



Ascent Solar Technologies

Initiating With Outperform (1)

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Analysts

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Unique Thin-Film Solar Technology, Ideal For Integrated Applications

Conclusion: ASTI is a development-stage solar company. We believe its unique, thin-film on plastic technology should be well-suited for specialty applications, likely to command better ASPs with fewer competitors. And, marketing via partners should yield a lean model. While not profitable until 2010, margins should scale rapidly with volume. Meanwhile, we expect production milestones and customer news to provide triggers. We see 45% upside vs. the market in 12 months and are initiating with an Outperform (1).

- **Attractive Building- And Electronics-Integrated Markets.** Solar PV, integrated with building or roofing materials (BIPV), or added to electronics products (EIPV), creates a value-added application, which differs from standard, rigid solar modules. Integration reduces installation and balance of system costs, and several countries offer higher BIPV subsidies.
- **Product May Be Tailored To Customer Needs.** The roll-to-roll manufacturing process uses monolithic integration (laser patterning and ink printing of interconnections) allowing ASTI to efficiently make laminates of various sizes and numbers of cells, without altering production tools.
- **Marketing Via Partners Should Yield Lean Model.** Norsk Hydro, one of the world's largest suppliers of building components, holds a 35% stake and is jointly developing BIPV products such as sun-shading systems. This approach should allow ASTI to leverage partners' brands and channels.
- **We See Rapid Margin Expansion As Volume Scales.** We project profits in H2:2010 as the first 30MW line ramps. Building capacity to 110MW should expand gross margin from about 29% in 2010 to 40% in 2012. We see 2012 net margin of 21% (taxed at 35%). Our 2012E EPS of \$1.50 assumes another equity raise and exercise of warrants. Discounting back to a 2010 P/E (at 25%), we see 45% upside vs. the market in 12 months.

ASTI (05/27)	\$13.21	Revenue \$MM						
Mkt cap	\$244.4MM	FY	2007	2008E	2009E	2010E	2011E	
Dil shares out	18.5MM	Dec	Actual	Prior	Current	Prior	Current	Current
Avg daily vol	513.7K	Q1	0.2	—	0.3A	—	—	—
52-wk range	\$6.5-28.4	Q2	0.2	—	0.3	—	—	—
Dividend	Nil	Q3	0.3	—	0.3	—	—	—
Dividend yield	Nil	Q4	0.3	—	0.3	—	—	—
BV/sh	\$7.08	Year	1.0	—	1.1	—	1.0	142.0
Net cash/sh	\$6.20	EV/S	—	—	116.6x	—	128.3x	0.9x
Debt/cap	4.0%							
ROE (LTM)	NM							
5-yr fwd EPS growth (Norm)	NA							
		EPS \$						
		FY	2007	2008E	2009E	2010E	2011E	
		Dec	Actual	Prior	Current	Prior	Current	Current
		Q1	(0.24)	—	(0.20)A	—	—	—
		Q2	(0.19)	—	(0.15)	—	—	—
		Q3	(0.19)	—	(0.10)	—	—	—
		Q4	(0.14)	—	(0.13)	—	—	—
		Year	(0.70)	—	(0.56)	—	(0.71)	0.00
		P/E	—	—	—	—	—	16.9x
S&P 500	1378.3							

Investment Thesis

ASTI is a development stage thin-film solar company. It started commercial production, for the purposes of product development and qualification, on a 1.5MW pilot line in Q2:08. We believe three factors make it attractive, despite its small size: it is likely to be one of the first to successfully commercialize CIGS thin-film technology, it uniquely uses roll-to-roll manufacturing on flexible plastic substrate (not rigid glass panels), and it uses monolithic integration, which is laser patterning and ink printing to interconnect cells into modules (not possible with flexible metal substrate). The resulting flexible, light weight laminates can be tailored to customer specifications, which should be particularly well suited for applications in building integrated PV (BIPV) and electronics integrated PV (EIPV). These specialty markets ought to command better ASPs with fewer competitors. Also, by working through channel partners, such as Norsk Hydro (which owns 35%), it should be able to gain market presence with relatively low expenses. Other partners include: ITOCHU, ICP Solar Technologies, Icopal, and Giscosa Sociedad Limitada. Capacity expansion to 110MW by year-end 2011 should drive strong revenue growth. We do not project profits until H2:2010, but margins should expand rapidly with volume. Meanwhile, the ramp of pilot production and more customer announcements should provide near-term triggers. Risk include: potential delays in achieving expected production volume, yields and conversion efficiency; failure to achieve customer qualifications and expected field performance; difficulty scaling the process from one-third meter to one meter wide substrate; the need to raise additional capital to fund expansion; competition from larger incumbent and many private thin-film PV companies; and potential changes to government subsidies for solar.

ASTI Revenue Buildup And Estimated Gross Margin (\$MM)

Production		2007	2008E	2009E	2010E	2011E	2012E
Pilot Line (1.5MW - 0.33 Meter)			0.5	1.5	1.6	1.7	1.7
Line One (30MW - 0.33 Meter)			0.0	0.0	22.0	29.0	30.4
Line Two (30MW - 1.0 Meter)			0.0	0.0	0.0	22.0	30.0
Line Three (50MW - 1.0 Meter)			<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>41.0</u>
Total Production			0.5	1.5	23.6	52.7	103.1
Shipments (MW)	2006	2007	2008E	2009E	2010E	2011E	2012E
BIPV			0.0	0.0	20.9	46.1	93.5
EIPV			<u>0.0</u>	<u>0.0</u>	<u>1.2</u>	<u>4.0</u>	<u>7.9</u>
Total - Shipments			0.0	0.0	22.1	50.1	101.4
ASP							
BIPV			\$0.00	\$0.00	\$3.00	\$2.80	\$2.60
% change Y/Y						-6.7%	-7.1%
EIPV			\$0.00	\$0.00	\$3.45	\$3.25	\$3.00
% change Y/Y						-5.8%	-7.7%
Revenue							
BIPV		\$0.0	\$0.0	\$0.0	\$62.7	\$129.0	\$243.2
EIPV		\$0.0	\$0.0	\$0.0	\$4.3	\$13.0	\$23.8
Contract Revenue		<u>\$1.0</u>	<u>\$1.1</u>	<u>\$1.0</u>	<u>\$0.0</u>	<u>\$0.0</u>	<u>\$0.0</u>
Total		\$1.0	\$1.1	\$1.0	\$67.0	\$142.0	\$267.0
Cost per Watt		2007	2008E	2009E	2010E	2011E	2012E
Raw Material					\$1.10	\$1.02	\$0.91
Labor and Overhead					\$0.61	\$0.51	\$0.40
Depreciation					<u>\$0.44</u>	<u>\$0.35</u>	<u>\$0.28</u>
Total per Watt					\$2.15	\$1.87	\$1.59
Gross Margin (estimated)							
BIPV		0.0%	0.0%	0.0%	28.2%	33.2%	39.1%
EIPV		0.0%	0.0%	0.0%	40.2%	42.2%	46.9%
Gross Profit		2007	2008E	2009E	2010E	2011E	2012E
BIPV		\$0.0	\$0.0	\$0.0	\$17.7	\$42.9	\$95.0
EIPV		\$0.0	\$0.0	\$0.0	\$1.7	\$5.5	\$11.2
Contract R&D		<u>\$1.0</u>	<u>\$1.1</u>	<u>\$1.0</u>	<u>\$0.0</u>	<u>\$0.0</u>	<u>\$0.0</u>
Total		\$0.0	\$0.0	\$0.0	\$19.4	\$48.3	\$106.2
Gross Margin		0.0%	0.0%	0.0%	28.9%	34.0%	39.8%

