Plant

WINTER 2022

PLANT.CA

CANADA'S MANUFACTURING MAGAZINE

CLEANTECH

How can manufacturers become more sustainable? P.12

PM 40065710

INVESTING

IN THE INDUSTRY'S FUTURE LEADERS?

WE CAN HELP.

Up to **$7,500** per placement

Apply today at **emccanada.org**

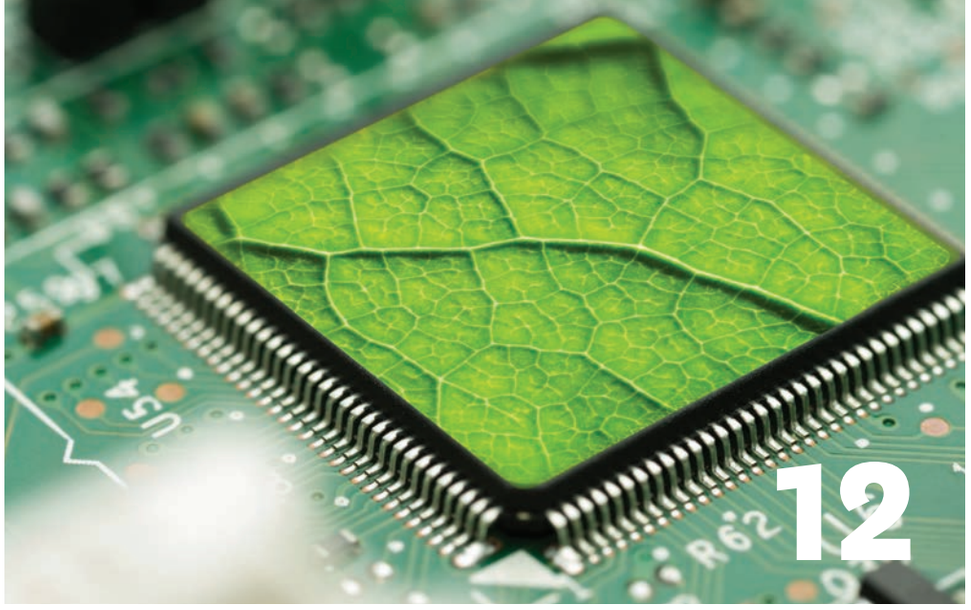
EMC's WILWorks Program lets you:

- Leverage cost-effective short-term labour
- Subsidize wages for already-hired students
- Strengthen your current workforce and future talent pool
- Support future leaders in the manufacturing industry with opportunity

EXCELLENCE IN MANUFACTURING CONSORTIUM

WILWORKS

Canada



INSIDE

WINTER 2022

In every issue

Cover Photo: Konoplytska / iStock / Getty Images

EDITORIAL
BY MARIO CYWINSKI

Happy new year

A new year looks to bring more stability, routineness, and prosperity

Two years into a global pandemic caused by COVID-19, many companies in the manufacturing space have learned to adapt on the fly and have been able to pivot to new ways of doing business.

However, some problems continue to persist, mainly supply chain issues that are having a major impact across Canada. We will be focusing on supply chain in our Spring 2022 issue.

However, other aspects within the manufacturing space are now seeing improvement. For one, companies that have been able to fight through COVID-19 disruptions are better prepared for the future. In turn, in this issue we look at the future by way of the clean technologies (cleantech) that are currently in use and others that are coming.

Late last year, we brought together a cross-section of experts in the cleantech space for a roundtable discussion. The panel included representatives from two associations, an alliance, a battery manufacturer, and a metal fabrication manufacturer. In a vibrant discussion, that was originally scheduled to be an hour, went for 90 minutes, and could have gone longer if not for panelists having to get to other commitments.

What we discovered during the discussion is that many manufacturers and those involved in the cleantech space, public sector or private sector and government, need more collaboration and co-operation. As some companies are hesitant to adopt cleantech, especially those that are small- to medium-sized, they may become obsolete if there is not enough uptake for it.

Electrification used within manufacturing plants was also discussed, as many vehicles within the plants can be made to be more 'green.' With battery technology improving every day, the fear of downtime because of electric machinery failing, is not as much of a concern.

As a follow-up to the roundtable, we will be running a webinar-based version in February, stay tuned for details coming up soon.

Plant will be moving to being a quarterly publication.

Look for all the great content that is coming in 2022.

As this is our cleantech issue, *Plant* is packed with great information to help our readers navigate the maze of what you can do to become greener and more sustainable. We look at the top five cleantech trends to look for in 2022, why we should be embracing cleantech, and why cleantech and lean are not as distant as you think.

Also, *Plant* was recently able to visit the first-ever Electricity Transformation Canada presented by the Canadian Renewable Energy Association in Toronto. The event brought together industry professionals to learn and speak about renewable energy.

Finally, with 2022 upon us, *Plant* will be moving to being a quarterly publication. Each issue will now be a theme, and will include extras such as roundtables, webinars, surveys, videos, and podcasts.

Look for all the great content that is coming in 2022.

Happy new year to all our readers, partners, advertisers, writers, and everyone involved in the manufacturing industry.

MARIO CYWINSKI, EDITOR
Comments? E-mail
mcywinski@annexbusinessmedia.com

Connect with Plant magazine
@PLANT_Magazine facebook.com/PlantMagazine/ /plant-magazine plant.ca

Plant
CANADA'S MANUFACTURING MAGAZINE
WINTER 2022 • Volume 80, Number 1

READER SERVICE
Print and digital subscription inquiries or changes, please contact
Beata Olechnowicz,
Audience Development Manager
Tel: (416) 510-5182
Fax: (416) 510-6875
email: bolechnowicz@annexbusinessmedia.com
Mail: 111 Gordon Baker Rd., Suite 400
Toronto, ON M2H 3R1

EDITOR Mario Cywinski
226-931-4194 · mcywinski@annexbusinessmedia.com

ASSOCIATE EDITOR Maryam Farag
437-788-8830 · mfarag@annexbusinessmedia.com

SENIOR PUBLISHER Scott Atkinson
416-510-5207 · satkinson@annexbusinessmedia.com

NATIONAL ACCOUNT MANAGER Ilana Fawcett
416-829-1221 · ifawcett@annexbusinessmedia.com

MEDIA DESIGNER Lisa Zambri

ACCOUNT COORDINATOR Debbie Smith
416-442-5600 ext 3221 · dsmith@annexbusinessmedia.com

GROUP PUBLISHER Paul Grossinger
pgrossinger@annexbusinessmedia.com

COO Scott Jamieson
sjamieson@annexbusinessmedia.com

ANNEX BUSINESS MEDIA
111 Gordon Baker Road, Suite 400
Toronto, ON M2H 3R1
Tel (416) 442-5600 · Fax (416) 510-5134
www.annexweb.com

SUBSCRIPTION RATES
Canada – $76.00 per year
USA – $201.00 (CAD) per year
International – $227.00 (CAD) per year
Single copy – Canada $12.00

Add applicable taxes to all rates. Combined, expanded or premium issues, which count as two subscription issues.

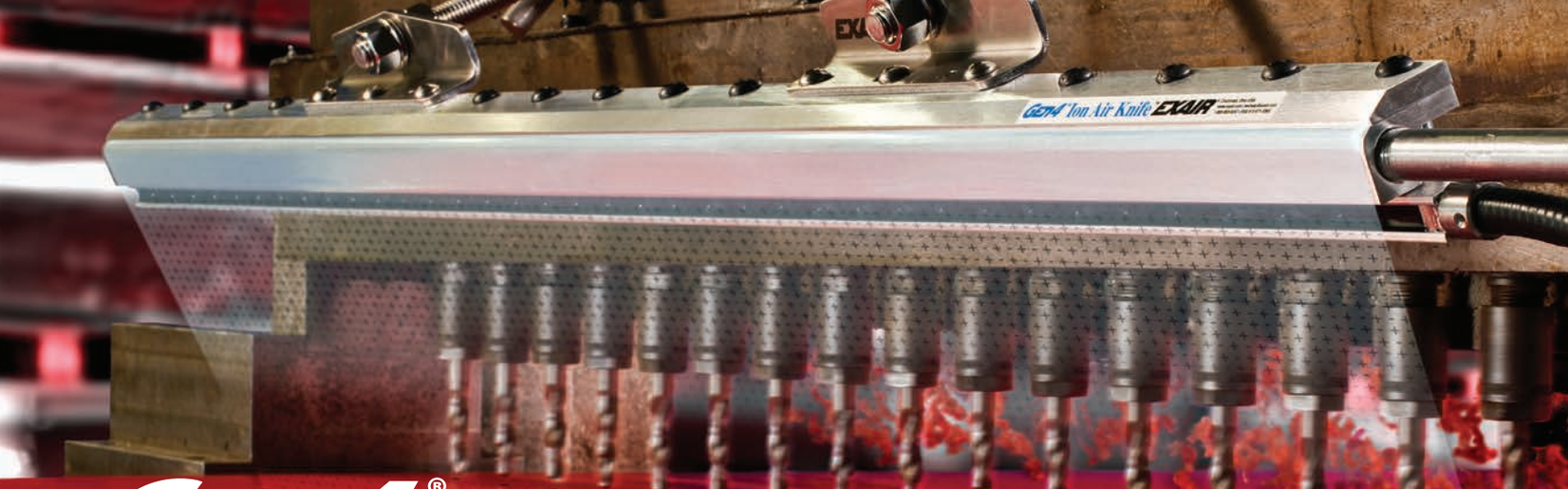
ISSN: 1929-6606 (Print), **1929-6614** (Online).

