No time to panic: a solar history lesson

REALITY CHECK alert: really big scandals happen in other industries, all the time. So we must all keep a sense of proportion about solar’s current woes, believes Paula Mints.

A handful of bankruptcies and it’s easy to get carried away with the doom and gloom.

But it’s not just the solar industry that is in the midst of challenging times. The whole world is currently edging (back) towards recession. Lingering effects of the financial industry scandals continue, with significant amounts right now being spent to subsidise the fallout (both pre- and post-scandal). Take Greece for example - significant Government (i.e. public) money is being spent right now to stop that country defaulting on its debts (although to what extent this will be successful is still up for debate).

In the past, scandals have enveloped Enron, WorldCom, Tyco, and Rite Aid, not to mention the derivative nightmare that brought about a global recession in its wake (also revealing the Madoff Ponzi scheme).

While the solar industry is currently mired in problems, we mustn’t forget that the debt crisis in Europe, which now includes Italy, and the potential default of Greece, have far more significance than that of a startup U.S. solar manufacturer with a total capacity of 0.277778% of total global PV manufacturing capacity.

The point is this: yes, there has been a string of unfortunate (and one very public) bankruptcies of solar companies in the U.S. (four at the last count, because as we go to press Stirling Energy Systems has become the latest casualty). But it is more important to understand the market environment that helped lead to them, and what the current market environment portends in this regard.

This is important particularly in the U.S. where well-needed funding is being cut from the National Renewable Energy Lab (NREL) in Golden, Colorado, and because the pendulum of investment (from all sources) in the U.S. into the solar sector has swung from one extreme to another in just a few weeks.

Learning from history – the early years

In the 2000 to 2010 period, the PV industry grew from Megawatts to Multi-Gigawatt level of shipments (and demand). This extraordinary feat is depicted in figure 1. But how did this level of growth happen?

In 1989 Germany introduced its 1000 rooftops program, taking place from 1989 through to 1993, and though this program did not precisely lead to a boom in demand for solar technologies, it did increase interest and activity.

In 1994, the government in Japan announced its own rooftop residential program - also providing subsidies to its PV manufacturing sector. These two subsidy programs were right at the vanguard in terms of Government experiments to stimulate the market for solar, via artificial subsidy instruments. Also during this time, the first Renewable Portfolio Standards appeared in the U.S.

During the late 1990s, Germany’s 100,000 rooftops program - along with zero

In the end, most companies with a value proposition...and that are lucky enough to have investment...will survive, though even some of these companies will fail.
financing - drove the industry over the 100-MWp mark in shipments. On the manufacturing side, discussions about potential upcoming polysilicon shortages began, and the industry started to take advantage of the economies of scale possible with 100-MWp worth of shipments. But it is important to remember that technology manufacturers lost money - negative margins - during this time. Significant R&D took place in large companies, oil companies as an example, as they positioned themselves to focus on the goal of a large, vibrant, profitable future market.

It is worth noting that in 1997, the first year the PV industry shipped more than 100-MWp, the total demand in the U.S. was 15.6 MWp, with total demand in Europe at 31.9 MWp (Europe demand was primarily into Germany).

Table 1 presents supply data; as well as shipments from regional manufacturers to the first point of sale (from 1990 through to 1999), along with average module prices (ASPs).

To the present day – 2000 to 2011

The Feed-in Tariff (FiT) model of incentives, which is the most successful instrument for stimulating demand in PV industry history, was first implemented in 2000. In February 2000, Germany implemented a 99 pfennig power production buyback for grid-connected PV systems, with a 20-year duration of payments.

Beginning in January 2002, the initial rate began to decrease by 5% per year until the end of the program. In 2004, the revision of the EEG (Germany’s renewable energy Act) created an even more attractive market for solar, and other countries in Europe started to take notice of this market’s success.

In the U.S., the renewable portfolio standards (RPS) – which broadly mandate utilities to use renewables - began expanding, though, with the deadline for RPS fulfillment not imminent and penalties for non-compliance often weak, these platform programs did little to drive demand at this time.

However, as deadlines for utility participation approached, utility...
activity stepped up. And at this time, the U.S. is a utility market – meaning that utilities buy the electricity produced. But incentives are still needed to stimulate demand.

During this period, FiTs proliferated across Europe, and in other countries such as South Korea, Japan and (to some degree) the U.S., prices increased, and, for the first time in PV industry history beginning in 2004, technology manufacturers enjoyed positive margins and profit.

