



Sectoral Profile

Fabricated Metal Product Manufacturing

Ontario

2018-2020



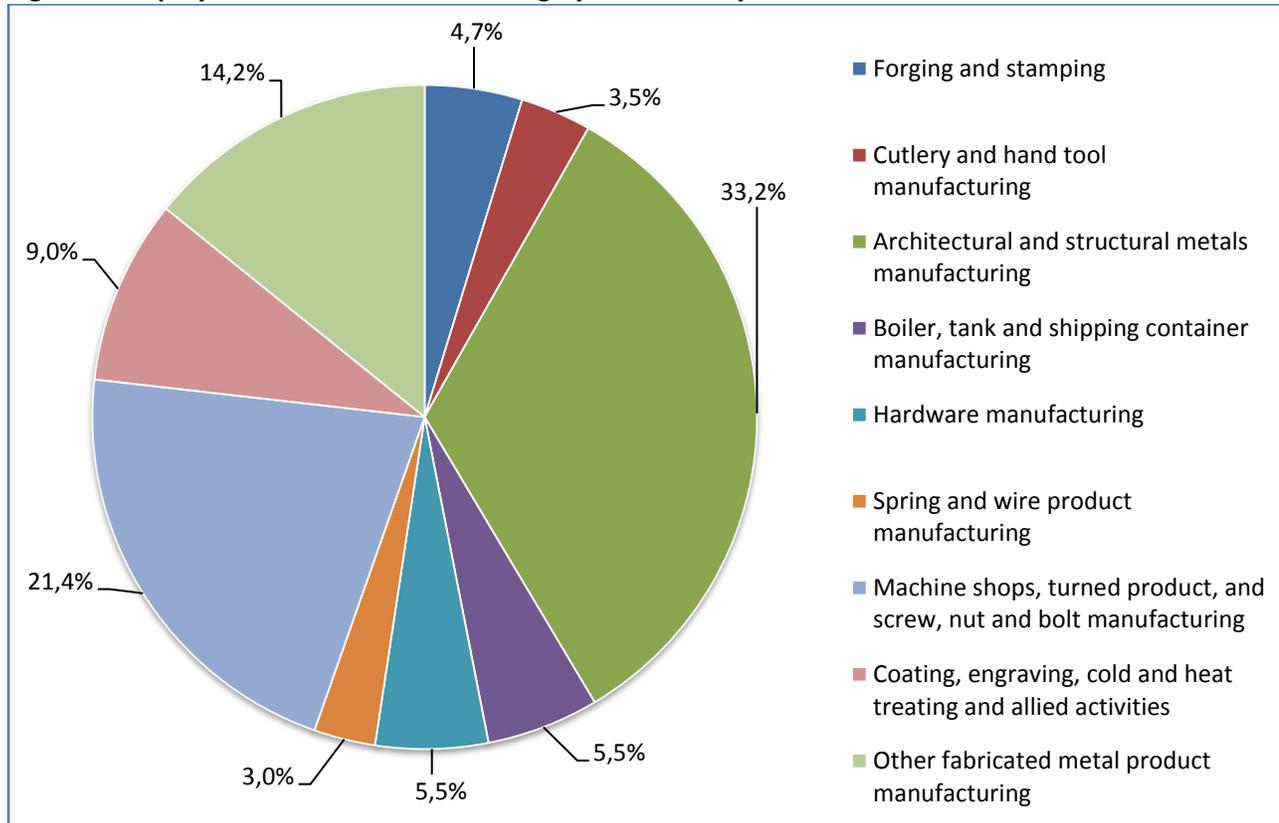
Sectoral Profiles provide an overview of recent labour market developments and outlooks for some of the key industries in various regions of the country

FABRICATED METAL PRODUCT MANUFACTURING FORGES AHEAD IN ONTARIO

- Steady construction activity and stronger manufacturing output will support the production of fabricated metal goods
- The development of lightweight materials, additive manufacturing, and technological advancements in a variety of industries will create opportunities for high-valued metal goods
- Steel and aluminum tariffs may affect input prices for fabricated metal producers
- There is a need for skilled workers in manufacturing-related trades such as machining and metal forming
- Labour market conditions should be rather stable for the fabricated metal product manufacturing industry over the 2018 to 2020 period

Ontario is the top producer of fabricated metal goods in Canada.¹ It is home to close to 42.0% of all fabricated metal manufacturers in the country, which includes most of the large industry players.² The province employed close to 43.0% of Canada's labour force in fabricated metal product (FMP) manufacturing in 2017.³ This industry is broken down into nine groups based on the type of goods made. Architectural and structural metals manufacturing, and machine shops, turned product, and screw, nut and bolt fabrication employed over one-half of the industry's workforce in Ontario (See Figure 1).⁴ Meanwhile, spring and wire product manufacturing, and cutlery and hand tool production have the fewest number of employees. In 2017, FMP manufacturing made up 6.9% of the manufacturing industry's total gross domestic product in the province.⁵

