



CANADIAN  
MANUFACTURERS  
& EXPORTERS

# CANADA'S NET ZERO INDUSTRIAL STRATEGY

JUNE 2022





# ABOUT THE ORGANIZATION AND AUTHORS

## CANADIAN MANUFACTURERS & EXPORTERS (CME)

Since 1871, CME has made a difference for Canada's manufacturing and exporting communities. Fighting for their future. Saving them money. Helping manufacturers grow. The association directly represents more than 2,500 leading companies nationwide. More than 85 per cent of CME members are small- and medium-sized enterprises. As Canada's leading business network, CME, through various initiatives including the leadership of the Canadian Manufacturing Coalition, touches more than 100,000 companies from coast to coast, engaged in manufacturing, global business, and service-related industries. CME's membership accounts for an estimated 82 per cent of Canada's industrial output and 90 per cent of exports.

## CME-MEC.CA

## MATHEW WILSON

Mathew Wilson is the Senior Vice President of Policy & Government Relations at CME. In his role, he leads the organizations' outreach with members to understand their business challenges and works with governments to implement changes on policies, programs, and regulations to support manufacturing growth. Mathew is a member of the association's executive team, playing a key role in the development and execution of its strategy, and a key spokesperson with members, government, and the public on its priorities.

## ALAN ARCAND

Alan Arcand is the Chief Economist at CME. In his role, he is responsible for developing and executing CME's major national research projects, conducting CME's macroeconomic analysis to support the organization across the country, leading tax policy efforts, and being a leading voice representing the interests of the association and members with government and with the public. Alan's background includes expertise in municipal, regional, and national economic matters including economic forecasting and analysis.

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# CME'S COMMITMENT: A CANADIAN NET ZERO INDUSTRIAL STRATEGY<sup>1</sup>

Canadian manufacturers are committed to creating a clean and healthy environment for all. We believe that Canadian industry can and should produce goods in the most environmentally friendly manner and to the highest global standards, where supportive policies are essential enablers. For decades, Canadian Manufacturers & Exporters (CME) and our members have worked with governments to improve and create common standards through effective environmental regulations and supportive programs.

The current strategic focus of environmental action is the race to achieve net zero greenhouse gas (GHG) emissions by 2050. The global manufacturing sector is leading this race through the aggressive adoption of technology and the creation of innovative new products aimed at meeting rising consumer demand for more sustainable goods. Many of Canada's top industrial companies have made commitments to be net zero by 2050 and are already taking aggressive action.

It is imperative that Canada and Canadian manufacturers become world leaders in the race to net zero. Many global industry leaders have pledged to be carbon neutral by 2050, and this means that they will increasingly demand that their supply chain partners implement comprehensive net zero strategies too. More and more, consumers, governments, and other businesses will demand action. Employers taking concrete steps to improve the environment will be more attractive to employees of today and the future. Finally, banks, investors, insurance companies and other financial services firms will also require concrete action in exchange for their support.

This transition will not be easy. In fact, it will be incredibly expensive for manufacturers to make the investments necessary to help Canada meet this extraordinarily ambitious goal. Therefore, CME and our members' support for Canada's 2050

net zero emissions target is contingent upon the government partnering with industry to develop a Canadian Net Zero Industrial Strategy, which includes all the following elements:

- Direct investment supports for emitters of all sizes to help them adopt emissions-reduction technologies, ensuring that support approaches are technology-agnostic.
- Financial support for the creation, commercialization, and manufacturing of low- and no-carbon products in Canada through tax incentives and government procurement.
- An effective and targeted SME net zero transition strategy, with a specific focus on education and global supply chain competitiveness.
- Support for effective energy solutions that recognize the necessity of existing supply, and the need to vastly increase the supply of energy, while fostering the development of new technologies that contribute to the decarbonization of the energy system.
- Support for the creation and expansion of corporate carbon offset programs.
- Transition strategies that are aligned and coordinated between Canada and our key trading partners to ensure competitiveness and to avoid carbon leakage.
- Climate policies that are aligned and coordinated between the federal and provincial governments.

These actions by government will enable a stronger, more innovative, and more globally competitive manufacturing sector and, therefore, are essential principles for the support of federal and provincial net zero policies.

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<sup>1</sup> As passed by CME's Board of Directors, June 23, 2021

# EXECUTIVE SUMMARY

Manufacturers face continuous pressure to innovate, problem solve, and improve performance. Over the course of the next decade, the way the manufacturing sector does business will continue to be altered, however at a much faster pace than previously seen. Evolutions in technology will continue to push the sector closer to full automation and to create new unimagined technologies. Geopolitical pressures, changing consumer demands, and the fallout from the COVID-19 pandemic is expected to lead to a shift to more localized production and supply chains to improve resiliency and flexibility. And societal pressures for improved social and environmental practices will dramatically change the types of products that manufacturers make and, most importantly for this discussion, how they make them.

These pressures are already reshaping Canada's industrial sector and have created opportunities to drive positive change and growth in the country. As a clear example, from an environmental performance perspective, Canada's industrial sector has emerged as leaders and champions of the transition to net zero<sup>2</sup> greenhouse gas (GHG) emissions by 2050. While the Canadian government has aligned to global net zero targets, so have most of Canada's leading and largest industrial companies that have publicly supported net zero policies and announced their strategies. Hundreds of millions of dollars are invested annually by manufacturers to reduce their carbon footprints. Billions have been invested to develop and produce the next generation of clean technology products – such as electric vehicles and clean hydrogen power.

While these actions have been aggressive, impressive, and are accelerating, we are only at the beginning of this transition. And make no mistake, Canadian industry, along with its global counterparts are moving to net zero GHG emissions. The key question for Canada in this transition as a small trade-exposed market is whether the country will support this industrial net zero transition while maintaining and growing the sector or will government policies ultimately undermine and harm industrial competitiveness?

Achieving the outcome of a growing industrial sector that achieves its net zero commitments by 2050 will be a daunting task. Canada's industrial sector has a relatively higher share of emissions-intensive trade-exposed companies; it is situated in a small domestic market surrounded by massive global competitors, it is near the bottom among its global peers

in terms of investment and technology adoption, and it is overwhelmingly represented by very small companies that need more resources to facilitate understanding and strategies to successfully manage this transition.

To achieve the desired outcomes, Canada requires a true partnership between government and manufacturers on an industrial net zero strategy that targets these challenges and works on common solutions. To date, governments have made many announcements and commitments, including very substantial investment support programs that were advanced by CME to aid in the transition to net zero and to encourage clean technology production. However, much of Canada's long-term plan – from all levels of government – appears to be more focused on regulation and taxation rather than on a supportive partnership for industrial growth, as seen in other countries.

As an example, the costs associated with Canada's climate action plan are poised to mount in the coming years as the price on carbon increases to \$170 per tonne of GHG emissions in 2030 and as stringency levels in the Output-Based Pricing System (OBPS) increase. These measures will cost manufacturers up to \$60 billion cumulatively based on current emissions profiles. In addition, the operational costs associated with fuel-switching and carbon, capture and storage (CCS) will amount to another \$60 billion by 2050 (\$2 billion annually). This will have a potential cumulative cost of over \$100 billion in additional costs for Canadian manufacturers between 2022 and 2030. The only way for industry to avoid these costs is to invest heavily in technology that reduces emissions in their operations.

However, Canada ranks near the bottom of most global investment attraction statistics. Between 2015 and 2019 (the latest year available), Canada attracted less than \$22 billion of the \$1.77 trillion invested per year in manufacturing (includes buildings, R&D and IP, capital, machinery and equipment, etc.) across the OECD. This accounted for only 1.2 per cent of the OECD total. By comparison, the US received 23-times Canada's amount while Mexico received 10-times.

To achieve net zero emissions in the manufacturing sector, CME estimates that between 2022 and 2050, Canadian manufacturers will need to invest \$180 billion (\$6 billion annually) in emissions reductions technologies alone. Today, the industry's capital expenditures on these technologies are less than \$1 billion annually – thus requiring at least a six-fold

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<sup>2</sup> Government and industry are in alignment that net zero emissions are achieved when CO<sub>2</sub> emissions are balanced by CO<sub>2</sub> removals over a specified period of time.

increase in investment in these technologies, while still trying to invest in other capital expansion programs. The first priority is clearly to focus on investment through a range of policy solutions and support programs that will encourage investment and technology adoption.

The second priority will be to engage the entire manufacturing sector as early as possible in the transition to net zero. While Canada's largest industrial players are already beginning the transition, most SME manufacturers are lagging. In CME's 2022 *Low Carbon Transition (LCT) Survey*, only 11 per cent of small manufacturers with less than 100 employees indicated that their companies had set targets to reach net zero emissions by 2050 or earlier, a much smaller proportion than the 47 per cent of large enterprises with 500 or more employees that have already done so. This is a massive problem when 96 per cent of the country's 90,000 manufacturers are small firms. And this challenge is complicated by the reality that many of these smaller manufacturers operate as suppliers to large corporations, and these large players will increasingly demand that their partners reduce their carbon footprints too or they will take their business elsewhere. More effective and targeted government programs, such as education, operational assessments and roadmaps, and investment supports, that help industrial SMEs transition to net zero will be essential.

