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ADVANCING CANADIAN MANUFACTURING

Volume 9, No. 03 >> Supplement, PLANT >>> September/October 2014

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CANADIAN INDUSTRIAL EQUIPMENT NEWS

### HIGHLIGHTS

- Biogas navigates uncharted territory
- N-Solv extracts bitumen without water
- Troubleshooting lubrication systems
- Linking to the oil sands supply chain

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# Dumbing down interprovincial trade

As Canada continues its quest for free trade with Europe, Asia and elsewhere, the provinces continue to hide behind the various internal barriers they have erected among themselves.

Saskatchewan premier Brad Wall pronounced it “dumb” during the gathering of the provincial first ministers in August and not to be outdone, federal industry minister James Moore declared them to be “the perfect storm of dumb,” after a Sept. 11 speech to the Vancouver Board of Trade.

Wall, for example, was surprised that a manufacturer of first aid kits would have to jump through regulatory hoops set up in 10 jurisdictions to operate across Canada. And he threatened have-not Ontario with retaliation if it didn't eliminate preferential conditions on provincial infrastructure procurement. Indeed, a manufacturer from the EU under CETA would have clearer access to projects than an out-of-Ontario company.

Moore cited some examples of his own, such as the red tape truckers must drive through to move goods across provincial borders.

And business groups would like to see the end of barriers, yet certain business sectors will lobby for protection against outsiders. Moore called Newfoundland out for blocking beer competitors by changing the size of bottles by a couple of millimetres.

Speaking of bottles, it's easier to buy French Merlot (Ontario again) than a nice, crisp white from BC, while marketing boards prevent eggs and dairy products from other-provinces finding their way to some Canadian's dinner tables.

Making a change in employment jurisdiction is a pain because each province has their own professional accreditation labyrinths to pass through, and their own standards for blending ethanol with gasoline at the refinery, thus helping to push up the price at the pump.

BC, Alberta and Saskatchewan have been going it alone on freer trade with their New West Partnership, a \$585-billion zone that opens up procurement policies and the movement of labour and goods. They have also pledged to address remaining barriers. Meanwhile, Moore wants to see agreement among the provinces to bring down the barriers by the end of the year, and the federal government can help the process along by tuning up the 1995 Agreement on Internal Trade (AIT).

Business groups (Canadian Chamber of Commerce, Canadian Manufacturers & Exporters, Canadian Federation of Independent Business, Dairy Processors Association of Canada and Restaurants Canada) offer five principles for a new Canada free-trade zone:

- Make it as ambitious and comprehensive as any free trade deal with a foreign country, covering all sectors of the economy with only specific, argued for and agreed to exceptions.
- If it's made and sold in one province or territory it should be sold in any other jurisdiction, even if standards and regulations differ. Very clear evidence must be provided for exceptions.
- Provinces and territories will work together to develop common standards and practices.
- An effective and efficient dispute resolution mechanism is needed with fair adjudication and enforcement.
- A new AIT would have an effective, transparent and inclusive governance structure.

The Public Policy Forum (a not-for-profit dedicated to improving the quality of government in Canada) will argue whether or not the cost to the economy is \$50 billion or \$3 billion, but dumbing down provincial trade with niggling protectionist measures is to no one's advantage, whatever the cost. They're inefficient, they sap productivity and barriers stifle investment.

Joe Terrett, Editor

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



COVER IMAGE: HUSKY ENERGY

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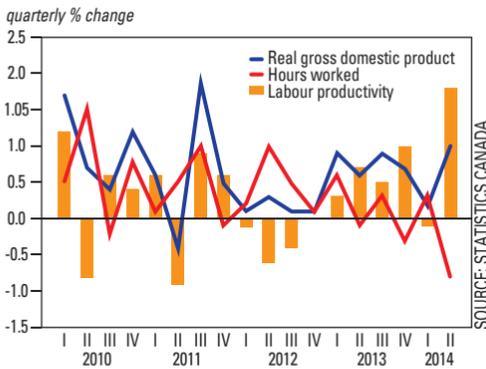
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» Pulse



Labour productivity shows a significant increase in Q2.

**PRODUCTIVITY IMPROVES**

Canadian businesses saw a 1.8% increase in labour productivity during Q2 after slipping 0.1% in Q1. Goods-producing businesses were up 1.7% and service-producing businesses 1.8%.

GDP rose 1%, its highest growth since Q3 of 2011 when it increased 1.9%. Output of service producers grew twice as fast as the output of goods producers businesses.

Hours worked declined 0.8% overall, 1% in goods-producing businesses and 0.6% in service-producing businesses.

Excluding utilities, all major industry sectors saw gains, including retail trade, mining and oil and gas extraction, manufacturing and wholesale trade.

Labour costs per unit of production increased 0.3% in the second quarter, one-third of the rate observed in the previous quarter.

Hourly compensation grew 2%, up 2.3% for goods producers and 1.9% for service providers. Compensation was up in all major industry sectors except transportation and warehousing.

**CAPACITY USE INCREASES**

Canadian industries operated at 82.7% of their production capacity in Q2, up 0.6% due mainly to manufacturing from Q1 and the fourth consecutive quarterly gain.

The transportation equipment and chemical product industries, after declining the previous quarter, were mainly responsible for this increase. Declines in seven industries – particularly primary metal (down 2.2% to 83.1%) – moderated manufacturing’s growth.

Mining and quarrying rose 2.7% to 67.5% with increased activity in most of the industry’s subsectors.

Oil and gas extraction increased 0.2% to 88%, driven by oil extraction.

**EXPORTS RISE IN JULY**

Canada’s merchandise exports increased 1.4% in July, while imports decreased 0.3%, which widens the trade surplus with the world from \$1.8 billion in June to \$2.6 billion.

Exports rose to \$45.5 billion, powered by motor vehicles and parts. Overall, volumes increased 1.1% and prices 0.3%.

Imports slipped to \$43 billion as prices declined 0.6% while volumes increased 0.4%.

Lower imports of aircraft and other transportation equipment and parts, consumer goods as well as metal and non-metallic mineral products were partially offset by higher imports of motor vehicles and parts.

Exports to the US rose 1.9% to \$34.4 billion and imports increased 1.2% to \$29.2 billion. Motor vehicles and parts was the main contributor to both gains.

Canada’s trade surplus with the US widened from \$4.9 billion in June to \$5.1 billion in July.

**IBC gets a lock on \$2M F-35 contract**

Will make components for fighter jet’s targeting system

**WILMINGTON, Mass. —** Lockheed Martin Missiles and Fire Control has tapped IBC Engineered Materials Corp., a subsidiary of Vancouver-based IBC Advanced Alloys Corp., to provide critical cast components for the electro-optical targeting system (EOTS) on the F-35 Lightning II fighterjet.



F-35 Lightning II fighter demonstrates missile launch.

PHOTO: LOCKHEED MARTIN

IBC, a manufacturer of rare metals-based alloys and related products, said the first component covered by this contract is an EOTS azimuth gimbal housing to be manufactured using its proprietary beryllium-aluminum casting alloy.

The company describes Beralcast alloys as more than three times stiffer than aluminum with 22% less weight and they can be precision-cast for simple or complex three-dimensional stability.

This first contract is for production of Lockheed Martin aircraft fitted with EOTS systems and spares. Pre-production has begun at the company’s Wilmington, Mass. manufacturing facility with initial deliveries scheduled to

begin later this year and into 2015.

The \$2 million contract includes engineering and hard tooling. IBC says its value could increase significantly over the life of the F-35 program.

The EOTS assembly being produced by Lockheed Martin is for all F-35 versions and planned production quantities are estimated to be more than 3,000 aircraft with deliveries through 2035.

The high tech F-35 Lightning II, a fifth generation fighter, features advanced low observable stealth technology.

IBC has production facilities in Indiana, Massachusetts, Pennsylvania and Missouri.

**Alberta books are back in black**

**OTTAWA —** After six years in the red, Alberta is expected to balance its books in 2014-15, says The Conference Board of Canada.

Its *Alberta Fiscal Snapshot: Promising (But Potentially Risky) Prospects* report is more optimistic than the government’s budget projection, thanks to higher resource revenues.

However Matthew Stewart, associate director of the Canadian Outlook, says resource revenues present a risk. “Funding so much of its operating expenditures with resource revenue helps to keep provincial tax rates low. But a large decline in royalties, such as what occurred in 2008-09, would make achieving and maintaining a balanced budget much harder.”

Economic growth in Alberta is projected to be the strongest in the country this year and next. Real GDP will rise by 3.5% this year and by 3.1% in 2015. It’s one of the few provinces (along with BC and Saskatchewan) set to have balanced books in 2014-15; and it’s the only province with a net surplus

of financial assets. This suggests interest payments on debt will be negligible over the forecast period.

While the Conference Board is projecting annual surpluses for three years, there are risks to the outlook, such as the potential constraints on economic growth if pipeline development stalls; and the ability to limit growth in health care spending.

Alberta Finance forecasts average annual revenue growth of 2.9% over the next three years and the budget plan is keeping average annual spending flat over the next three years.

The Conference Board’s forecast for oil prices and production is also higher than the province’s. It’s calling for 2016-17 royalties of \$2.6 billion more than the province is expecting.

With uncertainty surrounding the fate of the Keystone XL and Northern Gateway projects, the Conference Board says Alberta can’t fully realize the potential value of the oil sands without additional pipeline capacity becoming available sometime in the next five to 10 years.

**TransAlta to build and operate \$580M power station in Western Australia**

**CALGARY, Alta. —** TransAlta Corp. will build, own and operate a 150 megawatt combined cycle gas power station in South Hedland, Western Australia to supply power to state-owned utility Horizon Power and a Fortescue Metals Group subsidiary.

