



BT Imaging

Final report: project results

Lead organisation: BT Imaging Pty Ltd

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Contact name: Paul Pacino

Title: CFO

Email: info@btimaging.com

Phone: +61 (0)2 9043 3451

Website: www.btimaging.com



Project Overview

Project summary

The aim of the project was to properly specify, and then design and build two new products, the iLS-L2 and the LIS-B1. General release of these two products included customer trials and substantial revisions of prototypes in order to enhance performance and reduce cost.

This project was focused around the development of two new products to be used by manufacturers of silicon wafers and cells as used in photovoltaic modules. The key question for the development of each tool was whether we could design and deliver products to our customers that allowed them to reduce their manufacturing costs or increase their solar cell efficiencies (and hence revenues) sufficiently in order to generate a capital equipment 'payback' of less than 12 months (which is the current 'hurdle' for manufacturing equipment purchases in this industry).

Project scope

This project entailed various disciplines, namely; Tool Specification and Validation, Concept Design, R&D, Detailed Design & Build, Alpha and Beta customer trials, Final design revision and General Release of the tools.

The key benefit of these products to our customer is that they enable cost reduction for solar wafers and cells, as well as efficiency gains for solar cells and modules. Both of these help improve the cost position of clean and green solar energy versus the incumbent fossil fuel technologies. In fact, the full benefit of the two technologies as developed in this project could be as much as 2% efficiency gains in solar modules energy production and 10% cost reductions per Watt - we believe these tools will be a key part of the continuing 'learning curve' in the mainstream silicon solar industry. In addition the crack product tool had a number of spin-off products which was an unexpected benefit - essentially the same hardware platform can be used with different software to product to allow entirely different product applications.

Outcomes

The findings from this project are:

1. We completed the development of the block tool and this has been released as the LIS-B1. In the process we managed to achieve all the specifications that our customers care about.
2. We completed the development of the crack tool and this has been released as the iLS-L2. In the process we managed to achieve all the specifications that our customers care about.
3. In the process of developing the hardware for the iLS-L2 we also have managed to develop a product platform that has other product applications and therefore we have a number of unexpected spin-off products from this project.

The overall conclusion is the products have been fully developed and have been released into the market. The next step is to promote these products via Sales and Marketing efforts. Sales will

require trials by key customers, followed by full line deployment. Options for further R&D include (1) cost reductions for the hardware so we can reduce the price of these tools and maintain margins, (2) enhanced specifications, such as tighter resolution of defect detection. Both of these improvements will help the customer payback analysis and accelerate sales. These are a normal part of the product lifecycle within a manufacturing capital equipment supplier.

Transferability

BT Imaging is developing high-margin proprietary products and we have no intention of helping our competitors copy these new products or develop the skills to do so.

The publications resulting from this project include a press release and two general release product document which can be obtained at:

http://media.wix.com/ugd/b08910_e3773fcfeba6b52dd52b0edb26c6eaeaf.pdf

http://media.wix.com/ugd//b08910_e221865cb60d14b343a429764193e0a6.pdf

http://media.wix.com/ugd//b08910_71d5885733da06cde904cd898ed9f9af.pdf

The patents that were developed are listed below, accessible via patent search engines:

- Material or Device Characterisation with Non-Homogeneous Photoexcitation - Pending in China (201080032016.0).
- Separation of Doping Density and Minority Carrier Lifetime in Photoluminescence Measurements on Semiconductor Materials - Pending in US (13/384970), Pending in China (201080033122.0), Pending in Taiwan (99123819)
- Detection of Discontinuities in Semiconductor Materials - Pending in China (201080046719.9), Pending in Taiwan (99127293)
- Persistent Feature Detection - Pending in US (13/813765), Pending in China (201180039616.4)