Source: Cowen and Company, company reports

Valuation Focus: N-T Milestones, L-T Margins

ASTI - Comparable Valuation

23-May-08	Price (\$)	Mkt Cap (\$MM)	CY Revs			Rev Growth		EV/Revs		CY EPS (\$)			EPS Growth		P/E	
			2007	2008E	2009E	08-07	09-08	2008E	2009E	2007	2008E	2009E	08-07	09-08	2008E	2009E
Canadian Solar	38.49	1,247	303	836	1,362	176%	63%	1.6	1.0	\$ (0.02)	\$ 2.35	\$ 3.31	NM	41%	16.4	11.6
China Sunergy	12.10	481	235	431	589	83%	37%	1.1	0.8	\$ (0.21)	\$ 0.25	\$ 0.60	NM	140%	48.4	20.2
Energy Conversion Devices	55.32	2,253	167	337	566	102%	NA	6.3	NA	\$ (0.54)	\$ 1.07	\$ 3.09	NM	NM	51.7	17.9
Evergreen Solar	10.97	1,126	70	117	408	67%	249%	9.2	2.6	\$ (0.11)	\$ (0.28)	\$ 0.75	NM	NM	NM	14.6
First Solar	278.48	22,726	504	1,052	2,050	109%	95%	21.0	10.8	\$ 1.43	\$ 2.82	\$ 5.86	97%	108%	98.8	47.5
JA Solar	23.44	3,651	369	1,023	1,713	177%	67%	3.4	2.0	\$ 0.40	\$ 0.92	\$ 1.49	130%	62%	25.5	15.7
SolarFun	22.58	1,093	316	638	917	102%	44%	2.1	1.5	\$ 0.43	\$ 0.71	\$ 1.17	67%	65%	31.8	19.3
SunPower	85.19	7,130	776	1,350	1,900	74%	41%	5.3	3.8	\$ 1.26	\$ 2.18	\$ 3.47	73%	59%	39.1	24.6
Suntech	46.89	8,722	1,348	1,990	3,100	48%	56%	4.6	2.9	\$ 1.02	\$ 1.55	\$ 2.52	52%	63%	30.3	18.6
Trina Solar	48.33	1,223	302	750	1,220	149%	63%	1.6	1.0	\$ 1.46	\$ 4.05	\$ 5.15	177%	27%	11.9	9.4
Yingli	22.30	2,890	585	1,029	1,719	76%	67%	3.0	1.8	\$ 0.42	\$ 0.99	\$ 1.89	138%	90%	22.5	11.8
Ascent Solar Technologies	13.14	243	1	1	1	10%	-9%	NM	NM	\$ (0.70)	\$ (0.56)	\$ (0.71)	NM	NM	NM	NM

Source: Cowen and Company, First Call estimates

Thin-Film PV Should Enjoy A Premium

Contribution margin on additional throughput and efficiency should be high

Thin-film PV should have more inherent ability to achieve low cost per watt than crystalline silicon solar cells. We expect the shortage of polysilicon to end by 2010, resulting in significantly lower cost per kilogram. However, thin film uses less than 1% of the semiconductor material and more of the production cost is fixed, so contribution margin on additional throughput and efficiency should be high (we estimate 60%+ when 110MW is fully ramped). And, monolithic integration eliminates a separate back-end manufacturing process for assembling cells into modules.

Few Plays On CIGS; No Others On Plastic Substrate

In the lab, CIGS has demonstrated higher conversion efficiency than competing thin-film technologies that use different semiconductor materials, a-Si and CdTe. While a number of companies are developing CIGS, there is little commercial production. And, ASTI appears to be the only one using plastic substrate, which permits monolithic integration methods not possible with metal substrates.

N-T Triggers: Progress On Pilot Ramp, Partnerships

We expect news regarding product development and new partners

We do not project commercial revenue until 2010. In the meantime, we expect ASTI to announce milestones in ramping the 1.5MW pilot line and conducting field testing of products. There should also be news regarding product development with partners. It has already announced Norsk Hydro, ITOCHU, ICP Solar Technologies, Icopal, and Giscosa Sociedad Limitada, and others are likely to follow.

We Project An Attractive Long-Term Model

We see 2012 net margin of 21% (taxed at 35%)

Ultimately, we expect ASTI to be valued on a P/E multiple, which should reflect its growth, competitive position, and returns. We see a large, underserved market for integrated PV applications, likely to command higher ASPs with fewer competitors. We expect gross margin to expand from about 29% in 2010, to 40% in 2012. The route to market via partners should leverage expenses to less than 10% of sales. We see 2012 net margin of 21% (taxed at 35%). Our 2012E EPS of \$1.50 assumes another 5MM-share equity raise and exercise of the 10.5MM Class B warrants. Discounting back to a 2010 P/E (at 25%), we see 45% upside vs. the market in 12 months.

Risks

Difficulty Achieving Expected Yields And Efficiencies

We believe 6-8% module efficiency is acceptable to customers

Pre-production prototyping has consistently achieved cell efficiencies of 10-12%, and module efficiencies of 6-8%, with best results of 9.6%. Initial trials on the 1.5MW line produced average cell efficiencies of 9.5% and small area module efficiencies of up to 7.1%. We believe 6-8% module efficiency is acceptable to customers. However, ASTI must still demonstrate consistent results at higher volumes with good yields.

Dependence On New Equipment Suppliers, Larger Scale

A one meter wide web may result in unforeseen challenges

If the pilot line performs as expected, there should be little scale-up risk with the first 30MW line, because it will use the same one-third meter wide tools. However, there could be delays in delivering the larger number required. The second 30MW expansion will use a one meter wide web, which may result in unforeseen challenges with the process, resulting in design changes and delays.

Delays In Customer Qualifications Or Product Certifications

ASTI expects to achieve product certification by Q2:09

Since ASTI is jointly developing integrated applications with customers, it depends on successful test installations and other work to be carried out by partners. This process may encounter unexpected difficulties using the PV laminates in conjunction with particular products. Once development with partners is complete, new PV products require certification by entities such as Underwriters Laboratory, Inc. (UL), IEC and TÜV, which ASTI expects to achieve by Q2:09.

Need For Additional Capital To Expand Capacity

ASTI expects to invest another \$170-180MM in capital equipment

The proceeds of the recent offering should be sufficient to fund the first 30MW expansion. To reach 110MW planned capacity by the end of 2011, ASTI expects to invest another \$170-180MM in capital equipment and \$15MM in pre-production costs. We have modeled proceeds from another equity offering, exercise of the Class B warrants, and additional debt. Without these funds, expansion would be curtailed.

