

2016 **cleantech** **directions**

Industry on the RISE

Funding, policy shifts and pipeline deal-breakers push innovation to the fore

Inside:

- 2016 **cleantech** survey results
- Industry leader **roundtable**

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Lisa Wichmann

Cleantech Canada is excited to present the 2016 *Cleantech Directions* research and roundtable report on clean technology growth trends.

Much of this report stems from the insight of 12 industry insiders at our November 2015 roundtable discussion; and results from our annual clean technology business survey.

The most significant change from last year's report is the unbridled optimism the group shared during the conversation. Changes to government leadership in 2015, the promise of millions in investment and solid progress made at the COP21 conference are all having an energizing effect on this rapidly-expanding sector.

At the same time, cleantech entrepreneurs, financing organizations and policy makers are shaping new ways

to participate in the green economy both in Canada and overseas.

They're also galvanizing around calls to action, such as establishing more proving grounds for new technologies in Canada. The ability to prove out innovations at home is a key supporting factor in cleantech companies' ability to win global customers.

Cleantech businesses are also looking for shorter approval times and reduced administrative burden related to applying for grants and incentives, along with more accessible government procurement policies.

In the burgeoning bio products market, stakeholders need agreement on how to compare bio-based products to traditional petrochemicals, and standardized certifications.

The industry has come a long way from the days when corporate sustainability wasn't even mentioned in the boardroom. Clearly, cleantech is a sector whose time has come, promising to make 2016 a banner year for innovation.

Enjoy reading the report and feel free to send feedback, ideas, and comments to *Cleantech Canada*.

Lisa Wichmann

Editorial Director, *Cleantech Canada*

SPONSOR MESSAGE

For the second year, the Climate Change and Emissions Management Corporation (CCEMC) is pleased to support the *Cleantech Directions* survey and report.

We're a not-for-profit organization that was created by the Government of Alberta to support the province in the transition to a lower carbon future. Every year we commit millions of dollars in funding to cleantech projects that will help Alberta to reduce greenhouse gas emissions.

It's an exciting time to work in clean technology. The 2015 United Nations Climate Change Paris Conference produced a global agreement and governments are

taking action.

There is a growing understanding that cleantech provides multiple benefits, and technology developers are creating jobs, and helping to build a more diverse economy.

Clean technology is coming of age.



Climate Change and Emissions Management Corporation (CCEMC)

Welcome to *Cleantech Directions 2016*, a national research and roundtable project focused on cleantech market drivers and opportunities. Published by *Cleantech Canada*, this report shares findings from a survey of more

than 500 clean technology businesses and demand-side organizations; combined with real-world insight from our November 2015 panel of technology innovators, policy experts and industry insiders.



PHOTOS: Stephen Uhraney

(Back row, standing, left to right): Rob McMonagle, Gray Taylor, Bruce Dudley, Trevor Orton.

(Front row—seated, left to right): Jamie Stephen, Michael Kousaie, Pushkar Kumar, Annie Prigge, Jennifer Stoneburgh, Dennis Dussin, Ernie Lynch, Matthew Stevens.

ROUNDTABLE PARTICIPANTS

Rob McMonagle, Senior advisor on the green economy, City of Toronto

Gray Taylor, Principal at Gray Taylor Law and climate change policy expert

Bruce Dudley, Senior vice-president, Delphi Group

Trevor Orton, CEO and co-founder, Eyedro Green Solutions Inc.

Jamie Stephen, On behalf of Alberta Innovates Bio Solutions

Michael Kousaie, Head of business development for renewable energy and clean technology, Toronto Stock Exchange and TSX Venture Exchange

Pushkar Kumar, Founder of GreenMantra Technologies and entrepreneur

Annie Prigge, Partnership Program, Innovation and Energy Technology Centre, Natural Resources Canada (observer)

Jennifer Stoneburgh, Senior associate, cleantech ventures, MaRS Discovery District

Dennis Dussin, President, Alps Welding Ltd.

Ernie Lynch, CEO, Lynch Group of Companies

Matthew Stevens, CEO, CrossChasm Technologies.

Cleantech's Fresh Start

Funding, policy shifts and pipeline deal-breakers push innovation to the fore in 2016

It's a new day in Canada—and the country's cleantech industry is on the verge of taking a significant leap forward. That's the consensus of a group of industry leaders, insiders and entrepreneurs who gathered in a Toronto boardroom in November 2015 to discuss the fast-growing sector's performance and its outlook for the coming years.

Meeting just one day after the auspicious swearing in of Prime Minister Justin Trudeau and his cabinet at Rideau Hall in Ottawa, one thing was clear above all else: 2016 will mark a new beginning for Canada's clean economy.

"This is actually a really magical day," said Gray Taylor, one of Canada's foremost climate change lawyers and principal at Gray Taylor Law. "To be here today, right after a new cabinet, with this kind of openness [was sworn in]... This is a sea change."

In its first few weeks in office, the Liberal government wasted little time instituting a number of quick



rollbacks and changes, such as renaming the Ministry of Environment to officially recognize climate change. The Liberals have also promised significant financial support for Canada's cleantech sector and have prided themselves on their open, pro-science approach to governing.

Unlike Stephen Harper's long-ruling Conservative party, which many of the cleantech champions at the table saw as a significant hindrance to the sector's growth, the Liberals represent a second chance to build a Canadian energy sector that's both sustainable and exportable.

Added to that is the electoral jolt in Alberta that saw the provincial NDP party end the Conservatives' 44-year run in power.



“When you put a price on carbon, automatically, every cleantech business has a market advantage.”

— Gray Taylor
GRAY TAYLOR LAW



we're going to continue using fossil fuels for the foreseeable future—20 years or 30 years—is reducing the footprint of oil sands production.”