The \$580 million project includes the cost of acquiring existing equipment from Horizon. The development has been fully contracted under 25-year power purchase agreements with Horizon Power and Fortescue, and may be expanded.

The station will supply Horizon Power’s customers in the Pilbara region as well as Fortescue’s port operations. The power station is to be commissioned in 2017, creating approximately 250 jobs during construction and 20 jobs when in full operation.

TransAlta, a Calgary-based power generation company, has been operating in Western Australia since 1996.

**Timken adds to its service offerings**

**SASKATOON —** The Timken Co. has expanded its services at Standard Machine in Saskatoon to include Philadelphia Gear brand high-speed gearbox repair and Timken bearing remanufacturing.

Standard Machine, now a part of the Timken Power Systems group, recently opened a dedicated high-speed gear test bay in Canada to further expand its expertise in gearbox services.

Timken Canada has also re-launched a partnership with Garlock Sealing Technologies (an EnPro Industries company) to more aggressively pursue sales of their oil seal and bearing isolator products.

Timken, a US manufacturer of power transmission products with offices in Mississauga, Ont., has been selling Garlock products since 2006, but now has an extensive domestic inventory of seals and isolators, supported by Garlock’s manufacturing base in Palmyra, NY.

**CES expands US chemical production in Texas**

**CALGARY –** Canadian Energy Services & Technology Corp. (CES) has entered into an agreement to acquire all of the production and specialty chemical assets of Southwest Treating Products LLC.

CES, a Calgary-based supplier of chemicals to the oil and gas industry, said the acquisition will accelerate the expansion of its US production and specialty chemicals operations into the west Texas Permian Basin and the Eagle Ford shale in south Texas through its Jacam Chemicals 2013 LLC subsidiary.

No financial details were provided. Southwest, based in Sonora, Tex., is a private production and specialty chemical company that serves oil and natural gas companies.



Encana will no longer hold an interest in PrairieSky.

PHOTO: ENCAN

**Encana sells PrairieSky stake**

**CALGARY —** Encana Corp. is selling its 54% controlling stake in PrairieSky Royalty Ltd. to underwriters for \$2.6 billion.

The Calgary-based energy company created PrairieSky in June when it spun off a large portion of its royalty lands (5.2 million acres in Alberta) into the public company.

PrairieSky, based in Calgary, leases its properties to oil and gas developers and makes money from royalties.

## CRA running SME pilots

Program helps businesses avoid tax issues

**MISSISSAUGA, Ont.** — The Canada Revenue Agency (CRA) is running pilot projects to help small and medium enterprises (SMEs) reduce red tape and avoid tax-related problems and avoid audits.

The Liaison Officer Initiative (LOI) focuses on providing in-person support to businesses as their operations grow and understand their tax obligations.

Two pilot projects, launched in Ontario and Quebec, are based on what it calls a “right from the start” approach. CRA addresses non-compliance by focusing on educating, informing and supporting SMEs.

The pilots are to be expanded in BC, the Prairies and Atlantic Canada.

The CRA will provide information and guidance at key points in the lifecycle of a business so it avoids mistakes that would be more costly to correct down the road. That’s supposed to translate into fewer audits, re-assessments and fines.

Companies in industry sectors selected for the pilot will be contacted by the CRA and a liaison officer will offer a voluntary face-to-face visit that will focus on educational and preventative measures. Companies that participate will benefit from support visits, books and records reviews, and/or compliance support arrangements.

Visit [www.cra-arc.gc.ca/gncy/cmplnc/thrptpln/lsnff-crnttv/loi-qa-eng.html](http://www.cra-arc.gc.ca/gncy/cmplnc/thrptpln/lsnff-crnttv/loi-qa-eng.html) for more information.



*Pilot programs to help SMEs avoid audits.*

PHOTO: THINKSTOCK

## JV to develop Fiske oil play

**CALGARY** — 3MV Energy Corp. is forming a joint venture to drill and develop its Fiske property in Saskatchewan.

The Calgary-based oil and gas company with assets throughout west central Saskatchewan’s Viking oil

play is working with an unnamed “arm’s length” private company that will invest \$5 million in the property for a half interest.

The partner will be the operator, which will allow 3MV to rapidly develop its Fiske area Viking play.

## Pembina acquires Vantage pipeline to ND Bakken

**CALGARY**— Pembina Pipeline Corp. is acquiring the Vantage pipeline system and Mistral Midstream Inc.’s interest in the Saskatchewan Ethane Extraction Plant (SEEP) for US\$650 million.

Vantage is a recently constructed high vapour pressure pipeline that originates in Tioga, ND and terminates near Empress, Alta. The 700-kilometre, 40,000 barrel per day line provides access to North Dakota Bakken natural gas.

Calgary-based Pembina says the transaction provides access to a new and prolific resource play in North Dakota and has the potential to expand to 60,000 bpd.

As part of the deal, Pembina is also acquiring pipeline infrastructure from Mistral and its interest in SEEP. The 60 million cubic feet per day deep cut gas processing facility is centrally located to service the southeast Saskatchewan Bakken region.

The pipeline infrastructure includes a 105-kilometre, four-inch ethane pipeline and a 75-kilometre gas-gathering pipeline, both under construction.

Pembina expects SEEP and the pipeline to be in-service in mid-2015.

Pembina has also selected the site for its West Coast propane export terminal project, which will be in Portland, Ore.

It intends to have the US\$500-million, 37,000 bpd facility in service by early-2018 to provide propane supply from Western Canada to large, international markets.

## Careers



*Basha Hussein*

Vista Projects Ltd. has appointed **Basha Hussein** CEO, assuming responsibilities from the company’s founder, **Alex Campbell**. Hussein joined the Calgary-based oil and gas engineering firm in 2008 as a project engineer and the shareholder team in 2010. Most recently he was chief projects officer.

**Randall MacEwen** has been appointed president and CEO of Ballard Power Systems. He replaces **John Sheridan**, who is retiring after serving as the clean energy fuel cell developer’s CEO since 2006. MacEwen served as executive vice-president of Stuart Energy Systems Corp., an onsite hydrogen production company and as CEO of Solar Integrated Technologies Inc.

**Paul Timmons**, president of Superior Plus Corp.’s specialty chemicals business, is retiring. He has been with the Calgary-based specialty chemicals business or its predecessor, ERCO Worldwide, for more 30 years and was appointed president in 2001. Senior vice-president of operations **Ed Bechberger** will succeed Timmons.

Hemisphere Energy Corp. has promoted **Ian Duncan** to COO. He’s an engineer with 10 years of oil and gas experience who has been with the Vancouver-based oil and gas company since May 2011. **Ashley Ramsden-Wood**, also an engineer, has been appointed vice-president of engineering. She has consulted for Hemisphere since June 2012 and also played a key role in the success of the company. She has more than 12 years of oil and gas experience.

Pacific Future Energy Corp. has appointed former international trade minister **Stockwell Day** to its management team as a senior advisor, director, and chair of the company’s advisory committee. The Vancouver-based company plans to build and operate a \$10 billion “green” refinery in BC.



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» Carbon Capture

CO2 Solutions' technology recovers carbon dioxide for practical applications rather than sequestering.

BY NOELLE STAPINSKY

As greenhouse gas emissions continue to soar, climate change should be top of mind for everyone. But as scientist and environmentalist David Suzuki once said, "We're all in a giant car heading towards a brick wall and everyone is arguing about where they're going to sit."

Carbon dioxide (CO2) is a naturally occurring gas in the earth's atmosphere, but levels are rapidly rising, putting the planet in jeopardy of a major climate catastrophe. And since global economies aren't loosening their grip on fossil fuels, the focus has turned to curbing emissions by developing technologies such as carbon capture and sequestration (CCS), or carbon capture and storage.

In 2009, the International Energy Agency (IEA) called for the development of about 30 large-scale CCS demonstration projects around the world. Four are completed and Canada is one of the few countries that's actually following through with CCS demonstration projects.

The Boundary Dam project in Saskatchewan will be the world's first pulverized coal-fired power plant retrofitted with CCS, and in Alberta, Shell's Quest CCS program is expected to reduce CO2 emissions from oil sands operations by more than one million tons per year.

Indeed, government regulation would accelerate the adoption of CCS by CO2 emitting industries, but mass deployment would also lower costs. And Canada, as a global leader in CCS, is blazing the trail with technological innovation.

Clean capture

Montreal-based CO2 Solutions, a developer of an innovative enzyme-enabled carbon capture technology, has entered into a collaborative agreement with Husky Energy for a pilot project at its Pikes Peak South heavy oil site in Saskatchewan, where the company produces about 37,000 barrels of crude per day.

The company, founded in 1997, started by commercializing solutions to reduce CO2 using the enzyme carbonic anhydrase – naturally found in living organisms to manage CO2 during respiration. Its initial research focused on scrubbing CO2 from ambient air in closed spaces such as submarines. By the early 2000s, the company evolved its R&D to focus on small-scale industrial applications.

Louis Fradette, CO2's chief technology officer, says the company's technology is divided into a left and right side process. A salt solvent and enzyme scrubs the collected flue gas and absorbs the CO2. The scrubbed flue gas exits out of the top of the left side without any degradation products detrimental to human health and the environment.

"The enzyme acts like a human lung to manage the CO2 – a catalyst to make the chemical reaction happen faster. It allows us to reduce the size of equipment compared to what's currently used in the industry to scrub flue gas," says Fradette. "The salt solution eliminates all contaminants that would otherwise end up in the environment."

The CO2-absorbed solvent is then sent to the right side of the process where regeneration occurs, freeing the solvent of the CO2 and recovering a pure stream of the gas, which is compressed, stored and used for other applications rather than being pumped it into the ground to be sequestered.