Potential Changes In Government Support For Solar

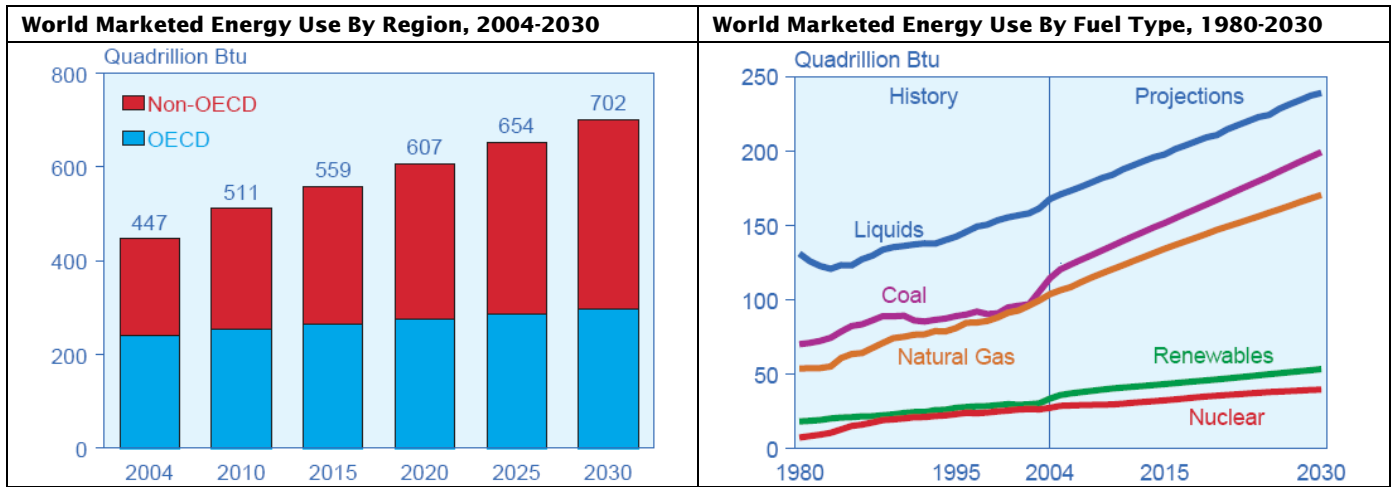
With the exception of Japan, solar PV power is not yet cost competitive with conventional, grid-supplied electricity. The majority of the global solar PV market depends on various kinds of government support for grid-connected installations: capital subsidies, which rebate a portion of the up-front system cost; feed-in tariffs, which require utilities to purchase power from solar installations at above-market rates; and tax incentives. These programs may be subject to periodic review and potential revision, or limited in duration. For example, Spanish and German subsidies are to be revised this year, and U.S. federal tax credits expire after 2008.

Competition From Incumbent And New Technologies

Larger, already commercial thin-film companies include First Solar and Energy Conversion Devices. Competitors currently developing or selling CIGS-based PV modules include AVANCIS, Global Solar Energy, HelioVolt, Honda, MiaSolé, NanoSolar, SoloPower, and Würth Solar.

Continued Growth In Global Energy Demand

International Energy Outlook - 2007



Source: EIA International Energy Outlook 2007

Fastest Growth Seen In Non-OECD Nations

Expected 95% growth in energy use in non-OECD countries

According to the U.S. Department of Energy, world marketed energy consumption is projected to rise by 57%, from 447 quadrillion Btu in 2004 to 702 quadrillion Btu in 2030. Growth in the more mature OECD countries should result in a 24% increase in energy use, while faster economic growth and the shift of energy-intensive manufacturing into these regions drives expected 95% growth in energy use in non-OECD countries, most notably in Asia (including China and India). High prices are expected to cause a shift away from oil, with liquids declining from 38% share of world energy use in 2004, to 34% in 2030. Despite concerns about emissions, coal is the fastest growing energy source, expected to rise from 26% in 2004, to 28% in 2030, while gas increases from 23% to 24%. Nevertheless, the three major fossil fuels are projected to remain dominant, rising from 86% to 87% overall. In the IEA reference case, renewable sources are expected to rise from 7% to 8% share mainly due to hydroelectric, while nuclear holds a 6% share.

World Marketed Energy Consumption By Country Grouping, 2004-2030E (Quadrillion Btu)

Region	2004	2010	2015	2020	2025	2030	Average Annual Percent Change, 2003-2030
OECD	239.8	254.4	265.2	275.1	285.9	298.0	0.8
North America	120.9	130.3	137.4	145.1	153.0	161.6	1.1
Europe	81.1	84.1	85.8	86.1	87.5	89.2	0.4
Asia	37.8	39.9	42.1	43.9	45.4	47.2	0.9
Non-OECD	206.9	256.6	294.2	331.9	367.8	403.5	2.6
Europe and Eurasia	49.7	54.7	59.4	64.4	68.7	71.5	1.4
Asia	99.9	131.0	154.7	178.8	202.5	227.6	3.2
Middle East	21.1	26.3	29.5	32.6	35.5	38.2	2.3
Africa	13.7	16.9	19.2	21.2	23.1	24.9	2.3
Central and South America	22.5	27.7	31.5	34.8	38.0	41.4	2.4
Total World	446.7	511.1	559.4	607.0	653.7	701.6	1.8

Source: EIA International Energy Outlook 2007

PV Is Well Positioned Among Renewables

Solar PV Targets Enormous Global Electricity Market

The U.S. alone is expected to grow 1.4% per year

Worldwide net electricity consumption is expected to nearly double, from 16.6 TWh in 2004 to 30.7 TWh in 2030 (U.S. DOE). While much of the increase stems from growth in the non-OECD countries (about 3.5% per year), consumption in OECD nations is expected to increase too (1.3% per year), driven by rising use of consumer electronics, office equipment, and telecommunications gear. The U.S. alone is expected to grow electricity consumption by 1.4% per year. From 2005 to 2030, the IEA estimates that about \$20T in investment will be required for electricity generation, transmission, and distribution.

The Entire Electricity Value Chain Is Seeing Rising Prices

Traditional power costs rising, solar declining

Demand for traditional power generation equipment as well as feedstocks is raising prices across the electricity value chain, and this is the case for coal as well as natural gas-based power generation. Aging and extension of transmission and distribution infrastructure stand to burden both mature and emerging economies. Engineering and construction costs are climbing due to high levels of activity and lengthening lead-times. Materials inputs in power plants, including steel, are also experiencing strong inflationary pressure. Finally, externalities arising from carbon emissions are another serious cost element, which we expect to be recognized in the form of a carbon tax (carbon-cap-and-trade) in due course. A recent MIT study suggested that the cost of carbon credits would raise the consumer price of electricity from coal-fired generation by 25 to 50 percent. Thus, the cost of fossil fuel-based electricity can be expected to continue to experience upward pressure, both the spark spread and total installed costs, while the cost of solar electricity—which has a costless, limitless energy source—is declining.

Solar PV Enjoys Many Advantages Vs. Other Renewables

Solar is a much larger available resource

We believe that solar PV has the potential for significant growth and penetration, thanks to a number of advantages over other renewable energy sources. Moreover, according to the U.S. DOE, solar is a much larger available resource (120,000TW) vs. wind (2-4TW) or remaining available hydroelectric (0.5TW):

- **Hydroelectric** power accounts for about 20% of electricity generation. However, it is difficult to expand capacity because of the limited number of suitable dam sites and the undesirable environmental impact of flooding large areas upstream. Moreover, the availability of hydroelectric power may be impacted by variations in annual precipitation and runoff.
- **Wind** power is less expensive per kWh, but is intermittent. Moreover, it faces challenges of site selection and requires transmission infrastructure. Wind is in most cases a central generating technology, as the scale of modern, cost-efficient turbines is too large to be utilized by typical homes or businesses.
- **Solar PV** is ideal for distributed generation. It is clean, quiet, reliable, modular, and scalable. It requires no regular maintenance and has a 25+-year lifetime. The output is intermittent, but tends to match closely with peak demand periods, when energy costs and grid congestion are greatest.

Diverse Demand Drivers

We believe that global interest in renewable energy has been driven by several factors: environmental concerns about greenhouse gas emissions and other pollutants from fossil fuels; desire for diversification of energy sources to reduce dependence on imports; constraints on transmission and distribution infrastructure, difficulty in site selection, and public resistance to new central generation power plants; and improved price performance of alternative technologies. Over the past five years, worldwide installations of solar electric PV systems have grown an average of more than 47% per year, to 2,826MW in 2007 (Solarbuzz).

