes, the 2022 Convertible Senior Notes, the 2023 Convertible Senior Notes, and the 2025 Convertible Senior Notes) and of convertible preferred stock. SunEdison issued approximately 51.9 million shares in exchange for approximately $244.3 million of the convertible notes and approximately $158.3 of the preferred stock. It can be surmised that at this point, SunEdison was attempting to reduce its debt-laden balance sheet and preferred stock commitments (which came with 6.75 percent interest). This debt-for-equity swap would be considered the second default for SunEdison, four months before its filing for bankruptcy. In addition, SunEdison issued the second-lien notes in exchange for approximately $335.9 million of existing convertible debt.16

After amending the first-lien credit facility to allow for additional secured debt such as the second-lien loans and notes, these second-lien notes allowed for convertible debt holders to
push their standing upward in the capital structure and become secured (they were previously unsecured) based on the same second priority liens on, and security interests in, all the assets and guarantors of the secured credit agreements. This, it can be assumed, occurred due to the deteriorating prospects of the firm, the need for capital to continue operations, and an amendment to the agreement of the exchangeable notes which reflected the first technical default and the liquidity constraints being faced.

While senior management still believed the company could survive, it is clear at this point from the multiple debt-for-equity swaps with the convertible senior notes and exchangeable notes as well as the debt-for-project swaps that creditors were beginning to clamor for assets to secure their claims. This move to debt-for-projects most likely caused concern for the convertible senior note creditors and prompted debt exchange as well as the large collateral and yield requirements of the second-lien loans and notes.

Secured Second-Lien Term Loans:

The second-lien credit agreement was established on January 11, 2016 with second priority to the guarantees and pledges of the first-lien credit agreement, in conjunction with the second-lien notes subsequent to the convertible note exchange. This financing package, which consisted of $500 million in Tranche A-1 term loans and $225 million in Tranche A-2 term loans, is intriguing both for its scale, given the breakdown in negotiations regarding the Vivint Solar transaction, and for the generous terms provided to the lenders. With the interest rate set at L+10 percent, it is clear at this point that investors in this debt package, which at the time included Tennenbaum Capital Partners LLC and Candlewood Investment Group LP, were very much aware of the issues plaguing SunEdison and its diminished credit profile. Another key aspect is the impact on all unsecured recourse and nonrecourse debt holders, as they were now buried by an additional $725 million of secured debt in the capital structure. With no corresponding change in the value of the operating assets of the firm, this effectively meant that there was $725 million less value available to these subordinated lenders.

While at first glance this might be viewed as a risky transaction given the issues surrounding SunEdison at the time, this investment was also designed to guarantee that the lender group would be able to participate in future debtor-in-possession financing that the company may require. To that end, the consortium of lenders negotiated a cap on the amount first-lien lenders could issue in DIP financing. While not uncommon as a negotiating tool in distressed situations, this cap was unique in that it was set so low to effectively guarantee the second-lien lender syndicate’s ability to participate in a majority of the DIP package.
DIP Financing:

As part of SunEdison’s bankruptcy declaration, it requested debtor-in-possession financing of $300 million to maintain operations and retain value for stakeholders through the Chapter 11 process. As is common through any bankruptcy, the company found itself at a disadvantage when negotiating terms for the financing package, most notable in the terms given to the second-lien lenders that participated in the DIP package. As is required by the absolute priority doctrine in a bankruptcy process, second-line lenders are paid only after first-lien creditors are satisfied, with DIP lenders paid before any other stakeholder. However, in negotiating the SunEdison DIP package, lenders were able to include a revision to both the first and second-lien credit agreements that stipulated for every dollar the group extended in DIP financing, two dollars of their original investment in the second-lien loans would be given the same seniority as the DIP package. With the second-lien lenders invested in $175 million of the DIP package, an amount secured by the cap initially put in place in the second-lien credit agreement, this effectively meant that these lenders got a guarantee on both $350 million in principal and any accrued interest related to these securities. With the original $725 million second-lien loan trading in the secondary market at approximately 32 cents on the dollar as of April 2016, this guarantee was an absolute windfall for investors eyeing significant losses on their initial investment. Effectively, second-lien loan holders were able to participate in $525 million of DIP and DIP-like financing, securities that are both relatively risk-free and extremely lucrative.

