

The Future of Photovoltaic Technology

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Agenda

The Investment Case for Solar

Second Growth Phase of Solar Era

Key Trends During the Second Growth Phase of Solar Era

Grid Parity Phase

U.S. Solar Market

Germany

Longer term Winners

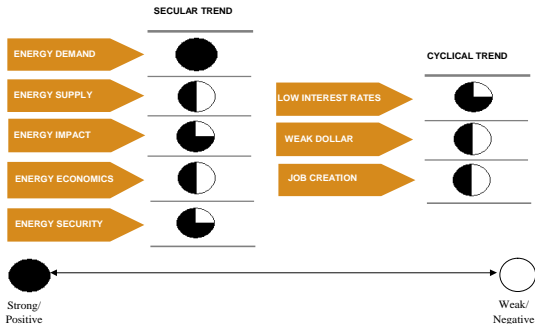
Summary

The Investment Case for Solar

Long Term Secular Growth Drivers

- Increasing energy demand, particularly resulting from strong growth of emerging economies
- Depleting supply of traditional energy sources
- Increasing trend toward using carbon-neutral solutions to address the climate change problem
- Improved solar energy cost economics
- Geopolitical factors such as energy security creating a positive shift in the energy policy of major governments.

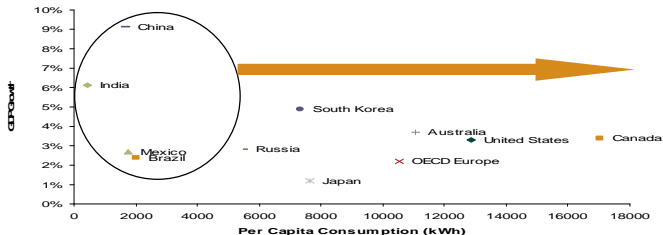
Solar Energy Investment Drivers



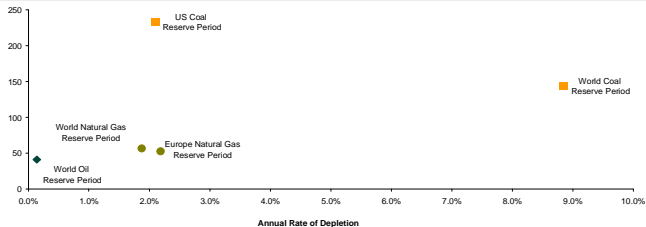
Source: Barclays Capital Research

Increasing Energy Demand & Depleting Energy Supply

GDP Growth versus Per Capital electricity Consumption



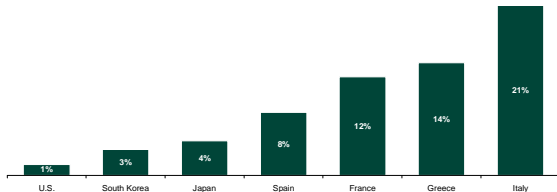
Reserve Period (# of years) of Traditional Resources



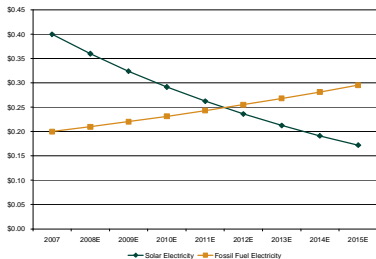
Source: Barclays Capital Research

Environmental Impact & Improved Economics for solar energy sector

Solar Contribution to Carbon Emissions Reduction by 2012



Solar Electricity Price vs.. Fossil Fuel Price



Source: Barclays Capital Research

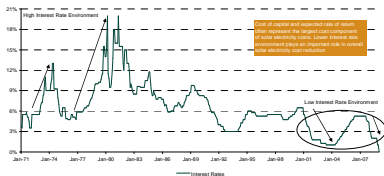
% of US Consumer Wallet spent on Electricity



Source: Dan Ford, US Utility Sector Analyst, Barclays Capital research

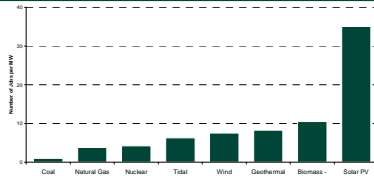
Geopolitical Factors & Favorable Interest Environment

Interest Rate Environment



Source: Barclays Capital Research, FactSet

Job Creation Potential



Source: INEEL, BC Sustainable Energy Association, Renewable Energy Policy Project, Barclays Capital research

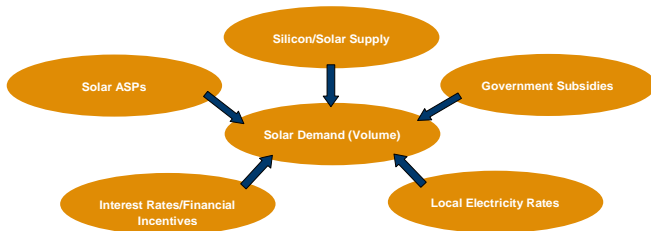
Energy Imports by Country

Country	Net energy imports as % of energy use	Primary electricity source	Total installed capacity (GW)	Installed solar capacity (GW)
Germany	61%	Coal (60%)	120	2.6
Japan	84%	Oil	248	1.7
US	28%	Coal (33%)	960	0.6
France	50%	Nuclear (60%)	113	0.1
Spain	76%	Coal	67	0.2
Portugal	83%	Coal	12	0.02
Italy	85%	Oil	77	0.06
Greece	67%	Coal	12	0.03
Ireland	87%	Oil	6	0.01
South Korea	82%	Coal	62	0.05

Source: Barclays Capital Research, EIA

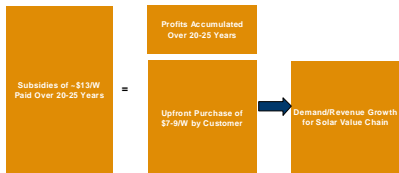
Factors affecting solar industry shipments