Solar Supported By Capital Subsidies Or Feed-In Laws

Governments may support solar and other types of renewable energy via tax credits, low interest financing, and renewable portfolio standards (RPS), which require utilities to obtain a percentage of their power from qualified sources. The largest source of funding for grid-connected PV systems generally takes one of two forms:

- **Subsidies** based on the expected or measured output of the system. The government pays a portion of the capital cost upon installation or during the first few years, allowing the user to recover the rest of the cost from reduced need for grid supplied electricity. Net metering allows the user to sell any extra output back to the grid at the retail price.
- **Feed-In Tariffs** require utilities to buy solar power from distributed sites at a specified premium over a multiyear period. In this case, the solar system owner sells all his power back to the grid and can earn a profit over the life of the system.

Solar Economics Compete With Other L-T Investments

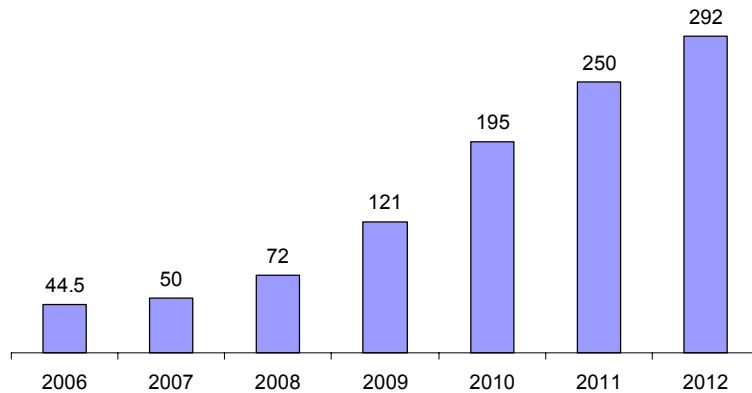
At a fundamental level, solar installations occur in diverse geographies because, we believe, individuals, commercial and industrial firms, and investors believe that the IRR is attractive at 7% or greater levels. Since systems pay back over 20+ years, in some instances with government guaranteed rates, they compete with other long-term, low-risk investments such as bonds or savings accounts. Returns vary by geography, since sunnier locations enjoy greater output for the same capital cost. The IRR appears to be roughly 10% or higher on most projects in Spain, for instance.

Solar Electric Systems Demand Exceeds Raw Material Supply

Growth for crystalline silicon PV products is constrained by availability of the key raw material, polysilicon (p-Si), which is expected to remain in tight supply at least through H2:08, and most likely into 2009. One indication of the strong demand for solar is the lofty price of spot p-Si, which may be quoted above \$400/kg, as compared to \$80-\$100/kg under long-term contracts. Photon Consulting projects polysilicon supply will increase from 72K MT in 2008, to nearly 300K MT in 2012.

PV systems pay
back over 20+
years

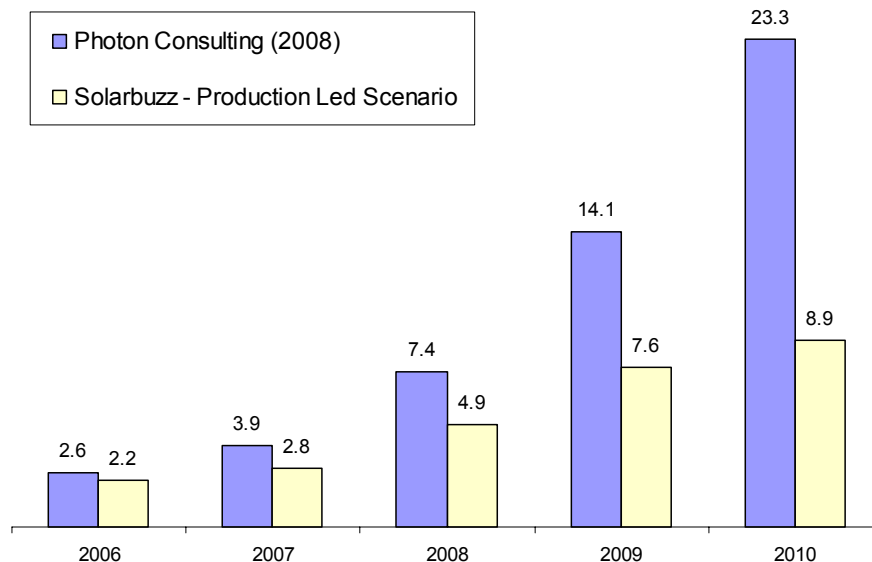
We expect tight
polysilicon
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Estimated Polysilicon Production, 2006-2012 (Thousand Metric Tons)

Source: Photon Consulting

Demand Scenarios Depend On Subsidies, Pricing, Materials

Demand scenarios vary based on expected growth in Germany, the world's largest market, which will review its feed-in law later this year; a similar review of Spanish policy, due to take effect in October; how rapidly other new markets such as Italy, France and Korea can ramp, as the permitting process for solar installations can be somewhat bureaucratic; evolution of policy support in the U.S. outside California; emergence of a domestic market in China; how rapidly PV prices can progress toward parity with grid-supplied electricity, including the expected rate of grid price increases; how much cost reductions and efficiency improvements can be translated into lower prices; and how rapidly thin-film production can increase. These factors result in widely diverging 2010 forecasts, ranging from about 9GW to 23GW.

Worldwide Solar Cell Production, 2006-2010 (GW)

Source: Photon Consulting, Solarbuzz

Attractive Markets For BIPV And EIPV

BIPV Roofing Membrane Installation



Source: Solar Integrated

The value of integration appears to be reflected in higher ASP/watt

Building Integrated PV Is A Value-Added Application

BIPV combines PV laminates with other building materials and structures, such as single-ply roofing membranes, standing seam metal roofs, siding, building facades, or sun shade systems. Since it is applied to an existing structure and shares the installation labor associated with that application, BIPV generally enjoys lower mounting and balance of system costs than retrofit solar modules. PV adds value to the existing application, which is typically sold at a price per unit area, rather than price per watt. The value of integration appears to be reflected in higher ASP/watt relative to conversion efficiency. For example, in the March quarter, we estimate that Energy Conversion Devices (ENER) had conversion efficiency of about 7% and an ASP of about \$3.00. First Solar (FSLR), which produces rigid glass modules, had average conversion efficiency over 10% and an ASP of \$2.45. In general, higher conversion efficiency should yield a price premium, due to the reduction in area-related costs. By comparison, crystalline silicon modules, with mid-teens average efficiency, were selling in the March quarter at ASPs near \$4.00/watt.

EIPV to provide off-grid battery charging for mobile phones and other devices should also command a premium for a lightweight, portable charging device.

