

# PLANT WEST

ADVANCING CANADIAN MANUFACTURING

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## GAME changer

Gradek Energy's organic beads tackle oil sands leftovers

NEW TECHNOLOGY SECTION

# CIEN

CANADIAN INDUSTRIAL EQUIPMENT NEWS

### HIGHLIGHTS

- Mantra technology stores renewable energy
- How Suncor is getting the dust to settle
- Cut your spare parts inventory and save
- When it's time to sell, consider your leverage

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# What ails manufacturing

Even when markets are good, manufacturing in Canada is not for the weak. A TD Economics special report that tracks manufacturing noted a couple of years where recovery from its long-term decline was “modest,” but in 2013 it took a significant step back.

A lower-value loonie will partially mitigate the “input cost disadvantage” that has been particularly troublesome to exporters, but TD notes there are still higher transportation, power and border-related costs inflicting additional drag on Canadian producers.

That ties in with production costs being high compared with much of the competition out there, which – incidentally – can be ferocious, and there are other challenges. Productivity lags the US, getting financing for expansion or innovation is tough and finding people with the right skills is, according to the Canadian Chamber of Commerce, the leading impediment to business success.

In its *Top 10 Barriers to Competitiveness for 2014*, the Chamber identifies key factors holding Canada back and what to do about them. Starting with skills, it notes four key areas that need to be addressed: upskilling; education and employment connections; immigration; and Aboriginal workforce development.

Canadian businesses are not globalizing as quickly as their OECD peers, says the report. More international trade agreements are needed, plus tariff and customs policies could use some updating.

Trade at home also requires attention. Canada is still dealing with internal barriers that impede business. For example, there are layers of regulations truckers must navigate as they cross provincial jurisdictions, there are barriers to skills mobility, local preference plays a role in some government procurement and don't count on finding a vast selection of out-of-province wine at your local liquor outlet anytime soon.

BC, Alberta and Saskatchewan took the lead by lowering barriers among themselves; now the rest of the country needs to catch up. The Chamber calls for more meaningful sanctions against jurisdictions that practice protectionism.

The tax system is described as costly and complex. There should be less emphasis on taxing income and profits. The Chamber pronounces consumption taxes less harmful and easier to collect.

Canada gets a rough ride from the international community about its environmental credentials. The Chamber politely describes it as a lack of clear sustainability policies. It recommends establishing a credible climate policy, clarifying the duty of businesses to consult with Aboriginals and to aggressively contest unfounded allegations about environmental stewardship.

Regulatory policies between Canada and the US could use some alignment. The report says mutual approaches would “lower costs, create more efficient supply chains, facilitate cross-border trade, reduce regulatory administrative costs for government and make Canada a more attractive location for foreign investment.”

More support for innovation is also needed to help manufacturers capitalize on new technology and processes that improve productivity. And a policy framework that reflects the importance of the “innovation ecosystem” is a must.

While the Chamber helps the federal government sort out Canada's competitiveness challenges, there is some work ahead for manufacturers.

TD Economics reports weak investment and lost capacity during the recession has left limited room for expanding output. Looking at this year and next, the prognosticators see steady US demand and the lower-value loonie as good omens. However, much will depend on whether or not companies respond by investing in new machinery and equipment, an area in which they lag their US counterparts, but key to boosting productivity and giving Canadian manufacturing a much-needed lift.

Visit [www.chamber.ca](http://www.chamber.ca) to download the Chamber of Commerce report.

Joe Terrett, Editor

Comments? E-mail [jterrett@plant.ca](mailto:jterrett@plant.ca).



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COVER IMAGE: ANDRÉ BERNIER



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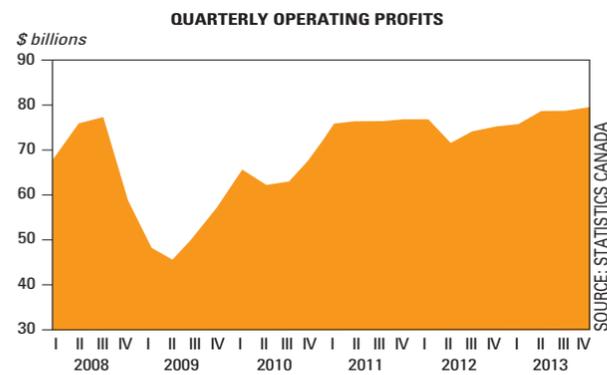
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» Pulse



The 0.8% gain in Q4 profits followed a 0.2% increase in Q3.

**PROFITS RISE IN Q4**

Canadian corporations earned \$79.1 billion in operating profits in Q4 of 2013, up 0.8% from the previous quarter. Overall, operating profits rose in 14 of 22 industries.

Profits in the manufacturing sector rose 0.7% to \$11.2 billion with eight of 13 manufacturing industries reporting increases. Growth came mainly from fabricated metal product and machinery manufacturing (up 14.1% to \$1.8 billion) as well as motor vehicle and parts manufacturing (up 22.6% to \$1.2 billion).

A decline in computer and electronic product manufacturing operating profits offset the gains.

**GDP STEPS BACK**

After increasing for five consecutive months, real GDP declined 0.5% in December. The output of goods-producing industries fell 0.9% while services industries decreased 0.3%.

Manufacturing decreased 1.7% in December.

Statistics Canada reported widespread declines in durable-goods manufacturing (down 2.6%), notably in transportation equipment. Significant declines were also recorded in fabricated metal products, computer and electronics products and non-metallic mineral products.

Non-durable goods decreased 0.5%, with declines in beverage and tobacco products as well as chemical products. Paper and printing with related support activities recorded gains.

Mining, quarrying and oil and gas extraction dipped 0.2%. Excluding oil and gas extraction, mining decreased 1.6%, mainly as a result of declines in potash. Support activities for mining and oil and gas extraction declined 2.1% as a result of decreases in both drilling and rigging services.

In contrast, oil and gas extraction grew 0.5%, driven by an increase in natural gas production.

**IPPI ADVANCES**

The Industrial Product Price Index (IPPI) rose 1.4% in January following a 0.6% advance in December, the third consecutive increase and the largest gain since February 2013. Gains were reported in 19 of 21 major commodity groups.

Growth came mainly from higher prices for energy and petroleum products, which rose 2.3%, driven mostly by light fuel oil (4.2%) and diesel fuel (3.7%). The IPPI excluding energy and petroleum products was up 1.2%.

Motorized and recreational vehicles posted a 1.7% advance closely linked to the depreciation of the Canadian dollar relative to the US dollar. Higher prices for passenger cars and light trucks (1.6%) were the main reason for the increase.

Chemicals and chemical products (2.9%) and primary non-ferrous metal products (2.7%) also pushed the IPPI up.

**BIG RMPI INCREASE**

The Raw Materials Price Index rose 2.6% in January, the second consecutive monthly advance and the largest increase since July.

Of the six major commodity groups, four were up and two were down. Crude energy products (up 3.7%) was the main contributor to the increase, largely because of higher prices for conventional crude oil (3.6%).

The price increases were partly due to higher demand because of the cold weather in North America. Excluding crude energy products, the index was up 1.5% in January.

Source: Statistics Canada

**Innergex starts up 17.5 MW BC hydro facility**

Northwest Stave River project will power more than 5,500 BC households annually

**LONGUEUIL, Que.:** Innergex Renewable Energy Inc. has begun commercial operation of the 17.5 megawatt Northwest Stave River run-of-river hydroelectric facility in BC.

The 17.5-megawatt hydroelectric facility is located on Crown land, approximately 50 kilometres north of Mission, BC. Construction began in 2011 and the project was commissioned in December 2013.

Northwest Stave's average annual production is expected to reach 63,300 megawatt-hours, enough to power more than 5,500 BC households. It will generate revenues of \$7 million and adjusted EBITDA of \$6 million in its first year of operation.

The project is covered by a 40-year fixed-price power purchase agreement with BC Hydro, which was obtained under the province's

2008 Clean Power Call Request for Proposals.

Innergex Renewable Energy is an independent renewable power producer active since 1990, which develops, owns and operates run-of-river hydroelectric facilities, wind farms and solar photovoltaic farms in Quebec, Ontario, BC and Idaho. It has an aggregate net installed capacity of 672 megawatts.

**Summit Helicopters acquires CC Helicopters in Kamloops**

**VANCOUVER:** Summit Helicopters has acquired CC Helicopters, which specializes in oil and gas exploration, forest survey and protection, and power line support.