Potential Solar Demand Drivers



Source: Barclays Capital Research

Solar Subsidies Provide Catalyst for Demand



Source: Barclays Capital Research

Solar – Multistage Growth Cycle

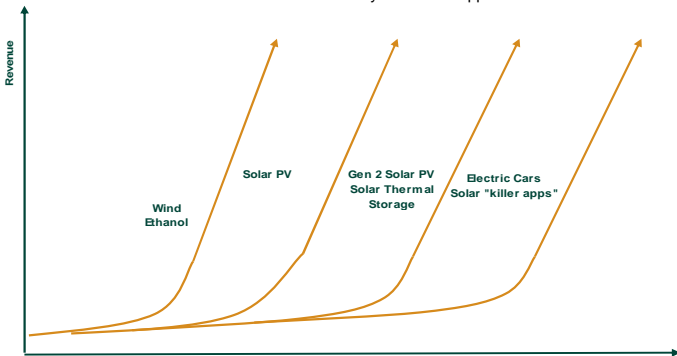


Source: Barclays Capital Research

Bottom Line

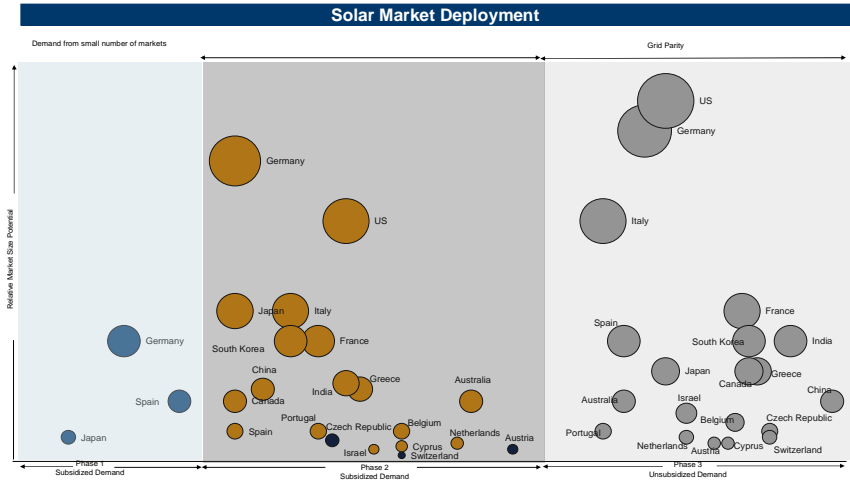
We expect solar technology to drive several new applications

- Currently in the second wave of investments in the global clean energy sector
- Expect worldwide solar investments to increase by \$90 billion by 2012.
- We see the 3rd wave of investments to be characterized by second generation solar PV technology, solar thermal and storage technologies.
- We see the 4th wave of solar investments to be influenced by solar killer applications such as electric cars.



Source: Barclays Capital Research

Solar Market Deployment



Source: Barclays Capital Research

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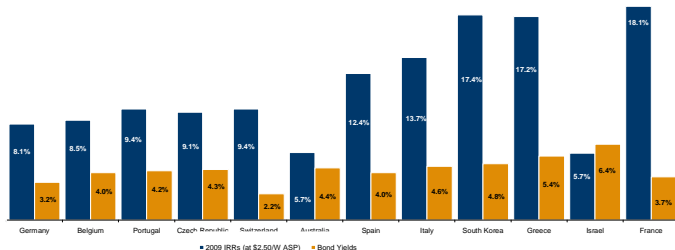
Summary

Second Growth Phase: Greater Supply of Lower Priced Panels

As supply increases, new downstream channels develop to take advantage of incentives

- Module prices are forecasted to decrease between 30% and 50% in 2009, driving higher IRRs in a generally stable subsidy environment
- Excluding Germany, Spain and the US, demand in 2009 is expected to increase by 33% YoY.
- Despite poor weather conditions and challenging financing backdrop, German Demand is expected to increase 40% YoY in 2009.

Comparison of Solar IRRs versus Government Bond Yields



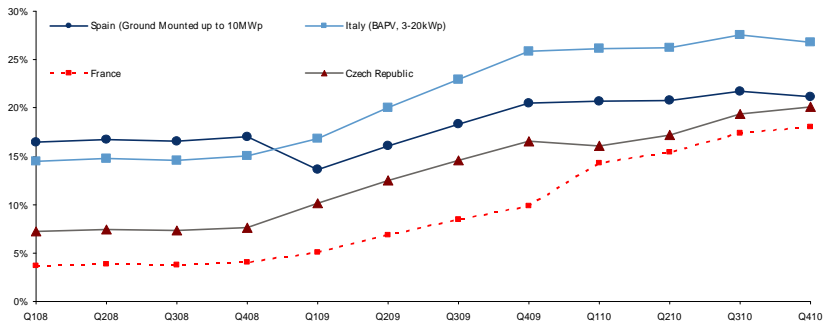
Source: Barclays Capital Research

Second Growth Phase: Evidence of Demand Elasticity

Summary

- Recent German market strength suggests that demand elasticity exists in markets where financing and permitting is not a constraint.

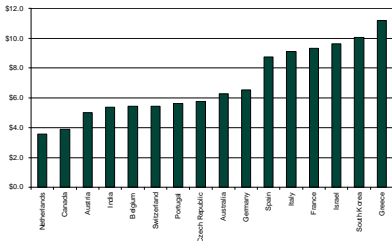
IRRs by Key Markets – Demand Elasticity Continues?



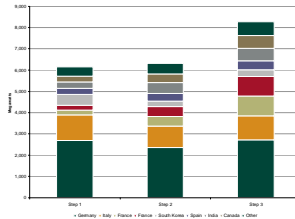
Source: Company Reports, Industry Sources, Barclays Capital Research

Second Growth Phase: New Incentives in Emerging Markets

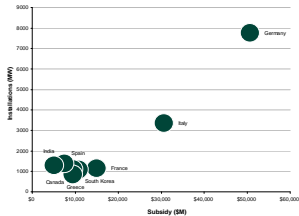
Net Present Value of Subsidies in Select Markets (\$/W)



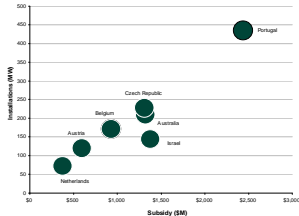
Installations Used In Calculating Phase 2 Subsidies



Total Subsidy Amount Allocated by Various Countries



Total Subsidy Amount Allocated by Various Countries

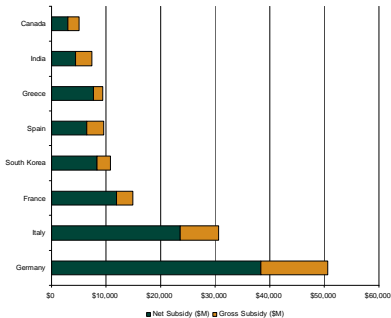


Source: Barclays Capital Research

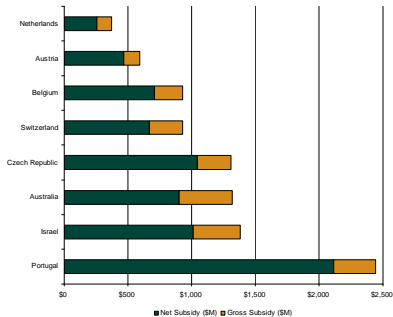


How Much Would Subsidies Really Cost?