PUBLICATIONS MAIL AGREEMENTT NO. 40065710

Return undeliverable Canadian addresses to:
PLANT Circulation Department,
111 Gordon Baker Rd. Suite 400,
Toronto, ON M2H 3R1

PRINTED IN CANADA

Funded by the Government of Canada | Canada



Gen4® Static Eliminators Remove Static Electricity and Dust!

Improved Performance and Greater Durability!

Prevent Shocks, Jamming, Tearing and Static Cling!

As humidity decreases, static electricity problems will increase.

- Materials tear, jam or curl
- Webs and films cling to themselves
- Electronic sensors fail, making false readings
- Hazardous sparks or shocks occur
- Product clings to itself, rollers and machine beds
- Dust attraction ruins surface finishes

EXAIR's Basics of Static Electricity White Paper can be downloaded here!

https://exair.co/bose18ad

Gen4® Super Ion Air Knife™

Produces a laminar sheet of airflow that floods an area or surface with static eliminating ions.

Gen4® Super Ion Air Wipe™

The uniform 360° ionized airstream neutralizes and cleans continuously moving surfaces.

Gen4® Ion Air Gun™

Eliminates static and dust from parts prior to assembly, packaging, painting or finishing.

Gen4® Ion Air Cannon™

Ideal for hard to reach spaces or confined areas that require a concentrated ionized flow.

Gen4® Ion Air Jet™

Delivers a concentrated blast of ionized air prior to shrink wrapping, packaging and printing.

Gen4® Ionizing Bars

Eliminates static cling, dust attraction and jamming on paper, plastics and film.

EXAIR manufactures a complete line of static eliminators to remedy common static problems. Many use our engineered airflow products to minimize air use and noise while delivering maximum results by moving more static eliminating ions to the product surface.

LEARN MORE ABOUT NEW Gen4® STATIC ELIMINATORS NOW!

https://exair.co/18_470

CE c UL us

Patented handheld static elimination for sterile environments.

EXAIR® Manufacturing Intelligent Compressed Air® Products Since 1983

11510 Goldcoast Drive • Cincinnati, OH 45249-1621 • Phone (513) 671-3322
FAX (513) 671-3363 • E-mail: techelp@exair.com • www.exair.com

blog.exair.com @EXAIR

NEWS

Photo: George W. Bush Institute

(From left): Sergio Alcocer, COMEXI; Tom Harris, Hillwood; Emilio Cadena, Grupo Prodensa; and Jean-Pierre Giroux, EMC.

MANUFACTURING

EMC DISCUSSES SKILLS AND LABOUR SHORTAGES AT GLOBAL AFFAIRS CANADA FORUM

At the invitation of Global Affairs Canada, Jean-Pierre Giroux, President, Excellence in Manufacturing Consortium (EMC), represented Canadian industry at a tri-lateral forum to discuss competitive landscape and workforce development issues for North American manufacturers.

The forum took place in conjunction with the first meeting of the new US-Mexico-Canada Agreement (USMCA/CUSMA/T-MEC) Competitiveness Committee. Representatives from the governments of Canada, Mexico, and the U.S. were in attendance to present their goals for the future of manufacturing competitiveness and workforce development, and to collaborate on regional efforts to enhance North American workers.

CUSMA replaced NAFTA, and is intended to create "a more balanced environment for trade, support high-paying jobs and grow the North American economy."

According to EMC, Canada's goal for CUSMA is to allow Canadian manufacturers greater access to American and Mexican consumer markets. "Canadian-made goods have a high reputation, especially following the pandemic, and customer demand for products developed by Canadian manufacturers is strong. Sharing a common approach for skills, standards and certification makes sense."

Giroux discussed EMC's solutions, including sector-wide engagement with both employers, workforce, youth and other stakeholders, through labour market intelligence, national skilled trade occupational development, and micro-credential certification programs concentrated on onboarding, upskilling and reskilling, as well as other work-integrated learning resources. Skills certification, and the development of industry-driven, internationally recognized competency standards are also topics occupying business leaders' minds.

SIGMA LITHIUM ANNOUNCES CONSTRUCTION OF PRODUCTION PLANT

Sigma Lithium Corporation has started construction to build the foundation and infrastructure installation of its green tech dense media separation production plant at its wholly-owned Grota do Cirilo Project.

Completion of this stage of the construction civil works is expected within three months, when the Brazilian sub-construction firm of Promon Engenharia Ltda. is expected to complete earthworks and the concrete plant drainage channels.

The first phase of the production plant has been designed to produce up to 220,000 tonnes per annum of six per cent battery grade lithium concentrate, equivalent to approximately 33,000 tonnes per year of lithium carbonate.

220,000

The first phase of the production plant has been designed to produce up to 220,000 tonnes per annum of six per cent battery grade lithium concentrate.

AUTOMOTIVE

GMC TEASES ELECTRIC SIERRA DENALI

General Motors released a teaser image of its third electric vehicle, the Sierra Denali EV. The all-electric version of GMC's pickup truck will join the GMC HUMMER EV and GMC HUMMER SUV.

The electric version of the Sierra will be built on the company's Ultium platform. It will launch in Denali trim only.

A full reveal will take place in 2022, and once production begins it will take place at GM's Factory ZERO Assembly Plant in Detroit and Hamtramck, Michigan.

STELLANTIS PARTNERS WITH FOXCONN

Stellantis N.V. signed a non-binding memorandum of understanding with Hon Hai Technology Group (also known as Foxconn Technology Group), creating a partnership that will design purpose-built semiconductors for Stellantis and third-party customers. The collaboration helps to support Stellantis' initiatives to reduce semiconductor complexity, design new purpose-built semiconductors for its vehicles, and provide capabilities and flexibility.

EXRO OPENS DOORS TO AUTOMOTIVE GRADE MANUFACTURING FACILITY IN CALGARY

Exro Technologies Inc. announced the official opening of its manufacturing facility in Calgary, Alberta.

Exro's 37,000-square-feet Canadian facility will feature automotive-grade production lines and product showrooms. It will be compliant with automotive grade manufacturing standards ISO 9001:2015 and IATF 16949, as well as ISO 26262 for

Photo: General Motors.

functional safety.

The facility can support low-volume manufacturing and deliver approximately 100,000 coil driver units per year for use across a range of electric mobility applications from two-wheel recreational to passenger vehicles, and up to commercial and industrial vehicle applications. The facility will also manufacture the battery control system for energy storage applications.

The facility will run on clean energy solutions, including solar power with a rooftop array containing 576 solar modules, producing 425W each for a total nameplate rating of 244.8kW, and battery energy storage solutions working towards its net-zero carbon emissions objectives.

ECONOMY

GLOBAL CHIEF EXECUTIVES HOLD POSITIVE OUTLOOK FOR 2022: REPORT

According to a survey by YPO Global Pulse, over 80 per cent of global Chief Executives across 44 industries believe economic growth will remain strong in 2022.

Conducted with 1,700 Chief Executives in 101 countries, top YPO Global Pulse Survey findings include:

Among those surveyed, 37 per cent reported a 20 per cent increase in revenue or more since the beginning of 2021, and only 17 per cent saw a decrease of 10 per cent or more since the beginning of the year. Hiring has picked up, with 38 per cent of respondents experiencing a 10 per cent increase or more in the number of employees since the beginning of 2021, though 45 per cent of firms said their total head count is about the same as it was in early 2021, and 16 per cent said they saw a decrease.

