

# Disruptive technology

*It's good to hold shares in leaders. Here are two stocks lighting the way*

By Anne Pappmehl

**D**isruptive technology is a term coined by Harvard Business School professor Clayton Christenson in his book *The Innovator's Dilemma* (1997).

It's called disruptive because it radically changes the way people, governments and businesses operate, in addition to creating new markets. The transistor, internal combustion engine and cellphone are examples of such technology.

LED (light-emitting diode) technology has been around for some time, but few might label it disruptive. In fact, over the years it's probably seen more failures than successes.

In what seems to be a sudden industry turnaround, LED is appearing across all sorts of industries worldwide and a couple of companies in Western Canada are helping the technology live up to its promise.

One is **TIR Systems Ltd.** (TIY-TSX, \$8.51, 604-294-8477, [www.tirsys.com](http://www.tirsys.com)), based in Burnaby, B.C. It delivers LED-based specialty lighting systems for three main market segments: architectural (think landscape lighting and concert halls), transportation (tunnels and train platforms) and corporate identity (gas station signs).

In addition, the company is developing a platform for more general lighting for the future.

The other company is Victoria-based **Carmanah Technologies** (CMH-TSX, \$3.05, 877-722-8877, [www.carmanah.com](http://www.carmanah.com)), which specializes in solar-power LED lighting for the marine, roadway and railway markets.

What's so innovative or disruptive about LEDs? Well, consider the inefficiencies of traditional light. Ten to 15 per cent of the



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electricity used to light an incandescent light bulb actually gets converted to light. The remainder is simply heat being burned off.

Not much has changed since Thomas Edison's groundbreaking invention 125 years ago.

Fluorescent lighting doesn't fare much better, wasting about two-thirds of the energy used.

Additionally, lighting hogs up about 20 to 25 per cent of the world's electricity supply, much of which comes from dirty sources like coal. That's a lot of carbon dioxide emissions going into the atmosphere from lighting our homes, businesses and entertainment facilities.

LEDs, on the other hand, produce light by moving electrons along semiconductor material, and they can fit into an electrical circuit. Unlike their incandescent ancestors, LEDs lack the wire filament that eventually burns out and they don't overheat.

Modern LEDs use 90 per cent less energy than regular light bulbs, but they have other advantages: a lower voltage, which makes them safer. They produce a better quality of light, have a longer life span (about the same as a transistor) and they require little if any maintenance.

On top of that, LEDs are all-weather durable. Solar-powered LEDs, Carmanah's market space, harness the power of the sun using a battery source for energy supply as opposed to an electrical current.

LED technology has been around awhile, but making it commercially viable hasn't been easy. Original LEDs took up a lot of power, didn't produce high-quality light and it was challenging to figure out how to turn them into something useful. As with many new technologies, the road to market is paved with trial and

error, and lots of R&D investment.

## Beginning stages

But with many of those challenges apparently solved, LED growth is at the beginning stages in many industries. You find them used in everything from bus stop signs to military landing strips to the new field of "architainment," using lighting for decoration or atmosphere enhancement.

TIR and Carmanah are among the product's Canadian innovators, and both have recently announced their first profitable years. In early 2003, TIR's stock was trading at under a dollar. By December 2003, it had jumped to \$3.65 and sales revenues increased by 187 per cent, exceeding one analyst's forecast of 138 per cent.

Since that time, TIR's share price has climbed further to the \$8-plus level. Analyst comments are currently unavailable as a result of some recent turnover; however, Bigen Ghazarian of Sprott Securities, who recently initiated coverage, rates the company a "market perform" and has a 12-month target of \$7.70 a share.

BP, formerly British Petroleum, known for being an early adapter of energy-efficient and environmentally friendly technologies, is using LightMark to replace its neon contour lighting on gas station canopies in the U.S., New Zealand and Australia, with orders totalling over \$32 million.

## Gaining contracts

That, together with some other new contracts, should ensure short-term profitability. TIR is targeting other early adopters worldwide and steadily gaining more contracts in an industry that's forecast to reach \$4.4 billion by 2007.

Carmanah's stock price has experienced a similar climb. In July

2002, it was trading at \$0.53 a share. In March 2003, it was at \$0.95. Today it's around \$3.25.

Fourth-quarter results for the period ended Dec. 31, 2003, showed an increase in annual revenue of 42 per cent, driven largely by sales not only within its core marine market space but also by extending into the aviation and railway markets.

Marcel Brichon, an analyst with Global Securities, predicts Carmanah's profitability will continue. While he is reviewing his price targets, he points out that the general positive outlook for the industry, together with Carmanah's concentration in and increasing sales to the marine industry, bodes well for future growth.

The falling U.S. dollar in 2003 has worked a little to the company's disadvantage because most of its sales are in U.S. dollars.

"But it's still a good place to be in because most of their costs are in Canadian dollars, so they get that kick," says Mr. Brichon. "Their margins are at 50 per cent, which is wonderful to see."

On the risk side, says Mr. Brichon, "I'm wondering at what stage a competitor like GE might step into that space. Carmanah is mitigating that by becoming very strong in the spaces it is in, and the company hasn't been spreading itself too thinly. Carmanah has been approved by the U.S. and Canadian coast guards, for example, so if anyone is doing anything in the marine space, Carmanah is the company they come to."

Besides which, in every market the company has stepped into so far, it has proven itself from both the technology and marketing aspects.

If LED turns out to be a truly disruptive technology, now might be the perfect time to invest in it.

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