FMP manufacturing is a core part of Ontario's industrial base. It is the third biggest employer across the manufacturing industry after motor vehicle and parts, and food processing.⁶ Fabricated metal producers supply a wide range of industries as well as households. The vast majority of companies in the FMP manufacturing industry have fewer than 100 employees in the province.⁷ Except for the larger producers, many businesses focus on a limited range of goods. This allows smaller manufacturers to compete in the landscape to serve specialized needs across various industries. Some of the key end users for fabricated metal goods include construction, numerous areas of manufacturing such as motor vehicle and aerospace, machinery and electrical equipment, metal and food processing, and oil and gas extraction.⁸

Figure 1: Employment in FMP Manufacturing by Sub-Industry in Ontario in 2017

Note: Total may not sum to 100.0 per cent because of rounding

Source: Statistics Canada

Sector Outlook: Employment should remain Steady in Fabricated Metal Product Manufacturing

The FMP manufacturing industry should see positive labour market conditions overall in Ontario over the 2018 to 2020 period. Employment in FMP manufacturing stood at just over 65,200 in Ontario in 2017.⁹ Employment in this industry has been rather stable since 2009 and conditions remain strong into 2018.¹⁰ Job growth took place in all of the larger sub-industries such as architectural and structural metals, machine shops, turned product, and screw, nut and bolt fabrication, and other fabricated metal product manufacturing during this period. This helped balance declines in some of the smaller areas such as boiler, tank and shipping container manufacturing, hardware production, and forging and stamping.

Some of the main factors that will influence future employment growth in the industry include:

- Labour supply and the shift towards a higher-skilled workforce
- Economic growth and demand from local industries
- Success in the global trade environment and foreign competition
- Future opportunities in new fields as well as material substitution

Fabricated Metal Production moves to Higher Skilled Labour

Companies in FMP manufacturing now require higher-skilled labour to meet the shift towards advanced manufacturing practices. Manufacturers now use more computer-controlled machinery to produce goods and

custom products. As a result, workers often require knowledge of numerical tools, robotics, and manufacturing software such as computer-aided design (CAD) and computer-aided manufacturing (CAM). There is also a need for micro-welding techniques in some occupations. Industry reports suggest that companies currently face challenges to recruit workers especially in manufacturing-related trades in machining and metal forming. The industry's workforce is aging, which has put more pressure on companies to hire more workers. Results from a recent survey by the Ontario Skilled Trades Alliance suggest that 41.0% of companies would increase hiring if qualified candidates were available.¹¹ Access to highly skilled labour is crucial for FMP manufacturers going forward as the industry focuses on specialized goods.

Some of the larger manufacturing-related trades in the industry include:

- Machinist and machining and tooling inspectors (NOC 7231)
- Tool and die makers (NOC 7232)
- Sheet metal workers (NOC 7233)
- Structural metal and platework fabricators and fitters (NOC 7235)
- Welders and related machine operators (NOC 7237)
- Construction millwrights and industrial mechanics (NOC 7311)

Outside of the trades, some of the main occupations in the industry include:

- Metalworking and forging machine operators (NOC 9416)
- Machining tool operators (NOC 9417)
- Labourers in metal fabrication (NOC 9612)

Increased Economic activity in Ontario will keep the Demand for Fabricated Metal Products Steady

Most of the demand for fabricated metal products comes from the domestic market, especially the construction and other manufacturing industries. Sales in the FMP manufacturing industry increased in the province by 2.3% to \$15.6B in 2017 and are on track to exceed this figure in 2018.¹² Sales increased or remained relatively steady in most of the sub-industries in 2017. One factor that may weigh on the industry though are steel and aluminum tariffs imposed by the United States and countermeasures taken by Canada as metal fabricators may face higher input costs.

High Levels of Construction activity will maintain Demand for Metal Goods

The construction industry is one of the largest buyers of fabricated metal products.¹³ Some of the staple items include concrete reinforcement bars, structural and sheet metal, framed windows and doors, fasteners, hand tools, and industrial valves and pipes. Non-residential building and engineering construction is the main driver of demand as opposed to residential building.¹⁴ Strong levels of non-residential construction in the province will encourage production in the FMP manufacturing industry over the forecast period. This will be particularly important for architectural and structural metals manufacturers, and machine shops, turned product, and screw, nut and bolt fabricators. Significant investments in public infrastructure will increase the construction of roads and bridges, transit lines, water and sewer systems, power transmission networks, and healthcare and public facilities.¹⁵ The start of large-scale nuclear refurbishment projects will also raise orders for items such as boilers, valves and structural metal parts. While residential construction may moderate into 2019, ongoing development of high-rise buildings in urban centres like the Greater Toronto Area will further provide work in FMP manufacturing.¹⁶

Stable Manufacturing Output will support Fabricated Metal Production

Steady activity in the manufacturing industry overall will increase the need for fabricated metal goods to maintain production and fulfill orders. The majority of manufacturing industries were operating at more than 75.0% capacity in September 2018, with a handful closer to the 90.0% mark in Canada.¹⁷ The Markit Canada Manufacturing Purchasing Managers' Index (PMI) continues to stay in expansion mode with optimistic business sentiment heading into 2019.¹⁸ The estimated monthly value of new orders received in FMP manufacturing rose between 2016 and 2017 and will likely rise again in 2018.¹⁹ Similarly, the estimated monthly value of unfilled orders increased further in 2017 to raise the backlog of work for Canadian fabricated metal producers.²⁰ Based on the current pace, unfilled orders are currently on track to increase again in 2018. Fabricated metal products feed throughout the manufacturing supply chain with some items passing through multiple downstream markets for use in goods production, professional and technical services, as well as household consumption.

