

# PLANT

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CANADIAN  
MANUFACTURING

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## HOT STUFF

PepperNorth scales up  
its sauce production

- Canada's automotive future
- Welland gets its groove back
- Pressure point: Managing IIoT risk
- CarbonCure makes the Clean Tech 100

# The Truth About Compressed Air!

If you think compressed air is too expensive and noisy - read this. The facts will surprise you!

## Compare these Blowoffs

There are a variety of ways to blow the water from the bottles shown in the photo below, but which method is best? To decide, we ran a comparison test on the same application using four different blowoff methods: drilled pipe, flat air nozzles, Super Air Knife (each using compressed air as a power source), and a blower supplied air knife (using an electric motor as a power source). Each system consisted of two twelve inch long air knives. The following comparison proves that the EXAIR Super Air Knife is the best choice for your blowoff, cooling or drying application.

The goal for each of the blowoff choices was to use the least amount of air possible to get the job done (lowest energy and noise level). The compressed air pressure required was 60 PSIG which provided adequate velocity to blow the water off. The blower used had a ten horsepower motor and was a centrifugal type blower at 18,000 RPM. The table at the bottom of the page summarizes the overall performance. Since your actual part may have an odd configuration, holes or sharp edges, we took sound level measurements in free air (no impinging surface).

### Drilled Pipe

This common blowoff is very inexpensive and easy to make. For this test, we used (2) drilled pipes, each with (25) 1/16" diameter holes on 1/2" centers. As shown in the test results below, the drilled pipe performed poorly. The initial cost of the drilled pipe is overshadowed by its high energy use. The holes are easily blocked and the noise level is excessive - both of which violate OSHA requirements. Velocity across the entire length was very inconsistent with spikes of air and numerous dead spots.



### Blower Air Knife

The blower proved to be an expensive, noisy option. As noted below, the purchase price is high. Operating cost was considerably lower than the drilled pipe and flat air nozzle, but was comparable to EXAIR's Super Air Knife. The large blower with its two 3" (8cm) diameter hoses requires significant mounting space compared to the others. Noise level was high at 90 dBA. There was no option for cycling it on and off to conserve energy like the other blowoffs. Costly bearing and filter maintenance along with downtime were also negative factors.



### Flat Air Nozzles

As shown below, this inexpensive air nozzle was the worst performer. It is available in plastic, aluminum and stainless steel from several manufacturers. The flat air nozzle provides some entrainment, but suffers from many of the same problems as the drilled pipe. Operating cost and noise level are both high. Some manufacturers offer flat air nozzles where the holes can be blocked - an OSHA violation. Velocity was inconsistent with spikes of air.



### EXAIR Super Air Knife

The Super Air Knife did an exceptional job of removing the moisture on one pass due to the uniformity of the laminar airflow. The sound level was extremely low. For this application, energy use was slightly higher than the blower but can be less than the blower if cycling on and off is possible. Safe operation is not an issue since the Super Air Knife can not be dead-ended. Maintenance costs are low since there are no moving parts to wear out.



## Facts about Blowers

Energy conscious plants might think a blower to be a better choice due to its slightly lower electrical consumption compared to a compressor. In reality, a blower is an expensive capital expenditure that requires frequent downtime and costly maintenance of filters, belts and bearings.

### Here are some important facts:

- Filters must be replaced every one to three months.
- Belts must be replaced every three to six months.
- Typical bearing replacement is at least once a year at a cost near \$1000.
- Blower bearings wear out quickly due to the high speeds (17-20,000 RPM) required to generate effective airflows.
- Poorly designed seals that allow dirt and moisture infiltration and environments above 125°F decrease the one year bearing life.
- Many bearings can not be replaced in the field, resulting in downtime to send the assembly back to the manufacturer.

Blowers take up a lot of space and often produce sound levels that exceed OSHA noise level exposure requirements. Air volume and velocity are often difficult to control since mechanical adjustments are required.

To discuss an application, contact:

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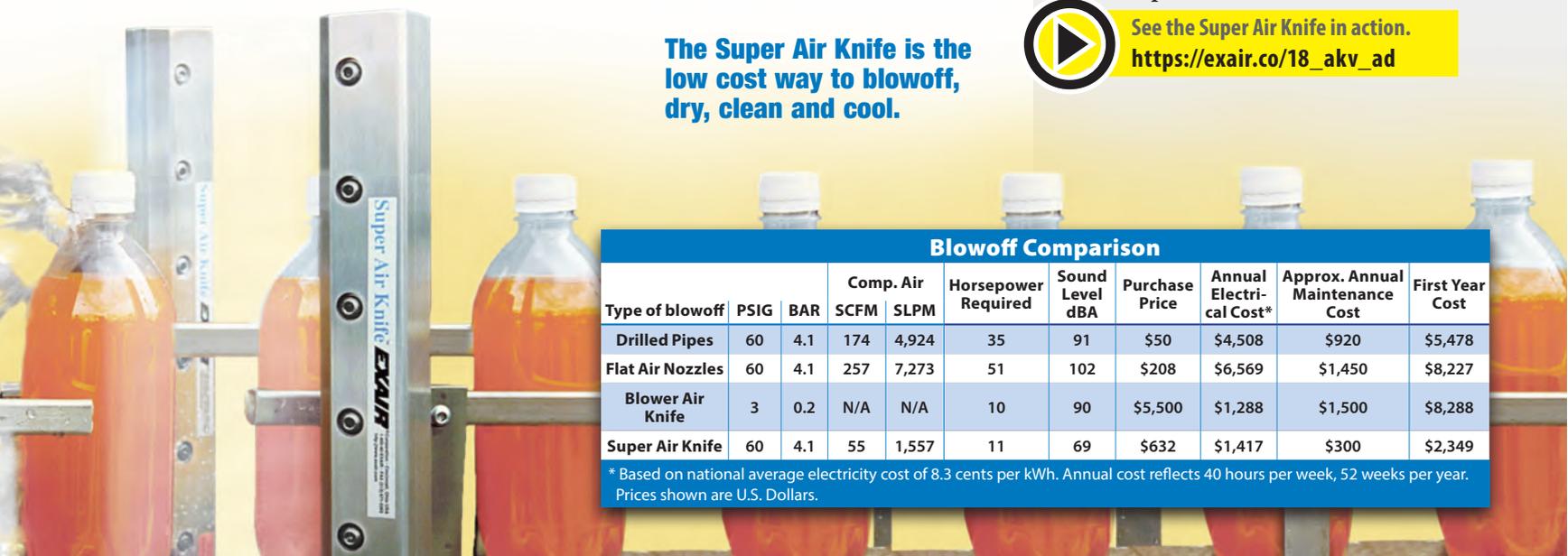
See the Super Air Knife in action.  
[https://exair.co/18\\_akv\\_ad](https://exair.co/18_akv_ad)

The Super Air Knife is the low cost way to blowoff, dry, clean and cool.

### Blowoff Comparison

Type of blowoff	PSI		Comp. Air		Horsepower Required	Sound Level dBA	Purchase Price	Annual Electrical Cost*	Approx. Annual Maintenance Cost	First Year Cost
	PSIG	BAR	SCFM	SLPM						
Drilled Pipes	60	4.1	174	4,924	35	91	\$50	\$4,508	\$920	\$5,478
Flat Air Nozzles	60	4.1	257	7,273	51	102	\$208	\$6,569	\$1,450	\$8,227
Blower Air Knife	3	0.2	N/A	N/A	10	90	\$5,500	\$1,288	\$1,500	\$8,288
Super Air Knife	60	4.1	55	1,557	11	69	\$632	\$1,417	\$300	\$2,349

\* Based on national average electricity cost of 8.3 cents per kWh. Annual cost reflects 40 hours per week, 52 weeks per year. Prices shown are U.S. Dollars.





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# Short-term gain, long-term pain

**G**uess what was supposed to happen in 2019? Aside from this being an election year, no more federal budget deficits. At least that was the pledge Justin Trudeau made when he campaigned for his dad's old job in Ottawa back in 2015. Since this is an election year, the Trudeau Liberal deficit addiction bears some scrutiny.

Last time around, he laid out a platform that promised deficits of no more than \$10 billion a year for the first three years and we'd be deficit-free by this year. All that planned spending during a period of non-economic turmoil was supposed to bolster Canada's so-called crumbling infrastructure and presumably cover Liberal policy commitments.

Well didn't Justin and his pals blow by that \$10 billion in the first eight months, clocking in at \$12.7 billion. That compares to a \$1 billion surplus under the previous regime the year before. And they have been busting through that ceiling every year since, abandoning any pretext of eliminating budget deficits. More than \$75 billion has been added to the federal debt, compared to the \$20 billion based on the Liberal's election plan.

Most folks have credit cards. If we spend on credit, we are required to make a minimum payment and cover hefty interest charges.

Governments have to pay interest too, although not nearly as much as we do on our credit card balances. But it's okay for them because of a rationalization called the debt to GDP ratio. That means the debt can pile up as long as the spender continues to pay interest without refinancing or harming the economy. And it can be pushed ahead for an eternity.

Not to worry, Trudeau says. The economy is humming, unemployment is low and business profits are up. Besides, finance minister Bill Morneau contends deficits and debts aren't all that important.

Former Prime Minister Paul Martin supports the Trudeau government's proclivity for deficits, being a good Liberal and this an election year. He is also aware of the danger presented by endless deficits and mounting debt.

In 1993, as finance minister, he faced a yearly deficit of \$42 billion after successive governments piled up red ink over the previous 25 years, starting with Trudeau senior. It was alarming enough for the government to slash \$25 billion from the federal budget in three years and post five budget surpluses, which allowed the government to ramp up its spending. Laser focus on the debt to GDP ratio, of course.

But what happens if the economy goes south because of a recession? Or, for example, an unexpected Trump eruption results in the US scuttling the NAFTA redo? What if interest rates are hiked? Growing interest payments will impact productive spending.

Here are some numbers to consider. Canada's net debt as of 2017-18 was \$758.8 billion with a \$26 billion interest charge.

A finance department report shows federal deficits until 2040-41. The debt will be almost erased by 2050, as the ratio drops from 28.5% in 2023-24 to 24% in 2055-56. But this dubious scenario presumes surpluses in the 2040s and 2050s go directly to reducing the debt. It's dubious because governments in the past (and current) always found reasons to put off debt reduction.

By contrast, the 2014 version of the financial report under the Stephen Harper regime projected decades of consecutive surpluses (perhaps equally dubious).

The Trudeau government wasn't elected in 2015 on a platform that included deficits and debt as far as the eye can see. Someone, please, revoke that credit card. This is short-term gain for long-term pain that saddles future generations with the risk and the fallout.

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# PLANT EXPO

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## BULLETINS

**3M Canada** received \$40,000 for implementing the ISO 50001 Energy Management Systems Standard from Natural Resources Canada through the Canadian Industry Partnership for Energy Conservation (CIPEC). The project enabled 3M Canada to improve the energy performance by 11.6% (since 2015) at its Brockville, Ont. personal safety manufacturing facility.

**BIOREM Inc.**, a clean tech company in Guelph, Ont., is expanding its global reach with new distribution partnerships. The company manufactures high-efficiency air emissions control systems used to eliminate odours, volatile organic compounds and hazardous air pollutants. Its products will be distributed by **Residum Solutions** in Barcelona, Spain and with **Korea Membrane Engineering Co.** in Seoul, South Korea.

**BDC**, a Crown corporation that provides financing to Canadian companies, is investing \$8-million in **Equispheres**, a Kanata, Ont.-based advanced materials firm. Equispheres will use the funding to execute its growth plan and secure contracts for its metal powders used in additive manufacturing applications that reduce fuel consumption and manufacturing waste.

**Automation D'Amours**, a specialist in robotics, industrial automation and instrumentation in Sayabec, Que., received \$380,000 from Canada Economic Development for Quebec Regions. The repayable contribution helped the company expand its plant and purchase an overhead crane and robots with cameras. More than \$950,000 was invested in the project.

**PowerHaz Energy Mobile Solutions Inc.**, a wholly owned subsidiary of **Cellcube Energy Storage Systems Inc.** in Edmonton, received \$500,000 in purchase order commitments from a national customer for engineered equipment. CellCube supplies vertically integrated energy storage systems to the power industry and recently acquired the assets of **Gildemeister Energy Storage GmbH**, renamed **Enerox GmbH**, the developer and manufacturer of CellCube energy storage systems.

## Air Liquide adds 20-MW electrolyzer hydrogen plant

Hydrogenics to deliver world's first system



*Air Liquide hydrogen production facility in Becancour, Que. PHOTO: AIR LIQUIDE*

**MISSISSAUGA, Ont.** — Air Liquide Canada has tapped Hydrogenics Corp. to design, build and install a 20-megawatt electrolyzer system for a hydrogen production facility in Quebec.

Hydrogenics, a manufacturer of hydrogen generation and fuel cell modules based in Mississauga, Ont., said the facility will use its advanced large-scale PEM electrolyzer technology. The plant is to be in commercial operation by the end of 2020, with an annual hydrogen output of just under 3,000 tons.

Air Liquide, a producer and distributor of industrial and specialty gases, will install the electrolyzer, which it describes as the largest in the world, at its hydrogen facility located in Becancour. The electrolyzer will increase the facility's capacity by 50%.

The company said the new production unit will significantly reduce carbon intensity compared to the traditional hydrogen production process by nearly 27,000 tonnes.

Hydrogenics has manufacturing sites, offices, engineering and service professionals in Germany, Belgium and Canada, and service centres in Russia, Europe, the US and Canada.

## Fortress Xylitol gets \$10M from NRCan for demo plant

**VANCOUVER** — Fortress Xylitol Inc. is getting \$10 million from Natural Resources Canada (NRCan) to support construction of a xylitol and bioproducts demonstration plant at the company's dissolving pulp mill in Thurso, Que.

The funding is in addition to previously announced federal and provincial contributions up to \$17.4 million.

The plant will demonstrate technology for the co-production of bioproducts. The aim is to transform the mill into a biorefinery.

