



A National Strategy for Canadian Manufacturing in the Digital Age



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Manufacturing in a Digital World

Manufacturing is the heart of the Canadian economy. Whether it is the tools, equipment and machinery businesses use or the products we consume every day, we all rely on manufacturing to better our lives. There would be no services economy without manufactured goods to support it. There would be no resources sector without manufactured inputs to help produce those raw materials.

However, the world of manufacturing is transforming. If it was ever about making a product out of local raw materials and selling it to nearby customers, those days are long gone. The integration of advanced technologies — both hardware and software — into our production processes and the goods we make is rapidly changing the very definition of what it means to be a manufacturer. Technologies like 3-D printing, advanced robotics and the Internet of Things are disrupting established markets and supply chains. They are blurring the lines between goods-producing industries, technology companies and service providers. They are changing customer demands and expectations of the products they consume.

Four Industrial Revolutions

- **First Industrial Revolution (1780s):** Mechanized production by harnessing water and steam power.
- **Second Industrial Revolution (1870s):** Mass production through the use of electric power and division of labour.
- **Third Industrial Revolution (1960s):** Automated production through the use of electronics and information technology systems.
- **Fourth Industrial Revolution (present):** Cyber-physical production through the fusion of physical and digital operations.

This interconnection and fusion of the physical and digital worlds is known as the Fourth Industrial Revolution. At its core, this revolution is about harnessing knowledge and digital information to spark a dramatic leap forward in innovation, product development and process efficiency. It will fundamentally transform how we live and work.

For Canadian manufacturers and exporters, this revolution can be either a threat or an opportunity. Businesses that embrace advanced manufacturing technologies and analytics will enjoy dramatically lower production costs, quicker product development times, and the flexibility to create innovative new products to meet changing customer demands. Those that do not will find it ever more difficult to meet the quality, cost and operational requirements of their customers.

How we respond to this new reality will determine the future of manufacturing in Canada. To adapt successfully, Canadian manufacturers need to be at the forefront of innovation, technological adoption and product commercialization. Our manufacturing future does not lie in a bygone era of assembly-line workers performing monotonous, low-skill tasks. It lies at the intersection of design, research, automation, commercialization and production.

While businesses must lead the way when it comes to charting a new course for manufacturing in Canada, they cannot act alone. Governments, educational institutions, service-providers, business associations and others all have a role to play in fostering the conditions for success. By working together and coordinating their efforts, these groups can ensure a prosperous future for Canadian manufacturing in the digital age.

Some may argue that manufacturing is dead, and not worthy of such attention, but that attitude has wide-reaching and negative consequences for all Canadians. Simply put, manufacturing is responsible for roughly 30 per cent of all of Canada's economic activity. If manufacturing fails in Canada, the entire economy will fail with it. This reality has shown itself clearly in recent years; as manufacturing activity – output, jobs, exports – has stagnated, so too has Canada's economy as a whole.

Over the past decade, other countries have begun developing and implementing national strategies to shape the future of manufacturing in their respective jurisdictions. These strategies recognize two fundamental realities: the transformative global changes in manufacturing that are being driven by technology, customers and the overall business environment; and the importance of manufacturing to their national economies.

All of these strategies are centred on a core question: how can government, public and private institutions partner to leverage the changes in technology and demands of customers to drive growth in manufacturing and the economy at large?

Given the importance of manufacturing to Canada and the opportunities and challenges presented by the Fourth Industrial Revolution, Canada needs a national manufacturing strategy of its own. Many other countries have such strategies in place. Until now, Canada did not.

This is why Canadian Manufacturers & Exporters (CME) launched Industrie 2030. Through this year-long research and consultation process, CME and its strategic partners have developed a vision and a path forward for manufacturing in Canada – one that would see manufacturing output and value-added exports double by 2030.

This series of reports represents the end of the first step along this path. It is the result of extensive consultations with businesses and other stakeholders across the country. It identifies the risks, challenges and opportunities that manufacturers and exporters face in the modern world. More importantly, it includes concrete recommendations for action towards our goal of doubling manufacturing output and value-added exports.

However, this is still just the beginning. In the coming months and years, CME will continue to work with businesses, governments and other stakeholders to monitor progress towards achieving our 2030 goals. Course adjustments may be necessary, but the destination will remain the same: a new era of prosperity for manufacturing in Canada to the benefit of all Canadians.

About Industrie 2030

Industrie 2030 began with a bold question: What would it take to double manufacturing output and value-added exports from Canada by the year 2030?

While it was clear that any strategy to achieve that goal must have advanced manufacturing technologies and digitization at its centre, it was equally clear that the strategy must be focused specifically on business needs, concerns and opportunities. Governments, educators and other stakeholders all have a role to play in the success of manufacturing and exporting, but it is businesses themselves who have the most relevant insight and the most at stake.