Net Present Value of “Gross” and “Net” Subsidies



Installations Used In Calculating Phase 2 Subsidies



- Gross Subsidy Burden for all governments during Second Growth Phase estimated at \$200 billion
- \$50 billion constitutes end customer profit, \$150 billion constitutes solar industry revenue growth
- Net Burden – Takes into account fossil fuel generated electricity costs replaced by Solar
- Net Cost Burden only \$125 billion over 12 countries

Source: Barclays Capital Research

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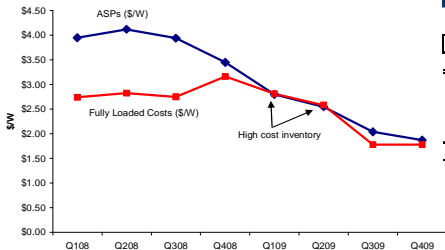
Summary

ASP Reductions Will Soon Hit a Near term Wall

Summary

- Module ASPs of Chinese manufacturers have declined from €3/W in 2008 to ~€1.35/W in Q309.
- Additional ASP declines in the near term are unlikely for two reasons:
 - ▶ Fully loaded costs of top 4 bankable Chinese manufacturers are currently between \$1.60/W and \$1.80/W
 - ▶ ASP spread between European and Chinese suppliers is the widest ever

Module ASPs vs. Fully Loaded Costs



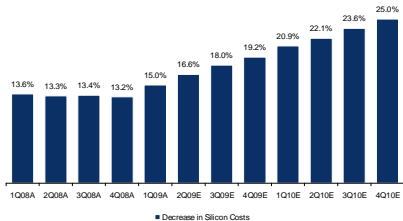
Fully Loaded Costs Decline as Shipments Increase

	Megawatts		
	200	250	300
Processing Cost (\$/W)	\$0.65	\$0.65	\$0.65
Wafer Price (\$/W)	\$0.80	\$0.80	\$0.80
Opex/W	\$0.23	\$0.18	\$0.15
Interest/W	\$0.10	\$0.08	\$0.07
Total Cost (\$/W)	\$1.78	\$1.71	\$1.67

Source: Company Reports, Barclays Capital Research

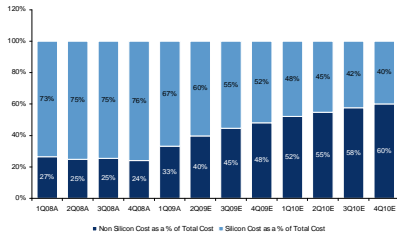
ASP Declines Hitting a Wall?

Decrease in Silicon Costs Required to maintain 20% GM, assuming 10% reduction in ASPs



Source: Barclays Capital Research

Silicon Cost vs. Non Silicon Costs



Source: Barclays Capital Research

Output (MM per year)	ASP (\$/W)	Op. Margin (%)	Op. Income (\$M)	Int. expense (\$M)	Capex (\$M)	# years reqd.
4000	1.3	5%	260	50	200	100
4500	1.3	5%	282.5	50	210	74
5000	1.3	5%	325	50	200	13
5200	1.3	5%	357.5	50	200	8

Note: Assumes 5% interest rate on \$1 billion debt, assuming \$0.50/W capex for 400MMW capacity

Source: Barclays Capital Research

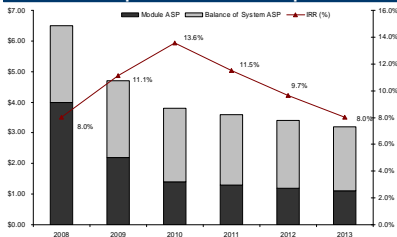
Poly price (\$/kg)	40
Poly cost (\$/W)	0.30
Wm-Siliconnet (\$/W)	0.80
Total cost (\$/W)	1.10
Op Loss Margin (%)	1.5%
ASP (\$/W)	1.30

2010 likely to be peak period of profitability for German Installers

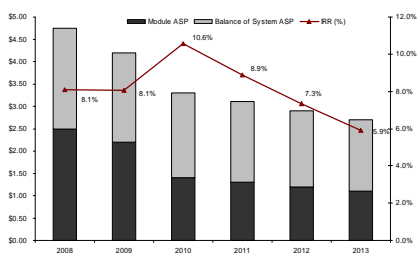
Summary

- We expect IRRs for roof top and ground mounted markets are likely to peak in 2010, leading to stronger than expected demand in Germany.
- Primary factors driving IRRs include:
 - ▶ Declining module prices to level where incremental price reduction is harder to achieve
 - ▶ Relatively stable Balance of System Costs.
- Rooftop IRRs are expected to peak at 13.6% in 2010 and to decline to 8% by 2013.
- Ground Mounted IRRs are expected to peak at 10.6% in 2010 and decline to 6% by 2013

Rooftop Market IRR Development



Ground Mounted Market IRR Development



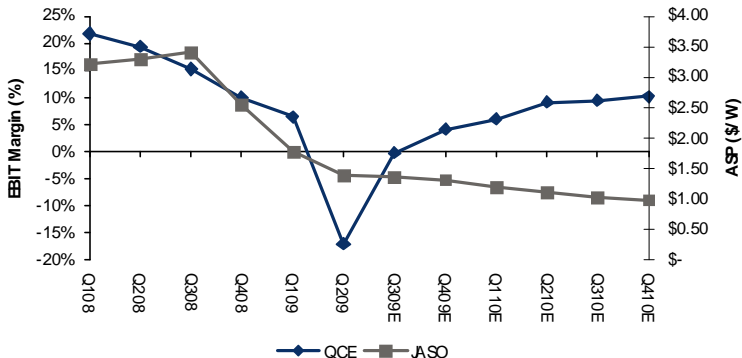
Source: Company Reports, Barclays Capital Research

Europe vs. China Share Transfer Will Continue

Summary

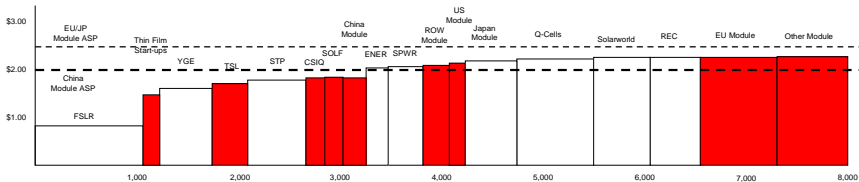
- As shown in the chart below EBIT margins of European cell suppliers continue to be driven by cell ASPs of Chinese cell players. Q209 was the first quarter when EBIT margins turned negative – margins are expected to improve sequentially for European cell suppliers in Q309 as Chinese cell ASPs continue to decline.

