PROJECT ARROW: Setting the Standard for ZEVs in Canada

Integrating Resource Ops into the EV Supply Chain

Countering Cyber Threats in a Digital Auto World

APMA’s Online Education Program Addresses Shifting Needs of Auto Sector
MOLDING THE EV FUTURE WITH LIGHTWEIGHTING INNOVATIONS

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ON THE COVER: This issue’s cover features APMA’s Project Arrow, the first original, full-build, zero-emission concept vehicle. An all-Canadian effort, it will be designed, engineered, and built by our world-class automotive supply sector and post-secondary institutions. The project brings together the best of Canada’s electric-drive, alternative-fuel, connected and autonomous and lightweight technology companies to answer the Prime Minister's call for a zero-emissions future by 2050.
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A Serendipitous Path to Success

The path to great successes—those moments in time that stand for history, adventures that define an epoch—is sometimes littered with unconnected vignettes of serendipity.

As you may know, we at the Automotive Parts Manufacturers’ Association (APMA) are building an all-Canadian designed, engineered, and supplied zero-emissions concept car that is getting attention the world over, Project Arrow.

Three-hundred-and-two companies—you read that correctly—have signed up to help us avenge the history of the Avro Arrow. Sixty years ago, this country announced to the world that we could run with the biggest and brightest aerospace powers anywhere. Then, almost immediately, we backed down and wounded a burgeoning national psyche, whose pain lasts to this day.

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Closer to home, the Highway 401 Corridor between Oshawa and Windsor is uniquely home to globally relevant clusters of automotive manufacturing and information technology. Importantly, too, it is emerging as a major hub of connected, autonomous and zero-emissions product development that will be the heart of Canada’s exciting car future.

Buckle up.

Regards,

Flavio Volpe
President
Automotive Parts Manufacturers’ Association

The Automotive Parts Manufacturers’ Association (APMA) of Canada’s Project Arrow zero-emission concept vehicle will demonstrate the Canadian automotive sector’s capabilities for leading design, development and advanced manufacturing of electric mobility.

Thank you to all of our private and public partners. This is just the beginning, there’s still much more to do.

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Answering the Prime Minister’s call for a zero-emissions future by 2050, APMA’s Project Arrow brings together the best of Canada’s automotive supply network. Here, we shed light on the importance of a tightly wound, integrated supplier network, critical in the development of the latest technology the automotive industry hails. From electric drive or alternative fuel to connected and autonomous tech platforms or lightweight technology, it can’t be done without suppliers.

It’s the companies that support a changing landscape in the supply base that drive the industry forward at great speed. Technological advancements and digital transformation on our shop floors are changing the automotive industry and increasing investment in the entire sector, as companies transform to meet evolving, modern original equipment manufacturer (OEM) customer and consumer needs. The automotive industry is adopting new trends every year, and they are not doing it alone.
Recently, I had a conversation with an ex-work associate of mine. It didn’t take very long before we started discussing the amount of thought that goes into planning and building a vehicle. We talked about how amazing it is and what makes it all tick.

The execution of all that up-front market testing, engineering, and thought is baffling, to say the least. Yet, a parallel focus not-to-be ignored is the speed with which it all comes together and how heavily that speed ties directly to the supply base. This process is engineered, measured, and eerily organized just the same. It’s worth noting that when I hear about something new and exciting coming from a car maker, my mind doesn’t go to the OEM—it goes to the supply base.

OEMs, regardless of jurisdiction on any given day, are continuously and relentlessly doing what they can to move the needle on the latest tech in mobility, connectivity, vehicle safety systems, rider comfort, crashworthiness, lightweight materials, styling—and the list goes on. Obviously, one thing that cannot be ignored is the importance and reliance on the supply base to produce such things that ultimately help OEMs bring exciting, new content to market. Yes, we know suppliers are the lifeblood of automotive manufacturing. But the extent and level to which OEMs define a successful relationship and measure both speed and quality are directly tied to just how integrated suppliers are—both up and down the line—partnered with similar goals and objectives.