The third priority will be to create a globally competitive business environment to reduce industrial business costs. If climate policies in all countries were as stringent as Canada's, these competitive concerns would not exist. Canadian government policies must protect domestic markets while allowing competitive access to foreign markets. An effective border carbon adjustment mechanism appears inevitable in this regard. In addition, Canada's historical pattern of patchwork regulatory policies will not work – a simple, flexible, harmonized, and consistent regulatory approach to climate change across the entire country is essential. And, industry needs access to a fast-growing, stable, and affordable supply of clean energy to power their operations.

The global race to net zero is gathering pace. The longer partnership and action are delayed, the harder it will be to reach our collective goals. There are two ways in which Canada can achieve its net zero targets in manufacturing: through massive investments in clean technology and other climate change solutions or through the offshoring of manufacturing production and jobs from Canada. Our collective challenge, and our call to action to all levels of government, is to step up and partner with Canadian industry to create an effective net zero industrial strategy that will grow manufacturing in Canada, thus generating the jobs of tomorrow, while at the same time securing the millions of jobs it provides in Canada today. Canada needs a collaborative partnership through an industrial net zero strategy.

# UNDERSTANDING THE PATH TO NET ZERO THROUGH CANADA'S MANUFACTURING SECTOR

Manufacturing, and the world that the sector operates within, is constantly changing. Often, we shape our world by creating new technologies and products. Other times, the world changes us by shaping our views and our approaches to how to do business. Over the course of the past decades there has been a rapid shift in how business is done, and particularly the role of the private sector in environmental, social, and governance (ESG) issues.

Today, one of the biggest areas of public commentary and discussion is around the impact of climate change, and the role that both Canada and Canadian industry play. Canada is a small contributor to the global challenge, accounting for only 1.5 per cent of the world's total greenhouse gas (GHG) emissions. Canadian industry is also a small contributor, responsible for under 40 per cent of Canada's total carbon footprint (calculated by summing heavy industry's share of 10.6 per cent and the oil and gas sector's share of 26.2 per cent). But the math matters less than the leadership that we can and must provide, along with the fundamental reality that the world is changing, action is being taken, and the Canadian manufacturing sector cannot be left behind.

Driven by public pressure, companies, like many governments, are taking swift action on climate change. From a government perspective, 193 parties (192 countries and the European Union) have joined the Paris Agreement as of early 2022, which establishes binding commitments by all signatories to undertake efforts to combat climate change. In Canada, action has focused largely on decarbonizing the energy system, putting a price on carbon to shift consumer behaviour, and introducing a series of support programs to help institutions, households, and companies reduce emissions.

What is less publicized is the role and actions of the private sector. It may surprise some, but businesses have been very aggressive and have committed to making significant reductions over the long-term. In fact, much of the government actions are mirroring work started earlier in the private sector. Thousands of companies have committed to reducing their emissions, not

only supporting the Paris Agreement targets, but committing to a net zero emissions future as well. This net zero commitment will have knock-on effects, as their products and their supply chain partners will be similarly affected by this change.

Canada's industrial sector is both leading this shift and being driven to change due to its deep integration in global supply chains. Companies across a range of industrial sectors including food, aerospace, energy, automotive, construction, and mining, to name only a few, have committed to be net zero by 2050 at the latest. These companies are taking a wide range of actions today to reduce their carbon emissions and have even more planned in the coming years. They plan to use a wide array of strategies to reduce emissions, including investing in emission-lowering equipment, shifting to low or no-carbon energy sources like hydrogen, and adopting carbon capture, utilization and storage (CCUS) and direct air capture (DAC) technologies. They are also launching new clean technology products aimed at a range of consumers, with electric vehicles capturing most of the public's attention to date.

While governments and the private sector are clearly aligned on the need to respond to the growing demands of consumers from around the world to address climate change, they are not necessarily aligned on the best path to achieve this outcome. CME firmly believes there is a clear path that should be followed to reach net zero emissions by 2050. To reach this objective, there must be a strong partnership between industry and government and alignment on the specific actions that they will take together. And this partnership must be focused on the practical business needs to drive investment and spur innovation and growth moving forward to assist in the transition, not punitive measures based on current realities.

Before exploring the details of the right path forward, it is critical to understand the challenge that we are trying to address within Canada to move to net zero emissions by examining the GHG emissions profile, technological progress, the size of the industrial sector, and its current environmental strategies.

## CANADA'S INDUSTRIAL EMISSION REALITIES AND REDUCTION CHALLENGES

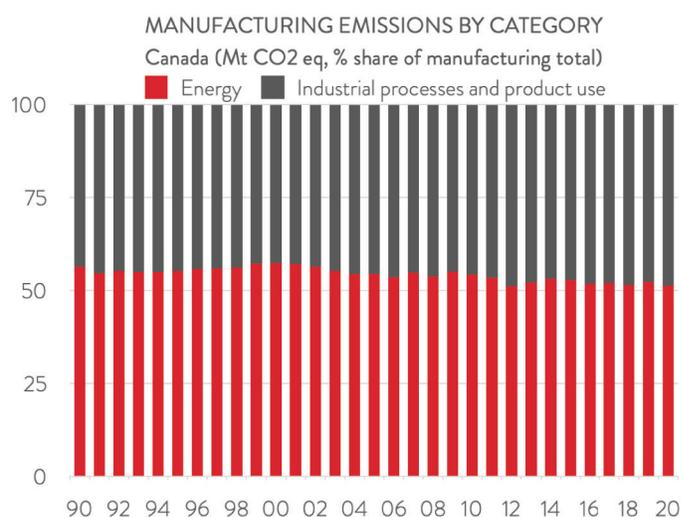
Canada's total GHG emissions in 2020 were 672 megatonnes of carbon dioxide equivalent (MtCO<sub>2</sub>e), down 8.9 per cent from 738 MtCO<sub>2</sub>e in 2019. It is important to point out, however, that this decline was an anomaly, as lockdowns during the first year of the COVID-19 pandemic severely limited travel. Indeed, emissions from the transport and oil and gas sectors posted the largest declines. Canada's emissions almost certainly increased in 2021 as the economy bounced back, and they will likely increase again in 2022 assuming that life continues to gradually return to some sort of normality.

In 2018, Canada ranked as the tenth largest GHG emitter in the world, with its share of global emissions equaling 1.6 per cent. For perspective, the world's top emitters in 2018 were China (11,706 MtCO<sub>2</sub>e or 23.9 per cent of global emissions), the US (5,794 MtCO<sub>2</sub>e or 11.8 per cent of global emissions), India (3,347 MtCO<sub>2</sub>e or 6.8 per cent of global emissions), and the EU region (3,333 MtCO<sub>2</sub>e or 6.8 per cent of global emissions).

Within Canada, the oil and gas and transportation sectors are the largest GHG emitters. Even with their outsized declines, they collectively accounted for half of total emissions in 2020. Heavy industry<sup>3</sup>, which includes energy-intensive manufacturing industries along with mining, was the fourth largest contributor to Canada's GHG emissions, with emissions of 71.8 MtCO<sub>2</sub>e, or 10.7 per cent of the total, in 2020.

The entire manufacturing sector—from heavy industry to light manufacturing—generated emissions of 93.1 MtCO<sub>2</sub>e, in 2020, making it responsible for about 14 per cent of Canada's total emissions. Still, the sector has made great strides in reducing its carbon footprint, with emissions peaking in 1996 at 134.8 MtCO<sub>2</sub>e.

The manufacturing sector generates emissions in two broad ways. First, many subsectors use fossil fuels to generate the tremendous amount of heat and energy they need to make their products. Industries that use a heavy amount of energy include iron and steel, non-ferrous metals, chemical, pulp and paper, and cement. In 2020, the manufacturing sector's emissions from energy use represented 51.3 per cent of the sector's total emissions, down from 56.3 per cent in 1990.



Sources: CME; Environment and Climate Change Canada.

Second, many subsectors also generate emissions as an inherent part of production. These are known as industrial processes and product use emissions. Emissions from industrial processes result from a chemical or physical transforming of material, while emissions from industrial product use result from the use of a product to deliberately exploit one or more physical or chemical properties of it. These emissions are largely generated through the production of cement, lime, ammonia, aluminum, iron and steel, and magnesium. In 2020, industrial process and product use emissions accounted for the remaining 48.7 per cent of the sector's total emissions, up from 43.7 per cent in 1990.