Across the manufacturing industry, the largest demand for fabricated metal goods comes from motor vehicle and parts production.²¹ The province has a vast automotive industry that spans across much of southern Ontario and supplies markets throughout the continent. This creates ongoing demand for a range of automotive products such as fasteners, moulds and castings, produced at machine shops, forging and stamping plants, and other allied and fabrication facilities. Some of these goods are used directly in motor vehicle assembly while others head to parts suppliers to create final goods or intermediate parts for further refining. The automotive industry has performed rather well as of late on the heels of higher motor vehicle sales and investment announcements to retool and expand operations. However, the planned closure of the General Motors of Canada Limited Oshawa Assembly Plant could weigh on the supply chain, including metal fabricators that supply the plant.

Machinery and equipment (M&E) manufacturing is another large user of fabricated metal goods.²² The FMP manufacturing industry should benefit from higher orders for machinery as businesses add production capacity and upgrade equipment.²³ Capital expenditures on M&E rose by 4.8% to \$29.9B in the province in 2017 based on preliminary estimates.²⁴ Capital intentions for 2018 suggest that private and public spending on M&E will rise even further to more than \$31.3B. This should help boost demand for fabricated metal parts that feed into various pieces of machinery used across the economy.

The closely related primary metal manufacturing industry is a substantial end market for FMP manufacturers.²⁵ Despite favourable demand from some of the larger end users of primary metals such as steel and aluminum, tariffs on these items may affect producers and cut into profits. Elsewhere in manufacturing, the backlog of orders in aerospace production, generally positive conditions in food and wood product manufacturing, and greater demand for high-value electrical devices may support orders for some fabricated metal producers.

Improved Conditions in Resource-based Industries may lead to new Work

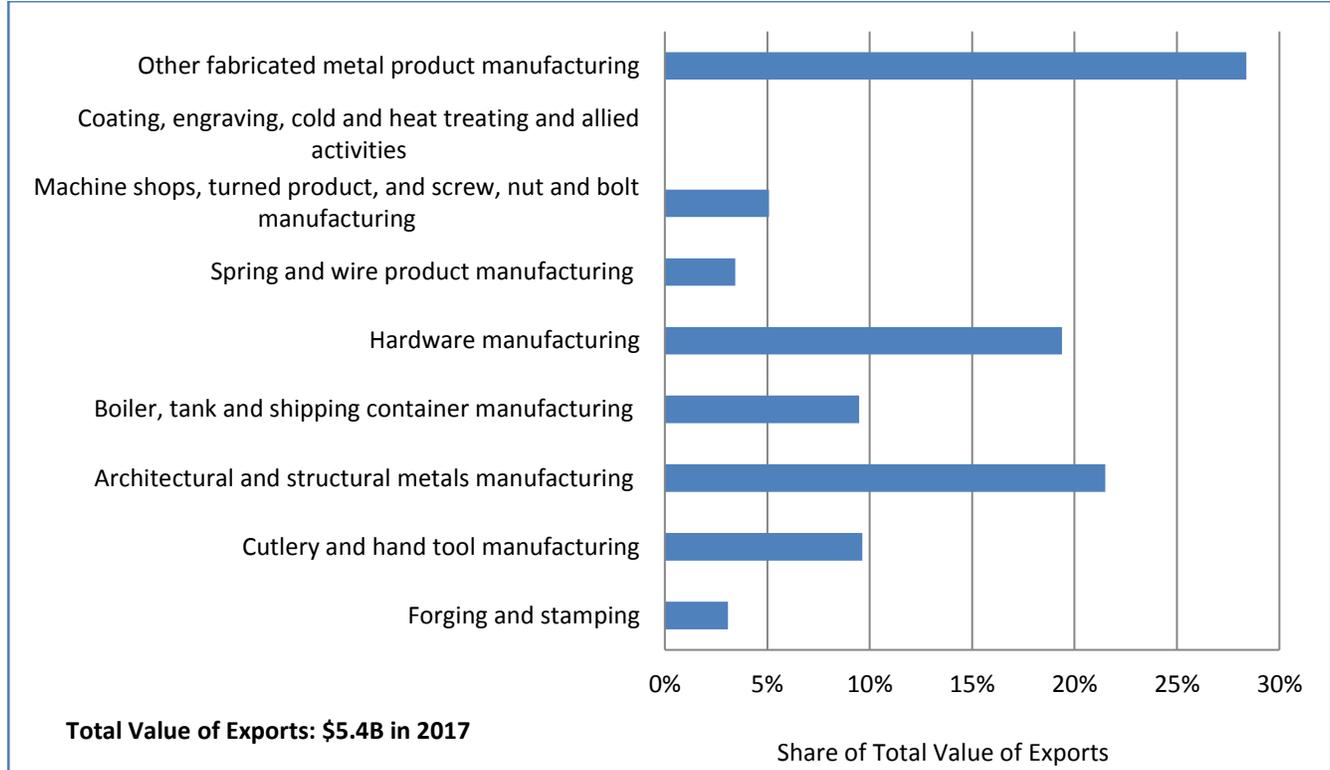
Several FMP manufacturers in Ontario make goods for resource-based industries such as oil and gas extraction and mining. Conditions in western Canada's oil patch remain somewhat subdued but the anticipated start of some large projects²⁶ could kick-start demand for fabricated metal goods.²⁷ Ontario is a key part of the metallic and non-metallic mining base in Canada.²⁸ Lower prices for base metals over the past few years have curbed exploration and investment activity but the outlook appears to be brightening. Improved spending along with a few mining projects moving forward in northern Ontario may raise the need for related goods such as chutes, plates, tanks, and railing systems.