Just-in-time cadence and the everyday tick-tock of automotive manufacturing is mind-boggling. As someone who has spent a career taking part, I’ve realized that as each year passes, the integration, expectation, and reliability of a tight-knit supply base—both up and down the chain to and from the OEM and Tier One level—have become more defined and pronounced. This is where the magic of opportunity lives. Truly, the speed of automotive design and manufacturing is driven by this phenomenon and rooted within the supply chain.

As we know, pricing doesn’t always play the largest role in sourcing decisions. With respect to ground-level tooling and automation companies, for example, design responsibility can be a blurred line in some cases. Yet, as time goes by, the reliance of a Tier One or Tier Two supplier helping to make key decisions that can alter or improve an OEM drawing or spec becomes more and more evident. Tier Ones, especially, are keenly aware of the importance of a healthy supplier network for themselves; relatively, just as the OEMs are to their own. Human resource pools at OEMs are running leaner than ever, thus, requesting suppliers down-the-line to become an extension of the OEM themselves—and this has become a real currency.

The Automotive Parts Manufacturers’ Association (APMA) recognizes this model among its members and is proud to say the rewards are revealing themselves on a case-by-case level. The fact is that ground-level suppliers represented within APMA’s newly launched Tooling & Automation group are already profoundly and positively affected by this.

Assisting customer and supplier partners with key factors related to the promise of cost control, just-in-time delivery, and the highest appearance and (functional) quality levels possible. This is already happening. The more pronounced and better-postured a supplier is to show this type of flexibility, the more likely they’ll be rewarded with a high rate of success in cultivation, weighted by the willingness to immerse themselves into the world of taking on much of the design and engineering responsibilities themselves. Ultimately, they’re driving incumbency through engineering. Tooling and automation companies are now, more than ever, distinct...
shareholders in decision-making, and lock-and-key holders to the success of their own product and process, as well as that of their customers and the end user.

APMA's Project Arrow is a perfect example of how this model works. Inspired designs, coupled with intense feasibility and engineering, work hand-in-hand. More specifically, our Tooling & Automation member companies are churning data, providing consultation, showcasing their ability to integrate themselves, and assisting in the design and manufacturing process as you read this. Relative potential sourcing considerations are guided by the willingness to do so, similarly in the same fashion of new model development on a refreshed vehicle platform at an OEM. Not only in a virtual space, but in the physical, too.

What’s more, the digitization of an industry that revels in the advancements of our shop and factory floors is creating benchmarking libraries at break-neck speeds, for decades to come. The ability to lead, reach, and connect further than ever before and implement the latest in advanced manufacturing principles on our shop floors parallels the shifting trends in manufacturing with respect to the internet of things, Industry 4.0 and 5.0, digital twinning, predictive and preventative maintenance on product and process—the list goes on and on.

Make no mistake, supplier companies that are in the business of making things—and moving things—from place to place are the beating heart of this industry. From advanced manufacturing principles constantly improving on the foundation of 100-plus years of lessons learned to innovative breakthroughs in lightweight composites and the mesmerizing technology of vehicle-to-vehicle and infrastructure communication, these things cannot happen without an aggressively expanding supply base, bringing the virtual to physical, partnering on the podium with what used to be the “competitor.”

The speed of automotive design and manufacturing can be clocked by checking the pulse of the supply base. Develop and cultivate their untapped resources and unleash them. I’ve said it many times: Automotive suppliers are the spark plug of innovation that this industry relies on more and more, as Canada pushes forward with leading-edge technology to develop our vehicles of the future.

Mike Bilton is the Chair of APMA’s Tooling & Automation group.
The Automotive Parts Manufacturers’ Association (APMA) rolled out a new online education program this spring, with the hopes it will address the skilled labour shortage facing many companies in Ontario’s auto sector.

