

**Ascent Solar Technologies,
Inc.**

(ASTI:NASDAQ)

Outperform 2**EQUITY
RESEARCH**

Pavel Molchanov
(713) 278-5270
Pavel.Molchanov@RaymondJames.com

Cory Garcia
Senior Research Associate
(713) 278-5240

April 21, 2008

Alternative Energy
Initiation of Coverage



A Thin Film Pure-Play Ascending the Growth Curve

All expressions of opinion reflect the judgment of the Research Department of Raymond James & Associates, Inc. (RJA) as of the date stated above and are subject to change. Information has been obtained from third-party sources we consider reliable, but we do not guarantee that the facts cited in the foregoing report are accurate or complete. Other departments of RJA may have information that is not available to the Research Department about companies mentioned in this report. RJA or its affiliates may execute transactions in the securities mentioned in this report that may not be consistent with the report's conclusions.

© 2008 Raymond James & Associates, Inc. All Rights Reserved

The Raymond James Financial Center, 880 Carillon Parkway, St. Petersburg, FL 33716
Institutional clients may call for additional information:
Research 800-237-5643 • Trading 800-237-8426

RAYMOND JAMES
& ASSOCIATES, INC.
Member New York Stock Exchange/NYSE

Table of Contents

Investment Considerations	4
Risks	14
Overview of Operations	15
Sales and Marketing	19
Management Profile	19
Recent and Projected Performance	20
Capital Spending and Financing	22
Recent News.....	23
Investment Conclusion.....	24

Appendices

Appendix A: Quarterly Income and Cash Flow	26
Appendix B: Condensed Financial Statements.....	27

Ascent Solar Technologies, Inc.

(ASTI:NASDAQ)

Outperform 2

April 21, 2008

Alternative Energy Initiation of Coverage

Ascent Solar Technologies (www.ascentsolar.com) is a development-stage designer and manufacturer of photovoltaic (PV) modules. In contrast to conventional polysilicon-based PV, the company utilizes a thin film technology that employs copper indium gallium diselenide (CIGS).

Pavel Molchanov
(713) 278-5270
Pavel.Molchanov@RaymondJames.com

Cory Garcia
Senior Research Associate
(713) 278-5240

ASTI: Initiating Coverage with an Outperform Rating

- Within the context of the secular PV growth story, a market that we believe is poised for sustainable 40%+ growth through 2012, thin film represents a disruptive technology. Although thin film offers lower conversion efficiency, it allows for significant cost reductions relative to conventional polysilicon-based PV, especially given the current polysilicon shortage. As an **early-stage but well-positioned** entrant in this arena – one of the few publicly traded thin film pure-plays – Ascent stands to benefit from the increasing adoption of thin film for a variety of PV applications.
- The two key features of Ascent's design are the use of (1) copper indium gallium diselenide (CIGS) for the semiconductor layer and (2) a flexible, plastic material for the substrate upon which CIGS is affixed. As compared to the two main thin film alternatives (cadmium telluride and amorphous silicon), CIGS has achieved **superior conversion efficiencies**. Meanwhile, Ascent's flexible substrate makes its product optimal for such applications as building-integrated and electronics-integrated PV.
- Ascent's modules have reached efficiencies of up to 9.6%, and the company is targeting 10-12% over the intermediate-term. While the R&D continues, initial production from the company's first 1.5 megawatt (MW) line is expected by the end of 2Q08. The capacity ramp-up program targets commercial-scale production of 30 MW by year-end 2009, rising to 110 MW by year-end 2011. This is a highly achievable roadmap, and we believe **there may be room for acceleration**, though of course equipment sourcing and financing naturally present some execution risks.
- As a development-stage company, Ascent is likely to have minimal revenue until 4Q09, and we project negative EPS until 4Q10. Beyond that, the sizable gains in revenue should translate into **rapid EPS growth**. Based on our 2012 EPS estimate of \$1.30, and applying a 30x multiple (consistent with our long-term growth rate assumptions), we arrive at a 2012 target price of \$39.00. Discounted back to 2009 at a 20% rate (conservative relative to the weighted average cost of capital of 10.3%) yields a target price of \$22.50. Given our bullish view of Ascent's commercialization prospects and market opportunities, though cognizant of the risks ahead, we are initiating coverage with an **Outperform** rating.

Current Price
(4/18/2008) \$15.07
Projected 12-Month Target Price: \$22.50

52-Week Range \$28.35-\$6.50
Dividend/Yield \$0.00/0.0%
Book Value (12/07) \$5.26
Suitability Venture Risk

Shares Out. (mil.) 13.8
Market Cap. (mil.) \$208
Avg. Daily Vol. (10 day) 321,216

Proj. 3-Yr EPS Growth Rate NM
LT Debt (mil.)/% Cap. \$0/0%

P/E Ratios (Non-GAAP)
2008E NM
2009E NM
2010E NM

Revenues (mil.)
2007A \$1
2008E \$2
2009E \$11
2010E \$67

EBITDA (mil.)
2007A \$(7)
2008E \$(12)
2009E \$(13)
2010E \$9

Cash Flow/Share
2007A \$(0.51)
2008E \$(0.57)
2009E \$(0.51)
2010E \$0.54

Out Year Non-GAAP EPS
2011E \$0.61
2012E \$1.30

Non-GAAP EPS FY=Dec	Q1 Mar	Q2 Jun	Q3 Sep	Q4 Dec	Full Year	GAAP EPS Full Year
2007A	\$(0.24)	\$(0.19)	\$(0.19)	\$(0.12)	\$(0.70)	\$(0.70)
2008E	(0.20)	(0.16)	(0.17)	(0.20)	(0.73)	(0.73)
2009E	(0.22)	(0.24)	(0.20)	(0.11)	(0.75)	(0.75)
2010E	(0.05)	(0.02)	(0.03)	0.08	(0.01)	(0.01)

Rows may not add due to rounding. Non-GAAP EPS excludes extraordinary items.



© Reuters Trader, 2008

Insider Trading BOT/SL
last 6 months 2,399,800 / 265,856
Float (mil.)..... 6.0
Common Equity
(mil.)/% of Cap\$48.6 / 100%

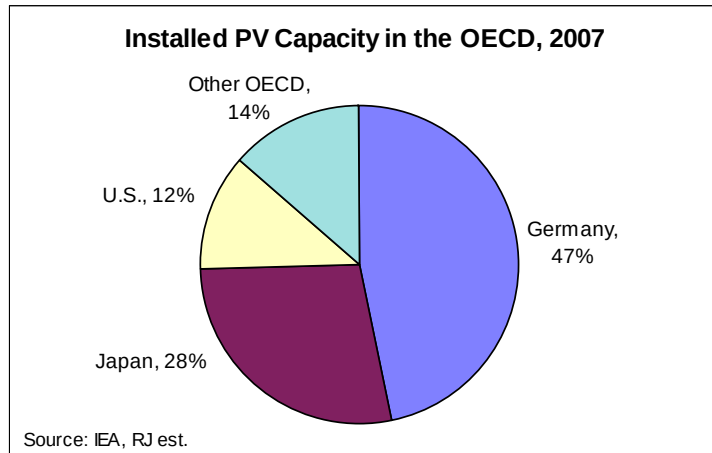
Strong Long-Term Outlook for the Solar Industry, in the U.S. and Overseas

Ascent Solar Technologies, Inc.

Ascent Solar Technologies (www.ascentsolar.com) is a development-stage designer and manufacturer of photovoltaic (PV) modules. In contrast to conventional polysilicon-based PV, the company utilizes a thin film technology that employs copper indium gallium diselenide (CIGS).

Investment Considerations

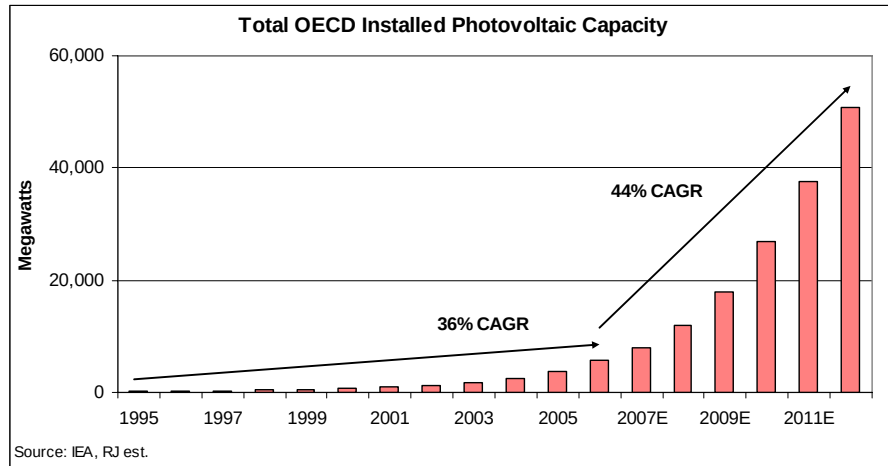
Driven by rising prices for conventional power and the intrinsic benefits of clean, renewable solar power, the global photovoltaics (PV) industry has exhibited impressive growth in recent years. Key PV markets include Germany, Japan, the U.S., Spain, Italy, Australia, and, increasingly, China and other emerging markets.



We are projecting global PV market growth of at least 40% annually through 2012 as a “base case.” Growth could be even greater under a higher-than-current level of international government support, particularly the setting of binding renewable energy targets in key PV markets, which are steadily materializing. Notably, the European Union has an ambitious target of, on average, 20% renewable energy within the EU’s energy mix by 2020. Over 20 U.S. states have enacted similar policies, called Renewable Portfolio Standards (RPSs), and some of these states have “carve-out” mandates specifically for solar power.

While its unit costs have decreased over time, commerciality of solar power is constrained by average prices that are, in general, higher than that of conventional power. In order for the solar industry to make a systematic penetration into the U.S. electricity market, installed solar system costs will need to drop from \$6-9 per watt to \$3-4 per watt. Given that costs were near \$50 per watt in the 1970s, the long-term trend suggests that technology-driven improvements in conversion efficiency will eventually narrow the gap, which we believe should happen between 2015 and 2020 in the U.S., and earlier in markets with higher power prices (such as Japan and Germany). In addition, polysilicon costs should come down from their current lofty levels in

the coming years. In the meantime, extensive government incentives around the world – including feed-in tariffs, tax credits, and rebates – help improve solar economics for end users.



Thin Film: A Disruptive Technology Within the PV Arena

Thin film PV represents a relatively new, rapidly evolving and differentiated offering within the broader PV arena – in short, **a textbook example of a disruptive technology**. Thin film differs from conventional PV technology, which is based on the extensive use of polysilicon. Thin film utilizes only about 1% of the semiconductor material used to produce traditional PV products. This leads to a significant advantage in manufacturing costs, especially given the fact that the polysilicon market is currently characterized by a tight supply/demand balance and exceptionally high prices – a state of affairs that is unlikely to change materially until at least the second half of 2009.

There are three major development areas within the thin film space. All have their advantages and disadvantages. Below we provide a brief description of the three main types of thin film PV.