While lucrative for second-lien holders, this was certainly a significant negative outcome for first-lien and all subordinated holders. Super priority status for DIP financing was certainly to be expected by both lender groups, but the push up in seniority of the $350 million in second-lien notes to pari passu with DIP financing was a potentially disastrous development for first-lien holders. Rather than having their claims subordinated to just $300 million in DIP financing ($125 of which was sourced from the first-lien lender consortium), the first-lien holders were buried by an additional $350 million in super priority debt. Although this circumstance may prove to be negligible, the true impact will ultimately depend on the valuation of SunEdison decided by the bankruptcy court.

Other Capital Structure Items:

The Non-Recourse debt included project-level obligations as well as trade debt. The project-level obligations were specific to each renewable-energy systems project, fully-collateralized by the project’s related assets. These obligations had limited to no claim to SunEdison, except specific instances where SunEdison was bound by certain commitments such as equity interests, operations, or maintenance. The Trade Debt represented operational trade claims or accounts payable. Within its initial filing, SunEdison estimated trade claims of
approximately $357 million.\textsuperscript{16} However, this reflected only those invoices actually entered into SunEdison’s books and records, with actual claims assumed by the company to be totaling substantially more.

Finally, SunEdison had equity interests of both preferred and common stock outstanding. The Series A Preferred Stock had 357,726 shares left outstanding with a 6.75 percent dividend. SunEdison had issued 650,000 shares on August 18, 2015 for $1,000 per share.\textsuperscript{38} As of the initial filing, SunEdison had approximately 436 million shares of common stock outstanding trading at a price of $0.34 per share.\textsuperscript{16} Later, these shares would be denied an official role in the bankruptcy process with a grim outlook for potential any recovery.

The bankruptcy filing of SunEdison gives some indication of the complexity of the capital structure and corporate structure, as well as the depths to which the company’s managers attempted to utilize financial engineering to overlay weak fundamentals. SunEdison’s leadership was either complicit in the company’s terminally flawed strategy or they were aware of its danger but ultimately too reluctant to stop and confront these strategy issues. To take a step back, as discussed above, despite multiple technical defaults on obligations in December 2015/January 2016, the firm was still pursuing Vivint, developing large-scale renewable-energy projects across the globe, and attempting to lay more debt on its balance sheet.

**Insolvency Risk Models and the Predictability of SunEdison’s Downturn**

One of the more interesting elements of the SunEdison bankruptcy was the rapid nature in which investor sentiment shifted, from a tone of overwhelming optimism to unwavering despondency in the span of less than six months. While hindsight is certainly 20/20, one of the most glaring questions posed by this change of events was how were so many in the financial community, both shareholders and lenders, caught off guard, especially for a company that so often accessed public markets for financing and advisory services. To explore this question, we utilized two insolvency risk models, namely the Z-Score Model and Z”\textsuperscript{15}. First introduced in 1968 by Professor Altman of the NYU Stern School of Business, the Z-Score model relies on a combination of quantifiable financial indicators of a firm’s performance that are then compared against a extensive database of large defaults to arrive at an indication of a firm’s perceived probability of default. Analysis of the database against the select set of financial ratios produces a multifactor regression model that serves as a foundation for the comparison conducted in this report. The original Z-Score model was then revised (denoted as Z”) to more accurately capture default risk for non-manufacturers and emerging market companies. For this report, both models were utilized with the intent of painting a clear picture of what publicly available information was signalling to those monitoring the company.
These multifactor regressions are summarized below:\(^5^7\):

\[
Z = 1.3 \times X_1 + 1.4 \times X_2 + 3.3 \times X_3 + 0.6 \times X_4 + 1.0 \times X_5 \\
\text{Where, } X_1 = \text{Working Capital/Total Assets} \\
X_2 = \text{Retained Earnings/Total Assets} \\
X_3 = \text{Operating Income/Total Assets} \\
X_4 = \text{Market Value of Equity/Book Value of Total Liabilities} \\
X_5 = \text{Sales/Total Assets}
\]

\[
Z'' = 3.25 + 6.56 \times X_1 + 3.26 \times X_2 + 6.72 \times X_3 + 1.05 \times X_4 \\
\text{Where discriminant variables remain unchanged except for:} \\
X_4 = \text{Book Value of Equity/Book Value of Total Liabilities}
\]

Each model has accompanied ‘zones’, or intervals of output that could be categorized as within 1) Safe Zone, 2) Gray Zone, and 3) Distress Zone. Such intervals were derived by linking average Z-score outputs to the actual credit rating of the firm being analyzed, and categorizing companies into zones based on a derived probability of default (bond mortality tables). For example, the top of the distress zone for the original Z-score model is 1.8, corresponding to the average Z-Score of companies with bonds rated at single-B in the sample set (with a 5-yr cumulative probability of default of 27.94 percent)\(^5^7\).