This is a field where cleantech will shine, he added, particularly in carbon capture and storage (CCS), an approach that collects carbon emissions from heavy emitters such as oil sands producers for storage or reuse in products such as concrete.

“There will be a massive appetite for anybody that has a technology that can significantly reduce the cost of capture,” Andries said, referring to the current challenge of making CCS affordable.

SHIFTING POLICY

Numerous cleantech firms are rising to the challenge, and will likely be helped along by shifting regulations in Alberta. The new NDP provincial government unveiled its climate change strategy in November 2015, including a strong focus on wind energy, a carbon tax, a cap on oil sands emissions and the phase-out of coal. The group agreed these new developments are cause for optimism.

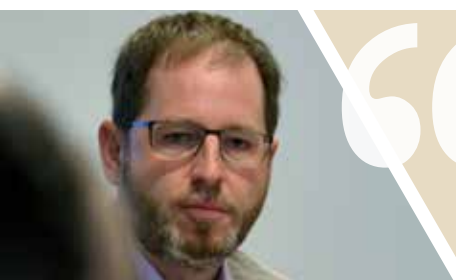
“We see cleantech as a huge growth opportunity for our business,” said Dennis Dussin, president of Alps Welding Ltd., a Vaughan, Ont.-based metal fabricator doing a significant amount of business with the oil and gas industry through projects such as piping systems, stacks and heat exchangers.

Unlike many companies waiting for carbon regulations to spur market growth, Alps Welding—which started out as a traditional fabricator—is already pursuing cleantech as a new revenue stream.



“The old government tended to be business focused and were [more] about competitiveness. They tended to deal with climate change around the edges,” said Kirk Andries, then managing director of the cleantech funding organization, Climate Change and Emissions Management Corp. (CCEMC) in Edmonton, in an interview following the roundtable. The stance deeply impacted Alberta’s critical oil sands industry, he added.

“The Keystone [pipeline] is an example that comes to mind. Obama dragged his feet for a long time and now has finally made his decision and the answer is ‘no’... because the source of supply is too carbon intensive. So when you speak of the future, one area that is an absolute priority if



“A lot of people in our industry and a lot of customers we deal with see cleantech as something that they have to do... as something that’s kind of forced on them. We see it as an opportunity.”

— Dennis Dussin
ALPS WELDING LTD.



“We’re starting to see now the first real impacts of the crisis. All of a sudden there’s a sense of urgency, and it’s a call for action.”

— Rob McMonagle
CITY OF TORONTO

“A lot of people in our industry and a lot of customers that we deal with see cleantech as something that they have to do... as something that’s kind of forced on them,” Dussin said. “We see it as an opportunity.”

COP21 MOMENTUM

Changing global sentiment about climate change and a growing effort to reduce greenhouse gas emissions will also invigorate the clean technology market this year.

At the COP21 conference in Paris, for instance, world leaders committed to some of the most significant international steps toward reducing emissions taken in years. When the dust from the immense amount of anticipation had settled in the French capital, leaders emerged with a consensus agreement between 196 countries that will aim to transition the global economy to carbon-neutrality by 2050.

The deal contained a binding accord mandating countries limit global warming to less than 2 degrees Celsius—a stipulation certain to bring renewable energy development to the fore around the world. Post-Paris, there’s no longer any denying it. Climate change’s time as a backburner policy issue, both in Canada and around the

world, is over.

“The rest of the world is decarbonizing. We run a very significant risk of being left behind,” Taylor said. “At the same time, the opportunities are there to grow both jobs, and the right kind of jobs.”

According to Rob McMonagle, senior advisor on the green economy with the City of Toronto, the slow attitudinal shift that has brought scientists, individuals and heads of state together on the climate change debate is finally reaching a crescendo.

“We’re starting to see now the first real impacts of the crisis,” McMonagle said. “All of a sudden there’s a sense of urgency, and it’s a call for action.”

Which begs the questions—are clean technology companies ready to capitalize on that momentum? Can large emitters, municipalities, manufacturers and other organizations put the right strategies in place to buy cleantech and entrench sustainability?

These are just a few of the questions tackled by the November roundtable delegates, who also drew insight from Cleantech Canada’s 2015 business survey of barriers and opportunities in the green economy. The research polled 500 executives across Canada—cleantech companies and emitters alike, to envision next steps and calls to action. 🌱



“When you marry up that imperative [of] solving major issues like climate change with creating jobs and potential, it’s a wonderful fit.”

— Bruce Dudley
DELPHI GROUP

Economic Impact

Cleantech poised to create long-term jobs

With increased government funding on the way—the Liberal government pledged \$200 million a year in new cleantech spending—and inbound regulatory changes virtually guaranteed to add new revenue streams—cleantech is poised to put some of its past fiscal woes in the rearview. As the sector starts to take flight, experts believe budding cleantech businesses will also help shore up Canada's sputtering economy.

"Whether you look at it from Alberta's perspective, or Ottawa's perspective, they've got to do something about the economy," Bruce Dudley, senior vice-president at the Delphi Group, said during a November roundtable of cleantech stakeholders hosted by *Cleantech Canada*. "It's worse than we thought," he added, pointing to shockwaves from falling commodity prices and the dipping dollar.

Instead of maintaining the status quo, which has left both Alberta and Canada's economies vulnerable to the vagaries of the commodity market, Dudley and other cleantech insiders want to see Canada take advantage of zeitgeist.

"[The economy] is a primary concern of any government—either maintaining what they have or recovering from where they're at," Dudley said. "When you marry up that imperative [of] solving major issues like climate change with creating jobs and potential, it's a wonderful fit."