Fortress Xylitol's process is expected to validate performance and produce pre-commercial quantities of the food-grade sweetener xylitol, plus complementary bioproducts for testing and use by customers.

"The demonstration plant project builds on the acquisition of S2G Biochemicals Inc. and the company's hemicellulose project at the Thurso mill," said Giovanni Iadaluca, president and CEO of Fortress.

Fortress Xylitol is a wholly owned subsidiary of Fortress Global Enterprises Inc., which operates its bioproducts business through Fortress Advanced Bioproducts Inc. in Vancouver.

## Refresco buys Cott pop business

**MISSISSAUGA, Ont.** — Cott Corp. has moved right out of carbonated beverages with the sale of its soft drink concentrate production business and its RCI International division (Cott Beverages LLC) to Refresco for US\$50 million.

Refresco, and independent bottler based in Rotterdam, then sold the RCI worldwide branded activities to RC Global Beverages Inc.

Cott Beverages LLC, which makes soft drink concentrates for bottlers in more than 70 countries, had \$80 million in sales during 2018, including concentrate production directly supporting Refresco's beverage manufacturing business.

Cott, based in Mississauga, Ont., describes itself as a water, coffee, tea, extracts and filtration service company.

## Partners to brew cannabis beer

Province Brands, Canna will co-package

**CAMBRIDGE BAY, NU** — Province Brands of Canada will produce a private label cannabis-brew beer through Canna Island Inc., a subsidiary of Murphy Hospitality Group (MHG) in PEI.

Province Brands is a beverage producer based in Cambridge Bay, a hamlet



*(L-R) Alex Youland, MHG's senior human resources manager and Adam Loo, culinary operations manager. PHOTO: MHG*

on Victoria Island in the Kitikmeot Region of Nunavut. MHG is a Charlottetown brewer and owner of restaurants, hotels and brew pubs operating in the Martimes. The companies will co-package a non-alcoholic, cannabis-brewed beer and beer infused with cannabis oil.

The beer will use a unique recipe from MHG, with production coming from Province Brands' 123,000 square-foot facility in Grimsby, Ont., which is under construction.

The buzz will come from the THC and other phyto-cannabinoids.

## Second factory for Canada Goose

Montreal-area plant to support 650 jobs by 2020

### TORONTO

— Canada Goose is opening its second factory in Quebec and eighth wholly owned manufacturing facility in Canada.

The manufacturer of luxury down-filled jackets said the new plant in the Chabanel area of Montreal is 115,000 square-feet. In operation by the end of March, it will employ more than 100 people, but the company expects the facility to support 650 jobs at full capacity by the end of 2020.

The factory will be equipped with the latest in wireless manufacturing technology and each sewer will have a tablet for digital guidance on operational execution. Production will cover the full Canada Goose collection, which is sold in more than 40 countries.

Canada Goose has three sites in Winnipeg, three in the Greater Toronto Area, and one in Boisbriand, Que., opened in 2017.



Canada Goose parkas challenging the cold at Observation Hill in Antarctica. PHOTO: GAELAN MARSDEN.

## Electra Meccanica opens SOLO production plant in China

EV maker to deliver 5,000 single-passenger vehicles this year

**VANCOUVER** — Electric vehicles (EV) manufacturer Electra Meccanica Vehicles Corp. has opened its Zongshen SOLO EV production facility in Chongqing, China.

The automotive manufacturer based in Vancouver said the plant, currently producing the company's SOLO single passenger EV, is to complete 50 vehicles by the end of March as it ramps up production to deliver 5,000 vehicles by the end of the year.

The company says its SOLO vehicle, which retails for \$15,500, has a 161-kilometre range, cruises comfortably at highway speeds and charges on a regular household 110-volt socket in under six hours.



Steven Sanders, chairman and Jerry Kroll, CEO, with a production SOLO EV at the Zongshen Facility.

PHOTO: ELECTRA MECCANICA VEHICLES

Electra Meccanica has been sourcing components from China and assembling the vehicle at its New Westminster, BC plant, but is shifting manufacturing to Zongshen for mass production.

## UK's Dairy Crest adds to Saputo's reach

**MONTREAL** — Saputo Inc. is expanding into the British dairy market with its \$1.7 billion acquisition of the Dairy Crest Group.

Headquartered in the UK, Dairy Crest manufactures and markets cheese, butters, spreads and oils under various British brands.

It also makes value-added dairy ingredients.

The company employs approximately 1,100 people in seven locations across the country.

Saputo, based in Montreal, makes a wide array of dairy products. As one of the top 10 dairy processors in the world, it has production facilities in Australia, Argentina and the US, where it ranks among the top three cheese producers.

## Smucker invests \$12M in its Sherbrooke plant

**SHERBROOKE, Que.** — Smucker Foods of Canada Corp. is investing \$12 million in its manufacturing facility in Sherbrooke, Que.

The plant, which employs 35 people, produces Carnation evaporated milk and Eagle Brand sweetened condensed milk products for Canadian consumers.

The investment is supported by \$1.8 million from the Federal Ministry of Agriculture and Agri-Food.

Smucker said it will upgrade equipment to increase the plant's flexibility and the variety of products produced while broadening its sourcing of domestic milk.

"This investment will go a long way toward solidifying our long-term presence in Sherbrooke," said Aurelio Calabretta, vice-president and general manager for Smucker Foods of Canada. "Through this initiative, we will be able to introduce new packaging capabilities previously unavailable to us in Canada."

Smucker, a subsidiary of The J. M. Smucker Co. in the US, began offering its products in Canada in 1988.

It has operations in Sherbrooke, Montreal, Markham and Brampton, Ont., and Calgary.

## CAREERS

Walter, a cutting tool manufacturer with regional headquarters in Waukesha, Wis., has appointed

**Richard Garrick** president of sales region world west. This territory includes



Richard Garrick

Walter Canada, Walter US, Walter Brazil and Walter Mexico. He was formerly the president of tool manufacturer Precorp, which joined Sandvik Machining Solutions in 2013.

### Mark Majewski

is the new CEO at IntelliFLEX Innovation Alliance, a not-for-profit industry partner based in Mississauga, Ont. It's focused on accelerating the growth of the printable, flexible



Mark Majewski

and hybrid electronics sector across Canada. He succeeds founding CEO **Peter Kallai**. Majewski is an experienced technology executive who ran the East Central US and Canada regions for STMicroelectronics.

Universal mCloud Corp., a Vancouver-based provider of artificial intelligence and analytics, and IoT-connected asset care technology, has appointed **Barry Po** chief product officer. He'll lead Universal mCloud's product management and marketing functions. Po joined the company in 2018 with the acquisition of NGRain (Canada) Corp. where he oversaw product management, marketing and business development.

Acceleware Ltd., a Calgary-based developer of radio frequency (RF) heating technology used to extract heavy oil and bitumen, and provide high-performance seismic imaging, has added two new executives. **Laura McIntyre**, vice-president, engineering, is a 15-year veteran in the industry, much of it involving work on thermal in-situ projects at two major oil sands producers. CFO **Brian LeBlanc** has served in senior executive roles, covering oil and gas, energy service, chemical processing, manufacturing, and wholesale/retail distribution.

## Oil sands treatment systems commissioned

MGX Minerals, PurLucid have two on the go and a third on the way

VANCOUVER — MGX Minerals Inc. and engineering partner PurLucid Treatment Solutions are commissioning a second advanced oil sands lithium extraction and wastewater treatment system that processes up to 10 cubic metres per hour. Mobilization of a third system is also finalized.

The Vancouver resource and technology company said the system will significantly reduce greenhouse gases through energy savings from steam-assisted gravity drainage in oil sands extraction (SAGD), while eliminating the need for offsite trucking and disposal.

MGX's rapid lithium extraction technology eliminates or greatly reduces the physical footprint and investment in large, multi-phase, lake-sized, lined evaporation ponds. The company's technology is



Raw water, intermediate chemical, final water prior to desalinization.

PHOTO: MXG MINERALS

applied across a complex range of brines, including petrolithium (oil and gas wastewater), natural brine and other brine sources such as lithium-rich mine and industrial

plant wastewater.

Water is treated in line, under temperature and pressure, without cooling first. This will result in significantly less energy use, a reduction in greenhouse gases and it eliminates heat exchanger fouling, a major operational challenge of SAGD facilities.

Lithium can be extracted by the technology once the water is cleaned of oil and bitumen during front-end water treatment system processing.

PurLucid's nanoflotation technology separates impurities from oil and gas wastewater and produces clean water as a final product. This allows for the recycling or controlled release of oilfield wastewater and reduces or eliminates downhole and associated transportation costs.



## PLANT ONLINE

### SOUNDING OFF

What readers have to say about breaking news

Have you checked out **PLANT**'s daily news online? Here are some headlines that have inspired members of the Canadian manufacturing community to chime in. They're edited, but use the links to see the raw — and for some — longer versions of their remarks plus the stories that inspired their reactions.

Stay up-to-date on the developments — domestic and global — that affect Canada's industrial sectors by watching the news feed at [www.plant.ca](http://www.plant.ca) or reading **PLANT**'s twice-weekly newsletter (hit Subscribe on the website).

#### Marketing? Get serious. Five reasons why you should embrace it

<http://www.plant.ca/GU08y>

➤ When marketing is an integrated activity with sales and communications — including traditional and online tactics — it's a powerful tool to help build a brand. However, from my experience, trade shows still work well. There is a trend to return to relationship building and trade shows are a perfect environment for face-to-face interactions. In fact, many companies that live online, such as Facebook and Yelp, have increased their conference activities!

#### Air Liquide adds 20 MW hydrogen system to Bécancour plant

<http://www.plant.ca/dMwjB>

➤ Sounds great but too bad they are generating the hydrogen by electrolyzing water. They should be extracting the hydrogen from oil and natural gas. So instead of burning hydrocarbons we use them to get hydrogen and generate electricity using fuel cells, thus eliminating the need to use precious water. Just think, you only need one utility hook up, hydrogen piped in like natural gas that's used to generate electricity to run everything in our houses and vehicles.

#### Butts, Trudeau's principal secretary, resigns amid SNC-Lavalin furor

<http://www.plant.ca/MgCVG>

➤ Well Wilson-Raybould did resign from cabinet so I guess that means she felt improper pressure coming from either Justin Trudeau or the PMO.

#### [15-sec. RANT] Ford government wants us to roll over on tariffs: Huh???

[www.plant.ca/yIY8M](http://www.plant.ca/yIY8M)

➤ The US will drop the tariffs when it's in their interests. It might not happen until the next election.

#### Federal spending dangerously near record Canadian levels

[www.plant.ca/D6tHW](http://www.plant.ca/D6tHW)

➤ The Fraser Institute opinions are almost uniformly predictable in their "take" and I find their predictably at odds with those of more mainstream economists, hence not particularly helpful. A more balanced approach would,

in my opinion, be more useful and pragmatic.

➤ Federal government spending as a percentage of GDP is in line with or lower than most all of the last several decades.

#### Trans Mountain pipeline work destroyed salmon habitat: scientist

[www.plant.ca/eKxWk](http://www.plant.ca/eKxWk)

➤ At all costs, save the salmon habitat and the salmon. Improve damage control. Orcas, bear depend on this.

#### Driverless cars now allowed on Ontario roads

[www.plant.ca/3P9EF](http://www.plant.ca/3P9EF)

➤ If accidents happen when there is a real driver behind the wheel, what sort of chaos can we expect when there is no driver?

➤ This is so crazy. It's only a matter of time before someone uses this technology for a terrorist act. Example: nobody in the car and then the car is sent to commit the act. Terrible. Imagine getting in an accident with a car that nobody is driving? Or if there is no one in the car as it is on the way to pick someone up. So many flaws to this technology.

## Boeing exec to deliver keynote at Winnipeg PLANT, DEX, MMP Expos

Amy May will speak to issues critical to all manufacturers

**WINNIPEG** — Amy May, general manager of Boeing Canada Winnipeg, will keynote the Design Engineering (DEX), **PLANT** and Metalworking Expos in Winnipeg on April 3. This annual table top industrial trade show returns to the Victoria Inn Hotel & Convention Centre.

May will delve into issues critical to all Canadian manufacturers, including:

- The importance of the manufacturing industry in Manitoba.
- Addressing the age gap by being a top employer of young people.
- Keeping top talent and managing a diverse workforce.
- Ensuring first-time quality on all parts.
- How Boeing ensures safety in the workplace.

During her career at Boeing Canada, May has worked as an industrial ergonomist supporting Boeing Fabrication's 737 and 757 programs.

She also supported the 787 airplane design and later moved on to management roles overseeing environment, health and safety and most recently served as director of Boeing workplace safety.

The DEX / PLANT/ MMP Expos provide a forum for face-to-face interactions with leading suppliers from a wide range of markets including metal fabrication, machine building and manufacturing. Registration is free.

Visit the **PLANT Expo** website: [www.plantexpo.ca](http://www.plantexpo.ca).



Boeing Canada general manager Amy May.

PHOTO: BOEING

## Magellan opens new plant in India

Also increases investment in Triveni joint venture



Magellan's 100,000 square-foot machining and assembly facility.

PHOTO: MAGELLAN

**BANGALORE, India** — Magellan Aerospace Corp. has opened a manufacturing and assembly facility in India.

The new 100,000 square-foot Magellan Aerospace (India) Pvt. Ltd.

facility, constructed on seven acres near the Bangalore International Airport, was completed at the end of 2018. Installing and commissioning the high-speed machining centres is underway.

The new cellular machining and assembly plant will specialize in high-speed milling and turning of aerostructure and aeroengine components produced from aluminium and hard metal materials.

Combined with Magellan's two joint ventures in India, API Surface Treatments and Triveni Aeronautics Pvt. Ltd., the Mississauga, Ont.-based Magellan is one of the largest suppliers of 'Make in India' manufactured commercial aircraft components.

The company has also increased its investment in Triveni Aeronautics to 75%. Triveni is based in Tumkur, Karnataka.

The company specializes in hard metal machining of aeroengine and aerostructure components.

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Volvo's 360c.

PHOTO: VOLVO



Larry Hutchinson.