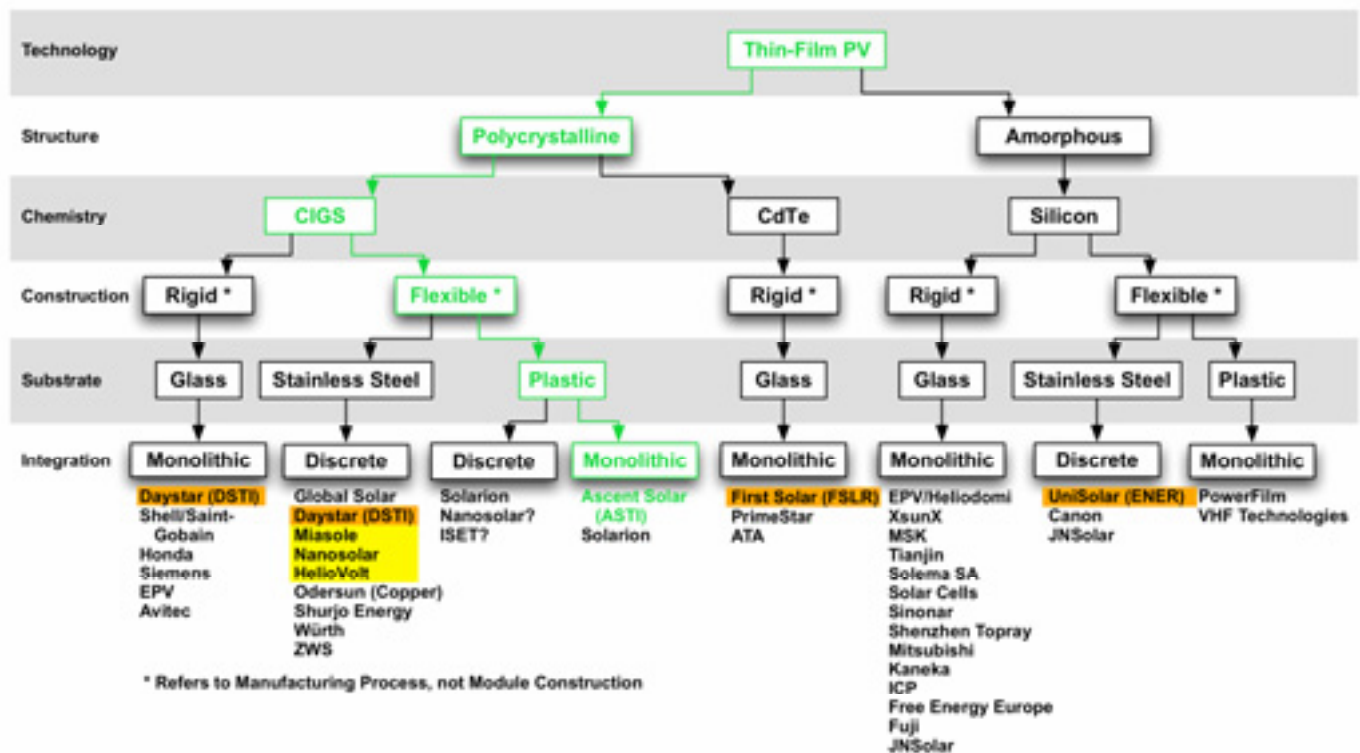
Copper Indium Diselenide (several variants): This type of thin film PV, which includes copper indium gallium diselenide (CIGS) among its variants, comprises copper, indium, and selenium, usually with other feedstocks as well. Copper is mined worldwide, with the largest production in Chile, and its price (like that of many metals) has been rapidly rising due to robust demand from emerging markets. Indium is produced mainly from residues generated during zinc ore processing. Gallium is not found in nature but is easily obtained by smelting. Selenium is most commonly produced from sulfide ores, such as those of copper, silver, and lead. With up to 20% conversion efficiency under standard test conditions, the best CIGS solar cell is nearly as efficient as the leading polysilicon-based cells, though efficiencies in commercial-scale production tend to be around 10%. In fact, in March 2008, the National Renewable Energy Laboratory (NREL) announced a new world record of 19.9% for CIGS cell efficiency in lab tests.

Cadmium Telluride (CdTe): This is arguably the best-known type of thin film PV due to the stunning success of First Solar, a pioneer in CdTe design that now enjoys by far the largest market cap (\$23 billion) of any U.S.-traded PV pure-play. First Solar is the only commercial-scale manufacturer of CdTe modules in the world and is in fact the world's largest thin film producer generally (irrespective of technology). The CdTe material consists of cadmium

and tellurium. The former is a common impurity in zinc, most often isolated during zinc production. The latter has the distinction of being one of the 10 rarest elements on earth – more rare than even platinum – and is mined in countries including the U.S., Russia, and Peru. CdTe conversion efficiencies are in the range of 8% to 10%, and double-digit efficiencies are targeted as the next step.

Amorphous Silicon (a-Si): This is the oldest type of thin film PV, with development dating back to the 1980s. It is the closest to conventional PV, being based on silicon, albeit a non-crystalline form. Conventional PV relies on slicing polysilicon ingots into wafers, while a-Si is suitable for chemical vapor deposition in much thinner layers. In addition to PV, a-Si is used in the manufacturing of liquid-crystal displays (LCDs). Historically, PV applications have been small-scale (for example, in calculators), due to relatively low conversion efficiencies of 5% to 7%.

The diagram below, prepared by Ascent, nicely illustrates the wide variety of subcategories of thin film technology. The few publicly traded thin film companies are highlighted with their respective tickers, and some of the highest-profile private thin film companies are also highlighted.



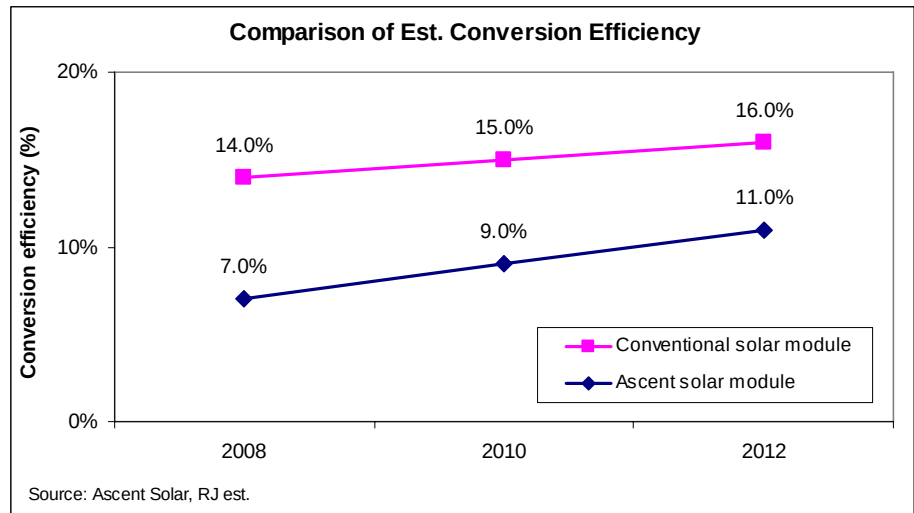
Ascent Solar Technologies, Inc. ©2007 — All categorization is based on knowledge available at the time; any inaccuracies are unintentional

Source: Ascent Solar.

The Thin Film Tradeoff: Lower Cost but Lower Efficiency

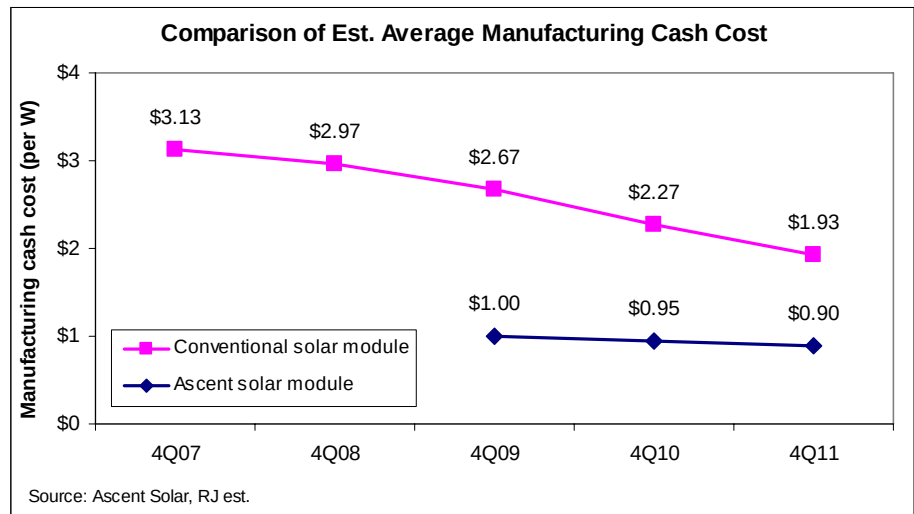
A key performance metric of PV products is their conversion efficiency. This is a measurement of the amount of sunlight converted by the module (the finished product used in PV applications) into electricity. At the present time, the average efficiency of a conventional polysilicon-based module is approximately 14%, with the highest mass-produced ones near 18%. By comparison, the efficiency of Ascent's modules has averaged in the 6% to 8% range, with highs at 9.6%. Because there is always some reduction in

efficiency during the cell-to-module step, Ascent's cells (like conventional cells) typically have efficiencies that are 2% to 3% higher than that of its modules. It is the module that should be focused on, since this is the product that is actually utilized by end users.



As shown in the above chart, we believe that Ascent can achieve aggregate efficiency improvement of 2% over the next two years, outpacing what we believe will be a 1% improvement for conventional PV. Longer-term, the efficiency gap between the two technologies should narrow further, with CIGS efficiency steadily ramping up faster than that of conventional PV, but it is unlikely to disappear altogether until at least 2015.

While the thin film design leads to lower conversion efficiency, there is no denying the fact that the avoidance of polysilicon in the manufacturing of Ascent's modules gives the company **a clear advantage on the cost side**. As shown on the next page, Ascent is targeting all-in manufacturing cash costs of \$1.00/watt when it reaches 30 MW of production capacity (as of 4Q09), decreasing further to \$0.90/watt at 110 MW of capacity (as of 4Q11). For context, we estimate that current production costs of a conventional PV module are near \$3.00/watt. This is almost certain to decline materially in the years ahead due to multiple factors (for example, progressively thinner wafers and eventually cheaper polysilicon as supply ramps up), but thin film is set to retain a cost advantage.



To summarize, this is the fundamental tradeoff between thin film PV and conventional PV: **Thin film PV has a lower cost structure and a lower conversion efficiency, while conventional PV has higher costs and higher efficiency.** This means that thin film is neither inherently “superior” nor “inferior” to conventional PV. For any given end user, therefore, the purchasing decision will vary based on individual considerations, most notably the type of application. For example, thin film products are well-suited for building-integrated PV (BIPV) projects, whereby modules can be integrated directly into roofing shingles, siding, and facades. On the other hand, retrofitting residential rooftops with PV is an application for which conventional PV may remain better-suited in many cases.

Prominent Industry Partners Support Marketing Effort

In order to create a differentiated strategic advantage in an increasingly competitive PV market environment, Ascent has entered into strategic partnerships with several prominent industry players. This business model leverages the core competencies of each side, with Ascent focused on product development and manufacturing, and its partners responsible for marketing directly to end users. In other words, Ascent plans to market its own product not directly, but through its partners.

Norsk Hydro: Based in Norway, Norsk Hydro is one of the world’s top five integrated aluminum companies, with a significant presence in the building systems market, especially in Europe. (The company’s oil and gas operations were acquired by Statoil in 2007.) Under Ascent’s relationship with Norsk Hydro, entered into in 2007, it is cooperating with Norsk Hydro to integrate its flexible PV modules into Norsk Hydro’s building products, including sun-shading systems, wall systems, and facades. The first of these products is expected to be a line of BIPV sun-shading systems that will be marketed under the brand name Brise Soleil. As a key aspect of the strategic partnership, **Norsk Hydro has taken an equity stake in Ascent, increasing it to 35% in March 2008.**

ITOCHU: Based in Japan, ITOCHU Corp. is large conglomerate, operating in numerous business segments. In February 2008, Ascent and ITOCHU announced the formation of a strategic partnership, including the following specific areas: (1) procurement of select machinery for Ascent’s manufacturing facility; (2) sourcing of raw materials as Ascent ramps up output; (3) distribution of Ascent’s products in Japan and other parts of the

world where ITOCHU is currently pursuing solar installations; and (4) managing Ascent's future relationships with original equipment manufacturers (OEMs) in Japan.