Perhaps most importantly though, the job growth will not be in an industry characterized by uncertainty such



as oil and gas or mining, but in a sector guaranteed to continue creating sustainable jobs long after the last oil rig is idled, the group commented.

With innovative technologies, world-class research and the right mix of funding, Canadian cleantech is well-positioned not only to support the world's shift away from traditional fuels and wasteful technologies, but lead it.

NEW IDENTITY

For decades, the cost of a barrel of Brent, West Texas or Western Canadian Select crude oil came at face value. Those days are over. In a world where businesses or governments must pay for each ton of carbon they use, the economic engine of the 20th century faces a less than propitious future.

"When you put a price on carbon, automatically, every cleantech business has a market advantage," commented Gray Taylor, one of Canada's foremost climate change lawyers and principal at Gray Taylor Law.

In North America and around the world, evolving climate change policies – like those adopted in Paris – are dramatically recalibrating the cost of clean technology and traditional energy sources.

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“Certainly we need roads and bridges, but those aren’t sustainable jobs. I’d like to see [government] put more funding into entrepreneurship...things that drive innovation, things that create intellectual property.”

—Trevor Orton

EYEDRO GREEN SOLUTIONS INC.

U.S., which is virtually guaranteed to be the death knell of the country’s coal industry, to provincial cap and trade systems in Canada, emissions regulations are redefining how people travel, what technologies power our homes and how companies do business.

Indeed, the question is no longer whether or not wind, solar and other renewable technologies can replace fossil fuels, but how long it will take. As Alberta shifts from its largely unilateral bet on oil, and the overall Canadian economy aims to dilute its heavy focus on commodities, the country is looking for a new identity.

THE INFRASTRUCTURE ENGINE

According to the Conference Board of Canada, service industries such as finance, insurance, computer and IT are all sectors of the economy expected to post significant growth in the near term. Skilled services, however, are not the only strength Canada has to offer.

Analytica Advisor’s 2015 Canadian Clean Technology Industry Report found Canadian cleantech firms already have a \$12-billion piece of the nearly \$1 trillion global clean technology industry.

The sector employs 50,000 people in Canada, in more than 800 firms. Direct employment in cleantech is outpacing several of Canada’s long established sectors, such as forestry and pharmaceuticals, the firm reported—a sure sign cleantech’s time has finally come.

Canada’s renewed focus on infrastructure spending could be another major impetus of growth for the green economy, the roundtable group noted, leading to more sustainable cities, transportation and energy systems.

Trevor Orton, for one, called for Canada’s federal,

provincial and local governments go even further than the Liberal government’s commitment to invest \$200 million in cleantech. He wants to see legislators approach clean technology in the same way it would vital infrastructure—and in some cases, invest in sustainable technology instead.

“Certainly we need roads and bridges, but to me, those aren’t sustainable jobs,” says Orton, CEO and co-founder of Eyedro Green Solutions Inc. a Kitchener, Ont.-based cleantech company providing electricity monitoring solutions.

“I’d like to see [government] put more funding into entrepreneurship—things that drive innovation, things that create intellectual property. It’s the intellectual property that creates value for companies that then create jobs,” he added. “That should be part of the longer term plan to complement the roads and bridges.”

Dudley agrees. “More roadways isn’t necessarily a solution,” he says. “It’s an easy way to spend infrastructure money, but the smart transportation investments would be perhaps the better investment.”

Given the impending “race to spend,” Dudley wants calmer heads to prevail and hopes to see decision-makers evaluate costs over a project’s entire lifecycle—and with an eye on benefits such as quality of life and sustainability—instead of the usual 10 or 15 year payback.

It remains to be seen how willing the federal and provincial governments will be to take more risks on fledgling cleantech firms and integrate next-generation solutions into their infrastructure spending, but driven by the newfound focus on planning more for the future, the industry is optimistic.



Investors on the Prowl

Problem-solution fit is key to attracting financing

At the time *Cleantech Canada's* roundtable met in November 2015, the value of Canada's 'green' sector on the Toronto Stock Exchange and TSX Venture Exchange was at or near its highest level ever, according to Michael Kousaie, the head of business development for renewable energy and clean technology at the Toronto Stock Exchange and TSX Venture Exchange (TSXV).

By the end of 2015, cleantech companies listed on the Exchanges reached their highest ever year-end market value, and raised \$2.4 billion in public equity capital—a new annual record. In fact, cleantech companies on TSX and TSXV have raised more than \$1 billion for seven years in a row.

There are more cleantech companies listed on the TSX and TSXV combined or the group's junior exchange than any other exchange in the world, and with 14 new companies having gone public since the beginning of 2014,

the outlook for the industry from an investor standpoint is undeniably encouraging, he added.

"If you can make money off of cleantech investing, people will invest," Kousaie said, during the discussion between entrepreneurs, policy experts and technology accelerators. "That's a very obvious point. But also something to keep in mind is that private sector investors are not charities. They're not looking to do things because it feels good. They're looking to do things because they've got investment return requirements and they've got timeline requirements."

As cleantech entrepreneurs with big ideas look to enter the market, keeping them focused on what their product can do for a company's bottom line—and investor returns—is paramount.

"If you don't have that problem-solution fit, you're not going to be a successful company," said Jennifer

Stoneburgh, a senior associate for cleantech at MaRS Discovery District.

Expert at assessing a company's potential, MaRS and other incubators like it, such as Waterloo's Communitech, excel at taking green startups looking to solve an environmental problem and channeling their ideas toward a real-world market. For investors, it's the market that matters, not environmental ideals.

"Once you get to the point in your businesses and once the sectors get to the point where it's economically viable without needing government, without needing subsidies, without needing x, y and z, then there is huge support available [in capital markets]," Kousaie said.

Communicating that value is sometimes challenging for cleantech start-ups, who might have scientific know-how in abundance, but lack business development and marketing savvy.

