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Six Canadian clean-tech trends

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the dirt on clean tech

6 things you need to know about green and sustainable technology

Not so very long ago, "clean tech" was the can of abrasive powder that people used to scour—and scratch—their enamel tubs and metal sinks. And ironically, it would end up polluting our rivers and lakes even as it cleaned kitchens and bathrooms. If domestic chores are the first thing that come to mind when you hear the phrase "clean tech," then put down that toilet brush and put up your feet: to get the dirt on the current state of clean tech, Backbone *magazine spoke with Vicky Sharpe, president and CEO of Sustainable Development Technology Canada (SDTC).*

Since this federal-government-backed not-for-profit foundation was established in 2001, it has helped more than 200 Canadian clean-tech companies develop their good ideas, with the goal of turning them into products ready for market. From our conversation with Sharpe, plus chats with the heads of Quantiam Technologies and Ostara Nutrient Recovery Technologies—two of the many clean-tech companies that have benefited from SDTC investment—*Backbone* presents six things every Canadian needs to know about clean tech.

1 Forget cleaning. It's about never getting dirty

Clean tech used to be called green tech, and much of the focus was on fixing problems like pollution. "When I started out there were a lot of what I would call 'environmental control or mitigation' type technologies," Sharpe said. "We've always gone with the other approach, which is how to do things better in the first place and take cost out of the system. SDTC has seen really great growth in the range and sophistication of technologies that start out with their whole premise being increased efficiency and higher performance."

2 Our capabilities are broad and diverse

Cluster development is all the rage in the modern economy, but don't go searching for a clean-tech cluster because that's not how it works. Clean-tech companies use their products and services to benefit other sectors. "We have a richness to our clean-tech sector that we don't always see elsewhere," Sharpe said. "But these respond to all of our key economic sectors—and we have very diverse sectors."

SDTC's portfolio of clean-tech investments includes companies working in more than a half-dozen major Canadian economic sectors. The first three—energy exploration and production, power generation and energy utilization—make up more than 60 per cent of SDTC's investment. This should come as no surprise, given Canada's rich petroleum reserves. "Canada excels at extraction methodologies in the oil and gas arena and we have been working for years on reducing the environmental impact of those things," Sharpe said. "That's something that tends to not get noticed these days, but we have strength in this area."

The balance is comprised of companies creating clean-tech solutions for transportation, agriculture, forestry, wood products, pulp and paper products, and waste management.

3 It's small business

Most of Canada's clean tech companies are SMEs, often small companies that grew out of academic research projects, and that can present its own challenges. "The way our university system works is that professors are not rewarded for building profitable companies. That means they typically need to take these good ideas out of the university environment and put them into companies whose job it is to take them to market," Sharpe said. "They still need to innovate but it's not about just creating the widget—it's about how to make it a better widget, and how to target the market and how to build a team to make sure they deliver. And I still see that as a bit messy and difficult."

The companies may be small, but they're big on talent and poised for growth. "We're only about 20 people but

illustration: steve munday / three in a box


GREEN

Steve Petrone, president and CEO of Quantiam Technologies, at his Edmonton facility.

photo: jessica fern facette

coating combats carbon

Thinking big started with thinking small at Quantiam Technologies. This Edmonton clean-tech company started in 1998 and developed a catalyst coating used in petrochemical furnaces that converts ethane or propane into olefins, the building blocks of the plastics industry. Quantiam's coating helps prevent carbon buildup inside the furnaces. "Operations today would normally run something like 10 to 40 days of making a product, at up to half a million dollars of revenue per day, and then at the end of that period they'd burn off the carbon that essentially collects like cholesterol in one's arteries—and they'd lose two of five days of production," said Steve Petrone, founder, president and CEO of Quantiam. "We've developed a coating that keeps the surface carbon free, so instead of running 10 to 40 days, the furnaces can run one to two years. It's a game changer."

One with environmental benefits, too: the furnaces operate more efficiently without all that carbon buildup, so they use 15 per cent less energy and generate fewer atmospheric emissions

with six PhDs, so we're very top-heavy in brain power," said Steve Petrone, founder, president and CEO of Quantiam, a clean-tech company serving the petrochemical sector. Petrone added that Quantiam expects to expand its staff by about 50 per cent by year-end.

4 But it's also big business

According to Sharpe, clean tech creates work for some 44,000 Canadians at about 700 companies that are either commercial operations or are about to enter the market. And that adds up to billions of dollars worth of business: the value of the companies in SDTC's portfolio alone is pegged at $1.9 billion. But SDTC states on its Web site that in the 19 rounds of funding it has conducted, it has received more than 2,000 statements of interest from approximately 6,100 companies and institutions, involving projects worth a potential $19.2 billion.

This sounds like a lot, but even successful clean-tech companies acknowledge there are significant challenges to building a Canadian business based on innovation. "The early part of the development of a company, which is perhaps the most critical, is the most difficult to fund," said Phillip Abrary, president and CEO at Ostara. "We do a decent job of providing research and development funding but I think we could do more...to create incentives for investors to invest in these types of companies, so we can actually attract needed capital here, as opposed to going abroad."

Abrary likes the idea of tax credits for Canadians who make investments in innovative companies that are hungry for capital, such as his. "It might help induce more capital to flow in the Canadian market. I think that's the part where we're a little bit weak," he said. "Going to the U.S. or elsewhere to attract money takes time and money. If we can do it at home and attract investment here, it would be great."

5 The world is taking notice

Canada is often characterized as a nation of traders, and Canada's clean-tech companies are building technology and businesses that cater to global markets.