ICP Solar: Based in Canada, ICP Solar Technologies develops, manufactures, and markets PV-based products and building materials. In April 2008, Ascent and ICP Solar announced the formation of a strategic partnership. Ascent will provide ICP Solar with output from its pilot 1.5 MW production line in 2008 and 2009, and ICP Solar will develop, test, and integrate it into ICP Solar's portable power and other electronics-integrated PV (EIPV) products. ICP Solar's focus on consumer applications of PV fits well with the flexible and lightweight plastic substrate underpinning Ascent's PV design.

Giscosa: Based in Spain, Giscosa Sociedad Limitada is a distributor and manufacturer of rubber membranes for roofing, reservoirs, and canals. In April 2008, Ascent and Giscosa announced the formation of a strategic partnership focusing on the development of BIPV roofing products, based on Giscosa's existing RubberSun product line. Ascent will provide Giscosa with output from its 1.5 MW production line, and the two companies plan to engage in demonstration-scale projects. Through this partnership, Ascent gains greater exposure to the Spanish solar market, one of the fastest-growing in the world.

Icopal: Based in France, Icopal SAS is a distributor and manufacturer of waterproofing solutions and building protections, which include supplying membranes for roofing, waterproofing, and civil engineering. In April 2008, Ascent and Icopal announced the formation of a strategic partnership focusing on the development of BIPV roofing products and targeting the European solar market. Ascent will provide Icopal with output from its 1.5 MW production line, and the two companies plan to engage in demonstration-scale projects.

Back-end-loaded Growth in Production Capacity Through 2011

In March 2008, Ascent reached initial operating capability (IOC) on its 1.5 MW production line, the primary objective of which is to continue to develop and refine the company's technology platform. The 1.5 MW line represents more of a research and development lab, rather than a true commercial-scale production plant. The technologies developed there will continue to play an integral role in the company's long-term expansion plans.

While many of its small-cap peers in the PV space – both conventional and thin film – have laid out aggressive capacity expansion programs in the hundreds of megawatts if not greater, Ascent has taken a more conservative approach. Mindful of possible delays in financing and equipment sourcing, management has laid out what we view as an eminently reasonable roadmap for starting full commercial operations, with ample time allowed for procuring and qualifying the necessary equipment, as well as optimization of production and certification of output. Of course, some operational bottlenecks along the way are likely, as indeed is the case across the board in the rapidly evolving PV space, with tightness currently seen across the value chain.

From only 1.5 MW currently, the company is targeting 110 MW of total capacity by year-end 2011, to be reached as follows:

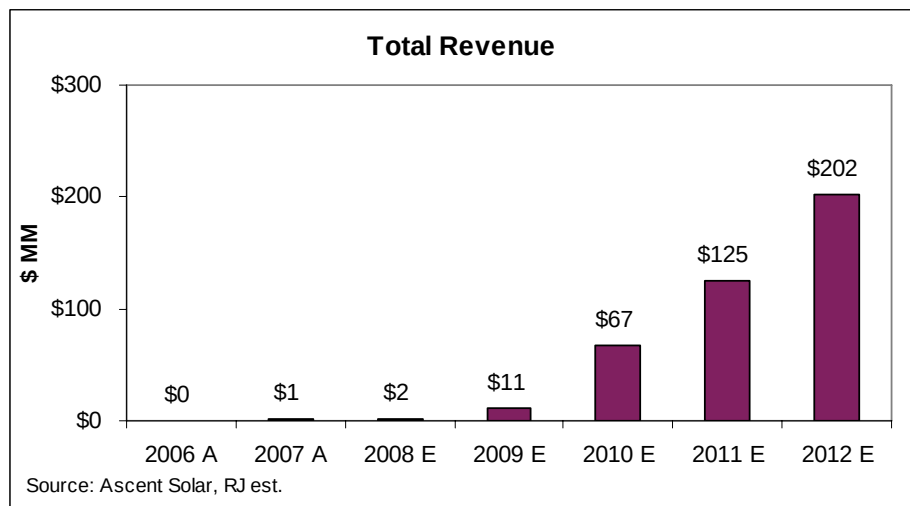
- 30 MW in 4Q09 (the company's first commercial-scale operations)
- 60 MW in 4Q10
- 110 MW in 4Q11

While the company has not yet specified any capacity expansion plans for beyond 2011, we believe that increases of 50 MW per year (on par with the 50 MW targeted for 2011) are realistic.

Strong Growth in Revenue...

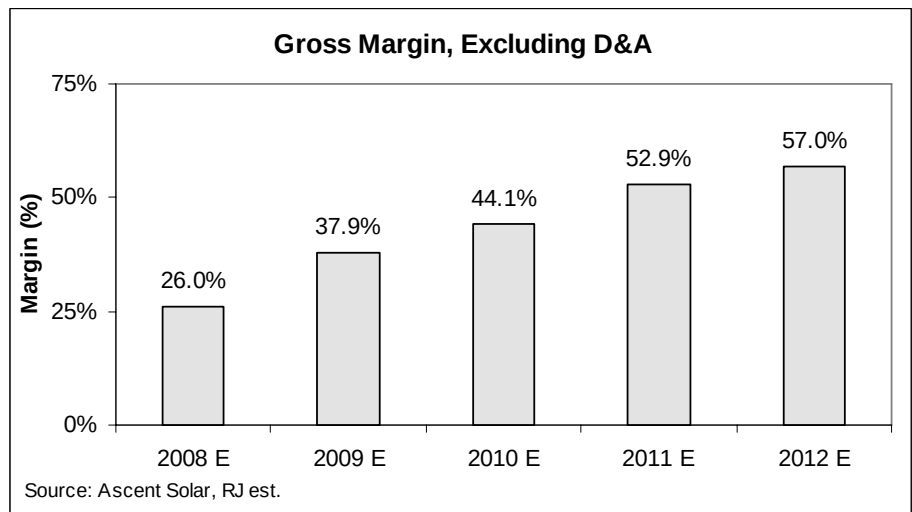
PV is certainly a secular growth industry in the aggregate, and within the context of this rapidly growing market, Ascent is poised to achieve strong revenue expansion over the intermediate-term, albeit from a currently minimal base, with 2010 looking to be the company's **“breakout” year**.

For 2008, we project de minimis product revenue of \$2 million, reflecting purely sales from Ascent's 1.5 MW line (i.e., without factoring in the possibility of research and development contract revenue). Given the capacity expansion plans outlined previously, we project revenue of \$11 million in 2009 (the bulk of that in 4Q09), soaring to \$67 million in 2010, followed by \$125 million in 2011 and \$202 million in 2012.



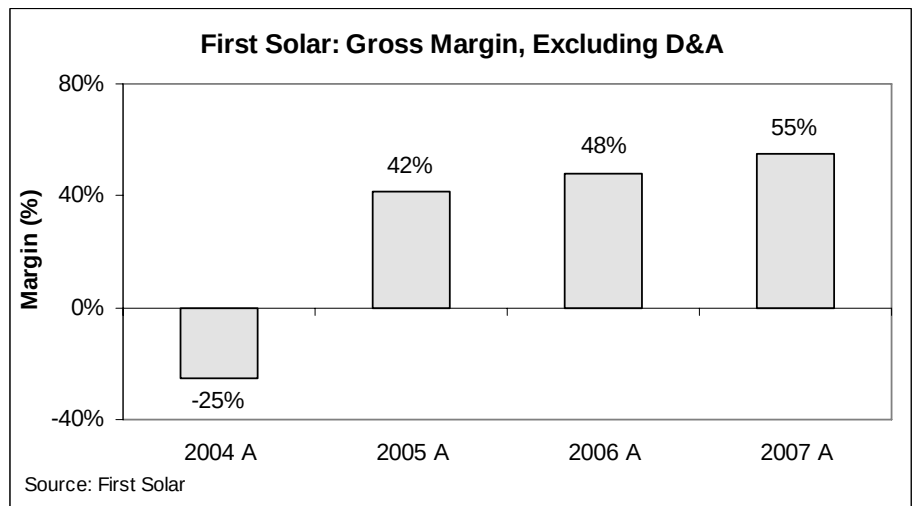
...and Hefty Margins...

Because Ascent has had no commercial production until 2008, there is no gross margin track record to rely on. What we can say is that Ascent's gross margins are likely to increase substantially as the company progressively attains its capacity targets, thereby achieving economies of scale, as well as continues its production optimization and conversion efficiency efforts.



As noted before, Ascent is targeting all-in manufacturing cash costs of \$1.00/watt when it reaches 30 MW of production capacity (as of 4Q09), decreasing further to \$0.90/watt at 110 MW of capacity (as of 4Q11). For average selling prices (ASPs), we are assuming an average of \$2.46/watt in 2008, gradually decreasing towards \$1.84/watt in 2012, which reflects normal ASP declines of 5% to 10% per year across the PV space. **In total, this implies an operating model in 2011 and beyond under which 50%+ gross margins look quite achievable. This is roughly double the typical 20% to 25% gross margins of conventional PV producers.**

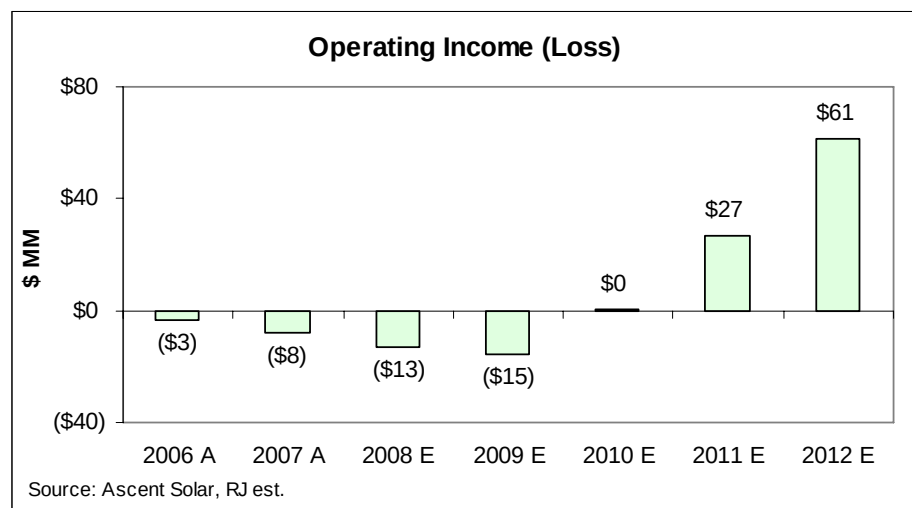
For further confirmation, we can look to the example of First Solar, the world's largest thin film PV producer. Although First Solar is a CdTe-based producer, not a CIGS one, we believe its margin structure approximates what Ascent can achieve once it reaches a full production run-rate (110+ MW). In 2007, First Solar's gross margin was 55%, up 7% from 2006, as shown below.