The *Cleantech Directions* survey—fielded in 2015—asked green start-ups to peg the quality of their pitch to investors. Only 30 percent said their pitch is "very effective" with an additional 35 percent saying it's "OK, but needs work." Less than half (40 percent) feel their customer pitch is effective.

When commercialized cleantech companies were asked about the biggest contributor to their success, "my technology solves a real industry problem" ranked number one. What problems are they tackling? The survey found on the demand side, companies are evaluating clean technologies to tackle waste management and recycling (which topped the chart at 64 percent), followed by energy efficiency in operations at 43 percent.

Not surprisingly, cleantech businesses and entrepreneurs cited a lack of financing and investment as the number one

barrier to expanding their business (37 percent), followed by unsupportive government policy at 36 percent.

GRANTS AND GOVERNMENT CONTRACTS

For cleantech companies selling to governments—or applying for grants and incentives—wins are hard earned. Any entrepreneur will tell you securing government funding or a contract often hinges on a painfully drawn-out procurement battle.

While the process is virtually guaranteed to include exhausting due diligence and timelines that seem agonizingly slow to those in fast-paced industries, as Pushkar Kumar, founder and chief strategy officer of Toronto-based GreenMantra Technologies stressed, "for an early stage company, getting that money is worth it."

Kumar—a 'serial entrepreneur' who has been behind multiple start-ups—said cleantech businesses need to understand that government has a responsibility to protect public money—but that doesn't mean the process couldn't run more smoothly.

Matt Stevens, CEO of CrossChasm, a Kitchener, Ont.-based provider of technology for electric vehicles, whose firm does the majority of its business outside the country because of the limited opportunity for EVs in Canada, takes particular issue with the scrutiny involved.

"The amount of due diligence you should be making for a small investment should be commensurate with the amount," he said. "Some procurement processes or funding processes put you through what makes perfect sense for a



Private sector investors are not charities. They're not looking to do things because it feels good. They're looking to do things because they've got investment return requirements and they've got timeline requirements.

— Michael Kousaie

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Reducing GHG Emissions.
Funding a way forward.



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“A lot of those countries want [the technology] to be de-risked in our backyard and that can be difficult when we don’t have the demand or the driving forces here.”

— Jennifer Stoneburgh
MaRS DISCOVERY DISTRICT



\$5 million project, for a \$500,000 order.”

He noted the significant problems his company experienced coming up against the two-tier funding system that assesses how much due diligence a project requires by simply asking if a project is valued above or below \$25,000.

“If you want cleantech innovation, there’s a lot of things that can be done that need more than \$25,000, but don’t need \$1 million,” Stevens said.

In addition to the lag time, Trevor Orton, CEO and co-founder of Eyedro Green Solutions Inc., pointed to the sheer amount of time it takes companies to put together the materials to win funding or contracts from governments.

“Every hour I’m spending apply for funding, I’m not building product, I’m not doing other things,” Orton said. “That’s been one of our biggest challenges—there’s only so many hours in the day. I can work 80 and 100 hour weeks, but there’s still things that aren’t getting done.”

It’s a problem for early-stage firms in particular, which can only afford to employ several workers. Government procurement is as daunting as it is rewarding—and cleantech firms continue to hope governments will make it just a little bit easier. 🐼



“When we’re doing cleantech, we can’t think that it has to be only Canada—it has to be about global scale. That’s the only way you can succeed.”

— Pushkar Kumar
GREENMANTRA TECHNOLOGIES

Sell Cleantech to the CFO

Cost still trumps sustainability when pitching greener products

“Environmental” may not be the dirty word it was in business 20 years ago, but that doesn’t mean the bottom-line has lost its significance. According to the experts, it’s the value proposition that’s changed, not the sales pitch.

As much as it pains cleantech companies—many of which are led by individuals or boards with some stake in the environmental movement—selling a clean technology still relies not on pitching its sustainability credentials, but on demonstrating how it can save a company money.

Matthew Stevens, the CEO of CrossChasm, has built his firm’s electric vehicle car platform into an international competitor by showing customers just that.

“Our view is that the sustainability officer can bring you in, but you sell to the CFO,” he said, during *Cleantech Canada*’s November 2015 roundtable discussion among entrepreneurs, cleantech accelerators and policy experts.

Moreover, the company does its research, identifying and targeting clients who stand to benefit the most from the technology, and have a pressing problem to solve.

“Our experience with finding the right customer is to find someone whose house is on fire,” Stevens quipped. “They’re more likely to say ‘do it’ because they really need what you have to offer.”

Dudley, who is part of the management team at sustainability consultancy Delphi—a firm that helps



companies of all stripes improve their environmental track record—agrees, saying businesses are interested almost exclusively in technologies that will lower costs and improve production.

“We have to stop trying to sell innovation in cleantech on purely environmental platforms,” he said. “They’re important, they’re part of the value proposition—but we know environmentalists aren’t buying multi-million dollar trucks for mining—business people are.”

REDUCING WASTE

Cleantech firms can certainly be encouraged by the changing sentiment about climate change, but at this early stage they shouldn’t mistake corporate efforts to conserve and become more efficient as purely a result of social responsibility.

Most corporations’ recent willingness to go green is less about a sudden realization of climate change and more a result of regulations adding additional costs to traditional technologies, along with a drive to reduce



have embraced low or zero emission vehicles—the U.S. state of California being the best example—regulations greatly increase the speed at which individuals and companies go green.

Still, experts don't think regulations should be the whole story.

Just like there are pitfalls to over-pursuing government funding and contracts, cleantech firms sitting patiently, awaiting regulations that will make their products viable are playing a dangerous game.