Financial details were not released and the acquisition is subject to regulatory approval.

Summit Helicopters is part of the Leducor Group and operates a fleet of helicopters based in the Northwest Territories, Yukon, Alberta and BC. It specializes in arctic operations, mining exploration, crew movements, oil and gas, environmental surveys, and business travel.

CC Helicopters operates a fleet of light, intermediate and medium



CC operates a fleet of light, intermediate and medium helicopters. PHOTO: SUMMIT HELICOPTERS

helicopters with IFR and VFR crews based in Kamloops and Lillooet, BC. It specializes in BC Air Ambulance medevac, oil and gas exploration and support, forestry survey and protection, environmental and wildlife survey, and power line support.

**Alterra completes Shannon wind acquisition**

**VANCOUVER:** Alterra Power Corp. has completed the acquisition of the Shannon wind project, a 202-megawatt wind farm in Clay County, Tex. from Horn Wind, LLC, a north Texas early-stage wind developer that has developed two other wind farms in the region.

In December, Alterra completed construction to ensure the project will qualify for the US Production Tax Credit. This included contracting Mortenson Construction to complete the initial phase of on-site construction and contracting Siemens Energy to begin manufacturing the project's main power transformer.

Alterra, a renewable energy company that operates six power plants with 566-megawatts of generating capacity, is working with several financing parties to close project financing, which is projected for the second quarter of 2014.

The company operates BC's largest run-of-river hydro facility and wind farm, two geothermal facilities in Iceland, and a geothermal plant in Nevada. It owns a 260-megawatt share of the capacity, generating approximately 1,300 gigawatt-hours of clean power annually.

**Cenovus investing up to \$3.1B in 2014**  
2013 production up 14% driven by Christina Lake

**CALGARY:** Cenovus Energy Inc. is investing between \$2.8 billion and \$3.1 billion in 2014, a 10% decrease from 2013.

The energy company says it has built a large inventory of approved projects and is now allocating more capital to develop those now under construction at Foster Creek, Christina Lake and Narrows Lake (as well as Grand Rapids and Telephone Lake, which are anticipated to receive regulatory approval in 2014).

Production at its Alberta oil sands operations increased 14% in 2013, largely driven by its Christina Lake project.

Volumes increased 55% as phase D reached full production capacity and E, the 10th phase, began production in July. The company expects to achieve full production capacity in the first quarter.

Christina Lake is to produce between 124,000 bbls/d and 136,000 bbls/d gross in 2014, representing 95% of capacity.

Higher production offset an 8% year-over-year decline in volumes at the Foster Creek site. The decrease



Volumes at Cenovus's Christina Lake project increased 55%. PHOTO: CENOVUS ENERGY

was partially the result of catching up on well maintenance that was deferred in 2012.

Total conventional oil production, including the heavy oil operation at Pelican Lake, averaged almost 77,000 bbls/d for the year, up 1%. Pelican Lake production increased 8% from the previous year.

The company says it also achieved increased production volumes from its horizontal well program in southern Alberta.

These increases were offset by the July sale of the Shaunavon tight oil assets in Saskatchewan, which resulted in a production decline of approximately 2,300 bbls/d on an annual basis compared with 2012.

## Canam to build new Edmonton Oilers arena

Steel fabricator gets four contracts totaling more than \$190M

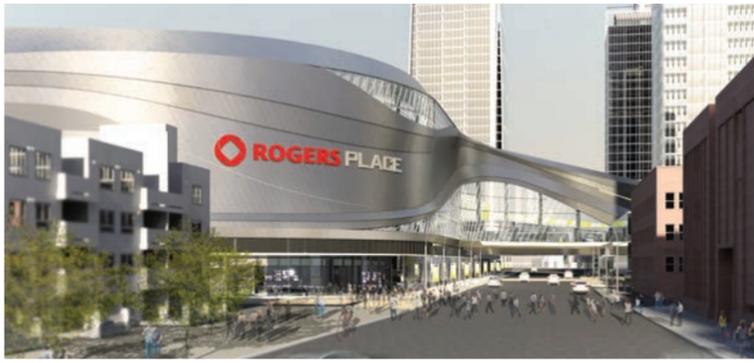
**BOUCHERVILLE, Que.:** Canam Group Inc.'s heavy structural steel business is on the upswing after receiving contracts for four projects in Canada and the US worth more than \$191 million, including a new arena for the NHL's Edmonton Oilers.

Structural-Heavy Steel Construction, a business unit of Canam Group Inc., has received a notice from PCL Construction Management Inc. to proceed to order the steel for the structure of Rogers Place, the future home of the Edmonton Oilers.

It is expected to open by the fall of 2016.

The steel components will be fabricated at Canam Group's facilities in Calgary, and St. Gédéon de Beauce, Que., with deliveries beginning in August and continuing into the third quarter of 2015.

It will also construct a retractable roof for the Arthur Ashe Stadium in New York, which hosts the annual US Tennis Association's US Open championship.



Rogers Place will accommodate 18,640 patrons.

PHOTO: CITY OF EDMONTON

The company will also build the steel structure of the Kimmel Pavilion, a 23-story building that will form part of the New York University Langone Medical Center. The 850,000 square-foot facility is slated to open in 2017.

Tutor Perini Corporation also awarded Structural a contract to build the steel structure of the Hudson Yards Tower C, a 47-story high-rise that's being built in New York City. Construction of the 1.7 million square-foot office tower, which is seeking LEED Gold certification, will be completed in 2015.

## NextUse proposes \$30M BC recycling plant

Coquitlam project would create up to 80 new jobs

**VANCOUVER:** NextUse Recycling Ltd. has applied to Metro Vancouver to build and operate a \$30 million material recovery and recycling facility.

The licence application is supported by the City of Coquitlam.

NextUse says the facility would create up to 80 new green jobs using advanced technology to recover useable, recyclable and compostable material from the waste stream.

It would be built in south Coquitlam, BC and have capacity to handle approximately 26% of Metro Vancouver's municipal solid waste.



The facility will handle 26% of Metro Vancouver's municipal solid waste. PHOTO: NEXTUSE

The company is also looking at building a facility in the Fraser Valley Regional District. An operation near completion in Vancouver will have the capacity to process 600,000 tonnes of

waste.

NextUse Recycling Ltd. is an affiliate of Belcorp Environmental Services Inc., a developer of recycling and resource recovery businesses.

## EnWave signs lease deal with Bonduelle

**VANCOUVER:** EnWave Corp. has signed a global royalty-bearing licence with processed vegetable producer Bonduelle.

EnWave will build a 120 kW MIVAP machine through its subsidiary Hans Binder Maschinenbau GmbH for Bonduelle's North American operations. The machinery will be delivered by late 2014, and will be used to produce dehydrofrozen (DHF) vegetables.

DHF vegetables are partially dehydrated and then quickly frozen, a process that retains nutritional content, colour, flavour and texture when cooked from frozen.

In anticipation of a successful R&D program, the two companies will concurrently collaborate on the design of a commercial-scale quantaREV machine for DHF vegetable production with target finished frozen product capacity of between three- and- four tonnes per hour.

The machine is to be completed in 2015 to launch DHF products on a commercial scale.

EnWave is a Vancouver-based industrial technology company developing commercial applications for its proprietary Radiant Energy Vacuum (REV) dehydration technology.



ATCO's Patrick Creaghan and Chief Rita Matthew of the Simpcw First Nation sign a relationship agreement. PHOTO: ATCO GROUP

## ATCO, BC First Nation pursue energy development

**CALGARY:** ATCO Energy Solutions has signed an agreement with the Simpcw First Nation in the North Thompson and Robson Valley region of BC to sustainable energy infrastructure projects.

ATCO will provide expertise the electricity infrastructure, power generation, workforce accommodation and pipelines.

The Simpcw says it will further its strategic goal of creating a strong future for its members. ATCO builds owns and operates non-regulated energy and water-related infrastructure.

## Bull Creek wind project approved

**CALGARY:** The Alberta Utilities Commission has approved BluEarth Renewables Inc.'s 115 megawatt Bull Creek wind project in Provost, Alta. on private land that's currently used for agriculture and oil and gas production.

The company says the project, which is located away from existing wind farms in southern Alberta, will increase the efficiency of Bull Creek's energy contribution to Alberta's Interconnected Electrical System.