For this reason, CME modeled the Industrie 2030 consultations after our successful Manufacturing 20/20 initiative. That 2004 exercise included in-person meetings, workshops and roundtables, and involved the participation of hundreds of leaders from across the country. These consultations prioritized business feedback, but also incorporated insight and perspectives from a wide range of stakeholders. The direction they provided directly or indirectly resulted in a number of significant policy changes to improve manufacturing competitiveness across the country.

The Industrie 2030 Consultation Process

Consultations were designed to solicit input, direction and recommendations on how to achieve our headline goal of producing and exporting twice as many manufactured goods in just 15 years. To aid in that process, CME published a discussion paper called *Roadmap to 2030: A path towards doubling Canadian manufacturing output and exports*. That paper made the case for why Canada needs a new manufacturing strategy for the digital age and identified a number of strategic outcomes that were necessary for Canadian manufacturing to prosper.

We then sought advice from Canada's manufacturing and exporting community, governments, experts, innovation leaders, and key support organizations for how to achieve those strategic outcomes.

Our consultations were comprised of two distinct elements and included over 1250 participants collectively through the in person and online elements, including:

- **Community Meetings:** 55 moderated discussions with groups of business leaders, 25 one-on-one meetings and 15 conference speeches. Meetings were held in every province, focusing on the issues, obstacles and opportunities facing manufacturers and exporters, as well as other steps that need to be taken if we are to achieve our goal of doubling manufacturing output and value-added exports by 2030. In total over 750 individuals participated in community consultations.
- **Online Survey:** CME's bi-annual *Management Issues Survey* of Canadian industry was leveraged to focus more closely on key Industrie 2030 issues. The survey questions were aligned with the in-person consultation discussions to add quantitative support to the qualitative feedback that was received. In this way, all industry leaders could make their voice heard, even if they were unable to participate directly in a roundtable discussion. In total, 553 business leaders completed the online survey.

The Industrie 2030 Strategic Plan

The feedback and insight provided by manufacturers in these consultations directly informed CME's strategic plan for how to achieve our goal of doubling manufacturing output and value-added exports by 2030.

First, there are specific business conditions that need to be in place for this goal to be achieved. Manufacturers cannot simply just produce twice as much as they did before. Rather, we must ensure Canadian businesses are able and willing to invest in their facilities, processes and products and they must find new customers in Canada and around the world to grow. To achieve this, they must be dynamic, profitable, productive, innovative and growing.

Dynamic companies are world-class, constantly innovating, and chasing new markets and customers. While many Canadian companies are dynamic, many others are simply standing still, content with their existing products and service offerings and their local markets. Many business leaders throughout our consultations described this as a typically Canadian conservative approach to business: develop a great innovative product that fits a niche local market; and invest only enough in the business to maintain current customer needs without over-reaching their existing base. All too often these companies stop growing, the original owners retire with no ability to pass their passion to the next generation, and the business is sold off, often to a foreign firm. This reality shows in many of Canada's statistics on manufacturing – the sector is largely comprised of small domestic firms with little in the way of global sales (especially outside of automotive). Again, while we do have many firms in many sectors of the economy that do not fit this mould, there are not enough. We need to focus on creating more dynamic Canada-based manufacturers that are globally oriented if we are to succeed in growing overall manufacturing activities.