Most Chief Executives (71 per cent) are very or somewhat concerned about the impact of inflation on their businesses next year. U.S. leaders (77 per cent) are more concerned about inflation than their global counterparts.

Inflation concerns could spell bad news for consumers, with respondents in the food and beverage (74 per cent), manufacturing (73 per cent) and retail and wholesale sales (62 per cent) industries planning to raise prices in response to inflation.

Thirty-nine per cent believe resolution of supply chain issues will come at the end of 2022, and 38 per cent expect it in 2023 or later. The global labour shortage continues, with 67 per cent of respondents saying it is somewhat or very difficult to find employees for the general workforce, and 57 per cent of respondents reporting the same levels of difficulty when it comes to C-suite and executive hires.

ONTARIO CREATES COUNCIL ON U.S. TRADE AND INDUSTRY COMPETITIVENESS

The Ontario government announced the creation of the Premier's Council on U.S. Trade and Industry Competitiveness, to be chaired by Unifor National President Jerry Dias, and will provide advice and recommendations on efforts to rally business leaders, elected officials and labour leaders to protect Ontario's rights under trade agreements.

Vic Fedeli, Minister of Economic Development, Job Creation and Trade and Jerry Dias will work together in the coming days to appoint additional membership to the Council.

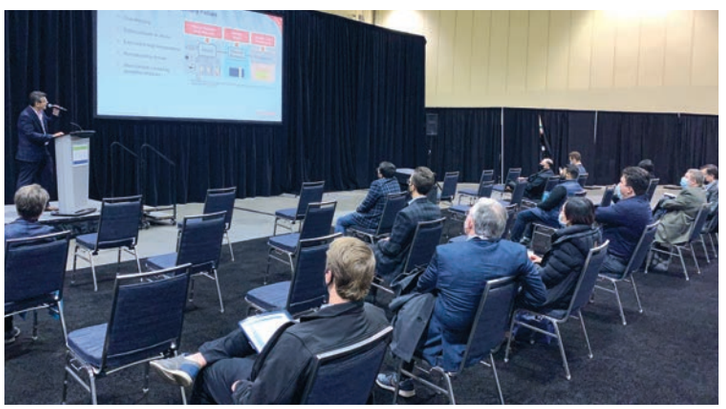
Currently, the U.S. Congress is debating protectionist measures that would threaten industries across Ontario, including auto, lumber, steel, agriculture and more. These measures would impact auto agreements that began in 1965 with the Auto Pact, were solidified in 1994 by NAFTA and re-affirmed in 2020 with the Canada-United States-Mexico Agreement. **PIt**

*Visit **plant.ca/news** for more industry news and events.*

CanREA ETC conference electrifies Toronto

BY MARIO CYWINSKI

The first-ever Electricity Transformation Canada took place recently at the Metro Toronto Convention Centre.



(Top and middle) The trade show included over 100 exhibitors. (Bottom) A wide selection of sessions and keynotes were available at the event.

The conference put on by the Canadian Renewable Energy Association (CanREA) brought together over 1,100 industry professionals to discuss and learn about renewable energy. One of the attendees was Ontario Minister of Energy Todd Smith, who spoke with CanREA's staff and board members.

Over 100 exhibitors took part in the trade show portion of the conference, with attendees, exhibitors, sponsors and CanREA members getting an opportunity to network face-to-face for the first time in a long time. The exhibit hall contained a presentation theatre, which provided short 20-minute presentations.

The conference was kicked off by CanREA launching its 2050 Vision. Plant covered the announcement here: *plant.ca/general/canrea-issues-a-call-to-action-for-electricity-sector-decision-makers-234333/* (QR code available at end of article).

"Getting to net-zero by 2050 will require Canada to build out wind energy, solar energy and energy storage at an unprecedented scale and speed," said Robert Hornung, President and CEO, CanREA.

Other keynotes included Growing wind energy, solar energy, and energy storage in Canada; and 100 per cent clean electricity by 2035: The clean power pathways project preview. A selection of sessions looked at all aspects of the renewable energy industry. Sessions included: The future of market-based renewables: Lessons learned from Alberta; The road to net-zero by 2050: Opportunities for electrification in Canada; Renewable energy partnerships with Indigenous communities; Green hydrogen as a driver of renewable energy development; Do we have what it takes? Strengthening Canada's renewable energy supply chain; International lessons on regional transmission and market integration; and many others.

"Alberta has seen a remarkable burst of growth in renewable energy projects," said Dale Nally, Associate Minister of Natural Gas and Electricity.

Speakers included: Lesley Gallinger, President and CEO, IESO; A.J. Goulding, President and CEO, London Economics International LLC, Suha Jethalal, President, Bullfrog Power, Jeff Labonté, Assistant Deputy Minister, Lands and Minerals Sector, Natural Resources Canada; Dale Nally, Associate Minister of Natural Gas and Energy; and others.

The conference closed with a plenary session on What are electricity system decision makers doing today to prepare Ontario for the electricity system of 2050.

"The system we all depend on must be able to respond to the increasing demand for electricity," said Lesley Gallinger, Independent Electricity System Operator President and CEO. "There's a lot to be done." **PIt**

More on CanREA 2050 Vision Announcement.

PHOTOS: Mario Cywinski

German Technology Day grows

BY MARIO CYWINSKI

The third annual German Technology Day, held recently, had its best-ever attendance. Two events were held this year, in Toronto and Montreal.

Returning as an in-person event (after going virtual in 2020), the theme this year was Safety, Security and Connectivity. Both locations also offered the event virtually.

The event was put on by Bosch-Rexroth, EPLAN, Festo, Murrelektronik, PILZ, Rittal and WAGO, all companies that are Canadian, but with German roots.

"The German Technology Day event was an immersive and eye-opening experience for the audience, made up of key representatives in the manufacturing and automation industry thanks to the discussions initiated by each presenter, and the keynote addresses by dignitaries from the German Consulates in Toronto and Montreal, as well as the German Chamber of Commerce who highlighted the ever-evolving German and Canadian industrial landscapes," according to organizers.

Thomas Schultze, Consul General, Federal Republic of Germany, Toronto, made the introduction for the Toronto event. He spoke about the impact of COVID-19, remote working, importance of German technology companies on the world stage, as well as the transition to a zero-carbon economy.

All participating companies displayed their products in an exhibitor hall section, as well as presenting their technology to the audience in the auditorium.

At the Toronto event, Roland Younk, President, EPLAN Canada and Andre Bousette, President, Rittal Systems Ltd., Canada, began the seminars and spoke about the partnership between EPLAN and Rittal. Younk followed with a presentation about EPLAN. Bousette than spoke about Rittal Canada and a Manufacturing 4.0 survey.

Next, Joshua Sese, CMSE – Certified Machinery Safety Expert, PILZ, discussed Pnoz and what it is. Other speakers included: Jesse Cox, Senior IoT Specialist, Linux and IIoT, WAGO; David Dolezal, Business Development Manager for Electric Automation, Festo; Colin Cartwright, System Sales Manager, Murrelektronik; and Dave Hinder, Product Manager for Electric Drives and Controls, Bosch Rexroth.

For those who missed the German Technology Day, presentations are available at: www.plant.ca/features/german-technology-day-grows/. PIt

(Top right) Thomas Schultze, Consul General, Federal Republic of Germany, Toronto, made the introduction for the Toronto event.

(Top left and bottom) Participating companies displayed products in the exhibitor hall.

PHOTOS: Mario Cywinski

Standing at work: get on the right foot

What do warehouse workers, nurses, retail salespeople, cashiers, machine operators and assembly line workers all have in common? The nature of their work keeps them on their feet, standing for prolonged periods of time.

BY CANADIAN CENTRE FOR OCCUPATIONAL HEALTH AND SAFETY

While standing is a natural human posture, it can become a health hazard if a worker has to remain on their feet regularly, or for extended periods of time, without relief by changing positions or walking. This prolonged standing can lead to sore feet, swollen legs, and varicose veins. It can also cause issues in other parts of the body, such as low back pain, stiffness in the neck, and general muscular fatigue. Eventually, over time, it can even develop into rheumatic diseases due to tendon and ligament damage.