European Cell Supplier Margins vs. Chinese Cell ASPs (\$/W)

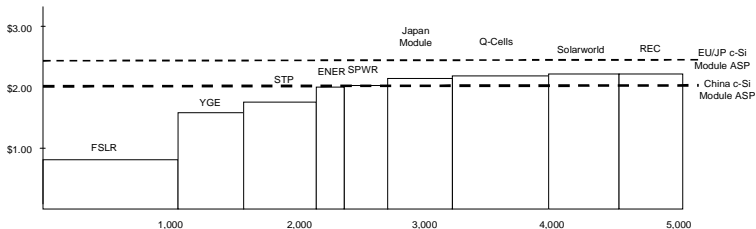


Source: Company Reports, Barclays Capital Research, ThomsonOne
 Note: QCE numbers are estimates, JASO numbers BarCap estimates

Bankability and Cost will Determine Winners and Losers



Source: Barclays Capital Research



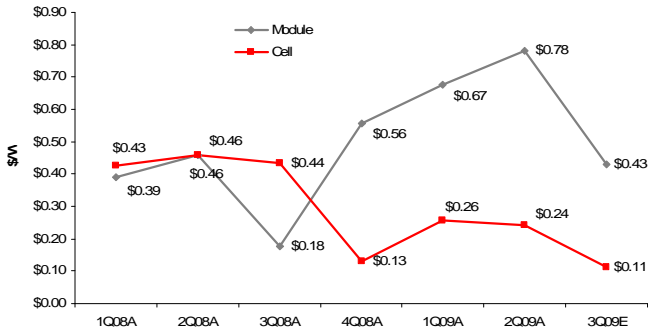
Source: Barclays Capital Research

Module Excess Returns Will Continue to Decline

Summary

- Excess returns for module manufacturers (defined by module ASPs - cell ASPs) peaked in Q209 at \$0.78/W (vs. \$0.67/W in Q109), whereas returns for cell manufacturers (cells ASPs - wafer ASPs) declined to \$0.24/W from \$0.26/W in Q109. We believe downside risk exists to excess returns of module players (see returns declining to \$0.43/W in Q309, excess returns declined to \$0.18/W in Q308); whereas limited downside risk exists to excess returns of cell manufacturers (see excess returns declining to \$0.11/W in Q309).

Excess Returns of Cell vs. Module Manufacturers



Source: Company Reports, Barclays Capital Research

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Second Growth Phase of Solar Era

Key Trends During the Second Growth Phase of Solar Era

Grid Parity Phase

U.S. Solar Market

Germany

Longer term Winners

Summary

Solar Investments Post Grid Parity

Utility vs. Residential Markets

- Grid Parity at Utility Level
 - ▶ Expected between 2010 – 2012 depending on the development of fossil fuel generated electricity prices.
 - ▶ We believe that solar electricity is already competitive with peak power generation capacity in some regions
 - Sunnier locations within Europe, where sunlight totals more than 1,800 hours a year
 - ▶ Utilities provide intermediate load power using part time natural gas generators
 - Accounts for 30% of global electricity supply
 - Used during daylight hours
- Grid Parity at Residential Level
 - ▶ Grid Electricity Prices in some markets are more than average prices of \$0.05-\$0.10 per kilowatt hour
 - Germany, Prices greater than \$0.25 per kilowatt hour
 - ▶ Spain, Italy and Germany have seen electricity prices at a CAGR of 7%-14% over the past 5 years
 - ▶ If trend continues, we expect grid parity at the residential level before 2012

Solar Investments Post Grid Parity

Grid Parity in some markets by 2010

- We believe lower silicon prices in 2009/2010 and reduction in non silicon costs through scale/conversion efficiency improvement have the potential to result in System Prices of ~\$4/W
- We believe at \$4/W, Solar could reach grid parity in some markets.

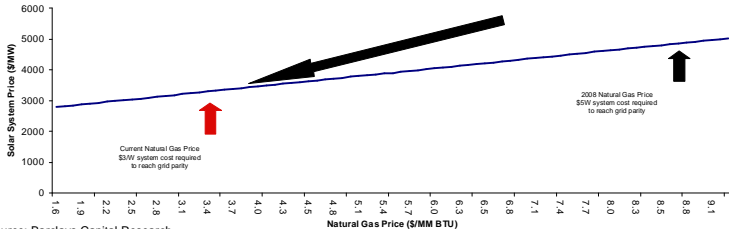
Supply Chain Cost Assumptions: Grid Parity by 2010

	POLY	WAFER	CELL	MODULE	SYSTEM
2008					
Price	\$0.70/watt (Contract) \$3.00/watt (spot)	\$2.10/watt	\$2.90/watt	\$3.70/watt	\$7.00/watt
Cost		\$0.30/watt	\$1.50/watt (blended cost)	\$0.30/watt	\$2.40/watt
			\$0.30/watt	\$2.40/watt	\$6.10/watt
			\$0.30/watt	\$3.30/watt	\$2.40/watt
			\$0.30/watt	\$3.30/watt	\$6.10/watt
2010					
Price	\$0.35/watt (Contract) \$0.45/watt (spot)	\$0.90/watt	\$1.40/watt	\$1.75/watt	\$4.00/watt
Cost		\$0.20/watt	\$0.60/watt (blended cost)	\$0.20/watt	\$1.75/watt
		\$0.20/watt	\$1.10/watt	\$0.20/watt	\$3.50/watt
			\$0.20/watt	\$1.60/watt	\$1.75/watt
			\$0.20/watt	\$1.60/watt	\$3.50/watt