The Digital Learning Program for Advanced Manufacturing (DLPAM) is a pilot project offered in conjunction with the Ontario government, which is providing $3.2 million in funding for the effort. The initiative aims to address the skills shortage among many of the 100,000 people employed in the province’s automotive sector.

Lauren Tedesco, vice-president of learning and development for the APMA, says the key target group for the program is hourly workers, including those who work on the production floor. She says many of those workers are vulnerable to the tech changes the industry is currently experiencing, including a shift to electric and autonomous vehicles.

“There is a real need for this because we’re seeing a huge shift happening in the automotive sector,” says Tedesco, adding that new graduates and recently displaced workers will also be eligible to participate in the program.

“It’s no longer the traditional scenario, where you just see people on the production line assembling vehicles,” says Tedesco. “There is a lot of technological changes happening in our industry, and we have to make sure our workforce remains globally competitive.”

The curriculum for the Digital Learning Program was developed by the APMA, along with a number of Tier One partner companies. continued on 14

By Jim Timlick
The initial focus of the program will be on health and safety training. Future subjects are expected to include lean manufacturing principles, manufacturing quality, and leadership.

Initially, the Digital Learning Program will be aimed at small- to mid-sized auto companies, many of which don’t currently have access to training programs of their own, says Tedesco.

“We know a lot of these small- and medium-sized businesses across the auto sector are resource-strapped. They might only have one HR person, or a part-time HR person, and finding affordable and accessible training is really difficult for them and takes a lot of time,” she explains.

The Digital Learning Program will be a completely digital-based platform. Participating learners will be able to access the program via any desktop computer, laptop, cellphone or tablet, meaning they can study whenever it’s convenient for them. They will also be able to study at the pace that best suits their individual circumstances.

Tedesco says the digital learning model was chosen because a majority of hourly workers spend most of their time on the shop floor and don’t have access to a computer during the workday.

“With this program, it’s literally putting learning in the hands of automotive workers, so there’s accessibility and ease-of-use,” she explains. “They’ll be able to log on 24/7, 365 days a year because we want to remove as many barriers to this kind of education as possible. It really gives people the opportunity to complete it on their own timeline.”

The initial health and safety training—and future courses—have been designed as “micro-credentials,” meaning they don’t have to be completed in one long learning block. Sessions will include a variety of different training methods, including videos, quizzes, and an interactive section, and have been designed to promote active learning.

“It’s not passive learning. You really are engaged with it every step of the way,” says Tedesco. “And because we continually change the format and try to keep it dynamic, there will be far better retention of the information being shared. It’s all about breaking things down to make it easier to digest.”

Because the program has been designed to be specific to the auto sector, the APMA is confident there will be a strong level of buy-in among companies and workers. The organization is forecasting to train about 5,000 workers during the first year of the program.

“The idea isn’t just about attracting people to the sector and making it more attractive—it’s really this idea that just because you’ve started a job or are now in the workforce, it doesn’t mean your education stops there,” adds Tedesco.

The Digital Learning Program will run as a pilot project through 2022. The APMA hopes for it to become self-sustaining and that it will be available on a continuing basis following the initial offering. To learn more about the program, go to https://apma.ca/digital-learning.

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Minerals and metals are a primary input into virtually any manufactured product, both directly and indirectly. And Canada’s rich abundance of nickel, graphite, and cobalt, along with its large reserves of lithium, has made it one of the only nations in the Western Hemisphere to have the domestic resources on-hand to help satisfy an ever-increasing enthusiasm for electric vehicles (EV).

There are currently only a few countries in the world where lithium—the key metal needed in the manufacture of lithium ion batteries—is found, like Australia, the so-called “Lithium Triangle” (Chile, Argentina, and Bolivia), China, Portugal, and now Canada. Sayona Mining is currently developing two projects in Québec amid the rapid growth in global demand for the precious metal, its flagship Authier Lithium Project (expected to provide up to 120,000 tonnes of lithium annually for the next 14 years) and the emerging Tansim Lithium Project.