BluEarth says it will apply for municipal development permits now that AUC approval is in place.

Headquartered in Calgary, BluEarth is an independent renewable power producer that focuses on the acquisition, development, construction and operation of wind, water and solar projects in North America.

## Athabasca forms joint venture with Wood Buffalo Metis Corp.

Agreement lasts 10 years with option to renew

**EDMONTON:** Athabasca Minerals Inc. has entered into a joint venture with the Wood Buffalo Métis Corp. to explore and develop and market aggregates, including industrial minerals such as granite, dolomite, limestone and silica sand. The deal also involves extracting, processing and selling aggregates within the Regional Municipality of Wood Buffalo.

The initial agreement lasts 10 years, but Athabasca has an option to renew the venture for an additional decade. Athabasca is permitted to drill, explore, produce and market aggregates within the boundaries of the Wood Buffalo municipality.

Wood Buffalo consists of the Fort Chipewyan Métis Local 125, the McKay Métis Community (Local 63), Fort McMurray Métis Local 1935 and Willow Lake Métis Local 780.

Wood Buffalo will also assist Athabasca with the marketing of aggregates and will provide equipment along with qualified members to Athabasca's workforce at competitive industry rates.

Athabasca is a resource company involved in the management, exploration and development of aggregate projects. The company also has industrial mineral land holdings in the vicinity of Fort McMurray and Peace River, Alta.

## Careers

Northern Gateway and its partners have appointed **Jim Prentice** to lead renewed efforts to consult with and establish partnerships with First Nations and Aboriginal communities in BC and Alberta. This will build on agreements already in place with 26 existing Aboriginal equity partners. Prentice is a former federal minister of Indian Affairs Northern Development, and has spent 30 years working closely with First Nations.



Jim Prentice

Baldor Electric Co. has appointed **Bob Nemecek** vice-president of Baldor Dodge mechanical sales for North America. He was a regional sales manager, a general product manager, vice-president for the company's power services business, and vice-president of marketing. Baldor, based in Fort Smith, Ark., is a manufacturer of industrial electric motors, drives and mechanical power transmission products.



Bob Nemecek

ATK Oilfield Transportation Inc. in Calgary has added **Dale Tremblay** to its board. Tremblay was the founder, chairman and CEO of the recapitalized Western Energy Services Corp.

**Gary Kubera** has stepped down from his position as president and CEO of Canexus Corp. **Richard Ott**, a director of the Calgary-based company, has been appointed interim president and CEO. Canexus is a producer of sodium chlorate and chlor-alkali products for the pulp and paper and water treatment industries.

**John Sutherland** moves up from vice-president of engineering to COO of Questor Technology Inc., a designer and manufacturer of high efficiency waste gas incinerators based in Calgary. He's a mechanical engineer.

# BIG problem, tiny SOLUTION

Tiny organic beads will provide energy companies with a faster, cleaner way to remediate tailings ponds and reclaim some of the waste for more productive use.

BY MATT POWELL, ASSISTANT EDITOR

In January, Gradek Energy was awaiting the results of a report by an outside consultancy that was expected to validate the company's reusable hydrocarbon sorbent (RHS) bead technology for oil sands tailings remediation.

Well, the results are in and they're promising.

RHS, a collection of small, oval-shaped beads, resemble after dinner mints offered at elegant restaurants. And although they're smaller than a nickel and weigh less than a kernel of popcorn, the beads are on track to deliver oil sands producers with a game changing technology for cleaning up Northern Alberta tailings ponds.

Because they're organic, the beads are "super-velcro" for hydrocarbons, but they repel water and other organics, which can be recovered and re-used. This presents the energy industry with a simple solution to the challenges associated with complicated and increasingly scrutinized tailings management.

The process performance assessment report conducted by Hatch Ltd. at Gradek's RHS test pilot plant in Montreal says the technology does what it's supposed to do.



## GRADEK'S RHS TACKLES OIL SANDS LEFTOVERS

"But we are suggesting the company complete additional testing on other materials," says Dean Robertson, global director for oil sands at Hatch, a Mississauga, Ont.-based management services, process and business consultancy for the mining, energy and infrastructure sectors.

Gradek's 2,400 square-foot test plant located in the east end of Montreal is where founder Thomas Gradek and his team of 12 – including chief engineer, Nathan Ashcroft, business development officer Robert Andrews, and Thomas's son and chief operations officer, Stephan – have pioneered and are currently perfecting the technology.

"We've analyzed the technology extensively in the total realm of oil sands operations," says Thomas Gradek, who developed the concept for RHS more than 20 years ago. "Now we're at the stage where we're confident we can assist the oil sands industry and improve

its carbon footprint to maximize production yields and do it all economically."

The specific results from the process assessment related to the percentage of bitumen recovery are under wraps, but Ashcroft says the report provides the technology with a proof of concept at the pilot plant stage.

"The report confirmed that after introducing the beads to the tailings streams, there was a significant impact on settling, dewatering and consolidation which has been verified by testing and Hatch."

### Next steps

Hatch has recommended that Gradek perform additional pilot test runs with non-settling tailings streams, such as mature fines tailings, middlings tailings or thin fine tailings. It has also recommended that a review of solids handling for the solvent wash to determine the minimum amount to bitumen ratio

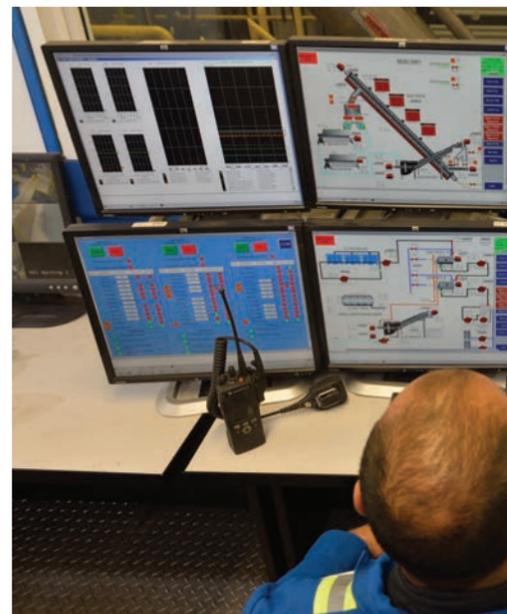
required to wash the beads and evaluate naphthenic acids removal.

Tailings treated by RHS showed an increased settling rate compared to the feed stream, and slightly higher self-weight consolidation. That factor indicates the beads could have a positive effect on non-settling tailings streams, such as thin fines tailings and floatation fine tailings.

With the results of Hatch's assessment in hand, Ashcroft expects the company to do a commercial demonstration of RHS by the summer of 2015.

Gradek says the technology will reduce the environmental impact of tailings ponds – the sometimes toxic pools of water, clay, sand and bitumen – but also presents an opportunity to recycle water, process it rapidly and send it to an energy operator's processing site for reuse.

"That cuts a huge cost for operators. The process alone would eliminate tailings that contain toxic carbons and



acids, which for climate change is a benefit," says Gradek. "We're transforming a wasted byproduct into a resource by dropping its carbon footprint."

Once they're deployed, the bitumen-filled beads, measuring 16 millimetres in circumference, are then removed from the pond, leaving just water and other organics that are split out and recycled. Gradek says the beads are reusable up to 500 times.

"[They're] completely inert, so there's no releases or leeching. Throw them into a glass of water and you won't see any bacteria or algae growth. The compound is completely harmless. There's zero environmental impact."

Mature fine tailings that make up the middle layers of the water basin can take decades to settle, preventing a timely reclamation of the site. RHS speeds up that process by removing hydrocarbons in the water basin, allowing other organics to settle more quickly.

### Dire beginning

Gradek came up with the idea for RHS during the aftershocks of the Gulf War in 1991. Hundreds of oil wells burned out of control in Kuwait while engineers tackled a massive offshore spill in the Persian Gulf caused by Iraqi military forces. A civil engineer at the time, Gradek had experience supplying oil companies with massive pieces of machinery in the Middle East and was invited by Kuwait's royal family to help with clean-up efforts.

"They weren't cleaning up at all," he says, recalling the three-month gig. "They were just moving waste from one place to another. I was shocked visiting these sites and witnessing how badly crews were handling things. There was no environmental remediation."

He wanted to develop a clean-up solution that minimized the environmental impact of producing oil, but required little energy.

