Employment and Social Development Canada | Emploi et Développement social Canada

Service Canada

Canadian Occupational Projection System 2022 Projections

Industrial Summaries 2022-2031

NOTE: The current industrial COPS projections were completed in spring 2022, i.e. before expectations about the risk of an eventual recession in 2023. However, the focus of the COPS projections is on long-term trends in industrial and occupational labour markets, not on short-term developments. These long-term trends are not expected to be affected markedly by an eventual recession as its impacts are expected to be temporary and of short duration.

COPS 2022: Industrial Summaries

The occupational projections prepared under the Canadian Occupational Projection System (COPS) require the production of a macroeconomic scenario and an industrial scenario to determine future long-term trends in overall employment growth and in the distribution of employment across industries and occupations.

The future long-term trends in Canada's economic growth and industrial structure will be heavily influenced by demographic developments, namely population aging and higher immigration. Such demographic changes are projected to have a major influence in the long-term evolution of Canada's labour force, employment, potential output, final domestic demand and, ultimately, the industrial composition of the economy. Technological progress is an additional factor influencing the industrial and occupational structure of the economy, as its impact on productivity is affecting labour demand by industry and occupation, while transforming the task and skill composition of employment across the economy. The transition towards a green economy and net zero emissions is also expected to influence the industrial outlook in terms of production and employment as well as the composition of labour demand in the future.

This report presents the industrial scenario that underlies the COPS 2022 projections. This scenario was developed in collaboration with Deloitte, based on information available as of Spring 2022. It provides a comprehensive analysis of the historical and future trends for each of the 42 industries defined by COPS. Those 42 industries cover the entire economy and are based on the North American Industry Classification System (NAICS), version 2017.

Each of the 42 industrial summaries includes the following information:

- Definition and characteristics of the industry;
- Key stylized facts and main statistics;
- Key occupations related to the industry (see text box);
- Historical performance in terms of production, employment and productivity;
- Domestic and external drivers of demand for the goods or services produced by the industry (links with the macroeconomic indicators, including major components of aggregate demand, such as consumption, investment and exports);
- Challenges and opportunities, including impacts of new technologies;
- A 10-year outlook for real GDP, employment and productivity.

More particularly, the purpose of the industrial summaries is to provide answer to three specific questions for each industry:

1. What have been the positive and negative drivers of growth in real GDP, employment and productivity over the past ten years?

2. What will be the positive and negative drivers of growth in real GDP, employment and productivity over the next ten years?

3. For what reasons growth in real GDP, employment and productivity is expected to accelerate (or decelerate) over the next 10 years relative to the previous 10 years?

KEY OCCUPATIONS BY INDUSTRY

Key occupations by industry are based on the National Occupation Classification (NOC), version 2016 (4-digit). They consist of the largest occupations within the industry and/or occupations that are highly concentrated in the industry (without necessarily being large occupations).

More specifically, they are occupations accounting for the largest shares of total employment in the industry (see example 1) and/or occupations for which the industry accounts for a significant share of total employment in the occupation (see example 2).

- Example 1: Carpenters (NOC 7271) and Electricians (NOC 7241) account respectively for 8% and 7% of total employment in the construction industry.
- Example 2: The construction industry employs 92% of Bricklayers (NOC 7281) although this occupation accounts for less than 1% of total employment in the industry.

The list of key occupations is generally sorted by the employment size of the occupation in the industry (decreasing order). Key occupations may be listed in more than one industry.

Key occupations generally exclude administrative and support occupations that can be fund in all or most industries such as:

- Administrative officers (NOC 1221)
- Administrative assistants (NOC 1241)
- Janitors, caretakers and building superintendents (NOC 6733)
- Accounting technicians and bookkeepers (NOC 1311)
- Receptionists (NOC 1414)
- General office support workers (NOC 1411)
- Accounting and related clerks (NOC 1431)
- Human resources professionals (NOC 1121)
- Payroll administrators (1432)
- Human resources managers (NOC 0112)
- Any other administrative or support occupations not related to the core activities of the industry.

Such occupations are excluded from the key occupations by industry, unless they represent an important component of core activities. For example, all businesses require accountants, but only accounting firms employ accountants as part of their core activities.

For practical purposes, key occupations also exclude occupations with a relatively small number of workers in the industry. The objective is to provide the readers with the most relevant occupations by industry and not to cover all occupations across the economy.

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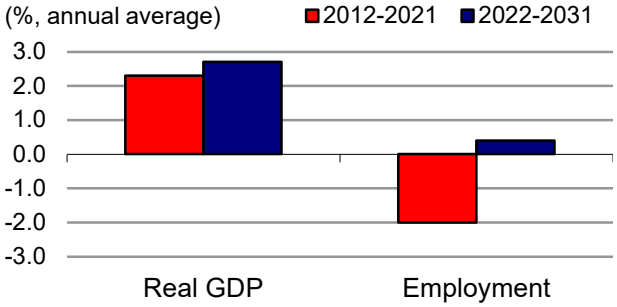
Agriculture (NAICS 1111-1119; 1121-1129; 1151-1152)

The industry is composed of three segments: crop production (77% of total production in 2021); animal production (16%); and related support activities (6%). Crop production includes oilseeds, grains, fruits, vegetables, plants, vines and cannabis. Animal production is the process of raising cattle, hog, poultry and other animals for generating meat, egg and dairy products. It also includes aquaculture and apiculture. Examples of related support activities are harvesting, fertilizing and sterilizing services, and any services related to raising livestock, including companion animals. Crop production is highly export-oriented, while animal production is mostly domestic-oriented. The industry employed a total of 251,800 workers in 2021, with 46% in crop production and 44% in animal production. Employment is largely concentrated in Ontario (27%), Quebec (22%), Alberta (14%) and Saskatchewan (11%). The workforce is characterized by a high proportion of men (68%) and self-employed (52%). Key occupations (4-digit NOC) include:

Managers in agriculture (0821)
General farm workers (8431)
Agriculture service contractors, farm supervisors and specialized livestock workers (8252)
Nursery and greenhouse workers (8432)
Harvesting labourers (8611)
Managers in horticulture (0822)
Aquaculture and marine harvest labourers (8613)
Contractors and supervisors, landscaping, grounds maintenance and horticulture services (8255)
Transport truck drivers (7511)
Managers in aquaculture (0823)

Real GDP and Employment Growth Rates in Agriculture



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

The agriculture industry is very sensitive to weather conditions, fluctuations in global demand and commodity prices, as well as economic activity in food processing and food services. At the national level, real GDP in the industry grew steadily over the period 2012-2020, driven by additional growth in domestic and foreign demand. On the supply side, innovations in biotechnology increased crop yields, while investments in advanced automation reduced production costs. The cannabis segment has led output growth since it was legalized for recreational use in 2018, growing at an annual average rate of 25%, nearly doubling its share in agricultural production from 15% in 2018 to 29% in 2021. The COVID-19 pandemic had a significant impact on the industry as producers were forced to respond quickly to new disruptions like labour shortages, increased health and safety regulations, market fluctuations, supply chain delays, the reduced capacity and closures of meat processing plants, and the shutdown of the food services industry. Despite these obstacles, the agriculture industry outperformed the Canadian economy in 2020, with output growing by 4.5%. However, severe droughts in Western Canada and flooding in British Columbia reduced crop yields for grain products in 2021, leading to a sharp decline in output and employment. The resulting pace of growth in the overall industry's real GDP averaged 2.3% annually over the period 2012-2021. As key aspects of farming, such as seeding, crop surveillance and ecosystem management, were increasingly automated, employment in agriculture declined almost continuously during the same period, down by 2.0% annually. Consequently, productivity gains accounted for all the growth in

output over the past decade. Productivity growth has been driven by a number of factors, including increased farm size, expanded prevalence of genetically modified crops, a jump in the use of pesticide and fertilizer, as well as the introduction of productivity enhancing machinery and equipment such as robotic milking machines, automated feeding systems, and advanced environmental control systems for cannabis production. Farmers are also increasingly employing drones to monitor crops, automated technologies for pest management, and data-intensive applications for optimal seeding and fertilization. The acceleration of automatization over the past several years has made agriculture the fastest growing industry in Canada in terms of productivity, which rose at an average annual rate of 4.3% from 2012 to 2021.

Real GDP in agriculture is projected to keep growing at a solid pace over the next decade, especially in the short term, as production recovers from the sharp decline recorded in 2021 and returns to pre-drought levels. After surging to record highs in 2021 due to lower world production and strong demand, prices are expected to remain elevated, as the Russia-Ukraine conflict is set to weight on already tight global agricultural production. Over the longer term, population growth in Canada will continue to support domestic demand while robust global demand will continue to maintain high prices and support exports, although prices should remain subject to high volatility due to unpredictable crop production and fluctuations in input costs (such as energy and fertilizers). With a large share of production destined to foreign markets, additional growth in global population, rising per capita income in developing and emerging economies, and greater trade liberalization will continue to drive demand. In the past several years, the Government of Canada negotiated new trade agreements and improved market access. For example, the Canada-European Union Comprehensive Economic and Trade Agreement (CETA) reduced the tariffs on many agriculture products destined to the EU market, but also offered better access to segments of the Canadian industry that are protected under supply management, increasing foreign competition on the domestic market. Other potential drivers of long-term growth prospects include increased use of biofuels and the impacts of climate change. Biofuels are a promising alternative to fossil fuels, but the lack of clarity in future policy that is necessary to define future market demand is expected to restrain growth in this segment. Finally, while continued disruption resulting from climate change can have a negative impact on production, it can also have a positive impact through an extension of the growing season. On the domestic front, the pace of growth in cannabis production is expected to slow to more sustainable levels as this segment matures, although it should continue to outpace growth in the agriculture industry as a whole.

Overall, real GDP growth in the industry is projected to average 2.7% annually for the period 2022-2031. This slight acceleration in output growth from the last decade is expected to lead to a modest rebound in employment, although additional gains in productivity will continue to restrain job creation. As a result, employment growth is expected to average a modest 0.4% annually over the projection period, leaving the number of agriculture workers below its pre-pandemic level of 2019. Higher international market integration and labour recruitment difficulties will continue to put pressure on Canadian farmers to be cost-effective through innovative technologies such as biometric sensors to examine livestock, self-learning milking machines, and driverless tractors guided by geo-positioning satellite devices. However, since much of the mechanization process and adoption of output-enhancing technologies have taken place over the past decade, productivity growth is not expected to be as robust over the next ten years, averaging 2.3%

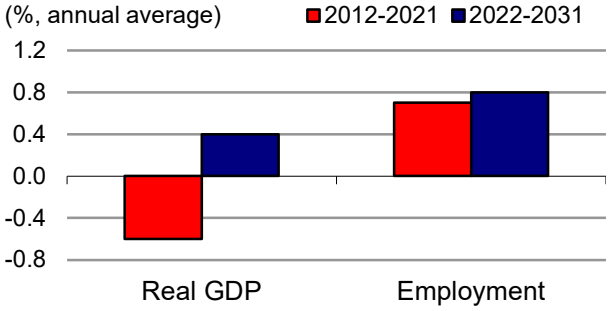
annually. An aging workforce and difficulties to attract domestic workers due to the seasonal nature of the industry, its rural location, low wages and long hours have also resulted in greater utilization of foreign temporary workers in agriculture. In its Budget 2022, the federal government announced an investment of over $1 billion in an effort to improve the industry's sustainability and reduce GHG emissions, as well as $156 million in funding to enhance the Temporary Foreign Worker Program, including $48 million to implement a new program for agriculture and fish processing.

Forestry and Logging (NAICS 1131; 1132; 1133; 1153)

This industry comprises establishments primarily engaged in logging; timber tract operations; forest nurseries; and related support activities such as transportation, reforestation, pest control and firefighting services. Logging and support activities are the two largest segments, accounting for most of production and employment. While direct exports represent a small portion of total revenues, the forestry industry strongly relies on sales from the wood products and paper manufacturing industries which export a large share of their production, mainly to the United States. The industry employed 50,700 workers in 2021, largely concentrated in British Columbia (38%), Quebec (30%) and Ontario (12%), with a workforce primarily composed of men (82%). Key occupations (4-digit NOC) include:

Logging machinery operators (8241)
Chain saw and skidder operators (8421)
Supervisors, logging and forestry (8211)
Forestry technologists and technicians (2223)
Logging and forestry labourers (8616)
Silviculture and forestry workers (8422)
Transport truck drivers (7511)
Conservation and fishery officers (2224)
Managers in natural resources production and fishing (0811)
Heavy-duty equipment mechanics (7312)
Forestry professionals (2122)

Real GDP and Employment Growth Rates in Forestry and Logging



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

The Canadian forestry and logging industry experienced negative real GDP growth over the period 2012-2021, as it was hit by cyclical challenges and structural changes in demand for wood and related products. After being severely affected by the fallout of the U.S. housing market prior and during the recession of 2008-2009, production partly recovered from 2010 to 2015 before trending down again from 2015 to 2020. The industry faced numerous challenges in the past several years, including lower demand for paper products due to the digital transition; the worst-ever fire seasons of 2017 and 2018 in British Columbia; the return of U.S. tariffs on Canadian exports of softwood lumber; and the significant decline in Canada's housing starts in 2018 and 2019. Unsurprisingly, the COVID-19 pandemic resulted in another negative year in 2020 before production straightened in 2021 in response to strong housing demand and renovation spending, which sent lumber prices skyrocketing. Indeed, with the increase in disposable income (arising from government support programs and a large accumulation of savings) and the continuation of home confinement and telework policies, many

households searched for a bigger house or a new house away from urban areas or turned to home improvements. But the rebound in forestry's output was not strong enough to offset the downward trend observed prior to 2021, resulting in a contraction of 0.6% per year on average in real GDP for the entire period 2012-2021. Despite the decline in production, employment expanded by 0.7% annually during the same period. This situation can be explained by a decrease in productivity, largely attributable to the mountain pine beetle infestation and devastating forest fires in British Columbia, which have negatively impacted productivity in the industry as the quality and accessibility of commercially viable timber decreased significantly. On average, productivity fell at an annual rate of 1.3% over the past ten years.

Over the projection period, output growth in forestry is expected to return to positive territory, although it will remain relatively weak, constrained by an additional decline in production in 2022 (as lumber prices fall back), the slowdown anticipated in residential investment across North America, lower demand for paper products, and limited supply of merchantable timber. The surge in housing prices and higher mortgage rates are expected to reduce new home construction and resale activity, restraining growth in renovation spending on both sides of the border, particularly in the short to medium term. A bit of cyclical recovery in the demand for housing is expected in Canada over the longer term, in response to higher immigration and stronger pressures on housing supply. On the other hand, housing starts are expected to stagnate in the United States, where builders currently have a huge backlog of unsold homes. Population aging and the resulting shift in the composition of housing starts from single-unit homes toward multiple-dwellings (duplexes, apartments and condominiums), which require less wood by unit of output, will also temper demand for wood products. Moreover, the imposition of U.S. tariffs on Canadian softwood lumber will continue to represent an obstacle for the industry, although the reduction of the tariff announced in the summer of 2022 (from 18% to 12%) will bring some relief to U.S. homebuilders and Canadian producers. At the same time, reduced supplies of merchantable timber caused by the pine beetle infestations and massive wildfires are expected to scale back production when salvage operations begin to wind down and annual allowable cuts (AAC) are reduced. The negative outlook projected in the pulp and paper industry will also inhibit output growth in the forestry industry.

On a positive note, the emergence of the biomass fuel industry and the increasing use of wood as a "greener" alternative in building construction are expected to support demand for forestry products over the long-term horizon. Indeed, mass timber construction represents an important opportunity for Canada's forestry and logging industry, particularly when considering the underwhelming prospects for North American single-family home construction. Several factors are supporting the growing use of wood in mid- and high-rise buildings, including advances in wood product technology, environmental concerns, and changing building codes. Under this perspective, the industry could benefit from the acceleration anticipated in non-residential building investment over the projection period, alleviating some of the weakness anticipated in residential investment. On average, real GDP in the industry is projected to grow by 0.4% annually from 2022 to 2031. This improvement relative to the past decade is expected to result in employment growth averaging 0.8% per year as productivity is projected to keep declining, albeit at a slower pace than in the past (-0.4% annually). In fact, a large part of the employment gains is expected to occur in 2022 as productivity growth should resume as soon as 2023. But productivity will be slow

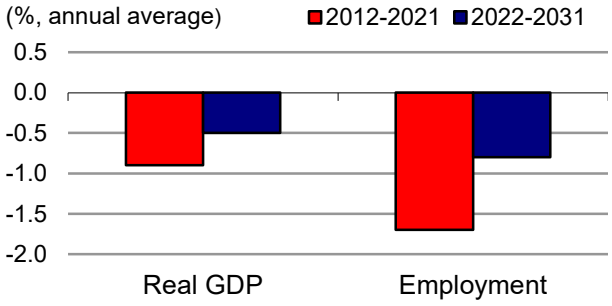
to return to its pre-pandemic level as the reduced timber supply will change the size and location of available timber stock. Renewed growth in productivity will result in more moderate gains in employment for the rest of the projection period as the exode of youth from rural communities and the growing number of lumbermen in their retirement years will continue to exert pressures on the industry's workforce.

Fishing, Hunting and Trapping (NAICS 1141; 1142)

This industry comprises establishments primarily engaged in harvesting fish and other wild animals from their natural habitats. It is composed of commercial inland and salted water fishing (excluding aquaculture which is part of the agriculture industry), as well as commercial hunting and trapping, including the exploitation and management of game preserves. Fishing is by far the predominant economic activity, accounting for almost all of the industry's production and employment. While direct exports represent a small portion of total revenues, the fishing industry relies heavily on sales from the seafood product preparation and packaging industry which exports about 75% of its production. Main export markets are the United States (53% of exports in 2021) and China (29%). The industry employed 17,000 workers in 2021, mostly concentrated in the Atlantic Provinces (78%) and British Columbia (11%). The workforce is characterized by a high proportion of men (81%) and self-employed (55%). The industry also shows the highest unemployment rate (average of 25% over the past 10 years) across the 42 industries covered by COPS, largely reflecting the seasonal nature of its activities. Key occupations (4-digit NOC) include:

Fisherman/women (8262)
Fishing vessel deckhands (8441)
Fishing masters and officers (8261)
Trappers and hunters (8442)

Real GDP and Employment Growth Rates in Fishing, Hunting and Trapping



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

The performance of the industry is largely determined by the availability of fish stocks. Supply constraints resulting from various quotas and moratorium imposed on different fish species in Canada accounted for some of the biggest challenges the industry has faced over the past decades. These restrictions were in response to overfishing and environmental factors that led to significant decreases of several fish stocks, most notably ground fish (such as cod and haddock) on the East coast and salmon on the West coast. Stimulated by surging demand from Asian markets, shellfish (lobsters, crabs, shrimps and scallops) have become the main species harvested on the Atlantic coast, filling some of the void left by the 1992 cod fishing moratorium. However, shellfish have also come under pressures over time due to increased predation, resulting in additional restrictions, notably for northern shrimps. At the same time, the salmon fishery is facing warmer environmental conditions in the Northeast Pacific Ocean, resulting in below average survival, smaller body sizes and declining stocks for most salmon species. Supply constraints have been a major drag on the industry, which saw its output

falling continuously since 2015, with the exception of a substantial increase in 2021 when the industry recovered from the COVID-19 pandemic after a sharp contraction in exports in 2020. This resulted in an average annual decline of 0.9% in real GDP over the period 2012-2021. The decline in production was accompanied by notable improvements in productivity (+0.8% per year), leading to significant job losses in the industry, with employment falling by 1.7% annually. While advanced vessel and better fish detection equipment have boosted landings and the cost-effectiveness of fishing operations, limited fish and seafood stocks diverted workers from less-efficient fisheries to other industries.

Supply constraints are expected to continue to exert pressures on output in the Canadian fishing industry over the projection period. With foreign demand accounting for 90% of total lobster catch, production will be supported by robust demand from the United States and the growing middle class in China and other Asian countries. Canada's free trade agreements with the European Union and the ten countries in the Asia-Pacific region are good news for the industry, as all tariffs imposed on Canadian fish and seafood products will be removed in these markets over the next decade. This development should be bolstered by an anticipated increase in lobster landings, as warming oceanic temperatures are expected to prompt lobster population to concentrate in more northern areas where water is colder. On the other hand, growth in most other fisheries will continue to be constrained by supply challenges. According to statistics released by the Department of Fisheries and Oceans about the status of key Canadian fish stocks in 2020, only 31% of the stocks were in the healthy zone (in terms of biological reproduction capacity). Nearly 60% of the British Columbia's salmon fishery was shut during the summer of 2021 due to low stock levels, which could take years to recover. It was also recently announced that most of the pacific herring fishery along the west coast will also be shut due to low stocks (the pacific herring are an important food source for salmon and other fish). The sharp reduction of shrimp quotas on the Atlantic coast, which is expected to persist through the short term, will continue to restrain growth in the industry, while the removal of the cod moratorium is not anticipated any time soon, given the uncertainty surrounding when or if the stock will ever rebound.

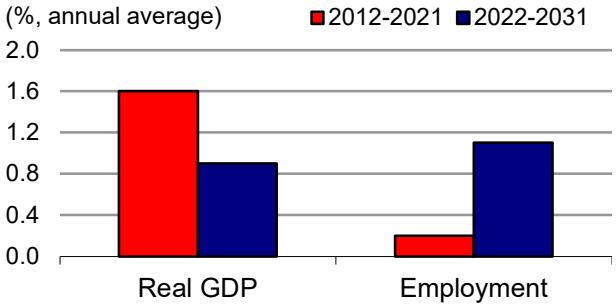
Changes made to the Fisheries Act in 2019 represents either a downside or upside risk to the outlook, as fish supply may be restricted by rigorous regulations, although the restoration of fish stocks and fish habitat is certainly a positive outcome for the industry in the long term. Stricter quotas imposed on different species stemming from limited fish stocks and environmental concerns are expected to erase the gains resulting from seafood exports. As a result, real GDP and employment are projected to keep declining over the period 2022-2031, but at a slower annual rate of 0.5% and 0.8% respectively. Further declines in employment reflect additional growth in productivity, which is also expected to decelerate relative to the past ten years (+0.3% annually). The emphasis on technical advances is expected to shift toward more efficient and more appropriate fishing gears in order to reduce the negative impacts on the ecological system. Youth out-migration from coastal communities, unfavourable working conditions and the growing number of fishermen in their retirement years will also continue to exert pressures on the industry's workforce.

Mining (NAICS 2121; 2122; 2123)

This industry comprises establishments primarily engaged in mining or preparing metallic and non-metallic minerals. It is composed of three segments: coal mining (9% of total production in 2021); metal ore mining (54%); and non-metallic mineral mining and quarrying (38%). The industry exports about two-thirds of its production, mainly to the United Kingdom (22% of exports in 2021), the United States (17%), China (16%) and Japan (7%). It employed 78,900 workers in 2021, with 51% in metal ore mining, 21% in non-metallic mineral mining and quarrying, 8% in coal mining, while the remaining 20% were not associated to any particular segment. Employment is mostly concentrated in Ontario (28%), Quebec (25%), British Columbia (21%) and Saskatchewan (9%), and the workforce is primarily composed of men (86%). Key occupations (4-digit NOC) include:

- Underground production and development miners (8231)
- Supervisors, mining and quarrying (8221)
- Heavy-duty equipment mechanics (7312)
- Underground mine service and support workers (8411)
- Construction millwrights and industrial mechanics (7311)
- Transport truck drivers (7511)
- Managers in natural resources production and fishing (0811)
- Industrial electricians (7242)
- Mine labourers (8614)
- Geological and mineral technologists and technicians (2212)
- Geoscientists and oceanographers (2113)
- Mining engineers (2143)
- Geological engineers (2144)

Real GDP and Employment Growth Rates in Mining



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Being a price-taker in the global marketplace, the performance of the mining industry is largely governed by world economic and geopolitical conditions that influence commodity prices. After being severely affected by the dramatic drop in demand and prices of most metals and minerals during the recession of 2008-2009, production slowly recovered from 2010 to 2014. The prices of metals and minerals peaked in 2011 and fell back gradually in the following years as China, which consumes roughly half of the global production of metals, began slowing its rate of industrialization, leading to weaker demand. In 2015, prices had fallen back to the level observed during the recession, but production at projects already in operation continued to grow, resulting in additional increases in output until 2017. By 2018-2019, prices were still relatively low, making the development of new projects simply not economically viable and production started declining. The decline amplified in 2020, as global demand fell sharply due to the lockdowns resulting from the spread of COVID-19. This trend was reversed in 2021, as supply disruptions coupled with increasing demand led to major increases in prices for a variety of metals and minerals. The resulting pace of growth in real GDP averaged 1.6% annually over the period 2012-2021. After peaking in 2017-2018, employment fell sharply in 2019-2020, before rebounding modestly in 2021. These fluctuations lowered employment growth to an average annual rate of only 0.2% over the past ten years, making productivity growth (+1.4% annually) the largest contributor to output growth. While productivity can fluctuate a lot with the composition of the commodities being mined, it has also been positively influenced by the growing use of various technologies such as

GPS surveying, three-dimensional data maps, airborne technologies, remote-operated equipment, automated loading and transportation systems, advanced robotics and seismic mapping and imaging.

The outlook for the Canadian mining industry remains positive over the projection period, although the pace of growth in output is expected to weaken relative to the past decade, with positive drivers of growth being tempered by environmental concerns. While output is expected to decline in 2022 as COVID-induced labour shortages and severe weather impacted major gold and iron mines at the beginning of the year, the next two years have better prospects as multiple major mines, mainly gold-producing, will come online. The outlook for non-metal mining is also promising, with growth in this segment primarily driven by potash mining, particularly under the ongoing conflict between Russia and Ukraine. Indeed, as the world largest producer of potash in the world (followed by Russia and Belarus), Canada is well positioned to provide an alternative for Russian exports of potash and meet increased global demand for a secure source of fertilizer. Over the longer term, mining activity is also expected to be supported by various initiatives from the federal and provincial governments. For example, in Budget 2022, the federal government announced a Critical Mineral Strategy intended to prioritize the development of key minerals. The goal of this $3.8 billion commitment is to enable Canada to develop domestic value chains, especially around the production of zero-emission vehicles, as well as to reduce the impact of future supply chain disruptions (such as those observed during the pandemic of COVID-19). To support this strategy, the federal government has identified 31 critical minerals used in the production of clean energy, with special emphasis on lithium, graphite, nickel, cobalt and copper. However, the developments of new projects, such as the Ring of Fire project in Northern Ontario, which has the potential to produce many critical minerals, still faces opposition from environmental and indigenous groups. Also, the time from exploration to production of new mines remains excessively long in Canada, which may discourage new investment. Finally, Canada's focus on meeting carbon reduction targets will restrict the growth of certain areas of mining and quarrying, such as coal production.

On average, real GDP in the mining industry is projected to grow at annual rate of 0.9% over the period 2022-2031. Despite slower output growth relative to the past decade, employment growth is expected to accelerate, averaging 1.1% annually, due to a turnaround in productivity, which is expected to decline marginally (-0.2% annually). In fact, most of the increase in employment and all the decline in productivity are expected to occur in 2022, reflecting adjustments to a post-pandemic environment. Starting in 2023, productivity growth is expected to resume and average 1.0% annually, which is more in line with its historical trend. Renewed growth in productivity will also result in more moderate gains in employment for the rest of the projection period, averaging 0.4% per year from 2023 to 2031.

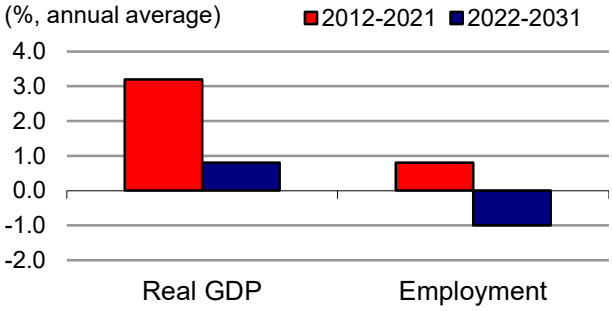
Oil and Gas Extraction (NAICS 2111)

This industry comprises establishments primarily engaged in operating oil and gas field properties, such as exploration for crude petroleum and natural gas, drilling, completing and equipping wells, and other related activities in the preparation of oil and gas. It includes both the production from wells using traditional pumping techniques and the production from surface shale

or tar sands using non-conventional techniques. Non-conventional production is accounting for more than 50% of total domestic production. Canada is the fourth-largest producer of crude oil and the sixth-largest producer of natural gas in the world. Alberta has always been the dominant producer in the country, supplying about 75% of total production of oil and gas, followed by British Columbia (mostly gas), Saskatchewan (mostly oil), and Newfoundland-Labrador (oil). About 80% of crude oil and nearly half of natural gas produced in Canada are exported, mainly to the United States. On the other hand, more than one-third of the crude oil used in domestic refineries and about 20% of the natural gas consumed in the country are imported. The industry employed 101,500 workers in 2021, mostly concentrated in Alberta (83%), with a workforce primarily composed of men (76%). Wages are among the highest across the country, being more than twice the all-industry average. Key occupations (4-digit NOC) include:

- Oil and gas drillers, servicers, testers and related workers (8232)
- Contractors and supervisors, oil and gas drilling and services (8222)
- Petroleum engineers (2145)
- Central control and process operators, petroleum, gas and chemical processing (9232)
- Managers in natural resources production and fishing (0811)
- Purchasing agents and officers (1225)
- Power engineers and power systems operators (9241)
- Geoscientists and oceanographers (2113)
- Heavy-duty equipment mechanics (7312)
- Construction millwrights and industrial mechanics (7311)
- Industrial instrument technicians and mechanics (2243)
- Steamfitters, pipefitters and sprinkler system installers (7252)
- Oil and gas drilling, servicing and related labourers (8615)
- Geological and mineral technologists and technicians (2212)

Real GDP and Employment Growth Rates in Oil and Gas Extraction



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

The Canadian oil and gas extraction industry both prospered and endured in a time where the landscape of the energy market evolved under different forces since the early 2000s. Crude oil prices increased markedly from 2003 to 2008 as rapid economic growth in China and other emerging markets boosted global demand for energy products. Higher prices spurred investment in the industry and contributed to launch the development of Alberta's oil sands. While production and prices fell significantly during the 2008-2009 recession due to sharp declines in global demand, they quickly recovered in the following two years. Thereafter, improved drilling and fracking technologies unlocked huge reserves of shale oil and shale gas in North America, especially in the United States who significantly reduced its dependence on imported energy. The increase in U.S. production and the shift in market power prompted OPEC-member countries to relax their output quotas to regain market share, leading to an oversupply on the global market and a sharp fall in crude oil prices in 2014-2015. Oil prices reached a bottom in 2016, before increasing marginally from 2017 to 2019. Despite the low-price environment, the industry's output continued to grow steadily from 2014 to 2019, largely driven by increased production capacity in the oil sands resulting from many years of massive investments. Prices and production fell back in 2020, as global demand decreased sharply due to the lockdowns resulting from the spread of COVID-19. This situation was reversed in 2021 when supply disruptions coupled with increasing demand led to a substantial jump in crude oil prices. The

resulting pace of growth in real GDP averaged a strong 3.2% annually over the period 2012-2021. However, growth in employment was much more modest, averaging 0.8% annually. This reflects significant job losses associated with lower investment and drilling activity following the oil price shock of 2014-2015, although employment rebounded firmly in 2021 in response to higher prices and production. Productivity also increased markedly in the past decade (+2.4% annually), contributing to most of the growth in output. Substantial improvements in productivity reflected major developments in hydraulic fracturing and horizontal directional drilling techniques and the fact that the production capacity in the oil sands has increased while becoming less labour intensive.

The outlook in terms of production and employment growth for the oil and gas industry is expected to weaken markedly over the projection period relative to the past decade, primarily reflecting limited production and pipeline capacity, as well as the trend towards electrification and clean energy. After surging in 2021, oil prices are expected to remain high in the near term as a lack of investment in North American oil over the past few years is limiting the ability of producers to increase supply. The Russia-Ukraine conflict is also adding a significant degree of supply uncertainty. In the first half of the projection period, a boost in conventional oil production due to high prices will lead to continued output growth. Going forward, as demand growth cools and global supply increases, crude oil prices are expected to fall gradually, before rising again, albeit modestly, leaving prices below the levels observed in 2021-2022 and resulting in a weaker outlook for Canadian oil producers in the second half of the projection period. The trend towards electrification and clean energy will also limit long-term growth prospects as consumers and businesses shift towards lower emission sources of energy. A key limitation on the expansion of the oil and gas industry in Canada will be the federal government's 2030 Emissions Reduction Plan, which targets a reduction in greenhouse gas emissions of 40 % below 2005 levels by 2030 and net-zero emissions by 2050. Another constraining factor is Canada's limited pipeline capacity to further export to international markets. For example, during the Russian invasion of Ukraine in early 2022, Canada had limited capacity to respond managing an increase of just 300,000 barrels a day. On a more positive note, there is still some potential for increased development in the industry as evidenced by the Bay Du Nord Development Project which the government approved in April 2022. The completion of the Trans Mountain Expansion Pipeline will also allow for an increase in oil production, while the completion of the Coastal GasLink Pipeline is expected to increase natural gas production for export.