“If Canada wants to be serious about climate change, helping the world get more electric cars on the road will be a significant contribution,” says Guy Laliberté, CEO at Sayona Québec Inc. “Lithium is where the world is heading, and Québec is fully equipped to meet this growing global demand. The Authier project—alone—will provide in total the equivalent of 13.8 million batteries for EVs, more than enough to meet the demand for all of Canada.”

The current supply chain for the manufacture of ion lithium batteries is long. Lithium is typically secured from Australia or South America, then sent to China for processing. The continued on 16
“We have minerals and the skills to convert those minerals into batteries in Québec, and we have a strong automotive industry in Ontario—the best ingredients to feed a hungry U.S. market, which is now primarily being served by China. This is a huge opportunity for Canada and Québec to step up.”

Growing the capacity of Canada’s supply chain in the areas where there remain gaps and continuing to advocate for policies that can ensure the resiliency and longevity of the existing supply chain for increasingly important minerals, like lithium.

There is a rising level of awareness within the consumer base for greater accountability, transparency, and credibility up and down the supply chain for the most environmentally and responsibly sustained source of materials and products. The mining industry has responded to this trend by implementing initiatives like MAC’s Towards Sustainable Mining (TSM) standard. Established in 2004, TSM is a globally recognized sustainability program that supports mining companies in managing key environmental and social risks. Participation in TSM is mandatory for all MAC members.

“The TSM standard has a number of areas of focus that coincide with the areas that increasingly matter to Canadian manufacturers,” says Brendan Marshall, MAC’s vice-president of economic and northern affairs. “In many respects, TSM has been ahead of the curve in preparing Canada’s mining industry to effectively communicate meaningful, transparent, and accountable facts about our performance in a variety of societal and environmental areas in a way demanded by current markets.”

TSM is a made-in-Canada initiative and, increasingly, other mining associations, governments, investors, and manufacturers are looking to TSM as a global best practice in sustainable and responsible mining. In recent years, mining associations in Spain, Finland, Norway, Botswana, Argentina, Brazil, Australia, and the Philippines have adopted the program.

“And when you look downstream, TSM provides the kinds of assurances that companies like Ford and GM look for as they sell their vehicles to customers,” says Marshall. “With TSM, automotive manufacturers can confidently say that they have the least carbon-intensive vehicle in the world because Canada has the lowest carbon-intensive mining practices anywhere in the world.”
From infotainment connectivity and over-the-air software updates to autonomous driving and vehicle electrification, digital innovations in the automotive industry, while wonderful, create cybersecurity risks. These risks expose automobiles to hackers, who can gain access to critical in-vehicle electronic units and data, potentially compromising critical safety functions and the privacy of drivers. It’s no surprise, then, that cybersecurity has become a core concern in the digital auto world.

Cara Wolf is founder and CEO of Ammolite Analytx, a Calgary firm that develops AI-powered cybersecurity solutions for organizations in the aerospace, defence, law enforcement, finance, energy, and healthcare sectors.

Wolf says her company is working in the area of self-driving cars, which she believes likely won’t be adopted in mass by consumers until the spectre of cyber threats has diminished.

Wolf points to the Car Area Network (CAN), the operating system for all cars rolling off production lines.

“CAN has been a decades-long source of amusement for hackers to hone their skills and play pranks that have, so far, been relatively harmless. But the days of teenagers taking over car controls just for fun are becoming increasingly more dangerous. Criminals, terrorists, and hostile power militaries are moving in,” says Wolf.

“If you look at autonomous vehicles, they rely on sensors and artificial intelligence communications, which can be hacked. Misinformation can be fed into the vehicles, so they will react based on an injection of malicious code,” she adds.