Figures 3, 4, 5 and 6 below summarize 1) the outputs of both models based on financial data from 2005 - Q3 2015 (last report date) and 2) relative contributions of each discriminant variable in an effort to more accurately characterize the individual drivers of fluctuations in each of the credit scoring models.
Figure 3. Z-Score Output

Figure 4. Z-Score Contribution Analysis

Figure 5. Z'' Output
**Figure 6. Z” Contribution Analysis**

Based on the outputs of both the Z-Score and Z” models, it is abundantly clear that indications of distress were present and that these insolvency risk models could have been used to accurately predict financial distress and the potential for bankruptcy well in advance of SunEdison’s April 2016 declaration. Even more interesting is the observed disconnect between these distress indicators and SunEdison’s stock price; that while the company’s fundamentals continued to deteriorate through the analysis period, the company’s stock price showed no sign of abatement. Ironically, over the same period in which precipitous crash in SunEdison’s stock price took place, the change in Z-score was largely in line with that of the previous years.

From the discriminant variable contributions chart for each of the models, we are able to identify the individual ratios that had the largest impact on changes in the model output. For the original Z-Score model, it is clear that changes in the second discriminant variable, Market Value of Equity to Book Value of Debt ratio, are what is driving changes in the the Z-score. This is in line with the actions that MEMC, and subsequently SunEdison, were taking at the time, namely raising debt to fund what would eventually be deemed ‘overpriced’ acquisitions. Essentially there was a disconnect between the value SunEdison convinced itself existed in the assets it purchased and the market’s own assessment of value, leading to significant decreases in the market value of equity to total liabilities ratio. This is significant as the ratio is a measure of how much the firm’s assets can decline in value before the company’s liabilities exceed the assets and the firm becomes insolvent.

Analysis of the Z” output highlights another key variable in assessing the solvency of SunEdison that further builds on the narrative established thus far: Retained Earnings/Total Assets (RE/TA). This ratio represents the amount of reinvested earnings of a firm over its entire life and is an indicator for how a particular company has chosen to finance its assets. With a low and declining RE/TA ratio, it is clear that SunEdison financed their assets with debt rather than
through the retention of profits, shifting the company to a higher-risk source of capital. Eventually, it is this debt burden and failed fundamentals that would precipitate the company’s bankruptcy.

**Developments During Bankruptcy**

Following the bankruptcy filing, SunEdison appointed John S. Dubel, originally the company’s Chief Restructuring Officer, to lead the company’s restructuring initiatives as the company’s new Chief Executive Officer. One of the more interesting early developments in the case centered around the appointment of an examiner. In an unusual move for a company embroiled in bankruptcy proceedings, SunEdison itself requested that an examiner be appointed in its first day declaration.\(^{30}\) With examiners responsible for evaluating the actions of a bankrupt company prior to bankruptcy with the intent of identifying fraudulent transfers or other violations of a distressed company’s fiduciary duty to its creditors, the appointment of an examiner is typically one requested by the creditors as a means of clawing back lost value, not the company itself. In this case, as asserted by Appaloosa Management, it appears the request for an examiner, with accompanied restrictions such as a maximum $1 million budget and 60-day timeline, was simply a poorly concealed effort by SunEdison’s management to minimize the negative impact an examiner’s findings could have on the outcome of bankruptcy proceedings. Given the heavy public criticism the company received from Appaloosa and other creditor groups, it is no surprise that SunEdison ultimately dropped this request as part of the negotiations for DIP financing.