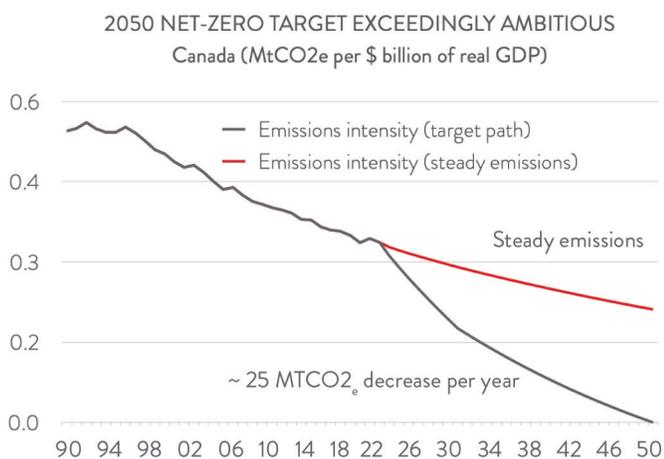
While the manufacturing sector's emissions from fossil fuel use have declined by nearly 30 per cent since 1990, emissions from industrial process and product use are down a more moderate 11.6 per cent. The stark reality is that the cement, chemicals, iron and steel, and pulp and paper subsectors, which together account for over half of Canada's manufacturing sector emissions, are among the most difficult industries to decarbonise, due in part to the requirement for high temperature heat and inherent process emissions that cannot be avoided with a switch to renewable energy sources. As a result, until major technological breakthroughs are achieved, these emission-intensive manufacturing industries will need to rely on CCUS and other carbon management technologies to reach net zero emissions.

<sup>3</sup> The heavy industry consists of emissions from mining, smelting and refining, pulp and paper, iron and steel, cement, lime and gypsum, and chemicals and fertilizers.

Canadian manufacturers spend hundreds of millions of dollars annually on pollution prevention and abatement measures, which is clear evidence of the industry's commitment to improve its environmental performance. In 2019, the latest year where data is available, manufacturers' investments on pollution prevention, abatement and control totalled roughly \$845 million. These investments were heavily concentrated in the sector's largest GHG emitters: primary metal, chemical, petroleum and coal product, paper, and wood product.

Thanks to these investments, the manufacturing sector's emissions intensity, defined as the volume of emissions per unit of real GDP, has been steadily improving, declining at an average annual rate of 0.6 per cent over the past 20 years. However, this trend will need to accelerate if Canada is to reach its ambitious dual goal of achieving deep domestic absolute emissions reductions, while at the same time growing the economy.

Indeed, while these investments in the manufacturing sector are paying off in reduced emissions intensity, this is a small amount compared to what is needed to meet Canada's target of net zero emissions by 2050. In fact, Canada would need to more than quadruple its current rate of technological progress, with emissions intensity falling at a 7.8 per cent average annual pace, to meet its target of emissions that are 40-45 per cent below 2005 levels by 2030. In other words, Canada would need to reduce its emissions by about 30 MtCO<sub>2</sub>e per year between 2022 and 2030 to meet its commitments. Achieving net zero emissions by 2050 will be a similarly daunting challenge, requiring emissions reductions of roughly 25 MtCO<sub>2</sub>e per year between 2022 and 2050.



Sources: CME; Environment and Climate Change Canada; Statistics Canada (Table 36-10-0104-01).



Sources: Statistics Canada; CME.

There are two pathways to achieve these reductions - technology investment to reduce emissions in production processes or ceasing production altogether. Given the importance of the sector to the Canadian economy, the only feasible option to reduce emissions is to rapidly accelerate technology adoption and investment. CME estimates that manufacturers will need investments of about \$180 billion to meet net zero targets by 2050. In other words, manufacturers would need to pour \$6 billion per year into manufacturing emissions reductions technologies—at least a six-fold increase over current capital expenditures on pollution prevention and pollution abatement and control, and an average of about 30 per cent higher than current total manufacturing capital investment trends.

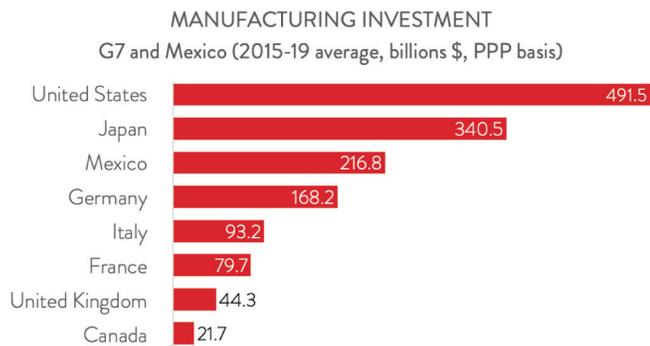
These clean technology investments are on top of the investments required to sustain and grow existing output capacity to remain globally competitive or launch and commercialize new products. To this point, CME has called on Canadian governments to target actions that help raise manufacturing investment to \$45 billion per year (equal to 2 per cent of total OECD manufacturing investment) in order to expand manufacturing production and accelerate technology adoption.

While the task is certainly daunting, it is achievable if the right plan is in place. Such a plan must focus on the most environmental and economically beneficial way to achieving net zero emissions in the industrial sector: technological progress and carbon offsetting. In short, the challenge for Canada is to ensure that the plan be structured to attract industrial investment to Canada rather than driving it away.

## CANADIAN MANUFACTURING INVESTMENT REALITIES

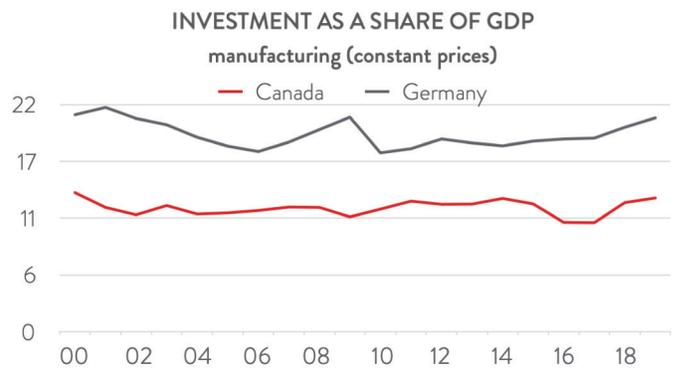
There is a direct link between technology adoption, emissions, and productivity. However, as detailed and documented by CME and other organizations, including the Government of Canada in various reports, Canadian industry is a global laggard in investment and technology adoption. This has hindered growth in the manufacturing sector and the economy overall with perpetually sluggish labour productivity growth, the single most important determinant of a country's prosperity and standard of living. Canada's poor technology adoption record also directly impacts our ability to compete for and win investment and jobs. It also means that Canada generates higher emissions than it otherwise could be.

To achieve carbon neutrality in manufacturing, Canada will need to reverse the long-term trend of anemic investment in the sector. As the chart below illustrates, between 2015 and 2019, manufacturing investment among 31 countries in the Organization for Economic Cooperation and Development (OECD) totalled nearly \$1.8 trillion per year. With average annual investment of \$21.7 billion, Canada accounted for only 1.2 per cent of this total. By comparison, the US received 27.6 per cent of OECD manufacturing investment (\$491.5 billion or 23-times Canada's amount) and Mexico received 12.2 per cent (\$216.8 billion or 10-times Canada's amount). Total world manufacturing investment is expected to increase as the global economy recovers from the COVID-19 pandemic and as companies look to reshape supply chains and purchase environmental technologies. These trends present a huge opportunity for Canada to increase its share of global manufacturing investment. However, if the past is any indication, this will be a major challenge for our country.



Sources: OECD; CME.

Germany, which is often cited as the global leader in technology creation and adoption in advanced manufacturing, provides a sharp contrast to Canada's realities. Germany's industrial output is nearly five times greater than Canada's, yet it has industrial emissions that are only one-and-a-quarter times larger. While some of this can be explained by differences in industrial structure between the two countries (Canada's manufacturing sector is relatively more energy-intensive than Germany's), credit for Germany's lower emissions intensity can also be attributed to higher levels of technology investment. From 2015 to 2019, investment as a share of GDP in the manufacturing sector averaged 19.3 per cent in Germany compared to only 11.8 per cent in Canada.



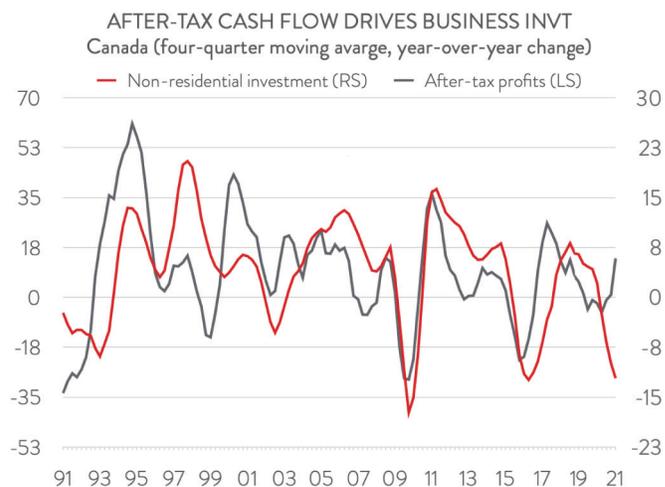
Sources: OECD; Statistics Canada; CME.