Eliminating hazards at the source is always the most effective solution. As part of an ergonomics program, solutions should focus on physically removing the hazard, followed by improving work design, adjusting work practices, and lastly, providing protective equipment to support the worker. The program should also include worker education on signs and symptoms to look out for.

Improving workplace design

It may not be possible to eliminate the need to stand on the job, but in a well-designed environment, workers are able to frequently change among a variety of well-balanced positions.

Where it is possible, provide a seat so that the worker can do the job either sitting or standing. For work that requires standing only, a seat should be provided regardless to allow the worker to sit occasionally. Seats, working tables and benches should all be adjustable, where possible. Adjustable working height is particularly important to matching the worker's size to their tasks. Adjustability ensures that the worker has an opportunity to carry out work in well-balanced body positions. When adjusting the working height isn't possible, consider creating a platform for the workers to stand on that provides enough room to stand and move safely.

Make sure there is enough room for the worker to move around and change body position. Provide built-in foot rails or portable footrests so they can shift body weight from one leg to the other.

Effective job design also includes varying tasks that require changes in body position and using different muscles. Facilitating job rotation and teamwork are both ways to make work easier on the feet by alternating work tasks.

> ***When adjusting the working height isn't possible, consider creating a platform for the workers to stand on that provides enough room to stand and move safely.***

Adjusting work practices

A well-designed workplace combined with a well-designed job makes it possible to work in a physically balanced position without unnecessary strain on the body. Education and training will help the individual work safely, including how to stand, move or lift.

Employers must inform workers about health hazards in the workplace, including body movements and positions that can cause discomfort and potentially lead to chronic injury over the long term. Worker education and training should also address how to adjust specific workplace layouts to the individual's needs.

Rest periods are essential elements of the workday and should be used by the worker to relax when muscles

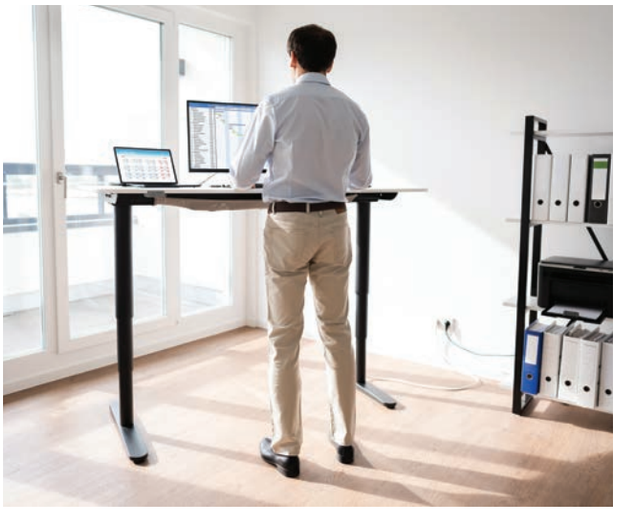
Photo: © Thananchai / Adobe Stock

are tired, to move around when muscles are stiff, and to walk when work restricts the ability to change postures or positions. Encourage workers to report any discomforts experienced during work. Reporting can help to identify ways to correct working conditions.

Factor in footwear

Aching, flat, or tired feet are common among workers who spend most of their time standing on the job. Since the human foot is designed for mobility, maintaining an upright stance is extremely tiring.

Selecting the right footwear can help. Where the floors are hard, footwear with thick insulating soles and shock-absorbing insoles should be worn. They should also provide adequate arch and heel support and cushioning while still being comfortable. Footwear that fits poorly or needs repair contributes heavily to foot discomfort. Pointed toes and high heels are particularly inappropriate for working footwear.



Flooring and anti-fatigue mats

The type of flooring used in the workplace is important to comfort, especially on the feet. Hard floors, such as concrete, are the least comfortable surface to work on. The impact of walking on a hard floor is similar to the impact of a hammer pounding the heel at every step. In general, materials that possess some elasticity, such as wood, cork, carpeting, or rubber, are gentler on working feet.

When changing the floor covering is not practical, anti-fatigue mats may be an option. These mats absorb the shock from walking and their cushioning reduces foot fatigue. When combined with proper work design and quality footwear, they can improve worker comfort. Make sure to install the mats properly to avoid tripping and falling incidents.

A well-designed job and workplace are essential to healthy and safe work. By recognizing ergonomic risks, employers can identify and address the hazards that can lead to discomfort and injuries to workers whose jobs keep them on their feet. PIt

---

The Canadian Centre for Occupational Health and Safety (CCOHS) *promotes the total well-being — physical, psychosocial, and mental health — of workers in Canada by providing information, advice, education, and management systems and solutions that support the prevention of injury and illness. Visit www.ccohs.ca for more safety tips.*

Photo © Andrey Popov / Adobe Stock

Clean technology in manufacturing

How can manufacturers become more sustainable?

BY MARIO CYWINSKI

Recently, PLANT held a roundtable looking at the adoption of clean technology in the manufacturing space, focusing on how manufacturers can be more sustainable and reduce their carbon footprint. This included a look at using renewable energy, how plants are becoming carbon neutral, and what companies are doing to help. PLANT also dived into the electric vehicle sector and how it is affecting the clean technology space in Canada.

Electrification is usually the first thing that comes to mind when thinking about clean technology, with many looking to the automotive space, which plays a big role in the manufacturing world. However, it is not limited to automobiles, as many vehicles that are used within a production plant can be electrified, and as battery technology continues to improve, electrification continues to be a way for companies to become more sustainable and 'green'.

One other aspect to keep in mind is that co-ordination among different levels of the process (government, private sector, public sector) is needed for companies to be encouraged to adopt clean technologies. As some (especially small-to-medium-sized businesses) are hesitant to be on the 'leading-edge' only for that technology to not be universally adopted.

Our expert panel was a true cross-section of the clean technology space, with representatives from associations, alliances, battery manufacturers, and metal fabrication manufacturers.

Q: Looking at the adoption of clean technology in the manufacturing space, how can manufacturers be more sustainable and reduce their carbon footprint?

Dennis Dussin, President, Alps Welding Limited: A lot of manufacturers in Canada are down the curve on adopting lean manufacturing. In the small and mid-sized manufacturing space, there are huge opportunities for companies to improve their efficiency and eliminate waste. Things like scrap and idle time on machines are where there is potential for gains in reducing the amount of energy required in the manufacturing sector. It is basically looking at overall operations and making them leaner.

The other low-hanging fruit is electrification. There's still a lot of vehicles that could be electrified, as well as warehouse and operating equipment; these can be addressed now without the need for a lot of emerging technologies to be available.

Robert Hornung, President and CEO, Canadian Renewable Energy Association: We see companies worldwide looking to make greenhouse gas emission reduction commitments, and often the first place they look to meet those commitments is what they can do to decarbonize their electricity supply. In Canada, it's more challenging for companies to do this because of our electricity market structures. Alberta is an exception and in 2021, over 1,200 megawatts of new wind and solar energy projects have been committed to respond to corporate demand for renewable energy. That's harder to do in other parts of the country, but utilities are responding. Nova Scotia is creating a green choice program to allow their manufacturers to make direct purchases of renewable energy. Saskatchewan is introducing two programs next year to do something similar. Utilities across the country are hearing demands from their customers to move towards greater adoption of renewable electricity, for both cost savings and greenhouse gas emission reductions.

Rajshekar DasGupta, COO, Electrovaya: Supply chain is a big component. It's too easy to say you are reducing emissions by just moving them offshore. In Canada, we have a clean grid, and the electrification will have a high impact here, expanding domestic supply chain. Also, there are manufacturing standards that have come out, including a standard for environmental manufacturing, which encourages recycling and reduction of waste.

Q: Clean tech encompasses a broad range of technologies related to recycling, renewable energy, information technology, green transportation, electric motors, etc. Where do you believe Canada is thriving the most? And in which area do you see potential for Canada to adopt cleaner tech?

Daniel Breton, President and CEO, Electric Mobility Canada: We have a lot of critical minerals that are key to making renewables

Photo: bernie_photo / iStock / Getty Images

and electric mobility. We must make sure that we are not just extracting the minerals and sending them elsewhere. Right now, most lithium being extracted from Canada goes to China. We have a historic opportunity to make sure that we develop a zero-emission vehicle supply chain and a renewables supply chain that can make Canada a global leader.