Sample European Feed-In-Tariffs By System Type (Euro cents/kWh)

	France	Germany*	Italy	Spain*
System Size	All	100kW-1MW	>20kW	20kW-200kW
BIPV	€ 0.57	€ 0.40	€ 0.44	€ 0.39
BAPV	€ 0.31	€ 0.40	€ 0.40	€ 0.39
Ground	€ 0.31	€ 0.32	€ 0.36	€ 0.31
*proposed				

Source: Cowen and Company

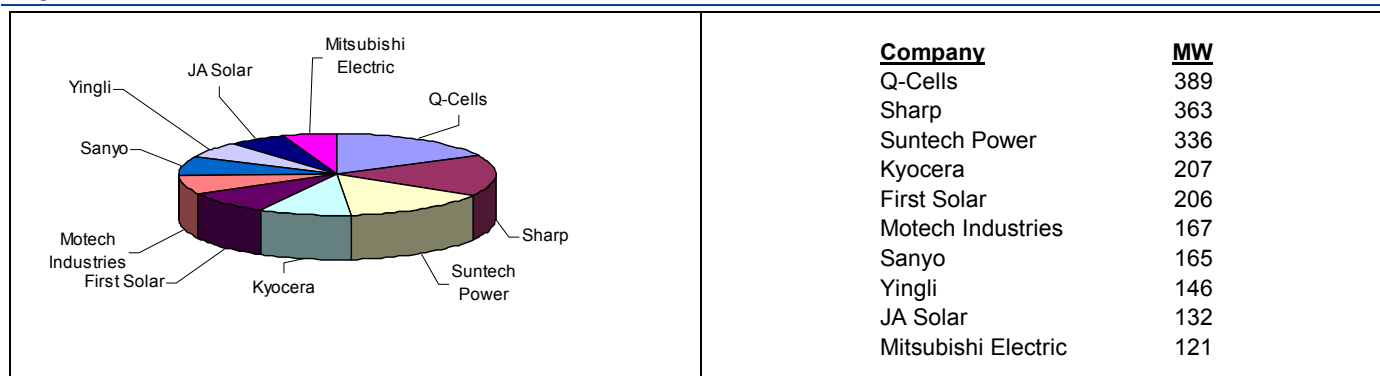
Some Countries Offer Higher Subsidies For BIPV

BIPV in France receives a much higher FIT

In France, BIPV installations receive a FIT of €0.57/kWh, compared to €0.31 for conventional modules and ground-mounted systems. The FIT in Italy is also higher, €0.44 for BIPV vs. €0.40 for building-applied and €0.36 for ground-mounted. While the proposed new FITs in Germany and Spain do not distinguish BIPV, higher rates are provided for rooftop installations vs. systems on the ground.

Competition: Crystalline PV, Thin-Films

Top Ten PV Cell Manufacturers In 2007 (MW)



Source: Solarbuzz

C-Si Still Dominates, But Thin-Film Rapidly Gaining Share

All but one of the top-10 PV manufacturers in 2007 produced crystalline silicon cells. However, thin-film has gained share, from about 6% in 2005, to 12% in 2007, according to Solarbuzz. Thin-film has the advantages of not being constrained by the shortage of polysilicon raw material and lower production cost per watt. Crystalline silicon enjoys higher conversion efficiency, 15-20%, vs. 6-10% for thin-film. Notably, several of the top crystalline silicon PV makers have either begun or announced plans for thin-film production, including: Q-Cells, Sharp and Suntech.

PV Cell Production By Technology, 2005-2007 (MW)

	2005	2006	2007
Crystalline Silicon	1558	2023	3036
% Share	94%	92%	88%
Thin Film	98	181	400
% Share	6%	8%	12%
Total	1656	2204	3436

Source: Solarbuzz

Most Thin-Film Competition In Conventional Rigid Modules

First Solar, which produces CdTe on glass modules, is the market leader in thin film, with capacity expected to surpass 1GW by the end of 2009, and cost per watt of \$1.14 in Q1:08. A number of companies are expected to enter the market with a-Si on glass modules, using equipment supplied by Applied Materials and Oerlikon Solar (a-Si modules are predominantly single-junction, expected to move to dual-junction, micro-morph). Competitors currently developing or selling CIGS-based PV modules include AVANCIS, Global Solar Energy, HelioVolt, Honda, MiaSolé, NanoSolar, SoloPower, and Würth Solar.

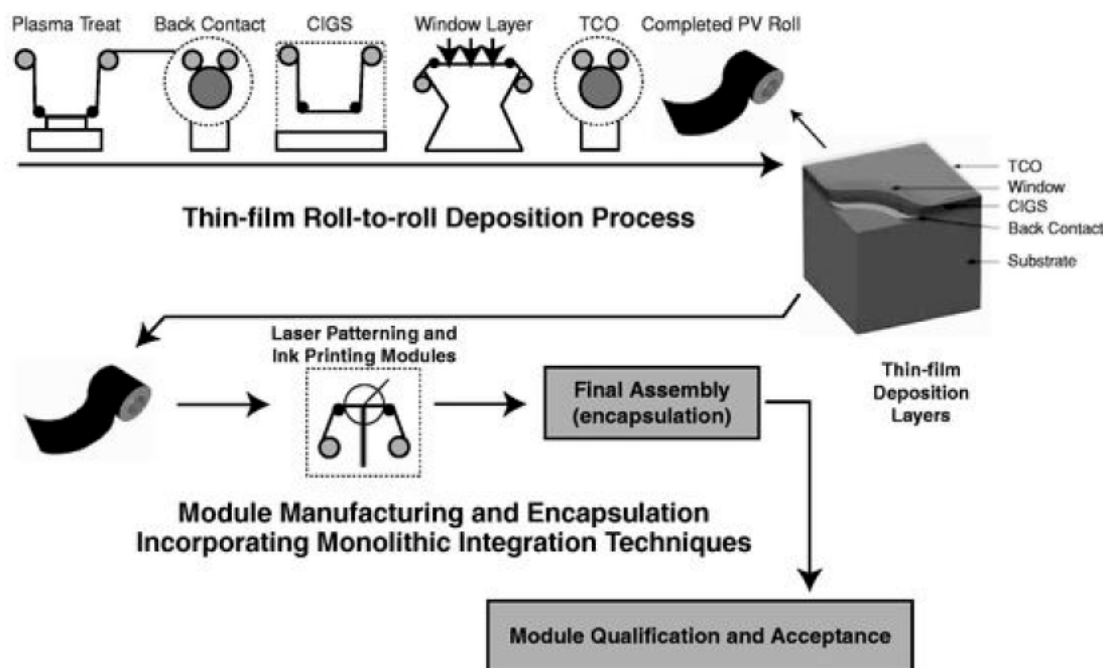
Flexible BIPV Segment Lead By ENER

There appears to be much less competition in BIPV on flexible substrates. Energy Conversion Devices (ENER), which produces triple-junction, a-Si on stainless steel substrate, is the leader in that segment, with capacity expected to reach 300MW by the end of F2010, and estimated cost per watt in the March quarter of \$2.09.

A number of companies are expected to enter the market with a-Si on glass modules

Unique Thin-Film On Flexible Plastic Substrate

ASTI Roll-To-Roll Manufacturing Process



Source: Company reports

Use Of Plastic Substrate Permits Monolithic Integration

This allows customized products from 2 meters long to the size of a BlackBerry case

ASTI's roll-to-roll manufacturing process creates solar cells by depositing thin layers of CIGS semiconductor and other materials onto a flexible plastic substrate. Monolithic integration creates modules with the desired number of cells by patterning the layers with a laser and printing interconnections. This allows the same production tools to produce application-specific products ranging from a BIPV laminate measuring two meters long, to an EIPV unit with 17 cells in the dimensions of a smart-phone case. Monolithic integration is possible on glass and plastic substrates. Thin-film on metal substrates must be cut into individual cells, which are then interconnected in a separate, back-end assembly step.