More than 20 years later, Gradek has earned the attention of Alberta oil producers and has been testing the beads in their tailings ponds. The company has also completed a partnership with a major (unnamed) oil sands operator.

More than \$15 million in private and public funding has been pumped into the project over the last two years as it moves towards commercialization.

Gradek's pilot plant, which became fully operational in 2013, is now in continuous operation, processing one tonne of materials per hour. The plant includes a full control room and mini laboratory that allows the company to control and analyze testing in real-time.

The process involves mixing the beads with oil sands tailings streams using a feedstock prepared onsite. Almost immediately bitumen and fines are absorbed from the stream.

"A mixer runs a cycle for up to 15 minutes, then the beads are moved into a solvent wash, stripping them of bitumen and releasing fines for filtration purposes," says Ashcroft.

The beads move to a vacuum dryer to be prepared for reuse, while the stream of bitumen and fines are introduced to an inclined plate separator that isolates clear water from the consolidated solids streams.

"The process allows us to reuse both the oil and the bead, which is a very novel and potentially game-changing concept for the management of oil sands tailings," says Ashcroft.

The Montreal facility also handles manufacturing, producing 400 beads per minute, but it has the capacity to increase output to 1,600. The beads, which require a high level of accuracy because of all the organic ingredients, are mixed, metered and suspended individually with special machinery (highly confidential, so there are no details available) developed by Gradek and an unnamed supplier.

"Residence time in the reactor is crucial, which is about six seconds at a temperature range that must be accurate to no more than plus or minus two degrees," says Gradek. "If the chemistry is off by even as little as 0.1%, we're in trouble."

He's counting on those little beads to make 2014 a big year, and the process assessment validating RHS should help them gain access for a swim in a few more tailings ponds.

"There are billions of dollars worth of tailings remediation projects developed each year," says Gradek. "And if you're able to solve real problems, it could become a multi-billion dollar industry for a technology like ours."

Comments? E-mail [mpowell@plant.ca](mailto:mpowell@plant.ca).

1. Chief operations officer Stephan Gradek shows just how small the RHS beads are.
2. Gradek's Montreal pilot plant processes one tonne of tailings per hour.
3. The company's manufacturing facility currently produces up to 400 beads per minute.
4. An on-site control room and mini lab allow the company to analyze tests in real-time.

PHOTOS: ANDRÉ BERNIER

## New energy Mantra

### MRFC tackles renewable power storage



ERC converts harmful CO2 into saleable chemicals and clean energy.

PHOTO: MANTRA ENERGY ALTERNATIVES

Technology would supply power producers with a low-cost system for high-volume power density applications.

BY MATT POWELL, ASSISTANT EDITOR

There's a problem with adding renewable capacity to the energy mix: storing it when the wind isn't blowing or the sun isn't shining.

"Energy storage is needed badly. When the wind isn't blowing, you can't rely on wind power. When the sun isn't shining, you can't depend on solar," says Larry Kristoff, president of Mantra Venture Group Ltd. "We're not just wasting energy, we're compromising power grids and costing conventional power producers a lot of money because they have to slow down or shut down their operations."

Mantra is confident it has a solution to the energy storage shortfall: a relatively low-cost swiss-roll fuel cell system, originally developed by UBC professor Colin Oloman.

"Talk to anyone in the renewable energy world and they'd agree that energy storage is the next big thing in that industry. It's at a point where you can't add capacity without enough energy storage," says Patrick Dodd, Mantra's chief technology officer.

Mantra Energy Alternatives Ltd., a Vancouver-based clean technology incubator and subsidiary of Mantra Venture Group, has developed its mixed-reactant fuel cell (MRFC) with the University of British Columbia (UBC) and with funding from the Clean Energy Research Centre and the Natural Science and Engineering Research Council of Canada (NSERC).

The company says the technology has the potential to reduce the complexity and costs of fuel cells because MRFC is platinum- and membrane-free, and doesn't require any platinum-based electro catalysts. This eliminates the need for expensive and failure-prone electrolyte membranes and bulky bipolar plates.

Because there's no membrane, Mantra says cost reductions of up to 68% over conventional fuel cells are achievable. Another cost reduction of 25% is achieved because there aren't any heavy flow plates.

In conventional fuel cells, the fuel and oxidant flow in separate streams and are kept apart by an ion-conducting membrane that divides the cell into anode and cathode chambers.

Mantra's MRFC employs a mixture of fuel and oxidant flows through the cell as a single stream, allowing for a variety of conventional cell stack designs. This simplification is possible because the fuel cells operate without the gastight structures within the stack that are required for sealing, manifolding and separating reactant delivery in conventional cells.

It also integrates with another Mantra technology developed by Oloman and acquired by Mantra in 2008. Electro reduction of carbon dioxide (ERC) would fuel the MRFC by converting CO2 emissions into saleable chemicals (and clean energy), such as formic acid.

"We're trying to convert CO2 from high emissions industries into a fuel source that produces electricity," says Amin Aziznia, the company's process engineer. "There's not enough platinum on earth to do that."

Aziznia says MRFC will also work for traditional fuel cell applications, such as small electronics and electric cars.

If successful, the deployment of Mantra's technology would be timely in Ontario where wind energy production has doubled over the last four years to 5.2 terawatt hours, according to the province's Independent Electricity System Operator (IESO). And 3,300 megawatts of renewable energy has been committed to Ontario's electricity grid by the spring of 2015, making the need for storage capabilities increasingly imminent.

Comments? E-mail [mpowell@plant.ca](mailto:mpowell@plant.ca).



4

# Letting the DUST settle

## GE's DUSTREAT MAKES MACKAY RIVER ROADS SAFER

Suncor has deployed the organic binding compound to enhance the safety of its access roads and reduce maintenance costs.

BY MATT POWELL, ASSISTANT EDITOR

The trucks rumbling along the access roads at Suncor Energy Inc.'s MacKay River oil sands site used to kick up a lot of dust, posing some serious health and safety issues for both drivers and workers.

But thanks to General Electric (GE), the energy producer has its dust problem under control and made the access roads at MacKay River safer while cutting maintenance costs associated with traditional dust suppression tactics.

"The majority of these dirt roads require some sort of dust suppression because they deal with heavy traffic, and when traffic is heavy, visibility is reduced which has an effect on safety," says Jeniffer Brown, GE's global lead product applications specialist.

Suncor deployed GE's organic binding

compound DusTreat, which is produced by the global conglomerate's power and water subsidiary, and results are positive. It has reduced airborne dust, the amount of water used, maintenance activities and diesel use, benefits that have all amounted to a decrease in the amount of carbon dioxide released into the atmosphere.

This partnership with GE is part of Suncor's wider efforts to cut water use.

Before, controlling the dust cloud at MacKay River involved continually watering the roads with spray trucks, sending as many as five up and down the road daily for continuous maintenance.

"A heavy rain season can also create a lot of potholes which increase safety issues, but frequent watering generates them as well," says Brown.

A cocktail of water and calcium chloride was deployed a few times a year as a preventative measure.

"We wanted to move away from traditional calcium chloride and water applications because those activities aren't environmentally sustainable," says Gwen Morgen, a maintenance coordinator at Suncor.

The process was not only expensive, it increased the amount of traffic along



When the dust is up at MacKay River.

the road, creating a need for even more maintenance to fill potholes caused by applying water to the dirt roads and grading. But the liquid would evaporate within minutes, especially during the summer months, so the company enlisted GE to get the dust under control with DusTreat, a sort of glue that binds dust particles and small rocks to harden the road surface.

The binder has also been used in mines and at power plants.

### DusTreat trial

Morgen says the two companies performed a trial in 2012 along a 35-kilometre stretch of road to test the different outcomes from treatments with water, calcium chloride and the DusTreat product.

It sprayed a 30-kilometre stretch with a cocktail of DusTreat and water, while the other five kilometres were split between water and the water-calcium chloride mix.

"We treated the MacKay River access road with DusTreat for the entire 2013

season," she says.

The result has been a 75% reduction in dust levels.

Suncor is using 85% less water, which has saved 136 million litres annually. By reducing the number of water trucks on the road from five to one, it has cut diesel fuel use by 70,000 litres, which has helped the company eliminate 190 tonnes of carbon dioxide emissions.