Overall, the outlook for the oil and gas industry is especially muted for Alberta and Saskatchewan, although Newfoundland and Labrador will be able to benefit from increased offshore production. The resulting pace of growth in real GDP is projected to average 0.8% annually over the period 2022-2031. This significant slowdown relative to the past decade is expected to lead to a decline in employment averaging 1.0% per year as productivity should continue to increase, albeit at a more moderate pace than in the past (+1.8% annually). Although productivity growth is projected to account for all the growth in output, employment will remain above the levels seen from 2016 to 2020, when the industry struggled with persistently low prices and a lack of pipeline capacity. Additional gains in productivity reflect advancements in extractive technology and modular facility design. However, productivity growth is expected to slow in the second half of the projection

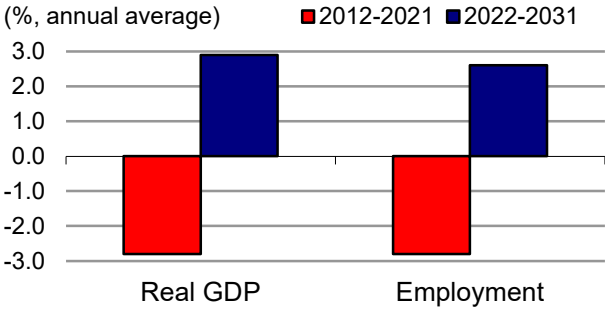
period due to the shift in the lifecycle of oil sand production (which is highly capital intensive) from its growth phase to its mature phase.

Support Activities for Mining, Oil and Gas Extraction (NAICS 2131)

This industry comprises establishments primarily engaged in providing support services, on a contract or fee basis, required for the mining and quarrying of minerals and for the extraction of oil and gas, such as drilling activities. It also includes establishments engaged in the exploration for minerals, other than oil and gas, such as taking ore samples and making geological observations at prospective sites. The industry is essentially oriented toward the domestic market as most of its production is supplied within the country. It employed 76,500 workers in 2021, mainly concentrated in Alberta (66%), followed distantly by British Columbia (9%) and Saskatchewan (9%), with a workforce primarily composed of men (84%). Key occupations (4-digit NOC) include:

- Oil and gas well drillers, servicers, testers and related workers (8232)
- Contractors and supervisors, oil and gas drilling and services (8222)
- Oil and gas well drilling and related workers and services operators (8412)
- Managers in natural resources production and fishing (0811)
- Underground production and development miners (8231)
- Oil and gas drilling, servicing and related labourers (8615)
- Supervisors, mining and quarrying (8221)
- Transport truck drivers (7511)
- Heavy-duty equipment mechanics (7312)
- Construction millwrights and industrial mechanics (7311)

Real GDP and Employment Growth Rates in Support Activities for Mining, Oil and Gas Extr.



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

The performance of the industry is closely related to capital spending in exploration and extraction activities from the mining and fuel industries. The fuel industry represents the most important contributor, with output in support activities for oil and gas extraction about four times the output in support activities for mining. The number of wells in operation and new drilling projects are key drivers for support activities and both are highly dependent on the prices of oil, gas, metals and minerals, which in turn are driven by global demand for energy and commodity products. The surge in prices observed prior and after the global recession of 2008-2009 resulted into major investments in the fuels and mining sectors, leading to a burst in various support activities, such as drilling, excavating, building and pumping wells for oil and gas field operations. After peaking in 2013-2014, output in the industry fell drastically in 2015-2016, recording a cumulative decrease of 46% in only two years, as a result of sharp declines in both crude oil prices and metal and mineral commodity prices, which led to major investment cutbacks, particularly from oil producers. While output partially recovered in 2017-2018, in line with a marginal rebound in energy and commodity prices, investments remained well below the levels observed in 2014. Output contracted again in 2019 and the decline amplified in 2020, as global demand fell sharply due to the lockdowns resulting from the spread of COVID-19. The situation

was reversed in 2021 when supply disruptions coupled with increasing demand led to a substantial jump in prices, although the rebound in output was not strong enough to offset the large declines recorded in 2015-2016 and 2020. This resulted in both real GDP and employment declining at an average rate of 2.8% per year for the full period 2012-2021, with most of the job losses occurring from 2013 to 2017. Employment in the industry reached a bottom in 2020, before increasing marginally in 2021. With employment declining at the same pace as real GDP, productivity remained essentially flat, on average, in the past ten years (0.0% annual growth).

Over the period 2022-2031, real GDP growth in support activities is projected to return to positive territory, averaging a strong 2.9% annually. While this appears to be a significant improvement relative to the previous ten years, a large part of the growth is expected to occur in the short term, driven by notable increases in drilling activity in 2022-2023 in response to higher oil prices. Going forward, growth is expected to slow, due to weaker prospects in oil and gas extraction, and to shift towards support and exploration activities in mining. Indeed, as demand growth cools and global supply increases, crude oil prices are expected to fall gradually and remain below the levels observed in 2021-2022, restraining investment growth from oil producers. The trend towards electrification and clean energy will also limit long-term growth prospects as consumers and businesses shift towards lower emission sources of energy. A key limitation on the expansion of the oil and gas industry in Canada will be the federal government's 2030 Emissions Reduction Plan, which targets a reduction in greenhouse gas emissions of 40 % below 2005 levels by 2030 and net-zero emissions by 2050. This is expected to restrict future oil and gas exploration and development activities as the industry adapts to meet government targets. On the other hand, there are several drivers of growth for support and exploration activities in mining. In Budget 2022, the federal government announced a Critical Mineral Strategy intended to prioritize the development of 31 key minerals used in the production of clean energy, with special emphasis on lithium, graphite, nickel, cobalt and copper. The goal of this $3.8 billion commitment is to enable Canada to develop domestic value chains, especially around the production of zero-emission vehicles, as well as to reduce the impact of future supply chain disruptions (such as those observed during the pandemic of COVID-19). The strategy also includes a 30% Critical Mineral Exploration Tax Credit for specific expenses related to mineral exploration within Canada. This is expected to stimulate growth in the mining segment of the support activities industry.

Given that support services for oil and gas extraction have a much higher weight than support services for mining, the subdued outlook for oil and gas extraction over the longer term will weigh on real GDP growth in the overall industry, with average annual growth falling from 8.2% in 2022-2023 to 1.6% in 2024-2031 (resulting in 2.9% for the full period 2022-2031). Nevertheless, renewed growth in output is projected to lead to a significant rebound in employment, averaging 2.6% annually over the period 2022-2031, with about half of the gains occurring in 2022-2023. That said, real GDP is not expected to return to the level observed in 2014, while employment will remain well below its historical high of 2013. Productivity growth is expected to improve slightly relative to the past decade, essentially driven by a large increase in 2022. The shift in output growth towards the less productive segment of support activities for mining is expected to weigh on productivity growth in the industry as soon as 2023, resulting in an average growth rate of only 0.3% annually for the entire projection period.

Construction (NAICS 2361-2362; 2371-2379; 2381-2389)

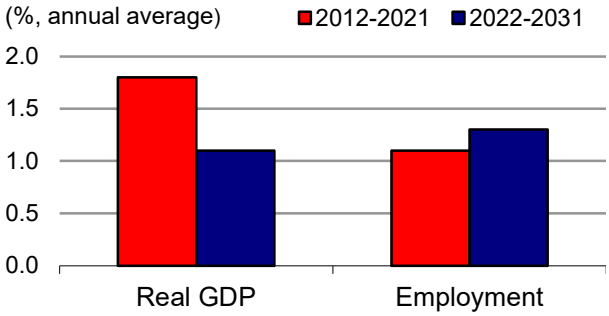
This industry comprises establishments primarily engaged in constructing, repairing and renovating buildings and engineering works, and in subdividing and developing land. These establishments may operate on their own account or under contract to other establishments or property owners. They may produce complete projects or just parts of projects. The industry is composed of three segments: construction of residential and non-residential buildings (industrial, commercial and institutional); heavy and civil engineering construction (such as highways, bridges, utility systems, mining, oil and gas facilities); and specialty trade contractors (such as masonry, painting and electrical work). Construction activities are oriented toward the domestic market and primarily driven by residential and non-residential investment, which is particularly sensitive to fluctuations in economic and financial conditions as well as demographic trends in Canada. The industry employed 1.4 million workers in 2021 (7.6% of total employment in the economy), with 56% in specialty trade contractors, 33% in residential and non-residential construction, and 11% in heavy and civil engineering construction (see footnote for data on GDP)[(1)]. Employment is mostly concentrated in Ontario (37%), Quebec (20%), Alberta (16%) and British Columbia (15%). The workforce is characterized by a high proportion of men (87%) and a significant concentration of self-employed (26%). Key occupations (4-digit NOC) include:

Contractors and supervisors, industrial, electrical and construction trades (7201-7205)
Home building and renovation managers (0712)
Carpenters (7271)
Construction trade helpers and labourers (7611)
Electricians (7241)
Construction managers (0711)
Heavy equipment operators (7521)
Plumbers (7251)
Painters and decorators (7294)
Contractors and supervisors in heavy equipment operator crews (7302)
Plasterers, drywall installers and finishers and lathers (7284)
Residential and commercial installers and servicers (7441)
Heating, refrigeration and air conditioning mechanics (7313)
Roofers and shinglers (7291)
Iron workers (7236)
Transport truck drivers (7511)
Construction estimators (2234)
Steamfitters, pipefitters and sprinkler system installers (7252)
Floor covering installers (7295)
Concrete finishers (7282)
Bricklayers (7281)
Sheet metal workers (7233)
Tilesetters (7283)
Insulators (7293)
Crane operators (7371)
Construction inspectors (2264)
Heavy-duty equipment mechanics (7312)
Construction millwrights and industrial mechanics (7311)
Elevator constructors and mechanics (7318)
Cabinetmakers (7272)
Glaziers (7292)
Civil engineers (2131)
Drillers and blasters (7372)
Telecommunications line and cable workers (7245)
Gas fitters (7253);
Waterworks and gas maintenance workers (7442)
Civil engineering technologists and technicians (2231)
Electrical power line and cable workers (7244)
Oil and solid fuel heating mechanics (7331)
Boilermakers (7234)
Water well drillers (7373)

(1) The breakdown for real GDP within the construction industry does not correspond to the NAICS codes, because GDP data are based on capital expenditures. According to this exclusive breakdown, residential and non-residential buildings construction accounted for 56% of the industry's real GDP in 2021, compared to 18% for repair construction and 27% for engineering and other construction activities.

The construction industry was a moderate performer for the Canadian economy over the past ten years, with output fluctuating significantly. After being impacted by the sharp declines in residential and non-residential investment during the recession of 2008-2009, output quickly recovered in 2010 and posted solid growth until 2014, spurred by substantial increases in capital expenditures on energy projects and the positive impact of low mortgage rates on housing activity. However, the industry's output fell back in 2015 and 2016, reflecting large declines in non-residential investment, primarily as a result of major investment cutbacks in oil and gas engineering structures due to the sharp decline in crude oil prices and the persistent weakness in natural gas prices. Lower energy prices resulted in delays or cancellations of higher-cost energy projects, ranging from oil sands development in Alberta to the building of liquefied natural gas (LNG) terminals in British Columbia. Output in construction slowly recovered from 2017 to 2019, supported by a modest rebound in non-residential investment, although growth was constrained by a small decline in residential investment. Real GDP in the industry contracted again in 2020 due to major lockdowns at the onset of the COVID-19 pandemic, before surging in 2021 in response to a substantial jump in residential investment. Indeed, with the increase in disposable income (arising from government support programs and a large accumulation of savings) and the continuation of home confinement and telework policies, many households searched for a bigger house or a new house away from urban areas or turned to home improvements, propelling resale activity, new home construction and renovation spending. The resulting pace of growth in real GDP averaged 1.8% annually over the period 2012-2021, compared to 1.1% for employment. The number of construction workers increased continuously from 2012 to 2019, but the pandemic led to major job losses in 2020. Despite a notable rebound in 2021, employment in the industry remained below its pre-pandemic level of 2019. The movements in output and employment also led to large fluctuations in productivity over the past ten years, with growth averaging 0.7% annually.

Real GDP and Employment Growth Rates in Construction



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

After peaking in 2021, real GDP in construction is expected to keep growing at a solid pace in 2022, before contracting in 2023-2024 and experiencing subdued growth thereafter. This slowdown relative to the previous decade reflects the small decline anticipated in residential investment over the projection period as the surge in housing prices and higher mortgage rates are expected to reduce new home construction and resale activity, restraining growth in renovation spending, especially in the short term. A bit of cyclical recovery in demand for new housing is expected over the medium term in response to higher immigration and stronger pressures on housing supply. However, the declining trend anticipated in household formation rates due to population aging and the shift in the composition of housing starts from single-unit homes toward multiple-dwellings (duplexes, apartments and condominiums) are expected to restrain investment related to new home construction in the longer term (as multiple dwellings units are smaller on average than single detached homes). Decent growth in renovation spending

is however expected to offset some of the weakness in new home construction and resale activity, partly supported by the various federal, provincial and municipal programs dedicated to green housing (such as home insulation, windows and doors, air-sealing, heat pumps and solar panels) and the desire of baby-boomers to make home improvements to continue enjoying their houses as they age.

Given the tepid outlook for residential investment, a better outlook for non-residential investment is expected to help supporting growth in construction activity over the projection period, driven by renewed growth in investment related to engineering structures and faster growth in investment related to the construction of non-residential buildings. Following a steep decline in the past several years due to lower oil prices, business investment in engineering structures is expected to straighten, mainly in the short term, supported by several energy projects such as the Trans Mountain Expansion project, the LNG Canada project, and the BC Hydro's Site C Clean Energy project. However, the investment outlook is more muted for the oil and gas sector over the longer term due to the trend towards decarbonization, the lack of domestic pipeline capacity and the difficulty of getting major projects approved. That said, some investment will still be required in maintenance and carbon reduction technologies. The electric power (utilities), transportation and mining industries are also expected to be important contributors to engineering construction due to growing demand for non-emitting sources of energy, public transit systems and critical minerals (used to produce many of the technologies needed for clean energy). On the non-residential front, the construction of industrial and commercial buildings will benefit from investments in areas such as electric vehicle manufacturing and increased demand for new warehouses due to the growing adoption of e-commerce. As office workers move towards a hybrid model or return full-time to the office, demand for office space should slowly resume, although the outlook is more muted as office vacancy rates remain elevated.

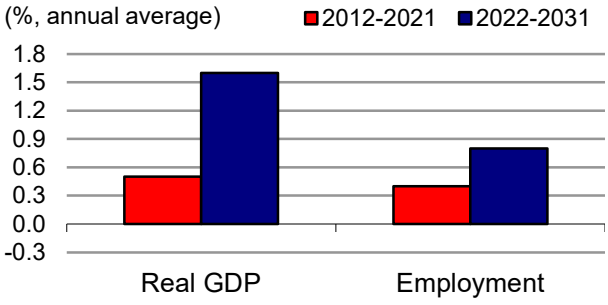
The federal government's infrastructure program launched in 2016 ($186 billion over 12 years) is also expected to continue to support the construction of public engineering structures and institutional buildings, at least until 2028. In addition to transportation, public transit, green and rural infrastructures, this program includes spending on "social infrastructure" such as early learning and childcare facilities, affordable housing, home care, and cultural and recreational infrastructure. The resulting pace of growth in real GDP for the construction industry is projected to average 1.1% annually over the period 2022-2031. Despite slower output growth relative to the past decade, employment growth is expected to accelerate slightly, averaging 1.3% per year, due to a turnaround in productivity, which is expected to decline marginally (-0.2% annually). However, all the decline in productivity is projected to occur in the short term as a result of a large increase in employment in 2022 (recovery to pre-pandemic levels) and significant declines in output in 2023-2024 (impact of lower housing affordability and higher mortgage rates). Starting in 2025, productivity growth is expected to resume and average 0.4% annually, which is more in line with its historical average. A shortage of trade workers is possibly the industry's biggest challenge over the long term as construction workers are already hard to find, and looming retirements threaten to increase this challenge. Innovative techniques, including 3-D printing and prefabricated dwelling components, could help address such shortages by partially automating homebuilding.

Electric, Gas and Water Utilities (NAICS 2211; 2212; 2213)

This industry comprises establishments primarily engaged in operating electric, gas and water utilities. These establishments generate, transmit, control and distribute electric power; distribute natural gas; treat and distribute water and operate sewer systems and sewage treatment facilities and related systems (such as steam and air conditioning systems). They generally operate through a permanent infrastructure of lines, pipes, treatment and processing facilities. Electric power generation, transmission and distribution are by far the largest of the three segments, accounting for 81% of production in 2021. The industry is mostly oriented toward the domestic market and is very sensitive to fluctuations in industrial production and construction activity. It employed 140,800 workers in 2021, with 78% in electric power generation, transmission and distribution, 9% in natural gas distribution, and 13% in water, sewage and other systems. Employment is mostly concentrated in Ontario (38%), Quebec (19%), Alberta (14%) and British Columbia (13%). The workforce is primarily composed of men (73%) and benefits from much higher wages than the national average, partly attributable to a high unionization rate. Key occupations (4-digit NOC) include:

Electrical power line and cable workers (7244)
Water and waste treatment plant operators (9243)
Power engineers and power system operators (9241)
Supervisors, petroleum, gas and chemical processing and utilities (9212)
Utilities managers (0912)
Power system electricians (7243)
Construction millwrights and industrial mechanics (7311)
Electrical and electronics engineers (2133)
Electrical and electronics engineering technologists and technicians (2241)
Waterworks and gas maintenance workers (7442)
Gas fitters (7253)

Real GDP and Employment Growth Rates in Electric, Gas and Water Utilities



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

After falling significantly in 2009 as a result of the economic downturn, output in electric, gas and water utilities quickly recovered in the following two years, supported by renewed growth in industrial production and construction activity. Output stagnated in 2012 and 2013, before increasing continuously until 2019, although the pace of growth was partly restrained by advances in energy efficiency and the decline in the electricity intensity of the Canadian economy (electricity intensity is defined as the quantity of electricity used per dollar of GDP). Business lockdowns and home confinement during the COVID-19 pandemic reduced the need for energy while extreme weather events (such as droughts and low rainfalls) disrupted electricity generation in some provinces, leading to significant declines in the industry's output in 2020-2021. This lowered the average pace of growth in real GDP to a modest 0.5% annually for the entire period 2012-2021. Although productivity is high in the industry given its capital-intensive nature, it has also seen little improvement in the past few years, with weather conditions depressing output in hydroelectricity. This has left real GDP growth to be largely supported by employment growth over the last decade, with gains averaging 0.4% annually (compared to only 0.1% for productivity). That said, while real GDP increased steadily until 2019, employment and productivity rather

showed large fluctuations, making the average pace of growth less meaningful for these two indicators.

Over the projection period, real GDP growth in the utilities industry is expected to accelerate significantly relative to the period 2012-2021, primarily driven by the recovery and expansion of the electricity segment. The industry is critical to the Canadian economy as it provides the basic infrastructure used to support economic growth in various other industries. In addition to benefit from continued growth in the industrial and commercial sectors of the economy, the industry will benefit from the acceleration anticipated in population growth due to higher immigration targets, increasing demand for water and energy infrastructure. But more importantly, the electricity segment will benefit from high levels of investment as the country moves toward decarbonization. Canada recently increased its 2030 greenhouse gas emissions reduction target to be 40% below 2005 levels, with the goal of achieving net-zero emissions by 2050. For example, this means much higher demand for electric vehicles and charging stations across the country. To support this transition, the construction of several renewable energy projects is expected to be undertaken over the next several years, including hydroelectric, solar and wind energy projects. Many provincially owned utilities companies plan on increasing capital spending in the near term and several other long-term projects are in the proposal stage. The goal of these investments is to modernize and improve the current infrastructure to meet the expected increased demand. Hydro-Quebec will lead the charge by increasing its capital spending by 35% over the next five years. Many solar and wind farms projects are expected to start in Alberta, representing billions in investment, while Ontario is planning to deploy small modular reactors (SMR) to generate low-carbon electricity.

The demand for renewable energy in the United States is also expected to remain strong and support future exports, primarily from Quebec, Ontario, British Columbia and Manitoba. For example, Hydro-Quebec recently signed a 25-year contract to supply power to New York City by 2025. The outlook is also positive for natural gas, supported by continued growth in natural resources and manufacturing, key users of natural gas, and by the fact that electricity producers in Alberta anticipate phasing out electricity generated with coal in 2023, switching instead to natural gas. Although the industrial use of natural gas in Canada could decline as the carbon tax increases, this will represent a shift from generating power from natural gas to electricity, not a displacement of demand. Overall, the strive towards economic electrification will keep the utilities industry growing, but the outlook is not immune to risks. The tight labour market and high inflation could delay construction schedules on some investment projects or make them more expensive than usual, weighing on profitability. In addition, extreme weather conditions, such as floods and droughts, are expected to become more common, which could weigh on the reliability of electricity output, especially in the provinces relying on hydroelectricity. That said, annual real GDP growth is projected to average 1.6% from 2022 to 2031 with gains in output evenly split between employment and productivity growth. Indeed, productivity growth is expected to pick-up to an average pace of 0.8% annually, as mega projects like Site C Clean Energy (British Columbia) come online and as output ramps up at the recently completed generating stations of Muskrat Falls (Newfoundland-Labrador) and Keeyask (Manitoba). Employment is therefore also projected

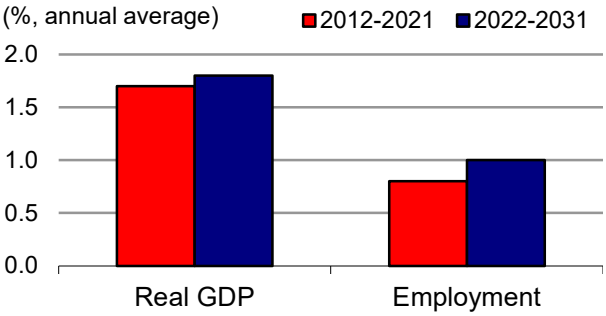
to grow at annual rate of 0.8% over the period 2022-2031, twice the pace observed in the previous ten years, partly reflecting faster growth in output.

Food and Beverage Products (NAICS 3111-3119; 3121; 3122; 3123)

This industry comprises establishments primarily engaged in manufacturing food as well as beverage and tobacco products. Food manufacturing is by far the most important segment, accounting for 77% of production in 2021, followed by beverage products (18%) and tobacco products (4%). The industry is largely domestic-oriented as about two thirds of its production is sold within the country. However, foreign markets are representing an increasing share of total sales, with exports accounting for 38% of revenues, up from 24% a decade ago. With a total of 311,500 workers in 2021, it is the largest employer of the manufacturing sector (18% of all manufacturing workers). Most workers are operating in food manufacturing (85%) and employment in the industry is largely concentrated in Ontario (38%) and Quebec (27%), with men accounting for 60% of the workforce. Key occupations (4-digit NOC) include: [(2)]

Process control and machine operators, food and beverage processing (9461)
Labourers in food and beverage processing (9617)
Supervisors, food and beverage processing (9213)
Industrial butchers and meat cutters, poultry preparers and related workers (9462)
Bakers (6332)
Testers and graders, food and beverage processing (9465)
Fish and seafood plant workers (9463)
Labourers in fish and seafood processing (9618)

Real GDP and Employment Growth Rates in Food and Beverage Products



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

The industry experienced an upward trend in output during most of the past decade, with all three segments recording positive growth. While steady increases in domestic consumption have been the backbone for the food and beverage segments during that period, output growth has been primarily fueled by rising foreign demand, particularly from the U.S. and Asian markets. The decrease in the value of the Canadian dollar since 2014-2015 also provided additional stimulus for exports. With consumers moving away from tobacco products, output in this segment stagnated until 2018, before expanding rapidly in recent years due to the legalization of cannabis in Canada. Growth in the industry's output was temporarily interrupted in 2020, but in contrast with most other manufacturing industries, the decline in production was marginal during the first year of the COVID-19 pandemic (-1.0%) as food is a necessity. Home confinement also led to significant increases in consumer spending at grocery stores as an alternative to restaurants, boosting output in food and beverage manufactured products in 2021 (+5.4%). The resulting pace of growth in the industry's real GDP averaged 1.7% annually for the entire period 2012-2021. After peaking in 2019, employment fell sharply in 2020, before rebounding in 2021

[(2)] Key occupations for manufacturing industries in general also include: Manufacturing managers (0911); Construction millwrights and industrial mechanics (7311); Material handlers (7452); Shippers and receivers (1521); Transport truck drivers (7511); Industrial engineering and manufacturing technologists and technicians (2233); Industrial electricians (7242); and Industrial and manufacturing engineers (2141).

but without fully recovering the jobs lost in the previous year. On average, employment increased at annual rate of 0.8% over the past decade, as productivity growth (+0.9% annually) was a significant contributor to output growth. Indeed, the growing presence of foreign competitors in the food and beverage market over the past several years forced the Canadian industry to undertake a significant amount of restructuring and consolidation to remain competitive globally. The larger plants have allowed manufacturers to take greater advantage of economies of scale, as well as containing costs per unit of output. At the same time, capital spending for some food segments has also started to pick up and the shift toward technology boosted productivity in the industry.

Over the period 2022-2031, output growth in the food and beverage manufacturing industry is projected to accelerate marginally relative to the previous decade as faster population growth, driven by higher immigration targets, will support growth in domestic demand. The trend for healthier food, including the choice of consumers to have higher quality, locally sourced and ethical products in a more transparent ecosystem will also benefit Canadian producers. The export-oriented segment of the industry is expected to continue to be supported by a relatively low Canadian dollar and further expansion into new markets through the Canada-European Union Comprehensive Economic and Trade Agreement (CETA) and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP). Exports of food products are also expected to benefit from rising incomes and the growing middle class in emerging markets. Developing countries generally have higher population growth rates than developed countries and a greater capacity to increase per-capita consumption of food. In addition to enhancing the price-competitiveness of Canadian exports of food and beverage products, the low value of the Canadian dollar is expected to increase import prices and encourage a shift toward local sourcing and domestic production. While tobacco consumption is projected to keep declining, further growth in the manufacturing of cannabis products is expected to offset this loss.

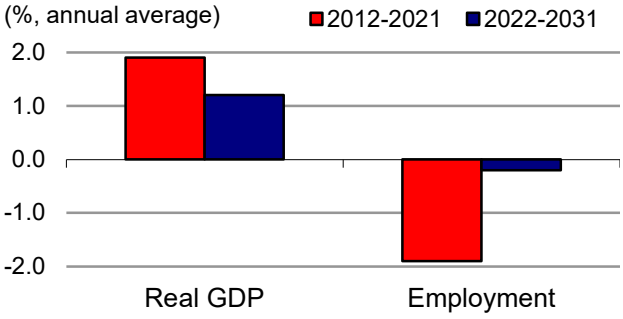
On the negative side, population aging is expected to restrain growth in demand for food products. It is widely accepted that the need to eat tend to decline as people age. Empirical evidence shows that older people spend a smaller proportion of their income on food and clothing, particularly once they are retired from the labour market. Moreover, the slower pace of growth anticipated in disposable income (resulting from the gradual slowdown in Canada's employment growth and massive retirements of baby-boomers) is also expected to weigh on consumer spending. Although food is a necessity and is generally less sensitive to fluctuations in household consumption, expenditures on food that are discretionary in nature are more at risk of weaker demand. Overall, the industry's real GDP is projected to increase at an average of 1.8% annually during the period 2022-2031. The small improvement in output growth and the slight deceleration in productivity growth relative to the past decade are expected to lead to a modest acceleration in employment growth, averaging 1.0% per year. Nevertheless, job creation will continue to be restrained by additional gains in productivity (+0.8% annually) as technological innovations, particularly in advanced robotics, are expected to lead to further increases in the automation of the production process.

Wood Product Manufacturing (NAICS 3211; 3212; 3219)

This industry comprises establishments primarily engaged in manufacturing products from wood. It is composed of three different segments: sawmills and wood preservation (33% of total production in 2021); veneer, plywood and engineered wood products (33%); and other wood products such as doors, windows and frames (38%). Overall, about 50% of the industry's production is shipped abroad, mostly to the United States which accounts for 88% of exports. In recent years, Japan has displaced China as the second largest export market, accounting for 5% of total exports in 2021. The three segments of the industry do not face the same degree of exposure to domestic and foreign economic conditions. Sawmills and wood preservation along with veneer, plywood and engineered wood products are highly dependant on foreign demand, with exports accounting for 55% of production. In contrast, other wood products are more sensitive to domestic demand with about three-quarters of production sold within the country. The industry employed 109,000 workers in 2021 (6.3% of total manufacturing employment), with 37% in sawmills and wood preservation, 15% in veneer, plywood and engineered wood products, and 49% in other wood products. Employment is mostly concentrated in Quebec (36%), British Columbia (22%) and Ontario (21%), and the workforce is primarily composed of men (83%). Key occupations (4-digit NOC) include: [(2)]

Labourers in wood, pulp and paper processing (9614)
Other wood products assemblers and inspectors (9533)
Supervisors, forest products processing (9215)
Sawmill machine operators (9431)
Woodworking machine operators (9437)
Other wood processing machine operators (9434)
Lumber graders and other wood processing inspectors and graders (9436)

Real GDP and Employment Growth Rates in Wood Product Manufacturing



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Wood product manufacturing in Canada experienced positive output growth over the period 2012-2021, although this growth was not consistent throughout the decade. After being severely affected by the recession of 2008-2009, the output gradually recovered from 2010 to 2016, supported by the recovery of the U.S. housing market, solid growth in residential investment in Canada (stimulated by low mortgage rates) and the need to process timber killed by the mountain pine beetle in British Columbia. Production fell back from 2017 to 2020, as the industry faced numerous challenges in the past several years, including the worst-ever fire seasons of 2017 and 2018 in British Columbia; the return of U.S. tariffs on Canadian exports of softwood lumber in 2019; and the significant decline in Canada's housing starts in 2018 and 2019. Unsurprisingly, the COVID-19 pandemic resulted in another negative year in 2020 before production straightened in 2021 in response to strong housing demand and renovation spending, which sent lumber prices skyrocketing. Indeed, with the increase in disposable income (arising from government support programs and a large accumulation of savings) and the continuation of home confinement and telework policies, many households searched for a bigger house or a new house away from urban

areas or turned to home improvements. The resulting pace of growth in the industry's real GDP averaged 1.9% annually for the entire period 2012-2021. Despite positive growth in output, employment fell at an annual average rate of 1.9% during the same period, with most of the decline occurring from 2016 to 2020. This means that productivity growth was the sole contributor to output growth, averaging a strong 3.8% annually over the last decade. In the past several years, a large number of operations were consolidated, leading to substantial gains in productivity as a result of a significant pick-up in investment in machinery and equipment, technological innovations in sawmills, increasing concentration of businesses, larger economies of scales, and higher value added through product development, particularly for wood fibre.

Over the period 2022-2031, output growth in the wood products industry is projected to weaken significantly relative to the previous ten years, while employment is expected to keep declining, albeit at a much slower pace. Production should continue to increase in 2022, but the surge in housing prices and higher mortgage rates are expected to reduce new home construction and resale activity in 2023-2024, restraining growth in renovation spending on both sides of the frontier. A bit of cyclical recovery in demand for housing is projected in Canada over the longer term in response to higher immigration and stronger pressures on housing supply, but housing starts are expected to stagnate in the United States (where builders currently have a huge backlog of unsold homes). Population aging and the resulting shift in the composition of housing starts from single-unit homes toward multiple-dwellings (duplexes, apartments and condominiums), which require less wood by unit of output, will also temper demand for wood products. The imposition of U.S. tariffs on Canadian softwood lumber will continue to represent an obstacle for the industry, although the reduction of the tariff announced in the summer of 2022 (from 18% to 12%) will bring some relief to U.S. homebuilders and Canadian producers. Such developments mean that future growth in the industry relies on the ability to diversify its export base. While British Columbia has been successful in targeting the Chinese and Japanese markets over the past decade, other provinces have shown little success in targeting markets outside of North America and Canadian exports of wood products to China have dropped significantly in recent years. The industry is also expected to face challenges from timber supply constraints, especially in British Columbia where annual allowable cuts have been reduced as the province works to restore the stocks of commercial timber that were destroyed by the pine beetle, limiting the ability to process lumber.