“One of the problems we have in cleantech is how we sell it,” Dudley said. “We often wait for a regulation. We're all thirsty for it—we're waiting, we're hovering, ready to pounce—but what industry needs [are] technology solutions that actually improve the bottom line.”

Dudley wants to see firms continue to work on innovating and lowering their cost structure, instead of relying of watchdogs to step in to make their cleaner solution a necessity for buyers.

“Regulation can create demand, but regulation seldom drives innovation,” Dudley said.

The growing market and increasing adoption of LED lighting is an excellent example of a clean technology taking an unregulated market by storm—and one upstart firms should look to emulate.

The energy-saving technology has demonstrated its ability to produce a relatively fast return on investment and is well on its way to becoming the dominant player in the lighting market.

If a cleantech firm's products or services can win out against competitors in an unregulated market, big business will come running. 🍷

waste and boost efficiency, the group agreed.

It may be 2015—as Trudeau quipped—but that doesn't mean the cult of the bottom line is any less dominant.

THE REGULATORY WAITING GAME

Though cost motivations still rule, Ontario's new cap and trade regulations and increasing carbon taxes in other provinces such as Alberta, will likely see cleantech bear far more influence on spending programs and investor preferences, the group noted. Executives in many industries will also be more attuned to reducing regulatory risk.

As evidenced by a number of automobile markets that



“Our experience with finding the right customer is to find someone whose “house is on fire,” They're more likely to say ‘do it’ because they really need what you have to offer.”

— Matt Stevens

CROSSCHASM TECHNOLOGIES

Growing a cleantech business

In September 2015, *Cleantech Canada* surveyed more than 500 cleantech businesses and demand-side organizations across Canada, to gauge their attitudes and perceptions about clean technology opportunities and barriers to growth.

The online survey was conducted by Bramm Research Inc. More than 300 respondents self-identified as cleantech businesses. For the purpose of this study, cleantech businesses primarily offer a product or solution that addresses climate, waste or resource challenges. Here are highlights of the findings.

FAST FACTS:

Stage of development: 64% of cleantech companies surveyed are generating revenue; 20% are in pilot/demonstration; 16% are in the test/ research phase.

Confidence: 79% are confident their business will reach the next stage within two years.

Location: 72% feel Canada is a good environment to grow a cleantech business.

Pitch: Only 30% said their investor pitch is “very effective” and 35% said it “needs work.”

Barriers: Lack of financing was cited as the top challenge (37%), followed by unsupportive government policy (36%); lack of industry incentives (29%); regulatory/zoning issues (19%); low demand (15%); lack of expertise (14%); low market intelligence (12%); scaling the technology (10%), among other barriers.

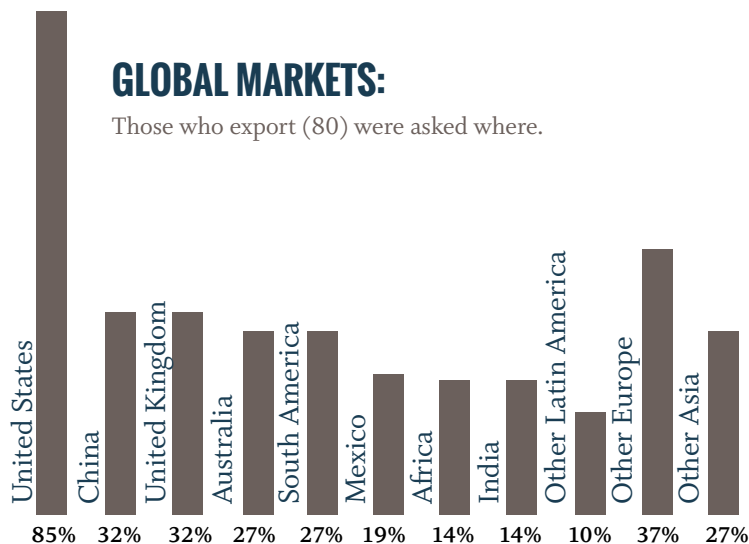
KEY TO SUCCESS:

The survey asked commercialized companies (196) what played the biggest part in getting them to the revenue stage.



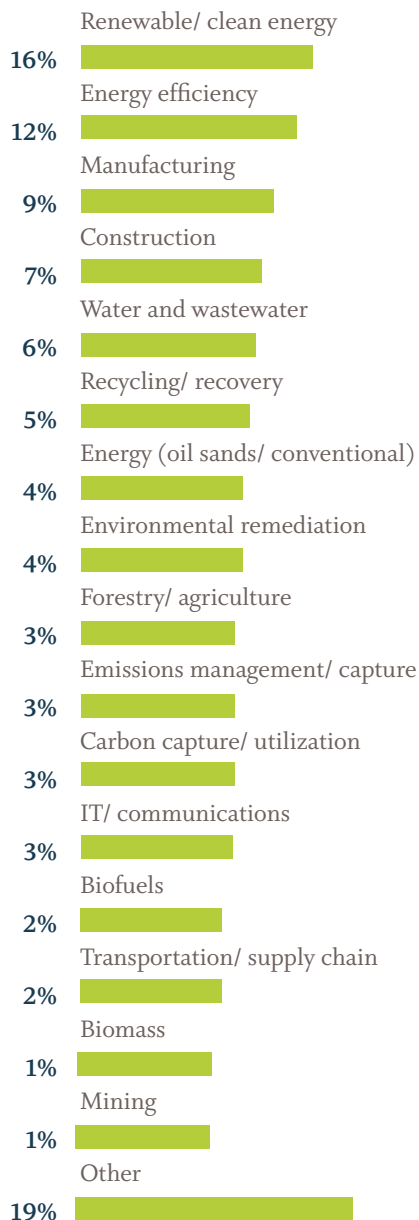
GLOBAL MARKETS:

Those who export (80) were asked where.