## Say 'No' to pod people

The automotive industry, preoccupied with the race toward fully autonomous vehicles, is forgetting something important: people still like to drive. So said Larry Hutchinson, president and CEO of Toyota Canada Inc., speaking to a room full of automotive influencers at their annual stakeholder dinner.

"Why have so many automakers lost their passion for driving?" he asked. "They seem to be so focused on the 'next big thing' – on the self-driving electric pod – they're forgetting that driving is fun."

Amen to that. Do we really want to become – pod people?

There are plenty of driverless concepts, from cars to taxis, buses and delivery vehicles, but in the "way out there" category is the Volvo 360c. The Swedish automaker would have us believe there's a need for an overnight sleeper that will transport executives to an early morning meeting in another city, "refreshed." The 360c is supposed to be an alternative to short-stop flying. Does this concept include a shower?

Sheesh.

Hutchinson told his dinner audience Toyota is taking a pass on the passive driver thing, and incorporating advanced automated safety technologies in ways that "enhance" the on-road experience.

## Burger, hold the meat

Maple Leaf Foods Inc., known for its packaged meat – as in beef, pork and poultry – is betting on plant-based protein offerings and adding more of them to its menu.

Canadian Press reports a new pea-protein Lightlife burger, launched first with American food service companies in January, will be available at US grocery stores in late March with a Canadian launch in April. "We are really, really jazzed up about this," said CEO Michael McCain, noting the Mississauga, Ont.-based company (some 24,000 employees) has seized on the rising demand for alternative proteins that look and taste like meat.

That may appeal to people who want to dial back their animal protein consumption, but it creates a dilemma for hardcore vegans. They abstain from the use of animal products – even eggs and dairy – and reject the commodity status of animals. It's not meat, but it's pretending to be. Does that count?

Bon appetit!



Beef-free.

PHOTO: ADOBE STOCK



Canadarm was essential to the space shuttle, Canadarm 2 built the International Space Station, so it's only fitting and right that the arm that will repair and maintain the Lunar Gateway will yet again be made in Canada by Canadians.

Prime Minister Justin Trudeau  
on Canada partnering in the NASA-led project.

## E-bikes debut in three EU countries

General Motors has built its automotive business on four-wheels, but now it's adding two-wheelers to the mix with the ARiV eBike brand. The two connected models are the Meld, a compact, and the Merge, a folding bike.

Both were engineered and designed at GM facilities in Michigan and Oshawa, Ont. They're launching first in Germany, Belgium and the Netherlands, where lithium-ion battery-powered eBikes are popular.

Pricing ranges between \$2,888 to more than \$5,000 depending on the model and country. Shipping begins in Q2.

ARiVs travel up to 25 kph with four levels of pedal-assisted power and the battery provides about 64 kilometres of ride time on a single charge.

The ARiVs come standard with rechargeable front and rear LED safety lights and oversized brake rotors for increased stopping power. They're also connected so riders can check metrics such as speed, distance, battery level, motor assist level, distance travelled via an app.



Developed in Oshawa.

PHOTO: GM

Coming up is a mode that will use a proprietary algorithm to help riders arrive at their destinations sweat-free. No sense getting too much exercise on a bike.

## No work e-mail after hours

Hands up manufacturers, how many of you can stay clear of e-mails post-workday?

With the "right to disconnect" movement gathering momentum (watch for the federal government considering changes to labour laws) there's a notion that constantly responding to work issues in the off hours can lead to burnout, hence lost productivity and potential disgruntlement.

Robert Half Technology, a firm that helps place tech pros, conducted a survey of 270 Canadian IT professionals and found 58% of them believe they could adhere to an e-mail ban. But 43% of workers don't believe their managers would adhere to it. And 48% said they'd sneak a peak anyway.

Perhaps people should be left to their own electronic devices.



Sneaking a peak.

PHOTO: ADOBE STOCK

## Trading nation

65% of manufacturers export

Canada's small domestic market makes it by necessity an exporting nation. And manufacturers have certainly been urged to engage in international trade, especially to look beyond North America. Yet only one quarter of all enterprises export, according to the *2017 Survey of Innovation and Business Strategy* by Statistics Canada. That is an improvement, though, over 20.8% in 2012.

The survey offers some interesting insights into Canada's exporting profile. Almost 65% of manufacturers do so, and most exporters are large enterprises (almost 44%), followed by medium-sized (almost 34%) and small (almost 23%).

Shipping costs are the most frequently reported "difficult" obstacle by 22.6% of survey respondents, followed by uncertainty of foreign or international standards and identifying foreign customers.

Obstacles identified by industry varied. Companies engaged in oil and gas extraction most often cited transportation infrastructures (84.7%) and shipping costs (66.2%). Computer systems design and related services rated the lack of internal resources or capacity as their biggest challenge, while enterprises in scientific R&D services cited difficulties related to access to financing.

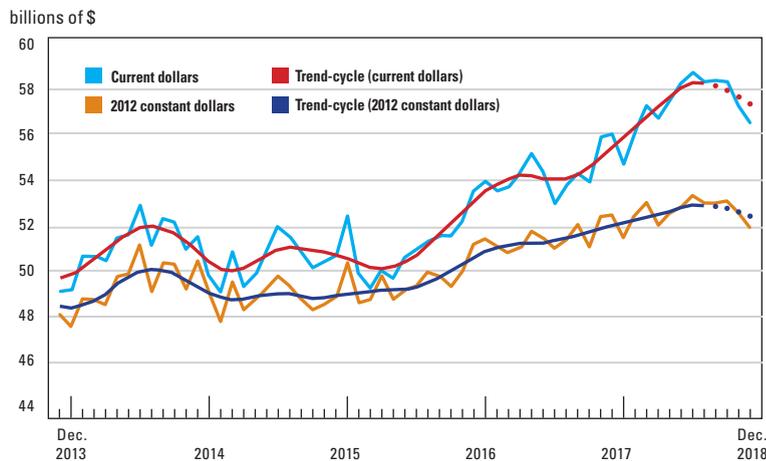
About 10% of products were either exported "as-is" by another business or incorporated into products that were then exported (8%). However, almost 20% of businesses did not know if their products were exported as-is or incorporated into products that were then exported.

Wholesale trade and manufacturing companies were the most likely to sell goods that were then exported "as-is." These industries were also the most likely to report sales of goods that were used as intermediate inputs by another business to produce products for export.

Two-thirds (66.3%) of all enterprises that bought from unaffiliated foreign businesses did so because they could not find a supplier in Canada, while 49.6% cited better quality goods or services and 47.5% noted reduced costs other than labour as important reasons.

# PLANT PULSE

## ECONOMIC DEVELOPMENTS AND TRENDS



Source: Statistics Canada

### SALES GROW IN 2018

Canadian manufacturing sales rose 5.4% (\$34.9 billion) to \$68.6 billion from 2017 to 2018. This was the third consecutive annual gain, following an increase of 6.1% in sales posted in 2017. The Industrial Product Price Index shows average prices in the sector rose 3.9% in 2018. Seasonally adjusted to current dollars, inventories increased 9.7% from December 2017 to \$84.6 billion a year later. Over the same period, unfilled orders rose 14.7% to \$97.3 billion. However, sales declined 1.3%. (Statistics Canada)

# \$1,115

Average weekly earnings for manufacturing in November, a year-over-year increase of 2.4%. Earnings growth was observed across several subsectors, with fabricated metal products and chemical manufacturing contributing the most. (Statistics Canada)



# 105,800

Jobs directly supported by vehicle assembly and auto parts production in Ontario, plus 100,000 more spin-off jobs (Government of Ontario).



# GDP

# 0.5%

The decline in manufacturing's contribution to GDP in November, the third slip in four months with most subsectors showing decreases. Non-durable manufacturing was down 0.3%; durable manufacturing declined 0.7%. (Statistics Canada)

# 9.6%



Year-over-year increase of oil sands extraction (non-upgraded crude bitumen and synthetic crude oil) since January 2018, outpacing growth in oil extraction (heavy, light and medium crude oil), which averaged 5.2%. (Statistics Canada)

PHOTO: SUNCOR



# 65%

Canadian manufacturers who are very concerned by US protectionist policies, followed by US/Trump administration's impact on nation-to-nation relationships (61%), changes involving the USMCA (56%) and global protectionism (40%), according to the **PLANT** Manufacturers' Outlook 2019. Top challenges over the next three years are managing costs (65%), pressures on pricing (61%) and filling skills needs (46%). Visit <https://www.plant.ca/general/manufacturers-outlook-2019-study-181160/> for a copy of the report.

IMAGES: ADOBE STOCK

# HOT STUFF

## PEPPER NORTH SCALES UP SAUCE PRODUCTION

Award-winning retail brand moves from a church basement to a full service plant.

BY CAROLYN COOPER

Ana and Drew Stevens knew their fiery food company was at a crossroads in 2016 when they landed a deal for their hand-made hot sauces to sit on the shelves of Sobeys' entire Ontario retail network. The fledgling family business already had products in approximately 70 independent stores across the province, but the relationship with Sobeys was a significant step into the mainstream grocery space. It would mean much wider distribution and potential sales. It would also require a substantial scale up in production.

"At the time we were still doing production in a church basement," recalls Ana Stevens, co-owner of Pepper North Artisan Foods. "It was an exciting time for our company, but it also forced us to think about what we were doing and how we were going to fill those larger purchase orders."

They had to decide either to go with a co-packer or start producing sauces themselves on a bigger scale, adds co-owner Drew Stevens. Losing control of quality was a main concern. "One of our core values is to

create the highest-quality product possible. Because it was so important for us to maintain the quality we decided we were going to continue to self-produce."

By establishing strong local partnerships to ensure a steady supply of raw ingredients that meet their quality standards, the husband and wife team successfully ramped up production at the Ontario Agri-Food Venture Centre (OAFVC) in Colborne, Ont.

Since then growth has been explosive for the Oshawa, Ont.-based company. It now has hot sauces and condiments in roughly 400 retailers throughout Ontario, Nova Scotia, New Brunswick and PEI, including at Sobeys, Whole Foods Market, Longo's, Loblaws, Ambrosia Natural Foods and Foodland chains, followed recently by Metro, Fortinos and Coppa's Fresh Market stores.

"Ultimately our plan is to become a national brand, a staple in Canadian households," says Ana. "But we never want to compromise on quality and integrity. We want to ensure we stay Canadian owned and operated. We also want to ensure that we're able to keep contributing to our community in terms of job creation and supporting the local farmer partnerships."

Pepper North launched in 2013 as an online business selling hot pepper seeds to an under-served Canadian mar-



ket. For years Drew's parents had run a produce market and had grown their own seasonal vegetables. Cultivating exotic hot peppers had become a particular passion for Drew and his brother Mike, although they were forced to rely on imported seeds from the US, South America and Australia.

Recognizing the gap in the market, the Stevens began drying their ever-widening range of homegrown specialty peppers and selling the seeds online.

As demand for the seeds climbed – along with the piles of leftover peppers – Drew began experimenting in the kitchen with the discarded peppers, mixing them with unexpected fruit flavours such as pineapple and orange, and hand bottling the hot sauces. At the urging of friends and family, the Stevens

decided to sell their first two recipes at local farmers' markets. Overwhelming response led to gourmet food shows, and numerous wins at spice and heat competitions across North America.

### Strategic decisions

By 2014, when they began to receive requests for more bottles than they could produce, the couple made the first of several successful strategic decisions.

"We were still growing our own peppers, but we couldn't really keep up with demand," Drew explains. "We had to decide then whether we would be farmers or processors. So we partnered with an Ontario farmer. Then we started approaching local stores. The decision changed the entire direction of our company, from being a small mom-and-



(Left) Ana and Drew Stevens sample Blueberry Plague hot sauce. (Above) Filled bottles of No Joke sauce.

PHOTOS: STEPHEN URHANEY

pop business to seeing a big opportunity for growth.”

Moving to the OAFVC was another key turning point for Pepper North, allowing it to boost production capabilities dramatically. The government-funded facility is a full-service food production plant that offers rentable space for small- to medium-size food ventures specializing in value-added fresh fruit and vegetable products. It’s designed to benefit both local

growers and processors.

“It’s allowed us to expand significantly from that time,” says Drew, who oversees all production. “We can produce in the neighbourhood of 2,000 bottles per day, and we’re making these batches on average once a week. There’s lots of room to grow.”

The centre offers a full commercial kitchen, lab, bottling line, packaging equipment, walk-in freezer with storage space – allowing Pepper North



(L-R) Filling bottles and capping (background). Stirring a batch of No Joke hot sauce. Filling bottles and quality inspecting.



(L-R) Labelling a batch of No Joke hot sauce and inspecting. Labelling and packaging a batch of No Joke hot sauce. Pepper North sauces on display at Foodland in Oshawa, Ont. (Franchise owner: James Needham).



to clean, flash freeze and store its raw ingredients for the coming year – and has highly trained staff that can be hired for production as required. It also allows manufacturers to carry out research and development onsite, and produce smaller test batches.

As soon as they hit the grocery shelves Pepper North's sauces stood out among the competition for their thick texture, unusual colours and sizzling specialty peppers. Also eye-catching were the bright labels (designed by Mike Stevens) and appropriately menacing names such as Blueberry Plague (made with wild blueberries, red habanero peppers, Trinidad scorpion peppers, wildflower honey, coconut water and lime juice) and Momento de Muerte (featuring red habanero peppers, Carolina reaper peppers and black cherries).

"We never dreamed our product would be on the mainstream grocery shelves. We always thought it would be a boutique brand," Drew says. He admits targeting a typically slow-moving category, with few domestic competitors, has been beneficial for the company. "Our angle from the beginning was to cater to a customer who is looking for something hotter than you would find in a mainstream store. We're not trying to compete against the mild-to-medium market – we do have a couple in the medium range but we mostly focus on the hotter end using more unique hot peppers such as ghost pepper, scorpion pepper and Carolina reaper." Drew says the challenge is always the cost of raw produce, especially for off-season ingredients, as well as maintaining consistent supply and quality as the company grows.