The organic, biodegradable compound renders road surfaces hard, dust-free and non-slippery for an extended period. On an ongoing basis, as trucks travel the roads creating new dust, and eventually spilling dusty material on the surface, just a light watering rejuvenates the product.

"Reducing the amount of maintenance work we have to do is huge because we're not using as much gravel and not having to grade as much," says Morgen.

The process is similar to sealing a backyard patio, Brown says. "Instead of coming to apply water a few times a day, they're only doing applications once a week, or a couple times a month,

### » Tech Tips

## Lubricant planning

Three things you should know

Tribological maintenance can be preventive (contamination control, lubricants storage, PM intervals) or predictive (monitoring, test methods and nondestructive testing techniques). Navdeep Swach elaborated on tribology's role at a technical session of the Society of Tribologists and Lubrication Engineers (STLE).

Swach has worked in the automotive, metals and nuclear industries before joining ArcelorMittal Dofasco as a tribology coordinator, where his responsibilities include providing technical expertise in tribological areas throughout the facility related to gearing, bearings and lubrication practices.

Here are three lube tips for maintenance pros:

- Viscosity is the single-most important factor in lubricant selection and lubrication plan development.
- Wear modes are determined by conducting a failure mode and effect analysis (FMEA). It's important to differentiate between incipient, misuse and catastrophic failures. Modes of wear include adhesive, abrasive, surface fatigue, delamination, corrosion or fretting.
- Failure phases occur in three specific time windows: during wear-in (at start-up); random (usually at mid-life); and wear-out (caused by fatigue or planned obsolescence).

### » Maintenance



Sharing stock level data cuts inventory cuts.

PHOTO:THINKSTOCK

## Balancing spares

How to reduce capital tied up in parts

BY STEVE GAHBAUER

Overstocking parts or being or understocked is an endless dilemma making having the right ones at the right time and keeping spare inventory costs low a fine art.

One way to achieve balance is to share stock level data between differ-

ent sites that may even be hundreds of kilometres apart. Scandinavian companies are doing it. They borrow critical parts from each other, or from other plants they own, thus reducing the capital tied up in maintaining spare parts at each location.

Anders Lif, global director for product and industry marketing at

IFS World Operations AB based in Linköping, Sweden and Jonas Berggren, president and CEO of Standard Solutions Group AB in Sandsvall, Sweden, discussed enterprise optimization and cost-cutting opportunities during last year's MAINTRAIN maintenance conference in Calgary, presented by the Plant Engineering and Maintenance Association of Canada.

They claim it's possible to save some 40% of the capital tied up in parts inventory by sharing data, borrowing spare parts from other sites, introducing naming standards and unique part numbers, reducing lead time to obtain spares, and by optimizing purchasing processes. But making it work hinges on eliminating confusing naming conventions.

Most companies have local conventions that differ from other sites, and different numbers for similar parts in those locations. True transparency requires common naming standards.

The Standard Solutions Group (SSG) has devised a master naming standard that allows information sharing on some 600,000 parts in its product database. The SKC Part Identifica-



depending on traffic.”

The binder creates an almost asphalt-like surface, Morgen says.

“Within a week, we knew we were on to something more than we had anticipated”

According to its 2013 Report on Sustainability, Suncor is also working to cut the volume of wastewater in its huge tailings ponds, which include sand, clay and residual bitumen. Last year, it started reusing 100,000 cubic metres per day of tailings water from its base oil sands mining operations at its steam-driven Firebag project.

And it will start up a \$150 million wastewater treatment facility this year, which is expected to reduce further the amount of water it draws from the Athabasca River to support its operations.

The MacKay River operation is expected to produce up to 430,000 barrels of crude per day this year, making for a lot of traffic along the dirt road, but it will be a lot less dusty.

Comments? E-mail [mpowell@plant.ca](mailto:mpowell@plant.ca).

tion Standard is origin-neutral and fully visible to all the players. Key advantages include: SSG information being used when new parts are created in a company’s maintenance system; unwanted duplication is avoided as new parts are created in a structural and unique way; all information is continuously updated from the product database with the latest status; and all logistics are simplified.

Greater availability through sharing will permit a reduction of tied-up inventory capital. The presenters quoted some significant examples: a reduction of 45% for flowmeters, 47% for wear discs, 43% for bearings and 38% for pump rotors.

Strategic centralized agreements allow for simplified ordering and sharing of inventory data between different sites, and criticality analysis drives sourcing needs.

This opportunity for enterprise consolidation shares the risk, reduces tied-up capital and takes advantage of an available public inventory marketplace.

Steve Gahbauer is a freelance business-writer. E-mail [gahbauer@rogers.com](mailto:gahbauer@rogers.com).

Comments? E-mail [jterrett@plant.ca](mailto:jterrett@plant.ca).

## » Events

### BSA 2014 Convention

#### BSA

May 3-6, Scottsdale, Ariz.

The Bearing Specialist Association’s annual conference brings together bearing distributors and manufacturers for networking and information sessions. Visit [www.bsaconventions.org/2014/about/](http://www.bsaconventions.org/2014/about/).

### Reliable Asset World

#### UE Systems

May 13-16, Clearwater, Fla.

This new conference provides a platform for total plant asset reliability and maintenance. Co-located with Ultrasound World X. Thought leaders in the asset reliability field will share cutting-edge knowledge and decades of experience. Exhibitors will showcase the latest products and solutions. Visit [www.reliableassetworld.com](http://www.reliableassetworld.com).

### Energy Summit 2014

#### EMC/NRCAN

May 14-15, Niagara Falls, Ont.

This national conference presented by Excellence in Manufacturing Consortium (EMC) in partnership with Natural Resources Canada (NRCAN) and the Canadian Industrial Program for Energy Conservation (CIPEC) will host Canada’s leading energy players to share best practices and the latest innovations in industrial energy efficiency. Visit [www.emccanada.org](http://www.emccanada.org).

### Automatica 2014

#### Messe München International

May 20-23, Munich, Germany

How robots and machine tools make metal-working more efficient. Current trends in assembly and handling technology, robotics and industrial machine vision will be addressed. Visit [www.automatica-munich.com/en/Home](http://www.automatica-munich.com/en/Home).

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Adding leverage to the acquisition scenario enhances the return to equity holders.

BY MARK BORKOWSKI

# SELLING? your company!

## CONSIDER THE LEVERAGED BUYOUT

Looking to sell your company? Your potential buyer group will most likely include private equity firms. To gauge their potential level of interest, have an understanding of what private equity firms look for in an acquisition and why.

A leveraged buyout (LBO) refers to a transaction in which an investor acquires a controlling interest in a company and a significant portion of the acquisition is financed through debt.

What makes a company a potential candidate for a leveraged buyout transaction?

Typically, companies that are attractive targets have three critical characteristics:

- Stable cash flows
- Ability to increase earnings
- Strong management teams

To borrow the money, the investor/now owner, will pledge the assets of the company as collateral to the lender. For larger, established companies, lenders will also look to collateralize the loan via the company's operating cash flow.

The lender will have the first right to the cash flow generated by the company for both interest and principal payments. Therefore, if the lender believes in the future cash flows of the company, it will be willing to lend beyond the value of the company's assets. In this scenario, known as a cash-flow loan, lenders will base the amount the investor is able to borrow on a multiple of the company's cash flow.

A leveraged buyout is generally the preferred acquisition method of private equity firms. Borrowing money (leverage) to consummate an acquisition enhances the returns to the equity holders (as long as the debt doesn't overwhelm



Borrowing money to consummate an acquisition enhances returns to equity holders.

PHOTO:THINKSTOCK

the company). To illustrate the impact leverage has on equity returns, let's use a simple example.

Suppose two private equity firms, A and B, find two completely identical companies. Each firm acquires a company for \$10 million. PE Firm A uses all equity capital and writes a check for \$10

million while PE Firm B borrows \$5 million from the bank to finance a portion of the acquisition, which means it then commits to equity capital of \$5 million.

In five years, both firms look to realize a return on their investment. They sell their companies for \$20 million. In analyzing the performance of the two trans-

actions, look at the initial cash invested, the amount of cash returned and the time period. Two common measures of performance are internal rate of return and cash-on-cash return.

### Return on investment

PE Firm A realizes \$20 million with the sale and PE Firm B realizes only \$15 million (since it had to repay the bank the \$5 million loan). However, PE Firm B had the superior return profile. In analyzing performance, you have to consider not only the total amount of capital realized, but also the dollar amount that was invested.