Matthew Fortier, President, Accelerate Alliance: The question is: where are we thriving now in Canada? We have clean energy in Ontario, Quebec, and British Columbia, and we can develop more of that. Alberta is doing a lot of great work. What we need is a policy or government culture which fosters more companies to do higher value work. Also, those companies need to grow and thrive to employ Canadians.

DasGupta: In the U.S., there's a 75 per cent requirement for domestic content in any federally funded electric bus procurement. Canada has a very substantial electric bus procurement plan, but there's no significant Canadian content requirement, so for the batteries of those buses, it's easier to use Chinese systems rather than Canadian-built. In the U.S., there's a strong incentive for domestic content, so it gets built and then becomes available for other industries, and it gives them a head start.

Hornung: Canada must recognize that it's competing for this investment and competing for these opportunities. If we don't provide an environment that's conducive to that investment, it will go somewhere else. Also, we're looking at a fundamental transformation in energy systems. New technologies will be needed to facilitate the transition going forward, both hardware and software; it's a system that we're changing. Canada, on the renewable side, has a big advantage; 80 per cent of our electricity is already non-greenhouse gas emitting, so we don't have to pay the same amount of investment and attention on decarbonizing, like other countries are, which gives us the potential to be a leader.

Dussin: When we look at clean tech, we look at what's kind of new and emerging and how can Canada be a player. What we don't look at is where we have been; Southern Ontario, for example, has been a leader in water treatment technologies, water filtration and water conservation. It has been a world leader in water technology, and as we move into a world where we're looking at conserving resources generally, water is going to be a huge issue and here we can be a global player.

Nuclear must also be part of the solution. Going forward, we're going to get into some issues about where electricity is going to come from. However, Canada, particularly in Ontario, has huge strength in the nuclear industry.

Q: What do you think governments can do to put Canada on the right road to a cleaner future and help support manufacturing in the adoption of clean technology?

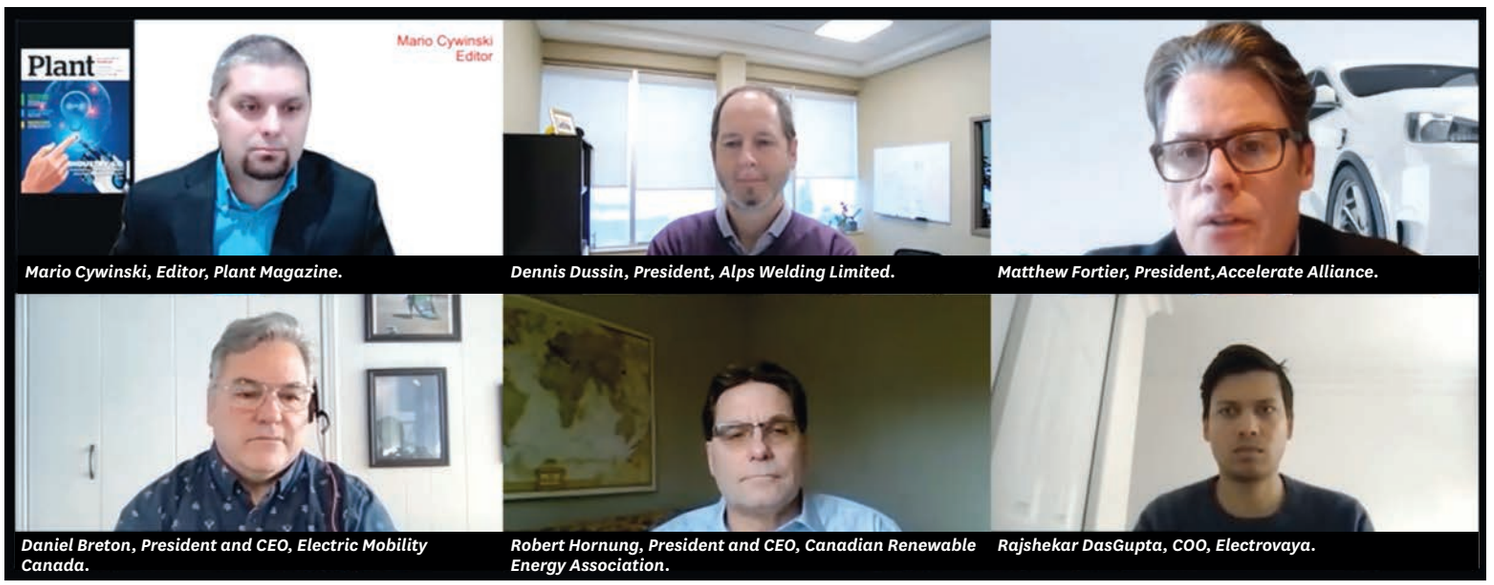
DasGupta: One example is encouraging domestic content in new initiatives like electric buses or trucks. If a subsidy does exist, our pace of change here has been disappointing, so we need all hands-on-deck in every sector. There is no reason Canada can't follow Norway's model and do even better with domestic production of these technologies. We need to do a good job on this now, if we don't take a leadership position, we will end up being a raw material supplier to other countries, who will then provide us the goods to solve our problems.

2050

Canada has committed to net zero greenhouse gas emissions by 2050..

Fortier: The lack of coordination across federal, provincial, and municipal governments on these kinds of files is striking. A lot of governments want to position themselves as global leaders in electric or zero emission vehicles and while their heart is in the right place, they don't seem to be talking with each other, so there doesn't seem to be any coordinated strategy. There is a huge opportunity for people to be working together, figuring out where the strengths are across the country and determining how to fill gaps. If we were to move the dial 10 per cent, we'd be much further ahead.

Hornung: A more strategic approach for the country is going to be critical. Canada has a commitment to move to net zero greenhouse gas emissions by 2050, which is fantastic, sends a very strong signal, and the Federal Government has been very consistent with voicing that. However, we have provincial governments that have never mentioned net zero by 2050. It's clear that we are not all on the same page or are all working towards the same objective. We need to build consensus, and once we have a common



Mario Cywinski, Editor, Plant Magazine. *Dennis Dussin, President, Alps Welding Limited.* *Matthew Fortier, President, Accelerate Alliance.*

Daniel Breton, President and CEO, Electric Mobility Canada. *Robert Hornung, President and CEO, Canadian Renewable Energy Association.* *Rajshekar DasGupta, COO, Electrovaya.*

objective, we have tremendous potential to collaborate and create economic opportunities in this country.

Breton: If we don't show leadership, we will end up losing jobs in Canada. For instance, in the automotive sector, if we don't build a supply chain for EVs from light to heavy duty, they will end up being made elsewhere. We want to fight climate change and create jobs. The oil and gas sector are going to go down over time, so we want to help workers transition from jobs in the fossil fuel industry to the renewable energy or electric mobility industries.

When we talk about being a global leader, if you look at the second quarter EV sales in Canada, they were at about five per cent; 10 per cent in Quebec, and 13 per cent in B.C. In September 2021, we're at 20 per cent EV sales in China, 22 per cent in France, 30 per cent in Germany, and 91.5 per cent in Norway, which by spring 2022 will be at 100 per cent EV sales.

Dussin: In terms of conventional oil and gas and energy transition, what is important is what the government can do to provide small and mid-sized manufacturers with clarity and certainty as to where our future lies. If you look at Ontario, we had a cap and trade system, and another government gets elected and things change. Now, we have carbon emission targets, but in 2022, things may change again. A consistent roadmap across the country and among the provinces that says it makes sense to develop these technologies is needed, because this is where we're headed long-term.

Q: What are the main barriers to the development of renewable energy sources? In turn, what actions should be taken to remove or replace these barriers to the chances of developing renewable energy sources?

Hornung: There's a broad consensus that we must clean up the electricity system and decarbonize, and we must expand it to support electrification across industry, transport, and buildings. Looking at a range of studies on net zero, it can be concluded that a reasonable scenario is that you need to increase wind and solar production 10X in the next 30 years, which means

you must build this out at a rate that's 8X faster than the rate we've averaged over the last five years.

Right now, our electricity regulatory frameworks don't provide a mechanism to allow energy storage to come into the grid or to provide services to the grid. The problem is that until that happens, it's just a great technology that nobody can use.

The most important thing that must happen is we need to create demand. Nobody is going to invest in new electricity supply unless they think there's going to be demand for that electricity going forward. Which is why we need comprehensive strategies around hydrogen and electrification, that's what will stimulate the investment in the supply that can enable those solutions to be implemented.