On a positive note, the increasing use of wood as a "greener" alternative in building construction is expected to support demand for wood products over the long-term horizon. Indeed, mass timber construction represents an important opportunity for the industry, particularly when considering the underwhelming prospects for North American single-family home construction. Several factors are supporting the growing use of wood in mid- and high-rise buildings, including advances in wood product technology, environmental concerns and changing building codes. Under this perspective, the industry could benefit from the acceleration anticipated in non-residential building investment over the projection period, alleviating some of the weakness anticipated in residential investment. On average, the industry's real GDP is projected to grow by 1.2% annually from 2022 to 2031, while employment is projected to keep declining, albeit at a much slower pace of 0.2% annually as the consolidation and transformation of operations that boosted productivity in the past ten years are largely completed (productivity is expected to increase at a more moderate

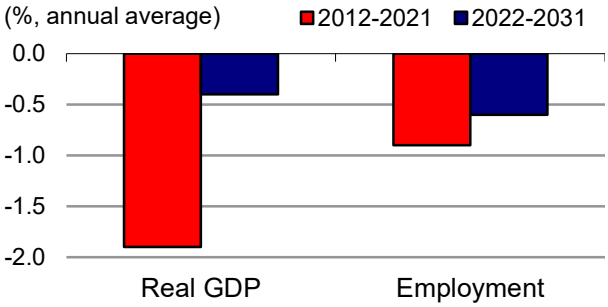
pace of 1.4% annually). Nevertheless, advancements in harvesting technologies, transport management and data analytics will lead to additional gains in productivity (and further declines in employment), maintaining a competitive advantage on domestic and foreign markets.

Paper Manufacturing (NAICS 3221; 3222)

This industry comprises establishments primarily engaged in manufacturing pulp and paper as well as converted paper products (such as paperboard boxes, corrugated boxes, fibre boxes and sanitary food containers). Pulp and paper is the most important of the two segments, accounting for 55% of production in 2021. Overall, the industry is export intensive with about 60% of its revenues coming from foreign markets, largely from the United States. The two segments, however, do not face the same degree of exposure to domestic and foreign economic conditions. Converted paper is highly dependent on domestic demand, with 70% of its production sold within the country. In contrast, pulp and paper is far more sensitive to foreign demand, with exports accounting for about 80% of its production, largely shipped to the United States (55% of exports) and China (25%). The industry employed 67,800 workers in 2021 (3.9% of total manufacturing employment), with 59% in pulp and paper and 41% in converted paper products. Employment is mainly concentrated in Quebec (33%), Ontario (31%) and British Columbia (19%), and the workforce is primarily composed of men (83%). Key occupations (4-digit NOC) include: [2]

- Paper converting machine operators (9435)
- Labourers in wood, pulp and paper processing (9614)
- Papermaking and finishing machine operators (9433)
- Power engineers and power systems operators (9241)
- Supervisors, forest products processing (9215)
- Pulp mill machine operators (9432)
- Plateless printing equipment operators (9471)
- Chemical engineers (2134)
- Pulping, papermaking and coating control operators (9235)

Real GDP and Employment Growth Rates in Paper Manufacturing



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

The industry has been through difficult times since the early 2000s as the rapid increase in the digitization of information and media has led to a long-term structural decline in demand for various paper grades, including newsprint. Moreover, stronger competition from abroad, notably from emerging countries such as Brazil and Indonesia, combined with the significant appreciation of the Canadian dollar (prior to 2014), left many pulp and paper mills facing competitiveness challenges. These problems were compounded by the collapse of the U.S. housing market and the global recession of 2008-2009, which led to numerous closures in domestic sawmills. Sawmill closures damaged supply chains further downstream, hampering the ability of many pulp and paper mills to gain a steady supply of key inputs into their own production processes. These factors forced firms to undertake major restructuring by consolidating and upgrading facilities and closing less efficient plants through mergers and acquisitions. After falling almost continuously from 2007 to 2013, real GDP in the industry slightly rebounded in 2014-2015, before returning to its downward trend in subsequent years despite the gradual re-orientation of

production toward segments that have stronger demand profiles, such as paperboard, paperboard containers and sanitary paper products. Unsurprisingly, the output continued to contract in 2020, during the first year of the COVID-19 pandemic, as shutdowns affected production. And the marginal rebound recorded in 2021 left production below its pre-pandemic level of 2019. Employment fluctuated a lot over the past decade, but the net result was additional job losses. Productivity also contracted as a result of low investment in machinery and equipment, with the industry spending more on repairs than on new capital in recent years. On average, real GDP and employment fell at annual rates of 1.9% and 0.9% respectively over the period 2012-2021, while productivity contracted by 1.0% per year.

Production and employment in the paper manufacturing industry are projected to keep declining over the period 2022-2031, albeit at a slower pace than the previous ten years. Most of the small decline in production is expected to occur in 2022 as output returns to its long-term downward trend after a temporary increase in 2021. Thereafter, production is expected to remain relatively stable, as exports should continue to benefit from a relatively low Canadian dollar and further expansion into niche market opportunities. Since most of paper products are priced in U.S. dollars, a weaker currency tends to increase the effective price Canadian firms receive for their products, boosting revenues and profitability. Beyond the U.S. market, exports could benefit from growing opportunities in Asian markets, although declining trade relations with China could temper growth. The predominance of electronic media will continue to reduce demand for traditional paper and newsprint, but the rise in retail e-commerce sales, both globally and in Canada, is expected to boost demand for packaging materials, supporting the production of paperboard and paperboard containers. The outlook for sanitary paper products also remains positive, supported by rising demand in both emerging and mature markets, while efforts to reduce the prevalence of single-use plastics present opportunities for the paper manufacturing industry to grow by offering sustainable alternatives (for example, paper instead of plastic bags).

On the negative side, growing production from competing suppliers in South America and Asia will keep putting pressures on Canadian manufacturers to consolidate operations, as firms in these regions are able to produce at lower costs and can also benefit from their closer proximity to key emerging markets. Moreover, timber supply constraints in Canada and the continuation of U.S. tariffs on Canadian exports of softwood lumber are expected to hurt domestic lumber production and boost the price of this key input for paper manufacturing. Lastly, carbon pricing policies and the phase-out of fossil fuels in the electricity sector are expected to drive up energy costs and restrain the global competitiveness of the Canadian paper industry, which is six times more energy intensive than the manufacturing average. On average, real GDP in paper manufacturing is projected to decline marginally from 2022 to 2031, down by 0.4% annually, a notable improvement relative to the previous ten years. This should help mitigate the severity of future employment declines to an annual rate of 0.6%, with most of the losses occurring in 2022 as employment is expected to remain relatively stable for the remainder of the projection period. Retirements and automation will continue to put downward pressure on the size of the industry's workforce. Indeed, an aging workforce is expected to result in an increasing number of retirements, while jobs consisting of repetitive and routine tasks, such as those performed by labourers and operators, should continue to be replaced by machinery. As a result, productivity growth is expected to resume marginally, averaging 0.2% annually, with most of the increase

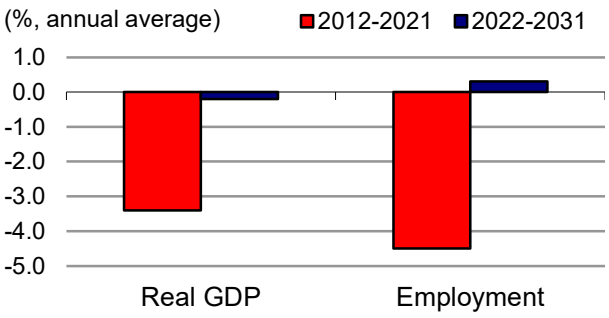
occurring in 2022. Smaller gains in productivity are expected for the remainder of the forecast horizon, as producers facing lower sales volumes may be reluctant to invest massively in machinery and equipment.

Printing and Related Activities (NAICS 3231)

This industry comprises establishments primarily engaged in printing and providing related support activities such as pre-press and bindery work. Printing is among the few manufacturing activities in Canada that are not significantly exposed to changes in global economic conditions and in the value of the Canadian dollar as only 10% of production is shipped to foreign countries, mostly to the United States (75% of exports). The industry employed 51,300 workers in 2021 (3.0% of total manufacturing employment), largely concentrated in Ontario (48%) and Quebec (23%), with a workforce predominantly composed of men (63%). Key occupations (4-digit NOC) include: [(2)]

Printing press operators (7381)
Graphic designers and illustrators (5241)
Supervisors, printing and related occupations (7303)
Other labourers in processing, manufacturing and utilities (9619)
Binding and finishing machine operators (9473)
Camera, platemaking and other prepress occupations (9472)
Plateless printing equipment operators (9471)
Graphic arts technicians (5223)

Real GDP and Employment Growth Rates in Printing and Related Actitvities



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Production and employment in the industry have been on a declining trend since the early 2000s, primarily reflecting lower demand for printed materials, largely attributable to the transition toward digital media. More specifically, printing has been adversely affected by the increasing use of more efficient technologies, such as electronic documents and digital applications. The Internet has pulled readers away from newspapers, magazines and other paper media products. Growing environmental concerns have also incited businesses and consumers to reduce their use of paper, such as printed bills, promotional brochures and other paper marketing materials. E-commerce and e-billing represent lower cost alternatives for businesses looking to reduce their expenditures, while e-readers continue to grow in popularity, reducing demand for conventional printing. The use and printing of manifold business forms have been declining for many years, as digital forms are cheaper and easier to track. Further developments in secure electronic signatures and fillable documents also contributed to amplify this trend. After stabilizing from 2015 to 2018, the declining trend observed in output and employment resumed and accelerated during the COVID-19 pandemic years as the rapid shift toward telework, online services and virtual learning led to additional decreases in the demand for printed materials. This resulted in net annual declines of 3.4% in real GDP and 4.5% in employment for the entire period 2012-2021. Since its employment peak of 2003, the industry has cut over half of its workforce through major consolidations in an effort to contain costs, increase efficiency and become more concentrated around large firms. These consolidation

efforts had a positive impact on productivity over the past two decades, with growth averaging 1.1% per year from 2012 to 2021.

Over the projection period, most of the challenges faced throughout the past decade will continue to be problematic for the industry, as the displacement of print by digital media is not expected to reverse. Structural changes in demand are expected to encourage the industry to look beyond the traditional printing processes for growth and move into areas where there is robust corporate demand, such as labelling, packaging, commercial screen printing and multi-surface printing. Examples of new printing technologies include erasable printing, three-dimensional digital printing for packaging, and jetted-material printing in a variety of materials, such as foil, wood, textiles, ceramics, metal and glass. With the surging demand for digital content, firms have also the opportunity to change and diversify their business models in order to provide more value-added services, including graphic design, logistics, marketing, communication and online content management services. While those new opportunities are not expected to enable the printing industry to expand significantly over the long term, they could help offset weaker demand for traditional printing.

The industry's real GDP is projected to keep declining in 2022 and stabilize for the remainder of the forecast horizon, resulting in a net average decline of 0.2% annually over the period 2022-2031. Despite the small contraction in output, employment growth is expected to return to positive territory, averaging a modest 0.3% per year, due to a turnaround in productivity, which is expected to decline by 0.5% annually. In fact, all the increase in employment and the totality of the decline in productivity are expected to occur in 2022-2023, reflecting adjustments to a post-pandemic environment. Starting in 2024, productivity growth is expected to resume (+0.6% annually) and employment to return to its declining trend (-0.6% annually). Indeed, with the industry shifting from traditional printing techniques to digital printing, firms are expected to spend more on their information and communications technology (ICT) infrastructure and less on labour. There could be, however, an increased demand for higher-skilled workers to operate the complex newer technologies.

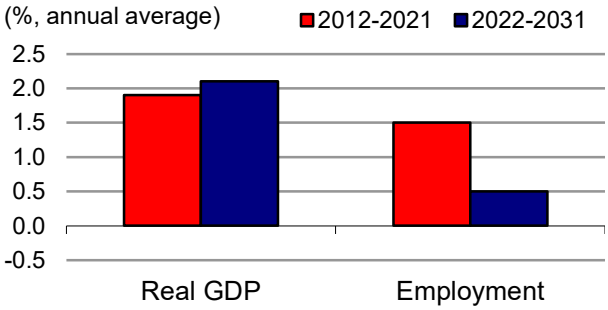
Chemical Products (NAICS 3251-3259)

This industry comprises establishments primarily engaged in manufacturing chemical products from organic and inorganic raw materials (such as petrochemicals and industrial gas, fertilizers and pesticides, pharmaceutical and medicine products, paint, ink, soap and cleaning products). Pharmaceutical and medicine products and basic chemicals are the largest two segments of the industry, accounting respectively for 33% and 23% of production in 2021. Overall, the industry is highly export intensive as more than 70% of its production is shipped to foreign markets, essentially to the United States which accounts for 76% of exports. Pharmaceutical and medicine products have the highest export intensity, with close to 100% of production delivered abroad. In contrast, pesticides and fertilizers have the lowest export intensity, with 75% of production sold on the domestic market. The industry employed 115,200 workers in 2021 (6.6% of total manufacturing employment), with 42% in pharmaceutical and medicine products, 19% in soap, cleaning compound and toilet preparation products, and 13% in basic chemicals. Employment is

mostly concentrated in Ontario (51%) and Quebec (26%), and the workforce is largely composed of men (66%). Key occupations (4-digit NOC) include: [(2)]

- Chemical plant machine operators (9421)
- Supervisors, petroleum, gas and chemical processing and utilities (9212)
- Chemical technologists and technicians (2211)
- Chemists (2112)
- Labourers in chemical products processing and utilities (9613)
- Central control and process operators, petroleum, gas and chemical processing (9232)
- Chemical engineers (2134)

Real GDP and Employment Growth Rates in Chemical Products



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Some segments of the industry, such as basic chemicals, synthetic resins and artificial and synthetic fibres and filaments, are strongly tied to the North American manufacturing supply chain. Other segments rely on demand for pharmaceutical and medicine products from the health sector, demand for fertilizers and pesticides from the agriculture sector, or demand for paint, coating and adhesive materials from the construction sector. After declining markedly prior and during the recession of 2008-2009, the production of chemical products gradually recovered from 2010 to 2019. During that period, the industry benefited from a number of factors stimulating domestic demand and exports, including: the economic recovery in Canada and the United States that followed the recession; the depreciation of the Canadian dollar since 2014-2015 (oil price shock); and the tariff reductions with the European Union brought by the Comprehensive Economic and Trade Agreement (CETA) in late 2017. The output contracted in 2020 as major shutdowns in manufacturing and construction activity at the onset of the COVID-19 pandemic led to a decline in the production of basic chemicals and lower demand for other inputs supplied by the industry. However, the decline in output was moderated by higher demand for pharmaceutical and medicine products as well as soap and cleaning products. The output recovered most of its losses in 2021 as the economy began to reopen and the demand for the various inputs produced by the industry picked up. The resulting pace of growth in real GDP averaged 1.9% annually over the entire period 2012-2021.

Employment in the industry fluctuated significantly from 2010 to 2019, but remained well below the levels observed in the early 2000s. Unlike many other industries, employment increased markedly in chemical products in 2020, up by 19.7%, reflecting the need to meet higher demand for pharmaceutical and cleaning products (such as COVID-19 testing kits and sanitizers). This boosted employment growth to an average of 1.5% annually for the period 2012-2021. Prior to the pandemic, productivity increased at a solid pace as growing competition from U.S. producers and emerging producers in Asia and Latin America forced the industry to restructure operations and, more recently, to invest significantly in machinery and equipment. However, the decline in output and the surge in employment observed in 2020 led to a sharp decrease in productivity, lowering the average pace of growth to 0.4% annually for the period 2012-2021 (compared to 3.2% annually from 2012 to 2019).

Over the projection period, output growth in the chemical products industry is expected to accelerate marginally relative to the previous decade, supported by positive prospects across many segments of the industry. Faster growth in manufacturing activity in Canada is projected to feed demand for basic chemicals. The global industry is gradually shifting to the use of natural gas liquids as feedstocks for the production of petrochemicals, and Canada is in an excellent position to take advantage of this trend due to its abundant supplies of liquefied natural gas. The ongoing conflict between Russia and Ukraine and political issues in Belarus poses significant challenges for the global fertilizer market, as those three countries are major producers and exporters. This is a great opportunity for Canada to provide an alternative and a secure source of manufactured fertilizers and other agricultural chemicals. Exports will continue to benefit from the relatively low value of the Canadian dollar, while demand for chemical products in India and China is expected to accelerate as the middle class in these countries continues to expand. Population aging is also expected to continue to boost demand for pharmaceutical and medicine products, one of the largest segment in the industry. Canadian exports of those products increased markedly in the past several years as the industry took advantage of strong demand from the United States, Japan and Europe. The Canada-U.S.-Mexico Agreement (CUSMA) strengthens intellectual property protection by increasing copyright durations and extending patent lifetimes on certain types of drugs. This is expected to make production and research and development (R&D) more lucrative in the pharmaceutical segment of the industry and stimulate investment in intellectual property. The price gap between brand-name and generic drugs has also been widening, providing opportunities for Canada's generics producers.

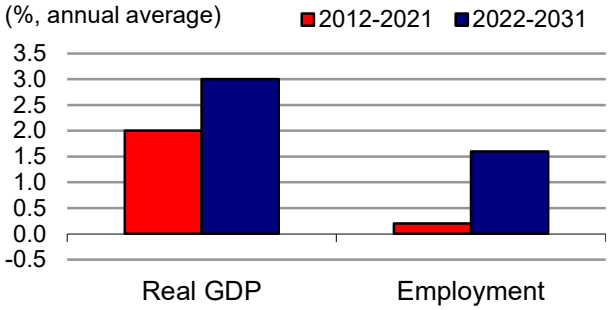
On the negative side, the quickly growing chemical industry in emerging markets represents a competitive challenge for Canadian producers. The United States is another important competitor as the surge in shale oil and gas production is providing U.S. chemical producers with an abundant and relatively inexpensive source of feedstocks. New policies to fight climate change have also created multiple layers of regulation with frequent overlaps between federal and provincial rules, increasing operating costs and reducing the competitiveness of Canada's chemical industry. While pharmaceutical production capacity increased significantly in Canada during the COVID-19 pandemic, many other countries have also increased their production capacity in this segment, which could moderate demand for Canadian pharmaceutical exports. On the domestic front, the industry also faces headwinds from declining residential construction activity in the near-term and a subdued outlook for the oil and gas sector in the longer term. Nevertheless, real GDP in chemical products is projected to grow at an average rate of 2.1% annually over the period 2022-2031. The substantial jump in employment in 2020 is expected to restrain job creation to an average rate of 0.5% annually, despite solid growth in output. A large part of the increase in production is expected to be met by additional gains in productivity. Low interest rates in the past decade have enabled many producers to finance new plants, including two that are expected to come online in 2022, and increase investment in machinery and equipment in order to improve efficiency and stay competitive. Emphasis on R&D activities for the production of advanced specialty chemicals is also expected to increase the value added in some segments of the industry. Overall, productivity is projected to grow at an average rate of 1.6% per year during the next decade.

Plastics and Rubber Products (NAICS 3261; 3262)

This industry comprises establishments primarily engaged in making goods by processing raw rubber (such as tires and inner tubes, hoses and belts, shoe and boot parts, latex products) and plastics materials (such as plastic resins, plastic packaging, polystyrene and urethane foam, plastic pipes, plastic bottles). Plastics are the largest of the two segments, accounting for 83% of production in 2021. Overall, close to half of the industry's production is exported. The two segments, however, do not face the same degree of exposure to domestic and foreign economic conditions. Plastics are largely dependent on domestic demand, with 56% of production sold within the country. In comparison, rubber products are more sensitive to foreign demand, with exports accounting for 70% of production, over 90% of which are shipped to the United States. The industry employed 94,100 workers in 2021 (5.4% of total manufacturing employment), with 84% in plastics and 16% in rubber products. Employment is mostly concentrated in Ontario (51%) and Quebec (29%), and the workforce is largely composed of men (68%). Key occupations (4-digit NOC) include: [(2)]

- Plastics processing machine operators (9422)
- Plastic products assemblers, finishers and inspectors (9535)
- Supervisors, plastic and rubber products manufacturing (9214)
- Labourers in rubber and plastic products manufacturing (9615)
- Rubber processing machine operators and related workers (9423)
- Chemical engineers (2134)

Real GDP and Employment Growth Rates in Plastics and Rubber Products



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Demand for plastics and rubber products is heavily tied to the North American manufacturing supply chain, making it particularly sensitive to business cycles. After falling markedly prior and during the recession of 2008-2009, the industry's production gradually recovered from 2010 to 2017, underpinned by the recovery in manufacturing and housing activity in Canada and the United States. The output remained stable in 2018-2019, before declining in 2020 as major shutdowns in manufacturing and construction activity at the onset of the COVID-19 pandemic led to a decline in the production of plastic and rubber products and lower demand for the various inputs supplied by the industry. However, the decline in output was moderated by higher demand for plastic products necessary for sanitation measures (such as plexiglass shields in retail trade and personal protective equipment in health care) and for single-use plastics associated with take-out food and online shopping deliveries. Production strongly rebounded in 2021, rising above pre-pandemic levels, as the shift in consumer spending toward goods and the surge in new home construction and renovation spending boosted demand for the various products and inputs manufactured by the industry. The resulting pace of growth in real GDP averaged 2.0% annually over the entire period 2012-2021. After falling sharply and continuously from 2006 to 2012, employment remained relatively stable during most of the past decade, with the exception of a strong jump in 2017 that was fully reversed in the following three years, including the first year of the pandemic. Employment partly recovered

in 2021, resulting in a very modest increase averaging 0.2% annually for the past ten years. The industry posted among the strongest gains in productivity across the manufacturing sector (+1.8% annually), reflecting further automation of the production process and the adoption of more advanced technologies such as 3D printing.

Over the projection period, output growth in the plastics and rubber industry is expected to accelerate significantly relative to the past decade, primarily driven by the faster pace of growth anticipated in manufacturing activity in Canada and a positive outlook for exports, spurred by a relatively low Canadian dollar and the increasing use of plastics in automotive, advanced manufacturing and energy efficiency. The new Canada-U.S.-Mexico Agreement (CUSMA) has reduced uncertainty about access to the industry's largest export markets, while free trade agreements with the European Union and several Pacific Rim countries will continue to facilitate export opportunities. The growing middle class in large markets such as China and India is also expected to increase demand for automobiles and airplanes, which are large users of plastic and rubber parts. Major restructuring undergone in the previous two decades has enabled the industry to become a major force in global markets and this welcome development should help to increase exports to emerging markets. Furthermore, technological developments have led to growing demand for plastics as a substitute for metals. For example, plastics are now being use more intensively in electronics, while efforts to reduce vehicle weight and fuel efficiency will continue to support greater use of plastics in automotive (which are lighter than traditional metal parts). Rising demand for electric vehicles is also expected to increase the use of light-weight plastic materials in the production of vehicles, charging stations and other related components. According to Global Market Insights[(3)], global demand for automotive plastics is estimated to increase from US$18 billion in 2020 to US$35 billion in 2027. In addition, growing demand for wind turbines, semiconductors and improvements in advanced manufacturing sector, particularly in 3D printing which makes extensive use of plastics, are expected to stimulate output growth in the industry. Those developments should help to offset the tepid outlook in new housing activity across North America, particularly in the short to medium term.

On the negative side, the environmental effects of plastics are encouraging consumers, businesses and countries to reduce their utilization of single-use plastics and increase the life cycle of existing plastic products. In Canada, the purpose of the Single-use Plastic Prohibition Regulations (SUPPR), which will come into effect in 2022-2023, is to ban the manufacture, import and sale of products such as single-use plastic checkout bags, cutlery, ring carriers, stir sticks and straws. Plastic producers that fail to adapt to this new environment could see their competitiveness erode. On average, real GDP in the overall industry is projected to grow by 3.0% annually over the period 2022-2031, starting with a large increase in 2022 and then growing consistently through the rest of the period. Faster growth in production is expected to result in a notable acceleration in employment growth, with job creation averaging 1.6% annually. The industry is also expected to record additional growth in productivity, albeit at a slower pace than the past decade (+1.4% annually), supported by further investments in technologies such as

[(3)] Global Market Insights, Automotive Plastics Market Report 2021-2027.

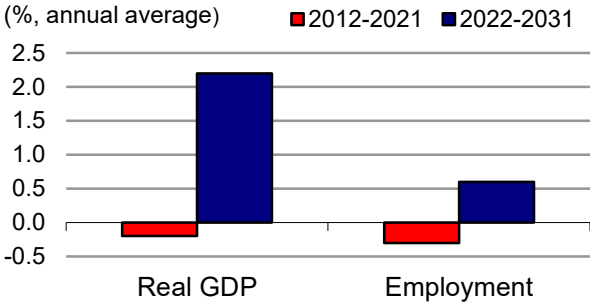
robotic automation systems and the growing use of computer systems to monitor for errors and find ways to improve efficiency.

Primary Metals and Mineral Products (NAICS 3241; 3271-3279; 3311-3315)

This industry comprises establishments primarily engaged in transforming crude petroleum and coal into intermediate and final products (such as fuels, hydraulic fluids and asphalt), in manufacturing non-metallic mineral products (such as bricks, ceramic, cement and glass), and in smelting and refining primary metals (such as iron, steel, copper or aluminum) for the production of bars, sheets, pipes, tubes or wires. The petroleum and coal products is the largest of the three segments, accounting for 38% of production in 2021, followed closely by the transformation of primary metals (35%) and non-metallic mineral products (27%). The industry exports about 40% of its production. However, within the industry, primary metals are the most exposed to global economic conditions as 65% of its production is shipped to foreign countries, mostly to the United States which accounts for 76% of exports. The industry employed 126,500 workers in 2021 (7.3% of total manufacturing employment) with 52% in primary metals, 35% in non-metallic mineral products, and 13% in petroleum and coal products. Employment is concentrated in Ontario (39%) and Quebec (32%), and the workforce is primarily composed of men (85%). Key occupations (4-digit NOC) include: [(2)]

Supervisors, mineral and metal processing (9211)
Machine operators, mineral and metal processing (9411)
Concrete, clay and stone forming operators (9414)
Labourers in mineral and metal processing (9611)
Crane operators (7371)
Glass forming and finishing machine operators and glass cutters (9413)
Inspectors and testers, mineral and metal processing (9415)
Central control and process operators, mineral and metal processing (9231)
Foundry workers (9412)
Machining tool operators (9417)

Real GDP and Employment Growth Rates in Primary Metals and Mineral Products



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Because the largest users of primary metals and mineral products are the manufacturing and construction sectors, the industry generally tracks the level of activity in these two sectors. More specifically, many of the industry's products are used as inputs for the manufacturing of motor vehicles, chemical products, and fabricated metals and machinery, as well as for the construction of houses, non-residential buildings and engineering structures. After being severely impacted by the recession of 2008-2009, the production of primary metals and mineral products partly recovered from 2010 to 2018, supported by the upturn in manufacturing and housing activity in North America, although growth was temporarily interrupted in 2015-2016 due to the sharp decline in non-residential investment in Canada, particularly in oil and gas engineering structures. The output slightly contracted in 2019 and the decline accelerated markedly in 2020 due to major shutdowns in manufacturing and construction activity at the onset of the COVID-19 pandemic. The modest rebound recorded in 2021 left the output significantly

below its pre-pandemic level of 2019. Those fluctuations resulted in a net decline in the industry's real GDP averaging 0.2% annually for the entire period 2012-2021. Employment was quite volatile during the past decade, but the net result was an average contraction of 0.3% per year, which reflected a marginal increase of 0.1% annually in productivity.

Over the period 2022-2031, output growth in primary metals and mineral products is projected to return to positive territory and strengthen markedly, with a significant part of the growth occurring in the short term as the industry continues to recover from the pandemic. In the longer term, the industry will benefit from the acceleration anticipated in manufacturing activity in Canada, particularly in fabricated metals and machinery as well as in automotive and non-automotive transportation equipment. Although growth in construction activity is expected to weaken relative to the previous decade, a number of factors are expected to stimulate demand for the building materials produced by the industry, including faster growth in the construction of commercial, industrial and institutional buildings, the shift toward multiple dwellings in the residential sector, renewed growth in investment related to engineering structures, and major investment in public infrastructure from the federal government. Such factors are expected to increase the demand for materials like bricks, ceramic, glass, cement, concrete, asphalt, iron, steel, aluminum, etc. Exports are expected to benefit from the relatively low value of the Canadian dollar and the removal of U.S. tariffs on steel and aluminum imported from Canada. The Canada-U.S.-Mexico Agreement (CUSMA) should also ensure tariff-free access to the key U.S. market over the projection period.

On the negative side, high oil prices are likely to increase input costs in the near term and lower profits in this very energy-intensive industry, pressing businesses to adopt greener manufacturing practices in response to the implementation of the federal carbon tax. Societal shifts to reduce emissions, such as the transition toward renewable energy sources, are also expected to restrain demand for petroleum and coal products, especially toward the end of the projection period. The resulting pace of growth in the industry's real GDP is projected to average 2.2% annually over the period 2022-2031, with about half the increase occurring in 2022-2023. This significant improvement relative to the past decade is expected to lead to a modest rebound in employment, with job creation averaging 0.6% per year. However, faster gains in productivity led by the modernization of machinery, combined with economies of scale resulting from increased production, are projected to contain employment growth in the industry. The digitization of the construction value chain can improve the efficiency of various metallic and non-metallic mineral products. For example, Building Information Modeling (BIM) is a 3D-model-based process that gives industry workers insights into planning the construction of buildings and infrastructures more efficiently. Productivity is projected to grow at an average rate of 1.6% over the period 2022-2031.

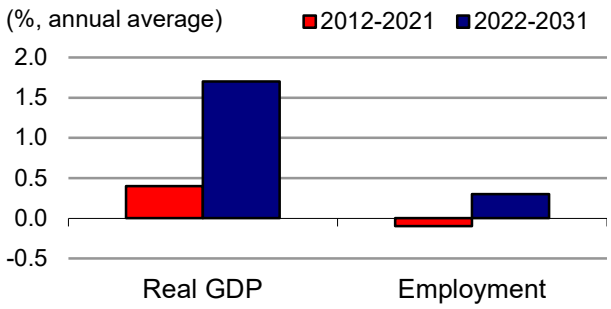
Fabricated Metal Products and Machinery (NAICS 3321-3329; 3331-3339)

This industry comprises establishments primarily engaged in manufacturing ferrous and non-ferrous metal products (such as hand tools, architectural and structural products, boilers, tanks and shipping containers, springs, wires, bolts and screws) and establishments producing industrial and commercial machinery (used in the production process of various primary, construction, manufacturing and services industries). Production in the industry is evenly split between its two segments: fabricated metal products (47% in 2021) and machinery (53%).

Overall, the industry is export intensive as around 60% of its production is shipped to foreign markets. The two segments, however, do not face the same degree of exposure to domestic and foreign economic conditions. Metal fabrication is highly dependent on domestic demand, with 73% of its production sold within the country. In contrast, machinery is far more sensitive to foreign demand, with exports accounting for about 95% of its production, 73% of which are shipped to the United States. Overall, the industry employed 271,900 workers in 2021 (15.7% of total manufacturing employment), with 49% in metal fabrication and 51% in machinery. Employment is mostly concentrated in Ontario (43%), Quebec (27%) and Alberta (11%), and the workforce is primarily composed of men (80%). Key occupations (4-digit NOC) include: [(2)]

- Machinists and machining and tooling inspectors (7231)
- Welders and related machine operators (7237)
- Supervisors, other mechanical and metal products manufacturing (9226)
- Labourers in metal fabrication (9612)
- Other metal products machine operators (9418)
- Metalworking and forging machine operators (9416)
- Machining tool operators (9417)
- Mechanical assemblers and inspectors (9526)
- Industrial painters, coaters and metal finishing process operators (9536)
- Assemblers, fabricators and inspectors, industrial electrical motors and transformers (9525)
- Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations (7201)
- Structural metal and platework fabricators and fitters (7235)
- Mechanical engineers (2132)
- Tool and die makers (7232)
- Mechanical engineering technologists and technicians (2232)

Real GDP and Employment Growth Rates in Fabricated Metal Products and Machinery



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

The industry primarily relies on business investment in machinery and equipment as well as activity in the primary, construction and manufacturing sectors, which are the largest users of metal products and machinery. Because those three sectors are very sensitive to business cycles, so is the fabricated metals and machinery industry. The negative impact of the 2008-2009 recession on North American industrial activity led to a large decline in the industry's output. Stimulated by the economic recovery and more particularly by the rebound in manufacturing and construction activity, real GDP fully recovered from 2010 to 2014. However, the industry's output contracted again in 2015 and 2016, as business investment in machinery and equipment (M&E) and engineering structures fell sharply in Canada and slowed significantly in the United States, following the collapse in crude oil prices. Production increased back from 2017 to 2019, primarily driven by the rebound in M&E investment in North America. Major shutdowns in industrial activity at the onset of the COVID-19 pandemic led to an additional decline in production in 2020 and the modest rebound recorded in 2021 left the output significantly below its pre-pandemic level of 2019. Those fluctuations lowered growth in the industry's real GDP to an average of 0.4% annually for the entire period 2012-2021. Employment was a bit volatile over the past decade, but the net result was a marginal contraction of 0.1% per year. The need to improve efficiency in response to the intensification of global competition, particularly from China

which has become a major exporter of machinery equipment, led to an average increase of 0.5% annually in productivity.