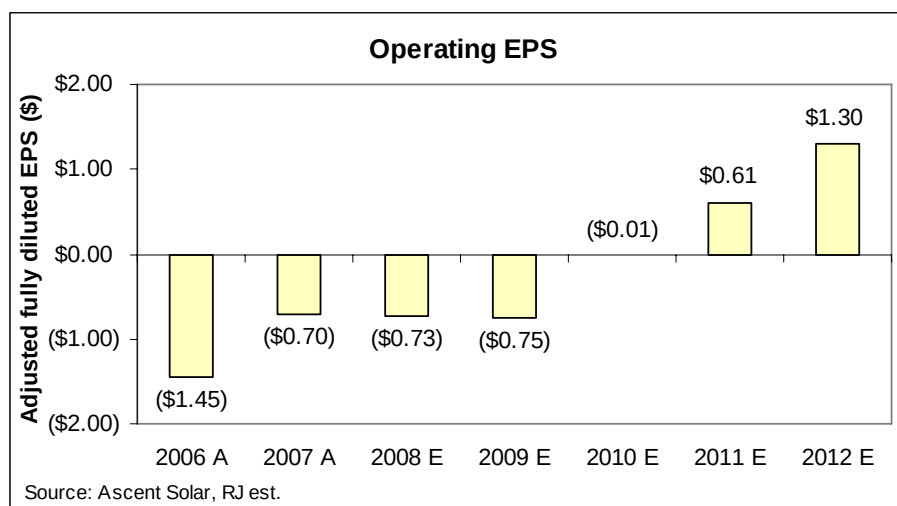
As a side note: In order to normalize for different companies' various accounting methods for depreciation and amortization, we calculate gross margin **before** D&A, the same approach we use with all alternative energy companies. As a result, the gross margins we calculate for Ascent are inherently higher than what the company reports under GAAP.

...Leading to Eventual Profitability

Given Ascent's minimal revenue for the time being, along with modest (in absolute terms) but increasing corporate fixed costs, the company is not likely to become profitable until 4Q10 (when it plans to reach 60 MW of capacity). After widening losses in 2008 and 2009 (reflecting rising costs for corporate headcount), we are projecting that Ascent's operating income will break-even in 2010 before firmly entering into positive territory in 2011.



Because Ascent has no debt (and hence no interest expense) and will not pay income tax until achieving profitability, its operating income is roughly analogous to net income. Accordingly, we project losses per share that widen in 2008 and 2009 before nearly reaching break-even in 2010 and finally profitability in 2011. These estimates do not add back stock-based compensation; if we did the add-back, EPS would still be negative in 2008 and 2009, but the losses would narrow considerably.



Ascent will be almost entirely dependent on external capital for financing its capacity expansion program through 2011. Because the company currently has no cash flow with which to service debt, **equity will almost certainly be the principal (or even sole) source of capital over this timeframe.** Accordingly, our EPS estimates assume dilution from equity offerings in 2008, 2009, 2010, and 2011. See this report's "Capital Spending and Financing" section for details.

Valuation Supported by Unique Technology and Long-Term EPS Growth

As a development-stage company, Ascent's financial results will not be meaningful in 2008 or 2009, and to a certain extent even in 2010. Accordingly, a peer valuation approach is not generally useful in the case of Ascent. Furthermore, the number of U.S.-traded thin film-focused companies is currently slim. That said, the table below shows the current valuation multiples of three thin film players – DayStar Technologies, Energy Conversion Devices, and First Solar. To provide some context, we also show the valuations of various conventional PV companies.

Company Name	Ticker	Rating	Share Price 4/18/2008	Market Cap (\$ MM)	EPS Multiples		
					2008	2009	
Thin Film							
DayStar Technologies	DSTI		\$3.36	\$110	NM	NM	(Consensus)
Energy Conversion Devices	ENER		\$32.89	\$1,326	NM	33.3x	(Consensus)
First Solar	FSLR		\$285.79	\$22,477	115.2x	56.0x	(Consensus)
Conventional							
Canadian Solar	CSIQ		\$26.08	\$711	16.0x	10.9x	(Consensus)
China Sunergy	CSUN		\$8.84	\$338	NM	22.4x	(Consensus)
Evergreen Solar	ESLR	MO2	\$9.60	\$1,162	NM	20.4x	(RJ est.)
JA Solar Holdings	JASO	SB1	\$25.75	\$3,967	33.8x	24.2x	(RJ est.)
Solarfun Power Holdings	SOLF		\$14.71	\$979	18.7x	11.7x	(Consensus)
SunPower Corp.	SPWR	SB1	\$89.33	\$7,539	41.4x	24.2x	(RJ est.)
Suntech Power Holdings	STP	MO2	\$47.05	\$7,239	29.3x	20.0x	(RJ est.)
Trina Solar	TSL	SB1	\$41.41	\$1,051	12.5x	10.1x	(RJ est.)
Yingli Green Energy	YGE		\$23.80	\$3,021	26.0x	13.8x	(Consensus)
Mean					36.6x	22.5x	
Ascent Solar	ASTI	MO2	\$15.07	\$172	NM	NM	(RJ est.)

Source: FactSet, RJ est.

The one key observation we would make from this table is that thin film companies trade at significantly higher valuations than conventional PV producers. Indeed, we believe that First Solar has the highest P/E multiple (based on both years) of any U.S. PV company. This clearly reflects the unique nature of thin film relative to the more commoditized conventional PV.

Given the obvious limitations of the peer valuation approach in this case, along with the extended time period until Ascent reaches profitability, the method we use to value Ascent is unique within the context of our alternative energy coverage universe.

- As noted above, our 2012 EPS estimate for Ascent is \$1.30.
- We apply a 30x multiple to this EPS figure, based on our view that the global PV market can expand 20% per year beyond 2012, and that thin film should grow faster (i.e., its market share is likely to increase). We view 30% as the long-term growth rate for Ascent.
- Our 2012 target price for Ascent therefore becomes \$39.00.
- Using a discount rate of 20% (a rate that is highly conservative relative to Ascent's weighted average cost of capital of 10.3%, as reported by Bloomberg), we arrive at a 2009 target price of \$22.54, rounded to \$22.50.

Given our bullish view of Ascent's commercialization prospects and market opportunities, though cognizant of the risks ahead, we are initiating coverage with an **Outperform** rating. Because Ascent is a development-stage company, we have assigned it a **Venture Risk** suitability rating.

Risks

Ascent is subject to many of the risks associated with alternative energy, which include:

- Conventional energy price risk
- Commerciality risk
- Public policy risk
- Regulatory risk

We highlight five risks especially relevant for Ascent.

Lack of Near-Term Profitability

We do not believe that Ascent will achieve profitability until 2010-2011. Similarly, the company's currently negative cash flow from operations represents another financial challenge and may necessitate outside financing in the future.

Competitive Market Environment

The photovoltaic (PV) market is highly competitive. Production capacity is increasing among both established producers and new entrants. Once polysilicon supply ramps up sufficiently, there will be the possibility of PV oversupply in the market, and average selling prices (ASPs) of PV products may decline quickly.

Product Quality and Performance Risk

Solar cells are complex and must meet stringent quality requirements. Products as complex as these may contain undetected errors or defects. For example, solar cells and solar panels may contain defects that are not noticed until after they are shipped or installed. Such defects could lead to re-engineering expenses and costs due to warranty provisions. They could also adversely affect customer relations and business reputation.

Government Policy Risk

Many national and local policy measures benefit the solar power industry, including tax incentives and contract opportunities. Any of these measures can be amended, suspended, or repealed, and such action could reduce demand for solar power equipment. This would negatively impact the revenue of companies in the industry.

Significant Ownership by Norsk Hydro

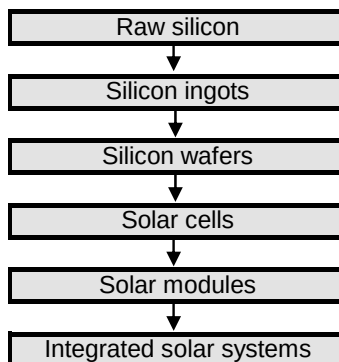
Norsk Hydro owns approximately 35% of Ascent's common stock. As a result, Norsk Hydro has the ability to exert a high degree of influence on all matters requiring stockholder approval. In particular, Norsk Hydro is able to influence decisions on such issues as Ascent's strategic relationships with other companies, capital markets activity, and acquisitions or divestitures.

Overview of Operations

Ascent's Manufacturing Process

To illustrate the fundamental differences between the manufacturing processes of Ascent relative to conventional PV producers, let us briefly review how the conventional process works.

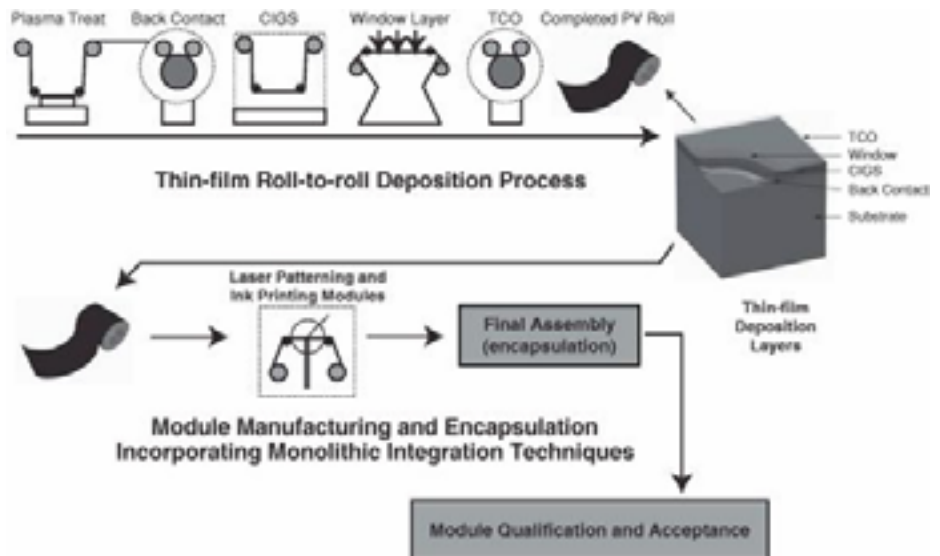
Conventional PV Value Chain



Source: Industry reports

As shown in the adjacent chart, the process begins with raw polysilicon – the basic feedstock. The polysilicon is then casted into solid ingots, which are then sliced into individual wafers. Everything up to and including the wafer stage is often considered the “upstream” of the value chain. The wafers are then processed into solar cells, which are in turn interconnected into finished solar modules. Strictly speaking, the manufacturing process ends here. As the last step, however, modules are combined with ancillary components to form integrated solar systems, customizable for various end user applications. The final three steps are often considered the “downstream” of the value chain.

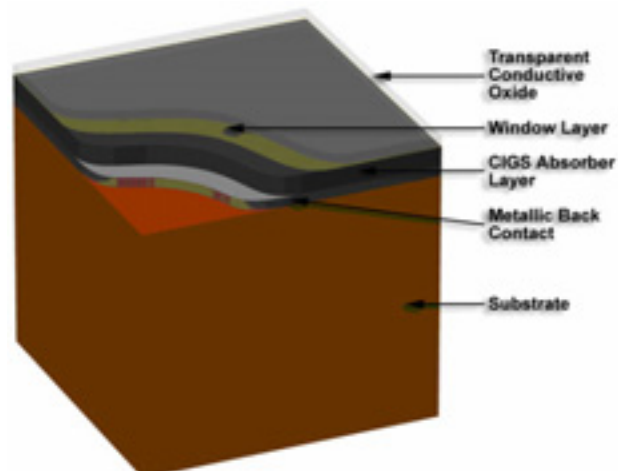
In contrast to the relatively fragmented process that was outlined above, which in most instances entails two or more participants along the value chain (few cell/module producers make their own wafers, for instance), Ascent's production is much more integrated. **Ascent uses a roll-to-roll manufacturing process and proprietary monolithic integration techniques.** The company utilizes laser patterning to create interconnects, thereby creating modules at the same time as cells. In so doing, it is able to eliminate an entire back-end processing step, saving time as well as labor and manufacturing costs relative to conventional PV competitors.