Pepper North uses only Ontario hot peppers produced from the company's original seeds, and buys locally grown ingredients whenever possible to work closely with their suppliers.

"We really focus on our strong relationships with farmers and orchards, as well as our distributor partners and our retail partners," Ana says, who oversees distribution, logistics, sales and customer service. "Having a partnership with us helps them as

well, so we want to make sure that what we do is mutually beneficial."

The family-run company also wants to ensure it helps build a strong local business community.

"We're not just a hot sauce company – we're so much more than that," Ana says. "As we grow we want to use the knowledge that we've gained over the past six years for other entrepreneurs just starting their companies, or for those hoping to scale up who want a bit of direction. We want to help them understand what the expectations are with retail and distribution partners and with consumers. It takes years to get into some grocery retailers, and it takes showing that your product sells. You're not going to get in overnight, it takes patience and you have to keep going."

### Extreme heat

Featuring only healthy ingredients has been as important to the success of Pepper North as maintaining quality. The sauces are free of preservatives, and rather than using cheaper white sugar and vinegar they include wildflower honey, maple syrup, apple cider vinegar and wine vinegar.

"We want a clean label, only whole ingredients not extracts, and we want our customers to see the real ingredients and taste the chunks of fruit," Drew says.

The company's original recipe, No Joke Hot Sauce, combines the extreme heat of ghost peppers with sweet onions, roasted garlic and fresh lime juice, tomatoes and red bell peppers. With a five out of 10 on the heat index (in other words, "hot"), the sauce is still its top seller. On the opposite end of the spectrum is Stargazer Hot Sauce (made with jalapeño peppers, Scotch bonnet peppers, ghost peppers and chipotle peppers – a nine or "ultra hot" on the heat index), which Drew says is at the top of his tolerance level. However, he says, "we never want to go to

the novelty sauce. There are sauces out there that are so hot you really can't eat more than a drop...we want to make sauces that are hot but appeal to people's tastes. We want people to enjoy it, finish it and buy another one. It's a fine line."

Pepper North relies heavily on social media to communicate that sort of message directly to customers and retailers. "Creating brand awareness has been our hurdle over the years, but we've been slow and steady," Drew says, explaining that they use their website, LinkedIn and Facebook to highlight new products, to post cooking videos showing the versatility of the sauces, and simply to talk to consumers.

"It's definitely been a big factor in our continued success," Ana says. "People recommend flavour combinations or ask about the peppers we're using. Listening and establishing those relationships inspires us to come up with new hot sauces. We also use the different platforms to educate our customers. It's important to us to communicate our production process through videos and pictures. And it's more engaging for our customers." It has also helped build sales momentum, as loyal customers post pictures of themselves online with their favourite Pepper North sauces.

To date Pepper North has won 29 industry awards, something the Stevens say has been a huge validation from the industry. The company is currently looking at distribution in Western Canada, and will launch an additional hot sauce this year. "Some companies have 12 or 14 hot sauces – we have six right now," says Drew. "We want to slowly increase our product line and focus on quality products. So that means taking the time to find the right ingredients and to develop them. We always want quality over quantity."

*Carolyn Cooper is a freelance business writer based in Kawartha Lakes, Ont. who has deep roots in the food and beverage industry. E-mail [cjcooperbrown@outlook.com](mailto:cjcooperbrown@outlook.com).*

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

## AUTOMOTIVE

Global restructuring is underway; bold moves are needed.

With General Motors' announced closure of its quality award-winning Oshawa Assembly Plant, and almost stagnant investment from automakers, you'd think the automotive industry in Canada was on the way out.

Not so, according to a KPMG in Canada report that says the way ahead is auto-technology innovation.

*The State of Canada's Auto Sector: Recalculating the Route Ahead* looks at an industry feeling the effects of shifting markets, increased global competition, new technology and consumer trends. The Canadian advisory company draws on KPMG's 20th *Global Automotive Executive Survey (GAES)*, an annual survey of 3,000 auto executives and consumers, to describe what's next, and that involves leaving old business models behind.

"General Motors' decision to close its Oshawa plant marks an inflection point for the Canadian auto industry," says Peter Hatges, a KPMG in Canada partner and national sector lead, automotive markets. "We're seeing the effects of a shift in global sales and increased competition from lower-cost markets, as the



No clear consensus on which technology would power vehicles of the future.

PHOTO: ADOBESTOCK

# Reshaping the auto INDUSTRY

## TECHNOLOGY INNOVATION IS THE WAY AHEAD

industry explores new frontiers in electric and autonomous driving. These factors are reshaping the roles of car makers, both original equipment manufacturers and their suppliers, within an evolving supply chain."

Not that the Canadian automo-

otive sector is without strengths. Hatges cites a skilled and available labour force, a mature supplier network and ongoing government support through manufacturing, production and R&D tax credits and incentives. And Canada's auto industry contributes \$19 billion to GDP, making it one of the country's largest manufacturing centres.

### Maintain vigilance

"The Canadian government has done its part to nurture our domestic auto industry, and defended the sector when negotiating the US-Mexico-Canada Agreement (USMCA)," Hatges says. "Ottawa needs to continue to maintain a vigilant watch ... as USMCA further reshapes supply chains, pricing and investment strategies in North America. Ultimately, it's up to industry to read the future and grab onto emerging opportunities."

KPMG found no clear consen-

sus on which auto technologies would power the cars of the future. Most executives believe multiple technologies will co-exist in the future, including internal combustion engines (ICEs), hybrids, battery electric vehicles (BEVs) and fuel cell vehicles (FCEVs). ICEs remain popular and hybrids are a top choice for consumers. BEVs are an important manufacturing trend, although one in three consumers agree price is the biggest barrier to buying a fully electric car.

What's the way forward? KPMG offers five suggestions to industry players:

**Be bold.** OEMs, suppliers and auto-tech innovators need to move beyond following trends and set the standard for industry innovation. This means coming to market with more effective ways to design, engineer and manufacture leading-edge automotive materials and technologies.

**Be the best supplier.** Despite protectionist sentiment in the US, the auto supply chain is highly integrated and global. To stand out, Canadian suppliers must contribute quality improvements, technology advances and cost savings to their customers. Being the supplier of choice means helping these companies manage new risks and contributing to profitability.

**Be visionary.** The future of mobility in Canada is complex

### Executive forecast

- Connectivity digitalization is back as the top key trend.
- There is not one global answer – the world is a combination of islands.
- The auto industry is about to run into a restructuring phase.
- 75% agree raw materials drive the preferred powertrain technology of a country.
- 77% agree the regulator will drive an OEM agenda that's also being driven by industry politics.
- Industry policies in Asia and the US seem to be far more advanced than in Europe.
- 66% believe that by 2030 less than 5% of cars will be produced in Western Europe.
- Executives agree that China will leapfrog the market with its battery electric vehicles.
- 60% of executives agree: in the future we will no longer differentiate between transport of humans and goods.

Source: KPMG's Global Automotive Executive Survey 2019



Cockpit view of an autonomous car.

PHOTO: ADOBE STOCK

and likely to encourage cross-industry partnerships. Rethink old business models and cooperate to create a mobility ecosystem that addresses the unique perspectives of millennials who are

less reliant on cars. Government will shape transportation and electricity infrastructure, influencing the type of cars Canadians will drive in the future. FCEVs, considered a breakthrough

for e-mobility, could solve the infrastructure challenges of Canada's vast geography and current battery limitations in cold weather conditions.

**Build Canadian tech al-**

**liances.** More can be done to tap into Canada's world-leading tech hubs. Ontario's auto and tech industries are particularly well positioned to meet these new demands. Cooperation and strategic alliances with the tech sector, rather than competition, will drive success.

**Be connected.** Brand is no longer so key for consumers as digitization, seamless connectivity and data security gain importance. As vehicles increasingly continue to connect to the roads, systems and apps around them, catering to those needs and providing the most integrated customer experience will be a competitive advantage.

Download the report at <https://home.kpmg/ca/en/home/insights/2019/02/the-state-of-canadas-auto-sector.html>.

**Comments?**

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## INVESTMENT

Working fast and efficiently is winning business investment.

BY KIM LAUDRUM

When it comes to investment, little Welland, Ont. – pop. 52,300 and located within eight hours of 60% of the population of the US – punches way above its weight.

The Welland Canal is a major part of the St. Lawrence Seaway, providing a deep draft passage that bypasses Niagara Falls between Lakes Erie and Ontario. It provides access to safe ports and rail routes to Canada's west or to the east, and easy access to the Atlantic Ocean as well as much of the rest of the world. Close to steel making giants in nearby Hamilton, Welland has attracted many manufacturers in the last century. But a seismic economic shift that began in the late 1990s threatened the city's vitality.

Ontario lost 300,000 jobs between 2000 and 2010, according to a 2014 report by the Mowat Centre at the University of Toronto's School of Public Policy and Governance. This is a story about how one small but mighty Canadian manufacturing city fought its way back to prosperity, grabbing the attention of Thomas Edison's global powerhouse GE along the way.

"We were losing industry fast and furiously," says Dan Degazio, Welland's director of economic development. We started by losing Atlas Steels, which was a big employer, probably about a couple thousand employees." Atlas Steels was Canada's largest producer of stainless steel. Since the 1980s its facilities, on a couple hundred acres, were sold and renamed several times until 2003 when Slater Steels was ordered to liquidate the facilities. "Welland lost probably a couple million square-feet of industrial building with that."

Others followed:

Graftech, a manufacturer of



GE's planned multi-modal plant in Welland.

PHOTO: PLANT

# Small city, big DEALS

## HOW WELLAND GOT ITS GROOVE BACK

graphite electrode products used in electric arc furnace steel, closed in 1999 – another thousand employees, another hundred acre parcel of land.

Stelco closed its Welland Pipe operation in 2003, eliminating 175 jobs.

Henniges Automotive, a rubber sealing and anti-vibration systems producer, closed its Welland factory in 2011. More than 300 jobs were lost.

Dana Corp., an auto parts giant that once provided close to 2,400 good-paying jobs in Niagara, closed its Thorold plant in 2008, axing the remaining 170 jobs.

"Then one of the most recent, biggest blows was losing John

Deere," Degazio says. Deere & Co., the world's largest manufacturer of agricultural machinery, closed its Welland factory in 2009. They had been in the city for more than 100 years. We lost over 1,000 employees (jobs) there."

### Stopping the bleeding

At the time Deere & Co. blamed the high Canadian dollar for undermining the cost advantage of operations. The loonie had risen to an all-time high of 110.3 cents US in November 2007, up from 62 cents US in early 2002. The company was the largest employer in Welland's private sector.

The economic development team had a plan to stop the

bleeding. They chased after green energy firms in 2008 because they appeared to be the trend to follow. "We landed a couple of major solar companies, but because of the financial crisis in 2008, that fell by the wayside," Degazio says. They regrouped. "Our thought was, 'We have a big world and we have a small city and we have to fill it back up.'"

About 20 years ago, Welland attracted Canadian Tire Financial, now called Canadian Tire Bank.

"We were lucky," Degazio says. "It was a call centre that's now rated one of the best employers in the country." Today, Canadian Tire Bank employs 1,600 people in Welland and nearby St. Catharines.

Other companies followed. Degazio extends credit to Lina DeChellis, a Welland economic development officer, for attracting Convergys CMG Canada, a human resources services provider, to the area about 15 years ago. Convergys brought in 700 seats to their call centre. That filled a lot of jobs. Convergys employs 350 people full time.

More companies came on board: ED Products, a global manufacturer of wiring har-



The Welland Civic Square houses the city hall and the Welland Public Library.

PHOTO: QVIRI

nesses, cables and electro-mechanical assemblies, employs 125 people full time; and Welded Tube of Canada, a producer of diversified steel pipe and tube, has 247 full-time employees. Hydac Technology Corp., a fluid technology solutions provider, expanded operations in Welland as did Bosch Rexroth, a drive and control solutions provider.

Northern Gold, a food processor from Canada's west coast, is one of the most recent arrivals to Welland. Its plant is 300,000 square feet.

The other feather in the cap for the economic development team came when GE's Distributed Power announced in June 2016 that it chose Welland as the site for its first "Brilliant Factory" in Canada, a \$265 million project. The plant combines digital technology and lean manufacturing to build large, gas-powered engines for global markets. It represents 450,000 square-feet of industrial space on a property that runs one kilometre long, and will provide 220 direct jobs while stimulating the region's economy.

It was a hard-earned reward. How did Welland beat out some 26 other municipalities for GE's business?

GE said it chose Welland because of its proximity to the US border and access to skilled workers. Welland's "aggressive" effort to attract its business was also a key factor. (In June 2018, GE sold its distributed power division to Advent International.)

"Our labour force here is second to none. Because of the strong manufacturing base we have a very strong labour force with transferable skills," Degazio says. "Also, we have Niagara College, one of the best-rated in the country for training for technical skills. It works very closely with a number of companies in industry."

### Incentive programs

As for Welland's aggressive pursuit of GE: Degazio says the light bulb moment came when attending conferences in the US and seeing the incentive programs there.

"US municipalities were sending letters to attract our companies and we had nothing to combat it or sway the companies to stay. We had no incentive programs at the time."

It would be nothing for companies in Welland to pick up and move 30 minutes away across the border to Niagara Falls or

Buffalo, NY, if the American incentives were good.

Welland developed a Gateway incentive program with help from the Ontario government. Having completed 11 or 12 Gateway incentive programs in the last five years, Welland is leading the Niagara region.

Some of the incentives include: a development charge waiver, so zero development charges; and a tax incentive – anywhere from a 40% to 100% grant or grant-back of the regional and city portion of taxes.