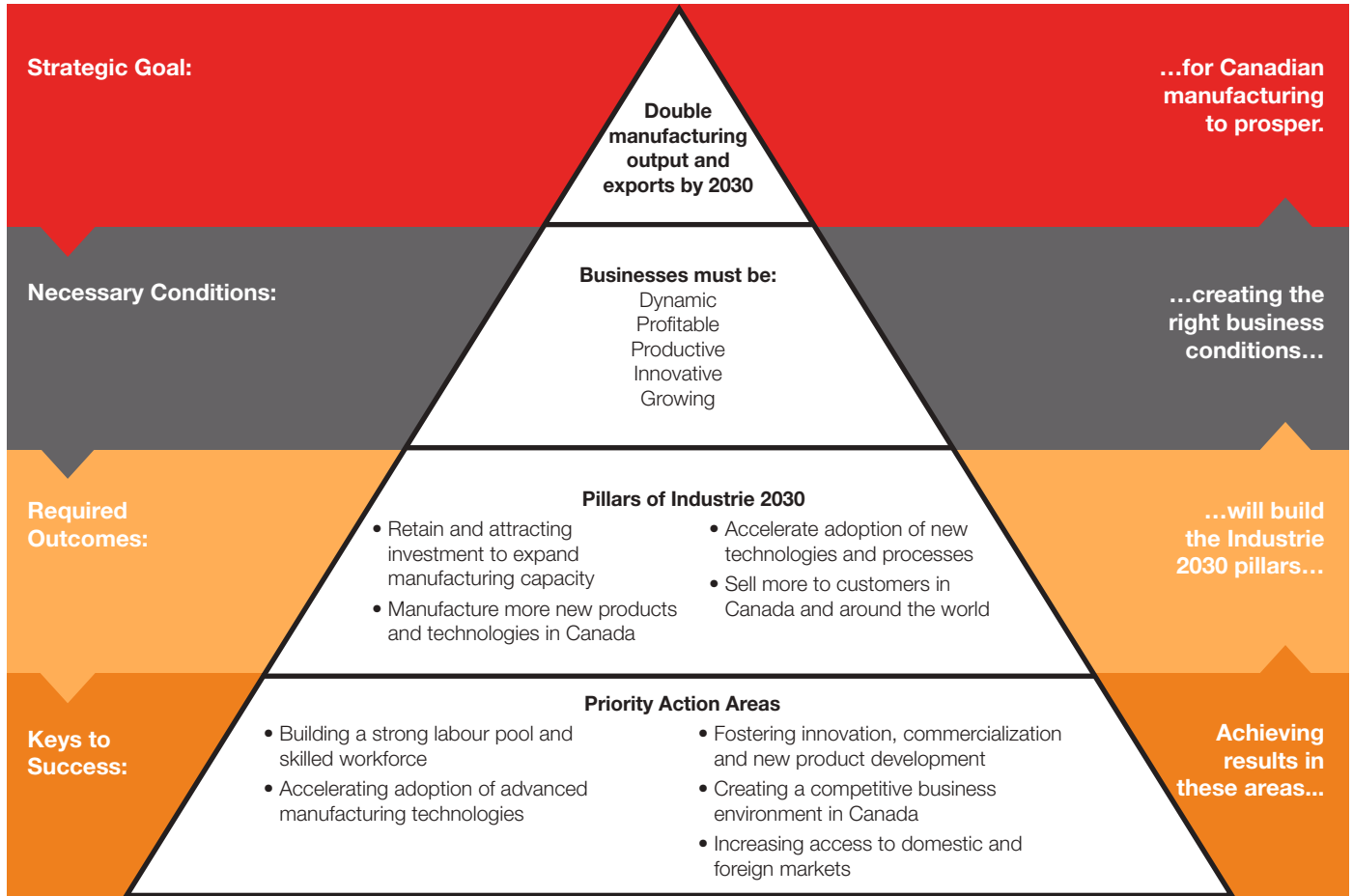
The first step toward a more dynamic manufacturing sector is profitability. Simply put, without profit, growth, innovation, expansion or investment in technologies is not possible. While this may seem overly simplified, it is important to state: profitability only occurs when business expenses are less than the revenue. Business revenue comes from the products and services that the company is creating and offering. This is almost entirely within the control of manufacturers themselves; they must drive change and improvements in this area.

However business expenses are much more complicated. While businesses do maintain control over some costs, like those of their suppliers, many costs are outside of their direct control, including a number of inputs, such as energy, as well as costs stemming from the tax and regulatory regime within which they operate. These all must be world-class if manufacturing is going to succeed and grow, and create great new products through innovative processes.

Productive manufacturers can compete with anyone in the world in any market. In modern advanced, globalized manufacturing, productivity stems from constant investment in processes, technology and the people to operate that equipment. Manufacturing technologies such as automation and computer-automated machines have been around for decades. New advanced technologies such as 3-D printers, smart robotics, and the Internet of Things are just a few of the technologies that are revolutionizing manufacturing processes and changing the types of products offered and the speed to market for those goods. These technologies also change the kind of workers businesses need, creating a much greater focus on computer and multi-dimensional skills.

While many Canadian manufacturers have, or are investing in, these technologies, many others are not. There are a variety of reasons why, including uncertainty over use and application, as well as access to financing. This is impacting overall productivity rates and our ability to compete globally.

THE INDUSTRIE 2030 STRATEGIC PLAN



Innovative businesses develop and commercialize new products and can adapt quickly to changing customer demands and foreign competition. They are early adopters of new technologies in their production and support networks and maintain a smart, well-trained workforce. Manufacturing is central to the success of Canada's overall innovation agenda. Many Canadian manufacturers across a wide range of sectors are leaders in both product and process innovation, at home and globally. At the same time, however, many companies are stuck in an innovation rut. As mentioned above, they are not investing sufficiently in new innovative processes, nor are they commercializing innovative products.

Growing businesses are successful businesses. Growth requires investment which, in turn, creates and sustains jobs, develops new products and expands production capacity. Large businesses can take advantage of economies of scale and lower per-unit production costs to enhance their competitiveness in Canadian and foreign markets. Structurally speaking, Canadian companies are smaller and have a more localized customer base than many of their competitors.