PE Firm A turned \$10 million into \$20 million in five years. PE Firm B turned \$5 million (half the amount of PE Firm A) into \$15 million (75% of the amount of PE Firm A) during the same period.

Admittedly, this simplified example does not take into account interest payments on debt, the tax-shield benefit of using debt in the capital structure, the increased risk of bankruptcy that occurs when companies take on debt, the ability to make dividend payments and other capital structure nuances. Yet even adding these factors, the outcome will remain the same. The addition of leverage enhances the return to equity holders.

*Mark Borkowski is president of Mercantile Mergers & Acquisitions Corp., which specializes in the sale of privately held companies. Visit [mercantilemergersacquisitions.com](http://mercantilemergersacquisitions.com).*

Comments? E-mail [jterrett@plant.ca](mailto:jterrett@plant.ca).

## » Training

### Coaching by numbers

Use data to identify improvements

BY HUGH ALLEY

Good managers use performance feedback to help improve the effectiveness of their team members. Here are five ways you can use data to do so.

**1. Keep performance information public and current.** Everyone needs to know how the department is doing. The information has to be current. Use measures such as profit, revenue, productivity, quality, delivery and safety. Too many measures make the process too complex, eventually rendering the results irrelevant. Use more detailed measures when you're investigating the reasons for performance issues, but only track them for a short time. And don't try to adjust for all the operational variables. Instead, look at measures from the perspective of the customer.

**2. Make teams responsible for their department information.** Looking after their own information brings them closer to the work. It has more meaning, but it's also a cheaper way to



Feedback improves performance and supports continuous improvement.

PHOTO:THINKSTOCK

collect data and post it faster (think white boards).

**3. Use performance changes as a prompt for investigation, not blame.** A change in performance should prompt curiosity. What else changed? Why did we get the new result? What can we do to either repeat it or prevent it? If the change is negative, look at the procedures that are in place and what training is needed.

**4. Do lots of small experiments and measure the results on a regular basis.** This shows how changes impact processes and procedures. Figure out how you expect the measures to change,

and watch the results (Plan, Do, Check, Act). This approach supports continuous improvement and provides a context for experimenting with new ways of doing things.

**5. Give credit where it's due.** Acknowledge good or great results with either a quiet "thank you" or some form of public recognition. People respond well when they are given the credit they deserve.

Good data will help your team improve performance. Using it to inspire curiosity and gauge the impact of changes focuses improvement efforts, which will help you do a better job of guiding training.

*Hugh Alley is president of First Line Training Inc. in Burnaby, BC, which focuses on increasing productivity by improving the skills of front line managers and supervisors. E-mail [halley@firstlinetraining.ca](mailto:halley@firstlinetraining.ca). Visit <http://firstlinetraining.ca>.*

Comments? E-mail [jterrett@plant.ca](mailto:jterrett@plant.ca).

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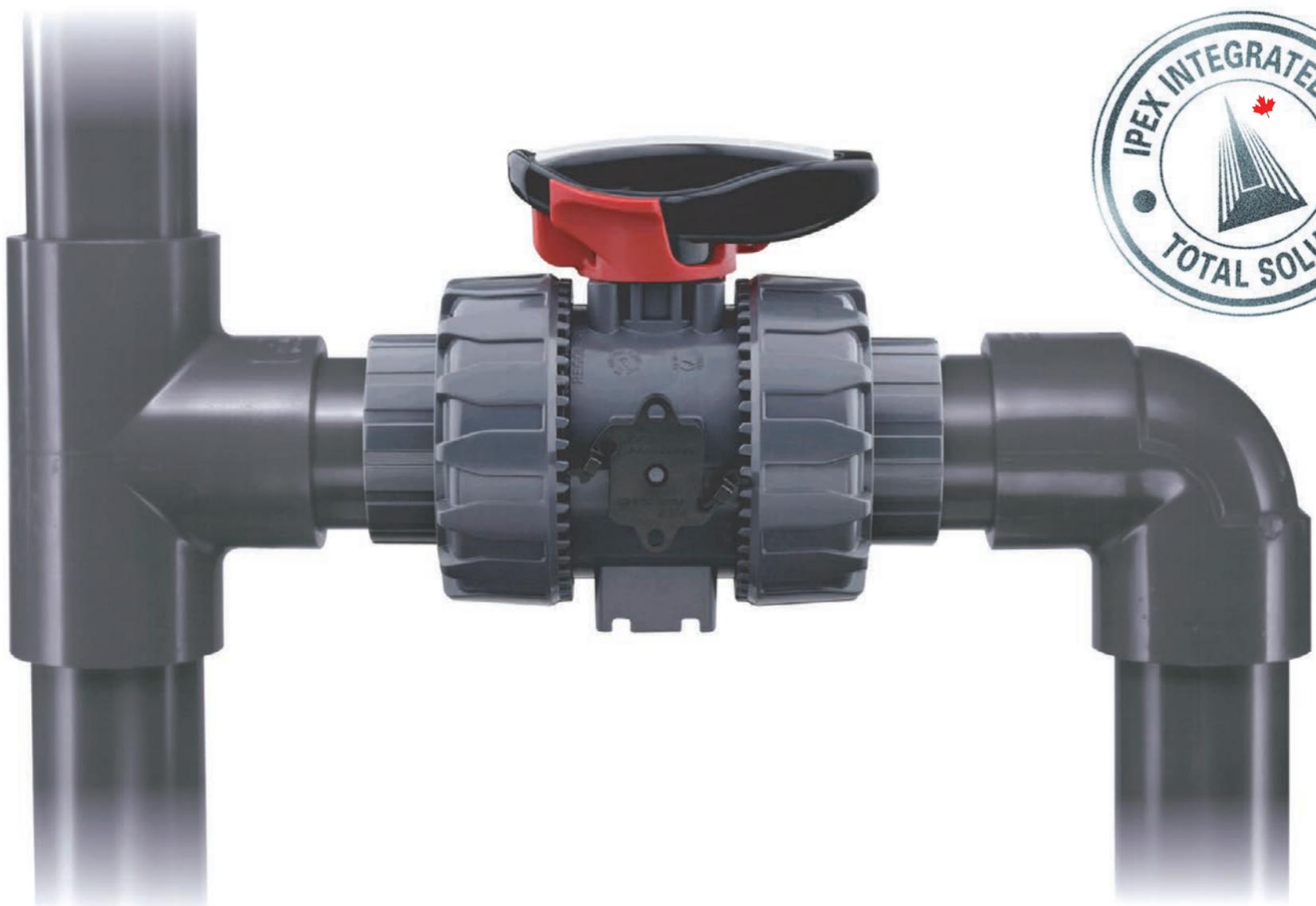
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# C I E N

## CANADIAN INDUSTRIAL EQUIPMENT NEWS

### LIGHTING



50,000 hours of run time.

#### LED LIGHTS UP REMOTE AREAS

Lind Equipment has added the LE-965LEDC to its Beacon Light line of LED floodlights for remote areas or work areas without power.

This 30 W LED light with rechargeable battery provides light that's equivalent to a 300 W quartz halogen for four hours on a single charge.

It's made of weatherproof cast aluminum housing with a tempered glass lens. The light's temperature is a natural 4,500 K for use indoors or outside, and provides up to 50,000 hours of run time, plus it starts up automatically in the coldest temperatures.

The LE965LEDC won't heat up and doesn't require frequent bulb changes.

It comes as a light head only (LE-965LEDC), or with a floor stand (LE965LEDC-FS), a 4- to 8-ft. tripod (LE965LEDC-TR), a magnet mount (LED065LEDC-MAG), or a strong scaffold clamp (LED965LEDC-CLAMP).

Lind Equipment is a Markham, Ont.-based manufacturer and distributor of industrial work lighting, portable power and GFCI products.

[www.lindequipment.net/LE965LEDC](http://www.lindequipment.net/LE965LEDC)

### VISION/IMAGING

#### CAMERA DELIVERS HIGH-SPEED IMAGING

Teledyne DALSA has two new versions of its successful Piranha4 series, expanding the scan family line to more than 10 models.

The cameras have 2 K resolution and combine advancements in CMOS image

sensor technology with a signal-to-noise ratio that delivers high-speed monochrome and colour imaging. The high dynamic range mode means the colour cameras operate at any angle to the web for greater vision flexibility.