Figure 2 presents average module prices from 2000 through to an estimate for 2015. The historical data in Figure 2 are hard, reflecting the global average price to the first point of sale in the market.

**What went wrong with solar?**

As we all know however, sometimes, even though plans seem to be well laid out, things do go wrong, or, at least in a different direction much of the time.

In solar, FiTs drove the market sky high, and for a while, prices with it. As prices soared, startup manufacturers (and others) entered the industry, promising to drive costs down while maintaining profits.

Investors, enjoying the promise of trouble free returns from FiTs, stimulated growth of the multi-Megawatt (utility scale) application. In addition, manufacturers in China announced plans to integrate from raw material through wafer and cell manufacturing, to module assembly and distribution.

Manufacturers in Taiwan, albeit a little more circumspect, focused on cell manufacturing. Though doubted by all, they succeeded in this regard. Considered together, manufacturers in China/Taiwan improved their share of global shipments from 2% in 2000 to 54% in 2010. The driver for interest by manufacturers in China/Taiwan (and for Government support in China), was the rapidly growing market in Europe.

From 2000 through 2010, demand in Europe for PV systems (primarily multi-Megawatt) grew by a compound annual rate of 69%. Europe’s demand growth is stronger than that of the compound annual growth for global shipments, which grew by 53% for the same period.

Shipments from China and Taiwan grew by a compound annual 39% for the period, with shipments from the U.S. declining by a compound annual 15%.

**Table 2** presents shipment shares by region and ASPs from 2000 to 2010.

**Table 3** presents European demand, global shipments and the shipment share of the U.S. and China/Taiwan from 2000 through 2010.

**Great expectations, realistic outcomes**

The current unfortunate spate of company failures can be traced back to the beginning of the solar boom. During this time individual companies and entire countries (China for

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<thead>
<tr>
<th>Category</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
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<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>CAGR</th>
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<tr>
<td>European demand</td>
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<td>120.0</td>
<td>172.6</td>
<td>232.6</td>
<td>472.4</td>
<td>676.1</td>
<td>1093.9</td>
<td>2178.7</td>
<td>4338.5</td>
<td>6568.0</td>
<td>13944.1</td>
<td>69%</td>
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<tr>
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<td>352.9</td>
<td>504.9</td>
<td>675.3</td>
<td>1049.7</td>
<td>1407.7</td>
<td>1984.6</td>
<td>3073.0</td>
<td>5491.8</td>
<td>7913.3</td>
<td>17402.3</td>
<td>53%</td>
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<tr>
<td>% Shipments China/Taiwan</td>
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<td>1%</td>
<td>3%</td>
<td>3%</td>
<td>4%</td>
<td>6%</td>
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<td>% Shipments US</td>
<td>30%</td>
<td>27%</td>
<td>21%</td>
<td>14%</td>
<td>13%</td>
<td>9%</td>
<td>7%</td>
<td>8%</td>
<td>7%</td>
<td>5%</td>
<td>6%</td>
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Table 3: European demand, global shipments, 2000 to 2010 (Copyright 2011 Paula Mints and Navigant)*

..the need for margins has been largely publically ignored for the past five years in favour of the misunderstood goal of grid parity.
example) viewed the market for solar as one that would exponen-
tially increase annually - for many, many years to come.

Viewing the twin goals of all solar manufacturers – decreased manufacturing costs and higher conversion efficiencies – they, by-in-large, chose lower cost as a central tenet for their market strategy. Low cost is often equated with healthy margins. In fact, the need for margins has been largely publicly ignored for the past five years in favour of the misconception that healthy margins give way to the current uncertain market conditions and low margins.

They must learn to survive and thrive with a patchwork of uncertain incentives, many of which lack the key requirement for a thriving market – stability. They must find the allusive price-elastic customer – that is, the customer who will pay more for electricity generated from solar for philosophi-
sical reasons, or because for some reason they need the reliable electricity supplied by solar (one example of a potentially price elastic customer is mining, operations. By contrast the off-grid customer is not price elastic).

In the end, most companies with a value proposition (a product that fits today’s market), and that are lucky enough to have investment (meaning money) will survive, though even some of these companies will fail. The solar market is brutal, and the industry is still in startup mode. It needs discern and public and private investment so that it can continue to develop its technologies.

Currently, the U.S. solar industry is suffering the slings and arrows of visible failures that happened on the eve of an elec-
tric revolution to promises that are brutal. The U.S. solar industry does not deserve to be fodder for either the media, or any particular party’s political agenda.