Over the period 2022-2031, output growth in fabricated metals and machinery is projected to accelerate significantly relative to the previous decade, with a large part of the gains occurring in the short term as the industry continues to recover from the pandemic. In the longer term, the industry will benefit from renewed growth in M&E investment and faster growth in manufacturing activity in Canada, along with additional growth in construction activity and a positive outlook for exports. After experiencing mitigate growth in M&E investment over the past decade, Canadian businesses are expected to replace or upgrade their existing capital stock in response to the development of new productivity-enhancing technologies and demographic pressures on labour supply. Those factors are projected to result in a sharp pick-up in M&E investment in Canada over the next decade, boosting domestic demand for industrial and commercial machinery. Domestic demand for fabricated metals and machinery is also expected to be driven by the acceleration projected in the construction of non-residential buildings, renewed growth in business investment related to engineering structures, and major investments in public infrastructure from the federal government. At the same time, efforts to reduce greenhouse gas emissions are expected to lead to significant investment to develop cleaner power generation and production techniques, supporting the industry's sales of more sophisticated machinery and equipment in Canada and abroad. On the external front, exports are expected to benefit from the relatively low value of the Canadian dollar and the removal of U.S. tariffs on steel and aluminum imported from Canada. The Canada-U.S.-Mexico Agreement (CUSMA) should also ensure tariff-free access to the key U.S. market over the projection period.

As investment in M&E continues to ramp up to improve productivity, neutralize labour shortages and reduce carbon emissions, the industry will have the opportunity to play a significant role in developing the next generation of machinery. The resulting pace of growth in real GDP is projected to accelerate over the period 2022-2023, averaging 1.7% annually, with a large part of the increase occurring in 2022-2023. Faster growth in production is expected to lead to a modest rebound in employment at an average pace of 0.3% per year. This means that most of the increase in output is expected to be met by additional gains in productivity, averaging 1.4% annually. Additive manufacturing, which refers to technologies that build three-dimensional objects by adding multiple layers of material, could potentially revolutionize how several fabricated metal products are created, reducing waste in production and improving efficiency. Although many jobs associated with repetitive and routine tasks are expected to be threatened by increased automation, there could be stronger demand for skilled workers who can operate more complex machinery used in the manufacturing process.

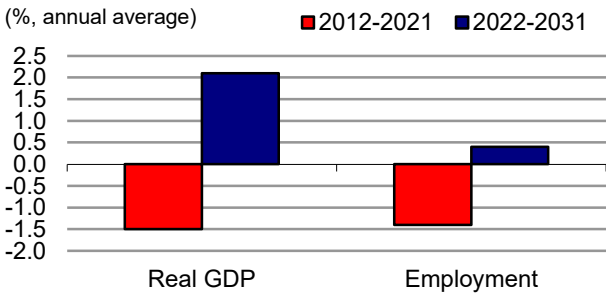
Computer, Electronic and Electrical Products (NAICS 3341-3346; 3351-3359)

This industry comprises establishments primarily engaged in manufacturing information and communications technology (ICT) devices, such as computers and peripherals, telecommunication and audio-video equipment, navigational and measuring instruments, as well as electronic components for such products. It also comprises establishments involved in manufacturing products that generate, distribute and use electrical power, such as generators,

transformers, switchgears, batteries, wires, electrical motors and household appliances. ICT is the most important of the two segments, accounting for about two-thirds of production in 2021. Overall, the industry is highly export intensive, with about 75% of its revenues coming from abroad, largely from the United States which accounts for 70% of exports. The industry is also largely exposed to import penetration with a substantial share of domestic demand met by imports, mainly from the United States, China and Mexico. It employed 106,700 workers in 2021 (6.1% of total manufacturing employment), with 60% in the ICT segment. Employment is mostly concentrated in Ontario (53%) and Quebec (26%), and the workforce is predominantly composed of men (72%). Key occupations (4-digit NOC) include: [(2)]

Electronics assemblers, fabricators, inspectors and testers (9523)
Assemblers and inspectors, electrical appliance, apparatus and equipment manufacturing (9524)
Electrical and electronics engineers (2133)
Supervisors, electronics manufacturing (9222)
Supervisors, electrical products manufacturing (9223)
Machine operators and inspectors, electrical apparatus manufacturing (9527)
Computer programmers and interactive media developers (2174)
Electrical and electronics engineering technologists and technicians (2241)

Real GDP and Employment Growth Rates in Computer, Electronic, Electrical Products



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

While the industry posted impressive growth in the late 1990s, largely driven by the strong performance of the ICT segment, production and employment fell almost continuously after the dot-com bubble burst of 2001. This reflects various challenges faced by the industry during that period, including the market saturation for ICT products in the early 2000s (largely due to an over capacity in the telecommunications infrastructure); the global recession of 2008-2009; the strong appreciation of the Canadian dollar (prior to 2014); and most importantly, the intensification of international competition on both domestic and foreign markets. Canada's market share in the United States has been declining since the early 2000s, while imports from China have more than doubled in the last ten years. Producers are increasingly relocating to low-cost countries and China's market share in Canada has been exceeding that of the United States since 2010 and is now accounting for more than 40% of Canadian imports of ICT products. Sales from the wireless communications segment were particularly affected by BlackBerry's difficulties and decision to stop making phones, in part because of intense competition from Apple's iPhone and Google's Android supported devices. After reaching a through in 2014, the industry's production rebounded from 2015 and 2019, primarily reflecting increased demand for semiconductors and other electronic components and growing exports to the United Sates, most likely attributable to a weaker Canadian dollar. Unsurprisingly, major shutdowns at the onset of the COVID-19 pandemic led to a sharp decline in production in 2020, offsetting all the increase recorded in the previous five years. And the modest rebound recorded in 2021 left the output significantly below its pre-pandemic level of 2019. On average, real GDP in the industry contracted at an annual rate of 1.5% over the period 2012-2021, compared to a decline of 1.4% for employment, with most of the job losses concentrated in 2013 and 2019. In contrast with many

other industries, employment slightly increased in 2020-2021, most likely reflecting increased labour demand for the production of medical instruments. Productivity growth has been minimal over the past decade, averaging only 0.1% annually.

Over the period 2022-2031, output growth in computer, electronic and electrical products is projected to return to positive territory and strengthen markedly, with a significant part of the growth occurring in the short term as the industry continues to recover from the pandemic. In the longer term, the industry will continue to benefit from steady increases in business investment in North America and growing opportunities brought by new technologies. After posting negative growth over the past decade, business investment in machinery and equipment (M&E) is expected to straighten markedly in Canada and continue to grow at a solid pace in the United States, boosting domestic and foreign demand for ICT products which rely heavily on corporate spending. High replacement rates and perpetual innovation for many ICT products are also expected to keep driving consumer interest in new products. New technologies, such as mobile and cloud computing, the Internet of Things (IoT), 5G network, advanced robotics, machine learning and artificial intelligence, are projected to result in growing global demand for ICT products. With electronics being increasingly embedded in a variety of consumer products, such as vehicles and appliances, and considering the proliferation of applications for smartphones and other ICT devices, the design and manufacture of sensors, measuring, control and navigational instruments represent a key source of growth for the industry.

The need to reduce carbon emissions is also expected to drive the demand for greener, more energy-efficient buildings. Smart building automation systems rely on computer and electronics manufacturers to provide the various instruments and devices that can regulate and control buildings' lighting, heating, ventilation and air conditioning. Canada has fared well in this market segment over the past several years, especially in the United States, as its competitiveness was boosted by innovative products that stand out relative to those of other competing nations. Those developments, combined with the relatively low value of the Canadian dollar and the Canada-U.S.-Mexico Agreement (CUSMA) should continue to stimulate exports in the industry and attract foreign investment. The electrical segment of the industry is also expected to benefit from the growing popularity of electric vehicles, which, according to the International Energy Agency[(4)], is projected to grow from 15 million vehicles in 2021 to 226 million in 2030. However, developing and maintaining intellectual property is critical for the industry's success, as it accounts for three-quarters of total investment in the industry. In light of numerous and promising opportunities, real GDP growth is projected to average 2.1% annually over the period 2022-2031. Renewed growth in production is expected to result in a modest rebound of 0.4% per year in employment, although most of the growth in output should come from faster gains in productivity resulting from increased automation within the industry and the shift toward higher value-added products. On average, productivity is expected to rise by 1.7% annually over the coming decade.

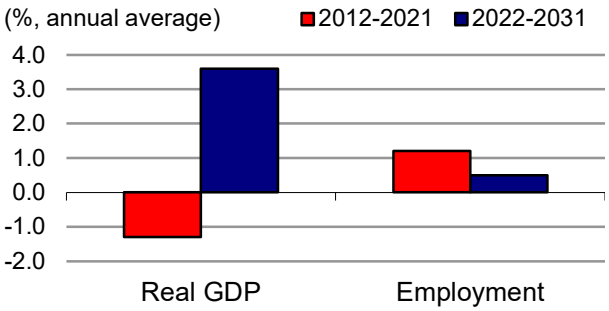
[(4)] International Energy Agency, Global Electric Vehicles (EV) Outlook.

Motor Vehicles, Trailers and Parts (NAICS 3361; 3362; 3363)

This industry comprises establishments primarily engaged in manufacturing motor vehicles (29% of total production in 2021); motor vehicle parts, including engines (64%); and motor vehicle bodies and cabs, truck trailers and non-commercial trailers (9%). Overall, the industry is highly export intensive as around 80% of its production is shipped to foreign markets, mostly to the United States which accounts for 95% of exports. The three segments, however, do not face the same degree of export intensity. The motor vehicles segment is the most export intensive (94%), followed by motor vehicle parts (57%) and motor vehicle bodies and trailers (42%). The industry employed a total of 168,200 workers in 2021 (9.7% of total manufacturing employment), with 36% in motor vehicles, 54% in motor vehicle parts, and 10% in motor vehicle bodies and trailers. The workforce is mostly composed of men (76%) and Ontario is by far the largest employer, accounting for 79% of all automobile workers in Canada. Key occupations (4-digit NOC) include:[(2)]

Other metal products machine operators (9418)
Motor vehicle assemblers, inspectors and testers (9522)
Supervisors, motor vehicle assembling (9221)
Metalworking and forging machine operators (9416)
Welders and related machine operators (7237)
Mechanical engineers (2132)
Labourers in metal fabrication (9612)
Mechanical assemblers and inspectors (9526)
Tool and die makers (7232)
Mechanical engineering technologists and technicians (2232)
Industrial painters, coaters and metal finishing process operators (9536)
Machining tool operators (9417)

Real GDP and Employment Growth Rates in Motor Vehicles, Trailers and Parts



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

The industry has been through major challenges since the late 2000s, primarily reflecting increased import penetration on the North American market and the aftermath of the 2008-2009 recession. In addition to the shift in consumer preferences toward more fuel-efficient Asian-made cars, the recession led to a drastic decline of new vehicle sales in the United States. As a result, the Detroit Three manufacturers undertook major restructuring programs to avoid bankruptcy, including a new era of wage negotiations. While Canada's automotive sector emerged as a more efficient global contender, that was not sufficient to offset the shift in production to Mexico, where wage rates are much lower. After falling drastically in 2008 and 2009, production in the Canadian industry partly recovered from 2010 to 2014, driven by the accumulation of a huge pent-up demand in the United States during the recession and softer financing conditions. Production remained relatively stagnant through 2019 with the gradual fading of the pent-up demand and the shift in consumer demand from the passenger cars toward light trucks such as sport utility vehicles (SUVs) and pickup vans. The industry was severely impacted by the COVID-19 pandemic as national lockdowns and transportation restrictions lowered demand for motor vehicles, while temporary shutdowns, supply chain disruptions and shortages of semiconductors affected production. Consequently, the output fell markedly in 2020 and contracted again in 2021, erasing all the gains recorded in the previous eight years. This resulted in a net decline in the industry's real GDP averaging 1.3% annually for the entire period

2012-2021. In comparison, employment was more resilient, growing at an average pace of 1.2% per year, despite some volatility. Following solid gains after the recession of 2008-2009 due to major restructuring and the high intensity of the industry, productivity stagnated from 2014 to 2019, before falling abruptly during the pandemic years of 2020-2021, primarily reflecting the large decrease in output. The net result was an annual decline of 2.5% in productivity over the full period 2012-2021.

Over the projection period, output growth in the industry is expected to return to positive territory and strengthen markedly, although it will take several years before production fully recovers from the pandemic. Following the significant decline in motor vehicle sales, the offloading of car rental fleets and the accumulation of household savings, demand is projected to increase back from both consumers and car rental companies, but output growth will remain constrained by persisting shortages in semiconductors, particularly in the short term. Over the medium to long term, the industry will benefit from the transition toward higher-end vehicles and electric vehicles. Indeed, the shift toward high-profit-margin and high-volume light trucks in Canadian automakers' product lineup will contribute to increase the value of the output. The growing production of light trucks, which are larger and require more components per vehicle than passenger cars, will also continue to benefit Canada's parts manufacturers moving forward. Additional models have recently entered the Canadian production lineup, including Toyota's RAV4 and Lexus NX models. Such developments are expected to boost the value and the volume of domestic parts purchases. In addition to the switch toward higher-end vehicles, auto manufacturers are investing significantly in the development of technologies that will support electrified, connected and self-driving vehicles. Stricter vehicle emission standards are encouraging original equipment manufacturers (OEMs) to develop more fuel-efficient vehicles, which is accelerating the lightweighting and electrification of traditional vehicle parts. This will push auto suppliers to innovate with non-traditional materials and designs, as well as advanced manufacturing processes. Fortunately, Canada is well positioned to benefit from these new developments through its Toronto-Waterloo high-tech and advanced manufacturing corridor, its highly skilled labour force, and various financial incentives and programs by the Federal and Ontario governments to attract investment and strengthen the automotive sector's competitiveness of OEMs and parts suppliers. Canada has also the capacity to become globally competitive in battery production for electric vehicles because of its large mineral endowments (such as graphite, nickel, cooper, lithium, and cobalt). A large portion of the $8-billion Net Zero Accelerator initiative put in place by the federal government will go toward creating a domestic battery supply chain within the country.

Canada's trade relations with the United States have also improved. The removal of U.S. tariffs on steel and aluminum imported from Canada has lowered material costs and increased profit margins for auto manufacturers, while the new Canada-U.S.-Mexico Agreement (CUSMA), which requires a portion of the production to be done by workers making at least US$16 per hour, will certainly provide Canada with an advantage by reducing the wage gap with Mexico. The relatively low value of the Canadian dollar is also expected to stimulate exports and reduce the cost of Canadian labour relative to the United States. However, the output is expected to plateau somewhat toward the end of the projection period, once production has returned to pre-pandemic levels. On average, real GDP in the industry is projected to increase at an annual rate of 3.6% over the period 2022-2031, recording the strongest growth rate among the manufacturing

industries with aerospace, rail, ship and other transportation equipment. Despite a substantial improvement in output growth, employment growth is projected to slow relative to the previous decade, averaging 0.5% annually, due to a strong rebound in productivity. An initial decline in employment is expected in 2022 as the industry adapts to significantly lower output levels, after which employment is projected to grow moderately until it rises slightly above its pre-pandemic levels and plateaus toward the end of the 2022-2031 period. Consequently, productivity growth is expected to be the largest source of output growth over the coming decade, averaging a strong 3.1% annually, with a significant part of the growth occurring in 2022. The industry is expected to increase its efficiency and improve its cost-competitiveness in response to the growing presence of high-tech and electronic equipment companies in new vehicle technologies. Several manufacturing facilities are undergoing large scale modernization projects in order to transform their production line toward electric vehicles and batteries, which entails updating their manufacturing equipment to cutting-edge and more efficient technologies. The industry is also implementing more advanced manufacturing processes, such as using artificial intelligence and 3D printing to produce lightweight car parts.

Aerospace, Rail, Ship and Other Transportation Equipment
(NAICS 3364; 3365; 3366; 3369)

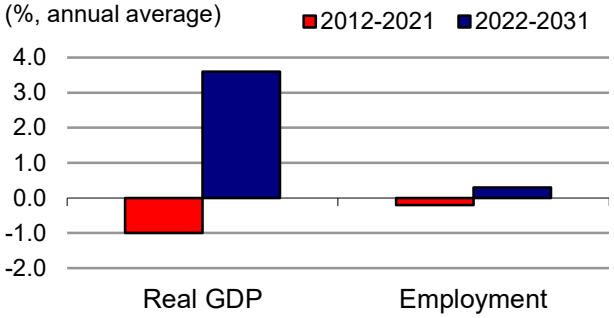
This industry comprises establishments primarily engaged in manufacturing aerospace products and parts; railroad rolling stock; ships and boat building; and other types of transportation devices (such as military vehicles, motorcycles, snowmobiles, golf carts, bicycles). Aerospace is by far the most important of the four segments, accounting for 70% of production in 2021. Overall, the industry is highly export intensive as around 55% of its production is shipped to foreign countries, largely to the United States which represents 55% of exports. The aerospace segment is the most exposed to global economic conditions as deliveries to foreign markets account for about 70% of total production. The industry employed 82,000 workers in 2021 (4.7% of total manufacturing employment), with 72% in aerospace, 14% in ships and boat building, 3% in railroad rolling stock, and 10% in other types of transportation devices. Employment is mostly concentrated in Quebec (47%) and Ontario (27%), and the workforce is predominantly composed of men (80%). Key occupations (4-digit NOC) include: [(2)]

- Aircraft assemblers and aircraft assembly inspectors (9521)
- Aerospace engineers (2146)
- Aircraft instrument, electrical and avionics mechanics, technicians and inspectors (2244)
- Supervisors, other mechanical and metal products manufacturing (9226)
- Industrial painters, coaters and metal finishing process operators (9536)
- Labourers in metal fabrication (9612)
- Welders and related machine operators (7237)
- Machinists and machining and tooling inspectors (7231)
- Mechanical assemblers and inspectors (9526)
- Boat assemblers and inspectors (9531)

The industry is highly integrated into global supply-chains and driven by trade, making demand for products such as finished aircrafts and related components like engines and parts tend to line up with developments in the world economy. After being severely impacted by the global

recession of 2008-2009, real GDP rebounded at a pace exceeding 5% annually from 2011 to 2014, stimulated by the global economic recovery and strong increases in new orders following the accumulation of a pent-up demand during the recession. Output fell again from 2015 to 2017, reflecting uncertain economic conditions resulting from the collapse in crude oil prices, slower economic growth in emerging markets, and trade tensions between Canada and the United States. In 2018 and 2019, production increased above its previous peak of 2014, in line with the notable acceleration in global and U.S. economic growth. However, the industry was severely affected by the COVID-19 pandemic as public health measures drastically reduced the volume of air travel passengers. Airlines faced difficult budgetary circumstances and many canceled orders for new aircraft to help balance their books. In addition, the grounding of passenger planes reduced the need for maintenance, repairs and aircraft parts, although the surge of e-commerce (air cargo) helped moderate the decline in this sub-segment. Consequently, the output fell markedly in 2020 and contracted again in 2021, erasing all the gains recorded in the previous eight years. This resulted in a net decline in the industry's real GDP averaging 1.0% annually for the entire period 2012-2021. In comparison, employment decreased by only 0.2% per year. After fluctuating significantly, employment experienced a significant jump in 2019, which reduced the impact of the large decline observed during the pandemic years. Productivity was largely stable during most of the past decade, until the pandemic caused a notable decrease in 2020, resulting in an average decline of 0.8% annually over the whole decade.

Real GDP and Employment Growth in Aerospace, Rail, Ship and Other Transportation



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Over the projection period, output growth is expected to return to positive territory and strengthen markedly, as the industry gradually recovers from the pandemic and global air travel continues to expand. The volume of air travel passengers is expected to return to pre-pandemic levels in the early years of the forecast, leading to a pickup in orders for new aircraft and renewed growth in output. However, it will take several years before the level of production fully recovers as commercial airlines remain in precarious financial circumstances and may decide to postpone some of their investments in new aircraft. In the longer term, the industry will benefit from additional demand for air travel. According to the International Air Transport Association (IATA)[(5)], the number of air travel passengers worldwide could double over the next 20 years, up from 4 billion passengers per year in 2019 to almost 8 billion passengers in 2040, which is the equivalent of the global population. More than half of this increase is expected to come from the Asia-Pacific region. The IATA is also committed to a carbon-neutral growth path with the goal of reducing the industry's net emissions to half their 2005 levels by 2050. To meet the substantial growth in air travel demand and these ambitious environmental targets, global airlines will need to invest significantly in new aircraft over the next decade, boosting growth in the global and Canadian aerospace industry. In 2021, the governments of Canada and Quebec announced a shared

[(5)] International Air Transport Association, Global Outlook for Air Travel.

investment of $693 million for several firms working on sustainable aviation projects, including CAE (which makes use of big data and artificial intelligence to advance research toward building electric aircraft) and Pratt & Whitney (to develop hybrid-electric propulsion system for jet engines). Combined with the Strategic Innovation Fund, total aerospace spending in the Federal Budget 2021 exceeded $2 billion. Aerospace will also play a significant part in Canada's Net Zero Accelerator initiative. Growing production and export levels for new aircraft models, such as Bombardier's new Global 5500 and 6500 business jets, will continue to support the industry, along with the federal government's recent decision to replace the aging fleet of CF-18 fighter jets by the F-35A manufactured by Lockheed Martin. The Canadian industry has seen $2.8 billion in contracts to date related to the construction of the fighter jet. The removal of U.S. tariffs on Canadian steel and aluminum and the new Canada-U.S.-Mexico Agreement (CUSMA) represent positive developments for exports, and may add efficiencies, or at least greater certainty, to North American aerospace supply chain. However, with global competition continuously on the rise, and the poles of economic power and air travel demand shifting toward Asia, the future success of the Canadian aerospace industry is being challenged on multiple fronts and experts are calling for a national strategy to address those concerns.

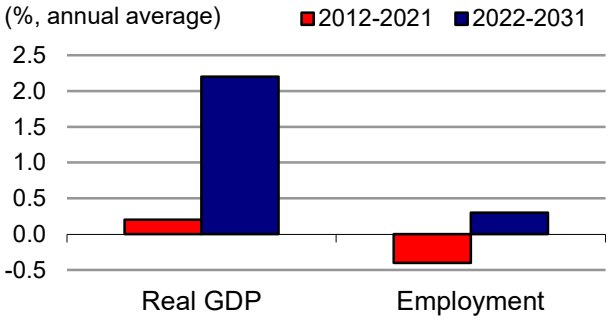
Other segments of the industry are expected to be supported by solid growth in shipbuilding and rail activity. Several major contracts have been awarded to Canadian businesses for the construction of combat and non-combat vessels for the Canadian Navy and Canadian Coast Guard under the federal government National Shipbuilding Procurement Strategy. The outlook for the fabrication of railroad equipment also looks quite optimistic as the transportation of oil by train is increasing at a rapid pace in North America due to the lack of pipeline capacity. Furthermore, changing demographics, increased road congestion and environmental concerns are all expected to foster global demand for transit systems, including rail and subway. On average, real GDP in aerospace, rail, ship and other transportation equipment is projected to grow at an annual rate of 3.6% over the period 2022-2031, recording the strongest growth rate among the manufacturing industries with motor vehicles, trailers and parts. Despite the strong improvement in output growth relative to the past decade, employment growth is projected to be modest, averaging only 0.3% annually, as firms are expected to boost investment in productivity enhancing machinery and equipment to keep pace with growing demand and a scarcity of skilled labour, particularly in aerospace. Increased spending on robotics and digitization will lead to further automation and smart manufacturing. Virtual and real-time representations of physical components as well as sensor-based predictive maintenance will streamline repairs and enhance productivity. Additive manufacturing will also help firms to produce more cost-effective components. Overall, productivity growth is expected to resume and average a strong 3.3% annually during the next decade, contributing to most of the growth in output. As factories rely more on big data and automation, workers will need to develop new competencies and wholly new positions such as data scientists may become more prominent.

Textile, Clothing, Leather and Furniture
(NAICS 3131-3133; 3141-3149; 3151-3159; 3161-3169; 3371-3379)

This industry comprises establishments primarily engaged in manufacturing textiles, clothing, leather, and furniture and related products (such as kitchen cabinets, bathroom vanities and counters). Furniture and related products are the largest of the three segments, accounting for 67% of production in 2021, followed distantly by textiles (17%) and clothing (16%). Overall, more than 50% of the industry's production is shipped to foreign countries, mostly to the United States which accounts for 90% of exports. Clothing is the most export intensive segment (85%), followed by textiles (50%) and furniture and related products (40%). All segments of the industry have also been facing a substantial increase in import penetration in both the Canadian and U.S. markets from low-cost producers, particularly from China. The industry employed 117,500 workers in 2021 (6.8% of total manufacturing employment), with 57% in furniture and related products, 30% in clothing and 14% in textiles. Employment is mostly concentrated in Ontario (37%) and Quebec (37%), with men accounting for the majority of the workforce (54%). Key occupations (4-digit NOC) include: [(2)]

Furniture and fixture assemblers and inspectors (9532)
Industrial sewing machine operators (9446)
Supervisors, furniture and fixtures manufacturing (9224)
Supervisors, textile, fabric, fur and leather products processing and manufacturing (9217)
Furniture finishers and refinishers (9534)
Other labourers in processing, manufacturing and utilities (9619)
Woodworking machine operators (9437)
Weavers, knitters and other fabric making occupations (9442)
Industrial designers (2252)
Labourers in textile processing (9616)
Inspectors and graders, textile, fabric, fur and leather products manufacturing (9447)
Textile fibre and yarn, hide and pelt processing machine operators and workers (9441)
Cabinetmakers (7272)
Fabric, fur and leather cutters (9445)

Real GDP and Employment Growth Rates in Textile, Clothing, Leather and Furniture



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

After peaking in the late 1990s, production and employment in the industry fell drastically during the following decade. This reflected various challenges faced by the industry over that period, including the intensification of competition from low-cost producers on the domestic and export markets; the reduction of trade barriers (more particularly the lifting of import quotas on textile, clothing and leather products in 2005); the strong appreciation of the Canadian dollar (which contributed to lower exports and increase imports); and the global recession of 2008-2009. Production and employment continued to decline from 2011 to 2014, albeit at a much slower pace, before rebounding modestly from 2015 to 2018. During those years, activity in the industry was supported by a restructuration of the textile and clothing segments toward high-value-added niche markets (which are less exposed to global competition) as well as the gradual recovery in North America's residential investment and its positive impact on the furniture segment. The decline in the value of the Canadian dollar that followed the collapse in

crude oil prices also helped to increase exports of textiles, clothing and furniture to the United States, which resulted in renewed growth in production and employment. Following a small dip in 2019, the output fell substantially in 2020 as major shutdowns at the onset of the COVID-19 pandemic disrupted production, erasing all the gains recorded from 2015 to 2018. Supported by increased demand for furniture in response to the substantial jump in residential investment, the industry's output rebounded marginally in 2021, leaving production well below its pre-pandemic level. Those fluctuations lowered real GDP growth to an average of only 0.2% annually for the entire period 2012-2021. After reaching an historical low in 2015, employment temporarily rebounded in 2016, but returned to its negative path thereafter, resulting in an average decline of 0.4% per year. While the decreases in employment have been less severe in the past ten years, the industry has cut about half of its workforce since the early 2000's due to the declining trend in production, largely attributable to the growing presence of low-cost producers on the domestic and export markets. In response to the intensification of global competition, manufacturers have restructured and consolidated their operations toward more value-added products, leading to an average increase of 0.6% annually in productivity during the last decade.

Over the period 2022-2031, output growth in textile, clothing, leather and furniture is projected to accelerate markedly relative to the previous ten years, with a large part of the gains occurring in the short term as the industry continues to recover from the pandemic. In the longer term, the industry should continue to benefit from the relatively low value of the Canadian dollar, which makes products manufactured in Canada more competitive relative to imports and contributes to support exports and domestic sales. Foreign demand is expected to be supported by the growing middle class and new market opportunities in emerging countries, particularly for high-end and luxury furniture. Canada's unique expertise in developing and producing technical and smart textiles used in the construction, health care, defence and aerospace industries also represents promising opportunities. That said, although some of the restructuring has forced the industry to move up the value-added chain and develop specialized niche products, the penetration of new export markets will remain very challenging in this highly competitive industry. While the Canada-U.S.-Mexico Agreement (CUSMA) should ensure tariff-free access to the North American market, it also exposes Canadian producers to increased competition from Mexican manufacturers where labour costs are significantly lower.

On the domestic front, the industry will be challenged by the fact that growth in consumer spending on durable and semi-durable goods is projected to weaken progressively due to slower growth in disposable income (resulting from the gradual slowdown in Canada's employment growth and massive retirements of baby-boomers. Higher interest rates are also expected to reduce consumer's ability to finance new furniture purchases. A weaker outlook for new housing and resale activity is an additional factor expected to restrain domestic demand for furniture and related products. On a positive note, the continued expansion of e-commerce will allow apparel manufacturers to market their products directly to costumers, eliminating retail markups and some of the downside factors that the industry is currently facing. On average, real GDP is projected to grow by 2.2% annually over the period 2022-2031, recording a strong increase in 2022 and more moderate gains for the remainder of the projection period. The significant acceleration in output growth relative to the past decade is expected to lead to a modest rebound in employment, averaging 0.3% per year, with most of the increase occurring in 2022, as additional gains in

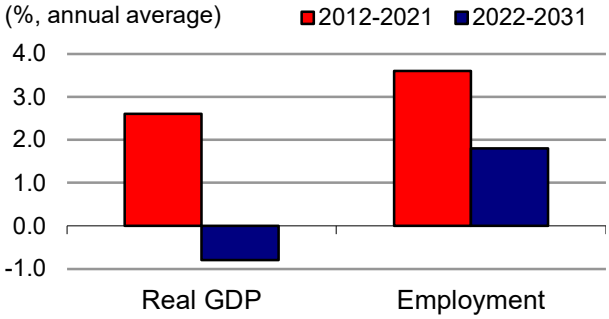
productivity is expected to restrain job creation thereafter. Overall, productivity growth is expected to accelerate at an average pace of 1.9% annually, reflecting the need to lower production costs in this highly competitive environment and reduce the efficiency gap observed with most other manufacturing industries in the past several years. While some parts of the furniture segment remain intensive in labour (e.g. wood furniture), there is still room to increase automation in the textile and clothing segments.

Miscellaneous Manufacturing (NAICS 3391; 3399)

This industry comprises establishments not classified in any other manufacturing industries. These establishments manufacture a diverse range of products, including medical equipment and supplies (such as blood transfusion equipment, surgical instruments, dental equipment, eyeglasses, contact lenses, prosthetics and wheelchairs) and miscellaneous products (such as jewellery and silverware, sporting and athletic goods, toys and games, and office supplies). Miscellaneous products are the largest of the two segments, accounting for 63% of production in 2021. Overall, about 50% of the industry's production is shipped to foreign countries, primarily to the United States which accounts for 70% of exports. The industry employed 113,800 workers in 2021 (6.6% of total manufacturing employment), with 73% in miscellaneous products and 27% in medical equipment and supplies. Employment is mostly concentrated in Ontario (54%), Quebec (21%) and British Columbia (10%), and the workforce is mainly composed of men (62%). Key occupations (4-digit NOC) include: [3]

- Other products assemblers, finishers and inspectors (9537)
- Supervisors, other products manufacturing and assembly (9227)
- Other labourers in processing, manufacturing and utilities (9619)
- Dental technologists, technicians and laboratory assistants (3223)
- Other medical technologists and technicians (except dental health) (3219)
- Denturists (3221)

Real GDP and Employment Growth Rates in Miscellaneous Manufacturing



Sources: Statistics Canada (historical data) and ESDC 2019 COPS industrial projections.

Since the products manufactured by the industry are largely utilized by consumers and businesses, production is primarily tied to household consumption and business spending. Furthermore, many of the industry's products can be classified as recreational or leisure goods, making demand for such products very sensitive to discretionary expenditures and business cycles. As a result, production and employment in the industry fell markedly during the global recession of 2008-2009, mainly reflecting lower demand for products in the miscellaneous segment due to rapid declines in discretionary income and corporate profits. After recovering in 2010-2011, driven by the release of the pent-up demand accumulated during the recession, output in the industry fell again from 2012 to 2014, partly in response to growing household debt and lower business confidence. Production increased back from 2015 to 2019, stimulated by a rise in exports following the significant decline in the value of

the Canadian dollar, and by a strong acceleration in household consumption attributable to robust labour markets in both Canada and the United States. In contrast with many other industries, miscellaneous manufacturing was not negatively impacted by the COVID-19 pandemic, as output continued to grow in 2020 and jumped significantly in 2021. Indeed, the surge in hospitalizations during the pandemic increased demand for medical equipment and supplies, while home confinement led to a shift in recreational spending from services (tourism, travel, entertainment, restaurants, etc.) toward goods (such as sporting and athletic equipment, toys and games, etc.). The resulting pace of growth in the industry's real GDP averaged a solid 2.6% per year for the entire period 2012-2021. Employment largely tracked the movement in output, but at a faster pace of 3.6% annually, due to a modest decline in productivity (-1.0% per year). Declining productivity primarily reflected softer capital spending in the industry over the past decade and the fact that a large number of firms are relatively small and highly labour intensive.