As part of the bankruptcy process, the company has looked to sell assets starting with those in the solar and wind sectors. In September 2016, according to a Bloomberg press release, the Company won approval of a $144 million sale of wind and solar assets to a unit of NRG Energy Inc.\(^{31}\) That sale closed in November and ultimately comprised of 1,500 megawatts and an upfront payment of $124 million with the potential for another $59 million if certain conditions are met.\(^{44}\) NRG also announced its intention to acquire 26 commercial and municipal solar projects in California, New England, and Florida from subsidiaries of SunEdison. Bidding procedures for the company’s solar materials business were also approved. A few months earlier, UK-based green energy company Ecotricity had announced that it had acquired SunEdison’s UK residential solar rooftop business for an undisclosed sum\(^{32}\) and that leading polysilicon and solar wafer producer GCL-Poly Energy Holdings was looking to acquire SunEdison’s polysilicon assets for $150 million.\(^{33}\)

In addition to the above, towards the end of September, TerraForm Global gave its consent to SunEdison to sell its entire Indian and Uruguayan portfolio of solar and wind projects. Following this approval, Greenko (backed by GIC and Abu Dhabi Investment Authority) agreed to purchase the India projects for an enterprise value of $315 million.\(^{34}\)
As of October 2016, following the sale of the above mentioned assets, the company was still taking steps to work out a reorganization plan without liquidating its prize asset - the controlling stakes in TerraForm Power and TerraForm Global. According to the plan, SunEdison could keep its shares in the YieldCos and restructure around it. In fact in September 2016, TerraForm Power and TerraForm Global announced that they were selling assets and that bidders had the option to make an offer for all of the assets, for SunEdison’s Class B shares in TerraForm Power, or to devise a way to be a new equity sponsor for TerraForm Power. A number of potential buyers including BlackRock Inc. and Golden Concord Holdings Ltd., a Chinese clean-energy group, expressed interest in the Company. Brookfield Asset Management Inc., and Appaloosa Management LP were also planning a joint offer but later declined to participate due to issues with the sale process.35

In November 2016 however, according to media reports, Brookfield and Appaloosa expressed strong interest in acquiring TerraForm Power and TerraForm Global - either by buying out 100 percent of the companies for cash, or purchasing their existing Class A and Class B shares and replacing SunEdison as sponsor. This was confirmed when the two groups publicly offered $1.8 billion for TerraForm Power and an undisclosed sum for TerraForm Global. The two YieldCos have allowed the offer to lapse and are still evaluating other alternatives.36

Along with the asset sales that took place post-filing of bankruptcy, there were some other notable developments as well. In August 2016, a group of shareholders in SunEdison requested for an official committee to represent them in bankruptcy process to ensure representation in any future negotiations regarding ultimate recoveries. However, the court dismissed their plea deeming it not necessary given the extremely low likelihood of any residual value after satisfaction of lender claims.25

**Conclusion**

In 1959, SunEdison (then MEMC) began life from humble origins as the upstart arm of an agricultural giant producing silicon wafers for the semiconductor industry. And indeed, throughout the majority of its 57 year history, SunEdison operated as a seemingly innocuous company run by ostensibly conservative leaders. Twice spun off from conglomerates that didn’t want to risk losing focus on their core business, an IPO and moderate success during the economic boom of the late 1990s precipitated harder times for the company during the cyclical downturn of the early 2000s. Near bankruptcy in 2001, SunEdison’s fortunes turned around relatively quickly under the tutelage of TPG-appointed CEO Nabeel Gareeb. Slowly and steadily, CEO Gareeb achieved success by capitalizing on a growing market for solar grade silicon. By the time TPG exited its investment and Nabeel stepped down as CEO, the company was again healthy, profitable, and growing. Not out to rule the world, not the largest player in its sector, and certainly not a household name in the newspapers, SunEdison was nonetheless respectable.
Enter Ahmad Chatila. Mr. Chatila ironically also came from humble beginnings, escaping from a civil war in Lebanon and emigrating to the US where he would study electrical engineering at Arizona State and Cornell. Ahmad worked in the semiconductor industry in a variety of capacities where he rapidly ascended the ranks before being hired as CEO of SunEdison in March of 2009. Seemingly ambitious prior to becoming CEO, his track record on the job paints the picture of a fanatic bent on rewriting the rules of what was possible in renewable energy, going so far as to claim that SunEdison would be worth $350 billion by 2020 and would one day rival Apple and Google in size. It was quite the ambitious goal for what was only years before a sleepy silicon wafer manufacturer.