Unlike amines, which are currently used in gas scrub-



# CO2's GHG solution

## PUTTING CARBON DIOXIDE TO WORK

bing, the salt solvent doesn't degrade when it's exposed to process conditions or generate any side reactions.

Jonathan Carley, vice-president of business development at CO2 Solutions, says the captured CO2 is useful in greenhouses to help plants grow faster, the pulp and paper industry for PH regulation, and it's used for carbonation at bottling plants.

"They have boilers used for heat to clean the bottles," he says. "You can take the CO2 from the boilers and inject it into the carbonation process."

But this technology is also a big opportunity for enhanced oil and gas companies, such as Husky Energy.

"Most of the CO2 used in enhanced oil recovery comes from natural sources, which are in decline," says Carley. "You can pump a ton of CO2 underground

and breathe life into aging oil wells. There are billions of barrels of reserves that can be extracted using this method, and if the enhanced oil recovery industry is going to expand, they're going to need to make use of CO2."

CO2 received \$5.2 million from the ecoEnergy Innovation Initiative to develop the Husky project, along with another \$500,000 from the Climate Change Initiative Management Corporation, Alberta's climate change investment arm.

Initial lab testing at CO2's 96,000 square-foot R&D facility proved that its process operated at a 0.5 ton per day scale, which significantly reduces the cost of CO2 capture below current technology.

"The benchmark would be what we call a once-



(L) Prototype of CO2 Solutions' enzyme-enabled carbon capture unit in Montreal. (R) Prime Minister Stephen Harper touring the facility in May 2013 where he announced a \$4.7 million grant from NRCan.

CO2 Solutions' carbon capture is going into Husky Energy's Pikes Peak-South heavy oil site for a pilot project. PHOTO: HUSKY ENERGY

through-steam-generator (OTSG) unit to produce steam and inject it underground to extract the oil," says Fradette. "With Husky, we designed our absorber so it scrubs the gas coming off these OTSG units."

The Husky pilot project begins in 2015. Initially, CO2 Solutions plans to capture 15 tons per day from the gas-fired boilers at Pikes Peak South. But Carley says by increasing the size of equipment, the system could capture up to 150 tons per day.

"The key is to have the cost of CO2 around \$30 to \$50 a ton to be profitable," he says.

CCS is a proven technology that has been around for some time, but there is some debate as to why it has yet to be widely adopted.

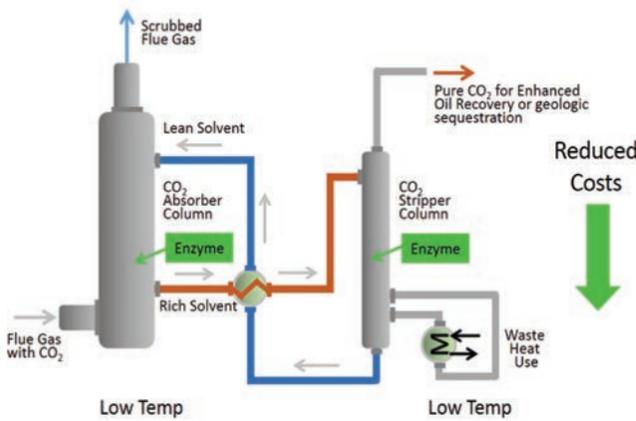
### Necessary action

According to James Meadowcroft, Canada research chair in Governance for Sustainable Development and professor in the School of Public Policy at Ottawa's Carlton University, the recession in 2008 caused some countries to idle or cancel projects. And in countries, such as Germany, there was public protest over the gas being put into the ground.

Indeed, the idea of having millions of tons of CO2 in the ground may not be appealing, but rapidly accelerating climate change isn't either. So far, pumping the harmful emissions into the ground is the most sustainable way to handle it.

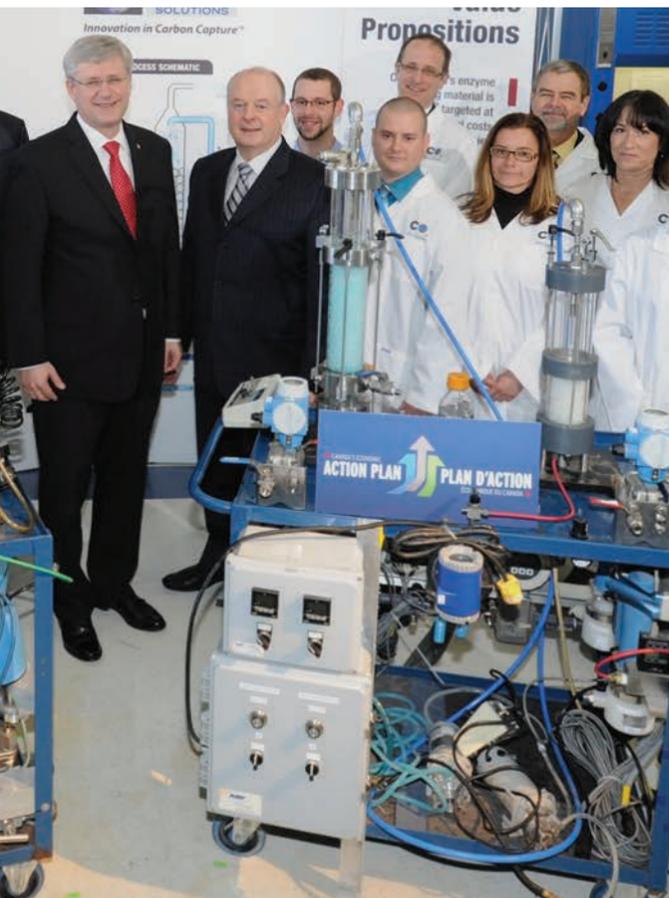
"The main problem with CCS is that it's expensive and takes energy to do," says Meadowcroft. "If you take a typical coal-fired power plant, it might take between 20% and 30% of the plant's output to carry out carbon capture on its own emissions."

In a recent release, Climate Change and Emissions Man-



How the CO2 Solutions system works.

PHOTOS: CO2 SOLUTIONS



## CANADA'S CCS PROJECTS

The International Energy Agency (IEA) says carbon capture and storage (CCS) could account for about 20% of global greenhouse gas reductions needed by 2050, based on a least-cost scenario to limit the global temperature rise to 2 degrees C. Here is an overview of projects underway in Canada.

### Commercial

#### Private funding

- Cenovus and Apache, Commercial EOR at Weyburn and Midale, in Saskatchewan.

### Demonstration

#### Funding from the federal and/or provincial governments

- SaskPower – Boundary Dam project in Saskatchewan
- Shell Canada Energy – Quest project in Alberta
- Enhance Energy – Alberta Carbon Trunk Line in Alberta
- Spectra Energy – Fort Nelson CCS exploratory project in BC

### Feasibility studies, pilot and other supporting projects

#### Funding from the federal and/or provincial governments

- International consortium – IEA GHG Weyburn-Midale CO2 Monitoring and Storage project in Saskatchewan
- Petroleum Technology Research Centre – Aquistore Project in Saskatchewan
- TransAlta Corp. – Project Pioneer in Alberta
- Capital Power Corp. – Integrated Gasification Combined Cycle Front End Engineering and Design study in Alberta
- ARC Resources – Heartland Area Redwater project in Alberta
- Husky Oil Operations Ltd. – Heavy Oil CO2 EOR and Storage in Saskatchewan
- Canada, Mexico and the US – North American Carbon Storage Atlas Project

Source: NRCan

agement Corporation chair Eric Newell applauded CO2 Solutions' innovative process, calling it a transformative technology that will reduce Alberta's GHG emissions and encourage its transition to a lower carbon economy.

Timing couldn't be better.

In July, a draft report (*Deep Decarbonization Pathways Project*, commissioned by the United Nations) delivered the blueprints necessary to curb rising emission levels to slow any impending climate crisis. This requires epic global cooperation that includes the implementation of more renewable energy sources, electrifying transportation and using proven technologies such as CCS, the report says.

The UN report, by the Sustainable Development Solutions Network (SDSN) and the Institute for Sustainable Development and International Relations, identified 15 countries that desperately need to reduce CO2 emissions in the next 36 years. The list includes the US and China, both leading global emitters, but Canada is also listed. To meet the necessary levels, emissions must be slashed from the current 36 gigatons to 11 gigatons.

"It's not hard to kick our fossil fuel addiction," says Meadowcroft. "There are plenty of other energy sources and we already have the technologies. But [fossil fuels] are so convenient, cheap and so many people are making money off them. Nobody is that excited about climate change yet."

CCS may be a huge investment now, but as it's developed and introduced into more industrial applications, costs will come down, giving energy producers the necessary tools to curb carbon emissions and meet global requirements.

CO2 Solutions is in a good position to help drive those developments away from Suzuki's brick wall.

Noelle Stapinsky is a Toronto and Huntsville, Ont.-based business writer and editor, and former features editor of PLANT. E-mail [noellestapinsky@gmail.com](mailto:noellestapinsky@gmail.com).

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

## Innovations

### » Gravity Drainage



N-Solv's solvent module at the Dover oil sands. PHOTO: N-SOLV CORP.

## Technology extracts bitumen water-free

N-Solv replaces steam with propane or butane

BY PLANT STAFF

Oil sands producers and insitu extraction operations are definitely guilty of being major consumers of water, but what if there was a technology that didn't require any?

That's just what N-Solv Corp. is trying to accomplish.

The Calgary-based company has developed and is working to commercialize an oil extraction process that uses proven horizontal well technology developed for steam assisted gravity drainage (SAGD) operations, but it doesn't use any water.

Instead, the five-step N-Solv process uses propane or butane to produce heat the way steam does and dilute bitumen at the same time, keeping reservoir temperatures below 80 degrees C to cut energy requirements by 85%. The company says the process will lower greenhouse gas (GHG) emissions by up to 12 million tonnes by 2021, given present rates of adoption.