Fabricated Metal Producers see Positive Global Demand though Trade Tariffs Linger

Although the FMP manufacturing industry mainly supplies the domestic market, exports are an important contributor to the industry’s overall success. The total value of fabricated metal products exported from Ontario has increased each year since 2012 to reach almost \$5.4B in 2017 (See Figure 2).²⁹ The FMP manufacturing industry exported slightly less than 35.0% of all goods produced in Ontario.³⁰ This figure has grown over the past several years, which may indicate that exports are becoming a bigger part of the industry’s market. The bulk of exports go to the United States with 86.7% of the total value of shipments sent south of the border in 2017.³¹ Fabricated metal producers should benefit from solid construction activity and sustained economic growth in the United States³² along with the lower CAD/USD exchange rate. Ontario’s FMP manufacturers are expanding into emerging regions such as Mexico as well. The value of shipments to Mexico grew by 147.0% between 2013 and 2017. This growth may continue as Mexico expands its industrial base and relies more on fabricated goods such as hardware, spring and wire products.

One area that has seen a sharp rise in the value of exports over the past few years is architectural and structural metals manufacturing.³³ The total value of exports from this sub-industry more than doubled between 2013 and 2017. This jump may stem from heightened activity in the United States construction industry and growth into developing markets such as India. The value of exports from the other fabricated metal product manufacturing sub-industry has also shown strong growth during this period led by gains in the American export market. On the import side, the total value of imported fabricated metal products to Ontario has trended upwards over the past decade but has stabilized since 2015. Most of the imported goods come from the United States, but the value of imported fabricated metal products from China has grown over the past few years. This may be partly from the broader shift in lower-valued manufacturing away from Canada to lower cost regions.

Figure 2: Share of Total Value of Exports by FMP Manufacturing Sub-Industry in Ontario in 2017



Source: Government of Canada, Trade Data

Changes to the Trade Landscape

Tariffs imposed by the United States on certain steel and aluminum imports from Canada and countermeasures on American exports have pushed up the price of steel and aluminum.³⁴ Although the FMP manufacturing industry continues to perform rather well as demand remains solid, steel and aluminum are some of the largest inputs used across the industry.³⁵ These tariffs could cut into profits as fabricators share some of the added costs with buyers or it could hinder total demand in the long term.³⁶ Some industry stakeholders are hopeful that the tariffs will subside as all three-member nations' move forward with the recently signed Canada-United States-Mexico Agreement (CUSMA). Despite the tariffs, CUSMA should continue to support the flow of goods such as motor vehicles, between Canada and the United States and provide access to the expanding Mexican market.

Meanwhile, the Comprehensive Economic and Trade Agreement (CETA) and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) may open new doors to European and Asian markets. CETA will eliminate the majority of European Union tariffs on fabricated metals and on machinery and equipment.³⁷ This may allow FMP manufacturers to better access developed industrial markets as well as find avenues to ship goods to expanding or emerging areas. Meanwhile, CPTPP will eliminate tariffs on certain industrial goods. This could potentially expand opportunities for fabricated metal producers to supply these downstream markets.³⁸ The conditions on tariff reductions vary between member nations and products.³⁹

New Areas of Growth and Potential Hurdles for Fabricated Metal Producers

Fabricated metal producers will find opportunities for high performance goods with the move to more advanced manufacturing in Ontario. Changing industry standards and cost saving measures have led manufacturers, particularly in the automotive and aerospace industries, to seek out new lightweight materials. The industry may further find avenues in developing areas such as optomechanics, biomedicine, and fields of information technology. Additive manufacturing is also a growing area that has the potential to produce lighter and stronger parts at a lower price.⁴⁰

Although the FMP manufacturing industry should see steady customer demand over the next few years, the move to plastics, ceramics, and carbon fibre components could temper conditions in some of the sub-industries over the long run.⁴¹ One solution that can help manufacturers deal with technological changes is to diversify its client base. Many fabricators have grown from serving one core industry to several markets with unique products to be able to withstand economic pressures and turns with greater ease.