Next-Generation Tools Will Use One Meter Wide Material

ASTI plans about nine months to evaluate and test the process

The 1.5MW pilot line and line one will use the same one-third meter wide substrate. ASTI expects to begin procuring tools for line one during Q2-Q3:08, and should complete qualification and commence production by Q4:09. It should begin procuring tools for lines two and three in Q3:09 and Q3:10, with production expected to begin in Q4:10 and Q4:11, respectively. We have conservatively modeled the production startup one quarter later for each line. In general, the production process variables, such as speed, thickness and composition are expected to remain the same for the larger substrate. The most challenging aspect of the transition is likely to be the CIGS deposition step, so ASTI has begun development of a prototype tool, which should be delivered in Q3:08. This should allow for about nine months in which to evaluate and test the process prior to ordering tools for line two.

Capacity Ramp Should Drive Margin Expansion

ASTI – Estimated Shipments, ASP, And Revenue (MW, \$MM, Except ASP)

Production	2007	2008E	2009E	2010E	2011E	2012E
Pilot Line (1.5MW - 0.33 Meter)		0.5	1.5	1.6	1.7	1.7
Line One (30MW - 0.33 Meter)		0.0	0.0	22.0	29.0	30.4
Line Two (30MW - 1.0 Meter)		0.0	0.0	0.0	22.0	30.0
Line Three (50MW - 1.0 Meter)		0.0	0.0	0.0	0.0	41.0
Total Production		0.5	1.5	23.6	52.7	103.1
Shipments (MW)	2007	2008E	2009E	2010E	2011E	2012E
BIPV		0.0	0.0	20.9	46.1	93.5
EIPV		0.0	0.0	1.2	4.0	7.9
Total - Shipments		0.0	0.0	22.1	50.1	101.4
ASP						
BIPV		\$0.00	\$0.00	\$3.00	\$2.80	\$2.60
% change Y/Y					-6.7%	-7.1%
EIPV		\$0.00	\$0.00	\$3.45	\$3.25	\$3.00
% change Y/Y					-5.8%	-7.7%
Revenue						
BIPV	\$0.0	\$0.0	\$0.0	\$62.7	\$129.0	\$243.2
EIPV	\$0.0	\$0.0	\$0.0	\$4.3	\$13.0	\$23.8
Contract Revenue	<u>\$1.0</u>	<u>\$1.1</u>	<u>\$1.0</u>	<u>\$0.0</u>	<u>\$0.0</u>	<u>\$0.0</u>
Total	\$1.0	\$1.1	\$1.0	\$67.0	\$142.0	\$267.0

Source: Cowen and Company, company reports

We Assume No Commercial Revenue Until Q1:10

We assume all the pilot line output will be used for trials

Production on the 1.5MW pilot line should total about 2MW through the end of 2009. There could be limited commercial revenue in H2:09, once products have achieved certification. However, we assume all of the output will be used for product development and customer field trials. It is also possible the first 30MW line could be in service in late 2009, but we model first production in Q1:2010. We expect line two (30MW) to be in production in Q1:11, and line three (50MW) to start in Q1:12. Conversion efficiency is assumed to be about 9% initially, expanding gradually, which yields a 5-7% increase in nominal capacity per line after 2-3 years in operation. Contract research backlog was \$2.1MM at the end of March, which we project will be completed by the end of 2009.

Integrated Applications Should Command Higher ASPs

If the product were being launched today, it would likely command higher prices

We model BIPV at \$3.00 per watt in 2010, declining about 7% per year, to \$2.80 and \$2.60 in 2011 and 2012. It is too early to confirm product prices for ASTI, as the applications are still in development. However, we believe a BIPV price premium is supported by data and comments from Energy Conversion Devices (ENER). In the March quarter, we estimate ENER had an ASP of about \$3.00. Management expects flat to slightly lower prices in F09, and has said that if the product were being launched today, it would likely command higher prices. The fact that the PV laminate material is flexible, lightweight and may be integrated with roofing material appears to support a higher ASP relative to conversion efficiency. For example, First Solar (FSLR), which produces rigid glass modules, had average conversion efficiency in the March quarter over 10% (vs. about 7% for ENER) and an ASP of \$2.45. In general, higher conversion efficiency should yield a price premium, due to the reduction in area-related costs. Crystalline silicon modules, with average efficiency in the mid-teens, were selling for ASPs near \$4.00/watt in March.

We model EIPV products at about 10% of sales, with a 15% ASP premium. Applications like chargers for mobile phones will use a small amount of material, and should be of high value in areas where access to grid power is limited.

ASTI - Estimated Cost Per Watt And Gross Margin

Cost per Watt	2007	2008E	2009E	2010E	2011E	2012E
Raw Material				\$1.10	\$1.02	\$0.91
Labor and Overhead				\$0.61	\$0.51	\$0.40
Depreciation				\$0.44	\$0.35	\$0.28
Total per Watt				\$2.15	\$1.87	\$1.59
% change Y/Y					-13.0%	-15.3%
Gross Margin (estimated)						
BIPV	0.0%	0.0%	0.0%	28.2%	33.2%	39.1%
EIPV	0.0%	0.0%	0.0%	40.2%	42.2%	46.9%
Gross Profit	2007	2008E	2009E	2010E	2011E	2012E
BIPV	\$0.0	\$0.0	\$0.0	\$17.7	\$42.9	\$95.0
EIPV	\$0.0	\$0.0	\$0.0	\$1.7	\$5.5	\$11.2
Contract R&D	\$1.0	\$1.1	\$1.0	\$0.0	\$0.0	\$0.0
Total	\$0.0	\$0.0	\$0.0	\$19.4	\$48.3	\$106.2
Gross Margin	0.0%	0.0%	0.0%	28.9%	34.0%	39.8%

Source: Cowen and Company, company reports

When the 110MW capacity is fully ramped, variable cost should be less than \$1.00

Gross Margin Should Expand Rapidly With Capacity Ramp

We project gross margin of about 29% in 2010, when the first 30MW line is in production, with an average cost per watt of \$2.15. As lines two (30MW) and three (50MW) ramp in 2011 and 2012, average cost per watt should decline to \$1.87 (-13%) and \$1.59 (-15%), about 2x as fast as ASPs, expanding gross margin to about 34% and 40%, respectively. When the 110MW capacity is fully ramped, variable cost per watt (raw material and direct labor) should be less than \$1.00, so contribution margin on incremental output (from higher yield, throughput or conversion efficiency) should be over 60% (assuming an ASP of \$2.60).

Production Startup Costs During Qualification, Expansion

We expect the cost of product produced for customer qualifications and field trials to be booked on a separate expense line. We assume about \$4MM per year of production startup costs in 2009-11, related to the ramp of lines one to three.

Marketing Via Partners Should Yield Lean Expense Model

We expect operating expenses of about 8% of sales in 2012

We expect ASTI to be concentrated in BIPV/EIPV applications, and not to enter the mainstream PV module market until capacity is much greater than 110MW. In 2007, ASTI entered a strategic relationship with Norsk Hydro, one of the world's largest suppliers of aluminum building materials, for the joint development of BIPV products such as sun-shading systems, wall systems and facades. One of the first products is expected to be a louvered sun shading system. Norsk Hydro introduced the concept in November 2007 under the brand name Brise Soleil. In February 2008, ASTI announced plans to collaborate with ITOCHU to develop OEM relationships in Japan and distribution in markets where it is active in solar. Other recent partnership announcements include ICP Solar (EIPV) in North America, Icopal (BIPV) in France, and Giscosa Sociedad Limitada. ASTI is in discussions with a number of additional companies to establish similar relationships in various geographic markets. Since it will use partners to develop and market the products, we expect operating expenses of about 8% of sales in 2012.

R&D Currently Includes Cost Of Government Contracts

Higher R&D in 2008/09 reflects the cost of government contracts, which is recognized as an operating expense, rather than in COGS.