Warm propane or butane is injected as a vapour and condenses underground, washing the valuable compounds out of the bitumen, draining downward to the production well as a solution containing solvent and oil. The process is expected to produce a lighter, partially upgraded, and more valuable oil product and may recover more resource from each well at lower capital and operating costs than existing in-situ processes.

Once it's pumped to the surface, formation water is removed from the produced fluids. Saleable oil is then separated from the solvent by flushing the solvent to a separate process stream.

The next step is to distill the solvent, removing non-condensable gases such as methane, and recycling high-purity solvent back into the reservoir.

For each barrel of oil removed from the reservoir, the volume must be replaced with solvent vapour. As the chamber grows, the make-up solvent is continually topped up. At the end of a well's life, the solvent is recovered and reused on another well or sold.

With more than \$10 million in funding from Sustainable Development Technology Canada and Alberta's Climate Change and Emissions Management Corp., the company leased land at Suncor's Dover oil sands operation to build a 500 barrel per-day pilot plant to test the new technology.

The \$57 million BEST (Bitumen Extraction Solvent Technology) pilot plant came online in 2013 and consists of a 300-metre horizontal well pair, with a surface plant for processing produced hydrocarbons to demonstrate the technology at field scale.

N-Solv says the pilot plant makes a water treatment plant and boilers unnecessary and replaces them with a small solvent purification plant and vapourizers.

The two-year demonstration pilot is expected to run until 2015 when Suncor will acquire the rights to the technology for hosting the plant at Dover.

If all goes well, water consumption at Suncor's insitu operations will come mostly from drinking.

» Maintenance

# Improve your CIRCULATION

## TIPS FOR LUBRICATION SYSTEM TROUBLESHOOTING

Know your circulating oil systems and how they respond to operational factors to maintain the smooth operation of machinery.

BY STEVE GAHBAUER

Lubrication is the alpha and omega of keeping rotating machinery in good working order. Neglect it and all kinds of premature equipment problems occur.

Gary Gagner, a lubrication specialist with SKF USA Inc. in Brewer, Me., covered circulating oil systems in a technical paper that outlines a plan for successful troubleshooting, and it starts with technicians that understand the functions and failure modes of each component, how the full system functions and how it responds to different environmental and operational factors.

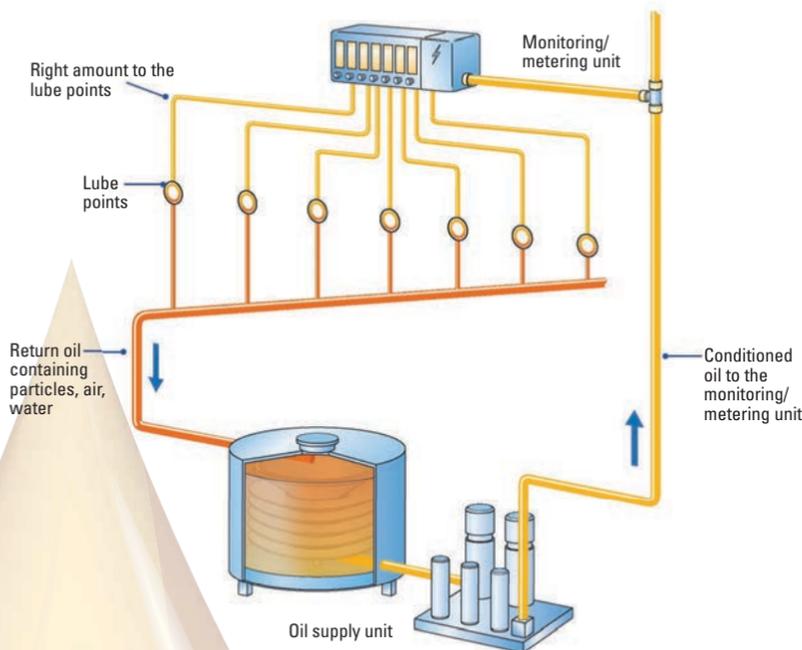
A circulating oil system's components include:

- A lubrication conditioning centre, which consists of a programmable controller, a reservoir, pumps, filters and a heat exchanger for cooling.
- Pressure piping that involves a main pressure distribution header to flowmeter stations, flowmeter station branch pipes and lubrication lines from flowmeter panels to lubrication points.
- Flowmeter panels that consist of a number of flowmeter banks of one to 10 flow tubes.
- Return piping that transports oil from the lubrication points to the main return header, which goes to the reservoir. Every main return header has air breathers and bypass valves that connect pressure lines to return lines.
- Sump units for lubrication points that can't be connected to main return lines, and for pneumatic units.
- Circuits that monitor and control reservoir temperature, pump safety relief, system oil pressure, oil filter bypass, stand-by pump activation and system logic. Indication and alarm circuits react to reservoir level and temperature, filter differential pressure, oil pressure and temperature, and moisture content.

So where do you start troubleshooting?

Signs of ineffective lubrication – usually the main issue – are metallic particulates in oil samples, oil samples showing below acceptable characteristics, wrong viscosity, water in oil and excessive energy use. The goal is to deliver the appropriate lubricant at the right frequency, viscosity, temperature and quantity. This is determined by the operating conditions and machine environment, speed, loading and temperature.

Record all information, take photos and obtain the system's available documents. Investigate existing equipment, such as the supply system and the drainage system. Ascertain that flowmeters can be accessed safely, ensure venting and gearcase drains work properly and check the lubrication conditioning centre for water problems. Hot oil on one side and cool oil on the other side of the reservoir top plate can cause serious condensation, but there are other ways water gets into the system.



How a lubrication system works. For information visit [www.skfusa.com](http://www.skfusa.com).

PHOTO: SKF

Also check for air contamination. It can shorten oil life because of oxidation, decrease lubrication efficiency and cause oil properties to deteriorate quickly.

Oil cooling is important, so check water and oil temperatures both in and out, and maintain proper oil pressure.

Pay attention to the cleanliness of the lubricant, eliminate sources of contamination, correct filtration levels where necessary, and check out the use of auxiliary equipment. Contamination control is aided by frequent oil sample analysis at strategic points and, to some extent, by reservoir design.

Match pump capacity and horsepower to the oil supply and do pressure drop calculations to maintain constant oil pressure. Piping, valves and heat exchangers should be 10 psi, filters 50 psi, main supply headers 15 psi, meter panel supplies 8 psi, flowmeters 5 psi, and piping-to-lube point 40 psi. Maintain constant oil temperature and check whether the system has adequate capacity for the main oil supply headers.

Regarding oil drainage and main oil drainage headers, compare what you have with what you need. If oil is not at the right temperature, it's not going to drain.

Check piping connections, mechanical housings, seal conditions, fluctuating oil flow rates, oil viscosity and start-up conditions for oil leakage.

Following these maintenance practices will ensure a circulating oil system is doing its job and preventing costly, unscheduled machinery downtime.

*This article is a synopsis of a presentation made at an education session hosted by the Society of Tribologists and Lubrication Engineers in Hamilton. Steve Gahbauer is an engineer and freelance business writer. E-mail [gahbauer@rogers.com](mailto:gahbauer@rogers.com).*

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

» Tech Tip



Check the winding temperature. PHOTO: THINKSTOCK

### Thermal inspection

What it tells you about your electric motors

Infrared inspection requires the direct contact of objects and line of sight but the ribs between the frame and stator core of many electric motors act as air thermal insulators, which could throw surface temperature out of whack. At the same time, bearing inner and outer races are in direct contact with the bearing housings and shaft, which provide more accurate temperatures for evaluation and trending.

Ambient temperature (around the motor) and the temperature generated by the motor during operation (directly related to the load) make up the actual operating temperature. Limits are based on the motor's insulation class and bearing grease limits for associated components. For instance:

- **Class A = 105 degrees C.** Based on original oil and paper or tar and paper insulation systems.
- **Class B = 130 degrees C.** Found in older standard efficient electric motors.
- **Class F = 155 degrees C.** Found in energy and premium efficient electric motors.
- **Class H = 180 degrees C.** Related to insulation systems for high temperature applications.
- **Class N = 200 degrees C.** high temperature applications.

The allowable total temperature for motors that have service factors of 1.0 is the insulation class temperature minus 10 degrees C. For motors that have service factors of 1.15 or better, the allowable total temperature is the insulation class temperature. If a motor has a Class F insulation system, a 1.0 service factor has limit of 145 degrees C, and a 1.15 service factor has a limit of 155 degrees C.

Temperature limits relate directly to the winding temperature rather than the surface of the motor.

Thermal imaging identifies specific point losses on a motor, but you have to know the loading at the time of the test. Skin temperature of a totally enclosed fan- or blower-cooled motor will vary from the fan towards the drive end, allowing the thermographer to identify any cooling issues.

Infrared inspection helps identify differences from the norm, but in many cases, using it alone takes a lot of time to evaluate or identify what's wrong and often lacks useful details. Use it as a system to scan groups of motors to identify gross defects that may be addressed through the application of the proper technology or inspection.

Source: *Success By Design*, with permission.



### LEAN ALERT

One of lean manufacturing's prime directives is to eliminate waste. Taiichi Ohno, father of the Toyota Production System, cites the following main sources of waste: overproduction; operators waiting; unnecessary movement of parts and products; unnecessary or incorrect processing; more inventory than needed for a pull system; operator movements that are straining or unnecessary; and inspection, rework and scrap.

Source: *Lean Enterprise Institute*

## » Regulation

Lethbridge Biogas navigates uncharted waters to establish a \$30 million waste-to-energy facility.