Germany has taken a decades-long comprehensive approach to developing its advanced manufacturing sector in a way that Canada simply has not. Driven by government strategy, the German industrial sector was where Industry 4.0<sup>4</sup> or the fourth industrial revolution got its start. Germany has national standards in place to foster innovation, boost investment, and drive growth in output and exports in the manufacturing sector. In contrast, Canada has so far only taken a piecemeal approach to industrial policy instead of following the successful German approach of implementing a comprehensive industrial strategy focused on technology adoption. For a net zero strategy to be effective and for the manufacturing sector to grow and thrive, such a strategy is essential as current trends simply will not support the transition.

<sup>4</sup> Industry 4.0 builds on the third industrial revolution that featured the adoption of computers and automation by enhancing it with smart and autonomous systems driven by data and machine learning.

However, while Canada’s manufacturers will need to dramatically scale up capital expenditures, they will need to do this in the face of expectedly rapidly rising operational costs stemming from inflation pressures, along with the rising price on carbon and other environmental regulations, including increases in the stringency of output-based standards over time, which the federal government has signalled will begin in 2023. As an example, CME estimates that the operational costs associated with fuel-switching and CCS will cumulatively amount to roughly \$60 billion (\$2 billion per year) by 2050. While significant, it is also an underestimate for three reasons. First, it will take a long time for manufacturers to fully switch to clean energy sources, meaning they face many years of higher energy costs associated with the price on carbon. Second, this estimate does not include integrated supply chain passthrough costs, particularly transportation costs. Third, it does not include regulatory compliance costs, which on their own could be quite substantial.

These rising costs have profound implications for businesses’ ability to invest. As the chart below shows, there is a strong positive correlation between business investment and profitability of companies. Manufacturers are only able to invest in emissions reductions technologies, business expansion, and the creation of new products if they are profitable and have cash to invest. Every dollar that is removed from the sector is a dollar that cannot be invested in technological change and emissions reductions.



Sources: Statistics Canada; CME.

As such, while we understand why governments have taken a “stick” approach towards industry to both grab the sectors’ attention and to provide long-term predictability around government action, governments must quickly move to providing more “carrots” for industry to support investments that enable the industry to transition to net zero, strengthen its global competitiveness, and grow its output.

And to give full credit, these carrots have been evident, although limited, through parts of 2021 and 2022. Leveraging the Net Zero Accelerator Fund, the federal and some provincial governments have supported massive investments in key sectors such as steel, chemical, automotive, and battery manufacturing. This is a solid indication that governments understand Canada’s investment realities, but clearly much more is necessary to achieve our ultimate goals for the entire industrial sector.

## CANADIAN MANUFACTURING CLIMATE ACTION READINESS

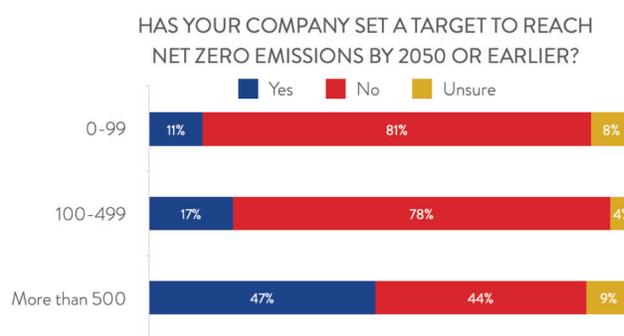
Moving Canadian manufacturing to net zero emissions while strengthening global competitiveness will be an incredibly difficult task. The only way to chart a path forward is to understand the structural realities of the sector, its climate ambitions, and design and implement policies and supports that reflect these realities.

Manufacturing is one of Canada’s largest economic sectors, directly generating 10 per cent of the country’s GDP and nearly two-thirds of its merchandise exports. Including direct and indirect impacts, the sector’s footprint amounts to nearly 30 per cent of Canada’s economic activity. The sector directly employs 1.7 million Canadians and supports their families and communities through stable, highly skilled, high-wage jobs, and supports over 3 million more Canadian jobs through its massive integrated supply chain.

A key characteristic of the sector is that the size distribution of firms is highly skewed toward small businesses. This has important implications for the sector’s ability to take on the challenge of reducing its carbon footprint. Of the roughly 90,000 manufacturers that operate in communities across Canada, about 86,000 or 96 per cent have less than 100 employees, while a mere 300 or 0.3 per cent are large businesses with 500 or more employees. These large companies, while few in number, have outsized direct economic impacts. In total, these firms generate over half of the sector’s domestic output and 60 per cent of Canada’s export value annually.

Still, many small companies play an important role in the advancement of the sector as direct suppliers within the supply chains of those large manufacturers. Small companies rely on large companies for business, and large companies rely on small companies for a range of components, parts, and services that allow them to remain competitive. In short, the health of the manufacturing sector is often driven by the health and the strength of this relationship within the supply chain.

Small and large manufacturers are at much different stages of readiness when it comes to transitioning to a low carbon economy. CME’s 2022 *Low Carbon Transition Survey* found that the larger the firm, the more likely it is that it has set internal GHG emissions reduction targets. In fact, nearly half of Canadian large manufacturing firms (500 or more employees) have set a target to be carbon neutral by 2050 or earlier. By comparison, only 17 per cent of medium-sized businesses (100-499 employees) and 11 per cent of small manufacturers (0-99 employees) said they have done the same. These results are consistent with the results of CME’s 2020 *Management Issues Survey*, indicating that small and medium-sized manufacturers continue to face barriers when considering emission-reduction targets.



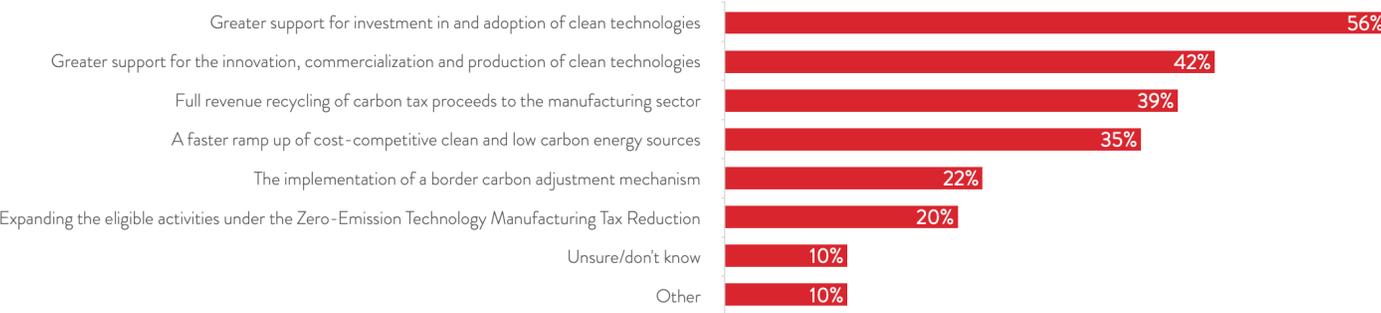
Source: CME—2022 Low Carbon Transition Survey.

As governments continue to introduce policies, taxes, and programs aimed at reducing emissions, and as more large businesses set internal GHG emissions reduction targets, pressure is going to mount on smaller firms to create and implement strategies of their own. In fact, this is already happening, and based on CME survey responses, Canada appears completely unprepared.

Simply put, large global firms are not only publicly supporting net zero strategies, but they are shifting their production and their products towards these goals. While their initial efforts mostly involved setting medium-term targets to reduce direct emissions from sources controlled or owned by them, their long-term efforts will involve targeting indirect emissions from the supply chain. As result, the suppliers of these large firms will face increasing pressure to cut their own emissions. Today, primary manufacturers are asking their Tier 1 suppliers (which tend to be medium and large companies themselves) to create actionable net zero strategies that not only cover their direct operations, but the entire integrated supply chain. As such, over the next few years, those Tier 1 suppliers will demand the same of their own supply chain network, which is primarily made up of small and medium-sized manufacturers. And to be clear, these are not requests. A failure to meet these expectations will lead to the loss of future business.

In addition to understanding manufacturers’ readiness to transition to net zero, CME was able to seek input from its members about the best support measures to help them make this transition. The top ranked measure would involve governments providing direct funding to industry to support the investment in and adoption of clean and low carbon technologies. The second most popular choice would involve more government incentives to support the innovation, commercialization, and production of these same technologies. It is important to note that supporting such investments would create a “win-win” for the industry and governments as investments that reduce GHG emissions not only improve environmental performance but economic competitiveness too.

**WHAT GOVERNMENT MEASURES WOULD BEST HELP YOUR COMPANY REDUCE ITS CARBON FOOTPRINT AND REMAIN COMPETITIVE?**



Source: CME – 2022 Low Carbon Transition Survey.