Sharpe said that in the decade the SDTC has been operating, the foundation has always looked to invest in companies with strong export potential. But as the sector has matured, SDTC has refined its focus to help its portfolio companies make global connections. "When we first started, the only thing we really did was look for great companies and help build them," she said. "Now we spend time with multinational corporations to figure out relationships with them. We'll take these corporations some of our portfolio for consideration and they will work together."

Ostara's Abrary said his company, currently selling to municipalities across North America, has now turned its sights on Europe. "We're building a facility in the U.K. right now," he said, adding Ostara's nutrient recovery system has global appeal. "As long as there is existing infrastructure to treat waste water, this is a very complementary piece of technology."

Similarly, Petrone said Quantiam's catalyst coating is unique, and that gives his company a potential market among 250 petrochemical plants worldwide, operating some 1,500 furnaces.

The advantage for Canadian companies is clear. In addition to acquiring a slice of a huge global market through their relationship with a multinational, those corporations often make investments in Canada. "The more progressive multinationals understand that to innovate, they often don't do it very well internally, and so they work with small companies to help bring innovation forward," Sharpe said. "But you can imagine the conversation between an SME and a multinational. It's a little difficult. So SDTC operates as a very useful bridge between the two."

As a result, Canadian companies are attracting foreign investment. Sharpe notes foreign investment in SDTC portfolio companies has grown 200 per cent over the past five years, compared to 50 per cent growth in Canadian investment. "We are building globally competitive companies and attracting global capital," she said. "It's a very powerful story: we're definitely competing well on the global scene."

6 Canada doesn't take enough notice

In fact, the biggest challenge to Canada's clean-tech sector is homegrown.

Clean tech is a high-risk, high-value sector driven by innovation, and it often takes patience that domestic sources of capital just don't have. "Fundraising has been difficult because (investors) are only looking for something where they're sure of an exit that's going to happen fairly quickly," Sharpe said. "Companies, when they get financed in Canada, generally get given small amounts of money. They are drip fed, and it can take a long time to build to critical mass.

"Ours is also a risk-averse culture in Canada," she said. "Yet it's the bigger-risk, higher-return opportunities that bring about the big gains and the big money."

The problem could be that Canada just doesn't take innovation as seriously as it should. Noting that Quantiam is part of a joint venture with Germany's BSF, Petrone pointed out that this one chemical company invests more in R&D than "the entire province of Alberta—private sector, public sector and universities. Alberta is awash in oil profits and investing very little in innovation to secure the future."

Beyond embracing innovation, what else would help? Abrary at Ostara suggests governments could provide incentives for Canadians to adopt Canadian clean-tech solutions. "If governments could encourage Canadians or Canadian companies or Canadian municipalities to adopt technology quickly, then companies could have a showpiece to take to others and, on that basis, sell the technology," he said. "Really, having full-scale operating facilities is the key to selling something in a risky technology development environment."

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>
> —VICKY SHARPE, SUSTAINABLE DEVELOPMENT TECHNOLOGY CANADA

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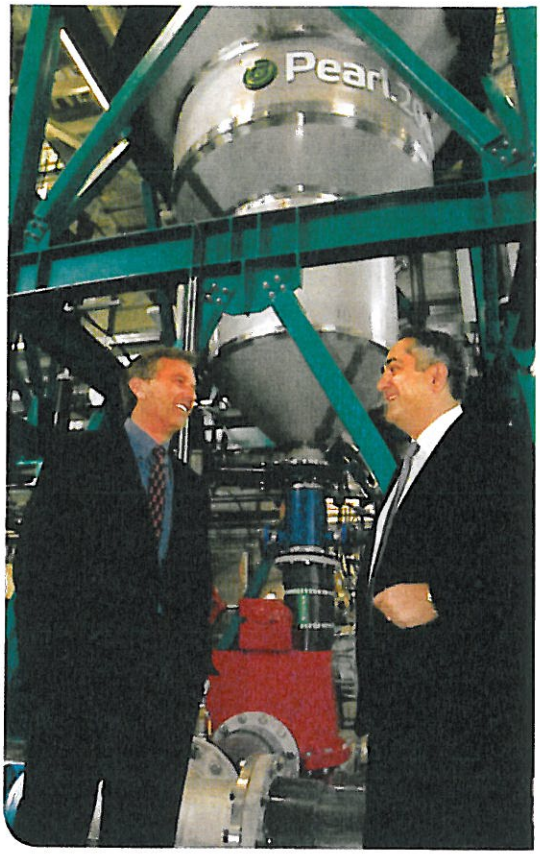

SDTC board member Robert F. Kennedy Jr. and Ostara CEO Philip Abrary with Ostara's Pearl 2000 System at the opening of Clean Water Service's Rock Creek Nutrient Recovery facility in May 2012.

photo: dave bozek / bozek productions

want, not waste

One person's trash is another's treasure: that maxim holds true even with municipal waste water. Founded in 2005, Vancouver's Ostara Nutrient Recovery Technologies recovers phosphorus and nitrogen from waste water and converts these into a slow-release fertilizer. "By removing these nutrients, we're preventing a pollution source that can cause a lot of problems in our waterways," said Phillip Abrary, Ostara's CEO. "More importantly, we're turning this material into a form of fertilizer that is far less susceptible to polluting because it is a slow-release fertilizer. This means a lot more of the nutrient ends up in the plant than would with a traditional fertilizer, which is highly soluble."

But for municipalities, the best news may be that Ostara's product is highly valued. For those using Ostara's system, what once was a problem has become a revenue stream that helps offset the cost of waste water treatment.