BY DAVID NESSETH

There was a time not long ago when Stefan Michalski knew regulators were happy to see him leave their office. As much as they supported the concept of biogas and green energy, it was more of a technology left to the Germans of the world, from where Michalski hails, not the wilds of Alberta.

Now more Stefan Michalskis are coming out of the woodwork looking for answers from Canadian regulators, particularly in Alberta, where the feedstock-laden landscape is an anaerobic digester's dream.

Still, the question remains whether provincial officials will eventually craft legislation that deals directly with the burgeoning technology of biogas, or continue what Michalski calls a "one-off" approach – a kind of regulatory patchwork that pulls heavily from the traditional oil and gas sector. In some ways it operates completely antithetical to the greener principles of a company like Lethbridge Biogas LP, his decade-long adventure into the somewhat uncharted waters of Canadian renewable energy.

The Michalskis of the world aren't just looking to regulators for answers, but to Michalski himself. His phone is ringing off the hook with green trailblazers looking for the secret to navigating the clean-tech world. But at this point in time, the only secrets appear to be patience and money, in that order.

"For what you do, there's no rule book," says Michalski, project manager at the Lethbridge facility, who spent some 15 years in Berlin working with biogas facilities. They're typically small and plentiful, in stark contrast to the mammoth \$30-million Lethbridge facility, the largest in Canada. "It's new, and hasn't been done. It starts with a lot of question marks, as regulatory agencies have not dealt with this."

A run-of-the-mill German biogas facility has a generating capacity of just 500 kilowatts, while the Lethbridge facility, which has the technological capability to be run through an iPhone, has a capacity of 2.85 megawatts ... and counting, as the six-person Lethbridge team (three of which are truck drivers) has plans to double that capacity.

As part of ECB Enviro North America Inc., Michalski's first several years in Alberta were essentially spent educating organizations such as Alberta Environment, the Natural Resources Conservation Board, Alberta Agriculture and Rural Development, and municipal-level officials. He would explain how the facility would work with more than a dozen vendors to obtain and process some 100,000 tonnes of manure, and all kinds of organics, into heat and electricity each year.



Two views of the Lethbridge Biogas facility, which currently produces 2.85 megawatts of heat and electricity, but management is working to double the plant's capacity.

PHOTO: LETHBRIDGE BIOGAS LP

# Forging a path for BIOGAS

## ... WITH ALMOST NO REGULATORY FRAMEWORK

"Salad, cheese, everything that's run out of its best before date," says Michalski. "As a society, we throw this stuff away, and that's the stuff we use to make green energy."

### Carbon emissions prevention

That processing versatility is made possible through the facility's high-pressure thermal hydrolysis, essentially a boiling and decompression process.

Had all that manure not been used in the Lethbridge facility, which began operating in December 2013, it would be breaking down in farm lagoons, polluting the atmosphere with carbon dioxide. Instead, over the next decade, waste-to-energy facilities like Lethbridge will prevent carbon tonnes into the hundreds of thousands from ever entering the atmosphere.

Eventually, Michalski knew he'd have to buy some plane tickets if regulatory officials were going to truly understand exactly what he was taking about. So, three trips were made to Germany between 2005 and 2007 to see biogas facilities in action. Michalski says the hands-on tour approach proved convincing. Talks progressed.

It became clear to Michalski, however,

that without a customized template for biogas, regulatory officials were going to lean on standards created within the traditional oil and gas sector framework. The project wasn't really going to be viewed for what it was – agricultural – but instead be given a regulatory foundation more suited to, say, an industrial diesel fuel plant.

"Everybody regulating is more of a problem than no one," says Jeff Bell, industry development officer with Alberta Agriculture and Rural Development. "There could be some clarity for who's responsible for biogas."

Bell says that since government funding for renewable energy took off in 2006, policy has had a hard time keeping up. While it has been tough to get the policy "right", he says all that has emerged is a microgeneration regulation and policy to protect against prion diseases, more commonly known as mad cow.

"Since then, there hasn't been a concerted reinvestment on the policy side," adds Bell. "It's a very frustrating process for biogas developers."

Had Michalski ventured into a smaller enterprise, like most digesters in Alberta

– using on-farm manure and not selling electricity to the grid – life would have been much simpler. Such facilities are typically developed by municipalities or to support large farming operations. It was his commercial vision that began to raise questions that hadn't really been asked before – the idea of making money from anaerobic digestion.

The primary difference between the European political landscape and the Canadian one is that Michalski sees the Europeans as having made organics diversion a priority. Some European countries have even introduced landfills bans for organics, something that Metro Vancouver is hoping to have in place by 2015.

### Waste-to-energy

Currently, Michalski is in competition with the local landfill. Residents and business bring organics to the landfill and leave them for a tipping fee, which is already quite low, or pay even less to a company like Lethbridge Biogas LP, which will turn the waste into energy. After the Lethbridge facility uses feedstock to power itself, the other 90% of the electricity is sold to the public grid at about six cents per kilowatt hour, which is rather low compared to many other jurisdictions.

However, many of those areas don't have such a strategic location in terms of access to feedstock.

The heat produced from the process, meanwhile, is used specifically for the high-tech in-house equipment from Plan-ET Biogas Solutions, but as the project team learns to better capture that heat, it will open up other innovative uses, perhaps along the lines of European-style district heating systems.

The biogas facility's engines are just 20-cylinder, but operate 24-7 to run three digesters. "You can't stop biology," says Michalski. To operate properly, the engines work in an oxygen-free environment climate controlled to a clammy 38 degrees C. There's next to no odour, and some of the leftover material can be used as fertilizer.

After Michalski was able to get regulators on-board with the Lethbridge project, it was time to look for investors – a difficult feat in a province so focused on the future of pipelines and oil sands. But money began to flow – not privately, at first, but publicly with a \$6.4-million grant from Alberta Energy, a \$5-million loan from Alberta's Agriculture Financial Services Corp., and an \$8.2-million grant from Alberta's Climate Change and Emissions Management Corporation (CCEMC).

With all the interest in the Lethbridge project, private investors emerged. But not ones "trying to make \$100 out of \$5," as Michalski puts it, but rather green-minded investors who believed in the philosophy of sustainability that drives the three-acre, 10,000 square-metre green energy juggernaut.

*David Nesseth is an environmental reporter with Glacier Media's Business Information Group.*

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

» Supply Chain

It takes time and money to get a foothold in Canada's oil sands market, but once in it's potentially a 30 to 50 year ride.

BY JOE TERRETT, EDITOR

There will continue to be a lot of money invested in Alberta's oil sands. The Canadian Energy Research Institute (CERI) is projecting capital investments worth \$207 billion between 2013 and 2022 plus MRO spending of \$1.4 trillion (from 2012 to 2046), providing plenty of new business opportunities for manufacturers and service providers from across the country. So how do those on the outside find a spot on the inside?

Clark Grue, president and CEO of Rainmaker GDB, laid out a pathway into the supply chain for participants in the National Supply Chain Forum (now called the **Canadian Energy Supply Chain Forum**) last November.

The Calgary-based advisory firm operating in Europe, the US, Canada and the Middle East, focuses on helping companies get into new markets. Grue, who has a background in the energy industry, began with a warning for potential oil sands suppliers: "Entering a new market can be very costly and it takes a lot of time. There's a risk that should be weighed carefully so you know your potential for success will be high."

The first question to ask is, what's your value proposition; what do you want to bring to the market? For example, a company advancing a process shift needs to allow a significant amount of time to run field tests and develop its product in that market. "You'll be disrupting a current process, which is difficult," he said.

A potential disrupter needs to test against what's already out there, tweak the strategy, come up with a strategic business plan, execute it, and figure out which groups should be dealt with.

Gathering information is key to developing a plan, which requires building relationships – and trust – on the ground. "If you're not here, you're not HERE," Grue emphasized.

Be aware of the market challenges: in addition to shortages of professionals and skilled trades personnel, western module fabrication facilities are reaching capacity, so the industry is looking at alternatives such as China, India, the US and the rest of Canada.

Understand how the supply chain works. It includes project owners, exploration and production companies;

# Want into the ENERGY market?

## WHAT YOU NEED TO KNOW ABOUT SUPPLYING THE OIL SANDS



Capital investment in oil sands development is expected to top \$207 billion by 2022. PHOTO: THINKSTOCK

primary suppliers for capital projects; and primary suppliers for operations.

Suppliers operate in three tiers:

- Direct (supports exploration and extraction, engineering and construction; professional, scientific and technical services). It's reliant on fabricators and manufacturers.
- Indirect (power generators, boilers, heat exchangers, metal tanks, steel pipes and tubes, mining and field equipment, pump and compressor manufacturing).
- Other (transportation engineering and engine turbine, power transmission and communication cable manufacturing, et.). It encompasses machine shops, warehousing, storage and truck transportation.

The players include executives who make strategic purchasing decisions, management that sets the rules of

engagement, project leads and field personnel.

There are several factors to consider in the value proposition: product innovation, design, delivery, quality, price, support, service, and warranty.

"Your value proposition will change, what you do with your product can change. Keep that in mind as you move forward," Grue advised.

He also outlined pre-qualification steps that include the following:

- Registration (provide in-depth supplier information).
- Company information (detail the organizational framework).
- Appropriate certificates and qualifications (show proof of health and safety standards and practices, overview of quality assurance).

health and safety standards and practices, overview of quality assurance).

- Compliance with company policies (work with the buyers to reach their goals).
- Current workload (outline projects on the go).
- Review of company systems (host a site visit).

Grue encouraged potential suppliers outside the province to have an Alberta presence. This could involve a partner already in the province with a complementary product and support team.

Rainmaker has created a supplier readiness survey that provides a comprehensive inventory of your supplier capabilities. This helpful checklist covers business structure, experience, capacity, quality, certification, health, safety and the environment, logistics, motivation and commitment.