Dussin: Canada is made up of many small and midsize businesses which have a reputation of being risk averse. Work needs to be done to reduce risk for investments, for residential applications, and for small business applications. Those who are looking at electrifying forklifts in warehouses say, "I don't know enough about that, I don't know if that's the right technology, the technology is going to get better in the next few years, so maybe we'll wait and see where that goes." The same goes for solar panels or electric cars, many people will see how things play out.

DasGupta: It's so easy to do well, for example, Chinese steel is produced with coal in large quantities. Now, on both the electricity and processing side, if you incentivize clean steel, the Canadian industry will flourish. Batteries are the same idea, the way batteries are manufactured, we have a technology that remove solvents, which is environmentally friendly. However, until now, there hasn't been a strong push to go in that direction, because people are quite happy to have those solvent emissions in Asia. But if you put regulations on that, you would support more domestic innovation, and it's better for the planet.

5 PER CENT

When we talk about being a global leader, if you look at the second quarter EV sales in Canada, they were at about five per cent

Q: What do Canadian companies have to do to become more carbon neutral? Do you feel complete carbon neutrality is an achievable goal?

Hornung: When looking at a country or company moving towards carbon neutrality, there are technological issues out there, but fundamentally, the biggest challenges are market signals and regulatory frameworks that enable us to be incentivized or have access to the technologies, that can help achieve decarbonisation objectives. We need R&D for new technologies, but we are massively underutilizing existing technologies.

Fortier: The best companies are asking themselves through their strategic planning processes, "What does the world want and can we make it for them? How can we make money by being carbon neutral? Because the world is moving that way and it's important to figure out that process." It's time for an honest internal conversation around what your company can be in the future. The future is important, but I've had many conversations with directors on big company boards who don't have these conversations.

Q: What are some of the obstacles (general or technical) that Canada faces in its path to go green? And how can this be overcome?

Dussin: The obstacle is not technical; it is organizational. We have all the pieces, resources, and knowledge; what we don't have is a coordinated approach across provinces and federally, through the public sector, or the private sector; it's having everything happening in isolation.

What are things going to look like in different provinces, what technologies are we going to back and get behind, and what are we most well-suited to. It's a lot of uncoordinated activity going on across the country. That's our biggest obstacle; the lack of a coordinated roadmap. We have all the pieces to the puzzle, but nobody with all the pieces on the table is trying to put them together into one picture.

Photo: Konoplytska / iStock / Getty Images

Breton: Education and training are very important. We need qualified workers, interested workers, and passionate workers to start working in our industry. We are looking to find workers and it's not an easy task, and I'm just trying to imagine what it's going to be after COVID when things pick-up. It's going to be an issue to find qualified people, so we must have plans to make sure we train or retrain as many people as we can, so they can fill these positions, because otherwise we won't be able to grow as fast.

Q: What are the most crucial areas or burning issues in energy-based research today?

DasGupta: The amount of research happening in energy is going up exponentially. In terms of battery research, the number of papers being published is increasing year by year. The big push in the battery space research is solid state batteries, which enable much higher energy densities that can potentially enable electric aircrafts and lower costs of EVs. In other sectors, there is hydrogen, where there is plenty of research going. Also, nuclear is a technology which we shouldn't ignore. France has 70 per cent of their electricity from nuclear energy. It's a non-emitting technology and Canada has some very valuable technology that hasn't been exploited or built on in many years.

A scientist said, "If Alexander Graham Bell came back to life today, and saw a smartphone, he would be really impressed; but if Thomas Edison came back to life today, and saw the electricity grid today, he'd say, well not much has changed." - Daniel Breton

Q: How will building out Canada's ZEV supply chain help to ensure Canadian metals and minerals mining supports the domestic production of electric vehicles?

Fortier: It provides a little bit more visibility and certainty to the industry that there are more downstream users of their product, and so, if you can create or help foster a market for that, it encourages production.

A lot of what we produce in the mining sector in the battery space is sent overseas into different markets, and then we buy these things back at a premium. They are built great, but you're not creating a lot more economic opportunity for the country, so if we can create a viable and integrated supply chain, it allows that product to stay domestic and reassures the industry to some degree.

It is only a segment of that industry, but it creates a market for their product that is domestic and is also an integrated North American market, but it allows predictability and access to the market in Canada. **Plt**

This Q&A is just a sampling of what our cleantech panel touched on as part of the roundtable. A plethora of topics were covered over the over 90 minutes discussion.
To listen to the complete roundtable discussion, go to: www.plant.ca/videos/roundtable-cleantech/.

Photo: frentusha / iStock / Getty Images

Top five cleantech trends to look for in 2022

The approaches that companies and communities should look for when applying cleantech in 2022. **BY SEAN SILVEY**

First, it's important to understand that cleantech is more of an approach than anything else. As the name implies, there is a technology component, but the "clean" is where the focus is.

Cleantech stems from both a desire to minimize our shared impact on natural resources and the environment, and the desire to ensure a viable path forward regarding the needs and uses of these resources.

Here are some clean tech trends to look for in the coming year:

1 *Renewable*

The talk around renewables, like wind and solar, goes beyond the large swaths of panels along highways or turbines lining windy canyon areas. With major storms and other natural disasters comes the realization that our power grids are not built to meet the electric power needs of communities, especially as those communities continue to grow. This is where hybrid power systems come in and combine multiple sources to deliver non-intermittent electric power. These microgrids rely on a combination of wind turbines, PV modules, battery banks, and generators, and they are well regulated for optimum conversion to meet load requirements in residential, commercial, and industrial settings.

In utility-scale solar, there are several new advancements coming. These include DC-coupled battery storage, solar power (DC) tracking systems, drone infrared scanning of the photovoltaic array, and smaller central inverters. These technologies and approaches will lead to continued efficiencies in solar as the premier renewable option for many.

2 *Electric vehicles*

In terms of cleantech and clearing the air of greenhouse gas emissions, the electric vehicle is the most tangible opportunity available. According to Bloomberg's annual electric vehicle outlook, there are approximately 5.6 million electric vehicles on roads today, globally. With rising fuel prices and new fuel economy regulations in many countries, adoption of electric vehicles as alternatives to fuel-powered vehicles is expected to rise dramatically. Bloomberg suggests this adoption could be as high as 40 per cent by 2025.

5.6 MILLION

According to Bloomberg's annual electric vehicle outlook, there are approximately 5.6 million electric vehicles on roads today, globally.

With so much opportunity, more manufacturers are jumping on the electric vehicle bandwagon with their own versions. In Europe, China, and North America, electric vehicle sales were up more than 150 per cent in 2021 over 2020 numbers.

3 *EV charging stations*

Electric vehicles are no longer the weekend-use only cars taken on short jaunts around town. Electric vehicles are becoming the replacement vehicles for many. These cars, trucks, and vans will be used daily and often be put through the paces of long commutes and road trips. The infrastructure of charging stations must be in place to make the electric vehicle a viable option for many. In fact, it is just as important that these charging stations are scattered about our roads and highways as it is that they have the latest technology that allows them to charge quickly.

There are three charging levels for different vehicles, including 120 V,

Renewables/solar

Photos: Fluke Corporation.

208-240 V, and 400-900 V. This last is the fastest and uses direct current (DC) rather than alternating current (AC) for supercharging.

4 *Adaptable and accessible tools*

The ability to manage energy use and reduce energy waste has historically been limited to professionals with years of experience, and often times with certification. As technologies continue to improve and manufacturers continue to innovate new products, the responsibility of energy management becomes more and more accessible to those with less experience. Remember that cleantech is not about big technology; it's an approach that helps eliminate wasteful practices that impact our natural resources and environment. When tools adapt to the user, they become more accessible for use in a wider variety of scenarios. Look for user-friendly, intelligent tools that use data to identify and validate energy-related issues, such as power quality analyzers, thermal imaging cameras for solar array inspections, and high-voltage DC clamp meters for industrial applications.

5 *Training programs*

Cleantech is expanding faster than expected as expertise attempts to catch up with vying innovation in the market. While it is not necessary to begin with a lot of experience, cleantech industries rely on local training houses and technical institutes to help develop effective technicians. These cleantech training programs (e.g., solar, electric vehicle charging station) are quickly expanding to offer those with little-to-no experience the opportunity to join a growing community of technicians. Entering the cleantech maintenance field today is akin to becoming a computer technician in the 1980s; the future is bright, and opportunity is abundant and only growing. **Plt**

Entering the cleantech maintenance field today is akin to becoming a computer technician in the 1980s; the future is bright, and opportunity is abundant and only growing.