Source: Ascent Solar.

Below is a basic outline of Ascent's manufacturing process and the tools used to implement it. The diagrams on this page depict this visually.

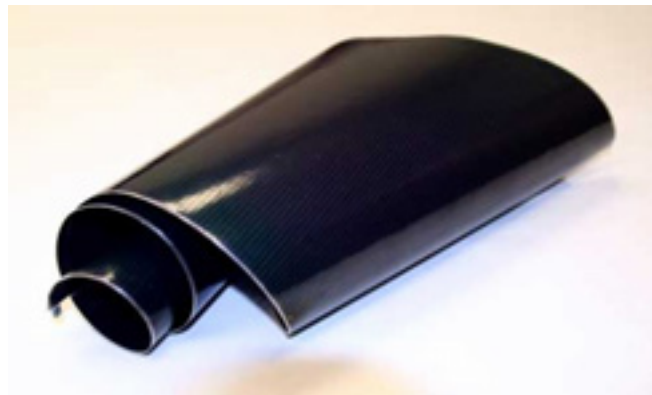
- **Step 1.** Thin-film vacuum coating of molybdenum back contact, implemented with a roll-to-roll tool for sputtering.
- **Step 2.** Thin-film vacuum coating of copper, indium, gallium, and selenium, implemented with a roll-to-roll tool for thermal evaporation.
- **Step 3.** Chemical spray coating of deionized water and cadmium sulfide, implemented with a roll-to-roll tool for chemical treatment.
- **Step 4.** Thin-film vacuum coating of transparent conductive oxide (TCO), implemented with a roll-to-roll tool for sputtering.
- **Step 5.** Laser patterning and ink printing of modules, implemented with a roll-to-roll monolithic integration tool.



Source: Ascent Solar.

CIGS on a Flexible Plastic Substrate

Ascent's choice of substrate material (i.e., what the thin film CIGS layer is affixed to) differentiates it from many other thin film PV manufacturers. The use of a flexible, lightweight substrate provides advantages in the higher-value-added building-integrated PV (BIPV) and electronics-integrated PV (EIPV) markets, where rigid substrates are unsuitable for many applications, while also allowing the company to compete in the commodity solar panel market as a low-cost producer. (The photo below illustrates the highly flexible nature of Ascent's modules.) The use of a plastic substrate also enables the company to employ monolithic integration techniques that may not be available to manufacturers who use metal substrates. **Ascent appears to be the only company focused entirely on the production of PV modules using CIGS on a flexible, plastic substrate.**



Source: Ascent Solar

Capacity Expansion Schedule

Ascent aims to be the first company to manufacture large, roll-format PV modules in commercial quantities that use CIGS on a flexible, plastic substrate. The company's manufacturing expansion plan entails the design, installation, qualification, testing, and operation of production tools to incrementally expand its production capacity to 110 MW. The company's future production facility, acquired in February 2008, is in Thornton, Colorado (near Denver). Management has laid out the following roadmap to full-scale commercialization.

2Q08: Following the declaration of initial operating capability on the 1.5 MW production line in March 2008, begin limited commercial production.

3Q08: Begin certification and qualification of products through Underwriters Laboratories (UL), International Electrotechnical Commission (IEC) and Technischer Überwachungs-Verein (TÜV). Also, begin procuring production tools for the first 30 MW of incremental capacity.

4Q08: Complete certification of products from the 1.5 MW line.

3Q09: Begin procuring production tools for the second 30 MW of incremental capacity.

4Q09: Complete qualification of production tools and begin production at 30 MW of aggregate capacity.

3Q10: Begin procuring production tools for the final 50 MW of incremental capacity.

4Q10: Complete qualification of production tools for the second 30 MW of incremental capacity and begin production at 60 MW of aggregate capacity.

4Q11: Complete qualification of production tools for the final 50 MW of incremental capacity and begin production at 110 MW of aggregate capacity.

On its first 30 MW of capacity, Ascent plans to use production tools that will process one-third meter wide plastic rolls identical to those used in its existing 1.5 MW line. On the next 80 MW of capacity (i.e., going from 30 MW to 110 MW), the company expects that the production tools will be engineered to process larger one meter wide rolls. Successfully transitioning to one meter wide rolls should significantly increase throughput, thereby reducing the number of manufacturing tools and, hence, the amount of capital spending required for equipment and facilities. Generally speaking, all other process variables, such as speed, thickness, and composition, should remain unchanged. Based upon discussions with its equipment suppliers, the company has identified deposition of the CIGS layer in the one meter wide format as the most challenging aspect of transitioning to one meter wide rolls. Consequently, the company has initiated the development of a one meter wide prototype CIGS production tool to begin evaluating and testing one meter wide area deposition sources and process control systems. This prototype tool is scheduled for delivery in 3Q08.

Purchasing and Sourcing

Ascent relies on several unaffiliated companies to supply raw materials used in its production process. The company acquires these materials on a purchase order basis and does not currently have long-term contracts with its suppliers, although it has not ruled out entering into such contracts in the future. The company acquires all of its high-temperature plastic from Ube Industries, Ltd. (based in Japan), although alternative suppliers of similar materials exist. The company buys molybdenum, copper, indium, gallium, selenium, and indium tin oxides from a variety of suppliers. Management is also in the process of identifying and negotiating arrangements with alternative suppliers of materials in the U.S. and Asia. In February 2008, Ascent and ITOCHU (also based in Japan) announced the formation of a strategic partnership. As part of this partnership, ITOCHU has committed to help Ascent with sourcing of both raw materials and equipment.

The manufacturing equipment and tools used in Ascent's production process are purchased from various suppliers in Europe, the U.S., and Asia. Management is continually on the lookout for procurement opportunities.

Intellectual Property

Ascent's technology was initially developed at ITN Energy Systems, a privately held technology company conducting R&D in various areas. ITN was established by Dr. Mohan Misra in 1994. Alongside an experienced team of scientists and engineers from major aerospace companies, the company set out to develop and commercialize emerging technologies, including thin film PV based on CIGS.

With the spin-off of Ascent in early 2006, ITN granted the company an exclusive and perpetual license for the use of its proprietary process and control technologies, instrumental in the production of Ascent's PV modules. Alongside the combination of trade secrets and patents from ITN, the company has non-exclusive licenses for a number of additional U.S. and foreign patents, primarily through its relationships with the Midwest Research Institute and the University of Delaware's Institute of Energy Conversion.

Sales and Marketing

In order to create a differentiated strategic advantage in an increasingly competitive PV market environment, Ascent has entered into strategic partnerships with several prominent industry players. This business model leverages the core competencies of each side, with Ascent focused on product development and manufacturing, and its partners responsible for marketing directly to end users. In other words, Ascent plans to market its own product not directly, but rather through its partners.

The targeted end markets for Ascent's PV modules can be divided into three main categories.

- **Building-integrated photovoltaic (BIPV) products:** The BIPV market incorporates solar modules directly into building and construction materials. Ascent's high-performance, flexible PV modules can be integrated directly into products such as roofing shingles, siding and facades, metal and composite panels, and roofing membranes. Currently, the company's strategic partnerships with Norsk Hydro, ITOCHU, Giscosa, and Icopal provide exposure to the BIPV market. Of note, the partnerships also provide a diversified geographic footprint.
- **Electronics-integrated photovoltaic (EIPV) products:** The EIPV market incorporates solar modules directly into portable electronic devices, which can include electronic packages, casings, battery packs, and portable power systems. Currently, the company's strategic partnerships with ITOCHU and ICP Solar provide exposure to the EIPV market.
- **Standard commodity PV modules:** Within this broad market, the company is looking to leverage its low-cost manufacturing process to provide a differentiated price point to its customers. Furthermore, the lightweight nature of the modules produced by Ascent could reduce overall system assembly and installation costs for end users.

Longer-term, Ascent anticipates venturing into the relatively lower growth, but high-value space satellite and near-space markets. The high quality of the company's CIGS products would be well-suited for an industry that places strong emphasis on product performance.

Management Profile

Ascent's senior management team has experience in the solar power industry and the technology sector in general. The company's board consists of seven members, of whom all but the chairman are non-executive.

Dr. Mohan Misra, Chairman and Chief Strategy Officer. Dr. Misra has served as Ascent's chairman since its inception in October 2005 and also took on the role of chief strategy officer in April 2007. He founded and has held the chief executive officer position at ITN Energy Systems, the private technology R&D firm that spun off Ascent, since 1994. With sponsorship from government (military), industrial, and private clients, ITN's primary research efforts are focused on the development of thin film, battery, fuel cell, and nanotechnologies. Prior to founding ITN, Dr. Misra spent 19 years with Martin Marietta (which merged with Lockheed to form Lockheed Martin in 1995) in the area of materials research, development, and manufacturing, serving much of the time as the head of research and technology.

Matthew Foster, President and Chief Executive Officer. During the spin-off of Ascent, Mr. Foster left his post at ITN Energy Systems to assume the role of president and CEO of Ascent. While at ITN, he served as executive vice president during two periods (1999-2001 and March 2004-October 2005). Between 2001 and 2004, he was president and CEO of Infinite Power Solutions, another ITN spin-off. Prior to joining ITN, he served as vice president of business development and advanced programs at Lockheed Martin. He has had over 25 years of experience in the aerospace industry.

Gary Gatchell, Chief Financial Officer. Mr. Gatchell is the most recent addition to the management team, joining Ascent at the end of March 2008. His role will be key in building out the financial infrastructure of the company, a role in which he previously gained experience during his tenure as CFO of Carrier Access Corp., a publicly-traded telecom equipment provider. He also served as CFO of Voyant Technologies (now part of Polycom) and as an audit manager at Big-4 accounting firm KPMG.

Ashutosh Misra, Senior Vice President of Operations and Corporate Affairs. Mr. Misra joined Ascent in April 2007 as senior vice president of operations and corporate affairs, resigning his seat on the company's board. While serving as executive vice president at ITN, prior to taking his current management position at Ascent, he would often pass on his operational expertise as a corporate advisor to Ascent. From November 2002 to March 2005, he served as president and CEO of Data Access America, the subsidiary of an India-based telecom company. He is the nephew of Ascent's chairman, Dr. Misra.

Dr. Prem Nath, Senior Vice President of Manufacturing. Dr. Nath joined Ascent in July 2006 as senior vice president of manufacturing. Prior to joining the company, he served as vice president of product manufacturing and development at United Solar Ovonix, a subsidiary of U.S.-based renewable power firm Energy Conversion Devices. With over 25 years experience in dealing with thin film technologies, he has been named on over 50 U.S.-issued patents.

Dr. Joseph Armstrong, Vice President and Chief Technology Officer. Dr. Armstrong has served as vice president and chief technology officer at Ascent since its inception in October 2005. Prior to the spin-off, he managed the advanced photovoltaic division of ITN Energy Systems, leading the progression into thin film CIGS products. Before joining ITN, he worked at Martin Marietta for 10 years. He has been named on four U.S. patents.