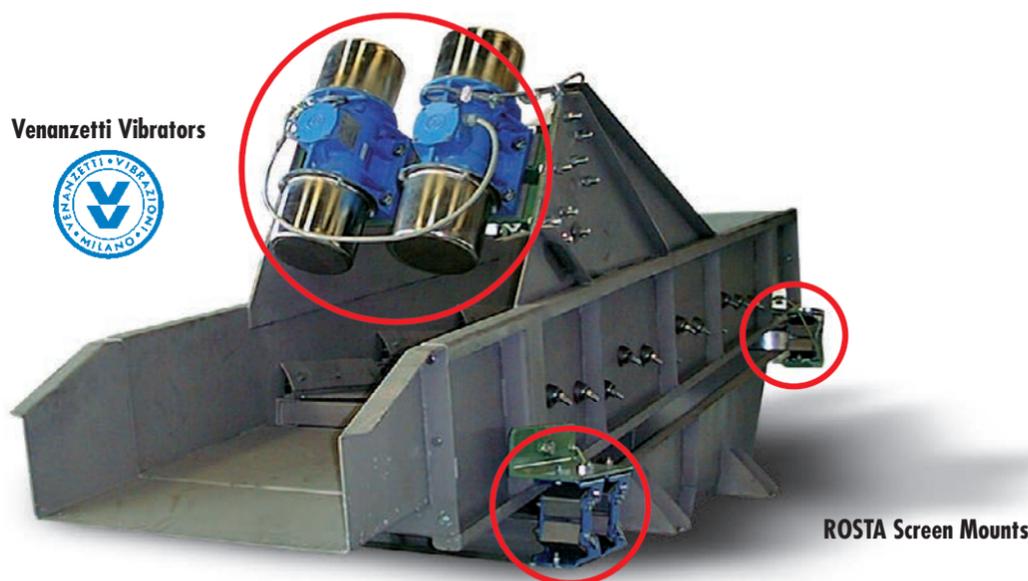
To cap the session, Grue offered 10 secrets to market success:

10. Learn about the challenges of the resource.
9. Understand the climate.
8. Respect the expertise in the market.
7. Learn to sell to engineers.
6. Understand the decision-making hierarchy.
5. Build support from influencers.
4. Establish a presence, be in the market.
3. Don't wait.
2. Bring solutions, not just products.
1. Build trust by delivering what you promise.

Grue warns potential suppliers that it takes time and money to tackle the energy market. Some have spent millions of dollars to make it happen. "It takes 18 to 36 months to really sell it. It seems daunting, but if you get a foot in, it's a 30- to 50-year market."

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

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#### CRITICAL LINKS

Visit [www.rainmaker-gbd.com/](http://www.rainmaker-gbd.com/), Market Development for an intro to the oil sands market.

Visit [www.supplychainforum.ca](http://www.supplychainforum.ca) for information about the Canadian Energy Supply Chain Forum Oct. 28-30 in Calgary.

# CIEN

## CANADIAN INDUSTRIAL EQUIPMENT NEWS

### » Efficiency Programs

ecoENERGY Efficiency for Industry offers up to 50% of eligible costs to a maximum of \$40,000.

Natural Resources Canada (NRCAN) provides resources to help incorporate energy management into best practices. The focus is on machinery and maintenance by establishing procedures that ensure greater efficiency and encourage responsible use of resources.

NRCAN has several programs in place to help your plant use energy smarter, but there's also funding available. Financial assistance flows through its ecoENERGY Efficiency for Industry program. It's directed at projects that improve industrial energy performance with assistance of up to 50% of eligible costs to a maximum of \$40,000.

ISO 50001 studies aim to support organizations that take a systematic approach to achieving continuous energy performance wins. Funded projects require a final report detailing energy performance improvements and the measures undertaken to meet the standard, including energy baseline and performance targets, timelines for achievement of targets, monitoring and reporting procedures, as well as projected results from the implementation.

Financial assistance is also available for process integration studies, which consist of a global energy analysis to determine the best use of heat in a facility. A site-wide approach employing an energy-mass balance, and specialized tools (such as pinch analysis) helps improve energy efficiency and competitiveness.

Other eligible projects may include:

- development and dissemination of tools and information related to energy efficiency;
- development, organization and delivery of training;
- assessments, evaluations and benchmarking studies; and
- development of technical guides and reports, implementation roadmaps, and best practices studies.

Here's how a forest products company reduced energy use through management best practices.

The company wanted to reduce energy use and greenhouse gas emissions so it applied for, and received, a \$2.37 million grant from NRCAN under the Pulp and Paper Green Transformation Program. With this investment, the mill reduced its water and energy consumption by



Use a site-wide approach to energy efficiency to improve competitiveness.

PHOTO: THINKSTOCK

# Smarter ENERGY use

## NRCAN OFFERS FUNDING FOR IMPROVEMENT PROJECTS

recycling filtrate within the bleach plant process. In addition, by upgrading its rotary lime kiln, energy use and lime consumption, the amount of suspended particulate matter, and the quantity of sulphur produced were all reduced.

### Improving performance

Funding was used to reduce oil consumption and GHG emissions in the recovery boiler with a retrofit of the cyclone evaporator that reduces liquor solids content to 68%. A new, strong black liquor storage system was also installed.

The grant supported a power boiler upgrade to an over-fire air system that reduces NOx emissions. Additionally, wood grinding equipment was installed for more efficient combustion. This upgrade increased the mill's annual pro-

duction of renewable energy by 12,040 gigajoules, displaced fossil fuels used for steam generation, and lowered its emissions by 6,250 tonnes per year.

A hog fuel management system that was implemented using Six Sigma promises significant savings. And a 2013 pilot reduced oil use by about 30 cubic metres from the year before, both years having similar weather conditions. This project required employee involvement but no investment.

Upgrades to the heat recovery system, among other energy efficiency projects, are to come.

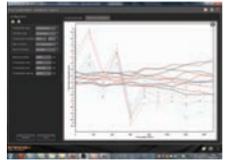
Visit <http://nrcan.gc.ca/energy/efficiency/industry/financial-assistance/5387>.

Source: Natural Resources Canada

### » Plantware

#### UPDATED LASER CALIBRATION

Renishaw's XCal-View software brings an updated look, increased functionality and greater flexibility to laser calibration data analysis.



Expected compensated performance.

The software, compatible with Renishaw's ML10, XL-80 and XR20-W rotary axis laser calibration systems, selects, edits and formats data.

Assessing machine errors and creating linear compensation files has been improved. The compare function overlays multiple data sets on the same screen, especially useful when monitoring the effect of mechanical and servo adjustments or comparing different types of data sets, such as linear and yaw errors. An "iprofile" entry screen generates data values fast.

Zero-point shifting offsets the data so the effective "i0i" position is different from the one used for data capture.

All graphs, statistics and data transfer easily to popular programs, including Microsoft Excel and most e-mail programs.

Renishaw (Canada) Ltd. based in Mississauga, Ont. is part of a global company that covers skills in measurement, motion control, spectroscopy and precision machining. [www.renishaw.com](http://www.renishaw.com)

#### HIGH PERFORMANCE IN SINGLE BOARD

Axiomtek's PICO880 fits the bill for integrators off industrial automation systems who require a compact, high-performance, single board computer.

It withstands temperature conditions from -20 to 70 degrees C and is expandable



with a PCI Express Mini Card slots and mSATA support. Withstands varied temperature conditions.

Two board-to-board connectors integrate audio, four USB 3.0 and USB 2.0, one PCIe x1, and a DisplayPort, two UARTs, LED and power on/off interfaces.

Standard features include one DDR3L SO-DIMM that supports up to 8 GB memory capacity; one USB 2.0 port; Intel AMT 9.5 support; one SATA-600 interface, one 10/100/1000 Mbps ethernet port that supports Wake-on-LAN, RPL/PXE; one DisplayPort and LVDS display interface with Intel integrated GFX graphic engine that delivers great 3D visual performance.

Axiomtek is a manufacturer of industrial PCs based in New Taipei City, Taiwan. [www.axiomtek.com](http://www.axiomtek.com)

## AUTOMATION



Multi-touch functionality

### PANEL PC IS FAST, FANLESS AND FLEXIBLE

B&R Automation's Panel PC 900 with multi-touch functionality takes advantage of state-of-the-art processors, including Intel Core i7 technology, to deliver high computing power.

Displays with an edge-to-edge, anti-glare glass surface and full-HD resolution monitors are available in four sizes ranging from 15.6 to 24 in.

With multi-touch functionality you zoom two fingers or quickly page forward with swipe gestures. Two-hand gestures for critical or potentially dangerous operations prevent unintentional operator errors.

Because they're fanless, SSD drives and CFast cards eliminate rotating components, making the systems maintenance free.

B&R is a manufacturer of industrial automation equipment based in Atlanta. [www.br-automation.com](http://www.br-automation.com)



### SENSORS DETECT FOREIGN SUBSTANCES

Carlo Gavazzi's multi-voltage CA-30CLN12M capacitive sensor with relay and optional time delay output detects solid, fluid or granulated substances. It's equipped with a two A SPDT relay output, and a time delay of up to 10 minutes

for feeding systems, silo and industrial applications.

The self-contained sensors assure a robust output and sensing flexibility. A threaded M30 housing makes mounting easy. Two IP67 integrated adjustment potentiometers adjust the sensing distances between 4 to 12 mm and there's an optional potentiometer for time delays between 1 sec and 10 mins.

The sensors are powered by a multi voltage supply between 21 to 255 VAC/DC with a 2 SPDT relay output. They're rated to NEMA 1, 2, 4, 4X, 5, 6, 6P and 12, as well as cULus approval and CE marking.