CLEANTECH SECTOR:

The survey asked cleantech companies to identify their segment.

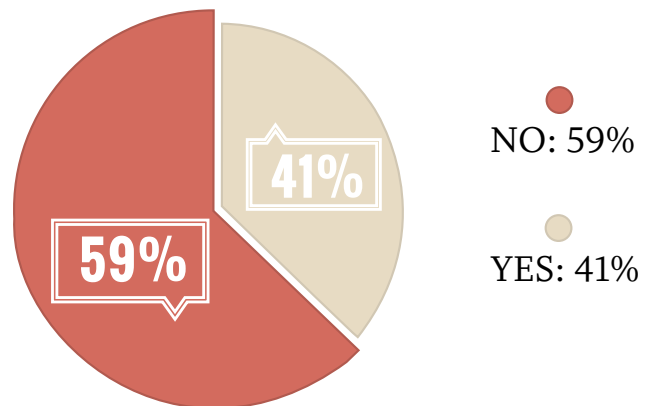


MAIN CUSTOMER MARKET:

The survey asked what is (or will be) cleantech companies' main market.

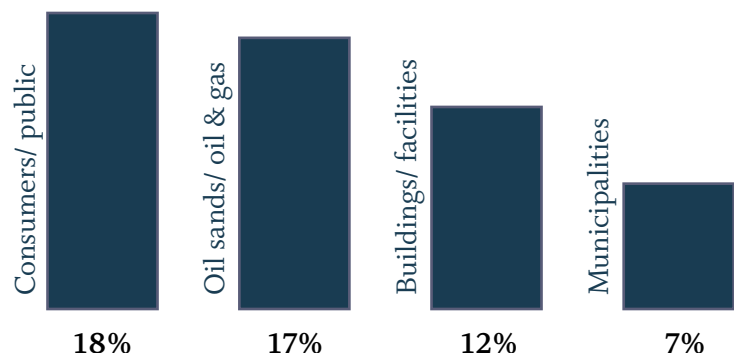
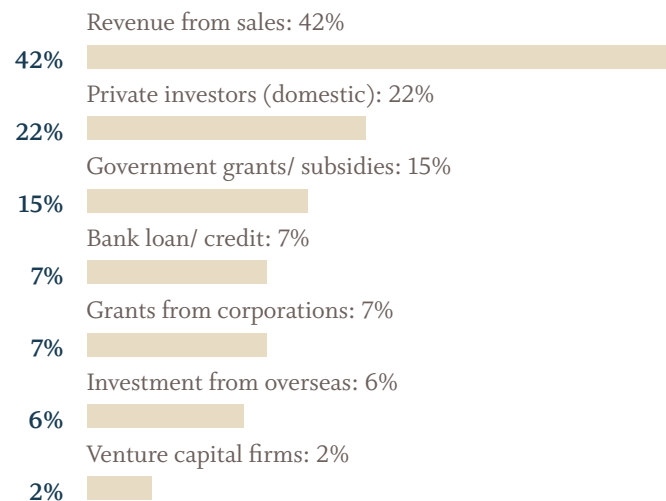
EXPORTING:

The survey asked if they sell outside Canada.



FUNDING AND FINANCING:

The survey asked all cleantech companies to identify their most important source of funding.





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A Motivated Buyer

Lynch Group shows the power of CEO support for cleantech



Ernie Lynch, CEO

There will always be outliers, and Ernie Lynch, CEO of the Lynch Group of Companies, is one of them.

An Ontario success story, the Lynch Group provides manufacturing hydraulic and electronic components. Despite being a manufacturer in what most would consider a traditional industry, Lynch has taken major steps toward integrating green and clean technologies into its facilities, and has plans to take its upgrades even further.

“We can’t run an economy on pulling coal out of the ground—or oil of the ground—and just burning it. That’s not sustainable,” Lynch said, during the Cleantech Directions roundtable discussion in November. “Once we grasp it and move forward with it, the economy will grow and there are tons of jobs.”

Among the on-site upgrades Lynch has already invested in at the company’s headquarters and manufacturing facilities in Mississauga, Ont. are a 30,000 square-foot vegetated green roof and a hydroponic tower garden. The company has skylights in its production areas and is also planning to upgrade to LED lighting paired with a solar array to illuminate its manufacturing facilities.

Lynch’s other solar ambitions include an EV-charging solar car port and a solar panel-covered walkway between two of the company’s buildings. The manufacturer is also in the preliminary stages

of pricing out a potential wind turbine and installing a solar hot water-heating system it would use for the facility’s parts washers.

Lynch offers a range of incentives to its employees for taking decisive action toward living more sustainably. Among others, the company provides cash incentives for employees who buy hybrid or electric vehicles as well as incentives for workers who move closer to the office.

Though Lynch admitted he would likely see some windfall from the many upgrades and incentives he offers—be it financial, or in the form of corporate loyalty—he says he would have taken those steps even if he knew he would never earn a nickel of the investments back.