Snapshot of Ontario's Fabricated Metal Product Manufacturing Centres

The FMP manufacturing industry plays a major role in the manufacturing heartland in southern Ontario. Many plants are in close distance to transportation, machinery, and primary metal manufacturing hubs. Labour market activity created by FMP manufacturers helps drive local economies through direct and indirect linkages across the supply chain.

The **Ottawa** economic region employed about 3.3% of the FMP manufacturing industry workforce in Ontario.⁴² Many of the fabricated metal producers are in larger urban centres such as Ottawa and Cornwall. There were a few announcements in the local industry. Laframboise Group announced that it would consolidate its operations into a larger facility in Cornwall in 2019 at a cost of \$20M.⁴³ Olsonfab announced that it would add a second facility in Cornwall, creating 13 jobs.⁴⁴ Equispheres Inc. will also expand operations at its metal powders

manufacturing plant, which will increase the company's workforce to more than 200 employees over the next five years.⁴⁵

Though the **Muskoka–Kawartha** economic region employed less than 2.0% of the FMP manufacturing industry workforce in Ontario, the region is home to several small and medium-sized producers.⁴⁶ Many of the fabricated metal producers are in larger urban centres such as Peterborough and Cobourg. Some positive news came out of the region recently. Havelock Metal Co. announced that it would build a new industrial facility in Peterborough that will employ about 40 workers.⁴⁷ Cameco Fuel Manufacturing Inc. received a \$62M contract to manufacture nuclear reactor components for Bruce Power's Major Component Replacement (MCR) Project.⁴⁸ Kawartha Metals Corporation announced that it would move into a larger facility in Peterborough in the spring of 2018 with plans to hire additional staff.⁴⁹

The **Toronto** economic region employed about 40.1% of the FMP manufacturing industry workforce in Ontario.⁵⁰ Toronto is home to several of the biggest and varied fabricated metal producers in Ontario. For instance, more than one-half of all hardware, metal can, stamping, and cutlery and hand tool producers are in the region. There were a number of announcements in the local industry. Dishon Limited announced that it would invest \$13.8M to expand operations at its Vaughan plant, creating about 54 jobs primarily in engineering, programming and machining by 2022.⁵¹ LaserNett Inc. expanded operations at its Mississauga facility with new equipment.⁵² Burloak Technologies also announced that it would establish an Additive Manufacturing Center of Excellence in Oakville.⁵³

The **Kitchener–Waterloo–Barrie** economic region employed about 17.8% of the FMP manufacturing industry workforce in Ontario.⁵⁴ Kitchener–Waterloo–Barrie is a hub for FMP manufacturing and has many of the biggest producers in Ontario. The region has a high share of machine shops, which may stem from its large automotive base. A fair number of the bigger FMP manufacturers are in Cambridge, Guelph, Penetanguishene, and Kitchener. News were mixed in the local industry. Kuntz Electroplating Inc. (KEI) announced that it would invest \$10.8M into a new production line that will lead to about 25 jobs by the summer of 2020.⁵⁵ Weber Manufacturing Technologies Inc. is in the midst of an \$8M upgrade to its facility in Miland, which will lead to additional jobs.⁵⁶ MiTek Canada, Inc. announced that it would build an expanded production facility in Bradford that will create 40 to 50 jobs when the site opens in 2019.⁵⁷ Meanwhile, Innovative Steam Technologies closed its boiler repair and steam generator manufacturing plant in Cambridge in May 2018, affecting about 76 employees.⁵⁸

The **Hamilton–Niagara Peninsula** region employed about 14.2% of the FMP manufacturing industry workforce in Ontario.⁵⁹ Hamilton–Niagara has several major fabricators given its deep steelmaking industry. The region also has a fair number of companies in metal valve manufacturing. One large announcement in the local industry was that Samuel, Son & Co. announced that it would invest \$18M to expand its Brantford automotive metal processing centre by the end of 2018.⁶⁰

The **London** economic region employed about 7.2% of the FMP manufacturing industry workforce in Ontario.⁶¹ The region has a higher share of machine shops most likely due to the area's automotive industry. There were a few announcements in the local industry. Marwood Metal Fabrication Limited announced that it would invest in hot stamping and press technologies at its Tillsonburg plant, creating 70 jobs.⁶² Bend All Automotive Incorporated announced that it would invest over \$13M in new technology at its London plant, creating 30 jobs when the project is complete by the end of 2020.⁶³ The National Research Council of Canada also opened its Manufacturing and Automotive Innovation Hub in London that will include work in areas such as additive manufacturing of metal parts.⁶⁴

The **Windsor–Sarnia** region employed about 7.8% of the FMP manufacturing industry workforce in Ontario.⁶⁵ Windsor–Sarnia is home to a few of the province's biggest fabricated metal producers. A large number of FMP

manufacturers in the region are machine shops, likely because of the area's strong footing in motor vehicle and machinery manufacturing. Many of the companies are in the larger urban centres such as Windsor, Sarnia, St. Thomas and Chatham.