Carlo Gavazzi is a manufacturer of industrial automation equipment based in Buffalo Grove, Ill.

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

## POWER SUPPLY



### REMOTE, PORTABLE POWER SUPPLY

MicroPower Direct's compact MPM-05PB single output, 5 W switching power supplies include a universal AC input, full safety approvals, and robust filtering for industrial power applications including remote or portable equipment where a reliable ground is not always available.

Six standard models operate from a universal input of 85 to 264 VAC (110 to 370 VDC) and single outputs of 3.3, 5, 9, 12, 15, or 24 VDC. Standard features include filtering to EN 55022, an input/output isolation of 4,000 VAC, and tight line/load regulation. All models are protected for over voltage, over temperature and short circuit faults.

The units are rated to IEC Safety Class II input (IEC 61140) and are used

without an earth ground. Each model, approved to EN 60950 and RoHS compliant, handles operating temperatures between -25 to 70 degrees C.

MicroPower Direct is a supplier of power conversion products based in Stoughton, Mass.

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

## METALWORKING



Environmentally friendly.

### WELD CLEANING SYSTEM CUTS COSTS

Walter Surface Technologies' SURFOX weld electrochemical cleaning system is a green alternative to highly toxic method for weld cleaning and chemical passivation with an improved stainless steel passivation tester to lower costs.

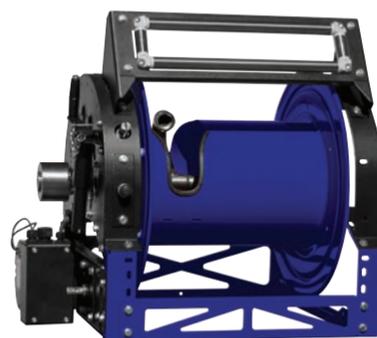
The system replaces mechanical abrasion and pickling paste with an electrolyte solution that's safer, environmentally friendly and increases efficiency.

Improved internal circuitry provides non-stop cleaning and a steady current for higher performance and productivity while eliminating downtime. There are also three settings for electrochemical cleaning, while a carbon fibre brush provides precise cleaning in narrow areas or tight corners. The improved tester's illuminated panel displays a numeric value to indicate passivation on the surface. It also logs data and protects it from tampering.

Walter Surface Technologies, based in Pointe-Claire, Que., develops products and systems for the metalworking industry.

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

## REELS



Compact footprint.

### REEL EASY

Coxreels' 1600 Series hand crank and motorized hose reels have a range of components configurations and a number of sizes to choose from for a robust platform.

They're available in a variety of drum and disc size combinations for many dimensions and hose length capacities, including 1 and 1-1/2 in. NPT, BSP or NST nickel-plated swivel inlets. A compact footprint fits in tight spaces.

An all-welded "hybrid" frame with the

strength of an "A" frame is mounted on a sturdy box frame.

Options include a universal bracket kit to accommodate the bevel gear rewind system and hose guide rollers at various angles.

A three gear ratio idler reduces speed and increases torque on motorized versions. The patent pending three-way industrial duty pin lock rewinds, locks and disengages the reel from free unwind and a three-way brake made of a high performance composite brake pad material has lock, drag friction and free spinning positions.

Coxreels is a manufacturer of hose, cord and cable reels based in Tempe, Ariz.

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

## CUTTING TOOLS

### PLASMA CUTTER HANDLES HEAVY-DUTY JOBS

Victor Thermal Dynamics's PAK 200i manual plasma cutting and gouging system delivers 100% duty cycle at 200 A, hand cutting up to 70 mm on mild steel, as well as 10 ipm (254 mm/min) on 51 mm carbon steel and removes up to 25 lb. of carbon steel per hour.



Removes up to 25 lb. per hour.

If there's accidental tip-to-work piece contact, the Tip Saver Plus feature reduces the tool's current to 35 A to ensure the tip is not damaged.

The unit also includes dual gas capability to improve cut quality and control on stainless steel and aluminum. The system can be configured to operate at 380-415 V, 480 V or 400 V CE.

It comes standard with the PCH 200 handheld torch, featuring a 70- or 90-degree torch head angle. A 180-degree torch for mechanized applications, such as pipe bevelling, is also available.

Applications include general fabrication, over the road transport trailers, railroad maintenance, vessel manufacturing, pipe bevelling and fabrication, petroleum refineries, foundries, chemical plants, mining operations and shipbuilding.

Victor Thermal Dynamics is a manufacturer of plasma cutting systems based in St. Louis, Mo.

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

## MACHINE VISION

### SENSORS SIMPLIFY 3D APPLICATIONS

Cognex Corp. has expanded its DS1000 3D laser displacement sensors, to now include an industrial vision controller and vision tool to perform 3D machine vision applications that require high resolution and expanded measurement ranges.

They're bundled with the company's VC5 vision controller, which handles up to four 3D sensors, as well as factory-

## TEST AND MEASUREMENT



### LASER METERS ARE USB-ENABLED

Ophir Photonics' USB version of the StarLite handheld, laser power/energy meter communicates directly with a PC that displays all measurements with StarLab 3.0 software.

The compact, lightweight unit covers a variety of beam measurements, including power, single shot energy, energy and frequency of high repetition rate lasers, and beam position and size.

A 320 x 240 pixel TFT display with 16 mm digits improves legibility and monitors power from pW to kW or energy from pJ to hundreds of Joules.

A USB option adds PC communication and data processing.

The meter monitors laser beam size and tracks position when used with BeamTrack thermal detectors.

320 x 240 pixel TFT display.

StarLab software graphically displays power meter data as line plot, histogram, bar chart or simulated analogue needle. Icons and graphics guide the user through the application, screen capture and print, and reverse highlighting of the numeric display. A COM object integrates laser beam measurements into sophisticated programming environments, such as Microsoft's Visual Basic, LabVIEW and MatLab.

And a "Smart Connector" interface automatically configures and calibrates the display when plugged into one of the company's measurement sensors.

Ophir Photonics is a developer of industrial instrumentation based in North Logan, Utah.

[www.ophiropt.com/photonics](http://www.ophiropt.com/photonics)

Expanded measurement ranges.



floor communications. It's pre-installed with Cognex Designer, an easy-to-configure software framework that simplifies 3D applications and the creation of graphical user interfaces.

The unit provides 3D tools such as height, plane fitting, plane-to-plane angle, volume, and cross section, giving it the power to perform all 3D inspections. It also delivers sub-micron measurements, addresses contrast-independent OCR and presence/absence applications.

Laser triangulation extracts 3D information from scanned parts, while displacement sensors allow precision inspection of parts regardless of contrast or lighting conditions. It's factory-calibrated for fast, consistent mounting.

Cognex is a developer of machine vision technologies based in Natick, Mass. [www.cognex.com](http://www.cognex.com)

## TOOLS

### NO-DAMAGE TUBE ASSEMBLY

RIDGID's inner tube core barrel wrench makes short work of extracting core samples from inner tubes in mineral exploration, geotechnical and environmental core drilling and soil sampling.

The wrench is fitted with a textured gripping surface that doesn't slip, so outer and inner tube components assemble and disassemble without damaging or deforming tubes or accessories.

Replaceable inserts extend the total lifetime of the tool and maximize grip strength while minimizing tube abrasion. Three-jaws prevent tube distortion, ensuring the inner tube of the core barrel system continues to fit within the outer tube. Jaws lock to prevent disengagement from the tube for simple making and breaking of connections and one-handed ratcheting.

The wrench is available in WLN-IT (Size N) and WLH-IT (Size H), WLB-IT (Size B) and WLP-IT (Size P).

RIDGID is a manufacturer of industrial tools and equipment based in Elyria, Ohio. [www.ridgid.com](http://www.ridgid.com)



No slip grip.

## WELDING

### HIGH-POWER WELDERS HANDLE BIG JOBS

Lincoln Electric's Vantage engine-driven welder series now comes in two models, both equipped with a Tier 4 Final (T4F) compliant Deutz turbo-charged diesel engine that meet new EPA diesel fuel emission standards for industrial applications.

Both welders are powered by 64 hp engines that produce 600 A/40 V at 60% duty cycle and 575 A/43 V at 100% duty cycle. Each model is capable of delivering 12,000 W single phase of 20,000 W three-phase and 120 or 240 VAC generator power. They handle stick, TIG, MIG and Flux-cored wire welding, and arc gouging.

Waveform Control delivers smoother arc characteristics, faster arc response and improved pipe welding, including reduced spatter. New pulsing capabilities improve arc control for out-of-position work and reduce heat input to lessen material distortion.

ArLink digital communication enables fast, reliable communications with components such as the Power Feed 25M semiautomatic wire feeder. Welding teams employ user memory presets for common repeated application welding procedures, as well as operator limits and lockouts.

A VMAC belt-drive rotary screw compressor produces up to 150 psi system pressure with on/off capabilities and gauges for monitoring compressor hours and pressure.

Lincoln Electric is a manufacturer of welding equipment based in Cleveland.

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



64 hp engines.

## CONNECTORS

### CONNECTORS HANDLE TOUGH ENVIRONMENTS

Appleton Electric's Powertite line of industrial plugs, receptacles and connectors has been expanded with 30 and 60 A non-metallic, corrosive-resistant plugs versions. Use them with all UL 1686-C1 receptacles in sewage plants, shipping docks, food and beverage processing plants, or other environments exposed to corrosives, frequent hose downs or severe weather.

An impact-modified PBT polyester housing resists corrosion, deformation and cracking, while UV-stabilization prevents degradation from sun exposure. A dual-moulded locking ring has rigid plastic threads on the inside and a rubberized grip on the outside for easily securing the plug to the receptacle.



NEMA 4X rated.