Over the period 2022-2031, the output in miscellaneous manufacturing is projected to contract, driven by significant declines in the early years of the forecast. This primarily reflects the unwinding of strong pandemic-related demand for medical equipment and supplies, and the fact that consumer spending is expected to move away from goods, given the accumulation of a significant pent-up demand for recreational services that were less accessible during the pandemic (such as tourism, travel, entertainment, and restaurants). Starting around 2025, output growth is projected to resume, primarily driven by renewed growth in demand for medical equipment and supplies as population aging is expected to increase spending on health care. Canadian firms have unique expertise in developing and producing the latest health-related equipment and are well positioned to take advantage of growing market opportunities, particularly in developed countries planning to improve their health care infrastructure. However, demand for recreational and leisure products is expected to be restrained by the slower pace of growth anticipated in disposable income in Canada and the United States (resulting from the gradual slowdown in overall employment growth and massive retirements of baby-boomers). Strong inflation and higher interest rates are also expected to put pressures on household budgets, restraining discretionary spending on luxury and recreational goods. On average, real GDP is projected to contract by 0.8% annually over the period 2022-2031, primarily reflecting lower demand for the industry's products in the near term, following a strong increase during the pandemic years. The anticipated decline in production is expected to result in slower employment growth relative to the previous decade, averaging 1.8% per year. Overall, productivity will keep declining, down by 2.6% annually, essentially reflecting lower production and higher employment during the early years of the projection period. Thereafter, productivity growth is expected to resume modestly, restraining job creation in the industry.

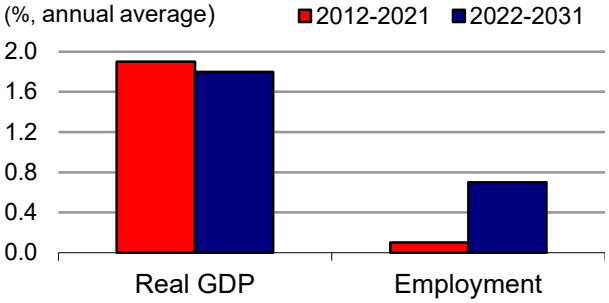
Wholesale Trade (NAICS 4111-4191)

This industry comprises establishments primarily engaged in wholesaling merchandise, and providing related logistic, marketing and support services. The wholesaling process is generally an intermediate step in the distribution of merchandise in large quantities to retailers, businesses and institutions. Machinery, equipment and supplies are the most important segment within the industry, accounting for 29% of both production and employment in 2021. Other key segments

include personal and household goods (18% of production and 11% of employment), building material and supplies (14%, 17%), food and beverages (10%, 16%), and motor vehicles and parts (9%, 8%). The industry employed 633,600 workers in 2021, mostly concentrated in Ontario (39%), Quebec (24%), British Columbia (14%) and Alberta (12%), with a workforce mainly composed of men (67%). Key occupations (4-digit NOC) include:

Sales and account representatives - wholesale trade (non-technical) (6411)
Technical sales specialists - wholesale trade (6221)
Retail and wholesale trade managers (0621)
Material handlers (7452)
Transport truck divers (7511)
Shippers and receivers (1521)
Supervisors, supply chain, tracking and scheduling co-ordination occupations (1215)
Heavy-duty equipment mechanics (7312)
Accounting and related clerks (1431)
Retail and wholesale buyers (6222)
Store shelf stockers, clerks and order fillers (6622)
Purchasing and inventory control workers (1524)
Storekeepers and partspersons (1522)

Real GDP and Employment Growth Rates in Wholesale Trade



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Wholesale trade primarily relies on household consumption and business investment, making the industry highly sensitive to fluctuations in domestic and foreign economic conditions. After being severely affected by the recession of 2008-2009, the industry's output quickly recovered in 2010 and continued to grow at a solid pace until 2019, with the exception of a small decline in 2015-2016, which coincided with slower economic growth in Canada resulting from the sharp fall in crude oil prices. The output contracted again in 2020, during the first year of the COVID-19 pandemic, with lockdowns leading to a temporary decline in consumer spending and a sizeable drop in business investment, particularly in non-residential structures and machinery and equipment. The decline in merchandise exports is an additional factor that contributed to the contraction in output since many wholesalers are involved in international trade and are deeply integrated in supply chains across multiple sectors of the economy. The output straightened markedly in 2021, up by 5.3%, as the increase in disposable income (arising from government support programs and a large accumulation of savings) led to a rebound in consumer spending and a surge in residential investment. More specifically, with the continuation of home confinement and telework policies, consumption expenditures shifted toward goods and many households searched for a bigger house or a new house away from urban areas or turned to home improvements, propelling resale activity, new home construction and renovation spending. Those developments stimulated the purchases of various durable and semi-durable goods such as furniture and home furnishing, office and computer equipment, building material and supplies, household appliances, amusement and sporting goods, etc. The resulting pace of growth in the industry's real GDP averaged 1.9% annually over the period 2012-2021.

After peaking in 2017, employment fell sharply in the following three years, before rebounding modestly in 2021. These fluctuations lowered employment growth to an average annual rate of only 0.1% over the past ten years, making productivity growth (+1.8% annually) almost the sole contributor to output growth. Productivity gains were driven by the growing adoption of new

technologies, such as radio frequency identification devices, which have allowed wholesalers to track their inventory more accurately with fewer workers. Increased competition from e-commerce have also helped consumers compare prices across wholesalers, putting downward pressures on profit margins and keeping hiring subdued.

Over the projection period, output growth in wholesale trade is expected to remain essentially unchanged from the period 2012-2021, as a weaker outlook for consumer spending on goods and for residential investment will be accompanied by a better outlook for business investment related to machinery and equipment, engineering structures and non-residential buildings. While the industry's real GDP is expected to keep growing at a decent pace in 2022, the rate of growth is expected to slow significantly in 2023-2024 as consumption moves away from goods (reflecting the significant amount of pent-up demand accumulated for some services during the pandemic). High inflation and rising interest and mortgage rates are also expected to restrain growth in consumer spending (particularly for big-ticket items) and reduce residential investment in the short to medium term. Once inflation returns to its target rate of 2%, output growth in wholesale trade should improve modestly. However, the gradual slowdown anticipated in Canada's employment growth and massive retirements of baby-boomers from the labour market are expected to restrain growth in disposable income and consumer spending over the longer term, while the decline anticipated in household formation rates due to population aging is expected to limit growth in residential investment. On the positive side, the industry, which also distributes merchandise to various businesses in addition to retailers, is expected to benefit from renewed growth in business investment related to machinery and equipment and engineering structures and faster growth in the construction of non-residential buildings, alleviating some of the weakness anticipated in the consumption of goods and residential investment. Those factors are expected to support the purchases of machinery and equipment and building materials and supplies, which account for the largest segments of the industry. The relatively low value of the Canadian dollar (which is projected to remain below 0.80 US dollar) is expected to have a mixed impact for wholesalers, increasing price competitiveness for exporters, but lowering price competitiveness for importers. That said, the Canada-U.S.-Mexico Agreement (CUSMA) will continue to foster growth opportunities for wholesalers involved in international transactions of merchandises.

On average, real GDP in the industry is projected to increase by 1.8% annually over the period 2022-2031. Despite similar output growth relative to the past ten years, employment growth is expected to accelerate significantly, averaging 0.7% annually, largely reflecting strong gains in 2022-2023, as some segments of the industry are still in the process of recovering the jobs lost during the pandemic. Starting in 2024, employment growth is expected to be essentially anemic as productivity-enhancing technologies related to inventory management and other logistical services are expected to continue to restrain job creation in the industry (especially for jobs involving repetitive tasks), while sensor-enhanced robotics threaten on-the-floor jobs (such as fork-lift drivers). Increased competition from e-commerce, on-demand production and other direct-to-customer operations by manufacturers that bypass intermediates will also have many implications for supply chains and for storage, pressuring wholesalers to restructure their operations by lowering labour costs and adopting automation enhancing machinery. On average, productivity is expected to increase by 1.1% annually over the projection period. This slower pace

of growth relative to the past decade essentially reflects the large gains anticipated in employment in 2022-2023.

Retail Trade (NAICS 4411-4543)

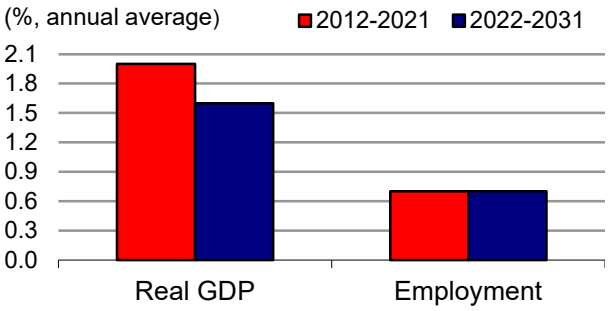
This industry comprises establishments primarily engaged in retailing merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. The retailing process is the final step in the distribution of merchandise in small quantities to the general public. Food and beverage stores are the most important segment within the industry, accounting for 19% of production and 26% of employment in 2021. Other key segments include motor vehicle and parts dealers (15% of production and 11% of employment), health and personal care stores (12%, 10%), general merchandise stores (11%, 12%), clothing stores (8%, 8%), and building material and garden equipment and supplies dealers (8%, 8%). With a total of 2.2 million workers in 2021, it was the largest employer across the economy. The workforce is characterized by a strong concentration of young (31% of workers are aged between 15 and 24) and part-time workers (35%). Employment is distributed proportionately to population: 37% in Ontario, 23% in Quebec, 15% in British Columbia, 12% in Alberta and 13% in the remaining provinces, with women accounting for a slight majority of the workforce (51%). Key occupations (4-digit NOC) include:

Retail salespersons (6421)
Cashiers (6611)
Retail and wholesale trade managers (0621)
Retail sales supervisors (6211)
Store shelf stockers, clerks and order fillers (6622)
Butchers, meat cutters and fishmongers - retail and wholesale (6331)
Other medical technologists and technicians (except dental health) (3219)
Automotive service technicians, truck and bus mechanics and mechanical repairers (7321)
Material handlers (7452)
Pharmacists (3131)
Shippers and receivers (NOC 1521)
Other customer and information services representatives (6552)
Food counter attendants, kitchen helpers and related support occupations (6711)
Other sales related occupations (6623)
Delivery and courier service drivers (7514)
Bakers (6332)
Retail and wholesale buyers (6222)
Service station attendants (6621)
Supervisors, supply chain, tracking and scheduling co-ordination occupations (1215)
Accounting and related clerks (1431)
Specialized cleaners (6732)
Transport truck drivers (7511)
Purchasing and inventory control workers (1524)
Opticians (3231)
Other automotive mechanical installers and servicers (7535)
Storekeepers and partspersons (1522)
Other repairers and servicers (7445)
Motorcycle, all-terrain vehicle and other related mechanics (7334)
Photographic and film processors (9474)
Jewellers, jewellery and watch repairers (6344)

Retail trade is essentially supported by consumer spending in Canada and the drivers for this industry are very similar to those for wholesale trade as the two industries are highly integrated. While the retail industry is mostly oriented toward the domestic market, the advent of e-commerce has increased the global trade of merchandises, making Canadian retailers more exposed to foreign competition, but also creating new market opportunities outside the country. After being negatively impacted by the recession of 2008-2009, the industry's output quickly recovered in 2010 and continued to grow at a solid pace until 2019, with the exception of a marginal decline in 2015, which coincided with slower economic growth in Canada resulting from the sharp fall in

crude oil prices. During most of the past decade, the industry benefited from steady growth in consumer spending, driven by solid job creation, declining unemployment, rising wages, stable inflation and low interest rates. However, the output contracted significantly in 2020, during the first year of the COVID-19 pandemic, with lockdowns leading to a temporary decline in consumer spending (except spending on non-durable goods such as food and beverage products). The output strongly rebounded in 2021, up by 7.4%, as the increase in disposable income (arising from government support programs and a large accumulation of savings) led to a recovery in consumer spending and a surge in residential investment. More specifically, with the continuation of home confinement and telework policies, consumption expenditures shifted toward goods and many households searched for a bigger house or a new house away from urban areas or turned to home improvements, propelling resale activity, new home construction and renovation spending. Those developments stimulated the purchases of various durable and semi-durable goods such as furniture and home furnishing, office and computer equipment, building material and supplies, household appliances, amusement and sporting goods, etc. The resulting pace of growth in the industry's real GDP averaged 2.0% annually over the period 2012-2021.

Real GDP and Employment Growth Rates in Retail Trade



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

After peaking in 2019, employment fell sharply in 2020, before rebounding in 2021, but without fully recovering the jobs lost during the first year of the pandemic. These fluctuations lowered employment growth to an average annual rate of 0.7% over the past ten years, making productivity growth (+1.3% annually) the largest contributor to output growth. New technologies, such as radio frequency identification devices, scheduling software, inventory management systems, self-serve kiosks and e-commerce have boosted productivity and replaced many of the tracking, shipping and storage tasks traditionally performed by workers. The high degree of competition in the industry has also forced many firms to close stores and reduced headcount to contain labour costs. Many previously well-established retail chains ceased operations, while several foreign-owned chains have expanded throughout Canada. Higher minimum wages have also encouraged firms to adopt new technologies and increase productivity to maintain their profit margins.

Over the period 2022-2031, output growth in retail trade is projected to moderate relative to the previous decade, primarily reflecting the slower pace of growth anticipated in consumer spending on goods. Indeed, the pace of growth in the industry's real GDP is expected to slow markedly from 2022 to 2024 as consumption moves away from goods (reflecting the significant amount of pent-up demand accumulated for some services during the pandemic). High inflation and rising interest and mortgage rates are also expected to restrain growth in consumer spending (particularly for big-ticket items) and reduce residential investment in the short to medium term. Once inflation returns to its target rate of 2%, output growth in retail trade should improve modestly. However, the gradual slowdown anticipated in Canada's labour force is expected to

constrain overall employment growth in the longer term, while the aging of the population will result in massive retirements of baby-boomers from the labour market. These two factors are expected to contain the pace of growth in disposable income and consumer spending, including spending on durable, semi-durable and non-durable goods sold by retailers. Older households also tend to consume more services and slightly fewer goods, reducing the share of goods in total consumer spending as a result of population aging. On the positive side, high import prices resulting from the relatively low value of the Canadian dollar (which is projected to remain below 0.80 US dollar) should continue to encourage Canadians, especially those living close to the U.S. border, to shop in Canada, supporting revenues in domestic retail stores. Changes in shopping patterns will keep influencing the outlook for retailers. As e-commerce expands, Canadian retailers are expected to face a surge in competition from global suppliers, but they are also expected to take advantage of new opportunities to expand their markets outside the country. Firms that sell goods abroad will be in a favourable position as the value of the Canadian dollar is expected to remain low throughout the projection horizon.

On average, real GDP in the industry is projected to increase by 1.6% annually over the period 2022-2031. Despite the slowdown in output growth relative to the past ten years, employment growth is expected to remain unchanged, averaging 0.7% annually, largely reflecting strong gains in 2022, as many segments of the industry are still in the process of recovering the jobs lost during the pandemic. Starting in 2023, employment growth is expected to moderate as the shift to online shopping will continue to increase competition and reduce profit margins, forcing retailers to lower labour costs and embrace new productivity-enhancing technologies. Greater emphasis on self-serve kiosks and better point-of-sale technology are expected to limit hiring, especially for cashiers, but also for retail workers involved in sales, inventory and customer management. On average, productivity is expected to increase by 0.9% annually over the projection period. This slower pace of growth relative to the past decade essentially reflects the large gains anticipated in employment in 2022.

Truck and Ground Passenger Transportation Services (NAICS 4841-4842; 4851-4859)

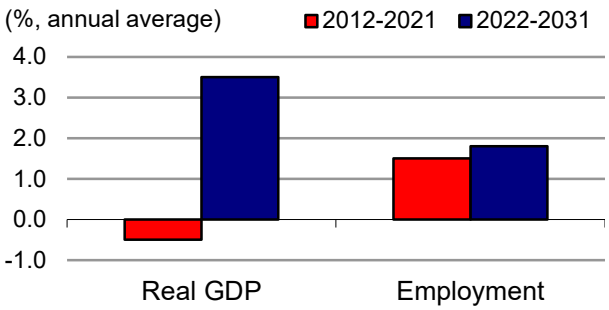
This industry comprises establishments primarily engaged in the truck transportation of merchandises and in a variety of transit and ground passenger transportation activities (such as urban transit systems, interurban and rural bus transportation, taxi and limousine services). Truck transportation is the largest of the two segments, accounting for 80% of production and 65% of employment in 2021. In comparison, transit and ground passenger transportation accounted for only 20% of production, but 35% of employment, making this segment the most labour intensive. Overall, the industry employed 500,400 workers in 2021, mostly concentrated in Ontario (40%), Quebec (25%), Alberta (12%) and British Columbia (11%). The workforce is primarily composed of men (83%) and characterized by a significant proportion of self-employed, particularly in truck transportation (30%). Key occupations (4-digit NOC) include:

Transport truck drivers (7511)
Bus drivers, subway operators and other transit operators (7512)
Taxi and limousine drivers and chauffeurs (7513)
Supervisors, motor transport and other ground
Material handlers (7452)
Managers in transportation (0731)
Dispatchers (1525)
Railway and motor transport labourers (7622)
Transportation route and crew schedulers (1526)

transit operators (7305)
Automotive service technicians, truck and bus mechanics and mechanical repairers (7321)

Ground and water transport ticket agents, cargo service representatives and related clerks (6524)

Real GDP and Employment Growth Rates in Truck and Ground Passenger Transportation



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

The industry is closely tied to the performance of the domestic economy and international trade. Since it is dominated by truck transportation services, the largest users are the retail trade and wholesale industries, as well as the goods-producing industries (agriculture, resources, manufacturing and construction). The demand is driven by the need to move inputs to producers, final goods to consumers, and primary products to international markets. On the other hand, transit and ground passenger transportation is strongly influenced by the degree of urbanization and the associated demand for public transit systems within major Canadian cities. After contracting during the recession year of 2009, the industry's output quickly recovered in 2010 and continued to increase almost continuously until 2019. During that period, truck transportation benefited from steady growth in the production, exports and consumption of goods, increasing demand for the transportation of merchandises, while transit and ground passenger transportation benefited from important investments in public transit systems from all levels of government across the country.

However, the industry was devastated by the COVID-19 pandemic, with business lockdowns, home confinement and telework policies leading to a drastic fall of 22% in output in 2020 alone. The output hardly rebounded in 2021 (+2.2% only) as the prolongation of public health restrictions continued to negatively impact tourism and commuting activity, which in turn weighed on transit and ground passenger transportation. This resulted in real GDP declining at an average rate of 0.5% per year for the full period 2012-2021, although this indicator is somewhat misleading as it masks the fact that all the decline occurred in 2020. After peaking in 2019, employment fell markedly in 2020 and the small rebound recorded in 2021 left the number of workers significantly below its pre-pandemic level. This lowered employment growth in the industry to 1.5% annually over the past decade. Because the decline observed in output in 2020 was deeper than the decline in employment, productivity fell markedly during that year, resulting in an average decrease of 2.0% annually for the entire period 2012-2021. Again, this indicator masks the fact that a large part of the decrease in productivity occurred in 2020.

Over the next decade, output growth in truck and ground passenger transportation is projected to return to positive territory and to strengthen markedly, as the industry progressively recovers from the pandemic in the first half of the forecast horizon. Truck transportation will benefit from solid growth in the goods-producing industries in the short to medium term, particularly in the manufacturing sector, driven by renewed growth in exports and the gradual resorption of supply chain disruptions. Transit and ground passenger transportation will benefit from the lifting of public health restrictions, the return of workers to the office on a part-time or full-time basis (commuting) and the recovery in travel and tourism activity. In the second half of the projection period, growth

in truck transportation is expected to moderate, in line with slower growth in manufacturing production and exports as well as a tepid outlook for retail and construction activity. However, transit and ground passenger transportation will continue to benefit from additional investment in transportation infrastructure and public transit, partly supported by the federal government's infrastructure program. The gradual displacement of the Canadian population toward urban centers will increase the need for transit alternatives in order to ease road congestion and reduce carbon emissions. Furthermore, with the carbon price set to reach $170 per tonne of GHG emissions by 2030, up from its current level of $50 per tonne, personal transportation will become increasingly expensive and drive more commuters toward public transportation.

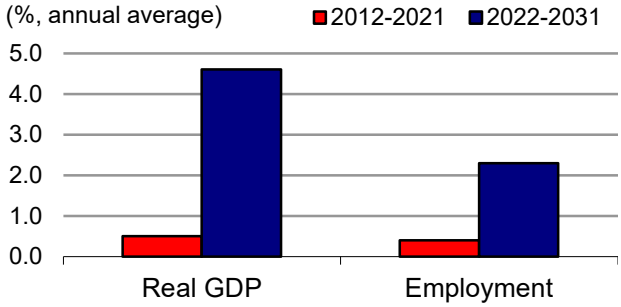
The resulting pace of growth in real GDP for the overall industry is projected to average a strong 3.5% annually over the period 2022-2031, with gains in output evenly split between employment and productivity growth. Due to the substantial improvement in output growth, employment growth is expected to accelerate slightly relative to the past ten years, averaging 1.8% annually. However, job creation will remain constrained by persisting labour shortages for truck drivers and a turnaround in productivity which is expected to straighten at an average pace of 1.7% per year over the next decade, with a large part of the recovery occurring in the near term in response to adjustments to a post-pandemic environment. Labour shortages are expected to remain over the projection period, driven by the large proportion of truck drivers in their retirement years, especially those involved in long-haul operations who are particularly difficult to attract due to specific license requirements and demanding working conditions (such as working 12-hours shifts and being away from home for extended periods of time). Such pressures on labour supply will encourage the industry to embrace productivity-enhancing technologies. While driverless vehicles are already in use in controlled environments like ports, mines and even Alberta's oil sands, it is unlikely that driverless freight trucks will appear on the roads over the next few years. Over the longer-term horizon, however, driverless trucks and cars are a real possibility. At the same time, non-traditional driving services like Uber and Lyft should continue to affect traditional taxi services, decreasing prices for consumers and lowering demand for taxi drivers.

Air, Rail, Water and Pipeline Transportation Services (NAICS 4811-4812; 4821; 4831-4832; 4861-4869; 4871-4879; 4881-4889)

This industry comprises establishments primarily engaged in transporting passengers and merchandises by air, rail and water. It also includes establishments transporting goods by pipeline (such as crude oil, natural gas and refined petroleum), those providing recreational transportation services (such as sightseeing or dinner cruises and steam train excursions), as well as those providing support services to various transportation establishments (specific to a mode of transportation or multi-modal). Support services are the largest of the six segments, accounting for 39% of production and 50% of employment in 2021. Other major segments include: air transportation (5% of production in 2021, down from 20% in 2019, and 22% of employment in 2021, down from 28% in 2019); rail transportation (23%, 15%); and pipeline transportation (28%, 6%). Overall, the industry employed 244,200 workers in 2021, mostly concentrated in Ontario (28%), Quebec (22%), British Columbia (20%) and Alberta (16%), with a workforce primarily composed of men (75%). Key occupations (4-digit NOC) include:

Air pilots, flight engineers, flying instructors (2271)
Transport truck drivers (7511)
Airline ticket and service agents (6523)
Pursers and flight attendants (6522)
Aircraft mechanics and aircraft inspectors (7315)
Public works maintenance equipment operators and related workers (7522)
Managers in transportation (0731)
Supervisors, supply chain, tracking and scheduling co-ordination occupations (1215)
Railway and yard locomotive engineers (7361)
Air transport ramp attendants (7534)
Deck officers, water transport (2273)
Customs, ship and other brokers (1315)
Longshore workers (7451)
Air traffic controllers and related occupations (2272)
Railway yard and track maintenance workers (7531)
Railway conductors and brakemen/women (7362) Water transport deck and engine room crew (7532)
Supervisors, railway transport operations (7304)
Railway carmen/women (7314)
Boat and cable ferry operators and related occupations (7533)
Ground and water transport ticket agents, cargo service representatives and related clerks (6524)
Railway and motor transport labourers (7622)
Railway traffic controllers and marine traffic regulators (2275)
Engineer officers, water transport (2274)

Real GDP and Employment Growth Rates in Air, Rail, Water and Pipeline Transportation Services



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

The industry relies heavily on domestic and foreign demand for travel as well as on transportation and international trade of merchandises. After being negatively affected by the recession of 2008-2009, the output quickly recovered in 2010 and 2011, driven by the recovery in domestic and global economic conditions, which resulted in increased discretionary spending on travel and tourism activities and renewed growth in international trade. Growth in output remained solid in subsequent years and was particularly strong from 2014 to 2019 as the industry benefited from the sharp drop in crude oil prices in 2014-2015, which resulted in lower fuel costs and a weaker Canadian dollar. More precisely, lower fuel costs allowed airlines to reduce fare prices, stimulating demand for their services, while a weaker currency attracted a higher number of international travelers flying to Canada and encouraged more Canadians to choose vacation within the country and use routes exclusively served by domestic airlines. A weaker currency has also contributed to increase Canadian exports, supporting demand for the transportation of goods by rail, boat or air cargo.

However, the industry was devastated by the COVID-19 pandemic, with business lockdowns, home confinement, travel restrictions and closed borders leading to a drastic fall of 24% in output in 2020 alone. While all segments of the industry were negatively impacted, air transportation was the most severely hit, with output falling by 73% as Canadian airlines reduced their supply in a substantial way, ending almost all international flights and more than half of the internal flights. The industry's output reached a bottom in 2021, as the recovery in rail, water and pipeline transportation was offset by an additional decline of 34% in air transportation due to restrictions on non-essential travels and quarantine requirements. Those fluctuations lowered real GDP growth in the overall industry to an average of only 0.5% per year for the full period 2012-2021, although this indicator is clearly misleading as it masks the fact that the industry experienced robust growth (+4.2 annually) prior to the pandemic. After peaking in 2019, employment fell

markedly in 2020 (-18%) and the small rebound posted in 2021 left the number of workers well below its pre-pandemic level. This lowered job creation in the industry to a modest 0.4% annually over the past decade. The movements in output and employment also led to large declines in productivity in recent years, resulting in an average growth rate of only 0.1% annually from 2012 to 2021.

Over the next decade, output growth in the industry is projected to strengthen markedly, led by the near-term recovery in air transportation, which will benefit from the lifting of public health restrictions, the reopening of the borders, and the recovery in travel activity following the accumulation of a strong pent-up demand during the pandemic. In the longer term, growth in this segment is projected to slow as business travel is expected to be less frequent, partly due to substantial improvements in telecommunication and telework technologies. However, the outlook for recreational travel is mixed. On one hand, higher incomes in emerging markets and massive retirements of baby-boomers in developed markets are expected to support demand for recreational travel. On the other hand, the slower pace of growth anticipated in disposable income in Canada (resulting from the gradual slowdown anticipated in employment growth) is also expected to put pressures on discretionary spending, including spending on air travel. Another factor that could restrain growth in demand for air travel moving forward is climate change activism. The transportation of merchandise by rail or boat is expected to do well in the short to medium term, benefiting from a solid rebound in exports and imports of goods and, in the longer term, additional investments in intermodal freight connectivity. The pipeline transportation will benefit from the completion of two major projects in the short to medium term: the Coastal Gas link (which will connect production fields with the LNG Canada export terminal) and the Trans Mountain pipeline expansion (which will increase capacity from its current capacity of about 300,000 barrels per day to 890,000 barrels per day), although it is unlikely to see any major new pipeline developments in the longer term given the difficulties building the current projects from a social, environmental and profitability perspective.

The resulting pace of growth in real GDP for the entire industry is projected to average a strong 4.6% annually over the period 2022-2031, with gains in output evenly split between employment and productivity growth. The substantial improvement in output growth is expected to lead to much faster growth in employment relative to the past ten years, averaging 2.3% annually, largely reflecting strong gains from 2022 to 2024 as the industry gradually recovers the jobs lost during the pandemic. Over the longer term, job creation is expected to moderate in line with slower growth in output and additional gains in productivity. On average, productivity growth is expected to straighten at an average pace of 2.3% per year over the next decade, with a large part of the growth also occurring in the short term in response to post-pandemic adjustments and frictions in labour supply, particularly in air transportation. Overall, the industry is highly intensive in capital with aircrafts, trains, boats and pipelines all requiring substantial investments, which will help support productivity growth over the forecast horizon. The growing number of competitors on the domestic and international markets will prompt the industry, particularly Canadian airlines, to increase efficiency and productivity at the expense of employment. For example, the introduction of self-service kiosk operation in airports around the world has increased efficiency across all aspects of the check-in and passenger processing system. Other factors enhancing productivity

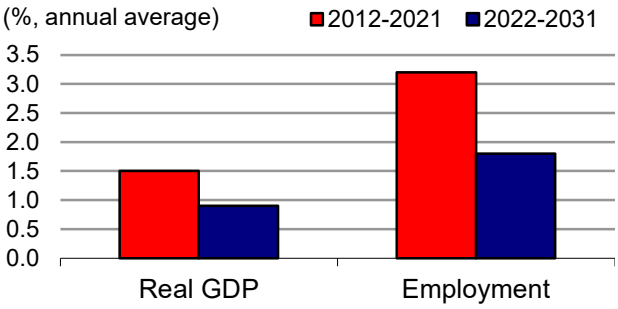
include measures that speed up maintenance work and the marketing of air services, as well as changes in the industry structure through mergers and acquisitions.

Postal, Courier, Warehousing and Storage Services (NAICS 4911, 4921-4922, 4931)

This industry comprises establishments primarily engaged in operating postal services; providing courier and delivery services; and operating general merchandise, refrigerated and other warehousing and storage facilities. Couriers and messengers are the largest of the three segments, accounting for 38% of production and 47% of employment in 2021. In comparison, warehousing and storage accounted for 36% of production and 23% of employment, versus 27% and 30% respectively for postal services. Overall, the industry employed 245,300 workers in 2021, mostly concentrated in Ontario (42%), Quebec (21%), British Columbia (14%) and Alberta (12%), with a workforce primarily composed of men (70%). Key occupations (4-digit NOC) include:

- Letter carriers (1512)
- Delivery and courier service drivers (7514)
- Material handlers (7452)
- Mail, postal and related workers (1511)
- Shippers and receivers (1521)
- Couriers, messengers, door-to-door distributors (1513)
- Supervisors, mail and message distribution occupations (NOC 1214)
- Supervisors, supply chain, tracking and scheduling co-ordination occupations (1215)
- Postal and courier services managers (0132)

Real GDP and Employment Growth Rates in Postal, Courier, Warehousing, Storage Services



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Over the past ten years, real GDP in the industry showed two distinct trends. The output was on a downward trajectory until 2016, primarily reflecting the growing use of e-mail, electronic billing, online advertising, and direct deposit services by households, businesses and governments, which displaced large portions of the traditional mail market. The output begun to straighten around 2017 and continued to expand at a solid pace in subsequent years, driven by a large increase in warehousing and storage activity and a significant recovery in postal, courier and delivery services. This situation reflected rising demand for warehousing services and parcel delivery resulting from the growing adoption of e-commerce by households and businesses. Canada Post, the largest company in the industry, responded to these trends by shifting their focus from letter mail to parcel delivery, while big players like Amazon opened many new warehouses and fulfillment centers in the country.

In contrast with many other industries, growth in output accelerated during the pandemic years of 2020-2021, as online shopping and demand for door-to-door deliveries surged in response to public health restrictions, such as the proscription of in-person shopping for non-essential items. This led to a jump in courier and messenger's output and additional growth in the other two segments of the industry. The resulting pace of growth in real GDP averaged 1.5% annually for the entire period 2012-2021. After stagnating from 2012 to 2016, employment increased markedly from 2017 to 2021 in response to renewed growth in output, resulting in job creation averaging a

strong 3.2% per year over the past decade. Despite attempts to reduce per-piece processing costs and restructure delivery routes, productivity in the industry declined at an annual average pace of 1.7%, with a large part of the decline occurring in recent years, primarily reflecting the fact that parcel delivery is a more labour-intensive line of business than mail delivery.