For instance, GE was receiving approximately \$30 million over

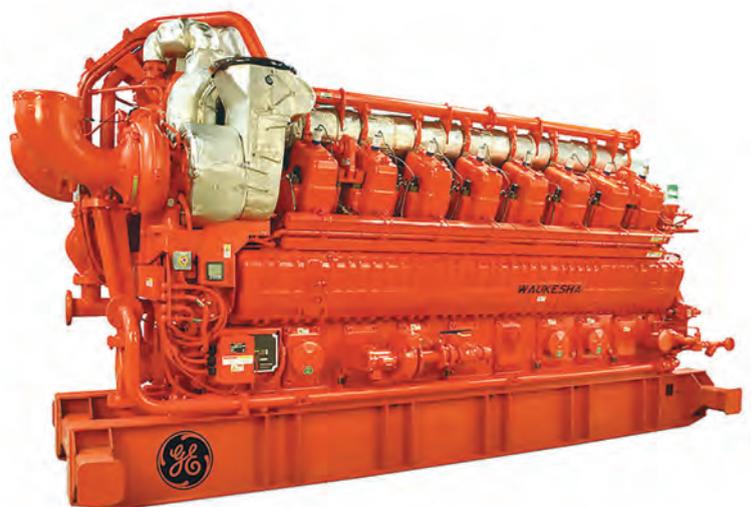
10 years under the Gateway incentive program. "Northern Gold will be receiving a 75% grant. They'll be getting roughly \$5 million over the next 10 years," Degazio says. "There are also a number of smaller ones that receive maybe \$30,000 or \$40,000 a year. In a small company, that's a pretty big help to them."

Export Development Canada played an essential role in securing the GE plant, which moved from Wisconsin. EDC pledged \$2 billion in federal export financing, giving Welland a tremendous advantage over locations in the US, where Congress had waffled on restoring funding to the US Export-Import Bank, a US trade credit agency, during GE's decision process.

"EDC played a big part in the GE project. That's a very, very valuable part of our investment. EDC can do things we can't," Degazio says.

But it's not just cash and tax incentives that companies seek, Degazio says. Welland's greatest strength, it turned out, was its ability to do work fast and get plants into the ground. "That's what we heard wherever we went. Our biggest incentive program was, 'We'll get your plant in the ground faster than anybody else.' And they did. GE was in the ground within six to eight weeks."

Northern Gold needed to be up and running within the year.



A GE reciprocating engine.

PHOTO: GE

Welland's economic development team helped make that happen.

"That's a company from Coquitlam, BC. They could have been anyplace because they are a food processor," Degazio says. Within one year of setting up shop in Welland, it started an expansion and doubled the size of the facility.

Getting into the ground quicker means companies realize a return on investment much faster. To expedite the process, Welland worked hard to eliminate red tape. The economic development office streamlined processes, access to the mayor and decision-making can happen at "a moment's notice," and clients contact Degazio directly by cell phone. They need only deal with one point person.

The process is also streamlined at the provincial level, with one point person to stickhandle any permits, regulations, incentives or taxes. Carrie Manchuk dealt with issues on that side. She made it possible for Welland staff and clients to meet with representatives from a number of ministries in a room, all at the same time, to resolve issues and develop a timeframe to move forward.

Property expenses are also a factor in the city's favour. "Let's

face it, industrial property anywhere in the GTA – Brampton, Mississauga – you're looking at \$2 million to \$3 million an acre. They are paying \$75,000 to \$200,000 an acre here," Degazio says. "If you're going to buy a property and you need 10 acres, and you're paying \$20 million for the property, but you can't get a building permit for two to three years, that's a hell of a lot of carrying charge."

Brampton Brick is the latest business attracted to Welland. "That plant will be 600,000 square-feet." Although Degazio says he's not sure yet how many employees will be hired, the impact on the city's coffers is expected to be positive.

What's in store for the future? Degazio is optimistic. "Automotive parts manufacturing just got a big boost out of the new NAFTA deal (USMCA). Our local college can work with those companies to train people for what they need."

Seems Welland is getting its groove back.

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*Kim Laudrum is a Toronto-based business writer and regular contributor to PLANT. E-mail [klaudrum@rogers.com](mailto:klaudrum@rogers.com).*

**Comments?**  
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## CLIMATE CHANGE

### Taking climate action

Big corporations are more engaged with green

Most large companies around the world are engaged in energy conservation and climate action activities, according to a Schneider Electric study. The *2019 Corporate Energy & Sustainability Progress Report* looks at the global trends, barriers and opportunities impacting enterprise energy and carbon-management programs.

Here are some highlights from the survey of more than 300 global professionals responsible for energy and sustainability at businesses with more than \$100 million in annual revenue:

- Nearly 60% have goals they've shared with customers, investors and other stakeholders.
- 28% are specific and ambitious in their goals, joining established initiatives such as RE100, science-based targets and zero waste to landfill.
- Companies operating in multiple geographies are nearly 10% more likely to make a public commitment than those in one region.
- Europe-based businesses set public goals more often than their North American peers (65% versus 58%).
- Most publicly committed companies (59%) see environmental concerns as the primary driver, above financial considerations (52%).
- These companies are more likely to implement advanced technology such as on- and offsite renewables, battery storage and electric vehicles.
- Companies collect data from almost three different sources on average.
- Utility bills are the most common, followed by energy management systems; however, 52% of organizations still use spreadsheets and only 18% gather data from IoT devices.
- The most common barriers to using data effectively are unreliable or incomplete data (48%), insufficient tools (41%) and lack of internal expertise (40%).
- 22% share all energy and sustainability data across departments – 58% share some data and 21% don't share data at all.
- 90% that share data between all departments agree they're able to get funding; and they are more likely to use a diverse portfolio of technologies.

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## PRESSURE POINT

It will open networks to vulnerabilities that must be addressed.

BY TAYLOR EDWARDS

Manufacturers around the world are becoming more aware of the potential the Industrial Internet of Things (IIoT) has to offer. Greater visibility, more efficient data utilization and tighter integration of underlying systems will boost production efficiency while increasing workforce flexibility and product quality.

IIoT is comprised of intelligent physical devices and processes embedded with electronics, software, sensors, actuators and connectivity that connect and exchange data with each other and people over the internet. This involves big data analytics, cloud computing, robotics, and the integration of IT information and operational technologies. Employing IIoT devices promises to change the way manufacturers think about resource allocation, production processes, materials handling and the workforce.

Canadian manufacturers, most of them small, have some catching up to do. The **PLANT** Manufacturers' Outlook 2019 survey shows just 7% of respondents are applying IIoT technologies; 32% are not familiar with it; and 31% say it's not applicable, although they might want to reconsider.

IDC, a global provider of market analysis and advisor services focused on information technology (among other markets) forecasts manufacturers spending the most on IIoT in 2019 (\$197 billion). This investment is largely focused on the development of solutions that support manufacturing operations and asset management. Manufacturers that implement IIoT can expect to facilitate the creation of new functions, open



IIoT drives devices that are part of an intelligent eco-system.

PHOTO: ADOBE STOCK

# IIoT offers BENEFITS

## ...BUT BE PREPARED TO MANAGE THE RISKS

new revenue streams and transform business models, driving measurably better outcomes for customers. And Accenture, a global consulting firm, estimates that by 2030, optimized production processes could add trillions of dollars to the global economy.

### Security risks

But along with the benefits are risks to network security. In 2014, a German steel mill was the target of a cyber attack when hackers spear-phished their way into employees' computers. The attackers took control of an edge device (in this case, the production management software). By hacking into the plant's control system, they were able to prevent a blast furnace from initiating its security settings for a normal shutdown procedure. This caused the furnace to overheat and melt down, causing extensive damage to the mill. What role did IIoT play? It sent sensitive operational data from an

edge device to the cloud, putting the data, the edge device and the mill's computer network at an increased level of exposure.

Manufacturers that harness the power of IIoT must pay careful attention to cybersecurity. You'll never prevent all attacks but an in-depth security approach that operates layered defences, rapidly mitigates harm, and fosters resiliency and recovery will serve to manage the risks.

A risk management plan should include the following:

- **Separate your network.** Operate manufacturing automation devices (IIoT linked devices) from one network and office, front-end client-facing terminals from another. This provides a barrier against intruders gaining access to the manufacturing operations from the more exposed office network.

- **Password management.** The *Verizon 2016 Data Breach Investigations Report* found 63% of data breaches occurred

as a result of lost, stolen or weak passwords. As potential points of entry to a company's network, it's important to maintain strong passwords to any IIoT devices connected to the network, including employee-owned devices. Implementing a robust password management policy and following it is key to a front-line defence. According to the *Keeper Security and Ponemon Institute Report*, 65% of small businesses with password policies do not enforce them.

- **Behind a firewall.** The Federal Communications Commission (FCC) recommends all small businesses set up a firewall to provide a barrier between internal data and hackers attempting to gain access. In addition to the standard external firewall, many companies are installing internal firewalls to provide an additional layer of protection. Employers should also consider providing remote employees with firewall software and support for their home networks to ensure consistency and compliance.

- **Plan of action.** In the event of an attack, having a cyber incident response plan in place is crucial. This plan contains written guides comprised of instructions, procedures and protocols for a response to various kinds of data security incidents.

Use of IIoT devices in manufacturing is inevitable, so begin the implementation process with the presumption that you're going to experience a cyber intrusion.

It's not a question of if but when.

---

*Taylor Edwards is a risk advisor, commercial insurance, at ProLink, a Toronto-based national risk management and insurance company. Visit [www.prolink.insure](http://www.prolink.insure). E-mail: [TaylorE@prolink.insure](mailto:TaylorE@prolink.insure).*

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# Training for the wrong SKILL?

## BE SURE ABOUT THE LEARNING OBJECTIVE



Be sure it's the lack of a skill that's hindering performance.

PHOTO: ADOBE STOCK

Three questions that focus learning in the right place.

BY HUGH ALLEY

**A**re you training for the wrong skill? While teaching a particular skill to a team leader there were challenges with the learning. This raised a question: was the skill central to the objective? Turns out it wasn't.

The objective was to make the constraint operation more effective. The lead was learning to coordinate when parts for a job arrived at a constraint. That's not a simple task and he wasn't getting it. Taking a closer look, it was apparent the hiccups didn't actually have much impact. In a situation where the constraint was operating just 30% of the time, there were much bigger opportunities to make improvements. So the training was stopped.

When training doesn't help meet an objective, it annoys the learner, wastes everyone's time, and distracts from solving the real problem.

Here are three questions that will help determine if training for a skill is required:

**1.** Is the employee clear about the objective? If the learner is striving for a different result,

training will be irrelevant. Be clear about the priorities for that role. Do you want quality before volume, or is deadline first?

**2.** Are there actual observations of the process to confirm a skill gap is the biggest contributor to the performance problem? You should be able to collect what you need in half a day. In the constraint example, this was the missed step. When the work was watched for three hours, lots of other problems were evident and they had a much bigger impact than things not arriving at the right time (which was what workers originally identified as the main problem).

**3.** Do you have at least one operator who can consistently achieve the required results? If so, training is probably useful. At the very least you'd like everyone achieving the same skill level. From there, work on improvements. But if no one is achieving close to what you need and you don't have standard work, establish how you want the job done before training begins. That might take some experimenting.

Before you train anyone, be sure they know what you're after, and be certain the lack of skill is what really hinders the

performance of the unit.

*Hugh Alley is an industrial engineer based in the Vancouver area who helps organizations achieve significant perfor-*

*mance gains. Call (604) 866-1502 or e-mail hughalley@gmail.com.*

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## THINK LEAN

Work environments are evolving with new roles, responsibilities and accountability.

BY RICHARD KUNST

Your company may have the technology, equipment and exposure to market, but you still need people to deliver that value.

The nucleus of all lean organizations is respect for people. We want to attract and retain those who are smart, resilient, willing to question the status quo and motivated to make a difference. We look for people who love to solve problems, persevere through failure and work collaboratively across teams to drive progress. Maximizing their attendance at work is key.

With the record low unemployment rate and the fear that current employees will leave for greener pastures, companies are changing how they view their workforces, so this is a good time to be innovative.

The foundation of a positive work experience is culture, which should be a differentiator for your company in the marketplace.

We need to expand our vision of how work is done. For example, how should work be structured: will it be teams with part-time workers? Will people have flexible schedules?

Another measure of autonomy is the ability to determine career paths. While this is especially important to both attract and keep millennials, the concept is applicable to all ages.

Innovation requires thinking outside the box. Here's one example of creative thinking. Most people need to take care of "life" business beyond and perhaps overlapping work tasks. Kids get sick and need their parents, seniors get sick and need their kids.

There are always personal errands to complete that distract employees from what they do best – helping you deliver the



Retaining the right people.

PHOTO: ADOBESTOCK

# People POWER

## EXPAND YOUR VISION OF HOW WORK IS DONE

company's product or service.

In most cases employees will book time off to fulfil and complete these tasks, but do they need to?

Enter the Concierge Service, a company benefit that would run some of those errands so the employee doesn't have to take time off.

Changing work environments bring new definitions of roles, responsibilities and accountability.

While many businesses are restructuring to compete or just survive, jobs and assignments are quickly evolving. Employees are being asked to step up and assume more tasks and assignments that in many cases come

without a change in compensation.

Taking on new assignments or expanding their scope can be exciting. You learn new skills and become more engaged in the company's success.

### No counting

In the midst of these changes, there's a tendency to "count" as people compare workloads. "I did this, so now it's your turn."

Applying a no counting rule in personal relationships will be a significant contributor to harmony in the workplace. It's amazing how easily counting occurs and how quickly it disappears from the workplace vocabulary when you call it.

The pressures that come with running a manufacturing business can at times fire up tempers. Although anger isn't particularly conducive to harmony in the workplace, here's something to consider. During a leadership training course, an instructor noted anger is the highest state of commitment. If we don't care about something, we show no emotion. When people are emotionally committed, it's natural for them to express anger when they're upset about change.

Look at your angry employees as committed employees. Help them channel that energy into bonding as a team and working on agreed priorities to ensure success.

*Richard Kunst is president and CEO of Cambridge, Ont.-based Kunst Solutions Corp., which helps companies become more agile, develop evolutionary management and implement lean solutions. Visit [www.kunstsolutions.com](http://www.kunstsolutions.com). E-mail [rkunst@kunstartofsolutions.com](mailto:rkunst@kunstartofsolutions.com).*

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Demonstrate the type of behaviour expected of others.