The plugs, rated to UL standards 1682, 1686, and 50E - Type 4X and 12, are also fitted with an extra large wiring chamber with backed-out terminal screws. A screwless tab locks the shell halves together in place with a simple push for a NEMA 4X-rated watertight seal.

Appleton Electric is a manufacturer of industrial electric products based in Rosemont, Ill.

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

## LINEAR MODULES

### LINEAR MODULE POSITION'S BIG LOADS

Schunk has combined a powerful linear motor drive with an ultra-smooth pre-loaded roller guide for its ELB linear axis. It provides precise and dynamic strokes in a module that position's high loads with accuracy of 0.01 mm.

The unit's maximum acceleration is 100 ms<sup>-2</sup> and maximum speed is 4 ms<sup>-1</sup>. Driving force (max. 150 N) is transmitted directly to the slide by the play-free



Repeat accuracy of 0.01 mm.

junction roller guide to enhance precision, shorten cycle times, and increase productivity and process stability in joining and placement processes.

The module comes in 50, 75 and 125 mm stroke versions. It can be equipped with an incremental stroke measuring system (sine/cosine interface) or with an absolute displacement encoder (Hiperface or SSI interface).

The modules are controlled either by the Bosch Rexroth IndraDrive controller or by the Siemens SINAMICS inverter.

Schunk, a manufacturer of industrial clamping and gripping systems based in Raleigh, NC says standard controller interfaces allow the module to be integrated into high-level control system quickly.

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

## » Events

### DMG Events

Sept. 29-Oct. 3, Calgary

The International Pipeline Exposition & Conference (IPE), a biennial event, showcases more than 200 of the pipeline industry's brands and the latest technologies, products and services. Approximately 5,000 registered participants. The Topics International Pipeline Conference is held in conjunction with IPE. Visit [www.internationalpipelineexposition.com](http://www.internationalpipelineexposition.com).

### PTDA Industry Summit

PTDA

Oct. 23-25, Orlando, Fla.

Power Transmission Distributors Association (PTDA) presents educational programming, business development opportunities and networking. The event includes MD-IDEX and the Manufacturer/Distributor Idea Exchange. Visit [www.ptda.org/IndustrySummit](http://www.ptda.org/IndustrySummit).

### Canadian Energy Supply Chain Forum JWN/AIPMAC

Oct. 28-30, Calgary

The Canadian Energy Supply Chain Forum (CESCF) brings energy companies and their supply chain partners together to explore long-term strategies. Presented by JuneWarren-Nickle's Energy Group (JWN) and The Alberta Institute of Purchasing Management Association of Canada (AIPMAC). Visit [www.supplychainforum.ca](http://www.supplychainforum.ca). E-mail [regsupport@junewarren-nickles.com](mailto:regsupport@junewarren-nickles.com). Call (866) 671-2778.

### MainTrain 2014

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# NGO radicals distort energy development

BY GWYN MORGAN

Under Canadian laws, major projects are subjected to regulatory hearings conducted by panels possessing the necessary expertise to reach technically and environmentally sound decisions. Proponents and opponents make their cases for and against, recognizing that the tribunal will ultimately determine the project's fate.

That was before "social licence," a term invented 20 years ago by BC mining engineer James Cooney, morphed into

**"In this dynamic, the playing field is almost always tipped against the project sponsor..."**

an additional obstacle for project sponsors to overcome. Cooney's new term was meant to describe a process whereby local populations would be informed about a project and their feedback taken into consideration in final plan design.

This logical and important step has since burgeoned into the expectation that no project should proceed without gaining broad "social licence," thereby presenting anti-development lobbies

with the opportunity to impact a project's fate by fostering opposition from those directly affected, and the public.

In this dynamic, the playing field is almost always tipped against the project sponsor. Opponents can make sensationally exaggerated and false allegations about a project without any fear of reprisal, even the smallest discrepancies in the project sponsor's information are met with a chorus of strident criticism.

A case in point is the huge effort that radical NGOs have exerted to convince First Nation groups that Northern Gateway, one of the most robust and safest pipelines ever designed, would destroy their water supplies and pollute their soil. These same groundless tactics have been used in an effort to turn public opinion across Canada against the project, while the NGO's real agenda is to stop development of the oil sands.

Multinational NGOs opposing Northern Gateway are also campaigning against the proposed Keystone XL pipeline, which would supply US oil refineries, and applying the same scurrilous tactics.

Among the vigorous, well-funded anti oil sands propaganda campaigns is Sierra Club's "Stop the Keystone XL" website that alleges, "Dirty oil sands development is ... decimating caribou populations ... and wolves are being shot ... from helicopters" ... Really? And San Francisco-based ForestEthics is conducting a "Stop the US Demand for Canada's Toxic Oil Sands" campaign aimed at Keystone XL. ForestEthics is also behind a "Clean up Your Transportation" campaign that has 19 major companies and two US cities pledging not buy product from oil sands refineries.

## New radicals

Meanwhile, rock stars and actors make well publicized "fact finding" visits to the oil sands where, after their earnest industry hosts have proudly shown their efforts to minimize environmental impacts, the celebrities spout apocalyptic anti-oil sands diatribes for the media before roaring off in their fossil-fuelled private jets.

A clear indication of contempt for due process under the laws of our land came in the wake of the federal cabinet's conditional approval of Northern Gateway. ForestEthics Oil Sands Campaign Director Ben West stated, "We will be helping organize non-violent direct action trainings. We hope it doesn't have to come to that, but we are getting organized to make sure folks will be safe if the courts fail to stop the project in time."

By the time large resource development projects reach the regulatory decision stage, many years and billions of dollars have been invested in identifying the resource, designing the facilities and the regulatory process itself. Shareholder support for these huge up-front risks is only possible if the regulatory process is clearly definable and the result enforceable.

Expecting project sponsors to win a public popularity contest against the fact distorting propaganda of ideologically anti-development NGOs would bring Canada's most important economic driver to a screeching halt.

*Gwyn Morgan is the retired founding CEO of EnCana Corp. This column is distributed by Calgary-based Troy Media.*

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



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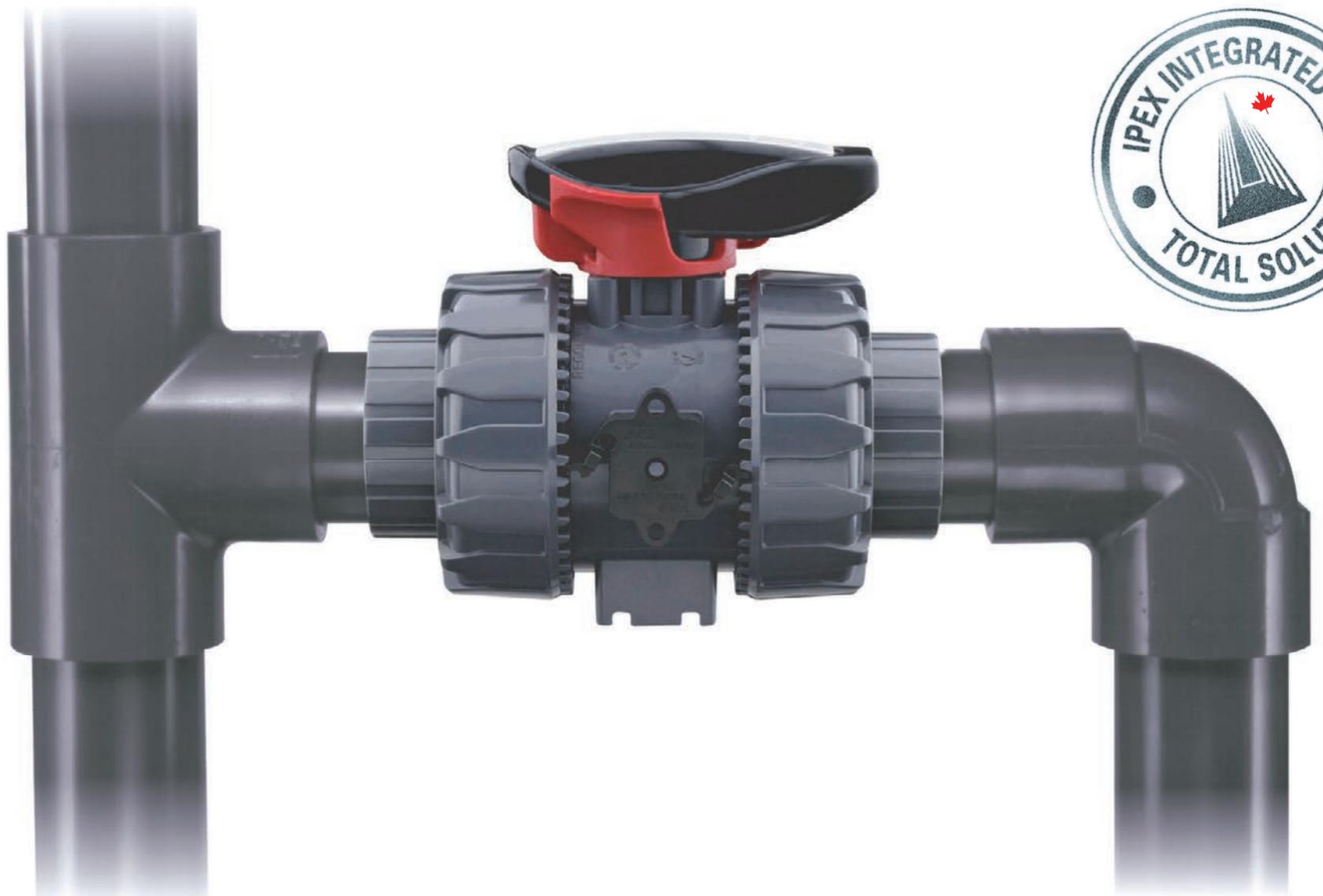
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