## CANADIAN MANUFACTURERS ARE LEADING THE WAY TO A LOW CARBON FUTURE

Many of Canada's top industrial companies have made commitments to be net zero by 2050 and are already taking aggressive action. Below is merely a small selection of examples of specific actions and investments.

### NOVA Chemicals

NOVA Chemicals converted its Corunna, Ontario ethylene manufacturing facility to enable use of up to 100 per cent natural gas liquids feedstock. From 2010 to 2018, the feedstock conversion has resulted in a 33 per cent reduction in GHG emissions for the Manufacturing East facilities, and a 14 per cent reduction for the company. These changes also resulted in the reduction of sulfur dioxide (SO<sub>2</sub>) emissions by more the 60 per cent and nitrogen oxides (NO<sub>x</sub>) by more than 40 per cent.

### Ford of Canada

Ford of Canada's Oakville Assembly Complex is retooling its global hub for battery electric vehicle production. This \$1.8 billion outlay represents one of the most significant investments in the province's auto sector in a generation. The Oakville plant will be modernized with a flexible manufacturing system that will be able to accommodate multiple battery electric vehicle (BEV) models. It will also include the installation of a battery-pack assembly line.

### ArcelorMittal Dofasco

ArcelorMittal Dofasco (AMD) announced its intention for a \$1.765 billion investment in decarbonization technologies at its plant in Hamilton. The intended investments will reduce annual CO<sub>2</sub> emissions at ArcelorMittal's Hamilton, Ontario operations by around 3 MT by 2028, which represents about 60 per cent of its emissions. This means the Hamilton plant will transition away from the blast furnace-basic oxygen furnace steelmaking production route to the Direct Reduced Iron-Electric Arc Furnace production route. AMD will introduce new manufacturing processes that contribute to a considerable reduction of CO<sub>2</sub> emissions and deliver other positive environmental impacts including the elimination of emissions and flaring from cokemaking and ironmaking operations.

### Vale

Vale has committed to investing around US\$2 billion in renewable energy over the next ten years to support and bring solutions to the low carbon economy. The projects are oriented towards solutions that expand the use of electricity from renewable sources in operations, thus promoting energy management and energy efficiency practices and routines. These solutions are geared at creating an environment that encourages the adoption of efficient behaviours and solutions, stimulates the search for different technological solutions, aligns the business portfolio to the transition to a low carbon economy, and leverages new business opportunities.

### Cenovus

Cenovus has been piloting solvent co-injection technologies that have the potential to reduce the greenhouse gas (GHG) emissions of their oil sands operations. While solvent co-injection may sound like a new technology, Cenovus has been testing these techniques in their steam-assisted gravity drainage (SAGD) operations for more than 15 years.

### Rio Tinto

In 2020, Rio Tinto pledged to address their own emissions, and those of their value chain, with the ambition of reducing their absolute emissions by 15 per cent by 2030 and achieving net zero emissions across their operations by 2050. These objectives are supported by their commitment to spend \$1 billion on climate-related projects in Canada and abroad from 2020-24.

### SNC Lavalin

SNC Lavalin has developed the CANDU Small Modular Reactor (SMR), the only all-Canadian SMR design available today to help the Government of Canada reach its goal of net zero emissions by 2050. Built on proven Canadian technology, this quickly deployable 300 MW(e) reactor features simplified systems, fewer components, and a modular design. The result is low-cost, low carbon power in a compact layer with a high-capacity factor.

## **GE Canada**

GE Canada gas turbines have been operating with hydrogen fuel blends in a variety of industrial applications, including steel mills, refineries, and petrochemical plants. GE is a world leader in gas turbine fuel flexibility, including more than 75 gas turbines that have operated (or continue to) on fuels that contain hydrogen. This fleet has accumulated more than 6 million operating hours and over 450 terawatt-hours of power generation. It includes a group of 25 gas turbines that have operated on fuels with at least 50 per cent (by volume) hydrogen. These units have accumulated more than 1 million operating hours, giving GE a unique perspective on the challenges and opportunities of using hydrogen as a gas turbine fuel. GE is currently working to develop capability for 100 per cent hydrogen in their gas turbine technology by the end of the decade.

## **Maple Leaf Foods**

On November 7, 2021, Maple Leaf Foods celebrated their second anniversary as the first major carbon neutral food company in the world. Their company is carbon neutral by aggressively avoiding and reducing their GHG emissions and investing in high-impact environmental projects to neutralize their remaining and currently unavoidable emissions. Maple Leaf has neutralized all their Scope 1 and 2 emissions and a portion of their Scope 3 GHG emissions. The Scope 3 emissions in their offset program include supplier emissions arising from animal production and packaging equivalent with the product volumes of Maple Leaf brands that display their Carbon Zero logo.

## **Algoma Steel**

Since 1993, Algoma Steel has reduced CO<sub>2</sub> emissions by 54 per cent per tonne of shipped steel and the company continues to identify and implement opportunities to reduce their carbon footprint. In June 2009, Algoma commissioned a 70 MW combined heat and power cogeneration facility, fueled with cleaned by-product gases from their ironmaking and cokemaking operations. The facility generates both steam and power for the steelworks, reducing Algoma's reliance on the provincial power grid by 50 per cent on average and freeing up this capacity for the rest of the province. This facility offsets 1,259 tonnes of NO<sub>x</sub>, 2,391 tonnes of SO<sub>2</sub> and 539,616 tonnes of Greenhouse Gas (CO<sub>2</sub>) from the Ontario air shed previously emitted by the coal-fired facilities. In 2021, Algoma announced that it will invest \$700 million to move completely to net zero production by 2050.

## **Stellantis**

Stellantis helped ensure the future of its Ontario production plants in Windsor and Brampton with a \$3.6-billion investment announcement to retool its two facilities to produce electric vehicles as well as an R&D facility in Windsor. Electric vehicle and battery research and development has already begun, and new vehicle production will begin as early as 2025.

# A CANADIAN NET ZERO INDUSTRIAL STRATEGY

The global manufacturing sector is moving toward a net zero future, spurred on by rising pressures from society, governments, investors, and employees. While industries and governments around the world are setting an aggressive action plan of emissions reductions and economic growth through structured transformation, Canada's industrial net zero future is still uncertain. Clearly, there is tremendous opportunity for Canada to capitalize on these rapid changes. Although, as a country we have taken some important steps toward these objectives, much more work needs to be done, and it must be done urgently and in partnership with industry and all levels of government.

Although the Canadian government has developed a net zero strategy and is taking many steps to achieve its targets, we are missing a crucial piece of the puzzle: a focus that will effectively transition our industrial base to net zero without compromising this critical segment of our economy. In short, Canada needs a Net Zero Industrial Strategy that will not only enable us to meet our climate objectives, but also to drive investment, innovation, and growth in the manufacturing sector.

Building on the framework passed by CME's Board of Directors, the next section of this report focuses on three specific areas for action to create a Canadian Net Zero Industrial Strategy: supporting carbon emissions reduction and investment and commercialization of clean technologies; supporting the development of an SME net zero strategy; and improving Canada's business environment and economic competitiveness. Each of these sections include specific recommendations and actions that industry and governments must take together to ensure Canada's transition to net zero is successful. As the sector and government move along the path toward net zero, these recommendations will require further development and refinement based on real world experience. Given the changing nature of these realities, we also believe it is critical that the government establish a senior executive working group consisting of government and industrial leaders that regularly measure our progress against targets and adjusts plans, policies, supports and regulations accordingly.

## SUPPORTING INVESTMENT IN EMISSIONS REDUCTION AND COMMERCIALIZATION OF CLEAN TECHNOLOGIES

Government support programs for technology investment aimed at emission reductions and clean technology creation must be the top priority for action. Such programs would be similar to what many other countries are already doing. Based on actions from countries that are further along in the transition to net zero, as well as from confirmed government supports for industrial net zero projects in Canada to date, investment supports should cover roughly half of required investments. This 50 per cent target is a recognition that companies are making investments to reduce their carbon footprint, while the government is working in the public interest to not only help companies lower their emissions, but also to boost economic development, innovation, and prosperity.

Canada and its provinces have introduced some support programs or are in the process of developing them. In 2020, CME successfully advocated for the creation of the five-year \$3 billion Net Zero Accelerator Fund to support emission reduction investments at Canada's largest emitting industrial facilities. This fund was expanded and increased to \$8 billion in Budget 2021, was listed as a key ongoing action in Budget 2022, and has already led to multi-billion-dollar investments in some of Canada's largest industrial players, including in steel, energy, and automotive. In addition, the federal government has proposed the Tax Reduction for Zero-Emission Technology Manufacturing, which aims to support the production and commercialization of zero-emissions technologies by reducing by half the general corporate and small business income tax rates for businesses that manufacture zero-emission technologies.