Recent and Projected Performance

Full-Year 2007

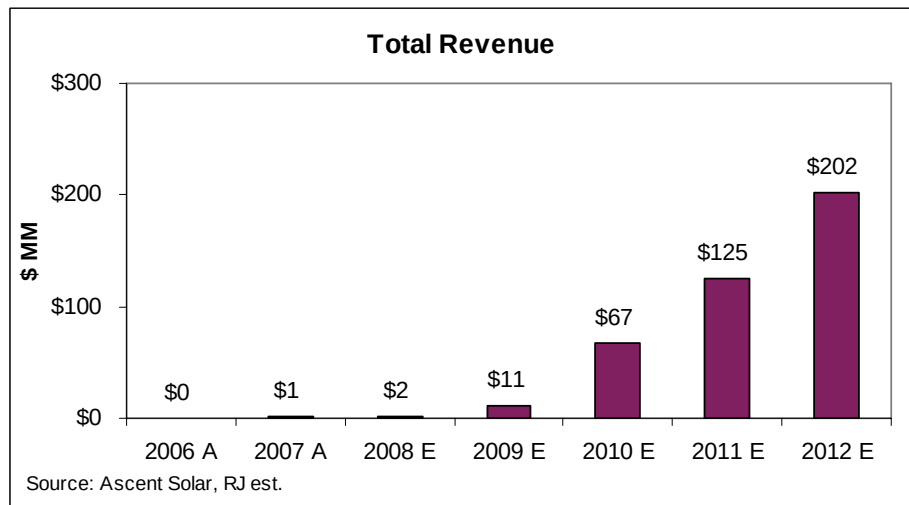
For 2007, Ascent generated \$1 million in revenues, which stemmed entirely from R&D contracts. Direct costs related to those contracts totaled ~\$700,000 for the year. Given that the company had no commercial production during 2007, there was no revenue or gross margin related to its manufacturing operations; however, the company did spend nearly \$4 million ahead of the start-up of its 1.5 MW production line. After factoring in G&A and interest expense, partially offset by interest income, Ascent posted a full-year net loss of \$6.5 million, or a loss of \$0.70 per share.

2008, 2009, and Beyond

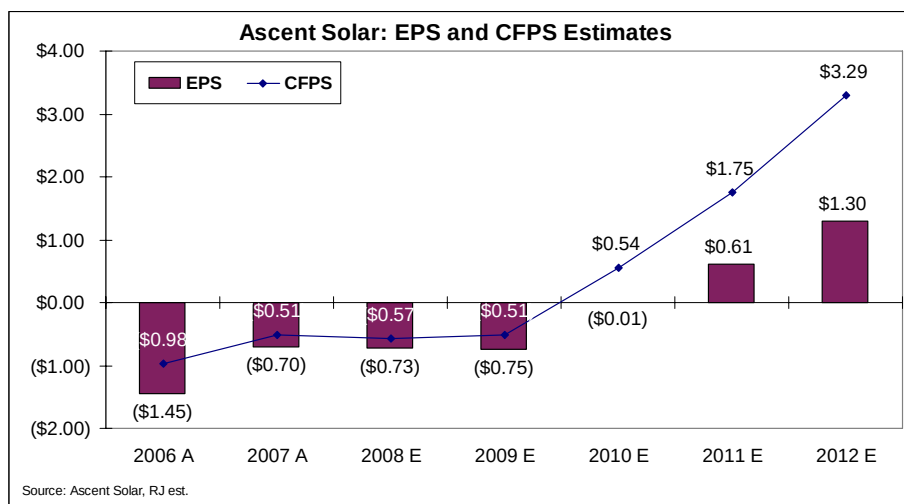
Driven by its capacity ramp-up program, Ascent is poised to achieve strong revenue expansion over the intermediate-term, albeit from a currently minimal base. For 2008, we project de minimis product revenue of \$2 million, reflecting purely sales from Ascent's 1.5 MW line (i.e., without factoring in the possibility of research and development contract revenue). Given the capacity expansion plans outlined previously, we project revenue of \$11 million in 2009 (the bulk of that in 4Q09), soaring to \$67 million in 2010, followed by \$125 million in 2011 and \$202 million in 2012.

While Ascent has no gross margin track record to rely on, we are assuming a gross margin of 26% in 2008 and 38% in 2009. As the company progressively attains its capacity targets, thereby achieving economies of scale, as well as continues its production optimization and conversion efficiency efforts, we are anticipating a steady increase in gross margin. In fact, given the manufacturing cost targets laid out by the company, alongside our declining ASP assumptions, we believe that 50%+ gross margins look quite achievable in 2011 and beyond.

For beyond 2012, we would conservatively assume revenue growth in the 20-30%+ range, on average, broadly reflecting our view of thin film PV market growth over the long run.

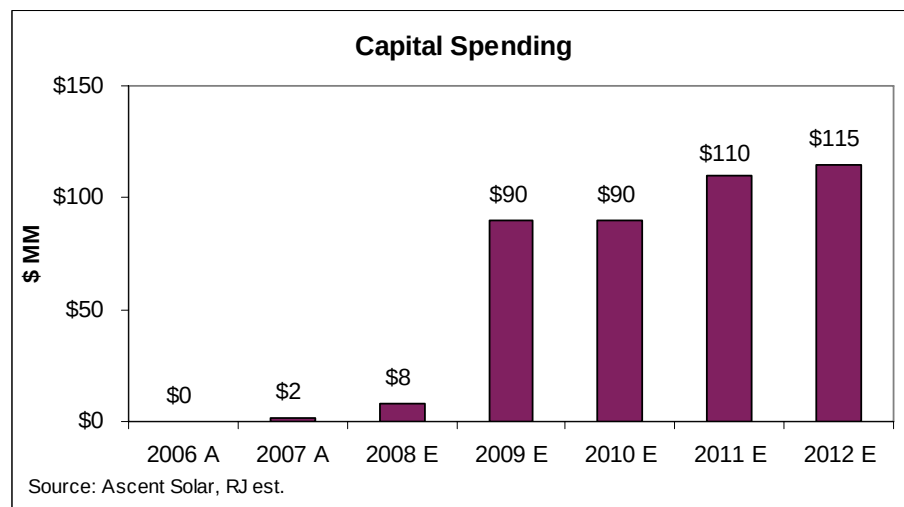


After widening losses in 2008 and 2009, which reflect rising overhead costs during the early stages of its production capacity ramp-up, we are anticipating that Ascent nearly reaches break-even in 2010 and finally becomes profitable in 2011. The chart on the next page shows our earnings per share and cash flow per share estimates through 2012.



Capital Spending and Financing

As of year-end 2007, Ascent had a pristine balance sheet, with cash and short-term investments totaling \$38 million, and no long-term debt. Following minimal capital expenditures in 2007 and 2008, we project spending ramping up sharply to \$90 million in 2009 and 2010, followed by \$110 million in 2011 and \$115 million in 2012.



Given its currently negative operating cash flow, Ascent will be almost entirely dependent on external capital for financing its capacity expansion program through 2011. Because the company currently has no cash flow with which to service debt, equity will almost certainly be the principal (or even sole) source of capital over this timeframe.

Ascent received \$28.4 million in fresh capital from Norsk Hydro in March 2008, as the company's largest shareholder increased its stake to ~35%. We would also point out that, in that same month, Ascent filed a registration statement for a proposed equity offering of \$80 million.

Given the step change in anticipated capital spending beginning in 2009, we believe regular equity financing should be expected through year-end 2011. In fact, inclusive of the recent sale of shares to Norsk Hydro and proposed public offering, we are assuming three additional equity offerings (one per year) through 2011, all totaling roughly \$395 million in the aggregate. Accordingly, we project that weighted average shares outstanding will increase from 9.2 million in 2007 to 28.8 million in 2012.

Recent News

On April 15, 2008, Ascent announced the formation of a strategic partnership with French-based Icopal SAS, a distributor and manufacturer of roofing systems. The partnership focuses on the development of BIPV roofing products and targets the European market. Ascent will provide Icopal with output from its 1.5 MW production line, and the two companies plan to engage in demonstration-scale projects.

On April 10, 2008, Ascent announced the formation of a strategic partnership with Spanish-based Giscosa Sociedad Limitada, a distributor and manufacturer of rubber membranes for roofing, reservoirs, and canals. The partnership focuses on the development of BIPV roofing products, based on Giscosa's existing RubberSun product line. Ascent will provide Giscosa with output from its 1.5 MW production line, and the two companies plan to engage in demonstration-scale projects. Through this partnership, Ascent gains greater exposure to the Spanish solar market, one of the fastest-growing in the world.

On April 1, 2008, Ascent announced the formation of a strategic partnership with Canadian-based ICP Solar Technologies, which develops, manufactures, and markets PV-based products and building materials. Through the partnership, Ascent will provide ICP Solar with output from its pilot 1.5 MW production line in 2008 and 2009, and ICP Solar will develop, test, and integrate it into ICP Solar's portable power and other electronics-integrated PV products. ICP Solar's focus on consumer applications of PV fits well with the flexible and lightweight plastic substrate underpinning Ascent's PV design.

On March 31, 2008, Ascent announced that it had reached initial operating capability (IOC) on its 1.5 MW production line, the primary objective of which is to continue to develop and refine the company's technology platform. The 1.5 MW line represents more of a research and development lab, rather than a true commercial-scale production plant. The technologies developed there will continue to play an integral role in the company's long-term expansion plans. In addition, the company announced the appointment of Gary Gatchell to the position of chief financial officer.

On March 27, 2008, Ascent announced that Norsk Hydro ASA has exercised an option to purchase an additional 2,341,897 shares of common stock and 1,689,905 Class B warrants, bringing its total stake in Ascent to approximately 35%. Total proceeds from the follow-on investment are \$28.4 million.

On March 20, 2008, Ascent announced that it has been awarded the second phase of an Air Force Small Business Innovative Research contract. The contract, which is valued at \$750,000, is geared toward the continued development of a flexible thin film tandem solar cell – which is a combination of two cells stacked atop one another, with the top and bottom cells gathering

energy from separate parts of the solar spectrum – targeting conversion efficiencies of 20%.

On March 14, 2008, Ascent filed for a proposed follow-on equity offering totaling \$80 million. The proceeds from the offering are anticipated to support the design, purchase, installation, qualification, and testing of production tools for the expansion of its commercial 30 MW thin film production line.

On February 28, 2008, Ascent announced the formation of a strategic partnership with Japanese-based ITOCHU Corp., a large conglomerate operating in numerous business segments. The partnership is centered around the following specific areas: (1) procurement of select machinery for Ascent's manufacturing facility; (2) sourcing of raw materials as Ascent ramps up output; (3) distribution of Ascent's products in Japan and other parts of the world where ITOCHU is currently pursuing solar installations; and (4) managing Ascent's future relationships with original equipment manufacturers (OEMs) in Japan.

Investment Conclusion

Within the context of the secular PV growth story, a market that we believe is poised for sustainable 40%+ growth through 2012, thin film represents a disruptive technology. Although thin film offers lower conversion efficiency, it allows for significant cost reductions relative to conventional polysilicon-based PV, especially given the current polysilicon shortage. As an **early-stage but well-positioned** entrant in this arena – one of the few publicly traded thin film pure-plays – Ascent stands to benefit from the increasing adoption of thin film for a variety of PV applications.

The two key features of Ascent's design are the use of (1) copper indium gallium diselenide (CIGS) for the semiconductor layer and (2) a flexible, plastic material for the substrate upon which CIGS is affixed. As compared to the two main thin film alternatives (cadmium telluride and amorphous silicon), CIGS has achieved **superior conversion efficiencies**. Meanwhile, Ascent's flexible substrate makes its product optimal for such applications as building-integrated and electronics-integrated PV.