Sean Silvey *is a product application specialist with Fluke Corporation. Previously, he was a field service manager in the HVAC industry for 15 years, training and supporting field service technicians as well as assisting customers in resolving HVAC issues.*

New technology/tools

Electric Vehicle charging station

Renewables/solar

Why we should be embracing cleantech

Today, considering the environment is just a way of life. After all, if we ignore the planet, eventually it will ignore us, and our well-being.

BY SHAWN CASEMORE

In the manufacturing world, there are plenty of new phrases that are becoming commonplace; circular supply chain, ecosystem and hybrid selling are a few that come to mind.

Not to mention that "cleantech" is placed now amongst these new terms, although the terminology itself isn't new. Like many of the terms mentioned earlier, the meaning of cleantech is typically relevant only to those directly involved.

Short for clean technology, it identifies any process, product or service that reduces negative environmental impacts. There are, of course, a variety of methods to do so, including energy efficiency, sustainable resources, and environmental protection activities. The list goes on.

Although cleantech can help manufacturers across Canada reduce their environmental impacts, many shy away because of a belief that the word "technology" represents a deep dark hole.

Run an event focused on cleantech and you aren't likely to get many productions or operations folks to join you, despite their knowledge and awareness around the need to reduce environmental impacts and the increasing number of ideas they have in doing so.

This is the gap we need to address.

It's time to remove any stigma from the phrase cleantech and embrace it for what it truly is: any method that will help reduce our environmental impacts. The "tech" simply refers to using technology to aid in this mission, something we are all embracing in our daily lives anyway. Consider how much online shopping you did for the holidays this year or the last time you visited a bank in person.

To embrace cleantech, then, we need to recognize that without technology, the impacts of our efforts will be far less. Moreover, many of these technologies once introduced become cost neutral.

Just look at the some of the Canadian companies in the Global Clean Tech 100 and you'll find homegrown opportunities to move your environmental objectives forward.

Axine Water Technologies in Vancouver, specialize in taking highly polluted industrial effluent and turning it into clean water. While Montreal-based Effenco builds hybrid power systems that can be installed on new and existing trucks to reduce fuel consumption.

When it comes to embracing cleantech, we're asking ourselves the wrong questions. Don't ask "how much is this technology going to cost me?" Instead, ask, "Where can technology advance my mission to reduce our environmental impacts?"

> ***The best way to get started is to attend an exhibit or tradeshow for cleantech to learn about the possibilities. You can also reach out to your local college or university to learn more about how they might be able to support your environmental objectives.***

The best way to get started is to attend an exhibit or tradeshow for cleantech to learn about the possibilities. You can also reach out to your local college or university to learn more about how they might be able to support your environmental objectives.

It has taken some time for us to become comfortable with making recycling a way of life. We can reduce our environmental impacts further if we embrace the concept of cleantech and look for ways to make the technology support our needs. **PIt**

Shawn Casemore *helps companies accelerate their growth. To learn more, visit his web site at www.shawncasemore.com.*

Photo: ©BillionPhotos.com / Adobe Stock

NOTHING IS TOO BIG

PROCESS EQUIPMENT FABRICATION

Alps Welding Ltd.

since 1974

alpswelding.com

Cleantech and lean are not as distant as you think

Where does lean fit into the cleantech equation?

BY RICHARD KUNST

Initially, it may seem that cleantech and lean are distant, until you look deeper.

Clean technology is any process, product, or service that reduces negative environmental impacts through energy efficiency improvements, the sustainable use of resources, or environmental protection activities.

There are subtle changes happening in many sectors. For example, in the chemical industry, common solvents are being reinvented, turning away from a base of petroleum to becoming a derivative of a biologic solution. Another example is the advancements being made in the use of hydrogen, and even in food, as protein is being replaced with plant-based meat products.

So, where does lean fit into this equation?

Lean can be applied everywhere that any process exists. It is the systematic identification and elimination of 'waste', helping a process become more agile, while providing additional capacity.

In the lean community, "waste" is defined beyond what we tend to throw in the garbage or the recycle bin; it covers many other attributes, and is defined by the thought peg of "downtime".

The followings are some examples of how lean can relate to cleantech:

Defects: Consider all the extra energy we consume while producing a defect. A focus on making it right the first time becomes more critical.

> ***Lean is the systematic identification and elimination of 'waste', helping a process become more agile, while providing additional capacity.***

Overproduction: overproduction can be a robber of energy. Not to mention the cost of sheltered storage for excess production.

Waiting: In this case, it is like idling a vehicle in a line while waiting for morning coffee, but it also happens in our working environments, since we most likely do not shut down our machines, computers, and lights while we wait for an answer.

Not fully utilizing people: Yes, you have the technology, but we still need people committed to making it work, even if it is just changing simple habits, like not leaving the water running from the faucet while brushing our teeth.

Transport: Take a closer look at your material conveyance methodology. If you have a bunch of lift trucks roaming around or you use a taxi cab to get around, it may seem convenient but it is expensive. Switching to Uber or Lyft may be cheaper to your wallet, but does not really change the mode even if you decide to select ride sharing. However, if you can give a bit more time and use public transit, it is dramatically more cost-effective and can handle a larger group.

Inventory: Cost to-make and to-store consumes so much energy. Have a look at the landscape of multitude of warehouses surrounding your cities, and just imagine if we could provide a good on-demand. It would be a great opportunity for on-shoring, or dramatic reduction in your set-ups and change-overs.

Motion: The extra time consumed to provide a good or a service, and time consumes carbon, so we need to look at that gift of time and how much do we cherish it from an energy-consumption perspective.

Excessive processing: It can encompass excessive reporting, redundancy of information, miss communication, which in many cases results in "unactionable information systems", but can include excessive machines for simple processes.

However, all of these consume more than what may actually be required to perform the required task. It becomes extremely important to right-size the resource to a particular application.

Ultimately, the beauty of being able to utilize a cleantech application will only be enhanced if you embrace it with the philosophy of lean. **Plt**

Richard Kunst *is an author, speaker and seasoned lean practitioner based in Toronto, who leads a holistic practice to coach, mentor and provide management solutions to help companies implement or accelerate their excellence journeys. You can reach him at www.kunstsolutions.com.*

Photo 1: Blackline Safety. Photo 2: Dieffenbacher. Photo 3: AutomationDirect.

SMART, CONNECTED WEARABLES

Blackline Safety's cloud-enabled G7 wearable safety devices provide connectivity. The wearables are small, worn like a cell phone, and detect gas leaks, falls and other health events. They operate on available cellular, with optional satellite connectivity. Workers are alerted to emergency situations and if workers are harmed or injured, their location is pinpointed. G7 wearables are backed by cloud-based software solutions.

www.BlacklineSafety.com

DIEFFENBACHER SHORT-STROKE PRESSES

Dieffenbacher short-stroke presses are designed for minimum energy consumption, high press forces and short cycle times. Presses close with small cylinders until just before the position where forming takes place. Thereafter, large cylinders act with the corresponding press force. Dieffenbacher closing system allows individual programming of the starting position of the forming. Adaptive accumulator management optimizes energy consumption by automatically determining during the first press strokes the exact energy required for forming. For subsequent production cycles, the hydraulic drive accumulator is charged only to the corresponding required pressure level. All settings are determined automatically by the machine control system, reducing the load on the machine to a minimum.

www.dieffenbacher.com

WEG ELECTRIC MOTOR CONTROLS

AutomationDirect WEG electric motor controls expand its application space in solutions for switching and controlling motors. Magnetic contactors are available with AC or DC coils, in ratings up to 60hp at 575V. RW27/67 series thermal overload relays include (1) N.O. and (1) N.C. isolated auxiliary contact, and mount directly to the compatible contractor for compact installation. RW-E series electronic overload relays protect motors in a range of applications by offering selectable trip classes. ESW series units with NEMA 1 rated enclosures offer a general industrial solution; PESW series units with NEMA 4 rated enclosures are used for harsh environments. MPW series manual motor protectors cover the function of motor starter, disconnect, controller, overload protection and branch circuit protection in a very compact device. Models are available in ratings up to 32A.

www.automationdirect.com

For more products, visit: ***www.plant.ca/technology-centre***

POSTSCRIPT
BY JAYSON MYERS

Technology isn't enough: Canada needs collaboration to meet its net-zero goals

It's been over a month since COP26 ended in Glasgow with big commitments and ambitious emission-reduction targets from Canada and many other countries. Now, let's get down to business. We need a strategy that will marry our best technological solutions with industry partners to meet our objectives.