Interest Cost Reflects Timing Of Capex Vs. Warrant Exercise

We model about \$85MM in incremental debt in 2009/10

We expect the majority of capital expenditures for the expansion to 110MW to be booked by mid-2010. We have assumed that the 10.5MM Class B warrants are not exercised until Q2:11, just prior to their July 10, 2011 expiration. As a result, we model about \$85MM in incremental debt during 2009/10, which is paid down by H2:11. If warrants are exercised earlier, this would reduce interest expense.

We See Break-Even By 2010, 21% Net Margin In 2012

As line one ramps up, ASTI should swing to a profit by H2:10. We model a 5% tax rate in 2011 and 35% in 2012 (assuming about \$35MM in NOLs), resulting in net margins of about 20% and 21% in 2011/12, and EPS of \$0.78 and \$1.50, respectively.

ASTI - Annual P&L Forecast (\$MM)

FY = DECEMBER	2006	2007	2008E	2009E	2010E	2011E	2012E
Net Revenues	\$0.0	\$1.0	\$1.1	\$1.0	\$67.0	\$142.0	\$267.0
% Change Y/Y			2%	-5%	6598%	112%	88%
Cost of Revenue	-	-	-	-	47.6	93.7	160.8
Gross Profit	-	1.0	1.1	1.0	19.4	48.3	106.2
Gross Margin		100%	100%	100%	28.9%	34.0%	39.8%
R&D	0.3	3.0	4.9	4.0	1.2	1.6	2.4
% Sales		290%	463%	400%	1.8%	1.1%	0.9%
G&A	3.1	5.9	5.5	8.8	10.4	13.0	19.5
% of Sales		577%	524%	880%	15.5%	9.2%	7.3%
Production Startup	0.0	-	1.9	4.0	4.0	4.0	-
Operating Expenses	3.4	8.9	12.3	16.8	15.6	18.6	21.9
% of Sales		nm	nm	nm	23.3%	13.1%	8.2%
Operating Income	(3.4)	(7.9)	(11.3)	(15.8)	3.8	29.7	84.3
% Operating Margin	nm	nm	nm	nm	5.6%	20.9%	31.6%
Interest Expense	(1.1)	(0.0)	(0.4)	(0.9)	(4.6)	(1.5)	(0.3)
Interest income	0.3	1.4	2.6	1.6	0.7	1.2	3.1
Other Income (Exp)	-	-	-	-	-	-	-
Pretax Income	(4.2)	(6.5)	(9.1)	(15.1)	(0.1)	29.4	87.0
% of Sales	nm	nm	nm	nm	-0.2%	20.7%	32.6%
Taxes	-	-	-	-	-	1.5	30.5
% Tax Rate	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	35.0%
Net Income	(4.2)	(6.5)	(9.1)	(15.1)	(0.1)	28.0	56.6
% Net Margin	nm	nm	nm	nm	-0.2%	19.7%	21.2%
GAAP EPS	(\$1.45)	(\$0.70)	(\$0.56)	(\$0.71)	(\$0.00)	\$0.78	\$1.50
Average Shares (MM)	2.882	9.237	16.277	21.150	25.350	35.663	37.725

Source: Cowen and Company, company reports

ASTI - Quarterly P&L Forecast (\$MM)

FY = DECEMBER	Q1:07A	Q2:07A	Q3:07A	Q4:07A	Q1:08A	Q2:08E	Q3:08E	Q4:08E
Net Revenues	\$0.2	\$0.2	\$0.3	\$0.3	\$0.3	\$0.3	\$0.3	\$0.3
% Change Y/Y					30%	21%	-23%	-5%
% Change Q/Q		-12%	56%	-19%	16%	-18%	0%	0%
Cost of Revenue	-	-	-	-	0.0	0.0	0.0	0.0
Gross Profit	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Gross Margin	100%	100%	100%	100%	100%	100%	100%	100%
R&D	0.8	0.6	0.8	0.8	1.7	1.2	1.0	1.0
% Sales	323%	300%	235%	321%	552%	480%	400%	400%
SG&A	1.0	1.3	2.1	1.5	1.3	1.4	1.4	1.4
% of Sales	423%	632%	663%	567%	436%	560%	560%	560%
Production Startup	0.0	0.0	0.0	0.0	0.0	0.5	0.6	0.8
Operating Expenses	1.8	1.9	2.9	2.3	3.0	3.1	3.0	3.2
% of Sales	746%	932%	898%	888%	989%	1240%	1200%	1280%
Operating Income	(1.5)	(1.7)	(2.6)	(2.1)	(2.7)	(2.9)	(2.8)	(3.0)
% Operating Margin	nm	nm	nm	nm	nm	nm	nm	nm
Interest Expense	(0.0)	0.0	(0.0)	0.0	(0.0)	(0.1)	(0.1)	(0.1)
Interest income	0.1	0.3	0.5	0.5	0.4	0.5	1.0	0.7
Other Income (Exp)	-	-	-	-	-	-	-	-
Pretax Income	(1.4)	(1.5)	(2.1)	(1.6)	(2.4)	(2.5)	(1.9)	(2.4)
% of Sales	nm	nm	nm	nm	nm	nm	nm	nm
Taxes	-	-	-	-	-	-	-	-
% Tax Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Net Income*	(1.4)	(1.5)	(2.1)	(1.6)	(2.4)	(2.5)	(1.9)	(2.4)
% Net Margin	nm	nm	nm	nm	nm	nm	nm	nm
GAAP EPS	(\$0.24)	(\$0.19)	(\$0.19)	(\$0.14)	(\$0.20)	(\$0.15)	(\$0.10)	(\$0.13)
Average Shares (MM)	5.695	7.555	10.609	11.355	11.808	16.250	18.500	18.550

Source: Cowen and Company, company reports

Expansion Funded By Two Equity Offerings, Debt, Warrants

In 2009, we model \$100MM from another equity offering

We estimate proceeds from the recent 4.37MM share follow-on offering, the investment earlier this year by Norsk Hydro, and a \$7.5MM loan from the Colorado Housing and Finance Authority should be sufficient to fund 2008E capital expenditures of about \$60MM and operating cash burn of about \$7MM. In 2009, we model \$100MM from another equity offering and \$25MM in debt to fund \$150MM in capital expense and \$15MM cash used in operations. In 2010, we assume another \$60MM in debt is added to cover \$76MM capital expense. Operating cash flow should turn positive in 2010, and in 2011, we assume \$115MM from exercise of the Class B warrants should be used to pay down all outstanding debt, except for the CHFA loan.