PHOTO: ADOBE STOCK

# Keep it CIVIL

## GOOD FOR THE BOTTOM LINE

**D**oes your workplace pass the civility test? In a respectful workplace, employees are courteous, caring and considerate when they interact.

For workers, a civil and respectful workplace translates into high levels of job satisfaction, greater perceptions of fairness and a more positive attitude. The bottom line also benefits, from improved morale, better teamwork, enhanced supervisor-staff relationships, and reduction in sick leave and turnover. When people

are treated with respect, they take more interest in personal development, engage in problem solving and generally enjoy their environment more.

So how do you get there? Here are 10 tips to help make respect and civility the standard in your workplace:

**1. Train and develop.** Provide resources on civil and respectful workplace behaviours such as listening, giving feedback, conflict resolution, anger management and dealing with difficult customers. It's also

important team members learn to recognize what constitutes uncivil behaviour and how to address it.

**2. Incorporate respect and civility in your communications.** Adopt non-discriminatory language and maintain the confidentiality of employees' personal information in all communications. Ensure that communications are easy to find and accessible to all by prominently displaying them on bulletin boards, in employee handbooks or online.

**3. Give your full attention.** Basic respect is the foundation of working relationships. In a civil workplace, everyone's input is recognized, valued and our attention is focused on the conversation at hand. This focus means giving people and what's going on in meetings your undivided attention. Be sure to turn off your cell phone or any other device that may create a distraction. If you're going to be late for a meeting or a shift, let the organizer know in advance.

**4. Use respectful language.** Express appreciation to co-workers for their help, avoid interrupting others when they're speaking, and apologize with sincerity if you have mistakenly offended someone.

**5. Say hello.** In an uneasy work environment, it's common for co-workers to not greet each other. Next time

you're passing a colleague in the hallway or in the lunchroom, acknowledge the person by saying, "Hello". Courtesy is infectious and helps build posi-

### New occupational disease resource

The Occupational Health Clinics for Ontario Workers (OHCOW) and the Canadian Centre for Occupational Health and Safety (CCOHS) are collaborating to create Prevent Occupational Disease, a new online repository of health resources.

The website ([www.preventoccupationaldisease.ca](http://www.preventoccupationaldisease.ca)) will help employers, managers and workers better understand and prevent occupational diseases such as cancer, musculoskeletal disorders and respiratory illnesses caused by exposure to hazardous substances, workplace environments or as part of work activities.

The website's resources relate to the science and mechanics of prevention; common hazards and their identification, exposure assessment and control; specific occupations and industries where the risk of developing occupational disease is higher; and internationally recognized occupational diseases.

The site will be continually updated with new content, including submissions from around the world through its online form.

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tive morale.

**6. Be considerate when you speak.** Humour in the workplace can take many forms and not all of them are appropriate or appreciated by everyone. Before making a joke, consider your audience. Is the joke at someone else's expense? Might it be embarrassing or demeaning? If the answer is yes, don't share the joke.



A respectful workforce translates into a higher level of job satisfaction.

PHOTO: ADOBESTOCK

**7. Be inclusive. Courteous, friendly – these are actions that foster a positive working culture.** Find

out how co-workers like to be addressed. Avoid giving people nicknames or pet names as that can be seen as belittling and

patronizing. Look for opportunities to include those you may not generally socialize with by acknowledging birthdays, inviting them to lunch, or asking for their input. Everyone wants to be recognized and have a sense of belonging.

**8. Practice humility.** Give others credit when they do a good job. By being modest and praising others, you contribute to building a culture of generosity and trust, while allowing others to share in the satisfaction of a job well done.

**9. Be a role model.** Promote and reinforce respectful leadership behaviour. Provide managers and supervisors with appropriate training and supports, and ensure they're available, present, and in contact with workers to recognize and resolve issues.

**10. Address uncivil behaviour.** Create and enforce guidelines and policies detailing expectations and consequences for inappropriate behaviour. Allow for constructive problem solving. Manage conflicts in an effective and timely fashion, and ensure follow-up with all parties involved.

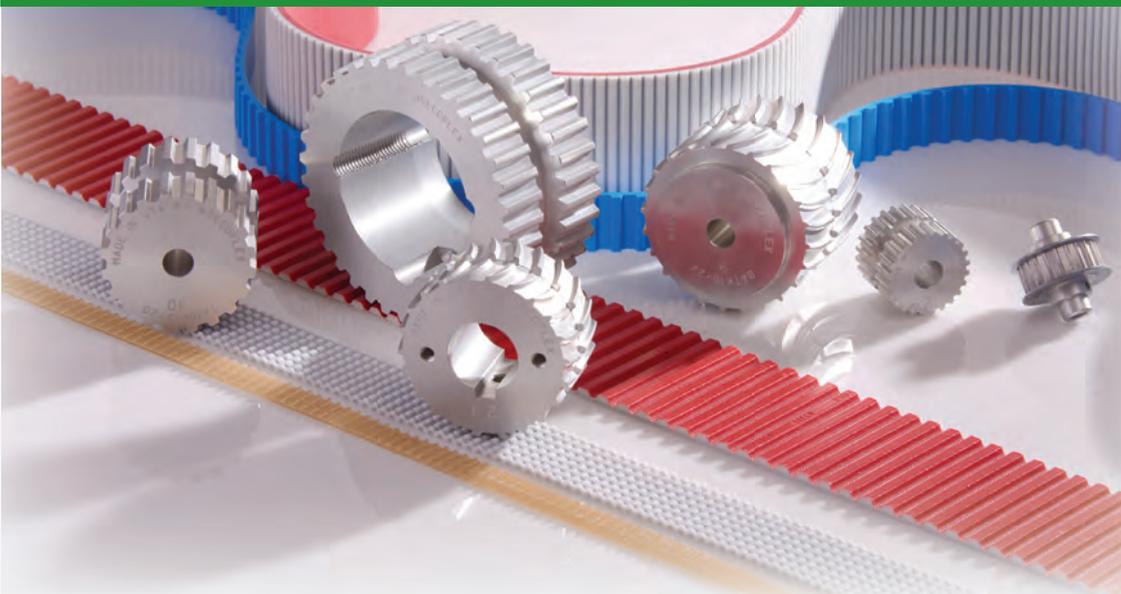
Everyday acts of civility, care and consideration go a long way to help everyone feel safe, comfortable and respected at work.

*The Canadian Centre for Occupational Health and Safety (CCOHS) in Hamilton contributed this article. CCOHS provides information, training, education, management systems and solutions that support health and safety programs and the prevention of injury and illness in the workplace. Visit [www.ccohs.ca](http://www.ccohs.ca).*

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## MAINTENANCE

Setting standards will improve functions by identifying and addressing problems.

BY STEVE GAHBAUER

**M**aintenance standards are key to plant performance. One of the most effective ways to ensure your plant is competitive and profitable is to conduct a maintenance and reliability assessment. Interviewing knowledgeable personnel with objective questioning ensures a solid overview of maintenance efforts to identify strengths and weaknesses. A quantitative assessment provides validation, cost justification and benchmarking of reliability KPIs.

A recent MainTrain maintenance conference convened by the Plant Engineering and Maintenance Association of Canada (PEMAC) hosted Matt Price, the reliability services manager of Pioneer Engineering in Calgary. He presented a technical paper on the use of a qualitative survey to focus on quantitative reliability assessment. Price, a certified maintenance reliability professional, specializes in condition monitoring and high-end analysis of rotating equipment in production plants as well as oil and gas facilities.

Fully understanding maintenance with the strengths and weaknesses of reliability can be a huge undertaking. Price noted a study is performed in one of two ways. The first calculates, tracks, and compares key performance indicators, watching work history trends and comparing business units.

The second is a qualitative approach, where plant employees are questioned about compliance with maintenance and reliability best practices to determine perceived strengths and weaknesses. A numerical assessment, while data-driven, doesn't necessarily bring the hole picture into focus. This approach does provide an understanding of actual costs



A maintenance and reliability assessment improves functions and addresses problems.

PHOTO: ADOBESTOCK

# Gauge RELIABILITY SURVEY FOR STRENGTHS AND WEAKNESSES

and work performed. But it also gathers an overwhelming amount of data without a clear direction of how to begin an analysis.

A qualitative assessment also has weaknesses, including potential bias from the personnel answering questions. However, it does provide a better overview of reliability and maintenance programs as viewed by those within the organization.

Price suggested a more effective and repeatable reliability assessment combines the two. A quantitative assessment uses the plant's CMMS work history to develop trends, key performance indicators and comparisons. These factors will either validate or invalidate what plant personnel say in a qualitative survey. Quantitative cost information is effectively used to justify projects, programs and personnel required to improve maintenance and reliability activities. A reliability assessment is most efficiently and effectively administered in this way.

Price stressed the use of a

qualitative assessment to better focus a quantitative analysis provides the best combination of overall understanding from personnel with the accuracy and reliability of historical data.

### Set targets

There are many reasons to conduct a reliability performance assessment. A lot can be learned from processes, procedures, or from people who are working to ensure equipment reliability. A better understanding of weaknesses helps set targets for improvement, and to determine the appropriate focus for resources. An assessment allows for comparison as well as to develop a course of action for improvement.

This includes prioritizing weaknesses, understanding available budget, manpower and material resources. An assessment will also aid economic justification for increasing funding or assistance for a reliability improvement program.

Price said an assessment should be broad in scope and

understanding of all the actions that have an impact on equipment reliability. Generally, this is broken into several sections. They include:

- projects and engineering
- operations
- preventive maintenance
- condition monitoring
- reliability-focused corrective maintenance
- CMMS
- materials handling
- reliability culture
- reliability engineering and programs.

Such an all-inclusive approach helps to eliminate many of the possible failure modes and ensures the failures that do occur can be scheduled, thus ensuring maximum operational flexibility around the repairs.

Industry must work toward sustainable and effective ways to stay in business. This includes containing costs and ensuring effective maintenance keeps the plant running and the budget balanced. The next step, often overlooked, is to push for forward-thinking maintenance and reliability programs. A maintenance and reliability assessment is one way to get there.

---

*Steve Gahbauer is an engineer, a Toronto-based business writer and a regular contributing editor. E-mail gahbauer55@gmail.com.*

**Comments?**  
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## SUSTAINABILITY

CarbonCure's mission is to reduce carbon dioxide emissions from concrete manufacturing.

Concrete is the building block of civilization. It's the foundation of all kinds of big infrastructure from roads, bridges and buildings to pipes and drains. Cement, a key ingredient that gives it strength, is responsible for up to 7% of the world's carbon dioxide emissions. So it's ironic indeed that a clean tech company in Dartmouth, NS is doing its bit to reduce the carbon emission count by injecting waste CO<sub>2</sub> from industrial sources into concrete to react with cement and make it even stronger.

CarbonCure Technologies recently made it onto the 2019 Global Cleantech 100 for the fourth consecutive year, adding to a growing list of recognitions (the company is also among the 10 finalists for the NRG COSIA Carbon XPRIZE that challenges competitors to convert CO<sub>2</sub> emissions into valuable products).

"This prestigious recognition will play a critical role in helping us realize our goals of technological advancements and geographic expansion, with the ultimate vision of reducing up to 500 megatonnes of CO<sub>2</sub> annually," said Rob Niven, founder and CEO of CarbonCure, part of the CO<sub>2</sub> capture and utilization industry forecasted to be worth \$1 trillion by 2030.

Niven was fresh out of McGill University with a Masters in Engineering when he founded the company, based on the fact that CO<sub>2</sub> can be chemically converted within concrete.

How does the carbon cure work? Here's how the company describes it:

A precise dose of CO<sub>2</sub> is injected into ready mix concrete and masonry products, where it's chemically converted into a mineral that improves the strength of the material. The CO<sub>2</sub> comes from industrial



CarbonCure technology will be installed in 15 imi Concrete plants.

PHOTO: CARBONCURE

# A cure for CARBON

## PUTTING CO<sub>2</sub> TO WORK IN CONCRETE MANUFACTURING

emitters via gas suppliers that collect, purify and distribute it. The carbon dioxide is stored at concrete plants in pressurized vessels that are refilled regularly by the gas suppliers.

### Forms a mineral

CarbonCure's scalable system is retrofitted into concrete plants in a day with a simple interface integrated with the batch computer.

In a ready mix dry batch application, the CO<sub>2</sub> is injected into the hopper. In a central mix or masonry application, the CO<sub>2</sub> is injected into the central mixer.

Once injected into the wet concrete mix, the CO<sub>2</sub> reacts with calcium ions from cement to form a nano-sized calcium carbonate mineral that becomes permanently embedded in the concrete.

A key advantage to this process is the CO<sub>2</sub>, transformed into a mineral, never makes it into the atmosphere as a green-

house gas.

CarbonCure has worked with more than 126 concrete producers across North America. One of them is Irving Materials Inc. (imi Concrete), a concrete and materials provider in Greenfield, Ind. It adopted CarbonCure's CO<sub>2</sub> recycling technology in 15 of its ready mix concrete plants across Indiana, Kentucky and Tennessee.

On average, every cubic yard of concrete made by imi Concrete will save 25 pounds of CO<sub>2</sub>.

The company operates 155 active ready mix plants across Indiana, Kentucky, Tennessee and Ohio. It first installed and tested the CarbonCure technology at its Whiteland, Ind. plant in July 2017. Three plants followed in November 2018. An additional 11 plants are scheduled for installations this year.

Last November, CarbonCure partnered with Singapore company Pan-United Corp.

Ltd. adding its technology to three plants, potentially saving more than 4,000 tonnes of CO<sub>2</sub> annually. At the time, Niven described Singapore as a vital gateway to the company's entry into Asia.

CarbonCure notes CO<sub>2</sub> utilization products for the concrete sector is good for about \$400 billion worth of market opportunity and have the potential to reduce up to 1.4 gigatonnes of annual CO<sub>2</sub> emissions by 2030. And its technologies have the potential to reduce up to 700 megatonnes of annual global CO<sub>2</sub> emissions and create up to \$26 billion in new production efficiencies.