Renewed growth observed in the industry's output in the past several years is expected to persist over the projection period, as retail transactions continue to move online and feed demand for parcel delivery and warehousing services. However, the pace of growth in real GDP is projected to slow significantly relative to the past decade, as much of the growth that was expected to occur gradually over the forecast horizon took place during the pandemic. In fact, the output is expected to contract marginally in the short term, in line with lower activity in retail trade, as consumer spending moves away from goods in response to the significant amount of pent-up demand accumulated for some services during the pandemic. In the longer term, the weaker pace of growth projected in disposable income in Canada (resulting from the gradual slowdown anticipated in employment growth and massive retirements of baby-boomers) is also expected to restrain growth in consumer spending and retail trade, limiting growth opportunities in the industry. Nevertheless, as the traditional mail market continues to decline, postal and courier services firms will face increasing pressures to make parcel delivery their key business line. This trend will be amplified by the fact that direct marketing, such as promotional brochures and catalog distribution, will simply not be able to compete with online marketing, which is more environmentally friendly and enables businesses to better personalize offers to customers by building a profile of their purchasing history and preferences. That said, the industry will benefit from the fact that retailers are increasingly relying on warehousing services, rather than store space, to decrease their turnaround time and deliver their products as fast as possible.

On average, real GDP in postal, courier and warehousing services is projected to increase by 0.9% annually over the period 2022-2031. The weaker pace of growth in output relative to the previous decade is expected to result in slower growth in employment, with gains averaging 1.8% per year. Productivity is expected to keep declining, albeit at a more moderate pace than in the past, with declines averaging 0.9% annually. As a result, employment growth will continue to be the sole contributor to output growth over the projection period. Further declines in productivity can be explained by the fact that the highly labour-intensive segments of postal and courier services require travel through increasingly congested traffic and rural areas. The productivity outlook is better for warehousing and storage, alleviating some of the weakness in delivery services. Advanced robotics, self-driving shelving carts, body sensors and artificial intelligence-powered management systems are examples of technologies expected to increase productivity in warehousing. Delivery firms also face threats from large e-commerce companies developing their own parcel delivery capabilities. For example, Amazon is currently experimenting the use of drones to deliver parcels to the customer's door and Canada Post is also looking at the potential benefits from this technology. However, if the use of drones become a reality, it is unlikely to occur until the latter part of the projection period due to huge logistical and regulatory challenges.

Finance, Insurance, Real Estate and Leasing Services (NAICS 5211-5269; 5311-5331)

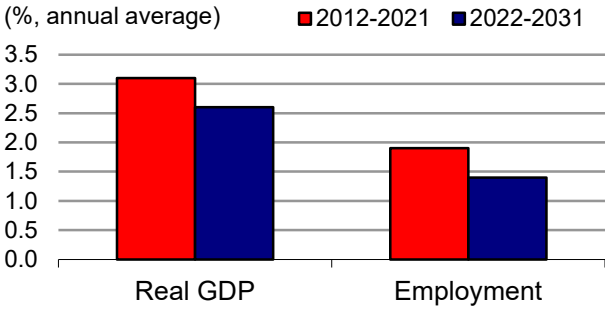
This industry comprises establishments primarily engaged in financial transactions or in facilitating financial transactions (such as banks, insurance carriers and brokerage agencies) and establishments primarily engaged in selling and buying real estate for others or renting and leasing various tangible or intangible assets. Real estate and leasing services are the most important segments in terms of production, accounting for 64% of the industry's real GDP in 2021, while finance and insurance are the most important segments in terms of employment, accounting for 73% of all workers. More precisely, the industry employed 1.3 million workers in 2021, with 49% in finance and banking, 24% in insurance, 23% in real estate and 4% in leasing. Employment is largely concentrated in Ontario (48%), Quebec (21%) and British Columbia (13%), with women accounting for a slight majority of the workforce (52%). The real estate segment is also characterized by a high proportion of self-employed (43%). Key occupations (4-digit NOC) include:

Other financial officers (1114)
Real estate agents and salespersons (6232)
Customer services representatives - financial institutions (6551)
Insurance agents and brokers (6231)
Banking, credit and other investment managers (0122)
Financial sales representatives (6235)
Financial and investment analysts (1112)
Accommodation service managers (0632)
Insurance adjusters and claims examiners (1312)
Property administrators (1224)
Banking, insurance and other financial clerks (1434)
Insurance, real estate and financial brokerage managers (0121)
Financial auditors and accountants (1111)
Information systems analysts and consultants (2171)
Supervisors, finance and insurance office workers (1212)
Securities agents, investment dealers and brokers (1113)
Computer programmers and interactive media developers (2174)
Insurance underwriters (1313)
User support technicians (2282)
Computer and information systems managers (0213)
Assessors, valuators and appraisers (1314)
Data entry clerks (1422)
Financial managers (0111)
Database analysts and data administrators (2172)
Business development officers and marketing researchers and consultants (4163)
Computer network technicians (2281)
Economists and economic policy researchers and analysts (4162)
Software engineers and designers (2173)
Collectors (1435)
Mathematicians, statisticians and actuaries (2161)

Although firms in the finance and insurance segments derive about one third of their revenues from outside Canada, the industry as a whole is heavily reliant on the performance of the domestic economy, given the importance of the real estate segment in terms of output. Overall, the industry is particularly sensitive to consumer spending and business investment, including residential and non-residential investment. Output and employment in the industry increased steadily over the past decade, even during the COVID-19 pandemic years of 2020-2021, driven by solid growth across all segments. The substantial rebound recorded in equity markets following the financial crisis of 2008-2009 gave a boost to the finance and banking segment, while mortgage and interest rates at all-time lows have stimulated growth in the real estate and insurance segments, with buyers purchasing homes at record high prices as well as a large volume of big-ticket items (such as cars or household appliances) because of low financing costs. Throughout the pandemic, ultra-low interest rates and government support programs allowed Canadian households not only to continue paying off their existing loans, but also to boost their income and savings. This factor, combined with home confinement and telework policies, led to a surge in real estate activity and

renovation spending, increasing the volume of mortgage and bank loans, as many households searched for a bigger house or a new house away from urban areas or turned to home improvements during the pandemic. The resulting pace of growth in the industry's real GDP averaged 3.1% annually over the entire period 2012-2021, posting among the strongest growth rates across the economy. Employment growth, however, was more modest, averaging 1.9% per year. This situation reflected significant gains in productivity (+1.2% annually), largely attributable to the growing use of online technologies in financial, banking and real estate services, allowing the industry to increase output with modest growth in employment. For example, premium calculations, sales and claim processing are being increasingly automated by insurance firms. The rise of fintech start-up companies is also playing an important role in encouraging Canada's largest banks to adopt more innovative technologies.

Real GDP and Employment Growth Rates in Finance, Insurance, Real Estate and Leasing



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Output growth in the industry is projected to soften over the period 2022-2031, primarily reflecting a more tepid outlook for real estate and lending services in the short term. High inflation and rising interest rates are expected to restrain growth in consumer spending, particularly for big-ticket items, while the surge in housing prices and rising mortgage rates are expected to reduce new housing and resale activity over the next few years, limiting growth in renovation spending. Those factors will not only restrain the demand for real estate and lending services, but also the demand for home and property insurance services. Once inflation returns to its target rate of 2%, output growth in the industry should improve modestly in the medium term, supported by some cyclical recovery in consumer spending and demand for new housing in response to higher immigration, stronger pressures on housing supply and an eventual decline in interest and mortgage rates. However, growth is projected to moderate again toward the end of the projection period, as the weaker pace of growth anticipated in disposable income (resulting from the gradual slowdown in employment growth and massive retirements of baby-boomers) and the declining trend projected in household formation rates (due to population aging) are expected to limit growth in consumer spending and residential investment.

On the positive side, the industry will continue to benefit from the First-Time Home Buyer Incentive. This program, put in place by the federal government a few years ago, offers 5% or 10% of the home's purchase price to put toward a down payment, making homeownership more affordable. Demand for business lending is also expected to be supported by a better outlook for non-residential investment, more specifically from renewed growth in investment related to machinery and equipment and engineering structures and faster growth in the construction of commercial and industrial buildings. That said, financial institutions are in the midst of a technological revolution, with fintech and insurtech applications transforming the traditional business models and opening doors to new competition, notably from the computer services industry. Such technologies include the use of artificial intelligence, big data analysis, robotic process automation (RPA), open banking and blockchain transactions to improve efficiency in the

delivery of financial and insurance services. For example, fintech is making financial services easier to use through mobile banking and automated advisory services, while insurtech calculates discount premiums by monitoring healthy behaviours through tracking devices or biometric sensors. However, the steady rise in the number of data breaches presents a risk for financial institutions and regulators must ensure those new applications are safe for consumers and firms before being fully implemented. The frequency and cost of natural disasters are also rising, threatening the stability and profitability of the insurance segment.

On average, real GDP in the industry is projected to increase by 2.6% annually over the period 2022-2031, down from 3.1% in the previous decade. Employment growth is also projected to slow somewhat, averaging 1.4% per year. Again, a significant part of the growth in output is expected to be fuelled by productivity gains (+1.2% annually) resulting from technological innovations. The increased prevalence of automation and online services in real estate, banking, insurance, and even investment services will continue to improve efficiency in the industry. However, productivity growth may not always come at the expense of employment growth. It is mostly the composition of jobs within the industry that is expected to change over the coming years. For example, the automation of repetitive tasks should reduce demand for less skilled workers such as bank tellers and customer service representatives. Demand for financial advisors could also be impacted, as new digital tools and platforms are automating a growing number of activities traditionally performed by portfolio management firms. In order to keep up with emerging fintech and insurtech startup companies, the industry is expected to hire a larger number of workers with specialized skills in information technology (IT), such as software engineers, data scientists and cyber security experts, which could more than compensate for the jobs that may be displaced. While fintech and insurtech firms can sell their innovative applications to financial institutions, many of them are supplying services directly to consumers and businesses, thereby competing directly with existing banks and traditional insurance companies.

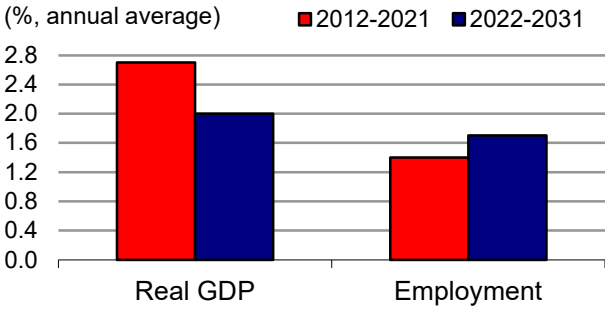
Legal, Accounting, Consulting and Other Professional Services (NAICS 5411; 5412; 5416; 5418; 5419)

This industry comprises establishments that provide highly specialized business services. It is composed of five segments: legal services (26% of production and 23% of employment in 2021); accounting, tax preparation, bookkeeping and payroll services (25% and 28%); management, scientific and technical consulting (25% and 22%); advertising and public relations (10% and 15%); and other professional, scientific and technical services such as photographic, translation and veterinary services (14% and 13%). Overall, the industry employed 718,100 workers in 2021, mostly concentrated in Ontario (43%), Quebec (22%), British Columbia (14%) and Alberta (12%). The workforce is characterized by a majority of women (60%), a high level of education, and a large proportion of self-employed (33%). Given the wide variety of activities, key occupations (4-digit NOC) include a mix of:

- Financial auditors and accountants (1111)
- Lawyers and Quebec notaries (4112)
- Professional occupations in business management consulting (1122)
- Accounting technicians and bookkeepers (1311)
- Translators, terminologists, interpreters (5121)
- Natural and applied science policy researchers, consultants and program officers (4161)
- Veterinarians (3114)
- Other business services managers (0125)

Legal administrative assistants (1242)
Paralegal and related occupations (4211)
Professional occupations in advertising, marketing and public relations (1123)
Photographers (5221)
Animal health technologists and veterinary technicians (NOC 3213)
Business development officers and marketing researchers and consultants (4163)
Graphic designers and illustrators (5241)
Advertising, marketing and public relations managers (0124)
Financial managers (0111)
Mathematicians, statisticians and actuaries (2161)
Agricultural representatives, consultants and specialists (2123)
Sheriffs and bailiffs (4421)
Forestry professionals (2122)

Real GDP and Employment Growth Rates in Legal, Accounting, Consulting Services



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

The industry strongly relies on the performance of the domestic economy and is largely driven by business activities and government expenditures. Corporate profitability is also a key driver of growth as higher profits mean more discretionary income to spend on legal, consulting and advertising services, often perceived as non-essential activities. Although the industry is mostly oriented toward the domestic market, it is also sensitive to foreign economic conditions since the clientele comes from various businesses, some of which are heavily reliant on foreign demand. After being negatively impacted by the recession in 2009, the output slowly recovered in the following three years, before expanding at a solid pace from 2013 to 2019. During that period, the industry benefited from several factors, including additional growth in corporate profits; robust demand for legal, accounting, consulting and advertising services in response to the growing number of businesses that chose to outsource internal operations; a rising volume of mergers and acquisitions; and strong growth in digital advertising spending. The convergence of international accounting standards and the growing international footprint of Canadian financial institutions have also supported growth in exports of accounting services, while a weaker Canadian dollar (following the oil price shock of 2014-2015) has allowed domestic consultants and advertisers to be more competitive on foreign markets.

However, the industry's output fell back in 2020, in line with the decline observed in domestic and global economic activity during the first year of the COVID-19 pandemic. All segments of the industry were severely impacted, with the exception of accounting services which are less sensitive to cyclical fluctuations in economic conditions. The output strongly rebounded in 2021, up by 8.4%, primarily driven by a substantial jump in corporate profits and by the accumulation of a pent-up demand for legal and consulting services. The resulting pace of growth in real GDP averaged 2.7% annually for the entire period 2012-2021, with gains in output evenly split between employment and productivity growth. Employment rose at an average pace of 1.4% per year, recording most of the increase from 2015 to 2021, while productivity grew by 1.3% annually, reflecting rapid advancements in cognitive technologies. Indeed, routine cognitive tasks have been increasingly automated and performed by technology, while non-routine cognitive tasks have been increasingly complemented and enhanced by technology. For example, tasks related to data entry, tax preparation, legal research and translation are being increasingly performed by

online applications and specialized software, while artificial intelligence and machine learning are complementing high-skill jobs related to professional and consulting services.

Over the projection period, output growth in the industry is expected to moderate relative to the period 2012-2021, primarily reflecting the slowdown anticipated in overall economic activity in the short term. After growing by an additional 2.3% in 2022, the output is projected to increase at a slower pace in 2023-2024 as high inflation and rising interest rates are expected to restrain growth in final domestic demand and business activity, resulting in lower corporate profitability. Once inflation returns to its target rate of 2%, output growth in the industry should improve modestly, supported by some cyclical recovery in business activity. Over the longer term, growth in output is expected to be in line with overall economic activity. The industry will continue to benefit from the growing trend in business-to-business outsourcing in order to increase operation efficiency, particularly from manufacturing firms which are more likely to be exposed to fierce competition from low-cost countries. Demand for legal and accounting services is expected to be stimulated by the rising complexity of corporate regulations and auditing practices, the increased frequency of cyber attacks and fraudulent activities, and the growing number of mergers and acquisitions. Consulting firms are also becoming increasingly prevalent in fields such as human resources management, environmental solutions and technology implementation. They are expected to benefit from increased spending in a variety of infrastructure projects as well as from the federal government's 2030 Emissions Reduction Plan. Demand for advertising services is expected to be stimulated by the use of big data in better understanding consumer behaviour, new advertising streams enhanced by mobile and video technologies, and the growing area of social media strategies. Artificial intelligence and machine learning can be leveraged by the different segments of the industry to solve increasingly complex business problems, potentially driving new lines of business.

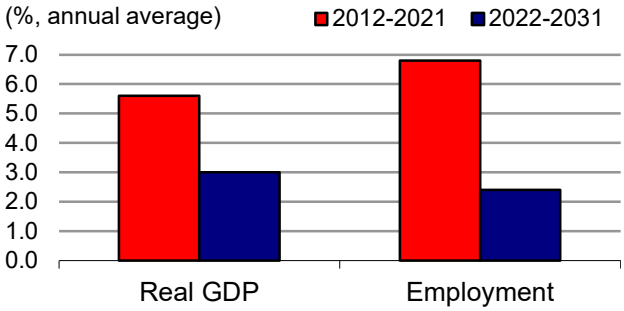
There is also some potential to increase exports of professional services as demand for Canadian expertise is growing rapidly. While the relatively low value of the Canadian dollar is expected to maintain price-competitiveness, particularly with the United States, the mutual recognition of professional qualifications under the Comprehensive Economic and Trade Agreement (CETA) is expected to enable professional service providers to bid on service contracts within the European market. On the negative side, many firms are exposed to risks involving revenue volatility and client retention, as the loyalty of clients is often tied to particular employees. On average, the industry's real GDP is projected to increase by 2.0% annually over the period 2022-2031. Despite slower output growth relative to the past ten years, employment growth is expected to accelerate marginally, averaging 1.7% per year, a result of weaker gains in productivity (+0.3% annually). The weaker pace of growth in productivity essentially reflects three years of negative or anemic growth at the beginning of the projection period. Starting in 2025, productivity growth is expected to resume and be more in line with its historical trend, which will also result in more moderate gains in employment for the rest of the projection period. That said, given the labour-intensive nature of the industry, highly educated individuals will continuously be needed for the rigorous analysis and face-to-face interactions.

Computer Systems Design and Related Services (NAICS 5415)

This industry comprises establishments primarily engaged in providing information technologies expertise (such as writing, modifying, testing and supporting software, including the creation of Internet home pages); planning and designing computer systems that integrate hardware, software and communications technologies; providing on-site management and operation of clients' computer and data processing facilities. It excludes the development and retailing of computer hardware and packaged software. The industry employed 531,000 workers in 2021, mostly concentrated in Ontario (49%), Quebec (21%), British Columbia (15%) and Alberta (8%). The workforce is primarily composed of men (75%) and characterized by a high level of education and a significant proportion of self-employed (19%). Key occupations (4-digit NOC) include:

- Information systems analysts and consultants (2171)
- Computer programmers and interactive media developers (2174)
- Computer and information system managers (0213)
- Software engineers and designers (2173)
- User support technicians (2282)
- Web designers and developers (2175)
- Computer network technicians (2281)
- Computer engineers (2147)
- Database analysts and data administrators (2172)
- Information systems testing technicians (2283)

Real GDP and Employment Growth Rates in Computer Systems Design and Related Services



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

The industry strongly relies on business investment and government expenditures related to software and information and communications technologies (ICT) in Canada. It is also characterized by a relatively high degree of exposure to trade for a service industry, with about 20% to 25% of its revenues coming from exports, mainly to the United States, making it sensitive to the investment environment south of the border. Driven by the growing adoption of computer technology from the private and public sectors and the necessity to adapt their operations to rapid innovations in hardware and software, output in the industry grew continuously since the late 1990s, even during economic downturns, albeit at a slower pace. Indeed, the increased complexity of ICT systems and the growing use of mobile devices have fuelled robust demand for computer services. Cloud computing, the Internet of Things (IoT), big data and predictive analytics are now part of many Canadian businesses' daily operations. Output growth and job creation in the industry was particularly strong in the past ten years, driven by robust demand from professional and business services, the largest users of computer services, and by the technological transformation of finance and insurance services which has opened doors to new opportunities. During the pandemic years of 2020-2021, the industry recorded additional gains in output and employment, as many businesses adopted telework policies, supporting demand for IT services. The resulting pace of growth in the industry's real GDP and employment averaged 5.6% and 6.8% per year respectively over the period 2012-2021, posting the strongest growth rates in output and employment across the 42 industries covered by COPS. However, productivity growth was negative (-1.2% annually), reflecting the fact that the industry is highly labour intensive and mostly composed of small firms that do not benefit from the same

economies of scale as larger companies. In June 2022, there were 39,986 firms in the industry, of which 31,939 (80%) had between 1 and 4 employees. Small firms are common in the industry due to the growing number of businesses that are adopting customized software applications, allowing various niche opportunities for computer services providers.

Over the projection period, computer system design services should continue to outperform most industries in terms of production and employment growth, but the pace of growth is expected to moderate relative to the previous decade. More precisely, output growth is projected to remain robust in 2022 (+10.4%), before weakening significantly in 2023-2024, as the slowdown anticipated in business activity (resulting from higher interest rates) and efforts to reduce government deficits (resulting from massive spending during the pandemic) are expected to restrain demand for IT services from the private and public sectors. Growth in output should improve modestly over the medium-term, supported by some cyclical recovery, and remain well above the pace of growth projected for the overall economy in the second half of the forecast horizon. The industry will continue to be driven by the need for businesses and governments to continually upgrade their ICT systems in order to keep up with the most recent technologies and remain competitive. Indeed, computer services benefit from the constant development of innovative computer and communications products that are designed and serviced by the industry. Cloud-based platforms, the Internet of Things (IoT), big data and open source software continue to gain in popularity, while the implementation of 5G networks and further developments in advanced manufacturing, autonomous transport, virtual and augmented reality, artificial intelligence, machine learning, language processing and biometric security represent a multitude of growth opportunities. Consumers and businesses own multiple electronic devices and are increasingly asking for compatibility, transferability and access to their content from any of those devices.

The industry will also continue to benefit from the growing number of firms across the economy that choose to outsource IT work in order to remain focused on their core activities. In many areas, IT investment cannot be delayed, particularly in the area of cybersecurity where threats to private and public targets continue to emerge, warranting significant new investment by any that has information to safeguard. Fintech and insurtech applications will keep opening doors to new start-ups, representing niche opportunities within the industry to compete directly with the traditional players in the delivery of finance and insurance services. Increased competition will continue to encourage the incumbent finance and insurance companies to transform their business models and improve their ICT infrastructure, resulting in additional demand for computer services. Simultaneously, the growing amount of data being made publicly available by all government levels through open data initiatives is expected to encourage the private sector to innovate and develop various applications to leverage this large pool of information, leading to the creation of new products and business models in the industry. Finally, a positive outlook for exports, partly supported by price competitiveness due to a relatively low Canadian dollar, is expected to bring more business opportunities to Canadian computer services firms. That said, the industry also faces increased competition on the global market, particularly from emerging economies.

The resulting pace of growth in the industry's real GDP and employment is projected to average 3.0% and 2.4% per year respectively over the period 2022-2031. Although this represents a

notable slowdown relative to the previous decade, computer services are expected to keep posting among the strongest growth rates in output and employment across the 42 industries covered by COPS. In addition to the slowdown projected in output growth, the weaker pace of growth in employment reflects difficulties to recruit highly skilled workers in the industry. Professionals in computer and information systems (NOC 217) had an average ratio of 0.4 unemployed worker for every vacant position in 2021, compared to an average of 1.0 for all occupations (when excluding unemployed not classified in any specific industry). Computer engineers (NOC 2147) are also expected to keep showing signs of shortages over the next ten years. In a context where it will be increasingly challenging to hire additional workers, the industry is expected to use its resources in a more efficient way and adopt the most cutting-edge technologies available in order to boost productivity. As a result, productivity growth is expected to resume over the projection period and average 0.6% annually.

Architectural, Engineering, Design and Scientific R&D Services (NAICS 5413; 5414; 5417)

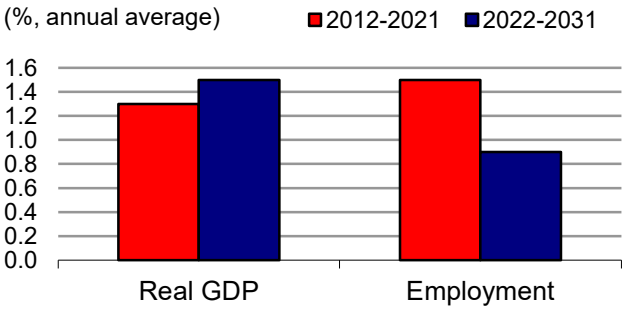
This industry comprises establishments that provide highly specialized business services in three different segments. Architectural, engineering and related services are by far the largest segment, accounting for 77% of production and 73% of employment in 2021. In comparison, specialized design services (which include interior, industrial and graphic design) accounted for only 4% of production, but 14% of employment, versus 19% and 13% respectively for scientific research and development services. The industry employed 424,900 workers in 2021, mostly concentrated in Ontario (40%), Quebec (23%), British Columbia (16%) and Alberta (13%). The workforce is mainly composed of men (64%) and characterized by a high level of education and a significant proportion of self-employed (24%). Key occupations (4-digit NOC) include:

Graphic designers and illustrators (5241)
Civil engineers (2131)
Other professional engineers, n.e.c. (2148)
Interior designers and interior decorators (5242)
Drafting technologists and technicians (2253)
Architects (2151)
Mechanical engineers (2132)
Electrical and electronics engineers (2133)
Civil engineering technologists and technicians (2231)
Engineering managers (0211)
Construction inspectors (2264)
Geoscientists and oceanographers (2113)
Land survey technologists and technicians (2254)
Architecture and science managers (0212)
Chemical technologists and technicians (2211)
Petroleum engineers (2145)
Biologists and related scientists (2121)
Theatre, exhibit and other creative designers (5243)
Mechanical eng. technologists and technicians (2232)
Architectural technologists and technicians (2251)
Electrical and electronics engineering technologists and technicians (2241)
Industrial engineering and manufacturing technologists and technicians (2233)
Chemists (2112)
Non-destructive testers and inspection technicians (2261)
Land surveyors (2154)
Biological technologists and technicians (2221)
Geological and mineral technologists and technicians (2212)
Industrial designers (2252)
Chemical engineers (2134)
Geological engineers (2144)
Industrial and manufacturing engineers (2141)
Physicists and astronomers (2111)
Landscape architects (2152)

The industry strongly relies on the performance of the domestic economy and is largely driven by business investment and government expenditures, as well as research and development (R&D) activities. More precisely, the architectural and engineering segment, as well as the design

segment are heavily tied to residential and non-residential investment, and the resulting impact on construction activity. Demand for engineering services also relies on business investment into machinery and equipment (M&E). In comparison, the R&D segment is closely tied to R&D spending from the private and public sectors for the development of new innovative products and technologies. Spending on R&D activities is generally driven by profitability in the private sector and by government expenditures in the public sector. Overall, the industry was a moderate performer for the Canadian economy over the past ten years, with output fluctuating significantly.

Real GDP and Employment Growth Rates in Architectural, Engineering, Design, R&D Services



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

After being negatively affected by the deterioration of the economic conditions during the recession of 2008-2009, the output straightened in the following five years, as low mortgage rates and high energy prices stimulated new home construction and the development of major energy projects. However, the industry's output fell back in 2015 and 2016, as non-residential investment and construction activity were severely affected by major investment cutbacks in oil and gas engineering structures due to the sharp decline in crude oil prices. Production recovered in 2017-2018 and continued to expand in 2019, supported by an increase in the construction of non-residential buildings, although growth was constrained by a small decline in residential activity. Real GDP in the industry contracted again in 2020 due to major lockdowns at the onset of the COVID-19 pandemic, but quickly recovered in 2021 in response to a substantial jump in new home construction. Besides large fluctuations in residential and non-residential investment, the declining trend in M&E investment and the stagnation of R&D spending are additional factors that contributed to restrain output growth in the industry. The resulting pace of growth in real GDP was rather modest, averaging 1.3% annually for the entire period 2012-2021. On the employment side, growth largely tracked the rate of output, albeit at a slightly faster pace of 1.5% per year, due to a small decline in productivity (-0.2% annually). Declining productivity reflects the fact that the sharp fall in non-residential investment following the oil price shock severely affected activity in the industry, lowering revenues and profitability, forcing many firms to reduce their capital expenditures, including investment in new technologies. The industry is also fairly labour intensive and relies on highly knowledgeable and skilled workers performing tasks that are less likely to be automated.

Over the projection period, output growth in the industry is expected to accelerate modestly relative to the period 2012-2021, primarily driven by faster growth in non-residential building investment and renewed growth in business investment related to engineering structures, machinery and equipment, as well as research and development activities. For example, the demand for architectural, engineering and design services is expected to be stimulated by the acceleration projected in the construction of industrial and commercial buildings in response to increased demand for energy efficient buildings, electric vehicle manufacturing plants and warehouse space due to the transition toward a green economy and the growing adoption of e-

commerce. Following a steep decline in the past several years due to lower oil prices, business investment in engineering structures is expected to straighten, partly supported by major projects in the electric power (utilities), transportation and mining industries in response to growing demand for non-emitting sources of energy, public transit systems and critical minerals (used in the production of clean energy). The federal government's infrastructure program launched in 2016 ($186 billion over 12 years) is also expected to continue to support the construction of public engineering structures and institutional buildings. In addition to transportation, public transit, green and rural infrastructures, this program also includes spending on social, cultural and recreational infrastructure. Furthermore, after holding back on investment in machinery and equipment for years, Canadian businesses are expected to replace or upgrade their existing capital stock in response to the development of new productivity-enhancing technologies, the acceleration anticipated in manufacturing activity, and demographic pressures on labour supply. Those factors are projected to result in a substantial rebound in M&E investment in Canada, boosting demand for engineering services. Similarly, renewed growth in business investment related to intellectual property, including R&D activities, is expected to boost demand for the industry's expertise in various fields of scientific research and industrial design.

However, the demand for architectural services is expected to be contained by the small decline anticipated in residential investment (including new home construction) over the projection period, as a result of the surge in housing prices and higher mortgage rates in the short term, and the downward trend in household formation resulting from population aging in the longer term. That said, increasing urban population should help support demand for new residential buildings and mixed-use properties containing retail, office and residential components, which would require the expertise of architects to develop. On the trade side, there is some potential to increase exports of engineering and architectural services as demand for Canadian expertise is growing rapidly. In addition to the relatively low value of the Canadian dollar which maintains price-competitiveness, particularly in the United States, the mutual recognition of professional qualifications under the Comprehensive Economic and Trade Agreement (CETA) is expected to enable the industry to bid on service contracts within the European market. On average, the industry's real GDP is projected to increase by 1.5% annually over the period 2022-2031. Despite the slight acceleration in output growth relative to the previous decade, employment growth is projected to slow significantly, averaging 0.9% per year, as a result of a pickup in productivity which is expected to increase by 0.6% annually. This situation reflects the need to improve productivity in response to growing difficulties in recruiting highly qualified workers and the need to improve cost-competitiveness in response to more open competition on the global market, particularly with the implementation of CETA. For example, many occupations related to engineers (NOC 2131, 2133, 2141, 2142) and architects (NOC 2151, 2152, 2153, 2154) are expected to keep showing signs of shortages over the next ten years. In a context where it will be increasingly challenging to hire additional workers, the industry is expected to adopt productivity-enhancing technologies such as building information modeling (BIM) systems to automate much of the work of design and engineering, 3D printing to produce components for modular construction, and drones to monitor and inspect large or difficult-to-access structures.

Management, Administrative and Other Support Services
(NAICS 5511; 5611-5619; 5621-5629)

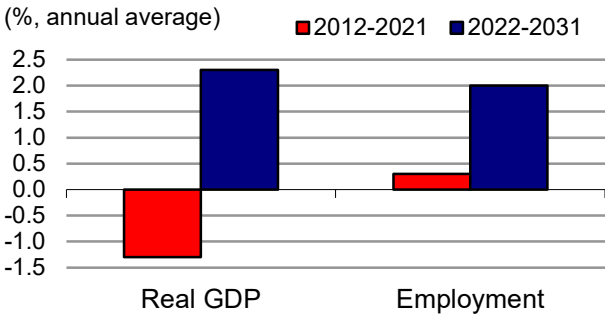
This industry is composed of three segments: management of companies and enterprises (including security holdings and head offices); administrative and support services (such as record keeping, employment placement, document preparation, call centres, collection agencies, travel arrangement, and security, janitorial and landscaping activities); and waste management and remediation services (such as the collection, treatment and disposal of waste material, soil remediation, waste water treatment, hazardous material removal). Administrative and support services are the largest and the most labour intensive of the three segments, accounting for 81% of production and 93% of employment in 2021. In comparison, management of companies and enterprises accounted for 6% of production and less than 1% of employment, versus 13% and 7% respectively for waste management and remediation services. The industry employed 707,700 workers in 2021 (down from 768,100 in 2019), mostly concentrated in Ontario (41%), Quebec (23%), British Columbia (15%) and Alberta (10%). The workforce is characterized by a slight majority of men (56%) and a significant proportion of self-employed (22%) and part-time workers (24%). The industry is also characterized by much lower wages than the overall economy average. Given the wide variety of activities, key occupations (4-digit NOC) include a mix of:

- Light duty cleaners (6731)
- Security guards and related security service occupations (6541)
- Landscaping and grounds maintenance labourers (8612)
- Janitors, caretakers and building superintendents (6733)
- Other customer and information services representatives (6552)
- Contractors and supervisors, landscaping, grounds maintenance and horticulture services (8255)
- Cleaning supervisors (6315)
- Material handlers (7452)
- Travel counsellors (6521)
- Public works maintenance equipment operators and related workers (7522)
- Specialized cleaners (6732)
- Landscape and horticulture technicians and specialists (2225)
- Human resources and recruitment officers (1223)
- Employment counsellors (4156)
- User support technicians (2282)
- Public works and maintenance labourers (7621)
- Court reporters and medical transcriptionists and related occupations (1251)
- Collectors (1435)
- Conference and event planners (1226)
- Pest controllers and fumigators (7444)
- Tour and travel guides (6531)

Overall, the industry is heavily reliant on the performance of the domestic economy, particularly business activities and corporate profitability as it is primarily engaged in activities that support the day-to-day operations of other organizations. With the exception of waste management services that are less sensitive to cyclical fluctuations in economic conditions, the other segments of the industry were negatively affected by the recession of 2008-2009, as a result of a sharp decline in corporate profits. It took three years for output to fully recover from its pre-recession level, before expanding at a more solid pace from 2013 to 2015, primarily driven by higher demand for employment, building and security services. The output started to trend down in 2016, reflecting lower activity in management of companies and enterprises (due to the restructuring, reorganization and consolidation of many activities and head offices) and weaker demand for office administrative services (partly due to the growing use of automated administrative software). The decline in output accelerated markedly in 2020 (-14%), during the first year of the

COVID-19 pandemic, as lower economic activity, telework policies and travel restrictions negatively impacted all segments of the industry and more particularly the following sub-segments: office administrative services, business support, employment services, building services and travel arrangement. With the continuation of public health restrictions, the output barely rebounded in 2021 (+1.5%), remaining largely below is pre-pandemic level. As a result, real GDP in the industry contracted at an average rate of 1.3% annually over the entire period 2012-2021. After peaking in 2019, employment fell significantly in 2020 (-8.4%) and the marginal increase recorded in 2021 left the number of workers well below its pre-pandemic level. This lowered employment growth in the industry to a modest 0.3% annually for the past decade. The movements in output and employment also led to repetitive declines in productivity in the past several years, resulting in an average contraction of 1.6% per year from 2012 to 2021.