The dual line scan camera delivers a maximum line rate of 100 kHz in TDI mode, or 200 kHz in Area mode. The 2 K trilinear model delivers a maximum line rate of 70 kHz. Advanced features include sub-pixel spatial correction, lens and shading correction, and flat field correction.

Both the colour and monochrome



Covers all the angles.

models use advanced chipsets to deliver high throughput with extended Camera Link cable lengths up to 30 m.

Teledyne DALSA is a manufacturer of digital imaging and semiconductors, headquartered in Waterloo, Ont.

[www.teledynedalsa.com/imaging](http://www.teledynedalsa.com/imaging)

#### IR IMAGERY FOR R&D

FLIR Systems Inc.'s A6700sc mid-wave infrared camera produces temperature-calibrated IR imagery for demanding research and science applications.

Featuring a highly sensitive 640x512 pixel resolution thermal detector, the camera is used for high-speed thermal events and fast-moving targets during electronics inspections, medical thermography, manufacturing monitoring, and non-destructive testing.

Short exposure times allow freeze motion to achieve accurate temperature measurements. The camera's image output "windows" for frame rates up to 480



Captures high-speed thermal events.

per second and accurately characterizes even higher speed thermal events.

The A6700sc cameras stream temperature-calibrated data over a gigabit ethernet to a PC for live imaging.

Using FLIR's ResearchIR software, researchers and scientists easily monitor, acquire, analyze and share data.

The camera also provides images for small thermal targets. With extender rings, users achieve a multitude of zoomed-in fields of view, imaging the entire part with the standard lens and then zooming in on any hot spots for further investigation. Close-up lenses detect spot sizes down to 15 um per pixel.

At only 7.7 x 4 x 4 in. 5 lb., the camera is also easy to mount in tight locations or in situations requiring light payloads.

FLIR Systems Inc., based in Portland, Ore., manufactures thermal imaging systems and subsystems.

[www.flir.com/A6700sc](http://www.flir.com/A6700sc)

### POWER



No hard disks, fans or batteries.

#### WEB COMPATIBLE HMI SAVES SPACE

The B&R Power Panel T-Series terminal is a fully web-compatible HMI that also configures as VNC client.

The terminals are available in four TFT display sizes from 4.3 to 10.1 in. and they come with two ethernet interfaces and two USB ports.

One of the two integrated functions is selected during configuration.

The terminals are compact and require minimal installation depth, and include an intelligent cable outlet arrangement making the panels easy-to-mount space savers.

There are no hard disks, fans or batteries so the HMI is maintenance-free. The panel front is IP65-rated, making the unit suitable for hygienic applications.

B&R industrial Automation, based in Atlanta, manufactures of automation equipment.

[www.br-automation.com](http://www.br-automation.com)

### CONNECTORS



Rated delivery 55 A.

#### INSERTS PACK IN THE POWER

HARTING's 3A crimp inserts pack a lot of power into a small package: rated delivery is 55 A at 40 degrees C.

Han Q 3/0 and Han Q 4/0 inserts fit into any Han 3A housing – either the standard metal, EMC (high shielding), HPR (external power) or Han-INOX (stainless steel).

Each Han Q 3/0 module, designed for semi-conductor production and motor applications that call for three poles and a ground, is a compact 42 mm<sup>2</sup> and has three contacts plus a ground. It accommodates wires ranging from 8 to 16 AWG.

The Han Q 4/0 is a four-pole version without a ground and is intended for use in Han 3A plastic housings as an AC or DC connector for fans, heaters and pumps. With four contacts, each connector can be used for two devices up to 52 A and 830 V, which is common in semi-conductor applications.

The HARTING Technology Group, with Canadian offices in Montreal, manufactures connection products.

[www.HARTING.ca](http://www.HARTING.ca)

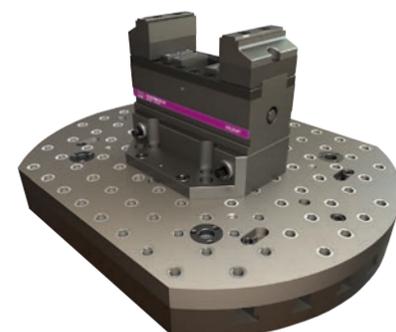
### WORKHOLDING

#### FIVE AXIS FOR QUICK SET-UP

Carr Lane's CL5 5-Axis workholding system provides quick and accurate set-ups.

It consists of a subplate, a riser and top tooling made up of a vise or a fixture plate. The subplate transforms a T-slot table into a modular fixturing plate, allowing flexible and easy clamping and locating of other tooling and/or fixtures. Each plate has built-in clamping and locating for risers.

Designed to get the part up from the machine table, the Quintus quick-change riser allows five-side access. It combines the riser, quick-change capability and



Built-in clamping.

### TEST AND MEASUREMENT

#### LOGGER MEASURES HARD TO REACH TEMPERATURES

Use the WTDL wireless temperature/humidity data logger from Dwyer Instruments for applications that require real time monitoring in hard to access areas.

The loggers transmit on a 2.4 GHz frequency up to 150 m indoors and up to 610 m outdoors. Increase measuring distance by using additional receivers.

A network of data loggers separate into smaller subnets with control by a single PC. The units also include a programmable alarm, which shows an on-screen alarm, sends a text message or e-mail if an alarm condition is met.

Dwyer Instruments Inc. is a manufacturer of test and measurements based in Michigan City, Ind.

[www.dwyer-inst.com](http://www.dwyer-inst.com)



Uses a 2.4 GHz frequency.

precise location in one piece. No other accessories are needed. And a range of either fixture plates or vises mount easily on top of the Quintus. Several versions of fixture plates and vises are available.

Carr Lane is a manufacturer of work-holding systems based in St. Louis, Mo. [www.carrlane.com](http://www.carrlane.com)

**MATERIAL HANDLING**

**FLOOR CRANE HANDLES HEAVY LOADS**

Rider-style floor cranes from Ruger Industries Inc. handle heavy items that require transport over long distances within a plant or warehouse.



*Comfortable compartment.*

The crane's compartment accommodates a comfortable and stable stance, with padded rails for right and lefthanded operators. It has a lifting capacity of 2,000 lbs. or larger with custom units. Electrically actuated traction and hydraulics provide a strain-free, ergonomic solution to transporting heavy loads. The full power cranes navigate door openings and narrow aisles. Suspended loads are held in place without motor or mechanical brakes. Features include push-button lifting and lowering, on-board charging, a change-free battery system and all necessary safety features.

Ruger Industries, a manufacturer of portable lifting devices, is based in Streetsboro, Ohio and is a division of The David Round Co.

[www.rugerindustries.com](http://www.rugerindustries.com)



*Moves product quickly.*

**TRANSPORT DRY BULK GOODS**

The VAC-U-MAX Flexible Screw Conveyor moves product from bulk gag unloaders, bag dump stations and storage vessels.

It transfers product materials with a bulk density of 40 lb. per cubic foot. over distances of up to 40 ft. at rates up to 10 tons per hour.

Typical applications include the refilling packaging machine hoppers, metered feed into mix tanks such as lime addition and gain-in weight hopper filling.

VAC-U-MAX is a manufacturer of pneumatic systems and support equipment for conveying, weighing and batching of dry materials based in Belleville, NJ.

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**GET A LOOK INSIDE YOUR PLANT**

AutomationDirect's Point of View software produces SCADA, HMI, and OEE/Dashboard projects deployable on development or remote workstations.

The software, which handles most Windows platforms, supports three remote application viewers: a dedicated viewer for plant operations where navigation must be restricted to specific HMI/SCADA applications; an Internet Explorer-based browser with access to authorized IP addresses; and a Studio Mobile Access viewer that works with any browser. Up to 48 simultaneous viewing clients of each type are supported.

A project tag database manages all runtime data, including internal variables and scanned I/Os. Configurable drivers communicate in real-time with programmable logic controllers, remote I/O devices, and other data acquisition equipment. Animated HMI screens and OEE dashboards provide a graphical view of the process, while integrated modules include alarms, events, trends, recipes, reports, scriptable logic, schedulers, a security system and a complete database interface.

The software contains 19 communications drivers for connection to most industrial controllers. Also included is a driver for Modbus communication.