The **Stratford-Bruce Peninsula** economic region employed about 3.3% of the FMP manufacturing industry workforce in Ontario.⁶⁶ The region has a fair number of producers involved in miscellaneous fabricated metal product manufacturing. Most of the fabricated metal producers are in the Stratford Census Metropolitan Area.

The **Northeast** economic region employed about 2.3% of the FMP manufacturing industry workforce in Ontario.⁶⁷ Many of the fabricated metal producers are in larger urban centres such as Sudbury, North Bay, and Sault Ste. Marie. There were a couple of expansions announced in the local industry. H&M Enterprise announced that it would purchase new equipment and expand operations at its metal fabrication, machining and welding plant in North Bay.⁶⁸ Specialty Alloys and Stainless Ltd. will also expand its custom metal fabrication plant in Lively.⁶⁹

Prospects in the Fabricated Metal Product Manufacturing Industry remain Positive in Ontario

The FMP manufacturing industry has a vital role in our economy. The industry produces goods that feed into several markets such as construction, manufacturing, and natural resources. Higher demand from the construction industry and increased manufacturing output will boost the need for fabricated metal products in the near term. Opportunities may exist for companies to expand into the global environment, build expertise in advanced manufacturing, and create innovative products for emerging industries. The industry will also have to contend with greater foreign competition, and shifts to other materials and concepts such as 3D printing. As FMP manufacturing moves forward, the industry will continue to be a key building block of the province's overall success.

Note: In preparing this document, the authors have taken care to provide clients with labour market information that is timely and accurate at the time of publication. Since labour market conditions are dynamic, some of the information presented here may have changed since this document was published. Users are encouraged to also refer to other sources for additional information on the local economy and labour market. Information contained in this document does not necessarily reflect official policies of Employment and Social Development Canada.

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¹ Statistics Canada. Table 16-10-0117-01 Principal statistics for manufacturing industries, by North American Industry Classification System (NAICS) (x 1,000)

² Industry Canada. Establishments by employment type and province/territory (2016). Retrieved from <https://www.ic.gc.ca/app/scr/app/cis/businesses-entreprises/332>

³ Statistics Canada. Table 14-10-0202-01 Employment by industry, annual

⁴ Ibid.