While these measures are a great start, much more will need to be done by Canadian governments over the coming years if emissions targets are to be met and if the manufacturing sector is to remain globally competitive and grow. As detailed earlier, it is estimated that Canadian industry will need to invest at least \$180 billion in its operations over the next 30 years to achieve carbon neutrality. Given current announced investment support programs, current government support is equivalent to a little over 4 per cent of the total investment needed, far short of the 50 per cent target.

To drive change and support growth, it is recommended that the government introduce stable, long-term investment support programs totalling at least \$90 billion or \$3 billion per year on average until 2050. Given the pressing need to jump-start investment actions and to achieve longer-term economic and environmental benefits, these supports must be front-loaded with the bulk of the funds being made available over the next decade, with support gradually tapering as we move closer to 2050. Based on feedback from the sector, we believe that support would be most effective if it is designed in the following ways described below. Specifically, the government should:

- **Introduce a broad-based, direct, investment tax credit to encourage investment in carbon reduction processing technologies in all sizes of companies.** To ensure that the administrative burden is low, companies should not be required to apply for and qualify for these credits. Rather, it should be a tax-based program that would apply pre-tax and be available to all domestic manufacturers that meet a specific absolute or percentage reduction in GHG emissions.
- **Increase the Net Zero Accelerator (NZA) Fund for large emission reduction projects to at least \$5 billion per year until 2030.** CME advocated for the creation of this fund to help support carbon reduction investments at the largest emitting industrial sites in the country. The early investments and support from industry have been promising – spurring billions of dollars of investments that will improve processes and eliminate millions of tonnes of GHG emissions. However, given early strong interest from industry to access these funds, the size and scope of the NZA is clearly inadequate.
- **Introduce a corporate climate reinvestment program based on the amount of carbon taxes paid by an individual company.** This approach would permit government to hold onto a company's carbon taxes paid for a defined period (up to five years) and allow companies to access those funds to reinvest in carbon reduction technologies throughout the period. Any funds not used would be returned to industry more generally for carbon reduction investments.

## SUPPORTING AND ENCOURAGING CARBON OFFSETTING AND CARBON CAPTURE, USE AND STORAGE

CME was pleased to see the federal government propose a refundable investment tax credit in Budget 2022 for businesses that incur eligible CCUS expenses, starting in 2022.

While investing in new production technologies will take Canada far along the road to achieving its ambitious climate targets, carbon offsetting and carbon capture, use and storage are essential to reaching carbon neutrality. In particular, access to these programs and the development of these technologies will be needed to balance emissions that are challenging to avoid, some of which are generated in the industrial sector.

Many types of carbon offset programs are being developed and deployed across the world, including direct purchases of offset credits, clean energy production, reforestation or land reclamation projects, and projects that support carbon reduction efforts in developing countries. These actions can result in real, measurable GHG reductions, while helping to finance clean technology adoption and energy efficiency in the sector. As such, governments must continue to support and promote the use of carbon offsets or credits by companies to reach carbon neutrality. Doing so will encourage companies to participate in broader and deeper emissions reduction projects.

At the same time, Canadian governments must support carbon reductions through the development and deployment of carbon dioxide reduction (CDR) technologies such as CCUS, bioenergy with carbon capture and storage (BECCS), and direct air capture (DAC).

All these technologies are in the early stages of development and, as such, require supportive government measures to spur the investment required to deploy them at the necessary pace and scale to reduce emissions. Canada is well behind the US when it comes to implementing such policies. The US Section 45Q Tax Credit, which provides a tax credit on a per-ton basis for CO<sub>2</sub> that is sequestered, was first enacted in 2008. The incentives were broadened and increased in the 2018 tax reform bill. Today, the credit provides incentives equal to US\$50 per metric tonne for CO<sub>2</sub> stored permanently underground but not used commercially and US\$35 per tonne for CO<sub>2</sub> that is used in enhanced oil-recovery operations (EOR) and in other commercial uses. Numerous state governments complement these federal tax incentives with their own incentives.

As such, it is recommended that:

- **The federal government proceed with its proposal to introduce an investment tax credit for CCUS this year, designed in consultation with industry.**

## SUPPORTING THE DEVELOPMENT OF CLEAN TECHNOLOGY MANUFACTURING

While much of the focus is rightfully on helping companies invest in new carbon reduction technologies as a pathway to net zero, Canada must also not lose sight of the economic development opportunities that are emerging from the transition to net zero. CME believes that Canada is well positioned to become a world leader in clean technology production. Not only would this help in our transition to a low-carbon economy, but it would also boost our exports and economic prosperity. Global demand for such products is set to increase sharply in the coming years, with sales possibly reaching \$2.5 trillion as soon as 2022. With the right supportive framework, Canadian clean technology businesses will be in a prime position to grow and capture more than its fair share of this global demand. To create jobs and support the growth of clean technology manufacturing in Canada, CME recommends the following actions:

- **Broaden the scope of the Tax Reduction for Zero-Emission Technology Manufacturing to include low emission technologies and other zero-emissions technologies.** CME was pleased to see Budget 2021 and Budget 2022 include this proposed measure in which the general corporate and small business income tax rates would be reduced by half for businesses that manufacture zero-emissions technologies. That said, we believe that the current list of eligible technologies is too limited. Canada's manufacturers are also producing or planning to produce other technologies that will help lead to significant reductions in emissions and promote economic growth, although they may not be truly "zero-emission." The proposal should be amended to add the production of these technologies to the list of eligible activities. Other zero-emission technologies, such as nuclear and grid equipment should qualify as investments in these technologies will be a crucial step in meeting Canada's net zero goals.

- **The government proceed with its proposal to introduce a tax credit for investments in clean technology but aligned with industry feedback.** The Ministry of Finance plans to engage with experts to establish an investment tax credit of up to 30 per cent, focused on net-zero technologies, battery storage solutions, and clean hydrogen. While this is welcome news, it is imperative that the government work closely with industry over the coming months to ensure that this tax credit achieves its intended purpose.
- **Modernize government procurement to include local economic, societal, and environmental benefits.** Governments are major consumers of manufactured products and, through their vast purchasing power, can shift corporate behaviour. In this sense, government supply chains across the world are expected to move toward net zero emissions in the coming years, enabling them to leverage their procurement spending to drive green innovation. However, when Canadian governments make large purchases today, the main consideration is the initial purchase price. CME has long argued that government procurement should take more than price into consideration including local economic impacts such as encouraging innovation, commercialization, production, and creating jobs. Along the same lines, governments should also include a set of criteria that address GHG emissions reduction and broader environmental impacts, as proposed under the Treasury Board's Greening Government Strategy. Given Canada's high environmental standards, our products tend to have lower carbon footprints than those from many other countries. In other words, if Canada adopted a green procurement policy, domestic industry would be a prime beneficiary.

## SUPPORTING THE DEVELOPMENT OF AN SME NET ZERO TRANSITION

CME strongly believes an industrial SME transition strategy must be central to the efforts of industry and government. This will not only support SMEs directly, but also large domestic industrial companies that rely on local SMEs as supply chain partners.

While many of these Canadian SME manufacturers are independent, creating and selling their own consumer products, a sizable portion are tied into larger globally integrated supply chains, most notably in industries such as transportation equipment (vehicles, aerospace, transit, etc.), natural resources (forestry, oil and gas, mining, etc.), and food (agriculture, beverages, meat processing, etc.). As finished goods manufacturers commit to reducing their emissions, they will demand the same commitment from their suppliers, otherwise they will take their business elsewhere. Yet, as is clear from CME member surveys, Canadian SMEs are unprepared for this transition.

To date, government support to help Canadian SMEs in their transition to net zero has primarily focused on small retrofit programs (for things like LED lighting) and other energy efficiency improvements. This leaves a major gap in program support for SMEs, many of which are unaware of the transition getting underway and lack the financial resources and expertise to even get started.

CME is proposing to work directly with governments on the development and deployment of an Industrial SME Net Zero Transition Plan that would be a central pillar of Canada's overall strategy. We believe this strategy should include the following elements and be rolled out sequentially over the next several years:

- **Introduce a net zero educational awareness campaign.** Raising awareness is the first step in helping SMEs transition to a low carbon economy. Instruction should focus primarily on how reducing emissions can become a competitive advantage for SMEs by enabling them to maintain customers and win new ones. To encourage action, it should also highlight the threats and opportunities in the global marketplace for SMEs that fail to keep up with the transition to net zero. This awareness campaign should be launched as soon as possible and continue for as long as needed to encourage industrial SMEs to act on climate change.
- **Support net zero operational assessments and the development of strategic business plans.** After awareness is raised and companies decide to act, they will need effective guidance from leading experts. This operational assessment business plan would be coordinated to ensure consistency, while still being flexible enough to meet the unique needs of each company. The assessment would cover a wide

range of operational and strategic issues including, but not limited to, energy use, technology adoption, carbon offset opportunities, and supply chain risks. The information gained through the assessment will help SMEs understand what actions and investments they need to take, along with how these actions will benefit them. All this guidance and support would be underpinned by a SME Net Zero Assessment Tool. Government should offset a portion or all the direct company costs.