Unsurprisingly, the business changed both rapidly and drastically as Chatila began assembling his empire. Beginning with the acquisition of SunEdison LLC in 2009, the combined company would engage in a tremendous acquisition spree, buying nearly every solar and wind asset that it could get its hands on. In the process, it unloaded its stable but unexciting (albeit cash generating) semiconductor and wafer manufacturing units, and renamed itself to clearly indicate its one and only focus:

“SunEdison is the world's largest renewable energy development company and is transforming the way energy is generated, distributed and owned around the globe.”

While the company did grow tremendously, it did so on the back of a mountain of cheap debt and financial engineering with its two YieldCos. Of greater concern and certainly one of the more shocking revelations of this entire analysis was the fact that SunEdison had failed to produce positive cash flow from operations at any point during Chatila’s tenure as CEO. For all the growth, all the deals, all the press, ego and excitement, the company could not generate cash let alone turn a profit.

SunEdison’s failure is solely a failure of management and strategy. It’s competitors, namely SunPower and First Solar - who sought more moderate, more stable and more reliable growth through carefully vetted projects, deft acquisitions, and cautious utilization of capital markets - are at present stable and healthy by all accounts. It seems that in the end, SunEdison, like Icarus, flew too close to the sun and paid the price for it. Or to be more accurate, their unsecured creditors paid the price for it.

As of the writing of this paper, it was estimated that the shortfall in the value of the assets versus the amount of the liabilities was anywhere from $1.0 to $2.5 billion. Negotiations and asset valuations are still in process, and all that appears certain at this point is SunEdison equity holders are likely facing a complete loss, based on the rejection of the formation of an equity committee and the obvious lack of residual value if such valuation ranges hold true. While it is clear that the company is attempting to restructure its investments around its holdings in TerraForm Power and TerraForm Power, and revert back to the company structure it pioneered, such an outcome is critically dependent on the value it is able to realize in its other, less
transparent investments. And while it is uncertain as to who will capture the most value from the bankruptcy restructuring, the unsecured claims and the nonrecourse debt appear to be where the fulcrum securities lies. Only time will tell.

Reference


18. SEC - SunEdison 2015 Q3 10Q


Exhibits

Exhibit 1: SunEdison’s Business Units

RSC - SunEdison’s RSC business unit is an international, multi-channel operation selling PV solar systems and equipment in the United States, as well as in Latin America and Australia, to residential and small commercial customers.

C&I - The C&I business unit primarily develops distributed generation community solar projects and sells the output of those projects under multiple PPAs to large commercial and industrial organizations, including, among others, municipalities, school districts, and housing authorities.

Utility - The Utility business unit builds large-scale renewable energy facilities, and sells power and other attributes produced thereby to utility and other customers. It also sells completed Projects to the YieldCos and other parties.

GAM - The GAM business unit services the renewable energy assets of its customers, which, in addition to SunEdison’s own assets, include renewable energy assets that are neither owned nor installed by SunEdison.

Solar Materials - In support of SunEdison’s downstream solar business (i.e., Project development and installation of renewable energy systems), the Solar Materials Business Unit manufactures polysilicon, silicon wafers, and solar modules.
Exhibit 2: SunEdison’s Typical Renewable Energy Development Project Structure

Exhibit 3: SunEdison’s Historical Debt Levels By Type
Exhibit 4: Selected SunEdison Income Statement Line Items

Exhibit 5: Pivotal Events Timeline

- July 2014: TerraForm Power IPO
- Jan. 2015: SUNE and TEP acquire First Wind Holdings, LLC
- July 2015: SUNE and Vivint Solar, Inc. enter into $2.2B merger agreement
- Aug. 2015: TerraForm Global IPO
- Dec. 2015: SUNE enters into D.E. Shaw Purchase Agreement in proposed settlement of $316M of debt (Exchangeable Notes)
- Jan. 2016: Appalossa Complaint challenges Vivint merger
- Feb. 2016: SUNE reaches $28.5 mm LAR Litigation Settlement
- March 2016: Vivent cannell deal with SUNE; alleges breach of merger agreement
- April 2016: SUNE delays filing of 2015 financials for second time
Exhibit 6: SunEdison Organizational Chart\textsuperscript{16}