PV Crystalox Solar PLC (PVCS)
Equity Research Report – 10th December 2012
EXECUTIVE SUMMARY

- **PV Crystalox Solar PLC (PVCS) trades below NCAV.** When all the company’s liabilities are deducted from its Current Assets there are EUR 100 mn remaining (GBP 82 mn) in comparison with current market cap of GBP 40.32 mn.

- **Three potential scenarios may materialise.** 1) **Liquidation** of the firm is likely to allow the return of cash to shareholders well in excess of the current market price. 2) **Potential acquisition** as part of the broad sector consolidation is likely to value the firm at significant premium to current market price. 3) **Continuation** of loss making activities is likely to destroy shareholder value. However, management are expected to make announcement before year end. Some form of shareholder return enhancement is expected (exceptional dividend, share buy-back).

- **The overall PV industry suffers from demand and supply imbalances which have resulted in dramatic price decreases along the entire supply chain.** This has driven many companies out of business already. Prices are expected to remain depressed in H1-2013 with moderate subsequent improvement.

- **Capable managers** at the top with vetted interest in the company provide reasonable expectation for shareholder friendly developments.

- **Valuation** based on NCAV/share under real and pessimistic conditions. Target price range of **12-20p** offering approximately **20-100%** upside to current share price.

COMPANY SNAPSHOT

PV Crystalox Solar PLC is a United Kingdom-based company. The principal activity of the Company and its subsidiaries is engaged in the production and supply of multicrystalline silicon wafers to the worldwide photovoltaic market. The Company supplies multicrystalline silicon wafers to some of the major photovoltaic cell makers worldwide. Its ingot production facilities are based in Oxfordshire, United Kingdom, where four production plants are in operation. Its customers are solar cell producers. The Company's subsidiaries include PV Crystalox Solar GmbH, PV Silicon Forschungs und Produktions GmbH, Crystalox Solar Limited, Crystalox Limited, PV Crystalox Solar KK and PV Crystalox Solar Silicon GmbH.
**BUSINESS DESCRIPTION**

- **PV Crystalox Solar** focuses on the first **three segments** of the photovoltaic (PV) value chain.

- **Solar grade silicon production**
  - In-house polysilicon production plant in Bitterfeld. All output from the Bitterfeld plant is used directly by PV Crystalox Solar for the manufacture of high-quality multicrystalline silicon ingots at ingot production facilities based in the UK.
  - **1800 MT** polysilicon production capacity (up to 3x expansion possible)

- **Ingot and block production**
  - The Group’s ingot production facilities are based in Oxfordshire, UK, where four production plants are now in operation.

- **Wafer production** (the product that the group sells)
  - PV Crystalox Solar supplies multicrystalline silicon wafers to the major PV companies in Europe and Asia from its wafering facilities in Germany and Japan.
  - **750 MW 2012 production capacity**
INDUSTRY ANALYSIS

- Global PV market going through transition and integration:
  - Declining incentives in key European markets
  - Growth in Japan and China

- Intensively competitive environment:
  - Price pressure across the value chain
  - Vast industry overcapacity primarily in China

- Wafer spot prices below industry production costs – fall to continue at a slower pace.

- Formal antidumping investigations in USA, China and Europe

- Significant factors affecting PV pricing:
  - Expectations of low prices
  - Lower incentive rates

- Aggressive pricing – not a new phenomenon in the PV industry – typically in combination with generous feed in tariff (FIT) rates.

- Incentives are designed to decrease over time and eventually time out.

- Primary differentiating feature in the PV industry is cost/price and efficiency.

- Overcapacity and high inventory work together to hold prices down as lower incentive rates made it impossible for prices to increase.

- Low average prices for PV technology lead to consolidation and failure on the supply side (technology developers).

- Demand side – low bids on projects (PPA and Tenders) – queue of projects globally that may not be developed or will prove to be loss generators for the project investors.

- At this point, the likelihood of a necessary price increase actually happening is slim.

- PV industry may have to wait until the industry consolidation grinds to a halt (which will result in an uptick in pricing) and costs descend to a level that is not mutually exclusive from prices.

- Players should work together to continue maturing business models so that when the consolidation finally ends the industry is ready to rapidly capitalise on the large global market for electricity.

PV Industry Quarterly Update - Q2'2012

Amonix announced the closing of its Las Vegas factory on July 18, 2012.

Centrotherm filed for bankruptcy.

Abound Solar filed for Chapter 7 bankruptcy.

GE has suspended the build-out of its Colorado CdTe production plant.

Konarka Technologies filed for bankruptcy protection.

SolarWorld announced that it would cut around 10% of its workforce by the end of this year.

Germany’s Schott Solar announced that it would exit crystalline PV production later this year but will continue its thin-film module business.

Germany’s aleo solar AG announced that it would close its module factory in Spain by the end of the year.

Italy-based PV module manufacturer MX Group ceased production in June 2012.

Germany’s Solarwatt filed for insolvency.
The list of the top ten manufacturers in 2011 no longer includes any companies that exclusively produce wafers.