- ⁵ Statistics Canada. Table 36-10-0402-01 Gross domestic product (GDP) at basic prices, by industry, provinces and territories (x 1,000,000)
- ⁶ Statistics Canada. Table 14-10-0202-01 Employment by industry, annual
- ⁷ Industry Canada. Establishments by employment type and province/territory (2016). Retrieved from <https://www.ic.gc.ca/app/scr/app/cis/businesses-entreprises/332>
- ⁸ Statistics Canada. Table 36-10-0001-01 Symmetric input-output tables, detail level (x 1,000)
- ⁹ Statistics Canada. Table 14-10-0202-01 Employment by industry, annual
- ¹⁰ Statistics Canada. Labour Force Survey
- ¹¹ Efron, S. (2018, February 05). Factories are desperate for skilled workers. *The Globe and Mail*. Retrieved from <https://www.theglobeandmail.com/report-on-business/small-business/talent/canadian-factories-say-shortage-of-skilled-workers-is-hurting-growth/article37848454/>
- ¹² Statistics Canada. Table 16-10-0048-01 Manufacturing sales by industry and province, monthly (dollars unless otherwise noted) (x 1,000)
- ¹³ Statistics Canada. Table 36-10-0001-01 Symmetric input-output tables, detail level (x 1,000)
- ¹⁴ Ibid.
- ¹⁵ BuildForce Canada. Construction & Maintenance Looking Forward, Ontario Highlights 2018-2027. Retrieved from http://www.buildforce.ca/en/system/files/products/2018_ON_Constr_Maint_Looking_Forward.pdf
- ¹⁶ Canada Mortgage and Housing Corporation. (Fall 2018). Housing Market Outlook – Toronto (GTA). Retrieved from <https://www.cmhc-schl.gc.ca/en/data-and-research/publications-and-reports/housing-market-outlook-highlights>
- ¹⁷ Statistics Canada. Table 16-10-0012-01 Manufacturing capacity utilization rates, by North American Industry Classification System
- ¹⁸ IHS Markit. (2018, November 01). IHS MARKIT CANADA MANUFACTURING PMI®. Retrieved from <https://www.markiteconomics.com/Public/Home/PressRelease/12e1a2d94e8f47e695cd896db59aa83c>
- ¹⁹ Statistics Canada. Table 16-10-0047-01 Manufacturers' sales, inventories, orders and inventory to sales ratios, by industry (dollars unless otherwise noted) (x 1,000)
- ²⁰ Ibid.
- ²¹ Statistics Canada. Table 36-10-0001-01 Symmetric input-output tables, detail level (x 1,000)
- ²² Ibid.
- ²³ Statistics Canada. Table 16-10-0047-01 Manufacturers' sales, inventories, orders and inventory to sales ratios, by industry (dollars unless otherwise noted) (Data available from January 2018 to September 2018)
- ²⁴ Statistics Canada. Table 34-10-0035-01 Capital and repair expenditures, non-residential tangible assets, by industry and geography (x 1,000,000)
- ²⁵ Statistics Canada. Table 36-10-0001-01 Symmetric input-output tables, detail level (x 1,000)
- ²⁶ ConstructConnect Project Research. (2018, July 13). 20 Major Upcoming Alberta and British Columbia Construction Projects – Canada – July 2018. *ConstructConnect, Inc.* Retrieved from <https://www.constructconnect.com/blog/economy/20-major-upcoming-alberta-british-columbia-construction-projects-canada-july-2018/>
- ²⁷ Statistics Canada. Table 386-0003 - Interprovincial and international trade flows, basic prices, summary level, annual (dollars), CANSIM (database).
- ²⁸ Ontario Mining Association. Facts & Figures. Retrieved from http://www.oma.on.ca/en/ontariomining/facts_figures.asp
- ²⁹ Industry Canada. Trade Data Online.
- ³⁰ Ibid.
- ³¹ Ibid.
- ³² ABC. (2018, December 05). ABC predicts construction sector will remain strong in 2019. *Building Design and Construction*. Retrieved from <https://www.bdcnetwork.com/abc-predicts-construction-sector-will-remain-strong-2019>
- ³³ Industry Canada. Trade Data Online.
- ³⁴ Department of Finance. Notice of intent to impose countermeasures action against the United States in response to tariffs on Canadian steel and aluminum products. Retrieved from <https://www.fin.gc.ca/activty/consult/cacsap-cmpcaa-eng.asp>
- ³⁵ McNeil, M. (2018, September 20). Surging steel prices protecting steelmakers from Trump tariffs. *The Hamilton Spectator*. Retrieved from <https://www.thespec.com/news-story/8912683-surging-steel-prices-protecting-steelmakers-from-trump-tariffs/>
- ³⁶ Rocha, R. (2018, July 02). These are the places most vulnerable to U.S. tariffs. *CBC News*. Retrieved from <https://www.cbc.ca/news/canada/tariff-impact-canadian-cities-1.4728226>