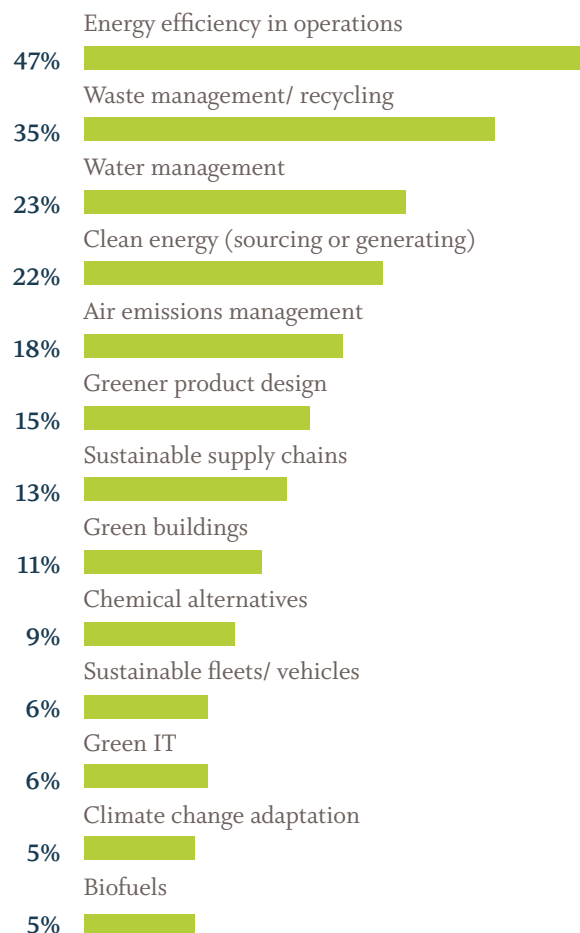
“I couldn’t care less about the economic part of it,” he said. “There’s definitely a gain—I mean it costs less to air condition if we have a green roof and it keeps heat in, but I don’t care as much about that as I do about the [environmental aspects].”

Executives focused on corporate responsibility and sustainability, such as Lynch, demonstrate that while the bottom line still reigns supreme in most cases, there is room for business leaders to take action and exercise corporate social responsibility by adopting environmental technologies.

Lynch hopes his example will encourage his employees as well as other companies to follow suit. 🌱

TOP INVESTMENT AREAS:

Energy efficiency is the number one priority for demand-side organizations (187 firms) when it comes to cleantech initiatives planned for the next two years.



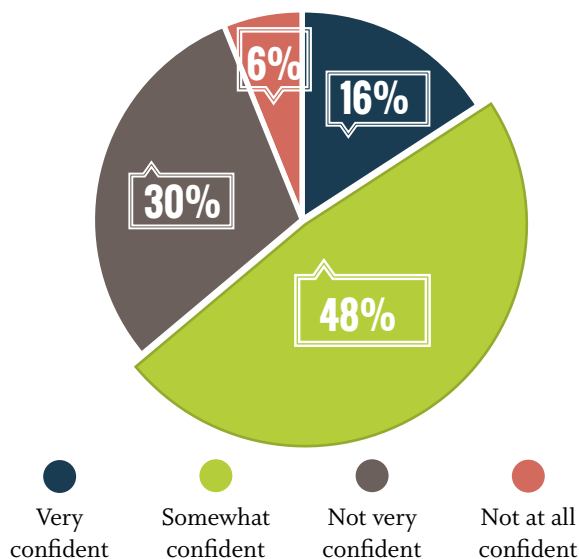
FAST FACTS:

Risk tolerance: When given the statement: “My company will only invest in cleaner or innovative new technologies if they’ve been proven or are well established,” 71% agreed.

Cost conscious: Sixty-five percent agreed with this statement: “My organization will invest in cleaner or innovative new technologies if they don’t cost more than traditional products/ services.”

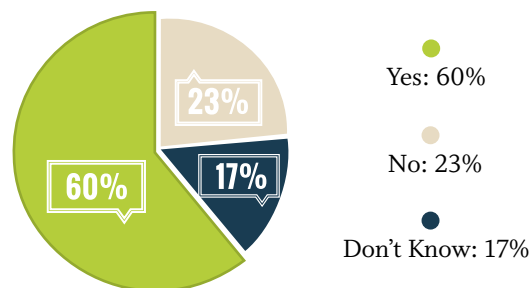
FINDING CLEANTECH:

Most respondents are confident their organization knows where to find reliable cleantech solutions.



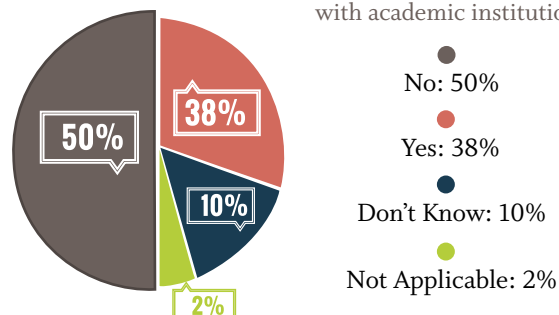
IMPORTANCE OF INNOVATION:

Executives were asked if innovation is an important cornerstone of their overall strategy.



ACADEMIC PARTNERSHIPS:

Respondents were asked if they work with academic institutions.



Exporting Cleantech to the World

It's a simple reality that a company can only be as big as the market it serves. With Canada's population hovering around 36 million, businesses that operate exclusively within the country's borders are often overshadowed and outmaneuvered by larger firms abroad. In the cleantech sector, however, the race to the top is just getting underway.

When expanding to a new market in a traditional industry, companies can expect to encounter a number of well-established players. In many cleantech fields though, the fiercely competitive, developed market has yet to mature.

With an innovative, economical product, a startup may be in a good position to establish itself before competition moves in. With this in mind, Canadian startups that look abroad early will not only open up new markets for their products, but create the opportunity to build a global business from the ground up.

"When we're doing cleantech, we can't think that it has to be only Canada—it has to be about global scale," said Pushar Kumar, founder of GreenMantra Technologies and entrepreneur, at a November cleantech roundtable hosted by *Cleantech Canada*. "That's the only way you can succeed."

Pointing to India, where the population and market potential of several individual cities is expected to soon rival all of Canada, Kumar thinks tapping into international markets is simply something a modern company has to do.

"[Canada] has a great network, which can take your technology out once it's proven here," he said. "Take it out and go into other geographies—be it the U.S., be it India, China."