At this writing, CarbonCure's website, which displays a running tally of CO<sub>2</sub> savings, had logged more than 24,000 tonnes, which translates into almost 29,000 acres of forest absorption in a year.

In September, the company secured investment led by Breakthrough Energy Ventures. As a clean technology investor, Breakthrough Energy's goal is to eliminate a half gigaton of greenhouse gas emissions per year. The investment will extend CarbonCure's international reach, bringing it and Breakthrough Energy closer to reaching their emissions reduction goals.

**Comments?**

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## DIGITALIZATION



Effective management of assets relies on useful, pertinent data.

PHOTO: ADOBE STOCK

Digital management accesses needed information quickly.

BY STEVE GAHBAUER

Data deficiency—the absence of critical data – and how available data is organized and managed are areas that need to be addressed to make maintenance efficient and effective. It's not possible to make evidence-based management decisions without good, relevant and reliable information. Digital asset management (DAM) keeps relevant data within reach, when needed.

Why digital management? Let's make the case by following how maintenance works best.

Vlad Bacalu, senior director of reliability and technical services at Aecom, an American multinational engineering firm, notes in a technical paper that implementing a good and sustainable 5S program improves the efficiencies of the maintenance team and creates a safer work environment. Such a program begins by directing and training operators to perform minor checks and inspections and un-

## Battle data DEFICIENCY BOOST ASSET RELIABILITY WITH RELIABLE INFORMATION

derstanding the nature of failure modes. The next step is to develop a thought process based on root cause analysis (RCA) and train maintenance technicians to follow it. Once the proper troubleshooting mindset is developed, the effectiveness of existing preventive maintenance programs can be evaluated and optimized.

As maintenance and reliability processes are related, developing the skills of the maintenance team becomes an important part of the reliability roadmap. A matrix shows the skills of each maintenance technician. Personnel need to interview operators to understand the conditions that caused failures. Once a repair is completed, and the operator is satisfied, the asset is returned to production.

All of that relies on useful, pertinent data – and on how well that data is managed. Effective equipment maintenance depends on it. That's where DAM comes in. This was the subject of a case study at a MainTrain maintenance conference in Saskatoon hosted by the Plant Engineering and Maintenance Association of Canada (PEMAC).

### Document problem

Palak Patel, an engineering technologist of the Ontario Clean Water Agency (OCWA), operates 16 transmission stations and four plants in Ontario's Peel region. Manuals and drawings are the basis of all plant operations and maintenance. Organizations are not only struggling to maintain these records, they're often also unable to provide relevant

## SUPPLY LINES

### CYBER JOINT VENTURE

Moxa Inc., a provider of industrial communications and networking technology with US headquarters in Brea, Calif., and Trend Micro Inc., a cybersecurity specialist, have signed a letter of intent to form a joint-venture corporation.

TXOne Networks will focus on the security needs in Industrial Internet of Things (IIoT) environments, including smart manufacturing, city and energy. It will build security gateways, endpoint agents and network segmentation to secure, control and provide visibility of operational technology and equipment.

Trend Micro Technologies Canada is based in Ottawa.

### SPECMETRIX PARTNER

Manutrol Inc. is the new international sales and support network partner in Canada for Sensory Analytics, a Greensboro, NC manufacturer of coating thickness and measurement systems. Its SpecMetrix system measures the thickness of applied wet or dry coatings in real-time.

The system is aimed at metal, flexible packaging, aerospace, automotive, electronics and industrial markets worldwide.

Manutrol is a provider of processing equipment and laboratory systems in Burlington, Ont.

### MICANAN ACQUIRED

Nice, an Italian multinational operating in the home automation, security and smart home segments, continues its expansion in North America with the \$8 million acquisition of Micanan, a manufacturer of garage door automation systems.

The Montreal company serves the North American market through branches in Chicago, Atlanta and Phoenix, Ariz.

The Nice Group has production, distribution and R&D facilities in more than 20 countries.

data when it is required for diligent maintenance work. By digitizing older manuals and drawings, many gaps were identified on missing documentation from previous projects.

OCWA faced the document management problem while operating the wastewater sites under its jurisdiction. To tackle the issue, the organization upgraded its Open Text database software and uploaded operation and maintenance manuals, and engineering drawings. Initially, manuals and drawings were scanned. When scanning was completed, the documents went through optical character recognition so each file could be searched for key words and easily viewed through different formats such as Pdf, Word, Excel and CAD. Other documents – reports on maintenance, inspections and safety – were also regularly uploaded to the database.

Frequent Open Text training was provided to staff to ensure everyone knew how to use the various functions of the database, such as editing, creating versions of documents and sharing them through a mobile phone application. Part of it is an archive system that's a major part of DAM and vital to centralize all reports and records onto one database where the information is easily accessible. Previously, records were kept on personal drives and erased when employees left OCWA. Now records are easily accessible to anyone and anywhere at any time.

There was one major issue: avoiding any duplication of documents being uploaded to the database. To resolve it, access to upload and edit is limited to managers and the document management team. Stakeholders are contacted to make sure documents are uploaded in the right format for easier access.

The DAM initiative is working for the OCWA. It now plays a vital role in assisting maintenance work across the agency's facilities and improves the efficacy of asset management.

*Steve Gahbauer is an engineer, a Toronto-based business writer and a regular contributing editor. E-mail gahbauer55@gmail.com.*

**Comments?**

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

## DIGITALIZE HYDRAULICS IO-Link now integrates fluid technology

Industry 4.0 is closer than you think. IO-Link from Rexroth is supported by about 150 companies and enables digital communication of peripheral valves and pressure switches. Now hydraulic actuators and sensors have been added to the network. This adds fluid technology to Industry 4.0 applications.

IO-Link standardizes and simplifies wiring with M12 connectors and unshielded 3-conductor/5-conductor cables to eliminate wiring by hand.

All communication blocks are available for the IoT-ready ILC and motion control systems. Combined with IndraWorks Engineering, they provide direct access to project planning, parameterization and testing. And parameters can be adjusted to new conditions.

Standardized plug and play devices reduce machine and system downtime. With authorized access, operating conditions such as temperature, operating hours and error status are evaluated during production.

Bosch Rexroth Canada is a supplier of drive and control technologies based in Burlington Ont.

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



*Simplified wiring with M12 connectors.*

PHOTO: REXROTH



*Wireless management.*

PHOTO: YALE

## TAKE CHARGE OF TRUCK BATTERIES

### Telemetry leverages connectivity

Poor management and charging habits lead to diminished performance of lift truck batteries, which results in premature replacement and extra costs.

Yale Battery Vision leverages connectivity and the cloud to prevent these issues. Wireless battery management monitors use 24/7 and alerts users of potential battery issues related to water level, smart charging,

warranty compliance, access and e-mail alerts.

It's available as a standalone or used in conjunction with the full Yale Vision telemetry system for lift truck fleets.

Yale Materials Handling Corp. is a supplier of materials handling lift truck products and services, based in Greenville, NC.

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



## QUICK CHANGE TOOLS

### Mount them on robots

Robot-based drilling, grinding, filing, cutting and deburring without time delays are possible thanks to quick tool change solutions from Suhner Industrial Products Corp.

Tools mount directly to the robot arm to perform operations previously not suitable for automation. Process forces are programmable, tolerances (shapes) will be balanced, programming time and effort (at the robot) for complex parts are reduced; and performance and process assurance can be increased significantly.

Suhner manufactures robotic solutions in Rome, Ga.

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



Angle grinder mounted to a KUKA robot.

PHOTO: SUHNER

## FLIR ACQUIRES ENDEAVOR

### Makes tactical UGVs



An Endeavor UGV.

PHOTO: FLIR

Thermal imaging and sensor manufacturer FLIR Systems Inc. has added to its unmanned business with its acquisition of Endeavor Robotic Holdings Inc. for US\$385 million.

Endeavor makes tactical unmanned ground vehicles (UGVs) for military, public safety and critical infrastructure markets.

These highly mobile, easy to operate ground robots use advanced sensing and action functions for handling explosive ordnance disposal, reconnaissance, inspection and hazardous materials support for troops, police and industrial users.

The Boston area firm's family of UGVs range from the 2.3-kg throwable FirstLook reconnaissance robot to the 230-kg Kobra heavy-lift robot. All models are controlled under one common command and control system.

FLIR also bought Aeryon Labs, a Waterloo, Ont. manufacturer of drones for US\$265 million.

Flir's Canadian office is in Burlington, Ont.

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

## G120X DRIVES INFRASTRUCTURE

### Fit for digitalization and linking to the cloud

The Siemens Sinamics G120X drive is made for pump, fan and compressor applications in industrial environments.

Power ranges from one to 700 hp (0.75 to 630 kW) operating in a temperature range from 20 to 60 degrees C with any standard motor, including SRMs.

An integral DC choke improves harmonics and EMC performance.

The compact drive saves space in the control cabinet and it's easily integrated into MCC solutions (including plug-in buckets).

Sinamics Connect 300 and the Mindsphere app Analyze MyDrives link to the cloud-based Mindsphere open IoT operating system for analysis of operating data.

Siemens is a global industrial technology company with Canadian headquarters in Oakville, Ont.

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



The drive easily integrates into existing applications.

PHOTO: SIEMENS

## MORE 3D PRINTING FOR PRODUCTION

### Major shift from prototyping coming



Automotive leads 3D printing product value.

PHOTO: ADOBE STOCK

Production-ready additive manufacturing platforms are rapidly moving from mostly prototyping to production, according to an ABI Research study.

The market analysis firm with offices in Oyster Bay, NY, predicts shipments will increase more

than 10 times by 2030 as the technology's use in structural and mission-critical commercial applications comes to fruition.

ABI says these systems will produce more than US\$360 billion worth of parts and end products each year and nearly US\$2 trillion by the end of the next decade.

Automotive applications will account for US\$148 billion in product value over that period, following closely by the machinery markets, but these figures differ from country to country.

The US leads in AM product value but under present conditions will be passed by China in 2029.

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

## PRODUCTS AND EQUIPMENT

### ROBOTICS

#### FINISHING FOR ALL ROBOT BRANDS



*Speed and flexibility.*

Fastems automated robotic finishing grinds, polishes, deburrs and brushes to eliminate variations common in manual operations and maximizes output of precisely

finished parts.

Control and robotic systems for all the major robot brands provide speed and flexibility, spindle choices and a variety of process tools and accessories.

The programmable compliance of pneumatic spindles enables tools to compensate for part feature variations such as those typical in castings. Electric spindles are suited to applications requiring many tools or where

tool changes are frequent.

Tooling for either type enables custom tailoring of processes for specific applications.

Fastems, based in West Chester, Ohio, is an independent integrator of robots and system solutions.

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

### MATERIAL HANDLING

#### EASILY MOVE 1,000-LB. BARREL



*Hand truck bears the weight.*

The four-wheel 10HT-4W hand truck from Liftomatic Material Handling transports all rimmed steel, fibre and plastic drums

weighing up to 1,000 lb.

It bears the weight of the load, saving the handler a lot of wear and tear. Two 10-in. main wheels with full roller bearings, and two 4-in. swivel casters support the drum while moving through plants and warehouses, secured by a parrot-beak clamping mechanism. It handles all drum sizes from 10 to 85 gal.

Liftomatic Material Handling Inc., based in Buffalo Grove, Ill., manufactures drum-handling equipment.

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

### METALWORKING

#### CUT THIN-GAUGE METAL FAST

Thin cut-off wheels from PFERD make a fast, clean cut with minimal burrs. Use them on thin gauge sheet metal, thin walled tubing and small diameter cross-sections.

Product types include SG



*Minimizes burrs.*

STEEL, made from a high-performance aluminum oxide grain that cuts steel and cast iron sheet metal, sections and solid material. Wheels in thicknesses of 0.045, 0.040 and 0.030 in. are recommended for fast cutting that minimizes burrs.

The SG STEELOX wheel is used for general purpose cutting of steel and stainless steel while the SG ALU is for non-loading cut-off use on aluminum and soft, non-ferrous sheet metal, sections and solid material.

PFERD Inc. is a manufacturer of abrasives, brushes and power tools based in Milwaukee.

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



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## DON'T GET BOXED IN

**Creform® carts present parts efficiently without boxes or dunnage.**

Delivering parts to the shop floor without packaging keeps your associates assembling. A special-purpose Creform cart handles parts safely and presents them for easy access. Eliminating the lineside packaging saves valuable time and space. At the station Creform carts will get you the parts you really need, when you really need them.



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## POWER

### HIGH PERFORMANCE SWITCHING

A SIP power relay from Littelfuse Inc.'s IXYS Integrated Circuits division provides up to 4,000 V of



On-resistance of 0.51 Ohms.

input-to-output isolation for high-performance switching.

The CPC1984Y is a normally open power SIP relay rated for up

to 1 A DC/1 Arms continuous load current. Optically coupled MOSFET technology provides the input-to-output isolation. The outputs, which employ IXYS ICD's OptoMOS architecture, are controlled by infrared LED.

Typical on-resistance rating is 0.51 Ohms with a maximum of 0.66 Ohms. Its 600 V blocking voltage provides sufficient design margin for both 110/220 Vrms power line applications for universal power supplies.

Other benefits include low power consumption, no snubbing circuits are needed to suppress arcs when switching, and the device's plastic package has a UL 94 V-0 flammability rating.

Littelfuse is a manufacturer of circuit protection, power control and sensing technologies.

<http://Littelfuse.com>

### MONITOR CRITICAL POWER APPLICATIONS



Additions to EcoStruxure.

Schneider Electric has a new version of its EcoStruxure Power Monitoring Expert and Power SCADA Operation for critical power networks and applications.

Power Monitoring Expert

acts as the window to a digitized power network, taking advantage of IoT connectivity and distributed intelligence. It connects to field devices such as power and energy meters, electrical distribution equipment and building energy systems, using the data to reduce energy costs and improve operational efficiency.

Power SCADA Operation provides real-time vision and control in power-critical facilities. A robust architectural redundancy ensures the network remains available even if a worst-case scenario occurs.

Schneider Electric, a global specialist in energy management and automation, has Canadian offices in Mississauga, Ont.