Source: Barclays Capital Research

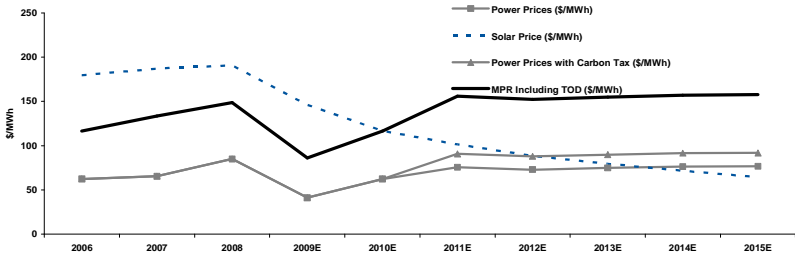
Solar Investments Post Grid Parity

Solar System Price versus Natural Gas Price



Source: Barclays Capital Research

Grid Parity Timeline

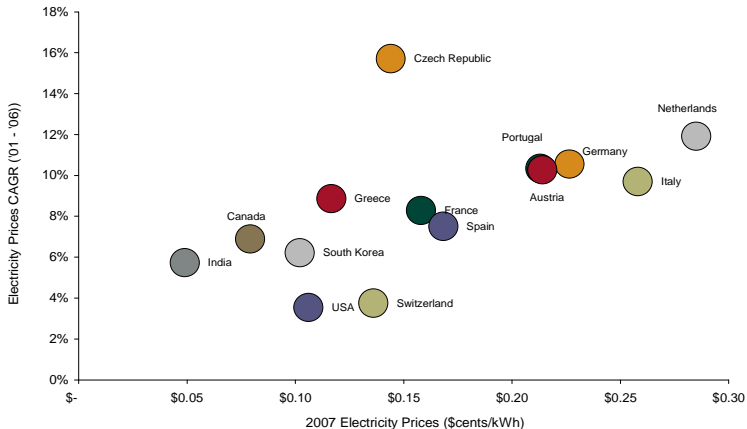


Source: Barclays Capital Research



Solar Investments Post Grid Parity

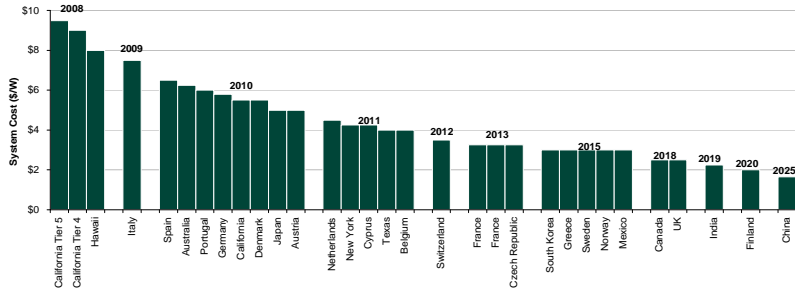
Household Electricity Price Trend and Projections in Key Solar Markets



Source: EIA, Barclays Capital Research

Solar Investments Post Grid Parity

Solar System Price Projections for Grid Parity in Some Regions

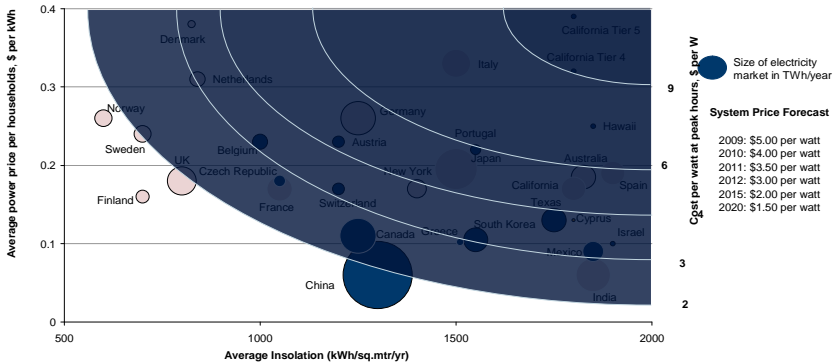


Source: Barclays Capital Research



Solar Investments Post Grid Parity

Grid Parity in Several Markets Likely Before 2012



Source: Barclays Capital Research, McKinsey Global Institute, CIA country files, European Photovoltaic Policy Group, Pacific Gas & Electric, Public Policy Institute of New York Stat

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Longer term Winners

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U.S. Solar Market

- The recent stimulus plan includes a number of provisions that we believe will support solar production in the US
- The Refundable ITC provides investors a 30% cash grant from the US Treasury for building a Solar project, instead of a 30% tax credit which had previously been the case.
- In addition the Loan Guarantee Program uses government money to backstop loans given for renewable energy programs.
- We believe these provisions in the stimulus package have the potential to drive 5.5GW to 7.5GW of solar installations from 2009 to 2011
- This number includes 1.1GW of Solar PV Utility installations, and 4.4GW of commercial solar PV installations

Incremental Solar Opportunity by 2011 (4.4GW)

	Retail Sales (MWh)	MWh/MW	0.5% Solar Penetration	
			MWh	MW
2010: 10% IRR				
HI	10,731,520	1,692	53,658	32
TX	320,614,840	1,800	1,603,074	891
DC	11,414,847	1,595	57,074	36
NJ	77,593,167	1,576	387,966	246
NY	145,081,709	1,502	725,409	483
CA	252,764,015	1,889	1,263,820	669
CT	32,214,610	1,461	161,073	110
NV	31,312,306	2,032	156,562	77
RI	7,887,575	1,562	39,438	25
2010: 5%-10% IRR				
NH	10,973,309	1,559	54,867	35
DE	11,761,153	1,550	58,806	38
MA	56,142,019	1,454	280,710	193
ME	12,367,668	1,614	61,838	38
NM	19,845,735	2,117	99,229	47
NC	125,656,807	1,666	628,284	377
2011: 10% IRR				
CO	46,723,841	1,914	233,619	122
OR	45,636,448	1,726	228,182	132
AZ	66,933,251	2,074	334,666	161
2011: 5%-10% IRR				
VT	5,663,772	1,473	28,319	19
FL	218,584,494	1,705	1,092,922	641
				4,373

Refundable ITC PV Market Opportunity (09-11)

Megawatts	Base	Upside
Commercial Solar PV	4,400	4,400
Solar PV Utility	1,100	1,100
Federal Solar PV Program	0	1,500
Federal RPS	0	500
Total Solar PV Demand (2009-2011)	5,500	7,500

Source: Barclays Capital Research



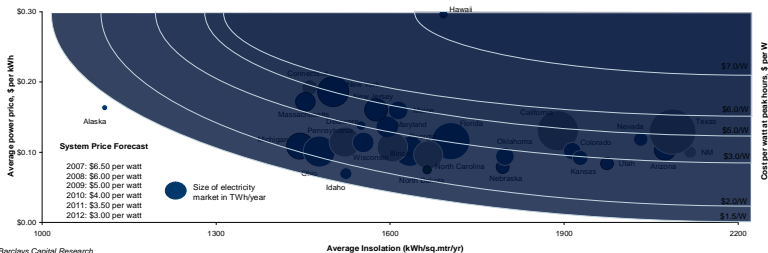
U.S. Solar Market

Sizing the Commercial Solar PV Market Opportunity: 4.4 GW Solar PV Potential by 2011

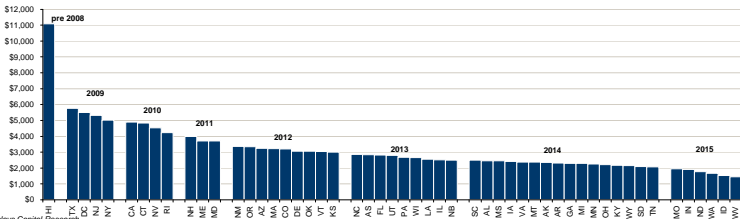
- Our Analysis on the next slide suggests that commercial solar projects in 9 states can generate greater than 10% IRRs in 2010 (assuming 7% interest rate), 40:60 Debt/Equity Ratio and excluding any state level incentives.
- We believe additional 6 states have the potential to be competitive with grid electricity prices with project IRRs of ~5% to 10% in 2010 (same assumptions as above, no state incentives)
- We believe, 3 additional states can achieve greater than 10% project IRRs in 2011 and 2 more states can achieve ~5% IRRs in 2011.
- Bottom-line - we believe commercial solar projects can sell electricity at competitive grid rates and generate 5%-10% IRRs in nearly 50% of the US market by 2011. Assuming solar energy generation represents 0.5% of the overall mix in the above states by 2011, total incremental solar PV opportunity over the next 3 years could be roughly 4.4GW or 10x the current annual installations run-rate and almost comparable to the size of the global solar market.