- **Connect SMEs to existing government supports.** Though currently limited in scope, governments across Canada have developed programs to help businesses transition to a low carbon economy. However, such programs are often too complex and administratively burdensome for SMEs to access. To address this issue, following the conclusion of the operational assessment, the transition plan would connect SMEs to existing government support programs and, where available, private-sector solutions.
- **Introduce a \$100 million annual direct investment support program.** Given the role that technology investments will play in moving companies to net zero, a direct investment support program like the Net Zero Accelerator Fund, but scaled to and targeted at SMEs, should be created. These types of programs work — CME successfully operated a program for the Ontario government that supported technology adoption aimed at emissions reductions. A \$100 million annual pan-Canadian program could follow a similar approach to meet the same objective of helping SMEs make emissions reduction investments.
- **Support the creation of a standardized SME net zero certification system.** As final product manufacturers continue to shift toward net zero, and as these companies demand the same from their supply chain partners, Canadian SMEs will be required to prove that they have set and implemented rigorous net zero targets. As well, governments will also require the same proof to be eligible to participate in green procurement projects. This suggests that there is a need for a Canadian Net Zero Certification Program. But rather than relying on others to dictate this standard and certification process, CME believes Canada should create its own globally aligned standard that fits our unique industrial realities. Where appropriate, this certification process could also be modified and applied to consumer branding and packaging for Canadian companies.

To ensure success, government should partner with private sector organizations that have broad experience and the network contacts to achieve the best possible outcomes for SMEs. In addition, given that most SMEs have yet to create their own emissions-reduction plans, let alone take any concrete action, these efforts must get underway as soon as possible.

## IMPROVING CANADA'S BUSINESS ENVIRONMENT AND COST COMPETITIVENESS

CME was pleased to see support for economic growth and innovation in Budget 2022, but these supports must be designed with industry consultation to determine needs and strategies. While supporting investment through direct and indirect measures is critical to the success of an industrial net zero strategy for Canada, that alone will not be sufficient to drive investment and growth in manufacturing. It is also essential that Canada governments consult with industry to focus on tackling many long-standing domestic cost and competitiveness challenges faced by Canadian industry, all of which together act as a significant drag on investment and growth and the ability of companies to competitively access foreign markets. Through consultation with industry, three key determinants of competitiveness emerged: regulatory policies, energy supply and pricing, and global alignment in approaches to carbon pricing.

## A BUSINESS-FRIENDLY REGULATORY ENVIRONMENT

To start, Canada's historical pattern of patchwork regulatory policies will not work as new regulations and expectations are placed on business. The government has even issued its own reports detailing the extent to which regulations increase business operating costs in Canada. For example, according to the *SME Regulatory Compliance Cost Report—September 2013*, produced by the Department of Innovation, Science and Economic Development (ISED), the total regulatory compliance cost (RCC) to Canadian SMEs was \$3,500 per business in 2011. In a separate ISED report, it was noted that:

*There is a negative association between a firm's regulatory burden and its productivity. A one per cent rise in RCC intensity is correlated with a 0.1 per cent decline in the firm's labour productivity. Regulatory burden also adversely impacts business performance and employment growth. For every one percentage point increase in the growth rate of RCC intensity, there is a 1.6 percentage point decline in a firm's revenue growth rate and a 0.5 percentage point decline in its employment growth rate.<sup>5</sup>*

The status quo of Canada's existing regulatory framework is untenable and will negatively impact the transition to net zero GHG emissions. Instead, industry needs a simple, flexible, harmonized, and consistent regulatory approach to climate change and the various policies that regulate industrial operations across the country. As such, it is recommended:

- **All environmental and climate policies and regulations take into account the results of non-partisan economic impact analyses, with regulatory changes only being made following full consultation with all affected parties.** Often economic impact assessments are done without effective consultation and are released after the regulations have been finalized. This leads to poor regulatory design and often unnecessary conflict with industry.
- **Regulatory design be focused on outcomes rather than processes.** Unfortunately, regulators often give more weight to processes rather than final outcomes. Ideally, industry should be given the flexibility to achieve regulatory compliance at the lowest cost possible.
- **Federal and provincial governments work together to ensure that climate policies and regulations are fully aligned and harmonized.** While this approach should apply in all situations, it is especially important in the case of environmental policies and regulations, given how many are the responsibility of the provinces. Examples of where alignment and harmonization are needed include clean energy development and electrification, CCUS, clean and low carbon fuel standards, the pricing of carbon through both the carbon levy and the output-based price component, critical mineral development, and air and water quality standards.

<sup>5</sup> Source: [https://www.ic.gc.ca/eic/site/pbri-iafp.nsf/eng/h\\_sx00156.html](https://www.ic.gc.ca/eic/site/pbri-iafp.nsf/eng/h_sx00156.html)

## INCREASING CLEAN ENERGY SUPPLY AND COST COMPETITIVENESS

Next to regulatory policies, one of the most significant challenges faced by Canadian industry in the transition to net zero will be energy supply and pricing. As mentioned earlier, the manufacturing sector faces increased operational costs of \$60 billion over the next 30 years, largely due to the increased costs of switching energy supplies from fossil fuels to cleaner alternatives. As such, Canadian industry needs access to a fast-growing, stable, and affordable supply of clean energy to power their operations. While Canada has made substantial progress in reducing emissions from power generation, much more will need to be done as manufacturing and the wider economy transitions to a low carbon future. In fact, it is estimated that Canada will need to roughly double clean energy generation capacity by 2050 to achieve carbon neutrality.

Energy is essential to the manufacturing sector. From operating machinery and equipment in the factory to the movement of goods at facilities and between suppliers and customers, the sector is fueled by the energy it uses. And, as mentioned above, energy use accounts for about 45 per cent of the sector's emissions.

The sector has worked hard over the past decade to clean the energy supply by switching from higher to lower carbon fuels and by also switching from fossil fuels to nuclear energy and renewables (hydro, wind, and solar). The truth is, despite the worldwide push to decarbonize the energy system, Canada and the world will still rely on energy from fossil fuels for at least the next couple of decades. This is because many sources of renewable energy are still works in progress, meaning they are not readily available, they are cost prohibitive, and they are unreliable because they depend on the weather to harness any energy.

Manufacturers must have access to a cost-competitive, stable, and a reliable energy supply to operate their facilities. As an example, a "brown-out," flicker, surge, or any minor disruption in power supply can cause manufacturers to cease operations, given that modern advanced manufacturing machinery and equipment is highly sensitive to power swings. When restarting stopped machinery and equipment, all equipment must be checked for damage to ensure safe operation, and every hour a plant is down can cause hundreds of thousands of dollars in lost production and revenue, and the accompanying production delays can negatively affect relations with customers.

Given these realities, governments should support the manufacturing sector during the transition to a cleaner energy supply by taking the following actions:

- **Ensure a stable supply of cost-effective energy, including low-carbon energy sources until carbon-free energy sources are reliably available.**
- **Significantly expand the availability of clean energy supply, including, but not limited to investments in nuclear and hydro-electric, as well as increasing intra-provincial transmission.**
- **Support development, use, and commercialization of alternative clean energy technologies** including batteries, hydrogen, and Small Modular Reactors (SMRs). These technologies will be needed to fuel vehicle fleets and supply stationary power to factories and other large facilities. While some work has been done in this area, Canada has been slow to develop its action plans and national frameworks. Government must take a much more aggressive approach.

Recently, one of the most discussed topics in this area has been a critical mineral strategy to not only extract the resources needed to decarbonize our economy, but also to leverage our natural resources to be a global powerhouse in advanced battery technologies. CME fully supports the creation of these strategies, but it encourages governments to speed the pace of their deployment to ensure we can capitalize on our natural assets. A major part of this strategy will involve improving regulatory regimes to allow quicker development of natural resources and to support the necessary creation of partnership between government, the mining industry, and potential users to share in the development costs.

Hydrogen also shows great promise for Canada both as a clean alternative energy source and as way to drive innovation and economic development. Indeed, the federal government's Hydrogen Strategy, announced in December 2020, strives to position Canada as a global industrial leader of clean renewable fuels. Along with being one of the top ten hydrogen producers in the world, Canada is also a world leader in creating modern advanced technologies leveraging this fuel source, which must be further developed to foster domestic manufacturing value-chains.

Similarly, Canada is at the forefront in the development of Small Modular Reactor (SMR) technology, which builds on our history as a world-class leader in nuclear power technologies. SMRs are smaller nuclear reactors that involve lower capital investment and modular designs to control costs. This technology could be a great energy solution for remote areas and large mining and manufacturing sites that have significant power demands.