[www.schneider-electric.ca](http://www.schneider-electric.ca)

## MOTION

### PRECISE OVERHEAD GANTRY MOTION



Small form factor.

PI's A-341 hybrid gantry XY/XYZ positioning stage provides the framework for controlled, precise overhead motion needed for 3D printing, assembly, pick-and-place, alignment, inspection and industrial automation applications.

Its cross axis uses a frictionless air bearing guiding system that controls velocity, repeatability, straightness and cleanliness. A lower dual-motor axis uses precision mechanical linear bearings for rigidity and reduced size. This combination optimizes step and scan applications in a small form factor. Absolute measuring encoders render homing procedures unnecessary and ironless linear motors eliminate cogging, providing smoother motion without vibration and better velocity control.

An optional vertical axis (Z-stage) with either ballscrew

drive or linear motor and pneumatic counterbalance can be integrated with the gantry cross axis.

PI, based in Auburn, Ma., makes motion products.

[www.pi-usa.us/en](http://www.pi-usa.us/en)

### AMPLIFIER ELIMINATES NON-LINEARITIES



Controls digital PID.

Aerotech's XL4s linear amplifier for closed-loop servo control of voice coil and single-phase motors, eliminates the non-linearities common with

PWM amplifiers.

Features include a multi-core, double-precision, floating-point DSP that controls the digital PID.

All parameters are soft-

ware-settable including control-loop gains and system safety functions. It delivers to industry-leading settling times, long-term thermal stability, and sub-micron-level tracking accuracy with advanced features such as full state feed-forward, 192 kHz servo rates, and look-ahead-based velocity control.

The 192 kHz servo rate directly correlates to better tracking errors and part quality at high-speeds in applications such as fast-tool servos, high-dynamic optical focusing axes, and high-speed pick-and-place machines.

The XL4s has an encoder interpolation feature, dedicated analogue and digital I/O, fibre-optic interface, and separate power connections for motor and control supply voltages.

Aerotech is a manufacturer of motion control, positioning tables/stages, and positioning systems based in Pittsburgh.

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

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## PRODUCTS AND EQUIPMENT

### SENSORS

#### THROUGH-BEAM SENSORS RESIST CHEMICALS

Balluff's stainless steel fork sensors resist aggressive cleaning agents, chemicals, coolants or other media in demanding packaging, food and beverage applications.

Normally open and normally closed outputs simplify integration into control systems.



*Integration simplified.*

With multiple light sources (red for easy setup, infrared for highly contaminated or environments with water or mist in the air), the sensor is used in a multitude of applications. Troubleshooting is fast and easy with the

pigtail with M12 connector and integral LEDs for output function and power on indication.

Balluff Inc. is a supplier of networked IO-Link control system architectures based in Florence, Ky.

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

### MATERIAL HANDLING

#### TRACK SYSTEMS ADD LIFT TO APPLICATIONS



*Articulated design.*

Konecranes XK-A and XK-S workstation cranes accommodate demanding lift applications. The modular enclosed-track systems handle lift options for loads up to 2 tons.

The aluminum XK-A is smooth, quiet and light. XK-S is the companion steel system for complex curves, turntables, motorization and transfer options. Both can be ceiling mounted or freestanding. And elements of the steel and aluminium profiles combine to suit a specific lifting goal.

The cranes' articulated design requires the least amount of force to operate and they don't need sway bracing on hanger drops of less than 15 ft.

Konecranes is a Springfield, Ohio manufacturer of lifting products.

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

#### SMOOTH FLOW OF BULK MATERIALS



*Raised by a hydraulic cylinder*

Flexicon's TIP-TITE drum dumper for use with poorly flowing or agglomerated materials rapidly transfers

free- and non-free-flowing bulk solid materials dust-free.

Similar in performance to

open chute dumpers but with total dust containment, the outlet on the downstream end is nearly equal in area to the drum opening. This allows agglomerated materials and large chunks to be discharged with a minimum of material bridging.

Drums from 30 to 55 gal (114 to 208 L) are positioned on the dumper platform, which is raised by a hydraulic cylinder, seating the rim against the circular end of the discharge transition. A second hydraulic cylinder tips the platform-hood assembly and drum, stopping at dump angles of 45, 60 or 90 degrees with a motion-dampening feature. At full rotation, the transition outlet mates with the gasketed square inlet on the lid of a hopper or downstream process equipment. A pneumatically actuated slide gate valve then opens and closes for total or partial discharge with no dusting.

A stainless steel transition can be supplied with a square or rectangular outlet, or circular outlets, with corresponding gasketed flanges for installation on downstream hoppers and receiving vessels.

Flexicon makes bulk material handling equipment in Bethlehem, Pa.

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

#### ERGONOMIC TABLE LOWERS LIFT HEIGHT



*Ergonomic features.*

LiftMat lowers the lift table height to just 3¼ in. The table made by Southworth Products gives workers unobstructed access to all four sides of a palletized load with no more bending or stretching. This conserves operator movement.

As boxes are added or removed, the platform is raised or lowered to the most comfortable height with a powered foot

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MDL55SR

Combustible Dusts  
MDL15



Combustible Dusts  
MDL30 40008SS  
(Food/Pharma)

Combustible Dusts  
MDL55 40012/3 (General Purpose)

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STEEL SHOT • INTERCEPT HOPPERS & PRE-SEPARATORS  
HSE / INDUSTRIAL HYGIENE SOLUTIONS • METAL CHIP COLLECTION & CLEANING

switch, or a hand-held push-button remote.

Some units come with a turntable that sits flush to the platform, allowing users to spin the load and remain in one position throughout the loading and unloading process. A rotational lock prevents the turntable from spinning when not use.

LiftMat has a 2,200 lb. capacity with a raised height of 31.5 in.

A full-perimeter toe guard stops downward travel if the lift comes in contact with any obstruction. An optional ramp allows loading and unloading of the platform with a hand pallet jack.

An external power unit comes prewired with a cord and plug for 115-V power. Platforms sizes from 24 x 60 in. up to 48 x 96 in.

Southworth Products is a manufacturer of material handling products based in Portland, Me.  
[www.SouthworthProducts.com](http://www.SouthworthProducts.com)

## FEEDING WITH GOOD VIBRATIONS

Vibratory feeders from Best Process Solutions Inc. smoothly convey products with adjustable flow at a rate that's either variable or fixed.



Electric or air-operated models have above-, below- or side-mounted drives and can be arranged for base mounting or overhead suspension.

Feeders come in custom vibrating trough lengths and special designs are available. And an optional BPS Inertial Isolation System eliminates the transfer of vibratory energy to support structures and buildings.

BPS is a manufacturer of custom-engineered, bulk-processing equipment and systems based in Brunswick, Ohio.  
[www.bpsvibes.com](http://www.bpsvibes.com)

## CONTROLLERS

### DPC GOES WITH THE FLOW

Aalborg Instruments' DPC digital controllers provide accurate and stable control of mass flow, volumetric flow, pressure and temperature parameters of process gases.

They support 90 gases and mixes, storing up to 20 custom mixes with up to five different gases each.

Aalborg Instruments makes precision instrumentation for flow measurement and control based in Orangeburg, NY.

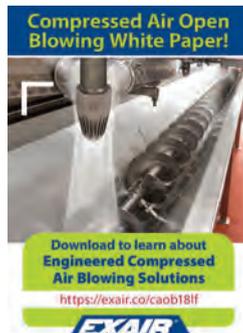
[www.aalborg.com](http://www.aalborg.com)



Supports 90 gases and mixes.

## Industrial Literature Review

### COMPRESSED AIR OPEN BLOWING WHITE PAPER



Compressed air is a limited resource that is generated in-house for the benefit of many operations. Learn how to ensure all point of use applications are using your compressed air in the most effective and efficient way

possible. Learn how engineered nozzles can help you use your air more effectively and efficiently. Download EXAIR's latest white paper, "Compressed Air Open Blowing." Visit <https://exair.co/caob18lf>.

EXAIR Corp.

## PLANTWARE



Automated capabilities.

### ECM 4.2 ADDS AP CAPABILITIES

IntelliChief has expanded its IntelliChief ECM 4.2 AP automation invoice matching capabilities, from both document capture and workflow phases.

The updated, easy-to-use interface supports two-way matching (invoice to PO) and three-way matching (invoice to PO to receiver). This processing occurs in both initial document capture and in workflow, providing safeguards and validations.

Information from the ERP is utilized to perform matching. IntelliChief keeps track of the PO quantity open and the receiving quantity available by saving needed information when an invoice line item is matched to a PO/receiver. This can be set to identify by PO Number, Item Number/ID, Unit Price, Line Total, PO Quantity Ordered, Receiving Quantity, or two Miscellaneous fields.

IntelliChief is a provider of automated document and workflow management solutions based in Tampa, Fla.

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

## EVENTS

### Hannover Messe Deutsche Messe AG April 1-5, Hannover

Industrial technology from R&D, industrial automation, IT, industrial supply, production technologies and services to energy and mobility. Visit [www.hannovermesse.de](http://www.hannovermesse.de).

### PLANT Expo 2019 Annex Business Media, FMA Inc.

April 3, Winnipeg  
April 23, Mississauga, Ont.  
May 15, Abbotsford, BC  
June 19, Sherbrooke, Que.

Products and solutions for manufacturing, processing machinery and MRO markets. Co-located with

Design Engineering's DEX Expo and Canadian Metalworking's MMP Expo. Visit [www.plantexpo.ca](http://www.plantexpo.ca).

### Automate 2019 Association for Advancing Automation April 8-11, Chicago

Showcases the full spectrum of automation technologies and solutions from traditional industrial applications to cutting edge. Visit [www.automate-show.com](http://www.automate-show.com).

### ISA Calgary DMG April 9-10, Calgary

Instrumentation, control and automation services, technologies and equipment. Visit <https://isacalgary.com>.

### CNAM 13th Annual Conference Canadian Network of Asset Managers May 6-9, Kelowna, BC

Professional development, idea sharing, workshops and networking with peers and new players in government, academia and industry. Visit <http://cnam.ca/upcoming-/2019-conference>.

### Operational Excellence in Energy, Chemicals and Resources Summit IQPC/PEMAC June 4-6, Calgary

The focus is on optimizing safety, efficiency, sustainability and reliability. Presented by IQPC and the Plant Engineering and Maintenance Association of Canada (PEMAC). Visit <https://opexsummit.iqpc.com>.



# Handle statistics with care

BY JAYSON MYERS

It has long been recognized you have to measure something to improve it. Accurate real-time measurements stand at the heart of good business planning, operational control and continuous improvement.

Advanced technologies are allowing manufacturers to collect, analyze and use data related to products, processes, business and logistics systems faster, more easily and in greater volume than ever before. Transforming data into new solutions – and new sources of business revenue – drives innovation, enables game changing improvements in productivity, process efficiency and customer. But when it comes to measuring the performance of the manufacturing sector, data from public statistical agencies are woefully behind the times.

Our economic statistics are geared more to the business structures of the 1970s. Why should we care? Because a distorted view of manufacturing is misleading if companies are trying to benchmark against industry-wide data. It can also lead to misguided policy decisions by governments that may downplay the importance of manufacturing because they aren't getting the full picture.

We need new definitions and new ways of measuring manufacturing to keep up with the changes shaping modern industry. It makes more sense to base those on how companies measure performance rather than on how economists assume the economy is run.

Here are some of the ways our economic statistics paint an inaccurate – and usually a very negative – picture of manufacturing.

First off, there's the definition of manufacturing. To be counted as a manufacturer, it's not good enough to produce something tangible. The main source of value (usually measured in terms of employee activity) needs to be involved in producing goods. Sounds reasonable. But today there are fewer people actually working in production. More companies generate value through the services they provide to customers, such as engineering, technology and logistics.

A production-based definition becomes even more complicated when companies have the flexibility to produce a variety of goods and services for different types of customers. And categorizing becomes increasingly difficult when companies define business in terms of production, innovation and customer service. It takes up to two years for more detailed data to be released about buying and selling across the economy as a whole, only to reveal our statistics understate the value of manufacturing output by about 12%.

The lack of an enterprise or a supply-chain view

also understates the importance of the sector. The modern manufacturer enterprise has a networked structure. Production and services are undertaken by a number of different companies rather than by one business unit. That means much of the sales, jobs and added value once recorded in manufacturing are now being tracked in the services sector.

Under the current definition, the contribution that manufacturing makes to the economy has shrunk from 16% to 11% over the past 20 years. However, the supply chain around manufacturing has grown to almost 45% of total economic activity, making the sector an even more important anchor of value creation. Indeed, it's the ultimate integrator of technology and services. Fewer people work directly in manufacturing, but many more work in jobs related to it or provide support.

Another problem arises when statistics report "real GDP" as a measure of value added. The reason for calculating a "real" number is to adjust for price changes. Fair enough. But price increases reflect more than inflation; they also occur because customers are willing to pay more for enhanced products or services. By not differentiating between value and inflation, price adjusted numbers do a better job of measuring volume growth than enhanced value driven by customization, innovation and differentiation – the specialty of smaller companies in particular, which by the way, make up most of Canada's manufacturing businesses.

A more accurate picture emerges when current dollar statistics are used to track manufacturing performance. Take profit margins – an indicator that all companies use to measure business performance. It turns out Canadian manufacturers are on average more profitable than their US counterparts. That's impossible to explain based on "real" calculations of output.

There's one more problem: macro statistics include the impact of plant openings and closures. They can be distorting if treated as a measure for benchmarking individual company performance.

Canada has lost a number of large manufacturing operations. That's one reason why productivity, investment and employment numbers have fallen. But macro statistics mask the productivity improvements and growth of companies that remain.

Bottom line, when it comes to using economic statistics, handle with care.

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*Jayson Myers, the CEO of Next Generation Manufacturing Canada, is an award-winning business economist and advisor to private and public sector leaders. E-mail [jayson.myers@ngmcanada.com](mailto:jayson.myers@ngmcanada.com). Visit [www.ngmcanada.com](http://www.ngmcanada.com).*

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

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November 2019

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