U.S. Solar Market

Commercial Project Grid Parity Scenario (with Refundable ITC)



Commercial Solar Grid Parity Timeline (Assuming 10% Project IRRs)



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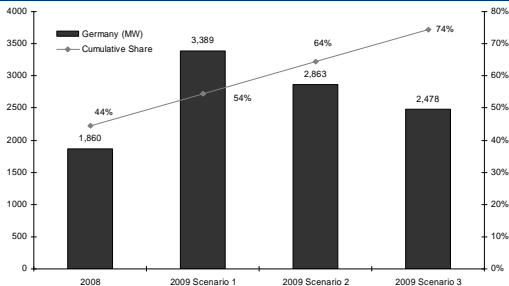
Summary

German Concentration Risk Increasing

Summary

- The German market is currently leading the recovery for most solar companies due to relatively easy access to financing for small projects.
- In 1H09 for instance, German market represented between 50% and 75% of shipments for most solar companies.
- Assuming German market mix remains unchanged from Q2-Q4, overall German shipments from select group of Chinese companies and First Solar would likely increase from 900MW in 2008 to 1.8GW in 2009.
- Our analysis suggests that the German market could grow to between 2.5GW to 3.4GW versus our prior expectations of ~2GW.

German Shipment Scenario Estimates (2009 MW)



Source: Company Reports, Barclays Capital Estimates

German Feed-in-tariff Risk Increasing

Summary

- Three factors raise concern over sustainability of German FIT from 2010:
- 1) Significant volume growth in 2009 and risk of further acceleration in 2010 as well as associated impact on rate-payers in a challenging economic environment,
- 2) Significant module ASP declines in 2009 (over 50% YoY declines) and attractive project economics may prompt policy makers to reconsider the generous FIT levels,
- 3) Subsidy programs by other emerging countries such as China and India and political implications of having a significantly higher incentive program in Germany.
- We note that if China introduces a 1.09RMB/kWh incentive program for ground-based systems (as some of industry checks suggest), incentives under the German subsidy program would be \$3.60/W higher than Chinese program.
- Even assuming lower labor/installation costs in China, we believe the \$3.60/W premium associated with the current subsidy program in Germany may not be sustainable.

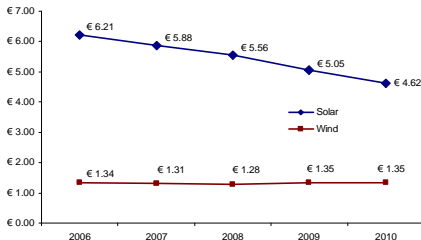
Net Present Value of German Subsidies is Significantly Higher than Potential Chinese Subsidies

NPV (\$/W)

Germany	\$5.61
China	\$1.99

Note: Germany FIT of 35.49 EUR Cents/kWh, China FIT of 1.09 RMB/kWh

Solar vs. Wind Subsidy Cost per Watt



Source: GWEC, German Solar Industry Association, Barclays Capital Research

German Subsidy Risk Increasing

Summary

- We believe that stronger than expected German installations in the second half could result in even greater subsidy burden from the existing program
- German Government budget for solar subsidies in 2009 was €6.2B assuming 1.5GW. Assuming 2.5GW in 2009, the subsidy burden is now likely ~ € 10.4B
- We believe that the planned 2010 subsidy was expected to be € 6.4B assuming 1.7GW of installations. Now assuming 3GW of installations, the subsidy burden is actually closer to € 11.2B.
- In order to prevent outsized spending in 2010, we believe subsidy cuts of close to 15%-30% may be necessary.

2009 Subsidy Burden Projection Analysis

	NPV/W	% Mix	Projected Installations	Subsidy Projections	Potential Volumes	Potential Subsidy
Ground Mounted	€ 3.65	25%	375	€ 1,369	625	€ 2,281
<30kW	€ 4.92	15%	225	€ 1,106	375	€ 1,843
>30kW	€ 4.68	15%	225	€ 1,052	375	€ 1,753
>100kW	€ 4.52	15%	225	€ 1,018	375	€ 1,696
>1000kW	€ 3.77	30%	450	€ 1,697	750	€ 2,829
Total (€ Million)				€ 6,242		€ 10,403

NPV/W	2009	% Annual Reduction			
		10%	15%	20%	30%
Ground Mounted	€ 3.65	€ 3.29	€ 3.10	€ 2.92	€ 2.56
<30kW	€ 4.92	€ 4.42	€ 4.18	€ 3.93	€ 3.44
>30kW	€ 4.68	€ 4.21	€ 3.97	€ 3.74	€ 3.27
>100kW	€ 4.52	€ 4.07	€ 3.85	€ 3.62	€ 3.17
>1000kW	€ 3.77	€ 3.39	€ 3.21	€ 3.02	€ 2.64

2010 Subsidy Burden Projection Analysis

	NPV/W	% Mix	Projected Installations	Subsidy Projections	Potential Volumes	Potential Subsidy
Ground Mounted	€ 3.29	25%	425	€ 1,396	750	€ 2,464
<30kW	€ 4.42	15%	255	€ 1,128	450	€ 1,991
>30kW	€ 4.21	15%	255	€ 1,073	450	€ 1,894
>100kW	€ 4.07	15%	255	€ 1,038	450	€ 1,832
>1000kW	€ 3.39	30%	510	€ 1,731	900	€ 3,055
Total (€ Million)				€ 6,367		€ 11,235

2010 Subsidy Burden Projection Analysis

	Projected Installations	Potential Subsidy - 10% reduc	Potential Subsidy - 15% reduc	Potential Subsidy - 20% reduc	Potential Subsidy - 30% reduc	Potential Subsidy - 35% reduc
Ground Mounted	750	€ 2,464	€ 2,327	€ 2,190	€ 1,916	€ 1,780
<30kW	450	€ 1,991	€ 1,880	€ 1,770	€ 1,548	€ 1,438
>30kW	450	€ 1,894	€ 1,788	€ 1,683	€ 1,473	€ 1,368
>100kW	450	€ 1,832	€ 1,730	€ 1,628	€ 1,425	€ 1,323
>1000kW	900	€ 3,055	€ 2,885	€ 2,715	€ 2,376	€ 2,206
Total (€ Million)		€ 11,235	€ 10,611	€ 9,987	€ 8,739	€ 8,114