Ascent's modules have reached efficiencies of up to 9.6%, and the company is targeting 10-12% over the intermediate-term. While the R&D continues, initial production from the company's first 1.5 megawatt (MW) line is expected by the end of 2Q08. The capacity ramp-up program targets commercial-scale production of 30 MW by year-end 2009, rising to 110 MW by year-end 2011. This is a highly achievable roadmap, and we believe **there may be room for acceleration**, though of course equipment sourcing and financing naturally present some execution risks.

As a development-stage company, Ascent is likely to have minimal revenue until 4Q09, and we project negative EPS until 4Q10. Beyond that, the sizable gains in revenue should translate into **rapid EPS growth**. Based on our 2012 EPS estimate of \$1.30, and applying a 30x multiple (consistent with our long-term growth rate assumptions), we arrive at a 2012 target price of \$39.00. Discounted back to 2009 at a 20% rate (conservative relative to the weighted average cost of capital of 10.3%) yields a target price of \$22.50. Given our bullish view of Ascent's commercialization prospects and market opportunities, though cognizant of the risks ahead, we are initiating coverage with an **Outperform** rating.

Public companies mentioned in this report.

Company Name	Ticker	Priced as of 04/18/08	RJ&A Rating (if Applicable)
Canadian Solar Inc	CSIQ	\$26.08	
Canon Inc.	CAJ	50.28	
China Sunergy Co. Ltd.	CSUN	8.84	
DayStar Technologies, Inc.	DSTI	3.36	
Energy Conversion Devices Inc.	ENER	32.89	
Evergreen Solar, Inc.	ESLR	9.60	Outperform
First Solar, Inc.	FSLR	285.79	
Honda Motor Company Ltd.	HMC	30.41	
JA Solar Holdings Co., Ltd.	JASO	25.75	Strong Buy
Lockheed Martin Corporation	LMT	106.24	
Polycom, Inc.	PLCM	20.73	
Royal Dutch Shell plc	RDS.A	76.39	
Siemens AG	SI	113.95	
Solarfun Power Holdings Co Ltd.	SOLF	14.71	
SunPower Corp.	SPWR	89.33	Strong Buy
Suntech Power Holdings Co., Ltd.	STP	47.05	Outperform
Trina Solar Limited	TSL	41.41	Strong Buy
Yingli Green Energy Holding Co. Ltd.	YGE	23.80	

Ascent Solar Technologies

QUARTERLY INCOME AND CASH FLOW (MILLIONS)

Earnings & Cash Flow	2006 A	2007 A	Q1 E	Q2 E	Q3 E	Q4 E	2008 E	Q1 E	Q2 E	Q3 E	Q4 E	2009 E	Q1 E	Q2 E	Q3 E	Q4 E	2010 E
Product Revenue	\$0.0	\$0.0	\$0.0	\$0.5	\$0.7	\$0.9	\$2.1	\$0.9	\$0.8	\$0.8	\$8.5	\$11.0	\$13.3	\$15.7	\$15.4	\$23.0	\$67.4
Other	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Operating Revenues	\$0.0	\$1.0	\$0.0	\$0.5	\$0.7	\$0.9	\$2.1	\$0.9	\$0.8	\$0.8	\$8.5	\$11.0	\$13.3	\$15.7	\$15.4	\$23.0	\$67.4
Cost of Sales	0.0	0.0	0.0	0.4	0.6	0.6	1.5	0.6	0.6	0.6	5.1	6.8	7.9	9.3	9.0	11.5	37.7
Gross Margin (%)				20.0%	25.0%	30.0%	26.0%	30.5%	31.0%	31.5%	40.0%	37.9%	40.5%	41.0%	41.5%	50.0%	44.1%
Depreciation and Amortization	0.0	0.1	0.0	0.1	0.1	0.1	0.3	0.1	0.1	0.1	1.1	1.4	1.5	1.8	1.8	2.7	7.8
Research and Development	0.7	4.0	1.2	1.4	1.6	1.8	6.0	1.9	1.9	2.0	2.0	7.7	2.1	2.1	2.2	2.2	8.5
Sales, General and Administrative	2.7	4.9	1.5	1.7	1.9	2.1	7.2	2.3	2.5	2.7	2.9	10.4	3.1	3.2	3.3	3.4	13.0
Other Operating Expenses (Income)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Operating Income	(\$3.4)	(\$7.9)	(\$2.7)	(\$3.1)	(\$3.4)	(\$3.7)	(\$12.9)	(\$4.0)	(\$4.2)	(\$4.5)	(\$2.6)	(\$15.4)	(\$1.3)	(\$0.7)	(\$0.9)	\$3.2	\$0.4
Other Non-Operating Expenses (Income)	(0.3)	(1.4)	(0.4)	(0.6)	(0.5)	(0.4)	(1.9)	(0.3)	(0.3)	(0.2)	(0.2)	(1.0)	(0.2)	(0.2)	(0.2)	(0.2)	(0.8)
Interest Expense	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pre-tax Extraordinary Items	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Income Tax Expense	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3
Net Income Before After-tax Extra. Items	(4.2)	(6.5)	(2.3)	(2.5)	(2.9)	(3.3)	(11.0)	(3.7)	(4.0)	(4.3)	(2.4)	(14.4)	(1.1)	(0.5)	(0.7)	2.0	(0.2)
After-tax Extraordinary Items	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minority Interest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reported Net Income	(4.2)	(6.5)	(2.3)	(2.5)	(2.9)	(3.3)	(11.0)	(3.7)	(4.0)	(4.3)	(2.4)	(14.4)	(1.1)	(0.5)	(0.7)	2.0	(0.2)
Adjustments for Non-recurring Items	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Adjusted Net Income	(\$4.2)	(\$6.5)	(\$2.3)	(\$2.5)	(\$2.9)	(\$3.3)	(\$11.0)	(\$3.7)	(\$4.0)	(\$4.3)	(\$2.4)	(\$14.4)	(\$1.1)	(\$0.5)	(\$0.7)	\$2.0	(\$0.2)
Reported Fully Diluted EPS	(\$1.45)	(\$0.70)	(\$0.20)	(\$0.16)	(\$0.17)	(\$0.20)	(\$0.73)	(\$0.22)	(\$0.24)	(\$0.20)	(\$0.11)	(\$0.75)	(\$0.05)	(\$0.02)	(\$0.03)	\$0.08	(\$0.01)
Adjusted Fully Diluted EPS	(\$1.45)	(\$0.70)	(\$0.20)	(\$0.16)	(\$0.17)	(\$0.20)	(\$0.73)	(\$0.22)	(\$0.24)	(\$0.20)	(\$0.11)	(\$0.75)	(\$0.05)	(\$0.02)	(\$0.03)	\$0.08	(\$0.01)
Primary Shares Outstanding, Mil.	2.9	9.2	11.4	15.3	16.8	16.8	15.1	16.8	16.8	21.8	21.8	19.3	21.8	21.8	25.8	25.8	23.8
Fully Diluted Shares Outstanding, Mil.	2.9	9.2	11.4	15.3	16.8	16.8	15.1	16.8	16.8	21.8	21.8	19.3	21.8	21.8	25.8	25.8	23.8
Cash Flow	2006 A	2007 A	Q1 E	Q2 E	Q3 E	Q4 E	2008 E	Q1 E	Q2 E	Q3 E	Q4 E	2009 E	Q1 E	Q2 E	Q3 E	Q4 E	2010 E
Net Income	(\$4.2)	(\$6.5)	(\$2.3)	(\$2.5)	(\$2.9)	(\$3.3)	(\$11.0)	(\$3.7)	(\$4.0)	(\$4.3)	(\$2.4)	(\$14.4)	(\$1.1)	(\$0.5)	(\$0.7)	\$2.0	(\$0.2)
Depreciation and Amortization	0.0	0.1	0.0	0.1	0.1	0.1	0.3	0.1	0.1	0.1	1.1	1.4	1.5	1.8	1.8	2.7	7.8
Deferred Income Tax	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3
Other Non-Cash & Adjustments	1.3	1.7	0.5	0.5	0.6	0.6	2.2	0.7	0.8	0.8	0.9	3.1	0.9	1.0	1.0	1.0	3.9
Cash Flow	(\$2.8)	(\$4.7)	(\$1.9)	(\$1.9)	(\$2.2)	(\$2.6)	(\$8.6)	(\$2.9)	(\$3.1)	(\$3.4)	(\$0.4)	(\$9.9)	\$1.4	\$2.3	\$2.1	\$7.1	\$12.9
Fully Diluted Cash Flow/Share	(\$0.98)	(\$0.51)	(\$0.16)	(\$0.12)	(\$0.13)	(\$0.16)	(\$0.57)	(\$0.17)	(\$0.19)	(\$0.16)	(\$0.02)	(\$0.51)	\$0.06	\$0.11	\$0.08	\$0.28	\$0.54
Stock Options Expense, Pre-Tax	\$1.0	\$1.0	\$0.3	\$0.3	\$0.3	\$0.3	\$1.0	\$0.3	\$0.3	\$0.3	\$0.3	\$1.0	\$0.3	\$0.3	\$0.3	\$0.3	\$1.0
Options Expense/Dil. Share, After-Tax	\$0.35	\$0.11	\$0.02	\$0.02	\$0.01	\$0.01	\$0.07	\$0.01	\$0.01	\$0.01	\$0.01	\$0.05	\$0.01	\$0.01	\$0.01	\$0.01	(\$0.01)
FD Adj. EPS Adding Back Options	(\$1.10)	(\$0.60)	(\$0.18)	(\$0.14)	(\$0.16)	(\$0.18)	(\$0.67)	(\$0.21)	(\$0.22)	(\$0.19)	(\$0.10)	(\$0.70)	(\$0.04)	(\$0.01)	(\$0.02)	\$0.08	(\$0.01)
YOY Change in Revenue	-	-					107.2%					429.5%					512.8%
YOY Change in EPS	-	NM					NM					NM					NM

Raymond James & Associates
Pavel Molchanov
(713) 278 – 5270
April 21, 2008

Ascent Solar Technologies

CASH FLOW STATEMENT (MILLIONS)

Operating Sources	2006 A	2007 A	2008 E	2009 E	2010 E
Net Income	(\$4.2)	(\$6.5)	(\$11.0)	(\$14.4)	(\$0.2)
Depreciation and Amortization	\$0.0	\$0.1	\$0.3	\$1.4	\$7.8
Deferred Income Tax	\$0.0	\$0.0	\$0.0	\$0.0	\$1.3
Other Non-Cash & Adjustments	\$1.3	\$1.7	\$2.2	\$3.1	\$3.9
Cash Flow	(\$2.8)	(\$4.7)	(\$8.6)	(\$9.9)	\$12.9
Fully Diluted Cash Flow/Share	(\$0.98)	(\$0.51)	(\$0.57)	(\$0.51)	\$0.54
Operating Uses					
Changes in Working Capital	\$0.1	\$0.4	\$0.0	\$0.0	\$0.0
Capital Expenditures	(\$0.1)	(\$1.7)	(\$8.0)	(\$90.0)	(\$90.0)
Total	(\$0.0)	(\$1.3)	(\$8.0)	(\$90.0)	(\$90.0)
Non-Operating Sources					
Asset Sales	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Acquisitions	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Change in Debt	(\$0.2)	\$0.0	\$16.6	\$99.9	\$77.1
Sale (Repurchase) of Stock	\$16.5	\$42.6	\$74.0	\$106.9	\$114.0
Other	(\$12.7)	(\$36.9)	\$0.0	\$0.0	\$0.0
Total	\$3.6	\$5.8	\$90.6	\$206.7	\$191.1
Beginning Cash	\$0.0	\$0.8	\$0.6	\$74.6	\$181.5
Change in Cash	\$0.8	(\$0.2)	\$74.0	\$106.9	\$114.0
Ending Cash	\$0.8	\$0.6	\$74.6	\$181.5	\$295.5