New transportation systems are one answer, as we have seen lately with the great rush to build smart urban infrastructure and new supply chains for electric vehicles. Another is industrial decarbonization. Industry is a vital source of our employment, wealth and economy, but it also expends vast amounts of carbon; about a quarter of global GHG emissions, according to the U.S. Environmental Protection Agency.

We need to find a way that will accelerate the path to net-zero emission facilities while presenting business opportunities for manufacturers to add value for customers and investors, and eliminate waste from production processes. In other words, we need a decarbonization strategy based on basic lean principles that manufacturers can incorporate into their business plans and that will deliver bottom-line results at the end of the day.

With world-leading innovation, plentiful carbon-free electricity and a disproportionately high number of cleantech companies, Canada is in a great position to accelerate the development of a new domestic cleantech industry, help global industry meet its emissions targets and transform our industries into low-carbon competitors, with all the jobs and growth that would entail. But our start-ups can't do it on their own. They need to find partners and customers – other companies that can help apply tech for industry and industrial customers that see the business benefits of deploying lower emission solutions.

To maximize adoption and create the greatest potential for growth and employment, we need to connect and strengthen collaboration between our cleantech sector and industry, manufacturers and resource processors in particular, and that depends on enrolling the support of other tech companies, business services, research organizations, educational institutions and investors from across Canada.

World-changing ideas are plentiful in advanced manufacturing. But it's also clear that very few companies have the ability or expertise to develop and fully commercialize or adopt world-beating technology on their own. Industrial companies don't buy technologies. They need cost-effective, manageable solutions. And those usually come in the form of integrated engineering projects that combine cleantech with other new digital, materials and production capabilities to deliver sizable business benefits for industrial customers. Simply put, young ventures need to integrate their solutions into larger networks, or value chains, that can commercialize their technologies in global markets.

That's where collaboration is key, because it doesn't always happen naturally. The free market eventually tends to push partners together, but our climate timeline is too urgent for an eventual, piece-meal approach. Market-driven partnerships work best when everyone knows what everyone else is doing and where investment risks are low. Innovation doesn't work that way. We need to find other ways to encourage and accelerate the market-driven adoption of industrial cleantech today.

I see this all the time at NGen. Whatever work we do to facilitate collaborations among researchers, tech companies, and manufacturers, is more important than the investments we provide. We do fund industry-led innovation projects, and over the past year, those projects have returned over 40 times our investments in sales. That comes from building collaborations and integrated solutions that generate economic benefits for business while making a positive impact on the environment.

Collaboration is facilitated by bringing a network together. In our case, that's more than 4,500-member organizations, researchers, education partners and businesses in industries ranging from steel, low-carbon mobility, high tech to food processing. Anyone who has the capability to solve advanced manufacturing problems and take advantage of emerging opportunities is welcome to become a member of NGen's advanced manufacturing network.

Take the case of Aspire Food Group, a Canadian start-up in the food protein world. Canadian media outlets have written stories recently about Aspire's giant indoor cricket processing facility that is being built in London, Ontario. The headlines have focused on the potential for human food, but the company's core markets are actually pet food and cricket fertilizer – products where Aspire's automated factory can optimize the time, cost and environmental impact of producing food protein. The opportunity is truly global.

Early on, Aspire recognized that it needed partners to scale up and commercialize the business. Other partners joined the project to help with sensors, automation, quality control and market development for the protein. The result was a Canadian start-up commercializing its products, creating jobs and getting its clean technology implemented faster than it ever could have alone. All in a zero-emissions facility that is slated to come on stream next year.

Aspire CEO Mohammed Ashour told the London Free Press that, "We would have had to hire a lot of people and develop our own infrastructure, but thanks to our collaborative approach we get something better than we could have done ourselves, more effectively, more quickly."

If Canada wants to reach net-zero with the greatest economic benefit, then this is the formula for achieving its goals. Cleantech plus collaboration paves the way for net-zero manufacturing and future business growth. Collaboration is the missing link between innovation and our future market-driven emissions policy. **Plt**

***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@ngen.ca. Visit www.ngen.ca*

Plant
CANADA'S MANUFACTURING MAGAZINE

2022 SPECIAL FEATURES

SPRING
SUPPLY CHAIN AND EXPORTING

The Covid pandemic exposed supply chain issues in the Canadian manufacturing sector. Business uncertainty resulting from volatile trade issues and global disruptions are forcing manufacturers to examine their supply chains.

SUMMER
TRAINING AND SKILLS DEVELOPMENT

Talent is a major issue withing manufacturing. This issue looks at how as an industry we will encourage people to embark on a manufacturing career. A shortage of qualified people is an ongoing problem.

This issue also features **PLANT magazine's annual salary survey**

FALL
ADVANCED MANUFACTURING

Plant's annual indepth look at Advanced Manufacturing adoption in Canada. Canadian manufacturers lag their global peers in the implementation of technologies, which improve productivity, production efficiency and provide deeper visibility into business operations.

THEMED NEWSLETTERS - EVERY THURSDAY

JANUARY	Automotive Green Technology Food and Beverage Best of the Month
FEBRUARY	Reports Government Aerospace Best of the Month
MARCH	Automotive Technology Machinery and Equipment Business Operations Best of the Month
APRIL	Government Aerospace Food and Beverage Best of the Month
MAY	Automotive Technology Government Best of the Month
JUNE	Business Operations Aerospace Green Technology Aerospace Best of the Month
JULY	Automotive Green Technology Food and Beverage Best of the Month
AUGUST	Government Aerospace Food and Beverage Best of the Month
SEPTEMBER	Automotive Technology Machinery and Equipment Business Operations Best of the Month
OCTOBER	Government Aerospace Food and Beverage Best of the Month
NOVEMBER	Automotive Technology Government Best of the Month
DECEMBER	Business Operations Aerospace Green Technology Aerospace Best of the Month

FOR MORE INFORMATION CONTACT:

SENIOR PUBLISHER
Scott Atkinson
T: 416-510-5207 **C:** 437-995-4651
satkinson@annexbusinessmedia.com

NATIONAL ACCOUNT MANAGER
Ilana Fawcett
C: 416-829-1221
ifawcett@annexbusinessmedia.com

Slotted Aluminum Rails

Cut how you need it and shipped fast

Sure frame™

SUREFRAME T-SLOTTED RAILS
STARTING AT
$0.23
per inch
(1010C)

SureFrame T-Slotted Aluminum Rails

SureFrame T-slotted aluminum rails are available in the most popular profiles and dimensions. T-slotted rails are ordered in your custom cut-to-length sections for maximum flexibility and minimum waste.

We also offer a full selection of assembly hardware for T-slotted rail systems, which includes T-nuts, fasteners, connecting components, joining plates and brackets, as well as floor, door and panel elements. SureFrame T-slotted rails, along with the assembly hardware components offered, are compatible with many other brands.

Features

- You specify length and cut angles for each piece
- No cut fees
- Free 2-day delivery on all orders over $49
- Available in 1 inch, 1.5 inch, 30mm, 40mm and 45mm profiles
- Complete selection of Fath installation hardware available

Also Available

- AC variable frequency drives (VFDs)
- Motors
- Wiring and electrical connection solutions
- Just about everything you need to complete your automation projects!

Research, price, buy at:

www.automationdirect.com/t-slotted-rails

Orders over $49 get FAST FREE SHIPPING

Our shipping policies make it easier than ever to order direct from the U.S.!

Fast free standard shipping* is available for most orders over $49 U.S., and that includes the brokerage fees (when using an AutomationDirect nominated broker). Using our choice of carrier, we can reach most Canadian destinations within 2 to 3 days.

*Free shipping does not apply to items requiring LTL transport, but those shipments can take advantage of our negotiated super-low flat rates (based on weight) that include brokerage fees.

See Web site for details and restrictions at:
www.automationdirect.com/canada

To see all products and prices, visit www.automationdirect.com

All prices shown are U.S. Dollars

Order Today, Ships Fast!

TOP RATED BY CUSTOMERS

AUTOMATIONDIRECT.com
1-800-633-0405 the #1 value in automation