

Nanoco Group

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Nanoco: selling tiny dots for big bucks

London's Alternative Investment Market is littered with small cap technology firms that often have one or two neat ideas but have great difficulty in translating their innovations into solid revenue streams. The past few years have seen many tech firms – from fuel cell developers to thin-film solar businesses to software makers – come and go, usually achieving little for AIM investors during their time on the junior stock market.

But there are exceptions. Take **Zytronic**, for example. Shares in this firm, which , disappointed during its first three years on AIM – a period that proved a very tough time for technology shares in general. But since early 2003, Zytronic's shares have increased more than five times.

Or take **StatPro Group**, which Proactive Investors recently profiled and whose shares have almost quadrupled during its six-and-half-years on AIM as revenues from its asset management software have steadily grown.

A more recent addition to AIM is Nanoco Group, which came to the market by way of a reverse takeover in March this year. This looks like another technology company that has plenty of potential after taking blue sky research from the nanotechnology area and turning it into useful applications for the electronics industry.

Spun out of Manchester University in 2001, Nanoco is commercialising fluorescent nano-crystalline particles (quantum dots) of semiconductor materials that have unique chemical, electronic and optical properties thanks to their small size. The dots, which are so small that 80,000 of them can fit across the width of a single human hair, have applications in biological marking and flatscreen televisions. And they can also be used in cleantech applications like low-energy lighting and next-generation photovoltaic cells, as well as in security applications.

Quantum dots work by absorbing energy, usually in the form of ultraviolet light, and then emitting bright-coloured visible light. The colour emitted by a particular quantum dot depends upon its size: it can be tuned for visible emission between two and 10 nanometres. For example, a 2nm quantum dot emits blue light, while a 10nm dot will emit red.

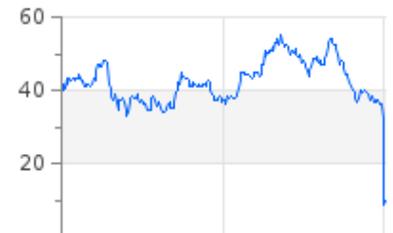
According to Nanoco, solid state lighting that mixes red and green quantum dots and applies them to a blue light-emitting diode (LED) can be used to produce white light very efficiently. The company estimates that LED lighting that includes quantum dots is at least twice as efficient as mercury-discharge lighting and up to 60 times more efficient than incandescent light bulbs. An additional benefit is that quantum dot-enabled lighting does not include environmentally-unfriendly heavy metals like cadmium.

In the solar energy sector, Nanoco says initial research has shown that the use of quantum dots can potentially improve sunlight conversion efficiencies to

Price: 9.48p

Market Cap: £27.13M

1 Year Share Price Graph



June 2018 December 2018 June 2019

Share Information

Code: NANO

Listing: LSE

52 week **High** **Low**
55.50p 6.50p

Sector: Semiconductors

Website: www.nanocogroupplc.co.uk

Company Synopsis:

Nanoco Group partners major R&D and blue-chip industrial organisations in the development of applications incorporating semiconductor nanoparticles, "quantum dots". Nanoco Group is traded in the NEX Exchange [HERE](#).

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levels of 40%-plus, compared with 10-20% using traditional photovoltaic devices. The company says it is working with a number of companies with relevant experience in this area and samples of quantum dots in thin films are under evaluation by potential partners.

In its last financial year, Nanoco received a \$2m payment as part of a \$10m upfront revenue agreement with a major Japanese LED manufacturer, which produces LEDs for the general lighting and LCD backlight market. Nanoco expects to get the remaining \$8m by the end of 2010 once it passes certain milestones agreed with the Japanese company.

According to Nanoco's chief executive officer, Michael Edelman, his Japanese customer manufactures 200 million LEDs per month, and it is currently in the process of ramping this production up to 400 million units per month.

Such sums show what an exciting investment proposition Nanoco could be, especially when one considers the price that Edelman says Nanoco is currently charging for its quantum dots – \$5,000 per gram – and that each LED requires 0.1 milligrams of the material. The price is set to fall to \$500 per gram once the LEDs become mass produced, but even so, this would mean that Nanoco could potentially generate \$20m per month from this one customer.

Edelman is confident of further major deals with other companies in the electronics sector. "We are experts in getting these materials to work in a specific application," he says, pointing out that because of Nanoco's knowhow electronic giants who are involved in display technologies currently need to deal with the UK-based company.

The technology is patented, and Nanoco insists on secrecy agreements with its customers when it comes to the actual processes used to put quantum dots into electronic devices. But is Edelman not worried that electronics companies might reverse engineer its technology in order to come up with their own methods of manufacturing and using quantum dots? He seems pretty sure that most companies will not bother. "It's a lot easier for them to work with us, and by partnering with us they can move a lot faster than trying to do it themselves," he says.

Recent maiden results for the business showed that the firm's revenue increase by 85% to £2m, while its pre-tax loss increased slightly to £780,000 (2008: £698,000 loss).

Outside of its four key target markets of LED lighting, electronic displays, bio-imaging and solar power, Nanoco also believes that its quantum dots have potential in sectors like security and anti-counterfeiting, as well as in "functional decoration" and printing.

But for the immediate future, the company is focusing on scaling up its manufacturing capacity and the delivery of its commercial product to its customers.

Nanoco's broker Zeus Capital has come up with forecasts that suggest this scale-up will be very aggressive. For 2010 and 2011, it estimates the company will generate £5.1m and £10m of revenues before a leap to £78m in 2012. Earnings per share are estimated to come in at 0.16 pence, 1.1 pence and 11.6 pence – which would be very good earnings growth indeed for a company whose share price is 74.5 pence at the time of writing.

As ever the proof will be in the pudding, but one wonders how long Nanoco will remain on AIM if it does manage to achieve these targets. Edelman certainly seems confident. "Maybe we'll go to Nasdaq in the future. Who knows?" he says.

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