BALANCE SHEET (MILLIONS)

Assets	2006 A	2007 A	2008 E	2009 E	2010 E
Cash & Marketable Securities	\$1	\$1	\$75	\$181	\$295
Other Current Assets	\$10	\$38	\$38	\$38	\$38
Net Book Value of PP&E	\$0	\$2	\$9	\$98	\$180
Other Long-term Assets	\$0	\$10	\$10	\$10	\$10
Total Assets	\$11	\$50	\$132	\$327	\$523
Liabilities & Shareholders Equity					
Current Liabilities	\$0	\$1	\$1	\$1	\$1
Long-Term Debt	\$0	\$0	\$17	\$116	\$194
Other Non-current Liabilities	\$0	\$0	\$2	\$5	\$11
Common Shareholders Equity	\$11	\$49	\$112	\$204	\$318
Total Liabilities & Shareholders Equity	\$11	\$50	\$132	\$327	\$523

Important Investor Disclosures

The common stock of Ascent Solar Technologies, Inc. currently has an **Outperform** rating within our four-tiered rating system. Definitions of our ratings follow:

- Strong Buy (SB1)** Expected to appreciate and produce a total return of at least 15% and outperform the S&P 500 over the next six months. For higher yielding and more conservative equities, such as REITs and certain MLPs, a total return of at least 15% is expected to be realized over the next 12 months.
- Outperform (MO2)** Expected to appreciate and outperform the S&P 500 over the next 12 months. For higher yielding and more conservative equities, such as REITs and certain MLPs, an Outperform rating is used for securities where we are comfortable with the relative safety of the dividend and expect a total return modestly exceeding the dividend yield over the next 12 months.
- Market Perform (MP3)** Expected to perform generally in line with the S&P 500 over the next 12 months and is potentially a source of funds for more highly rated securities.
- Underperform (MU4)** Expected to underperform the S&P 500 or its sector over the next six to 12 months and should be sold.

Out of approximately 682 rated stocks in the Raymond James coverage universe, 56% have Strong Buy or Outperform ratings (Buy), 37% are rated Market Perform (Hold) and 7% are rated Underperform (Sell). Within those rating categories, 30% of the Strong Buy- or Outperform (Buy) rated companies either currently are or have been Raymond James Investment Banking clients within the past three years; 17% of the Market Perform (Hold) rated companies are or have been clients and 7% of the Underperform (Sell) rated companies are or have been clients.

Suitability ratings are not assigned to stocks rated Underperform (Sell). Projected 12-month price targets are assigned only to stocks rated Strong Buy or Outperform.

Suitability Categories (SR)

- Total Return (TR)** Lower risk equities possessing dividend yields above that of the S&P 500 and greater stability of principal.
- Growth (G)** Low to average risk equities with sound financials, more consistent earnings growth, possibly a small dividend, and the potential for long-term price appreciation.
- Aggressive Growth (AG)** Medium or higher risk equities of companies in fast growing and competitive industries, with less predictable earnings and acceptable, but possibly more leveraged balance sheets.
- High Risk (HR)** Companies with less predictable earnings (or losses), rapidly changing market dynamics, financial and competitive issues, higher price volatility (beta), and risk of principal.
- Venture Risk (VR)** Companies with a short or unprofitable operating history, limited or less predictable revenues, very high risk associated with success, and a substantial risk of principal.

Analyst Holdings and Compensation: Equity analysts and their staffs at Raymond James are compensated based on a salary and bonus system. Several factors enter into the bonus determination including quality and performance of research product, the analyst's success in rating stocks versus an industry index, and support effectiveness to trading and the retail and institutional sales forces. Other factors may include but are not limited to: overall ratings from internal (other than investment banking) or external parties and the general productivity and revenue generated in covered stocks.

Raymond James Relationships: RJA expects to receive or intends to seek compensation for investment banking services from the subject companies in the next three months.

Company Name	Disclosure
Ascent Solar Technologies, Inc.	Raymond James & Associates makes a NASDAQ market in shares of ASTI.
Evergreen Solar, Inc.	Raymond James & Associates makes a NASDAQ market in shares of ESLR.
JA Solar Holdings Co., Ltd.	Raymond James & Associates makes a NASDAQ market in shares of JASO.
SunPower Corp.	Raymond James & Associates makes a NASDAQ market in shares of SPWR.

Valuation Methodology: The Raymond James methodology for assigning ratings and target prices includes a number of qualitative and quantitative factors including an assessment of industry size, structure, business trends and overall attractiveness; management effectiveness; competition; visibility; financial condition, and expected total return, among other factors. These factors are subject to change depending on overall economic conditions or industry- or company-specific occurrences. Our valuation methodology for Ascent is primarily based on a target multiple of share price to projected forward-year EPS. The methodology also takes into account a target multiple of enterprise value to projected forward-year EBITDA and a target multiple of enterprise value to projected forward-year revenue.

General Risk Factors: Following are some general risk factors that pertain to the projected 12-month target prices included on our research for stocks rated Strong Buy or Outperform: (1) Industry fundamentals with respect to customer demand or product / service pricing could change and adversely impact expected revenues and earnings; (2) Issues relating to major competitors or market shares or new product expectations could change investor attitudes toward the sector or this stock; (3) Unforeseen developments with respect to the management, financial condition or accounting policies or practices could alter the prospective valuation; or (4) External factors that affect the U.S. economy, interest rates, the U.S. dollar or major segments of the economy could alter investor confidence and investment prospects.

Specific Investment Risks Related to the Industry or Issuer

Conventional Energy Price Risk

Alternative energy competes with conventional energy sources, the most important of which are crude oil, natural gas, and coal. Declines in the price of conventional energy can make alternative energy less competitive, and in some cases make it economically unviable. Consumers are less likely to view alternative energy as a practical option if conventional energy is relatively more attractive from an economic standpoint.

Commerciality and Technology Risk

Not all types of alternative energy are currently commercial, and some may never reach full commercial viability. There is no guarantee that future technological developments will be favorable to alternative energy, and in fact, some developments could render some types of alternative energy obsolete or unattractive.

Public Policy Risk

Many types of alternative energy currently benefit from favorable government policies, including tax incentives for producers and/or consumers, direct and indirect subsidies, and mandatory use requirements. These policies are subject to change and may become less favorable in the future.

Regulatory Risk

Like all subsectors of energy, alternative energy is subject to many government regulations at various levels, including environmental and land use regulations. These rules can reduce the profitability of alternative energy and could potentially result in delay or loss of commerciality.

Risk Factors for Ascent Solar Technologies, Inc.

Lack of Near-Term Profitability

We do not believe that Ascent will achieve profitability until 2010-2011. Similarly, the company's currently negative cash flow from operations represents another financial challenge and may necessitate outside financing in the future.

Competitive Market Environment

The photovoltaic (PV) market is highly competitive. Production capacity is increasing among both established producers and new entrants. Once polysilicon supply ramps up sufficiently, there will be the possibility of PV oversupply in the market, and average selling prices (ASPs) of PV products may decline quickly.

Product Quality and Performance Risk

Solar cells are complex and must meet stringent quality requirements. Products as complex as these may contain undetected errors or defects. For example, solar cells and solar panels may contain defects that are not noticed until after they are shipped or installed. Such defects could lead to re-engineering expenses and costs due to warranty provisions. They could also adversely affect customer relations and business reputation.

Government Policy Risk

Many national and local policy measures benefit the solar power industry, including tax incentives and contract opportunities. Any of these measures can be amended, suspended, or repealed, and such action could reduce demand for solar power equipment. This would negatively impact the revenue of companies in the industry.

Significant Ownership by Norsk Hydro

Norsk Hydro owns approximately 35% of Ascent's common stock. As a result, Norsk Hydro has the ability to exert a high degree of influence on all matters requiring stockholder approval. In particular, Norsk Hydro is able to influence decisions on such issues as Ascent's strategic relationships with other companies, capital markets activity, and acquisitions or divestitures.

Additional Risk and Disclosure information, as well as more information on the Raymond James rating system and suitability categories, is available at www.rjcapitalmarkets.com/SearchForDisclosures_main.asp. Copies of research or Raymond James' summary policies relating to research analyst independence can be obtained by contacting any Raymond James & Associates or Raymond James Financial Services office (please see www.raymondjames.com for office locations) or by calling (727) 567-1000, toll free (800) 237-5643 or sending a written request to the Equity Research Library, Raymond James & Associates, Inc., Tower 3, 6th Floor, 880 Carillon Parkway, St. Petersburg, FL 33716.

The views expressed in this report accurately reflect the personal views of the analyst(s) covering the subject securities. No part of said person's compensation was, is, or will be directly or indirectly related to the specific recommendations or views contained in this research report. In addition, said analyst has not received compensation from any subject company in the last 12 months.

Investors should consider this report as only a single factor in making their investment decision.

For clients in the United Kingdom:

For clients of Raymond James & Associates (RJA) and Raymond James Financial International, Ltd. (RJFI): This report is for distribution only to persons who fall within Articles 19 or Article 49(2) of the Financial Services and Markets Act (Financial Promotion) Order 2000 as investment professionals and may not be distributed to, or relied upon, by any other person.

For clients of Raymond James Investment Services, Ltd.: This report is intended only for clients in receipt of Raymond James Investment Services, Ltd.'s Terms of Business or others to whom it may be lawfully submitted.

For purposes of the Financial Services Authority requirements, this research report is classified as objective with respect to conflict of interest management. RJA, Raymond James Financial International, Ltd., and Raymond James Investment Services, Ltd. are authorized and regulated in the U.K. by the Financial Services Authority.

For institutional clients in the European Economic Area (EEA) outside of the United Kingdom:

This document (and any attachments or exhibits hereto) is intended only for EEA institutional clients or others to whom it may lawfully be submitted.

Additional information is available on request.

Proprietary Rights Notice: By accepting a copy of this report, you acknowledge and agree as follows:

This report is provided to clients of Raymond James & Associates, Inc. (RJA) only for your personal, noncommercial use. Except as expressly authorized by RJA, you may not copy, reproduce, transmit, sell, display, distribute, publish, broadcast, circulate, modify, disseminate or commercially exploit the information contained in this report, in printed, electronic or any other form, in any manner, without the prior express written consent of RJA. You also agree not to use the information provided in this report for any unlawful purpose.

This report and its contents are the property of RJA and are protected by applicable copyright, trade secret or other intellectual property laws (of the United States and other countries). United States law, 17 U.S.C. Sec.501 et seq, provides for civil and criminal penalties for copyright infringement.

Copyright 2008 Raymond James & Associates, Inc. All rights reserved.

**The Raymond James
Energy Research Team**
(800) 945-6275

J. Marshall Adkins
Director of Energy Research

Wayne W. Andrews
Exploration & Production

John Freeman, CFA
Exploration & Production

Darren Horowitz
Midstream Suppliers

Jim Rollyson
Coal, Oilfield Services

Collin Gerry
Oilfield Services

Pavel Molchanov
Alternative Energy/
Exploration & Production

Kristal Choy
Sr. Research Associate

Cory Garcia
Sr. Research Associate

Kevin Smith
Sr. Research Associate

Wyatt McCormack
Research Associate

Emily Wang
Research Associate