Automation Direct is a supplier of automation products based in Cumming, Ga. [www.automationdirect.com](http://www.automationdirect.com)

**OMNISERVER GETS AN UPDATE**

Software Toolbox's OmniServer universal data acquisition software has been updated. Version 2.8 supports CSV import and export functions and there are several user interface enhancements for communicating with non-standard device types such as barcode readers, weight scales, RFID systems, sensors, and other devices without an off-the-shelf driver solution.

This provides greater flexibility when configuring OmniServer for large-scale projects with larger numbers of items and/or devices for communication. Import and export also shares objects between OmniServer configurations and protocols.

Usability is improved when operators import protocols and configuration through the OmniServer configuration interface. The OmniServer polling runtime can also be started from the configuration interface.

Software Toolbox based in Charlotte, NC, is a provider of industrial automation software.

[www.softwaretoolbox.com](http://www.softwaretoolbox.com)

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# Pipelines boost government revenues

BY SEAN SPEER AND KENNETH GREEN

New pipeline infrastructure to East and West Coast ports is key for Canadian resource companies to diversify their customer bases and to raise Canadian export prices relative to global benchmarks. But new pipelines – and the reassignment of existing ones – has become politicized.

The debate has reached a stalemate of sorts. The economics of greater market access for Canadian resources has run directly into an environmental backlash.

**“The economics of greater market access for Canadian resources has run directly into an environmental backlash...”**

However, the impact that the current impasse has had on government finances is one aspect of the debate that seems to have attracted little attention. Specifically, low energy prices stemming from limited transport options have come to reflect themselves in less tax revenue.

The economic case for new pipelines is well documented. Canada has the world’s third largest proven oil reserves, it’s the fifth largest exporter of crude oil

and the fifth largest producer of crude oil, and production is expected to grow. According to the Canadian Association of Petroleum Producers (CAPP), production from Alberta’s oil sands is to more than double between now and 2030, rising from 3.2 million barrels of oil per day to 6.7 million barrels.

What are the economic benefits of such development? A 2011 study by the Canadian Energy Research Institute (CERI)

projects that investments and revenues from new oil sands projects would be more than \$2 trillion between 2010 and 2035. This would result in a \$2.1 trillion increase in the Canadian economy, and job growth in the oil sands from 75,000 in 2010 to more than 900,000 by 2035.

The lack of safe, low-cost transportation capacity to move oil to world markets is the major barrier to this substantial economic development. These limitations are reducing revenues from Canadian oil sales by at least \$17 billion per year and, depending on market fluctuations, those losses could reach \$25 billion per year according to a 2013 study.

The fact is Canada’s current price discount for its energy exports also means less tax revenue for the federal and provincial governments. The numbers are considerable. Alberta collected \$2.4 billion less in oil sands royalties in the most recent fiscal year while Saskatchewan has also lowered its projected royalty revenue by \$287 million in 2012-13.

### Billion-dollar perspective

Lower personal and corporate income tax revenues resulting from slower employment growth and reduced business profits further affect governments. The federal Department of Finance, for instance, has estimated that if Canadian prices were to return to historic norms for crude oil and to half the prevailing natural gas prices in Europe, the federal government would collect an additional \$4 billion in revenues.

To put this in perspective: \$4 billion in new revenue would almost wipe out the \$5.5 billion budgetary deficit the government is currently projecting for next year and is more than the size of budgetary surplus it anticipates for 2015-16.

So the potential for additional government revenues is significant, and those revenues could be put to good use increasing Canada’s tax and economic competitiveness. For example, this additional revenue could be used to lower personal incomes tax rates in Canada, which are high relative to other jurisdictions such as the US. It could also be used to reduce government debt and lower debt servicing costs, thus freeing up room for other budget priorities.

The current debate about new pipeline construction typically fails to account for the potential impact on government revenues. It’s an important issue that should not be ignored.

*Sean Speer is the associate director of fiscal studies and Kenneth Green is senior director of energy and natural resource studies at the Fraser Institute, a public policy research and education organization with offices across Canada. Visit [www.fraserinstitute.org](http://www.fraserinstitute.org). This column is distributed by Troy Media in Calgary. Visit [www.troymedia.com](http://www.troymedia.com).*

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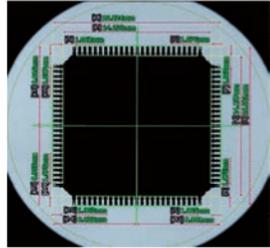


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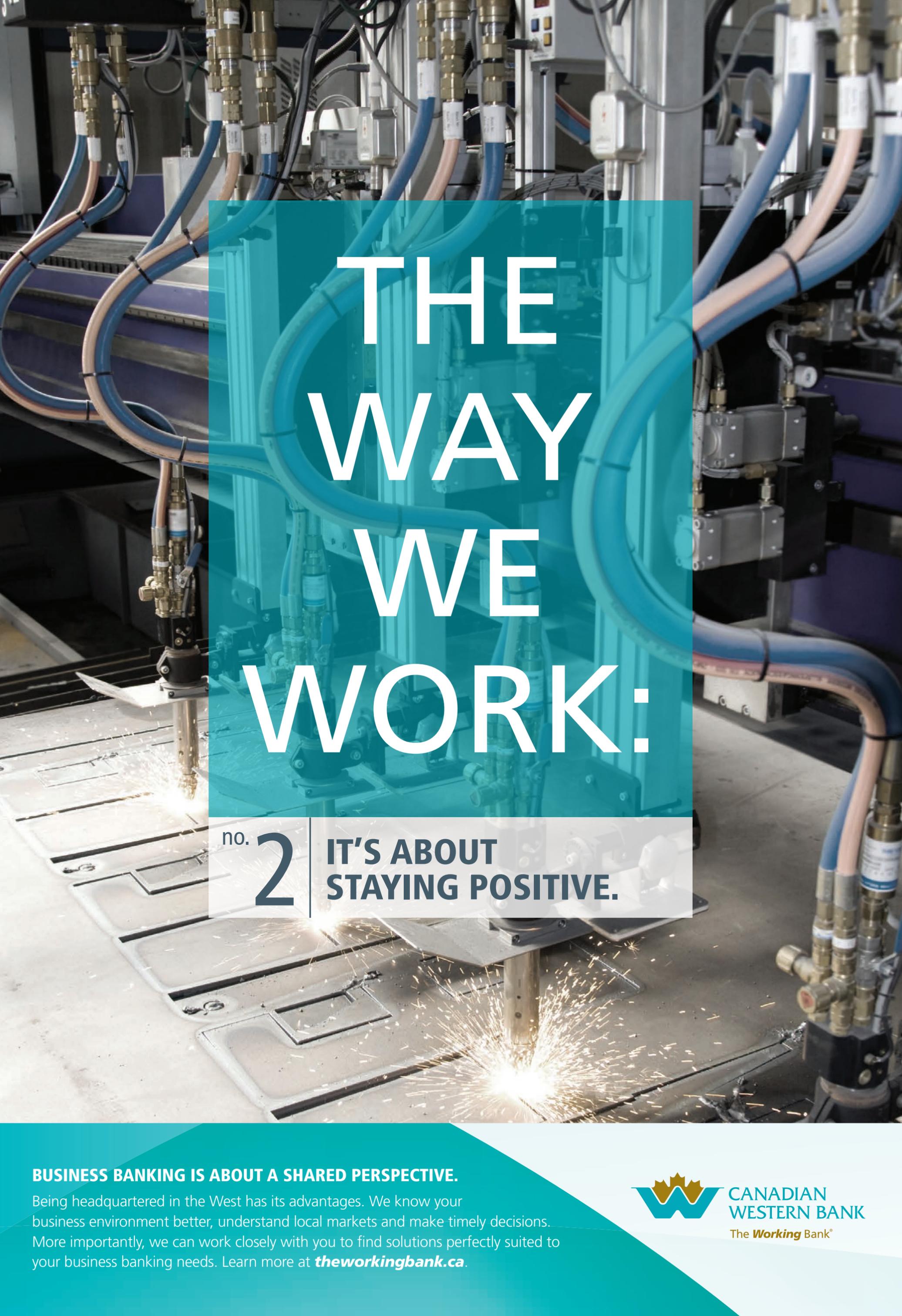
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A photograph of industrial machinery, likely a laser cutting machine, with a teal semi-transparent overlay. Sparks are visible from the cutting process. The text 'THE WAY WE WORK:' is centered in white on the teal overlay.

# THE WAY WE WORK:

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