Agenda

The Investment Case for Solar

Second Growth Phase of Solar Era

Key Trends During the Second Growth Phase of Solar Era

Grid Parity Phase

U.S. Solar Market

Germany

Longer term Winners

Summary

China Non-Silicon Advantage

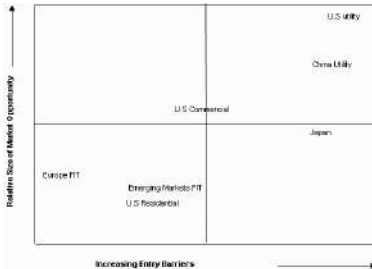
Non Silicon Cost Overview					
Non Silicon Cost Structure	China	Europe/U.S	Sustainable?	Notes	
Cell to Module	\$0.35	\$0.71			
Direct Labor	\$0.02	\$0.14	Y	2,500RMB/mth labor costs in China, \$5K/mth in U.S	
CIF	\$0.01	\$0.03	N		
Factory Overhead	\$0.01	\$0.03	N		
Yield loss	\$0.01	\$0.01	N		
Materials	\$0.30	\$0.50			
EVA Backsheet	\$0.10	\$0.10	N	Same in both regions	
Aluminum	\$0.05	\$0.10	N	Currently cheaper in China	
Glass	\$0.05	\$0.10	N	Currently cheaper in China	
Junction Box	\$0.10	\$0.20	N	Currently cheaper in China if domestic boxes are used	
Poly to Ingot/Wafer	\$0.30	\$0.30			
Wafering	\$0.21	\$0.21	N	Same equipment/technology in both regions	
Casting	\$0.09	\$0.09	N	Same equipment/technology in both regions	
Wafer to Cell	\$0.25	\$0.49			
Consumables	\$0.17	\$0.17	N	\$0.12 for metallization pastes, \$0.05 for gases etc.	
Direct Labor	\$0.02	\$0.14	Y	2,500RMB/mth labor costs in China, \$5K/mth in U.S	
Electricity	\$0.03	\$0.15	Maybe		
Yield loss	\$0.02	\$0.02	N		
Factory Overhead	\$0.01	\$0.01	N		
Total Cost (ex-depreciation)	\$0.90	\$1.50			
Depreciation	\$0.10	\$0.30			
Ingot/Wafer	\$0.06	\$0.18			
Cells	\$0.03	\$0.09			
Modules	\$0.01	\$0.03			

Source: Barclays Capital Research

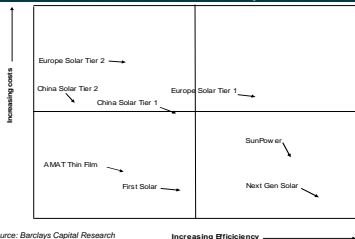
Longer – Term Winners

Companies Positioned to increase scale

- Focus on companies that can scale rapidly without sufficient need for growth capital
- We believe that companies focused on capital intensive segments like polysilicon manufacturing may not be in a position to scale rapidly enough
 - Long term when companies generate free cash flow, we believe fully vertically integrated companies are likely to be most profitable

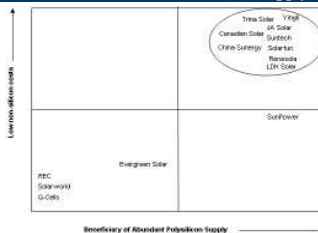


Cost vs. Efficiency



Source: Barclays Capital Research

Non Silicon Cost vs. Silicon Supply



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Industry Supply Model

Annual Supply (MT)	2007	2008	2009E	2010E	2011 E	2012E
INCUMBENT POLY SUPPLIERS						
Hemlock Semiconductor	10,000	12,325	17,850	27,900	27,200	32,300
Tokuyama	4,803	5,143	6,163	7,300	7,820	9,520
Mitsubishi Materials	1,551	1,700	1,870	2,168	2,465	2,720
Sumitomo Titanium	935	1,148	1,190	1,190	1,233	1,360
Mitsubishi Polysilicon	1,148	1,254	1,339	1,445	1,615	1,785
REC	5,270	5,950	7,500	10,500	13,175	17,638
Wacker	8,175	11,800	15,150	17,128	25,628	29,878
MEMC	3,465	3,800	4,800	7,875	8,750	9,625
INCUMBENT POLY SUPPLIERS - Total	35,346	43,119	55,861	75,505	87,885	104,825
NEW ENTRANT POLY SUPPLIERS						
NON - CHINA POLY SUPPLY						
OCI	0	2,125	9,138	16,500	14,663	16,575
M.SETEK	750	4,680	5,313	6,000	14,100	16,000
Nitel Group	0	0	300	760	3,500	3,500
HOKU Materials	0	0	0	0	0	0
Solarworld	50	150	404	850	1,025	1,175
Others (Russia, New entrants)	250	600	900	650	250	0
Non - CHINA Total	1,050	7,555	16,054	24,760	33,538	37,250
CHINA POLY SUPPLY						
Asia Silicon	0	0	500	4,000	6,000	6,000
Daqu Group	0	750	1,440	3,300	3,300	3,300
Emei Semiconductor	250	300	300	325	350	350
Luoyang Semiconductor	500	510	1,000	3,150	3,300	3,300
LDK Solar	0	100	2,000	4,000	6,000	6,000
Jiangsu Zhongneng - GCL	500	2,000	8,000	17,040	18,000	18,000
Wuxi Zhongcai	150	400	700	1,000	1,000	1,000
Sichuan Xinguang	100	725	1,625	1,750	1,500	1,500
Shenzhen Nanbo	0	250	500	500	500	500
Shunda	0	0	800	2,600	3,000	3,000
Yunnan Aixin	0	150	300	300	300	300
Ningxia Yangguang	0	250	600	600	600	600
Others (China)	0	250	450	450	450	450
China - Total	1,500	5,685	18,215	39,015	44,300	44,300
NEW ENTRANTS - Total	2,550	13,240	34,269	63,775	77,838	81,550
Total (excl. Met Poly)	37,896	56,359	90,130	139,280	165,723	186,375