Real GDP and Employment Growth Rates in Management and Administrative Services



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Over the projection period, output growth in management, administrative and other support services is expected to return to positive territory and straighten markedly, as the industry slowly recovers from the pandemic and continues to expand. The lifting of public health restrictions, the improvement in business activity, the gradual return of workers to the office, and the recovery in travel and tourism activity are expected to lead to renewed growth in demand across various segments of the industry, including business support, employment services, building services, and travel arrangements. However, the same factors that restrained activity in management of companies and enterprises and demand for office administrative services are expected to continue in the future. As a result, production and employment in the industry are not expected to reach pre-pandemic levels until half-way the projection period. In the longer term, the industry will continue to benefit from the growing number of firms across the economy that choose to outsource management, administrative and other support functions in order to remain focused on their core activities and increase operation efficiency, particularly manufacturing firms which are more likely to be exposed to fierce competition from low-cost countries. Under that context, the acceleration anticipated in Canadian manufacturing activity, combined with solid activity in other sectors of the economy, represent greater opportunities for the industry. The acceleration projected in the construction of commercial, industrial and institutional buildings is expected to boost demand for building services such as cleaning and landscaping, care and maintenance, guard and security, mail routing and logistical support services. Labour shortages (resulting from massive retirements of baby-boomers and a tight labour market) and skills mismatches (resulting from technological change) are expected to stimulate demand for employment, recruitment and training services. Activity in waste management and remediation services is also expected to increase, as environmental concerns have led to the creation and implementation of new waste regulations and more demand for waste management services, particularly in recycling and composting.

On average, the industry's real GDP is projected to increase by 2.3% annually over the period 2022-2031. Despite the substantial rebound in output relative to the previous decade,

employment growth is projected to slow marginally, averaging 2.0% per year, as a result of a slight pickup in productivity which is expected to increase by a modest 0.3% annually. While the industry is highly labour intensive, an increasing number of occupations and tasks are being automated and performed by technology, particularly those involving routine or low-skilled work. At the same time, a growing number of non-routine jobs and cognitive tasks are being complemented and enhanced by technology. For example, tasks related to administrative support, travel arrangements and staffing services can be increasingly performed by software and online applications, while rapid advancements in robotics and security systems may result in greater automation of tasks related to janitorial, cleaning and security services. Artificial intelligence and machine learning may also complement tasks associated with more complex administrative and management work.

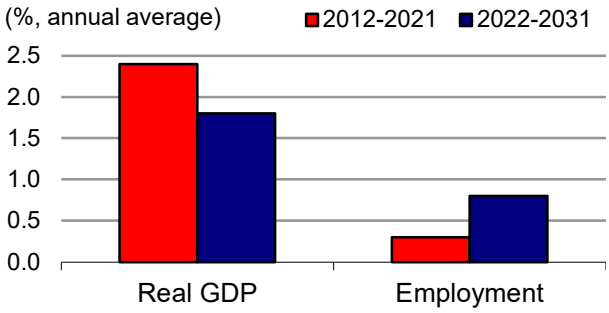
Information, Culture and Telecommunications Services
(NAICS 5111-5112; 5121-5122; 5151-5152; 5171-5179; 5182; 5191)

This industry is composed of six segments: publishing (newspapers, magazines, books and software); motion picture and sound recording (movies, videos, television programs, commercials, music recording); radio and television broadcasting (radio and TV networks, including pay and specialty channels, but excluding Internet broadcasting); telecommunications (providing telephone, television and Internet services through wireline, co-axial cable, optical fiber, wireless and satellite technologies); data processing, hosting and related services (data entry, data storage, data analysis, web hosting, music and movie streaming); and other information services (news syndicates, libraries and archives, Internet broadcasting of textual and audio/video content, web search portals). Production and employment are distributed quite unevenly across the six segments. Telecommunications services are the largest segment, accounting for 58% of production and 34% of employment in 2021, making this segment the most capital intensive, but also the most highly concentrated with five companies accounting for about 85% of revenues. In comparison, motion picture and sound recording accounted for only 7% of production but 25% of employment, making this segment the most labour intensive. Publishing services accounted for 18% of production and 19% of employment, compared to 18% and 22% respectively for the remaining three segments. Overall, the industry employed 393,500 workers in 2021, largely concentrated in Ontario (44%), Quebec (22%) and British Columbia (18%), with men accounting for the majority of the workforce (62%). Given the wide variety of activities, key occupations (4-digit NOC) include a mix of:

Producers, directors, choreographers and related occupations (5131)
Telecom. installation and repair workers (7246)
Library assistants and clerks (1451)
Graphic designers and illustrators (5241)
User support technicians (2282)
Information systems analysts and consultants (2171)
Telecommunication carriers managers (0131)
Computer programmers and interactive media developers (2174)
Journalists (5123)
Couriers, messengers and door-to-door distributors (1513)
Computer and information systems managers (0213)
Telecommunications line and cable workers (7245)
Other technical and co-ordinating occ. in motion pictures, broadcasting and performing arts (5226)
Film and video camera operators (5222)
Announcers and other broadcasters (5231)
Software engineers and designers (2173)
Managers - publishing, motion pictures, broadcasting and performing arts (0512)
Librarians (5111)

Support occupations in motion pictures, broadcasting, photography, performing arts (5227)
Audio and video recording technicians (5225)
Editors (5122)
Computer engineers (2147)
Computer network technicians (2281)
Cable television service and maintenance technicians (7247)
Graphic arts technicians (5223)
Library and public archive technicians (5211)
Broadcast technicians (5224)

Real GDP and Employment Growth Rates in Information, Culture and Telecom. Services



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Digital technologies have transformed the ways information and cultural products are produced, distributed and consumed, and telecommunications services providers are playing an increasing role in making these products accessible to the public. Basically, the industry is heavily reliant on consumer spending and businesses expenditures in Canada, making it sensitive to fluctuations in domestic economic conditions, although the telecommunications segment appears to be relatively resilient in period of economic downturns. After experiencing a small decline during the recession of 2008-2009, the output increased at an accelerating pace from 2010 to 2019, recording solid growth across all segments of the industry, except broadcasting which experienced negative growth. During that period, the industry benefited from robust demand for mobile telephony, high-speed Internet and music and movie streaming services, as well as the diffusion of an increased volume of content on the Internet (information, data, news, advertisement, social media, audio/video content, books, etc.). Broadcasting (which excludes Internet broadcasting) was the only segment to record a declining trend in output prior to the pandemic and this can be explained by the shift in consumption patterns toward online content and music and movie streaming (such as Spotify, Youtube, Netflix and Amazon Prime), which has reduced demand and advertising revenues in traditional radio and television networks. The industry's output temporarily contracted in 2020, during the first year of the COVID-19 pandemic, as lockdowns, home confinement and physical distancing measures reduced activity across several segments such as motion picture and sound recording. However, people continued to use telecommunications services for work, shopping, socializing and entertainment, leading to additional growth in this segment. Data processing, hosting and related services, which capture music and movie streaming, also recorded additional growth.

The resulting pace of growth in the industry's real GDP averaged 2.4% annually over the period 2012-2021. Despite solid output growth prior to the pandemic, employment was on a downward trend, falling at an average pace of 2.2% per year from 2012 to 2019, due to significant declines in the broadcasting, telecommunications and publishing segments. However, this situation was reversed during the pandemic as people looked to get an increasing volume of information, culture and telecommunications services from the safety of their home, leading to substantial rebounds in employment across the industry (+8.8% in 2020 and +14.1% in 2021). These gains were strong enough to outpace the declines recorded in the previous eight years, resulting in positive employment growth averaging 0.3% annually for the full period 2012-2021. This means that the increase in output came entirely from productivity growth prior to the pandemic (as employment

decreased) and entirely from employment growth during the pandemic (as productivity decreased). Overall, productivity growth averaged 2.3% annually in the past ten years, mostly driven by the downsizing of several industry segments prior to the pandemic and by the fact that telecommunications services are highly capital intensive.

During the projection period, output growth in the industry is expected to moderate relative to the period 2012-2021, evolving more in line with overall economic growth. More precisely, output growth is projected to remain robust in 2022 (+6.0%), before weakening in 2023-2024, as strong inflation and higher interest rates are expected to weigh on final domestic demand, including consumer spending and business investment. Growth in output should improve modestly over the medium-term, driven by some cyclical recovery, and remain around the pace of growth projected for the Canadian economy in the second half of the projection period. The industry will continue to be supported by robust demand for online content and the growing requirements in terms of data transmission and storage. More specifically, the shift in the distribution and consumption of information and cultural products toward digital media will continue to stimulate demand for Internet publishing and broadcasting as well as music and movie streaming, boosting growth in the data processing, hosting and other information services segments of the industry. The telecommunications segment will also continue to benefit from the increasing amounts of data used by consumers and businesses through mobile devices and fixed Internet services due to the growing popularity of streaming applications, cloud computing, unified communications and cyber security solutions. Renewed growth anticipated in business investment in machinery and equipment (including information and communications technologies) is an additional factor expected to support spending on telecommunications services.

The next generation of wireless networks will play a central role as well, with the deployment of 5G technologies across Canada. In the long term, 5G networks will result in faster downloads, lower latency, and better performance on various devices, including smart cars and the Internet of Things (IoT), creating new market opportunities. Furthermore, the growing popularity of online platforms for music and movie streaming should continue to support growth in the motion picture and sound recording segment, while the relatively low value of the Canadian dollar will maintain Canada's competitiveness as a location for the production of American movies and TV series. Netflix has announced it will open its first Canadian office in Toronto. This first corporate office will join Netflix's current studio operations in Toronto and Vancouver and reinforces the company's recognition of the movie industry in Canada. On the negative side, output and employment in the traditional radio-television broadcasting segment (which excludes Internet broadcasting) are expected to keep contracting, although this segment should eventually reach a new equilibrium following the significant disruptions caused by the digital revolution.

On average, the industry's real GDP is projected to increase by 1.8% annually over the period 2022-2031. Despite slower output growth relative to the previous decade, employment growth is projected to accelerate, averaging 0.8% per year, as result of softer gains in productivity which is expected to grow by 1.0% annually. The telecommunications segment, which represents the backbone of all activities powered by Internet connectivity, is expected to add new positions moving forward, particularly in areas requiring high skills such as IT professionals and data scientists. Employment is also projected to increase in most other segments of the industry,

including motion picture and sound recording. Because this segment is highly labour intensive, it is expected to restrain productivity growth in the industry. Providing access to broadband services to rural areas is an additional factor that may explain the slowdown anticipated in productivity growth, as getting infrastructure to remote populations is expensive and typically not productivity enhancing. High capital and labour costs related to the deployment of 5G networks may also limit the increase in productivity in the short to medium term. That said, productivity growth is still expected to remain the largest contributor to GDP growth in the industry over the projection period, powered by rapid advancement in digital and telecommunication technologies.

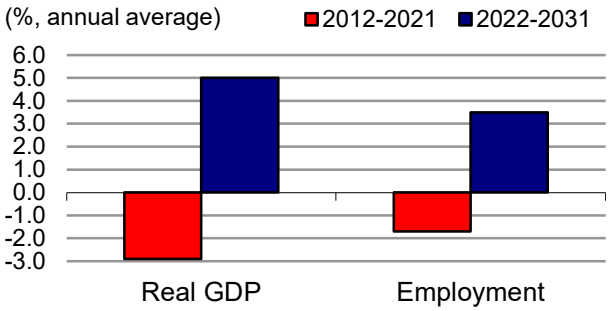
Arts, Entertainment and Recreation Services (NAICS 7111-7115; 7121; 7131-7139)

This industry comprises establishments primarily engaged in operating facilities or providing services to meet the cultural, entertainment and recreational interests of their patrons, including live performances and events or exhibits intended for public viewing. It is composed of three segments: performing arts, spectator sports and related services (live presentations involving actors, singers, dancers, musicians, writers, athletes, and their respective agents, managers and technicians); heritage institutions (museums, historic sites, zoos, botanic gardens, nature parks); and amusement, gambling and recreation industries (such as golf courses, skiing facilities, marinas, recreational, sports and fitness centres, bowling centres, amusement parks, arcades, casinos, etc.). Amusement, gambling and recreation services are the largest segment, accounting for 59% of production and employment in 2021. The other two segments accounted for the remaining share of production (i.e. 41%; breakdown is not available for GDP), with performing arts, spectator sports and related industries accounting for 32% of employment, compared to 10% for heritage institutions. Overall, the industry employed 328,400 workers in 2021 (down from 445,400 in 2019), mostly concentrated in Ontario (40%), Quebec (20%), British Columbia (17%) and Alberta (11%). The workforce is evenly split between men and women and is characterized by a large proportion of part-time workers (36%). The performing arts and spectator sports segment is also characterized by a high concentration of self-employed (65%). Given the wide variety of activities, key occupations (4-digit NOC) include a mix of:

Program leaders and instructors in recreation, sport and fitness (5254)
Operators and attendants in amusement, recreation and sport (6722)
Authors and writers (5121)
Actors and comedians (5135)
Musicians and singers (5133)
Painters, sculptors and other visual artists (5136)
Landscaping and grounds maintenance labourers (8612)
Coaches (5252)
Facility operation and maintenance managers (0714)
Technical occupations related to museums and art galleries (5212)
Casino occupations (6533)
Sports officials and referees (5253)
Other performers, n.e.c. (5232)
Artisans and craftspersons (5244)
Producers, directors, choreographers and related occupations (5131)
Recreation, sports and fitness policy researchers, consultants and program officers (4167)
Other technical and co-ordinating occ. in motion pictures, broadcasting and performing arts (5226)
Conference and event planners (1226)
Recreation, sports and fitness program and service directors (0513)
Audio and video recording technicians (5225)
Outdoor sport and recreational guides (6532)
Support occ. in motion pictures, broadcasting, photography and performing arts (5227)
Conductors, composers and arrangers (5132)
Library, archive, museum and art gallery managers (0511)
Managers - publishing, motion pictures, broadcasting and performing arts (0512)

Accommodation, travel, tourism and related services supervisors (6313)
Conservators and curators (5112)
Athletes (5251)
Tour and travel guides (6531)

Real GDP and Employment Growth Rates in Arts, Entertainment and Recreation Services



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

The industry is largely driven by consumer spending, corporate profits and tourism and travel activity, making it particularly sensitive to fluctuations in domestic and foreign economic conditions, as well as changes in discretionary expenditures. It is also heavily reliant on government funding, particularly grants dedicated to art organizations. After being negatively impacted by the recession of 2008-2009, the industry's output reached a trough in 2010 and stagnated during the subsequent three years, as consumers and businesses remained cautious about economic conditions and restrained their discretionary expenditures. The output straightened markedly from 2014 to 2019, driven by the release of some pent-up demand and major sporting and historical events hosted in Canada in 2015 and 2017 (PanAm Games, FIFA Women's World Cup, 150th anniversary of the Canadian Confederation and 375th anniversary of Montreal). The decline in the value of the Canadian dollar in 2014-2015 and the fact that Canada was recognized as the best travel destination by Lonely Planet and the New York Times in 2017 also attracted a large number of foreign tourists, particularly Americans, while encouraging more Canadians to choose vacation within the country, increasing demand for arts, entertainment and recreation activities during the pre-pandemic years.

However, the industry was devastated by the COVID-19 pandemic, with home confinement, physical distancing measures and travel restrictions leading to a drastic fall of 41% in output in 2020 alone. A wide range of activities across all three segments of the industry were negatively impacted (concert venues, sport events, cinemas, theaters, museums, casinos, fitness centers, contact sports, etc.). With the continuation of public health restrictions, the output barely rebounded in 2021 (+4.4%), remaining largely below is pre-pandemic level. As a result, real GDP in the industry contracted at an average rate of 2.9% annually over the entire period 2012-2021, although this indicator masks the fact that the industry experienced decent growth prior to the pandemic (+2.5% annually). After peaking in 2019, employment fell by 24% in 2020 and by an additional 3.0% in 2021, leading to an average decline of 1.7% per year over the past decade. Again, this indicator masks the fact that all the decline in employment occurred during the pandemic. Because the decrease observed in output in 2020 was deeper than the decrease in employment, productivity fell markedly during that year, resulting in an average decline of 1.2% annually for the full period 2012-2021 (but productivity experienced positive growth prior to the pandemic).

Over the projection period, output growth in arts, entertainment and recreation services is expected to return to positive territory and straighten markedly, as the industry gradually recovers from the pandemic. The lifting of public health restrictions; the reopening of concert venues, sport stadiums, cinemas, theaters, museums, casinos and gyms at full capacity; the accumulation of a

pent-up demand for a wide range of services offered by the industry; and the recovery in travel and tourism activity are all factors projected to lead to a substantial jump in output in 2022 (+32%). However, the pace of growth is projected to soften in 2023-2024, as strong inflation and higher interest rates are expected to put pressures on household budgets and corporate profits, restraining growth in discretionary spending on arts, entertainment and recreation services, which are generally perceived as non-essential activities. Once inflation returns to its target rate of 2%, interest rates should eventually start to decline and contribute to support disposable income and corporate profits, allowing individuals and businesses to increase discretionary spending and the industry to eventually close the gap with pre-pandemic levels in terms of output and employment. The industry should benefit from massive retirements of baby-boomers from the labour market, as this large and relatively well-off demographic group will have more time to spend on leisure activities. Baby-boomers are expected to inherit a substantial amount of wealth and assets over the next decade, providing another source of income to spend on arts, entertainment and recreation activities (this will help to compensate for the slower pace of growth projected in disposable income and consumer spending resulting from the gradual slowdown anticipated in Canada's employment growth). Tourism activity should continue to benefit from a favourable currency situation, labour markets close to full employment in Canada and the United States, and the fact that Canada will be co-hosting the 2026 FIFA World Cup (with the United States and Mexico). Moreover, demand for health and fitness clubs will continue to increase as a result of rising health consciousness and the diversification of wellness services. Canada's aging population will also lead to an increase in demand for more lucrative and adapted fitness services, further bolstering output in the industry.

On average, the industry's real GDP is projected to grow by a strong 5.0% annually over the period 2022-2031, partly driven by a large increase in the first year of the forecast. The strong rebound in output relative to the previous decade is also expected to lead to a notable pick-up in employment, with job creation averaging 3.5% per year, recording about half the gains in 2022-2023 as the industry slowly recovers the jobs lost during the pandemic. Thereafter, job creation is expected to moderate in line with slower growth in output and additional gains in productivity. Overall, productivity growth is expected to straighten at an average pace of 1.5% annually throughout the next decade, with a large part of the growth also occurring in 2022 in response to post-pandemic adjustments and frictions in labour supply, particularly in performing arts, spectator sports and related services. Because many arts and culture organizations are non-profits, the industry depends on volunteers to complement paid staff, and this is an important consideration when it comes to future employment and productivity trends. As the baby-boom generation enters retirement, this demographic group will have extra leisure time, not just for consuming the output of the industry, but also for contributing to it as volunteers, allowing the industry to increase production without necessarily hiring additional paid workers. Another trend that should contribute to increase productivity is capital investment. Many cultural and recreational facilities dated from the 1960s and 1970s are expected to be renovated and upgraded through the infrastructure program put in place by the federal government. The renewal of those facilities should help to improve the quality of service, increase attendance and, ultimately, raise output in the industry. The rapid development of technological innovations in the area of virtual entertainment is an additional factor expected to increase productivity over the projection period.

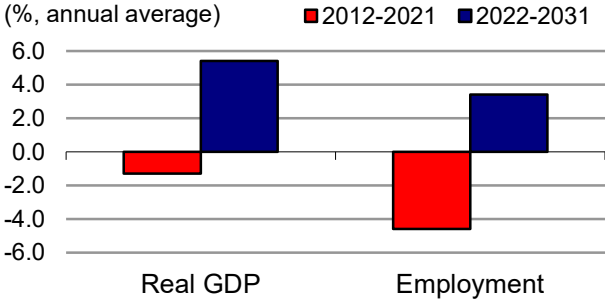
Accommodation Services (NAICS 7211; 7212; 7213)

This industry comprises establishments primarily engaged in providing short-term lodging to travellers and vacationers in facilities such as hotels, resorts, motels, bed and breakfast homes, and cottages and cabins. These establishments may offer complementary services, such as food and beverages, recreational services, conference rooms and convention services, laundry and parking services. The industry also includes establishments operating recreational vehicle (RV) parks and campgrounds (including hunting and fishing camps); and establishments operating rooming and boarding houses, which may serve as a principal residence for the period of occupancy. Traveller accommodation is by far the largest of the three segments, accounting for 86% of employment in 2021, followed by RV parks and recreational camps (12%), and rooming and boarding houses (2%). The 4-digit NAICS breakdown for GDP is not available. Overall, the industry employed 130,500 workers in 2021 (down from 188,900 in 2019), mostly concentrated in Ontario (34%), British Columbia (23%), Quebec (17%), and Alberta (11%), with women accounting for the majority of the workforce (61%). The industry is also characterized by much lower wages than the overall economy average and a significant proportion of part-time workers (26%). Key occupations (4-digit NOC) include:

Light duty cleaners (6731)
Hotel front desk clerks (6525)
Accommodation service managers (0632)
Janitors, caretakers and building superintendents (6733)
Accommodation, travel, tourism and related services supervisors (6313)
Executive housekeepers (6312);
Support occupations in accommodation, travel and facilities set-up services (6721)

* Also include many occupations related to the food services industry:
Food and beverage servers (6513)
Cooks (6322)
Food counter attendants, kitchen helpers and related support occupations (6711)
Chefs (6321)
Bartenders (6512)
Maîtres d'hôtel and hosts/hostesses (6511)

Real GDP and Employment Growth Rates in Accommodation Services



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Accommodation services are heavily reliant on tourism activity and business travel, which in turn are driven by consumer spending and business activity both from the domestic and foreign sides (domestic tourism accounts for about 60% of total revenues). Consequently, the industry is particularly sensitive to fluctuations in domestic and foreign economic conditions, travelling costs, and the value of the Canadian dollar. After stalling during the global recession of 2008-2009, output increased at a subdued pace until 2015, reflecting the persistent weakness in discretionary spending on tourism activity and business travel and the slowdown of the Canadian economy following the oil price shock of 2014-2015. The pace of growth in output accelerated markedly from 2016 to 2019, as tourism activity benefited from multiple factors, including a notable increase in consumer spending attributable to robust labour markets in both Canada and the United States; major events such as the 150th anniversary of the Canadian Confederation and the 375th anniversary of Montreal; and the recognition of Canada as the best travel destination by Lonely Planet and the New York Times in 2017. Lower fuel costs and the

sharp depreciation of the Canadian dollar in 2014-2015 have also contributed to improve tourism activity and increase domestic and foreign demand for accommodation services. Indeed, lower fuel costs have resulted in lower air and ground transportation fares, while a lower currency has attracted a large number of foreign tourists to Canada, particularly Americans, and encouraged more Canadians to choose vacation within the country.

However, the industry was devastated by the COVID-19 pandemic, with home confinement, physical distancing measures, travel restrictions and closed borders leading to a drastic fall of 40% in output in 2020 alone. Due to the continuation of public health restrictions in 2021, travel in Canada remained far below typical levels, but the industry was able to recuperate some of its losses, with output rebounding by 17%. As a result, real GDP contracted at an average rate of 1.3% annually over the entire period 2012-2021. Despite solid output growth prior to the pandemic (+2.8% per year), employment was on a downward trend, falling at an average pace of 1.1% annually from 2012 to 2019. This declining trend accelerated during the pandemic, as employment collapsed by 28% in 2020 and by an additional 4.8% in 2021, leading to an average decline of 4.6% per year over the past decade. Overall, productivity growth was positive, averaging 3.3% annually in the past ten years, essentially driven by the downsizing of the industry prior to the pandemic. Technological innovations, such as online hotel bookings and chatbots, have played an important role in reducing labour demand and increasing productivity by streamlining customer services and delivering smooth business-to-customer interactions. Growing competition from new business models like Airbnb and Vrbo has also amplified the need to contain operating costs in the industry. Many of the rentals found through those digital platforms are less expensive than hotels and often offer a more unique experience than traditional accommodations, thereby appealing to budget-conscious travellers. According to Statistic Canada, revenues from those types of private short-term accommodation services surged from $265 million in 2015 to $2,760 million in 2018, with Airbnb and other private short-term rentals accounting for 18% of the inventory for accommodations in Canada.

Over the projection period, output growth in accommodation services is expected to return to positive territory and to straighten markedly, as the industry continues to recover from the pandemic and keeps expanding. The lifting of public health restrictions; the return of conferences and business travel; the accumulation of a pent-up demand for tourism activity; and the recovery in arts, entertainment and recreation activities (such as concerts, major sport events, etc.) are all factors projected to lead to additional jumps in output in 2022 (+29%) and 2023 (+12%). However, once the output fully recovers, its pace of growth is expected to soften significantly, as strong inflation and higher interest rates will put pressures on household budgets and corporate profits, restraining growth in discretionary spending on leisure and business travel, which are often perceived as non-essential activities. When inflation returns to its target rate of 2%, interest rates should eventually start to decline and contribute to support disposable income and corporate profits, allowing individuals and businesses to increase discretionary spending and the industry to expand further. Tourism activity should continue to benefit from a favourable currency situation, labour markets close to full employment in Canada and the United States, and the fact that Canada will be co-hosting the 2026 FIFA World Cup (with the United States and Mexico). The industry will also benefit from massive retirements of baby-boomers from the labour force, as this large and relatively well-off demographic group will have more time to spend on tourism activities,

including campgrounds and RV parks. Baby-boomers are expected to inherit a substantial amount of wealth and assets over the next ten years, providing another source of income to spend on travel and accommodation services (this will help to compensate for the slower pace of growth projected in disposable income and consumer spending resulting from the gradual slowdown anticipated in Canada's employment growth). Tourism activity is expected to be increasingly reliant on overseas travellers, particularly from emerging economies where demand for travelling is rising in line with higher incomes. Compared with U.S. tourists, overseas travellers tend to stay longer in Canada and spend more. On the negative side, the growing number of firms and organizations using online platforms for meetings and conferences to save on business travel is expected to restrain demand for accommodation services, especially in downtown office-centric areas.

On average, the industry's real GDP is projected to grow by a strong 5.4% annually over the period 2022-2031, driven by large increases in the first two years of the forecast. The notable rebound in output relative to the previous decade is also expected to lead to a strong pickup in employment, with job creation averaging 3.4% per year, recording most of the gains from 2022 to 2025. Thereafter, employment growth is expected to moderate in line with slower growth in output and additional gains in productivity. Overall, productivity growth is expected to average 2.0% annually throughout the next decade, with a large part of the growth occurring in 2022-2023 in response to post-pandemic adjustments and frictions in labour supply. Indeed, because the industry was severely impacted by public health restrictions and a high level of uncertainty during the pandemic, many previously employed individuals have found jobs in more secure industries, leading to cyclical frictions in labour supply. In the longer term, productivity growth is expected to soften as a significant part of the adjustments to technological innovations and new business models already took place prior to the pandemic. Nevertheless, there is still room for additional gains in productivity through technologies such as contact center automation platforms, which pair automation with artificial intelligence. By allowing companies to automate a large part of their customer service requests, such technologies leverage conversational AI and easy-to-navigate platforms, and often include built-in telephony, customer relationship management integrations and advanced analytics with regards to customer behaviour. Accommodation services are also characterized by a high degree of labour turnover due to the prevalence of part-time and seasonal work and much lower wages relative to other industries. Those factors, combined with demographic pressures on Canada's labour force and a tight labour market, represent additional incentives for the industry to improve productivity as it may become increasingly challenging to compete with other industries to attract workers. As a result of additional gains in productivity and potential difficulties in retaining and attracting workers, employment in accommodation services is not expected to return to pre-pandemic levels over the projection period.

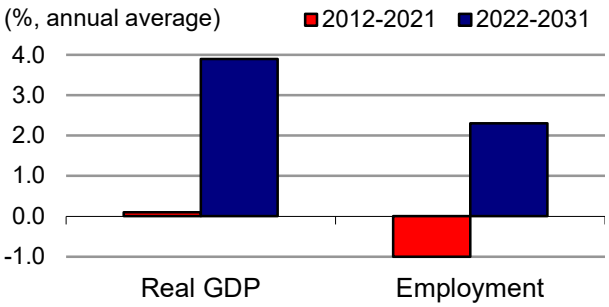
Food Services (NAICS 7223; 7224; 7225)

This industry comprises establishments engaged in preparing meals, snacks and beverages for immediate consumption on and off the premises. It is composed of three segments: special food services (caterers and mobile food services); drinking places serving alcoholic beverages (bars, taverns, pubs and night clubs); and full-services restaurants and limited-service eating places

(family and fine-dining restaurants, fast food restaurants, coffee shops). It does not include food service activities that occur within establishments such as hotels, civic and social associations, amusement and recreation parks, and theatres. However, leased food-service locations in facilities such as hotels, shopping malls, airports and department stores are included. Full- and limited-services restaurants are by far the largest segment, accounting for 93% of employment in 2021, followed by special food services (5%) and drinking places (2%). The 4-digit NAICS breakdown for GDP is not available. Overall, the industry employed 827,200 workers in 2021 (down from 1,028,800 in 2019), distributed proportionally to provincial population: 38% in Ontario, 20% in Quebec, 17% in British Columbia, 12% in Alberta and 13% in the remaining provinces, with women accounting for the majority of the workforce (55%). The industry is characterized by much lower wages than the national average and by the largest concentration of part-time workers in the economy, accounting for 51% of its workforce. Food services also provide many young people with their first job, as 45% of workers were aged between 15 and 24. Key occupations (4-digit NOC) include:

Food counter attendants, kitchen helpers and related support (6711)
Cooks (6322)
Food and beverage servers (6513)
Restaurant and food service managers (0631)
Food services supervisors (6311)
Maîtres d'hôtel and hosts/hostesses (6511)
Chefs (6321)
Bartenders (6512)
Bakers (6332)
Delivery and courier service drivers (7514)

Real GDP and Employment Growth Rates in Food Services



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Food services are heavily reliant on consumer spending and are particularly sensitive to growth in disposable income and changes in discretionary expenditures. Tourism activity, both from the domestic and foreign sides, is an additional driver of demand, as non-local consumers account for about one quarter of the industry's revenues. Demand for food services also relies, to a smaller degree, on business activity (e.g. business lunches, business travel and conferences). Following a slight contraction in the aftermath of the 2008-2009 recession, the industry's output quickly recovered in 2011 and continued to expand at a solid pace until 2019. Robust growth in consumer spending, stimulated by a healthy labour market, rising disposable income and low interest rates, combined with a growing affinity of Canadians to dine out, were key drivers behind the industry's solid performance. Tourism activity was an additional driver of growth, as the sharp depreciation of the Canadian dollar in 2014-2015 attracted a large number of foreign tourists to Canada, particularly Americans, and encouraged more Canadians to choose vacation within the country, increasing demand for food services. Lower transportation costs resulting from lower fuel costs, and major events such as the 150th anniversary of the Canadian Confederation and the 375th anniversary of Montreal, also promoted greater tourism activity.