ASTI - Cash Flow Forecast (\$MM)

FY = DECEMBER	2006	2007	2008E	2009E	2010E	2011E	2012E
Net Income (Loss) - GAAP	(4.2)	(6.5)	(9.1)	(15.1)	(0.1)	28.0	56.6
Depreciation & Amortization	0.0	0.1	2.0	2.4	11.7	21.0	33.3
Stock-based Compensation	0.3	1.7	0.2	0.0	0.0	0.0	0.0
Other Adjustments	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Working Capital Changes:							
Inventory	0.0	0.0	(0.3)	(2.7)	(6.8)	(6.6)	(10.8)
Accounts Receivable	0.0	(0.2)	0.0	0.0	(14.2)	(12.2)	(20.6)
Related Party Receivable	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0
Other Assets	(0.1)	(0.2)	0.0	(0.2)	(1.7)	(1.8)	(3.1)
Accounts Payable	0.0	0.2	(0.0)	0.0	14.1	12.2	20.6
Related Party Payable	0.1	0.1	(0.1)	0.0	0.0	0.0	0.0
Deferred Rent	0.0	0.0	(0.0)	0.0	(0.0)	0.0	0.0
Accrued Expenses	0.0	0.5	(0.2)	0.0	0.3	0.2	0.1
Total Working Capital Decr (Incr)	0.1	0.4	(0.5)	(2.9)	(8.3)	(8.2)	(13.8)
Cash Flow From Operations	(2.8)	(4.3)	(7.4)	(15.6)	3.3	40.8	76.1
Capital Expenditures	(0.1)	(1.8)	(59.9)	(150.0)	(76.0)	(16.0)	(16.0)
Deposits on Manufacturing Equipment	(0.4)	(9.4)	2.6	0.0	0.0	0.0	0.0
Patent activity costs	(0.0)	(0.1)	(0.0)	0.0	0.0	0.0	0.0
Other Investments	(9.9)	(27.2)	4.1	33.1	0.0	0.0	0.0
Total Cash From Investing	(10.4)	(38.4)	(53.2)	(116.9)	(76.0)	(16.0)	(16.0)
Change in Debt	(0.4)	0.0	7.5	24.7	59.6	(85.4)	(0.4)
Proceeds Issuance of Shares	14.3	42.5	85.5	100.0	0.0	0.0	0.0
Changes in Equity	0.0	0.0	1.2	(0.0)	(0.0)	115.5	0.0
Total Cash From Financing	13.9	42.5	94.1	124.7	59.6	30.1	(0.4)
Effect of Exchange Rate Changes	-	-	-	-	-	-	-
Change in Cash Position	0.8	(0.2)	33.5	(7.8)	(13.1)	54.9	59.7
Beginning Cash	0.0	0.8	0.6	34.1	26.3	13.2	68.1
Ending Cash	0.8	0.6	34.1	26.3	13.2	68.1	127.8

Cowen Summary:

Cash Flow from Operations (a)	(2.8)	(4.3)	(7.4)	(15.6)	3.3	40.8	76.1
Capital Spending	(0.1)	(1.8)	(59.9)	(150.0)	(76.0)	(16.0)	(16.0)
Owners' Cash Flow	(2.9)	(6.1)	(67.3)	(165.6)	(72.7)	24.8	60.1
Financing	13.9	42.5	94.1	124.7	59.6	30.1	(0.4)
Non-Recurring Items	(9.9)	(27.2)	4.1	33.1	0.0	0.0	0.0
Beginning Cash	0.0	0.8	0.6	34.1	26.3	13.2	68.1
Change in Cash	0.8	(0.2)	33.5	(7.8)	(13.1)	54.9	59.7
Ending Cash	0.8	0.6	34.1	26.3	13.2	68.1	127.8

(a) Excludes non-recurring items

Source: Cowen and Company, company reports

Working Capital Assumptions Could Prove Conservative

We model inventory turns of about 6x and A/R DSO of 60. Since customer demand is likely to exceed capacity, these ratios could prove to be conservative, resulting in better operating cash flow. For example, an increase in inventory turns to 8x and decrease in A/R DSO to 45 would yield about \$4MM and \$6MM, respectively.

ASTI - Balance Sheet Forecast (\$MM)

FY = DECEMBER	2006	2007	2008E	2009E	2010E	2011E	2012E
Assets:							
Cash & Cash Equivalents	\$0.8	\$0.6	\$34.1	\$26.3	\$13.2	\$68.1	\$127.8
Short term Investments	9.9	37.1	33.1	0.0	0.0	0.0	0.0
Inventory	0.0	0.0	0.3	3.0	9.8	16.4	27.2
Accounts Receivable	0.0	0.2	0.2	0.2	14.4	26.6	47.2
Related Party Receivable	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Current Assets	<u>0.1</u>	<u>0.3</u>	<u>0.3</u>	<u>0.5</u>	<u>2.2</u>	<u>4.0</u>	<u>7.1</u>
Current Assets	10.8	38.3	68.0	30.0	39.5	115.0	209.3
PP&E, net	0.1	1.8	66.7	214.3	278.6	273.6	256.3
Deposits On Manufacturing Equipment	0.4	9.7	0.0	0.0	0.0	0.0	0.0
Patents	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Other	<u>1.0</u>	<u>0.0</u>	<u>0.4</u>	<u>0.4</u>	<u>0.4</u>	<u>0.4</u>	<u>0.4</u>
TOTAL ASSETS	\$11.3	\$49.8	\$135.2	\$244.8	\$318.6	\$389.1	\$466.1
Liabilities:							
Accounts Payable	0.1	0.3	0.2	0.2	14.4	26.6	47.2
Amounts Due To Related Parties	0.2	0.3	0.2	0.2	0.2	0.2	0.2
Accrued Expenses	<u>0.1</u>	<u>0.7</u>	<u>0.5</u>	<u>0.5</u>	<u>0.8</u>	<u>1.0</u>	<u>1.1</u>
Current Liabilities	0.4	1.2	0.9	0.9	15.3	27.8	48.5
Long-Term Debt	0.0	0.0	7.5	32.2	91.8	6.4	6.0
Deferred Rent	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total Liabilities	\$0.4	\$1.2	\$8.5	\$33.2	\$107.1	\$34.2	\$54.5
Stockholder's Equity:	10.9	48.6	126.7	211.6	211.5	355.0	411.6
TOTAL LIABILITIES AND EQUITY	\$11.3	\$49.8	\$135.2	\$244.8	\$318.6	\$389.1	\$466.1
Turnover:							
Assets	nm	nm	nm	nm	0.21	0.36	0.57
Non-Cash Assets	nm	nm	nm	nm	0.22	0.44	0.79
Inventory Turns	nm	nm	nm	nm	4.8	5.7	5.9
A/R DSO	nm	70	70	70	60	60	60
A/P Days Payable	n/a	88	85	85	60	60	60
Leverage:							
LT Debt/Equity	0%	0%	6%	15%	43%	2%	1%
Total Debt/Capital	0%	0%	6%	13%	30%	2%	1%
Debt-Cash/Equity	-98%	-78%	-47%	3%	37%	-17%	-30%
Assets/Equity	104%	102%	107%	116%	151%	110%	113%
Cash/Assets	95%	76%	50%	11%	4%	17%	27%
Returns:							
ROA	-37.0%	-21.2%	-9.8%	-7.9%	0.0%	7.9%	13.2%
Non-Cash ROA	-1468.0%	-101.7%	-22.6%	-10.5%	0.0%	8.9%	17.2%
ROE	-38.4%	-12.0%	-6.0%	-5.5%	0.0%	6.1%	9.6%
Per Share:							
Operating Cash Flow	(\$0.96)	(\$0.46)	(\$0.45)	(\$0.74)	\$0.13	\$1.14	\$2.02
Depreciation	\$0.00	\$0.01	\$0.13	\$0.11	\$0.46	\$0.59	\$0.88
Cash	\$0.27	\$0.06	\$2.09	\$1.24	\$0.52	\$1.91	\$3.39
Working Capital	\$3.61	\$4.01	\$4.12	\$1.37	\$0.95	\$2.45	\$4.26
Book Value	\$3.78	\$5.26	\$7.78	\$10.01	\$8.34	\$9.95	\$10.91

Source: Cowen and Company, company reports

Addendum

STOCKS MENTIONED IN IMPORTANT DISCLOSURES

Ticker	Company Name
ASTI	Ascent Solar Technologies

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(a) Assumptions: Time horizon is 12 months; S&P 500 is flat over forecast period.

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