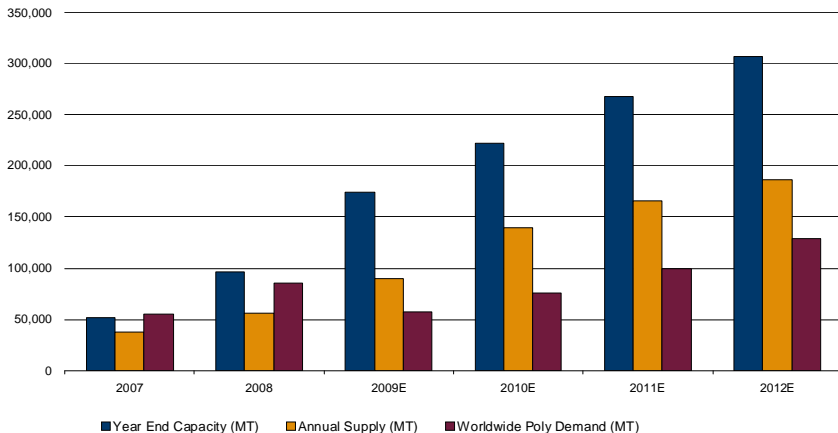
Source: Barclays Capital research

Industry Demand Model

MW	2007	2008	2009E	2010E	2011E	2012E
Japan	230	230	276	373	484	557
y/y (%)	-21%	0%	20%	35%	30%	15%
Germany	1,328	1,860	2,604	2,864	3,437	4,125
y/y (%)	38%	40%	40%	10%	20%	20%
Italy	87	338	507	710	1,065	1,384
y/y (%)	45%	45%	50%	40%	50%	30%
Spain	428	2,460	300	550	660	792
y/y (%)	289%	475%	-88%	83%	20%	20%
France	16	33	98	392	510	1,020
y/y (%)	50%	100%	200%	300%	30%	100%
Greece	12	30	44	87	113	147
y/y (%)	900%	150%	45%	100%	30%	30%
Czech Republic	4	7	112	146	189	246
y/y (%)	NM	100%	1500%	30%	30%	30%
Austria	3	6	13	16	21	27
y/y (%)	56%	150%	100%	30%	30%	30%
Portugal	12	18	27	35	46	59
y/y (%)	NM	50%	50%	30%	30%	30%
Switzerland	3	6	7	9	12	15
y/y (%)	15%	100%	15%	30%	30%	30%
The Netherlands	1	2	10	13	17	22
y/y (%)	-33%	100%	400%	30%	30%	30%
Belgium	2	4	104	135	176	228
y/y (%)	NM	100%	2500%	30%	30%	30%
Cyprus	1	2	6	9	14	20
y/y (%)	NM	100%	200%	50%	50%	50%
Rest of Europe	107	107	46	55	66	79
y/y (%)	45%	42%	-70%	20%	20%	20%
US	220	360	360	750	2,052	3,488
y/y (%)	57%	64%	0%	108%	174%	70%
Canada	4	9	53	370	554	832
y/y (%)	16%	100%	500%	600%	50%	50%
China	24	29	115	461	876	1,226
y/y (%)	20%	20%	300%	300%	90%	40%
South Korea	42	280	98	132	165	207
y/y (%)	100%	560%	-65%	35%	25%	25%
India	17	31	63	119	226	384
y/y (%)	45%	80%	100%	90%	90%	70%
Australia	16	20	26	36	47	57
y/y (%)	65%	25%	30%	40%	29%	22%
Israel	0	0	9	14	21	32
y/y (%)	0%	50%	2000%	50%	50%	50%
Others	164	121	75	98	127	165
y/y (%)	54%	-9%	-38%	550%	534%	724%
Total	2,877	5,953	4,852	7,374	10,877	15,113
y/y (%)	48%	122%	-17%	49%	48%	39%

Source: Solarbuzz, Barclays Capital Estimates

Industry Supply/Demand

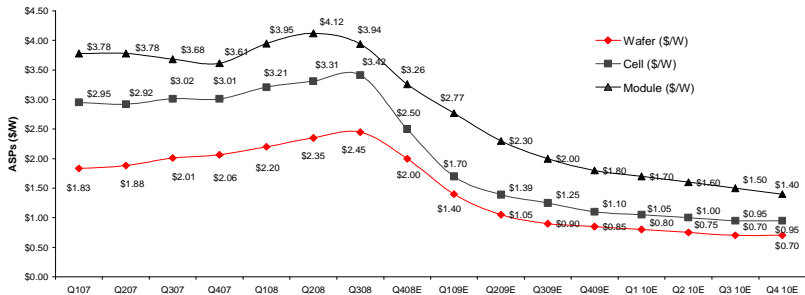


Source: Barclays Capital research

Industry Supply/Demand Model

ASP Assumptions

ASP Assumptions



Source: Industry Reports, Barclays Capital Estimates

Pricing Assumptions

- We now forecast \$1.80/W module ASP exiting Q409 versus our prior forecast of \$2/W and \$1.40/W module ASP in Q410 versus our prior forecast of \$1.50/W.

Barclays Capital Pricing Assumptions

Barclays Capital ASP Assumptions (\$/W)								
	Q109E	Q209E	Q309E	Q409E	Q1 10E	Q2 10E	Q3 10E	Q4 10E
Spot Poly (\$/kg)	90	80	65	55	50	40	35	35
Contract Poly (\$/kg)	75	70	70	60	60	55	50	45
Wafer (\$/W)	1.40	1.05	0.90	0.85	0.80	0.75	0.70	0.70
Cell (\$/W)	1.70	1.39	1.25	1.10	1.05	1.00	0.95	0.95
Module (\$/W)	2.77	2.30	2.00	1.80	1.70	1.60	1.50	1.40

Source: Industry Reports, Barclays Capital Estimates

Solar Polysilicon Requirement

	2007	2008	2009E	2010E	2011E	2012E
New PV Installation (MW)	2,677	5,953	4,952	7,374	10,877	15,113
Inventory Requirement (MW)	350	425	500	400	450	500
Total PV Module Shipments (MW)	3,027	6,378	5,452	7,774	11,327	15,613
Efficiency Loss	2.0%	2.0%	2.0%	1.5%	1.5%	1.5%
Total PV Cell Shipments (MW)	3,363	7,086	6,057	8,404	12,245	16,879
Thin Film Supply (MW)	300	500	1,700	2,400	3,500	4,500
Polysilicon Consumed (ton/MW)	9.5	9.0	8.5	8.0	8.0	8.0
Total Solar Poly Req'd (MT)	29,099	59,278	37,038	48,032	69,963	99,030
Poly demand from Semis (MT)	26,446	26,214	20,799	27,406	29,657	30,218
Total poly demand (MT)	55,546	85,492	57,837	75,438	99,620	129,248
Poly supply (MT) - excluding scrap/UMG	37,896	56,359	90,130	139,280	165,723	186,375
Supply over Demand (MT)			(32,293)	(63,842)	(66,102)	(57,127)

Source: Solarbuzz, Barclays Capital Estimates

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China Sunergy Co., Ltd. (CSUN - USD4.59) 2-Equal Weight / Neutral
Energy Conversion Devices (ENER - USD12.34) 2-Equal Weight / Neutral
Evergreen Solar Inc. (ESLR - USD1.94) 2-Equal Weight / Neutral
First Solar Inc. (FSLR - USD136.61) 2-Equal Weight / Neutral
JA Solar Holdings Co., Ltd. (JASO - USD3.86) 2-Equal Weight / Neutral
LDK Solar Company Limited (LDK - USD9.68) 2-Equal Weight / Neutral
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