How do we ensure that Canadian manufacturers are dynamic, profitable, productive, innovative and growing? By addressing the four pillars of Industrie 2030 that were set out in our initial discussion paper, *Roadmap to 2030: A path towards doubling Canadian manufacturing output and exports*. Only through making meaningful progress in these four areas can manufacturing in Canada grow. The four Industrie 2030 pillars are:

- **Retain and attract investment to expand manufacturing capacity.** Expanding manufacturing capacity in Canada is critical. Over the past decade, manufacturing capacity has decreased significantly and existing facilities are running at or near peak capacity. Canada needs new capital investment from domestic and foreign sources that both increases the capacity of existing facilities and adds new capacity as well.
- **Manufacture more products and technologies in Canada.** Developing, commercializing and manufacturing new products in Canada leads to new investment and new opportunities to service customers around the world. Canada has a strong history of developing and commercializing new innovative products, but we must accelerate these processes to expand demand for Canadian-made products.
- **Accelerate adoption of new technologies and processes.** The adoption of new advanced manufacturing technologies can dramatically improve operational efficiency and flexibility while reducing production costs, and improving environmental performance. In this way, new technologies are critical to improving the competitiveness of Canadian manufacturing. They create new opportunities to manufacture more products in Canada and sell them to the world.
- **Sell more to customers in Canada and around the world.** Canadian companies must expand their customer bases both in traditional markets and beyond. The development of innovative products will accelerate market demand, as will the opening of new markets around the world through free and fair trade liberalization agreements. In addition, Canada must be better at recognizing the value of goods “made in Canada” and promote and celebrate those products that are designed, engineered and manufactured right here.

The purpose of the Industrie 2030 process was to identify the programming and policy requirements needed to accomplish these four goals. Through our extensive cross-country consultations, five keys to success were identified:

- 1. Building a strong labour pool and skilled workforce;**
- 2. Accelerating adoption of advanced manufacturing technologies**
- 3. Creating a competitive business environment in Canada;**
- 4. Fostering innovation, commercialization and new product development**
- 5. Increasing access to domestic and foreign markets**

Taking decisive and effective action in these five areas is the foundation of the Industrie 2030 strategy. Stemming from our extensive consultations and survey results, CME identified a number of key issues, themes and recommendations for action within each priority area. An overview of these recommendations can be found in the Industrie 2030 summary paper *2016 Management Issues Survey* which are supported by forthcoming detailed reports for each priority area.

Addressing these issues through meaningful programming and policy action will build the four pillars of Industrie 2030. These, in turn, will create the business conditions that are needed if Canada is to double manufacturing output and value-added exports by 2030.

Next Steps

The National Manufacturing Summit in Ottawa on October 18 and 19, 2016 and the release of this series of reports marks the conclusion of the first phase of Industrie 2030. We have set a goal of doubling manufacturing output and value-added exports by 2030. We have solicited input and have developed recommendations to help us achieve that goal.

It is now time to put words into action. CME has no interest in simply producing a large paper destined to sit, unread, gathering dust on a few shelves. These reports are intended to be a blueprint for action.

In the coming months and years, CME will be working with its partners to implement the recommendations contained in these reports. We will create industry working groups to tackle the priority areas for action and the recommendations and strategies. We will work with our partners in government and the supporting service sectors to achieve these goals. Make no mistake, this will not happen overnight. It will be a sustained focus for our organization, partners and members that will lead to us reaching our goals that will require additional research and consultations, developing new programs, focusing our advocacy efforts, creating new partnerships and improving existing ones.

As such, Industrie 2030 is a living strategy. We have developed a series of performance measures to help us gauge progress towards meeting our 2030 goals. If progress is not being made, our priorities and recommendations will evolve accordingly.

Ensuring success in the process towards our ultimate objectives will be based on the direct input and support of Canadian industry and the large support network that helps sustain and grow this most important business sector. CME and our partner organizations look forward to continuing this process to establish a new era of prosperity for Canadian manufacturers and exporters across the country.

Together we can manufacture change.

Who We Are

About Canadian Manufacturers & Exporters

Since 1871, we have made a difference for Canada's manufacturing and exporting communities. Fighting for their future. Saving them money. Helping them grow.

The association directly represents more than 2,500 leading companies nationwide. More than 85 per cent of CME's members are small and medium-sized enterprises. As Canada's leading business network, CME, through various initiatives including the establishment 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 network accounts for an estimated 82 per cent of total manufacturing production and 90 per cent of Canada's exports.

cme-mec.ca

About the Canadian Manufacturing Coalition

The Canadian Manufacturing Coalition is comprised of more than 50 major industry groups, united by a common vision for a world-class manufacturing sector in Canada.

The Coalition speaks with one voice on priority issues affecting manufacturers, and what must be done to ensure all Canadians continue to enjoy economic growth, high-value outputs and high-paying jobs. The Canadian Manufacturing Coalition's member organizations represent roughly 100,000 companies through their collective networks.

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