For companies lacking the resources to look global right out of the gates, carving out a piece of the lucrative U.S. market is a logical first step. Meanwhile, with trade barriers falling worldwide, there has never been a better time to go global.

THE BACKYARD PROVING GROUNDS

It may be a strong rallying call, but breaking through the Canadian border is no small task, regardless of how innovative a company's offering.

Though they may face less direct competition, one of the most significant obstacles Canada's cleantech companies face abroad is a short, or non-existent, track record. The government in Ottawa may be willing to take a chance on a Canadian technology, but the same can't be said for governments or businesses around the world—at least not those without strong sales or a demonstration project in their own backyard.

"It looks bad when we go to the U.K. and say we haven't tested in Canada," said Matt Stevens, CEO of CrossChasm, an electric vehicle technology provider in Kitchener, Ont. "It's a black eye."

Building a client base is one of many reasons firms often pursue government work or funding. Securing a strong track record of completed projects and satisfied customers is as important for an early-stage company as building revenue.

For technologies that just don't apply to the cold,



Relative to our population we have immense natural resources and that's what we should leverage.”

— Jamie Stephen

ON BEHALF OF ALBERTA INNOVATES BIO SOLUTIONS

sparsely populated Great White North though, this is painstakingly difficult to achieve.

“A lot of time, the market for a new technology is not in Canada,” said Jennifer Stoneburgh, senior associate, cleantech venture services with MaRS Discovery District. “It’s overseas where you have high electricity costs or you have drought...But a lot of those countries want it to be de-risked in our backyard and that can be difficult when we don’t have the demand or the driving forces here.”

Cleantech companies and incubators are hoping the Canadian government will take a more active role in helping firms build demonstration projects. Then, with results in hand, companies can go overseas with hard figures to bolster their pitch.

BUILDING A CANADIAN BRAND

Even taking the new government’s commitment to diversify into account, there’s no denying Canada’s economy remains fundamentally resource-based. While some cleantech advocates see this as a hindrance, others see the opportunity.

“What country in the world should be the leader in carbon management technology?—It should be Canada,” said Dennis Dussin, president of Alps Welding Ltd. in Vaughan, Ont., a fabricator doing increasing numbers of cleantech projects in sectors such as oil and gas. We’re a resource-based economy, we have all these challenges, we should be the ones selling all this to everyone else in the world,” he argued.

Dussin thinks Canada is perfectly-positioned to leverage the commodities that have been the economy’s

greatest liability over the past year and a half, as well their greatest strength over the past 10. With the right mix of support from government, industry and academia, he thinks Canada can lead the world in decarbonization technology.

“We should be saying, ‘how do we use this carbon challenge to invent a new industry and be a huge exporter of this technology,’” Dussin said. “That’s where I think a lot of the jobs are going to be—not just satisfying the need here, but satisfying the need internationally.”

Jamie Stephen, an expert in the bio-economy, agrees whole-heartedly. “Everybody in the world wants to be in cleantech,” Stephen said, speaking on behalf of Alberta Innovates Bio Solutions. And as a result, Stephen thinks Canadian cleantech firms, or companies looking to transition, need to ask themselves what they have expertise in.

“It’s really in natural resources,” he said. “Being able to recognize that we’re not Silicon Valley, obviously we’ve got some key hubs, but at the same time, relative to our population we have immense natural resources and that’s what we should leverage.”

With some of Canada’s major oil and gas players dabbling in wind and solar, as well as in technologies that make their traditional operations cleaner, companies are already looking to future-proof their business.

The next step, Dussin, Stephen, and others agree, is to build a sustainable, highly-exportable Canadian cleantech industry.

After a landmark 2015, it has never looked more possible.



David Kennedy is a reporter with *Cleantech Canada*

BUILDING CANADA'S BIO-ECONOMY

Bio-based products such as alternative fuels are poised to drive Canada's burgeoning cleantech sector. To gauge opportunities and challenges in the bio-economy, *Cleantech Canada* checked in with BioFuelNet Canada, a national consortium of industry, government and academia focused on biofuel growth.

According to the organization's scientific director, Donald Smith, the biofuel industry is all about leveraging what Canada has at a premium.

"We produce quite a lot of biomass and we have a small population relative to our surface area," Smith, who is also a professor at McGill University, said. "On a per capita basis, we're in a strong position."

BioFuelNet estimates replacing 25 per cent of Canada's traditional fossil fuel consumption with biofuels could reduce carbon dioxide emissions by 62 million tons per year. With a lot of room to grow, an industry of that size would employ as many as 100,000 people nationwide and utilize crops that are purpose-grown for biomass on marginal land as well as residue from food production.

Like other clean technologies though, biofuels face a number of impediments.

Getting experts to come together on a standard measure for life cycle analysis, which would help the industry demonstrate how effective it is at eliminating emissions, is one of the most significant issues.

"Solving the life cycle analysis problem would help a lot," Smith said. "There's a lot of controversy over how people... [calculate] life cycle analysis for greenhouse gas emissions.

"It would be good to have people actually to the point where they agree."

Meanwhile, BioFuelNet says the industry also needs to standardize the certification process for bio products; today, there are more than 500 standards around the world. A lack of data on petroleum "parity" to effectively compare biofuels against traditional energy sources is yet another hindrance.

While the organization acknowledges biofuels are not going to be the solution to every environmental problem, Smith thinks bio products offer a cleaner alternative for industries that are simply not capable of eliminating fluid fuels in the short term—such as aviation.

"When you look at the energy sector... there is no silver bullet," Smith said, remembering countless conversations with industry colleagues. "The best you can hope for is silver buckshot. It's going to take a lot of pieces to replace it all."

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