*Author’s note: All of the data and analysis used in this article is based on primary research, which is, no secondary sources, no other litera-
ture, et al, were used. No data were harmed in the analysis presented, which is based on classic market research principles.

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ANNOUNCEMENT

IN THE UNITED STATES BANKRUPTCY COURT FOR THE DISTRICT OF DELAWARE

In re

EVERGREEN SOLAR, INC.

Chapter 11

Petition Case No. 11-11290 (GM) Related Docket No. 13

NOTICE OF AUCTION AND SALE HEARING

PLEASE TAKE NOTICE that on August 5, 2011, Evergreen Solar Inc. (the “Debtor”), en-
tered into an agreement (the “Joint Venture Agreement”) to convey substantially all of the Debtor’s assets (together, the “Joint Venture Assets”) to JVR Solar Holdings, LLC (“JVR Holdings”), an entity equally held by the Joint Venture parties, in exchange for cash consideration and the assumption of debt. Pursuant to the Joint Venture Agreement, the Debtor will file a motion to sell the Joint Venture Assets free and clear of all liens and security interests. The Debtor hereby requests and hereby grants this notice, pursuant to section 363(f) of the Bankruptcy Code, except as set forth in the Asset Purchase Agreement.

PLEASE TAKE NOTICE that the terms and conditions of the proposed sale to JVR Holdings are set forth in the Joint Venture Agreement attached to the Sale Notice. The Joint Venture Agreement represents the result of arm’s length negotiations, conducted by the Debtor to obtain the highest and best offer for the Assets.

PLEASE TAKE NOTICE that on September 1, 2011, the Debtor, acting by and through the Debtor’s Prepetition Trust, filed a motion requesting an order (the “Preliminary Order”) approving the bidding procedures (the “Bid-
ing Procedures”), which will set the dates and times related to the sale of the Assets under the Joint Venture Agreement. All interested parties should familiarize themselves with the Bidding Procedures.

PLEASE TAKE NOTICE that pursuant to the terms of the Bidding Procedures Order, in the event that there is more than one Qualifying Bid for one or more Lots of the As-
sets, an auction (the “Auction”) to the Assets will be conducted at the offices of Wachtell, Lipton, Rosen & Katz, New York, New York 10036 on Monday, October 10, 2011 at 10:00 a.m. (ET) (the “Auction Date”). Only the Debtor, JVR Holdings, the Qualifying Bidders, the Supporting Stockholders, the Debtors, Prepetition Creditor Committee, and the Creditors’ Committee and advisors to such of those parties, may attend the Auction in person, and only JVR Holdings and such other Qualifying Bidders will be entitled to make any subsequent bid at the Auction.

PLEASE TAKE NOTICE that a hearing the “Auction” will be held before the Honorable Mary F. Walrath, United States Bankruptcy Judge, on November 4, 2011 at 9:00 a.m. (ET) (the “Hearing Date”), to confirm the results of the Auction and approve the sale of the Assets to JVR Holdings, in the United States Bankruptcy Court for the District of Delaware, 824 Market Street, Wilmington, Delaware 19801. The Debtor, with the consent of the Supporting Stockholders, which consent shall not be unreasonably withheld, may adjourn the Sale Hearing one or more times without further notice by making an announcement in open court in the course of the Sale Hearing or by filing a corresponding order form a subsequent Adjournment.

PLEASE TAKE NOTICE that pursuant to the terms of the Bidding Procedures Order, the Bankruptcy Court has currently set (i) October 29, 2011 at 4:00 p.m. (ET) as the deadline for (a) all general objections to the Sale of the Assets, (b) all objections to the Joint Venture Agreement, and (c) objections to any portion of the Assumps of the Bankruptcy Code and Rules of Bankruptcy Procedure. Any interested party desiring to file an objection in connection with the Auction and/or the Debtor’s sale of a portion of the Debtor’s assets to JVR Holdings in the Joint Venture, should file such objection in writing with the United States Bankruptcy Court, c/o the Honorable Mary F. Walrath, United States Bankruptcy Judge, 824 Market Street, Wilmington, Delaware 19801, postmarked no later than October 20, 2011.

ANY PERSON, ENTITY OR PARTY WHOSE INTERESTS MAY BE IMPAIRED BY THE SALE PROCEEDINGS SHOULD NOTIFY THE COURT AND THE DEBTOR THEREOF.