As part of its efforts to foster growth in battery, hydrogen and SMR technology, CME is encouraging the government to take the following actions:

- **Establish clear and nationally consistent regulatory regimes, essential for the development and safe use of these new energy technologies.**
- **Establish a Next Generation Energy Innovation Fund to support the development of national demonstration projects.** This fund would provide long-term, annual support to develop clean energy technologies such as fusion, hydrogen, SMRs, and battery storage. This fund should support the development of commercial-scale reactors by leveraging existing electricity generation sites. This step would help determine a long-term approval “envelope” for these sites, which in turn would provide certainty to the investment community.
- **Provide direct financial incentives for companies to support the advancement of these technologies by being among the earliest adopters.** The incentive to promote early adoption would help de-risk the initial investment, as these companies will be “beta testing” these technologies to determine if they are beneficial for broader use in industry and society.
- **To support industrial transportation fleet modernization and the shift to renewable fuels, proceed with the proposal to launch a new purchase incentive program for medium- and heavy-duty ZEVs (MHDVs).** Governments have been focused on transiting Canada’s household vehicle fleet to zero-emission vehicles (ZEVs). While this would mark a significant step in our bid to achieve net zero emissions, these actions should not preclude additional actions to support the decarbonization of Canada’s industrial vehicle fleet. This includes vehicles used at production sites and on roads and highways to deliver goods and supplies to businesses and consumers. CME was pleased to see the government propose a new incentive program for MHDVs in the budget, but more will need to be done. In particular, governments must increase its support of both the development and the adoption by industry of alternative fuel vehicles, including trucks, forklifts and other heavy machinery – including the necessary charging infrastructure.

## IMPLEMENTING A BORDER CARBON ADJUSTMENT MECHANISM

As noted throughout this report, Canadian manufacturing is part of a globally integrated sector that manufactures and supplies products to consumers around the world. Given the proliferation of free trade agreements, along with the expansion of the World Trade Organization, companies can manufacture almost any good almost anywhere in the world and sell it in almost any market in the world. In other words, Canadian manufacturers compete at home and abroad against companies from every corner of the world. And while innovation can often differentiate products and provide a strategic advantage, often it is price that drives final consumer decisions, whether the consumer is an individual, government or business.

Canada's approach to carbon emissions reduction has been, and will continue to be, a mixture of program support, carbon pricing, and regulation. Putting a price on carbon and imposing new regulations will increase the cost of doing business and thus threatens to put Canadian companies at a competitive disadvantage. If climate policies in all countries were as stringent as Canada's, then competitive concerns would not exist. However, while most countries are acting or planning to act, including likely the US, the reality is that many competing jurisdictions have less stringent climate plans than what is being proposed for Canada.

To limit this competitive disadvantage, the government launched the federal Output-Based Pricing System (OBPS) in January 2019, a regulatory trading system for industry. The OBPS is designed to ensure there is a price incentive for industrial emitters to reduce their GHG emissions while, at the same time, maintaining competitiveness and protecting against carbon leakage. However, the OBPS generally only covers facilities that emit at least 50 kilotonnes (kt) of GHG emissions per year, with the possibility for smaller facilities (of 10kt and above) to opt in voluntarily.

As such, lower emitting facilities are subject to the price on carbon, which is scheduled to increase to \$170 per tonne by 2030. At the same time, facilities covered under the OBPS will have to contend with planned increases in the stringency of output-based standards over time, which are expected to begin in 2023. As such, if these companies cannot reduce emissions quickly enough to remain price competitive globally, they will be tempted to shift production (along with emissions)

to countries with laxer constraints on GHG emissions. In other words, the OBPS does not fully eliminate the risk of carbon leakage. This is a huge problem for two reasons. Not only does carbon leakage damage the Canadian economy, but it can also lead to an increase in global GHG emissions, thus damaging the environment too. As such, it is recommended:

- **The federal government implement an effective and administratively simple border carbon adjustment (BCA) mechanism** that is globally competitive, aligned with the United States, and includes both import charges and export rebates. A BCA can be a cost-effective way of reducing carbon leakage by protecting domestic industries at both home and abroad from cheaper foreign goods produced in countries with a lower or no price on carbon and less stringent environmental regulations.

That said, while the introduction of a BCA could be an important component of the move toward net zero, it must be introduced in a way that limits negative domestic economic impacts and supports value-added exports. The government should take the following steps and take the following factors into consideration as it considers whether to implement a BCA:

- Conduct a comprehensive cost-benefit analysis (CBA) in consultation with industry before making any final decisions on the design or implementation of a BCA mechanism;
- Ensure that the regulatory framework underlying a BCA is simple for companies to administer;
- Ensure that a BCA mechanism is WTO-compliant and fully aligned and harmonized with the United States and Canada's other key trading partners
- Maintain OBPS stringency at current levels while implementing complementary BCA mechanisms
- Include export rebates as part of a BCA mechanism;
- Provide supports and offsets to relieve competitive pressures of a BCA on downstream industries; and
- Use funds generated by the BCA to support carbon reduction emissions investments and regularly publish and update a list of funded projects.

# CONCLUSION

Canada has faced incredibly tumultuous times over the past two years, triggered by the public health crisis and economic fallout of the COVID-19 pandemic. While the coronavirus continues to present new challenges, the widespread deployment of vaccines and new antiviral treatments offer hope of a more normal life in the months ahead.

As the pandemic recedes, climate change and the transition to a low-carbon economy will move to the top of the policy agenda. Canadian manufacturers are committed to creating a clean and healthy environment for all, and many of Canada's top industrial companies have pledged to reach net zero emissions by 2050. However, this transition will be incredibly difficult and prohibitively expensive. It will only succeed with the right levels of investment and support from governments.

As highlighted in this report, CME estimates that the cost of taking the manufacturing sector to net zero by 2050 will consist of \$180 billion in investment costs and \$60 billion in operating costs. However, the report also highlighted the fact that Canada's manufacturing sector has struggled to attract investment in recent years. In other words, taking the industry to net zero will not be

achieved under business-as-usual trends. This points to the urgent need for policy reforms that strengthen the competitiveness of Canada's manufacturing sector. Simply put, Canada will need to improve its business environment if the government is to reach its ambitious dual goal of achieving deep domestic absolute emissions reductions, while at the same time growing the economy.

One of the strategic objectives of the federal government's recovery plan is to speed up the shift towards a low carbon economy. Given its economic significance, the manufacturing sector must be a central pillar of this plan. This is especially true given the fact that global demand for clean technology is increasing at an explosive rate, and Canadian firms are well positioned to tap into this growth. Therefore, putting the revival of manufacturing at the heart of Canada's post-COVID-19 recovery plan will not only enable us to meet our climate objectives, but it will also generate economic prosperity and good jobs for Canadians in all parts of the country. To seize this opportunity, and to build a more competitive, greener, innovative, inclusive, and resilient economy, the federal government must partner with manufacturers to implement a Canadian Net Zero Industrial Strategy.

# SUMMARY OF RECOMMENDATIONS

## SUPPORTING CARBON EMISSIONS REDUCTION AND INVESTMENT AND COMMERCIALIZATION OF CLEAN TECHNOLOGIES

- Introduce a broad-based, direct, investment tax credit to encourage investment in new technologies by all sizes of manufacturers and all emissions profiles.
- Increase the Net Zero Accelerator Fund for large emission reduction projects to at least \$5 billion per year until 2030.
- Create a corporate climate reinvestment fund based on the amount of carbon taxes paid by an individual company.
- Proceed with the proposal to introduce an investment tax credit for CCUS this year, thus leveling the playing field vis-à-vis the US.
- Broaden the scope of the proposed Tax Reduction for Zero-Emission Technology Manufacturing to include low emission technologies and other zero-emissions technologies.
- Proceed with the proposal to introduce a tax credit for investments in clean technology, aligned with industry feedback.
- Modernize government procurement to include local economic, societal, and environmental benefits.

## SUPPORTING THE DEVELOPMENT OF AN SME NET ZERO STRATEGY

- Introduce a net zero educational awareness campaign.
- Support SME net zero operational assessments and the development of strategic business plans.
- Connect SMEs to existing government supports.
- Introduce a \$100 million annual direct investment support program.
- Support the creation of a standardized SME net zero certification system.

## IMPROVING CANADA'S BUSINESS ENVIRONMENT AND ECONOMIC COMPETITIVENESS

- Ensure that regulations take into account non-partisan economic impact analyses with regulatory changes only being made following full consultation with industry.
- Ensure that regulations are outcomes-based so that they specify the desired result, rather than prescribing processes and actions.
- Ensure that federal and provincial government climate policies and regulations are aligned and harmonized.
- Maintain a stable supply of cost-effective energy, including low-carbon energy sources, until carbon-free energy sources are reliably available and cost competitive.
- Significantly expand the availability of clean energy supply.
- Support the development, use, and commercialization of alternative clean energy technologies.
- Support industrial transportation fleet modernization and the shift to renewable fuels.
- Implement an effective border carbon adjustment (BCA) mechanism that is globally competitive, aligned with the United States, and WTO-compliant.

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