“This technology is available now, it’s being used now, and it’s just going to get to be more and more prevalent,” says Wolf. “We have to be able to defend against these kinds of cyberattacks in order for autonomous vehicles to be considered safe enough for mass adoption in our city streets.”

Wolf says some malicious code making its way to vehicle software is actually coming from hostile hackers in countries such as China, Russia, Iran, and North Korea who are intent on wreaking havoc in communications, not just in the United States but in Canada as well.

“I don’t think enough people realize the severity of the problem nor understand just how vulnerable we are,” she says.

A key component of autonomous vehicles is Vehicle-to-Everything (V2X), the wireless technology that enables vehicles to communicate with other vehicles and the infrastructure around them. V2X can already be found in many newer automobiles that have driver assistance features.

Ikjot Saini, a professor and automotive cybersecurity expert at the University of Windsor in Ontario notes that the connectivity essential to V2X can pose a significant cybersecurity challenge.

“With V2X, there’s lot of information being broadcast by vehicles to nearby vehicles, and this information is often not encrypted because of the constraint of real-time. We want to process the information in real-time for safety reasons, but there are so many implications from a security point-of-view,” she says.

Saini and Wolf agree that as vehicles get more and more digitized, it’s become an even bigger challenge to protect the personal information of individuals who may not think twice about entering their home address in their car’s GPS system or feeding all of their contacts into a hands-free device linked to their car’s computer.
According to a January 2021 survey by KPMG, Canada’s automotive industry is nearing a tipping point, with more than two-thirds of Canadians who plan to buy a new vehicle in the next five years saying they’re likely to buy an electric vehicle (EV), either pure or hybrid, over a conventional gas-powered vehicle.

“Our poll research illustrates huge consumer demand in Canada for EVs, putting the onus on manufacturers and governments, alike, to shift gears, not only to meet the expected surge in EV sales, but to invest heavily in the necessary infrastructure,” said Peter Hatges, partner and national sector leader of automotive at KPMG in Canada in a press release.

Due to this most recent resurgence of EVs (electric cars are not a new phenomenon and were, in fact, more popular than internal combustion engines up to the early 20th Century) the automotive industry is now arguably experiencing its most important transformation since the introduction of the assembly line in 1913, which helped lead to the hegemony of gasoline-powered vehicles.

As concerns over climate change are increasingly driving consumer behaviours, EVs will only become more popular, becoming an increasingly familiar sight along Canadian roads. And it’s not difficult to see their appeal. Electric cars are low-to-zero emission, are better for the health of the environment, and tend to be cheaper to operate, both for “refuelling” and overall general maintenance. Perhaps most importantly, however, EVs are also extremely fun to drive and are on the cutting-edge of new automotive technology.

“Think about life before the cell phone. Could you go back?” asks Gitanjali DasGupta, a clean tech expert and global strategist in disruptive technologies. “That’s what it’s like when you drive an electric car; going back to gasoline is difficult once you’ve lived electric. And if you want to reduce the cost of poor air quality, take a step forward to making change to protect our fragile planet and reducing the negative impact of the Anthropocene Age, and ensure the economic competitiveness of a country’s economy or industry, then EVs are the only way to go.”

With about four times more microcontrollers in an electric car as there are in an internal combustion vehicle, EVs will truly change the way we drive. The amount of raw computing potential of an EV throws open many new frontiers for the automotive industry, as its vehicles become “smart” enough to navigate future cities, sporting enhanced crash avoidance technologies, entertainment features, and greater autonomy.

“You can look at cell phones to see how quickly something like battery technology is able to improve and then apply that kind of evolution to EV,” says DasGupta. “We’re seeing the true transformation of the automotive industry because the underlying enabling technology is evolving leaps and bounds, year after year. The opportunities are really as endless as your imagination allows.”