- ³⁷ Government of Canada. Canada-European Union Comprehensive Economic and Trade Agreement – Benefits for Ontario. Retrieved from <https://www.international.gc.ca/trade-commerce/assets/pdfs/agreements-accords/on-ontario-eng.pdf>
- ³⁸ Government of Canada. Benefits of the CPTPP for Ontario. Retrieved from <http://international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/cptpp-ptpgp/regions/ON.aspx?lang=eng>
- ³⁹ Government of Canada. What does the CPTPP mean for industrial goods? Retrieved from <http://international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/cptpp-ptpgp/sectors-secteurs/industrial-industriels.aspx?lang=eng>
- ⁴⁰ Samuel Son & Co., Limited. (2018, May 29). Burloak Technologies to Open State-of-the-Art Additive Manufacturing Center. *CNW Group Ltd.* Retrieved from <https://www.newswire.ca/news-releases/burloak-technologies-to-open-state-of-the-art-additive-manufacturing-center-683935491.html>
- ⁴¹ Canadian Metalworking. (2018, September 17). Metal stamping market to reach \$289.2 billion by 2023. *Canadian Metalworking Canadian Fabricating & Welding*. Retrieved from <https://www.canadianmetalworking.com/news/fabricating/metal-stamping-market-to-reach-289-2-billion-by-2023>
- ⁴² Statistics Canada. 2016 Census
- ⁴³ Peters, B. (2018, December 12). Laframboise Group Expands Cornwall Operations. *Choose Cornwall*. Retrieved from <https://choosecornwall.ca/news-english/laframboise-group-expands-cornwall-operations/>
- ⁴⁴ Peters, B. (2018, December 06). EODP Leverages \$14 million in Investment. *Choose Cornwall*. Retrieved from <https://choosecornwall.ca/news-english/eodp-leverages-14-million-in-investment/>
- ⁴⁵ Jones, D. (2018, June 25). Ottawa’s Equispheres receives \$5 million investment from Lockheed Martin. *Design Engineering*. Retrieved from <https://www.design-engineering.com/lookheed-martin-investment-1004030286/>
- ⁴⁶ 2016 Census
- ⁴⁷ Kovach J. (2017, December 20). New facility for Havelock Metal under construction in Peterborough industrial park. *Peterborough Examiner*. Retrieved from <https://www.thepeterboroughexaminer.com/news-story/8174545-new-facility-for-havelock-metal-under-construction-in-peterborough-industrial-park/>
- ⁴⁸ Longwell, K. (2018, April 25). Cameco in Cobourg makes a \$62 million deal. *Northumberland News*. Retrieved from <https://www.northumberlandnews.com/news-story/8566236-cameco-in-cobourg-makes-a-62-million-deal/>
- ⁴⁹ Kawartha Metals Corp. (2018, January 17). Kawartha Metals to be anchor tenant at new Peterborough Industrial Centre. *Kawartha Metals Corp.* Retrieved from <https://kawarthametals.com/kawartha-metals-to-be-anchor-tenant-at-new-peterborough-industrial-centre/>
- ⁵⁰ Statistics Canada. 2016 Census
- ⁵¹ Government of Ontario. (2018, April 17). Ontario Supporting Over 100 Advanced Manufacturing Jobs in Vaughan. *Ontario Newsroom*. Retrieved from <https://news.ontario.ca/medg/en/2018/04/ontario-supporting-over-100-advanced-manufacturing-jobs-in-vaughan.html>
- ⁵² Canadian Metalworking. (2018, April 25). LaserNett expands laser cutting capabilities. *Canadian Metalworking Canadian Fabricating & Welding*. Retrieved from <https://www.canadianmetalworking.com/news/fabricating/lasernet-expands-laser-cutting-capabilities>
- ⁵³ Canadian Metalworking. (2018, May 29). Burloak Technologies to launch AM Center of Excellence in Oakville, ON. *Canadian Metalworking Canadian Fabricating & Welding*. Retrieved from <https://www.canadianmetalworking.com/news/management/burloak-additive-excellence>
- ⁵⁴ Statistics Canada. 2016 Census
- ⁵⁵ Pender, T. (2017, August 24). Kuntz boosting productivity with \$10.8M project. *Waterloo Region Record*. Retrieved from <https://www.therecord.com/news-story/7519799-kuntz-boosting-productivity-with-10-8m-project/>
- ⁵⁶ Mendler A. (2017, November 14). Midland’s Weber Manufacturing investing \$8 million to expand production capacity. *Simcoe.com*. Retrieved from <https://www.simcoe.com/news-story/7868543-midland-s-weber-manufacturing-investing-8-million-to-expand-production-capacity/>
- ⁵⁷ Finney L. (2017, December 06). MiTek Canada planning new facility in Bradford, bringing new jobs. *Bradford West Gwillimbury Topic*. Retrieved from <https://www.simcoe.com/news-story/7982224-mitek-canada-planning-new-facility-in-bradford-bringing-new-jobs/>
- ⁵⁸ Jackson, J. (2018, May 17). Innovative Steam shuts down. *Waterloo Region Record*. Retrieved from <https://www.therecord.com/news-story/8617005-innovative-steam-shuts-down/>
- ⁵⁹ Statistics Canada. 2016 Census

- ⁶⁰ CRM Staff. (2018, June 05). Samuel invests \$18 million in automotive metals processing facility in Brantford, Ontario. *Collisionrepairmag.com*. Retrieved from <https://www.collisionrepairmag.com/news/20658-samuel-invests-18-million-in-automotive-metals-processing-facility-in-brantford-ontario>
- ⁶¹ Statistics Canada. 2016 Census
- ⁶² CTV News. (2017, March 02). Ottawa investing over \$5M in two Tillsonburg plants. *CTV News*. Retrieved from <https://london.ctvnews.ca/ottawa-investing-over-5m-in-two-tillsonburg-plants-1.3306633>
- ⁶³ Government of Ontario. (2018, March 09). Ontario Supporting Over 870 Jobs in Ayr and Woodstock. *Ontario Newsroom*. Retrieved from <https://news.ontario.ca/sb/en/2018/03/ontario-supporting-over-870-jobs-in-ayr-and-woodstock.html>
- ⁶⁴ Canadian Metalworking. (2018, December 05). NRC launches Manufacturing and Automotive Innovation Hub in London, Ont. *Canadian Metalworking Canadian Fabricating & Welding*. Retrieved from <https://www.canadianmetalworking.com/news/management/nrc-launches-manufacturing-and-automotive-innovation-hub-in-london-ont->
- ⁶⁵ Statistics Canada. 2016 Census
- ⁶⁶ Statistics Canada. 2016 Census
- ⁶⁷ Ibid.
- ⁶⁸ Young, G. (2018, November 07). Expanding local business unable to find workers. *North Bay Nugget*. Retrieved from <https://www.nugget.ca/news/local-news/expanding-local-business-unable-to-find-workers>
- ⁶⁹ Government of Ontario. (2018, March 15). Ontario Supporting 675 Jobs in Essex County *Ontario Newsroom*. Retrieved from <https://news.ontario.ca/sb/en/2018/03/ontario-supporting-more-than-670-jobs-in-essex-county.html>