Wafer manufacturers either produce silicon or cells as well.

Integrated solar companies that carry out all the steps in the supply chain under one roof, from silicon to module production, are better shielded against price drops – as long as the fall in prices is limited to an intermediate product.

The dramatic slump in prices could lead to wafers being produced by merely a few specialized manufacturers, which would be able to survive on low margins by producing a vast number of units. This is a trend which has already emerged in silicon manufacture.

The moderate EU market scenario assumes rather negative behaviour with little reinforcement of existing support mechanisms, significant decreases in supportive measures and limitations being imposed on existing schemes. In countries close to transition, consumers are not reacting well to the prospect of PV markets without feed-in tariffs (FITs).

Global market development is dependent on many factors, making it even harder to predict than EU developments alone. Although a further price reduction is expected, the inevitable consolidation process will force many companies out of the market. Consequently, oversupply will ease and prices will fall more slowly.
PVCS – VALUE DRIVERS

Flexible strategy to account for short- medium-term conditions

- The interim Group strategy focuses on cash conservation and retention of capabilities, at the expense of emphasis on growth
- Continued focus on operating cost reductions
- Retaining flexibility of production
- Continued focus on major PV companies
- Focus on further developments of the leading silicon processing technology
- Cash conservation

Resilient geographical sales profile

- About 2/3 of group Revenues from outside EU market
- Opportunity to capitalise on growth in China and Japan

Capable management team

- **John Sleeman** (Interim Chairman, Non-executive Director) is Chartered Accountant and Chartered Banker. Experienced in the energy sector and a specialist in structured financial solutions and strategic advice. Founding partner of S.P. Angel Corporate Finance LLP.

- **Dr Iain Dorrity** (Chief Executive Officer) has a PhD in Physical Chemistry. With the company since 1986. Over 25 years’ experience in crystal growth and semiconductor materials with an emphasis latterly on multicrystalline silicon technology.

- **Dr Peter J Finnegan** ((DBA, MBA, FCMA) Chief Financial Officer) has a Doctorate in Corporate Finance, an MBA and is a Fellow of the Chartered Institute of Management Accountants. Involved in the Group’s management since 1985. Responsible for finance, accounting, planning, financial control, legal matters and investor relations.

Managers-shareholders interest alignment

- **Dr Iain Dorrity** (Chief Executive Officer) is a major shareholder with over 10% stake in the company.

- Managerial bonuses are contingent on EPS and total shareholder return (TSR).

- Chairman and Chief Executive’s joint statement: “The Board will make the necessary decisions during the remainder of the year to serve the best interests of shareholders”.

Positive long-term outlook for the photovoltaic industry, but mindful of the intensely competitive environment medium-term, which has already led to companies leaving the industry.

The Group has a strong net cash balance and reorganisation continues to enable the return of cash to shareholders. Further announcement expected before the year end.

Extensive finance knowledge combined with deep industry experience. Managers at the top seem capable to steer the company through the difficult times.

High insider ownership and bonuses directly related to financial and market performance. It is reasonable to expect upcoming decisions to be shareholder friendly.
PVCS – VALUE INHIBITORS

Polysilicon prices to continue downward slide in 2013

• Market fundamentals suggest that downward pressure will persist through 2013.
• As long as it is cheaper to buy polysilicon on the spot market than via long-term contracts, prices will continue to tumble, and the gap between the two will remain significant for the foreseeable future.
• “Big four” polysilicon producers – GCL-Poly, Hemlock Semiconductors, Wacker Chemie and OCI – are likely to weather the storm.
• Analysts, expect casualties among second-tier players – a list that includes REC, LDK, ReneSola, MEMC and Tokuyama.

PV oversupply to persist until 2016

• Looking forward to 2016, capacity expansion is expected to persist and consolidation among manufacturers to continue.
• Oversupply in the production of polysilicon, wafer and solar panels, as such, should continue to upset PV prices and development.
• In the silicon wafer segment, capacity expansions are expected to continue through 2016.
• Top ten silicon wafer makers are expected to hold a combined market share of 70% in 2016, implying that the market will be more condensed.
• Financially-fragile companies – those within the silicon wafer segment in particular, with either negative or decreasing marginal returns will be forced to quit by the deep-pocket leading players.

PVCS – MAJOR RISKS

• Price of wafers on the spot market remain below cash cost of production.
• Changes in spot prices for polysilicon affect firm competitiveness and the viability of the plant at Bitterfeld.
• The loss of a major long term contract customer might adversely impact the Group’s financial performance.
• Reliance on key suppliers could adversely impact group’s financial performance.
• Government incentives, support and legislation are crucial to stimulate the take up of solar electricity.
• Over capacity in the PV industry reduces module prices and adversely impacts on profitability.
• Exchange rate fluctuations might create earnings and balance sheet fluctuations.
• Loss of a key production facility could disrupt firm’s ability to deliver contracted wafer volumes.

Photovoltaic module prices will continue to fall this year. They are expected to regain lost ground by Q4 2013.