In order to get ahead of the EV trend and ensure a healthy future for domestic innovation and job growth, Canada will need to step up its innovation investment game.
Wolf believes that with the acceleration of scientific breakthroughs like artificial intelligence and quantum computing, the need for effective security tools, like anti-malware that can detect insidious injections of malicious code, is even more pressing.

For this reason, Wolf thinks it’s essential to build in protection from cyber threats all the way from the car design phase to the showroom floor.

“Cybersecurity can’t be an afterthought,” says Wolf. “You’ve got to do it from the ground up.”

Wolf maintains tackling the serious cybersecurity threat in the automotive industry is a shared responsibility of corporations and government—and that much more needs to be done.

“We’re not investing enough in the cybersecurity space for Canadian-made anti-malware and Canadian made-product, both in terms of sensors and in terms of cybersecurity tools. Cybersecurity is very underfunded in this country,” she says.

“Right now, we’re very reliant on other countries, like the United States, Israel, and the United Kingdom to provide us with cybersecurity tools, when we should be building our own capacity with our own people.”

Wolf points out there are initiatives from Ottawa, like CyberSecure Canada and the Cyber Security Cooperation Program that address the problem, but she maintains it’s not nearly enough. Wolf also believes it’s time for companies in the automotive industry to step up by investing much more in research and development and the build-up of Canadian-made cybersecurity tools.

From an automotive perspective, traditional automakers in North America and around the globe are already beginning to move into the EV space. This will provide a tremendous opportunity for the next generation of developing companies and industries to pop up, from new software and hardware providers to chip manufacturers, battery suppliers, and other ancillary or industry-supportive businesses.

“It’s like the early AOL days of the internet and we’re all just waiting to see who the new Apples, Google, and Amazons are going to be,” says DasGupta. “There is just so much opportunity for new entrants to establish themselves and for existing players within the automotive industry to branch out and grow beyond where they are today. But if you’re not part of this wave or at the forefront of this new technology, then you’re going to lose out on what will become one of our largest—if not the largest—emergent industries for generations to come. So, don’t be a laggard.”

EV technology is the convergence of energy and automotive, and, historically, Canada is well-positioned along the value chain when it comes to the development and production of lithium ion batteries, from its strength within the global mining sector and its scientific know-how to its proven automotive manufacturing capabilities and ready availability of hydro-electric power.

With that said, Canada has traditionally not been as supportive as other countries in terms of innovation and financing new technologies, resulting in many companies taking their ideas elsewhere to grow. In order to get ahead of the EV trend and ensure a healthy future for domestic innovation and job growth, Canada will need to step up its innovation investment game.

“If you were to ask me if we’re doing enough, the answer would be no. Can we do more? Absolutely,” says DasGupta. “If Canada is willing to invest—and potentially lose—the same amount of money in our battery industry as it was on the TransCanada pipeline, we would be in a totally different place today as it relates to electric vehicles. We need a greater commitment to this kind of technology, or we risk being left behind.”

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The Canadian automobile manufacturing sector has undergone a significant transformation over the last decade, as automakers try to keep up with the constantly changing demands of consumers looking to have the latest technology incorporated into their new ride.

Consumers haven’t been the only beneficiaries of this technological transformation. It’s also been a boon for many start-ups in the original equipment manufacturers (OEM) industry. For example, Ford recently invested $500 million in electric vehicle (EV) start-up Rivian, and GM ponied up about $1 billion investment in Cruise, a fledgling self-driving car company.

Some industry experts suggest there’s never been a better time to be a start-up OEM in the auto industry. Smaller companies tend to be able to roll with the punches much more quickly than their larger auto manufacturer counterparts. Additionally, smaller start-ups have the freedom to use different production practices than larger companies—their hands aren’t tied to using sprawling, dated plants for the manufacturing side of things. Nowadays, new OEMs have flexibility in how they start.

“You can benefit from smaller plant footprints and grow in volume, but you can grow smartly,” says Warren Ali, senior vice-president of innovation for the Automotive Parts Manufacturers’ Association (APMA).