Down trend in Polysilicon, Wafer and Cell prices is likely to maintain pressure on performance.
Two cases presented:

1) Real values

2) Pessimistic assumption (based on % of real)

Scenario 1. Gradual Liquidation

PV Crystalox Solar

1) Real values

NCAV / Share = 20p
Liquidation Value / Share = 37p

2) Pessimistic assumption

NCAV / Share = 12p
Liquidation Value / Share = 17p

Market Price: 10p

=(50% Real NCAV)
=(83% Pessimistic NCAV)
=(27% Real Liquid Value)
=(58% Pessimistic Liquid Value)
ACQUISITION VALUATION

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Long-Term</th>
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<tbody>
<tr>
<td>Prod. Capacity (MW)</td>
<td>750</td>
<td>750</td>
<td>750</td>
<td>750</td>
<td>750</td>
<td>750</td>
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<tr>
<td>Price (USD/W)</td>
<td>0.2</td>
<td>0.23</td>
<td>0.25</td>
<td>0.28</td>
<td>0.3</td>
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<tr>
<td>Revenue (USD mn)</td>
<td>150</td>
<td>172.5</td>
<td>187.5</td>
<td>210</td>
<td>225</td>
<td>225</td>
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<tr>
<td>Margin</td>
<td>10.00%</td>
<td>12.00%</td>
<td>14.00%</td>
<td>16.00%</td>
<td>18.00%</td>
<td>18.00%</td>
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<tr>
<td>Cashflow (USD mn)</td>
<td>15</td>
<td>20.7</td>
<td>26.25</td>
<td>33.6</td>
<td>40.5</td>
<td>40.5</td>
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<td>D. Rate</td>
<td>10.00%</td>
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<tr>
<td>D. Factor</td>
<td>0.91</td>
<td>0.83</td>
<td>0.75</td>
<td>0.68</td>
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<td>0.56</td>
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<tr>
<td>PV (USD mn)</td>
<td>13.64</td>
<td>17.11</td>
<td>19.72</td>
<td>22.95</td>
<td>25.15</td>
<td>22.86</td>
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<td>PV (Y 1-5) (USD mn)</td>
<td>98.56</td>
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<td>PV (Terminal) (USD mn)</td>
<td>228.61</td>
<td></td>
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<tr>
<td>Total PV (USD mn)</td>
<td>327.17</td>
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<td>USD/GBP</td>
<td>0.62</td>
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<td>Total PV (GBP mn)</td>
<td>202.85</td>
<td></td>
<td></td>
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<td>Shares Out (mn)</td>
<td>416.73</td>
<td></td>
<td></td>
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<td>Acquisition Price (GBP)</td>
<td>0.49</td>
<td></td>
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Scenario 2. PVCS Acquired
Based on current PV Wafer production capacity.
Cashflow assumed = Revenue x Margin
Assumed Cost of Capital 10%
Market Stabilisation in 5 Years
Potential Acquisition Price 49p
Market Price: 10p
=(20% Acquisition Price)

NOTE: Conservative valuation:
1) Low long-term price
2) Low long-term margin
3) High Cost of Capital

Medium-Term Outlook

<table>
<thead>
<tr>
<th>Medium-Term Outlook</th>
<th>2012 H2 Income (EUR 000s)</th>
<th>-25,000.00</th>
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</thead>
<tbody>
<tr>
<td>E 2013 FY Income (EUR 000s)</td>
<td>-21,000.00</td>
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<tr>
<td>Cumulative Cash Decrease (EUR 000s)</td>
<td>-46,000.00</td>
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<tr>
<td>Shares Outstanding (000s)</td>
<td>416,725.34</td>
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<tr>
<td>Estimated Cash/Share Decrease (EUR)</td>
<td>-0.11</td>
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<tr>
<td>EUR/GBP</td>
<td>0.81</td>
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<tr>
<td>Estimated Cash/Share Decrease (GBP)</td>
<td>-0.09</td>
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<table>
<thead>
<tr>
<th>Remaining NCAV / Share (GBP)</th>
<th>Real</th>
<th>Pessimistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.20 - 0.09 = 0.11</td>
<td>0.12 - 0.09 = 0.03</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Remaining Liquidation Value / Share (GBP)</th>
<th>Real</th>
<th>Pessimistic</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>0.37 - 0.09 = 0.28</td>
<td>0.17 - 0.09 = 0.08</td>
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</tbody>
</table>

Scenario 3. Medium-term losses
Management continues with current cash conversion strategy in the medium term without shareholder friendly actions.
Losses in 2012 and E2013 decrease available cash/share.
Shareholder value is destroyed
NCAV/Share (Real) 11p
LiquidV/Share (Real) 28p
NCAV/Share (Pessimistic) 3p
LiquidV/Share (Pessimistic) 8p
Market Price: 10p

CONCLUDING REMARKS

- Company is surrounded by short and medium term uncertainties
- Announcement by management is expected before year end
- Current market valuation may be attractive if:
  - Liquidation is considered as an option
  - Sector integration leads to acquisition bids
  - The business is reorganised successfully
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