Start-up OEMs today don’t necessarily have to face the more costly manufacturing practices that plague larger manufacturers. Instead, they can embrace newer formats and explore new suppliers, which can be a game-changer. Being able to invest outside of their own company gives manufacturers the opportunity to reinvent themselves in the eyes of their consumers. A company trying to brand itself similarly to, say, Apple, is a tough sell and a tricky value proposition. By choosing to invest in another company outside of your own gives you the power to connect yourself to a company that’s already got a proven track record.

“You’ll still grow because you’ve put money into something else,” says Ali. “And as that thing grows, the value of the money you put into it grows along with it.”

When you think about it, what’s happening in the auto sector right now is similar to what we saw the cell phone industry go through during the past decade.

Rather than being focused exclusively on units sold, auto manufacturers are shifting gears to provide consumers with an enhanced customer experience after they’ve driven off the lot.

With this shift, nearly every single OEM or major auto company is defining itself as not just a manufacturer of a product but as a tech company. To face this new frontier, companies are expanding...
Meet APMA’s Members

The Automotive Parts Manufacturers’ Association’s mission is to grow and promote a vibrant and globally competitive Canadian automotive supply chain. APMA members are engaged, recognized, and act as a central partner in helping to build our country’s economic future. We salute each and every member for their support.

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Sciemetric Instruments, Inc.
SEW Eurodrive Company of Canada Ltd.
Sherrard Kuzz LLP
SHW Pumps & Engine Components Inc.
Siemens Canada Ltd.
Sinteris Inc.
Ste-Co Plastics Inc.
SME
Sorel Forge Inc.
Specialty Innovations and Manufacturing (Maxtech Licensee Co.)
Studio 63 Inc.
Technical Management Consultants Inc.
Thermon Canada Inc.
Toolplas Systems Inc.
Topbin Insurance Solutions
Toronto-Dominion Bank (The)
Toshiba Machine Company Canada Ltd.
Toyota Tsusho Canada Inc.
TRQSS Inc.
University of Waterloo – WatCAR
University of Windsor
Vehiquilla Inc.
Vision Transportation
Vox ISM Inc.
Wells Fargo Equipment Finance
Windsor Mold Group
Willsi Towers Watson
Woodbridge Group (The)
Zip Mold Inc.
continued from 20 their brands and portfolios, which, in turn, allows them to expand their relationship with the buyer. The result is a hybrid of the way business used to be done and how future business will be conducted—with a nod to the expected growth of environmentally friendly options and the value proposition these vehicles bring.

Perhaps there’s been no better example of the value of this new way of thinking than electric vehicle manufacturer Tesla. Ten years ago, it was considered an edgy, little upstart most people knew little about. Today, the company is worth more than Facebook, and it sold nearly a half-a-million cars in 2020, alone.

And that’s good news for fledgling companies like Haze Automotive, a new auto tech start-up focused on developing premium electric vehicles.

"BloombergNEF states that although EVs make up only a fraction of a per cent (of vehicles) in today’s global market, they will eventually account for 58 per cent of the market in 2040," says Sean Hazaray, CEO of Haze.

“We’re about to see a ‘hockey stick’ curve for electric vehicles later this decade, and the buzz really started going in 2020,” Hazaray adds.

As larger companies consider diving into this end of the consumer pool, it might be worth their while to invest in some of these smaller start-up companies. In addition, keeping a watchful eye on how these start-ups strategically scale-up operations could, in turn, provide some insight into how larger companies might consider reimagining their plants for optimal results.
Steel: the energizing material

Our industry-leading offer for electric vehicles helps car makers to create environmentally friendly solutions by reducing vehicle weight and increasing engine performance.

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We see a future where everyone can live and move without limitations. We are developing technologies, systems and concepts that make vehicles safer and cleaner, while serving our communities, the planet and, above all, people.

Forward. For all.