However, the industry was devastated by the COVID-19 pandemic, with home confinement, physical distancing measures, telework policies and travel restrictions leading to a drastic fall of

31% in output in 2020 alone. Due to the continuation of public health restrictions in 2021 (such as closures or capacity limits to in-person dining/drinking at restaurants and bars), the demand for food services and drinking places remained far below typical levels, but the industry was able to recuperate some of its losses, with output rebounding by 14%, largely supported by food delivery and take-out services. This resulted in anemic growth in real GDP for the entire period 2012-2021, averaging 0.1% annually, although this indicator masks the fact that the industry experienced robust growth prior to the pandemic (+3.0 annually). After peaking in 2019, employment fell by 21% in 2020 and very few of the job losses were recuperated in 2021 (+2.6%), leaving employment well below its pre-pandemic level and resulting in an average decline of 1.0% per year over the past decade. Again, this indicator masks the fact that job creation in the industry was similar to the national average prior to the pandemic (+1.3% annually), recording all the gains in food services as employment contracted significantly in drinking places. Overall, productivity growth was positive, averaging 1.1% annually in the past ten years, with most of the gains occurring prior to the pandemic when restaurants begun to explore more sophisticated technological innovations, resulting in output growth exceeding employment growth. Applications such as self-service ordering kiosks and the ability for customers to place orders and pay via mobile devices have automated operations traditionally involving several steps and personal interaction with clients and among workers. The rise in minimum wages is an additional factor that encouraged firms to adopt new technologies and increase productivity to maintain their profit margins. The industry is also facing indirect competition from the growing popularity of home meal solutions and meal kit delivery services, such as those supplied by Goodfood and HelloFresh.

Over the projection period, output growth in food services is expected to accelerate markedly, as the industry continues to recover from the pandemic and keeps expanding. The lifting of public health restrictions; the reopening of restaurants and bars at full capacity; the gradual return of workers to the office; and the recovery in travel, tourism and recreational activities are all factors projected to lead to additional jumps in output in 2022 (+17%) and 2023 (+8%). However, once the output fully recovers, its pace of growth is expected to soften significantly, as strong inflation and higher interest rates will put pressures on household budgets, restraining growth in discretionary spending devoted to restaurants and bars. When inflation returns to its target rate of 2%, interest rates should eventually start to decline, relieving some pressures on household budgets and discretionary spending. That said, a number of factors are expected to limit the capacity of the industry to expand moving forward. For example, as more firms and organizations adopt a hybrid work model and use online platforms for meetings and conferences to save on business travel, the demand for food services in downtown office-centric areas will struggle to return to pre-pandemic levels. The gradual slowdown anticipated in Canada's employment growth and massive retirements of baby-boomers from the labour market are also expected to restrain growth in disposable income and consumer spending over the longer term, including discretionary spending on food services. Moreover, if the dining habits among retiring baby-boomers follow the trends of the previous generation, they are likely to spend more of their food dollars at home as they age. On the positive side, tourism activity should continue to benefit from a favourable currency situation and a growing inflow of overseas travelers, particularly from emerging economies where demand for travelling is rising in line with higher incomes. The aging of

Canada's population is also expected to increase demand for food services from health care institutions, which account for more than half of institutional food services sales.

On average, the industry's real GDP is projected to grow by a solid 3.9% annually over the period 2022-2031, driven by large increases in the first two years of the forecast. The strong acceleration in output growth relative to the previous decade is also expected to lead to a notable pick-up in employment, with job creation averaging 2.3% per year, recording most of the gains from 2022 to 2025. Thereafter, employment growth is expected to moderate in line with slower growth in output and additional gains in productivity. Overall, productivity growth is expected to accelerate at an average rate of 1.6% annually throughout the next decade, with a large part of the growth occurring in 2022-2023 in response to post-pandemic adjustments and frictions in labour supply. Indeed, because the industry was severely impacted by public health restrictions and a high level of uncertainty during the pandemic, many previously employed individuals have found jobs in more secure industries, leading to cyclical frictions in labour supply. Over the longer term, the industry will continue to explore ways to digitalize dining in order to improve productivity. Businesses are expected to increase the incorporation of data-gathering software and analytics programs into their operations via point-of-sale transactions, mobile applications, reservation systems, drive-thru traffic, customer rewards programs and social media. The technical feasibility of automation for various occupations within the industry given current technologies remains significant. For instance, the tasks performed by food counter attendants and kitchen helpers are at risk of being automated over the next 10 to 20 years. The shift in consumption patterns toward food delivery and take-out services, particularly from younger generations, is also expected to reduce labour intensity in some segments of the industry and increase productivity. Food services are characterized by a high degree of labour turnover due to the prevalence of part-time and seasonal work and much lower wages relative to other industries. Those factors, combined with demographic pressures on Canada's labour force and a tight labour market, represent additional incentives for the industry to improve productivity as it may become increasingly challenging to compete with other industries to attract workers. As a result of significant gains in productivity and potential difficulties in retaining and attracting workers, employment in food services is not expected to return to pre-pandemic levels until the end of the projection period.

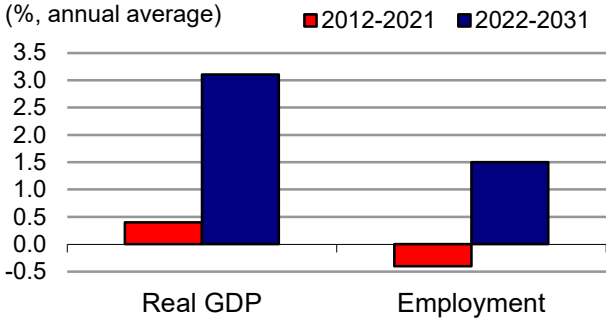
Repair, Personal and Household Services (NAICS 8111-8114; 8121-8129; 8131-8139; 8141)

This industry comprises establishments not classified in any other services industries and provides a wide range of services to consumers or businesses. It is composed of four segments: repair and maintenance (on motor vehicles, electronic equipment, commercial and industrial machinery, personal and household goods); personal and laundry services (such as hair care, esthetic services, dry cleaning and funeral services); religious, grant-making, civic and professional organizations (supporting religious, social and political causes); and private household services (employing individuals such as home support workers, housekeepers, gardeners, family caregivers and baby-sitters). Repair and maintenance services are the largest segment, accounting for 38% of production and 36% of employment in 2021, followed by religious, civic and professional organizations (36% of production and 28% of employment), personal and laundry services (19% and 31%), and private household services (7% and 5%). Overall, the

industry employed 734,100 workers in 2021 (down from 812,500 in 2019), distributed proportionally to population: 38% in Ontario, 21% in Quebec, 15% in British Columbia, 13% in Alberta, and 13% in the remaining provinces. The workforce is characterized by a slight majority of women (52%), lower wages than the national average, and a significant concentration of self-employed (28%), particularly in personal and laundry services (48%). Given the wide variety of activities, key occupations (4-digit NOC) include a mix of:

- Hairstylists and barbers (6341)
- Automotive service technicians, truck and bus mechanics and mechanical repairers (7321)
- Estheticians, electrologists and related occupations (6562)
- Home child care providers (4411)
- Professional occupations in religion (4154)
- Motor vehicle body repairers (7322)
- Contractors and supervisors, mechanic trades (7301)
- Welders and related machine operators (7237)
- Pet groomers and animal care workers (6563)
- Home support workers, housekeepers and related occupations (4412)
- Electronic service technicians (household and business equipment) (2242)
- Dry cleaning, laundry and related occupations (6741)
- Heavy-duty equipment mechanics (7312)
- Tailors, dressmakers, furriers and milliners (6342)
- Funeral directors and embalmers (6346)
- Other religious occupations (4217)
- Conference and event planners (1226)
- Upholsterers (6345)
- Appliance services and repairers (7332)
- Jewellers, jewellery and watch repairers (6344)
- Image, social and other personal consultants (6561)
- Shoe repairers and shoemakers (6343)

Real GDP and Employment Growth Rates in Repair, Personal and Household Services



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

The industry mostly relies on the performance of the domestic economy, more specifically consumer spending and business activity in Canada, which in turn are driven by growth in disposable income and corporate profits. The religious, civic, grant-making and professional organizations segment is particularly sensitive to discretionary spending and cyclical fluctuations in economic conditions. Following a slight contraction in the aftermath of the 2008-2009 recession, the industry's output quickly recovered in 2011 and increased almost continuously until 2019, recording moderate growth across all segments of the industry, except private household services which experienced negative growth. During that period, the industry benefited from the increase in consumer spending, stimulated by a healthy labour market, rising disposable income and low interest rates. Business activity was an additional driver of growth, with corporate profits contributing to increase demand in the repair and maintenance segment of the industry, but also in religious, grant-making, civic and professional organizations. Private household services were the only segment to record a declining trend in output prior to the pandemic, most likely due to the growing prevalence of businesses (rather than individuals) offering services to households, such as weekly cleaning services, meal delivery kits, lawn cutting, etc. (such services are not classified under NAICS 81 when they are supplied by businesses – for example, landscaping services are rather classified under NAICS 56: Administrative and support, waste management and remediation services). That said, all segments of the industry were severely impacted by the COVID-19 pandemic, with lockdowns, home confinement and

physical distancing measures leading to a decrease of 15.5% in output in 2020 alone. Due to the continuation of public health restrictions in 2021, the demand for repair, personal and household services remained below typical levels, but the industry was able to recuperate more than half of its losses, with output rebounding by 8.2%. The resulting pace of growth in real GDP averaged a very modest 0.4% annually over the full period 2012-2021 (+1.6% prior to the pandemic). After peaking in 2019, employment fell by 9.2% in 2020 and was little changed in 2021, resulting in an average decline of 0.4% annually for the past ten years (but +0.7% prior to the pandemic). Overall, productivity increased by 0.8% annually, with most of the gains occurring in the first half of the previous decade.

During the projection period, output growth in repair, personal and household services is expected to accelerate markedly, as the industry continues to recover from the pandemic and keeps expanding. The lifting of public health restrictions (such as physical distancing, wearing masks and more frequent cleaning); the reopening at full capacity of personal services facilities (such as hair and beauty salons, massage studios, saunas and bath houses, tattoos and piercing shops); and the accumulation of a pent-up demand for a wide variety of services offered by the industry are all factors that will continue to support the recovery in output in 2022 (+7.1%). Once the output fully recovers, its pace of growth is expected to soften, but remaining above the growth rate projected for the overall economy. In fact, several factors will contribute to support additional growth in the industry moving forward. For example, as strong inflation and high interest rates are putting pressures on household budgets, this may encourage consumers to hold onto their vehicles and other major equipment for longer, driving demand for repair and maintenance services. Also, shifting attitudes toward reducing consumption, recycling and reusing items are gaining traction as younger generations are more concerned about climate change. Renewed growth anticipated in business investment related to commercial and industrial machinery and equipment (including electronic and precision equipment) is an additional factor expected to support demand for repair and maintenance services. Moreover, an aging population is expected to stimulate demand for personal and private household services, including funeral, cemeteries and crematoria services, personal assistance, family caregiving, housekeeping and home support services. The religious, civic, grant-making and professional organizations segment is also expected to benefit from the increasing number of retired workers who will have more time to spend on voluntary and charity work or in supporting and advocating various social and political causes. On the negative side, the industry will be challenged by the fact that growth in consumer spending is projected to weaken progressively over the longer term, in line with the slower pace of growth anticipated in overall employment and disposable income.

On average, the industry's real GDP is projected to grow by a solid 3.1% annually over the period 2022-2031, partly driven by a large increase in the first year of the forecast. The strong acceleration in output growth relative to the past decade is also expected to lead to a rebound in employment, with job creation averaging 1.5% per year. However, the employment data available in early 2022 pointed to additional job losses during that year. Starting in 2023, employment growth is projected to resume, although the industry is not expected to fully recover the jobs lost during the pandemic until 2028 due to slower growth in output (after 2022) and additional gains in productivity. Overall, productivity is expected to increase at a faster pace of 1.6% annually throughout the next decade. Despite the high degree of labour-intensity characterizing the

industry, productivity growth will account for about half of the increase in production. The repair and maintenance segment is expected to post the strongest gains in productivity, being the most likely to adopt innovative equipment and automation technologies. For example, repetitive or high-risk repair and maintenance activities can be increasingly performed by advanced robotics and artificial intelligence. The industry is also characterized by a higher share of workers aged 55 and over relative to most other industries and is therefore more exposed to retirements. This factor, combined with demographic pressures on Canada's labour force and a tight labour market, is expected to induce employers to automate an increasing share of their operations and to come up with new and more efficient ways of delivering services, leading to faster gains in productivity.

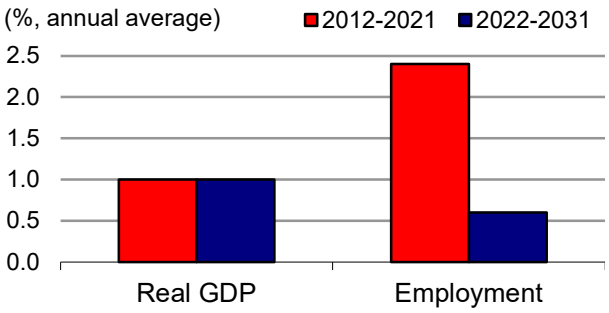
Elementary and Secondary Schools (NAICS 6111)

Elementary and secondary schools comprise establishments primarily engaged in providing academic courses that consist of a basic preparatory education, from kindergarten to grade 12. They employed 876,900 workers in 2021, with women accounting for 75% of the workforce. Employment is distributed proportionately to population: 38% in Ontario, 26% in Quebec, 12% in British Columbia, 11% in Alberta, and 14% in the remaining provinces. Key occupations (4-digit NOC) include:

Elementary school and kindergarten teachers (4032)
Elementary and secondary school teacher assistants (4413)
Secondary school teachers (4031)
School principals and administrators of elementary and secondary education (0422)
Early childhood educators and assistants (4214)
Educational counsellors (4033)
Education policy researchers, consultants and program officers (4166)
Audiologists and speech-language pathologists (3141)
Instructors of persons with disabilities (4215)
Library and public archive technicians (5211)

* Also include a significant number of Bus drivers (7512).

Real GDP and Employment Growth Rates in Elementary and Secondary Schools



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Economic activity in elementary and secondary schools is mainly driven by demographic trends in population aged 5 to 17 and particularly sensitive to government expenditures in education. Growth in output was relatively modest over the past ten years, as positive growth in population aged 5 to 12 was accompanied by negative growth in population aged 13 to 17. Despite moderate growth in school-aged population, the increase in public and private expenditures on elementary and secondary education led to a growing output in most years, with the exception of 2020 when schools were completely shut down in some provinces due to the COVID-19 pandemic. During that year, the output fell by 8.7%, pushing many parents to home-schooling initiatives. However, with the reopening of schools throughout 2021, the output quickly recovered (+8.9%), resulting in an average growth rate of 1.0% annually in real GDP for the entire period 2012-2021.

While output growth was rather modest, employment growth was much stronger, averaging 2.4% per year over the past decade, largely supported by additional gains during the pandemic years. In contrast with output, employment continued to expand in 2020 as most teachers remained employed throughout the pandemic and switched to working from home during lockdown periods. More importantly, employment surged in 2021 (+8.0%) as some provinces gave children the option of attending school virtually or in-person and the need to provide those two types of services concurrently boosted labour demand. With employment growth outpacing output growth, productivity contracted at an average pace of 1.4% annually in the past ten years, recording a large part of the decline in 2020. Thai said, the concept and measurement of productivity in educational services may differ from the other sectors of the economy where goods and services are traded and more easily valued in monetary terms. For example, the introduction of more computers in the classroom may improve the educational experience of students, but this development may not necessarily show up in the productivity figures because the number of teachers does not necessarily adjust to the growing use of technology.

Over the projection period, output growth in elementary and secondary schools is expected to remain relatively modest, with significant gains in the near term accompanied by weaker gains in the longer term. In the first half of the forecast horizon, school enrolment will benefit from additional growth in population aged 5 to 17, primarily driven by the strong rebound projected in teenage population (13 to 17) as low fertility rates will restrain growth in population aged 5 to 12. Increased immigration targets are also expected to raise the number of immigrants' children entering the primary and secondary school systems. In the second half of the forecast horizon, growth in school-aged population is expected to weaken and population aging will continue to erode the federal and provincial tax bases, while simultaneously putting further pressures on the health care system, limiting the ability of governments to expand expenditures in educational services.

The resulting pace of growth in the industry's real GDP is projected to average 1.0% annually over the period 2022-2031, a pace similar to the past ten years. However, after surging in 2021, employment growth is projected to slow significantly relative to the previous decade, averaging 0.6% per year. This reflects a notable pickup in productivity, which is expected to increase at an annual rate of 0.4%. The turnaround in productivity can be explained by the fact that most elementary and secondary schools are expected to cease offering online education after the pandemic, lowering the need for additional labour and leading to renewed gains in productivity. The growing adoption of technology in the classroom is also expected to have a positive impact on productivity, or at least efficiency. For example, with the use of learning management systems (LMS), students can access online resources to get assistance beyond the physical reach of their teacher. For students who need to spend more time practicing a concept, online exercises can also help them work at their own pace and still keep up with their peers. The growing use of educational tablets in the K-12 schooling system (i.e. from kindergarten to 12th grade) has brought mobility to the classroom while improving learning. Electronic documents, emails, virtual labs, virtual field trips, electronic textbooks, and free online resources help schools save money and provide students with more efficient educational experiences. Teachers can also utilize technology to access virtual expert improvement courses (most are free) and personal learning networks (PLN) to discover resources, share thoughts, and get support from their colleagues.

Again, while those developments are expected to improve the efficiency of the education system, it is not clear how they will translate in terms of productivity numbers.

Colleges, CEGEPs and Vocational Schools (NAICS 6112, 6114-6117)

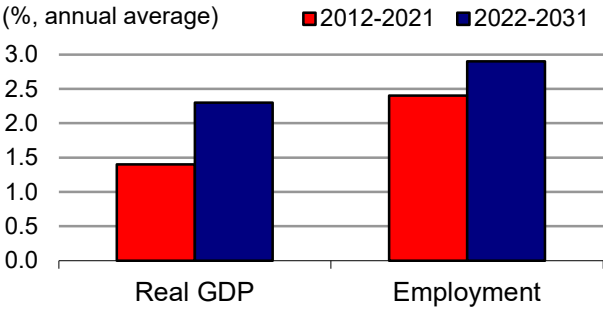
Community colleges and CEGEPs comprise establishments primarily engaged in providing academic or technical courses and granting associate degrees, certificates or diplomas that are below the university level. The requirement for admission to an associate or equivalent degree program is at least a high school diploma or equivalent general academic training. Vocational schools comprise establishments such as business, computer and management training schools, technical and trade schools, and other schools primarily engaged in providing instruction in fine arts, sports, languages and a variety of other topics (first-aid training, driving lessons, adult literacy programs). These establishments may be privately owned and operated, either for profit or not, or they may be publicly owned and operated. Community colleges and CEGEPs account for the largest share of output (68% in 2021), while vocational schools account for the largest share of employment (56% in 2021; with “other schools” alone accounting for 48%). This situation can be explained by the fact that vocational schools are characterized by a high proportion of part-time workers (51%) and self-employed (48%). Overall, the industry employed 280,300 workers in 2021, with women accounting for 59% of the workforce. Employment is distributed proportionately to population: 38% in Ontario, 24% in Quebec, 16% in British Columbia, 12% in Alberta, and 10% in the remaining provinces. Given the wide variety of educational services offered by the industry, key occupations (4-digit NOC) include a mix of:

College and other vocational instructors (4021)
Other instructors (4216)
Program leaders and instructors in recreation, sport and fitness (5254)
Musicians and singers (5133)
Education policy researchers, consultants and program officers (4166)
Dancers (5134)
Coaches (5252)
Post-secondary teaching and research assistants (4012)
Administrators in post-secondary education and vocational training (0421)
Educational counsellors (4033)

Economic activity in community colleges and CEGEPs is largely driven by demographic trends in the 17-21 age cohort (the prime age for attending college or seeking technical training) and is particularly sensitive to government spending in education. In comparison, many of the educational services provided by vocational schools cover multiple age groups (including children, youth and adults) and are partly supported by consumer spending on extra-curricular activities associated with arts, sports and hobbies in general (such as music, dance, ski or tennis lessons). Overall, the industry appears to be resilient to cyclical downturns, reflecting the fact that during bad economic times, youth usually stay in school longer, while displaced workers return to school to upgrade their skills in response to poorer job opportunities. As a result, the output continued to increase during and shortly after the recession of 2008-2009, before stagnating from 2012 to 2016 due to a decline in population aged 17-21. This demographic trend was reversed in subsequent years, contributing to a significant acceleration in output growth from 2017 to 2019, which was also supported by a sharp increase in the number of individuals in multiple age groups who enrolled in vocational schools.

However, the output fell by 7.2% in 2020, mostly reflecting a large decline in the vocational segment as many establishments providing extra-curricular activities (associated with arts, sports and hobbies) were shut down during the COVID-19 pandemic. Immigration and border restrictions also negatively impacted the enrolment of international students in colleges and CEGEPs. With the reopening of vocational schools and the digital transformation of the learning process, the output recovered a large part of its pandemic losses in 2021 (+6.4%), resulting in an average growth rate of 1.4% annually in real GDP for the entire period 2012-2021. In comparison, employment growth averaged 2.4% per year, and the job losses recorded in 2020 (-7.1%) were fully recuperated in 2021 (+7.4%). A large part of the employment gains recorded the past decade took place in vocational schools where most establishments have a high concentration of part-time workers, which tends to boost their employment numbers relative to other establishments. The significant gap observed between output and employment growth over the past ten years reflected a declining trend in productivity, which contracted by 1.0% annually. This situation can be partly explained by the high degree of labour intensity in vocational schools, which are characterized by a strong concentration of part-time workers (in COPS, labour productivity is measured by real GDP divided by the total number of workers, rather than the total number of hours worked). It could also reflect changes in the types of programs offered within schools and the fact that colleges and CEGEPs were slow to embrace digital technologies in the delivery of education services prior to the pandemic.

Real GDP and Employment Growth Rates in Colleges, CEGEPs and Vocational Schools



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Over the projection period, output growth in colleges, CEGEPs and vocational schools is expected to accelerate significantly, as the industry continues to recover from the pandemic and keeps expanding. Growth is projected to be driven by the return of international students to Canada in the near term and by a strong rebound in population aged 17 to 21 relative to the past decade. The growing demand for higher educated and skilled workers, resulting from the changing nature of work and the continued shift toward a digital economy, is expected to keep pushing up enrolment rates in colleges and technical schools in Canada. This is also true for older workers who may see the need to upgrade their skills in order to adjust to technological progress. Indeed, automation is increasing rapidly in many sectors of the economy, not only in the goods-producing sector, but also in the services sector. Some jobs are being eliminated, while many others are changing and require new skills and technical training to better integrate and complement technology.

On average, the industry's real GDP is projected to grow by 2.3% annually over the period 2022-2031. The significant acceleration in output growth relative to the previous decade is also projected to lead to faster growth in employment, with job creation averaging 2.9% per year. Overall, productivity is expected to keep contracting, albeit at a slower pace than the last ten years, with declines averaging 0.6% annually. In fact, a large part the increase in employment and the totality of the decline in productivity are projected to occur in 2022-2023, reflecting

adjustments to a post-pandemic environment. Starting in 2024, productivity growth is expected to resume and result in more moderate gains in employment for the rest of the projection period. Renewed growth in productivity reflects the fact that colleges and other educational institutions have adopted the use of virtual learning and other digital technologies in the classroom during the pandemic. This trend is expected to persist and even amplify in the future, leading to modest gains in productivity, despite the fact that the industry will remain labour intensive.

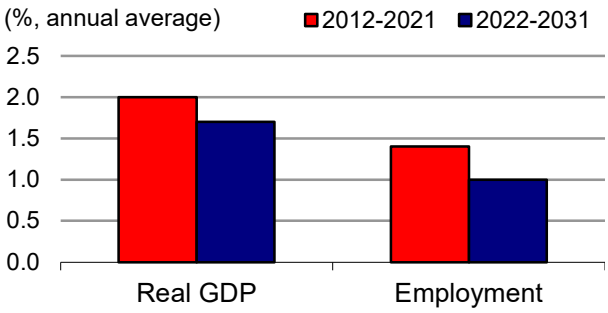
Universities (NAICS 6113)

Universities comprise establishments primarily engaged in providing academic courses and granting degrees at the bachelor or graduate levels. The requirement for admission is at least a high school diploma or equivalent general academic training for baccalaureate programs, and often a baccalaureate degree for professional or graduate programs. Canadian universities employed 295,000 workers in 2021, distributed proportionately to population: 38% in Ontario, 21% in Quebec, 15% in British Columbia, 13% in Alberta, and 14% in the remaining provinces. The workforce is characterized by a majority of women (57%) and a relatively high share of part-time employees (25%). Key occupations (4-digit code) include:

University professors and lecturers (4011)
Post-secondary teaching and research assistants (4012)
Administrators - post-secondary education and vocational training (0421)
Education policy researchers, consultants and program officers (4166)
Educational counsellors (4033)
Librarians (5111)

Economic activity in universities is largely driven by demographic trends in the 18-24 age cohort (the prime age for attending universities) and particularly sensitive to government expenditures in education. Overall, the industry appears to be resilient to cyclical downturns, reflecting the fact that during bad economic times, youth usually stay in school longer, while displaced workers return to school to upgrade their skills in response to poorer job opportunities. As a result, the output continued to increase during the recession of 2008-2009 and kept expanding at a relatively solid pace until 2019. Despite sluggish growth in population aged 18-24 during that period, the number of enrolments in universities increased continuously, largely supported by international students, although Canadian students still accounted for about 85% of total enrolments in 2019 (down from 91% in 2011).

Real GDP and Employment Growth Rates in Universities



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

The COVID-19 pandemic led to major disruptions in universities across the country in 2020, with most institutions cancelling in-person classes and moving to virtual learning. However, the contraction in output was modest (-0.5% only) and essentially reflected a decline in international student enrolments due to the closure of visa application centres and travel restrictions. In fact, Canadian student enrolments continued to increase in 2020, limiting the decline in output. With

the return of international students and additional growth in total enrollments, the output strongly rebounded in 2021 (+2.8%), resulting in an average growth rate of 2.0% annually in real GDP for the entire period 2012-2021. On the employment side, growth generally tracked the rate of output, albeit at a weaker pace of 1.4% per year, as productivity increased at annual rate of 0.6%. This means that productivity growth accounted for 30% of output growth. New technologies such as online courses and e-learning applications have enabled universities to meet the growing demand for their services, without increasing employment excessively.

Over the projection period, output growth in universities is expected to moderate somewhat relative to the past decade, primarily reflecting subdued growth in population aged 18 to 24 in the coming years. However, this situation will be partly offset by further increases in international student enrolments in the short to medium term and an acceleration in population growth among the 18-24 age group during the second half of the forecast horizon. University enrollment will continue to be supported by the growing demand for higher educated and skilled workers, resulting from the changing nature of work and the shift toward a digital economy. Some jobs are being eliminated by automation, while many others require new skills and more sophisticated knowledge to better integrate and complement technology, including artificial intelligence. Therefore, higher skills and educational requirements on the labour market are expected to keep pushing up enrolment rates in post-secondary education, particularly in sciences, technology, engineering and mathematics (STEM).

On average, the industry's real GDP is projected to grow by 1.7% annually over the period 2022-2031. The weaker pace of growth in output relative to the previous decade and additional gains in productivity are also projected to lead to slower growth in employment, with job creation averaging 1.0% per year. Overall, productivity is expected to increase at an annual rate of 0.7%. The adoption of virtual learning and other digital technologies inside and outside the classroom before and during the pandemic is expected to continue moving forward, leading to further gains in productivity.

Health Care (NAICS 6211-6219; 6221-6223; 6231-6239)

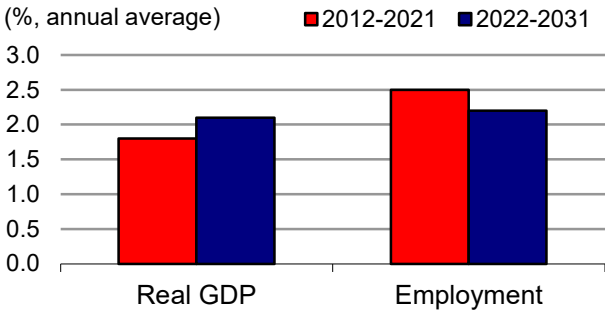
This industry comprises establishments primarily engaged in providing health care by diagnosis and treatment and providing residential care for medical and social reasons. It is composed of three segments: ambulatory health care services which include offices of physicians, dentists and health care practitioners, and medical and diagnostic laboratories (44% of real GDP and 33% of employment in 2021); hospitals which include general medical, surgical, psychiatric and substance abuse hospitals (40% and 47%); and nursing and residential care facilities which provide services to people with developmental handicaps, mental illness and substance abuse problems and services to the elderly and persons who are unable to fully care for themselves or who do not desire to live independently (16% and 20%). With a total of 2.0 million workers in 2021, health care was the second largest employer of the Canadian economy, behind retail trade. The workforce is primarily composed of women (79%) and characterized by a high level of education and a significant concentration of part-time workers (21%). The ambulatory health care services segment is also characterized by a strong concentration of self-employed (33%). Health care employment is distributed proportionately to population: 37% in Ontario, 22% in Quebec,

14% in British Columbia, 12% in Alberta, and 15% in the remaining provinces. Key occupations (4-digit NOC) include:

Registered nurses and registered psychiatric nurses (3012)
Nurse aides, orderlies and patient service associates (3413)
Licensed practical nurses (3233)
General practitioners and family physicians (3112)
Social and community service workers (4212)
Specialist physicians (3111)
Medical administrative assistants (1243)
Physiotherapists (3142)
Dental assistants (3411)
Nursing co-ordinators and supervisors (3011)
Managers in health care (0311)
Dental hygienists and dental therapists (3222)
Medical laboratory technicians and pathologists' assistants (3212)
Psychologists (4151)
Massage therapists (3236)
Social workers (4152)
Medical radiation technologists (3215)
Other assisting occupations in support of health services (3414)
Dentists (3113)
Paramedical occupations (3234)
Medical laboratory technologists (3211)
Health policy researchers, consultants and program officers (4165)
Other medical technologists and technicians (except dental health) (3219)
Occupational therapists (3143)
Respiratory therapists, clinical perfusionists and cardiopulmonary technologists (3214)
Dietitians and nutritionists (3132)
Pharmacists (3131)
Practitioners of natural healing (3232)
Audiologists and speech-language pathologists (3141)
Chiropractors (3122)
Optometrists (3121)
Other professional occupations in therapy and assessment (3144)
Medical sonographers (3216)
Opticians (3231)
Cardiology technologists and electrophysiological diagnostic technologists, n.e.c. (3217)
Instructors of persons with disabilities (4215)
Denturists (3221)
Health information management occupations (1252)
Dental technologists, technicians and laboratory assistants (3223)

* Occupations in the industry also include a significant number of Light duty cleaners (6731); Food counter attendants, kitchen helpers and related support occupations (6711); and Cooks (6322).

Real GDP and Employment Growth Rates in Health Care



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Health care is largely influenced by demographic trends in Canada and very sensitive to government expenditures in health and social programs. Demand for health care is essentially immune from cyclical fluctuations in domestic economic conditions because health care is a necessity. As a result, the industry's output continued to increase during the recession of 2008-2009 and kept expanding at a relatively solid pace until 2019. During that period, growth in output was mainly driven by robust demand from a growing and aging population, and it would have been stronger if not for surging provincial fiscal deficits in the afterwards of the recession, which led governments to restrain public health care funding, particularly in Ontario and Quebec. Increased demand for health care, combined with expenditure constraints at the government level, resulted in long wait times for certain non-life-threatening conditions, such as knee and hip replacements, as well as lengthy delays to see specialists. The other development that took place during that period was the "delisting" of a number of services in some provinces, such as annual eye exams and physiotherapy, which became subject to

restrictions or no longer covered in full by the health care system. The COVID-19 pandemic also led to major disruptions in health services across the country, with output falling by 4.2% in 2020, essentially reflecting a severe decrease in the ambulatory segment as output continued to grow in the hospital and nursing/residential segments. During that year, offices of physicians, dentists and other health care practitioners (chiropractors, physiotherapists, optometrists, audiologists, etc.) were temporarily closed or operated at reduced capacity, and many procedures were put on hold to tackle the pandemic. A large number of Canadians also delayed seeking health care for fear of possible COVID-19 exposure or concerns of overloading the system. However, the output strongly rebounded in 2021 (+8.5%) and quickly returned above its pre-pandemic level, resulting in an average growth rate of 1.8% annually in real GDP for the entire period 2012-2021.

On the employment side, increased demand for health care led to the creation of 447,000 jobs in the industry over the past decade, although growth was temporarily interrupted in 2020 (-0.3%) due to notable job losses in the ambulatory segment. The rapid spread of COVID-19 and the difficult working environment created by the pandemic also led to a significant rise in absence from work (illness, burnouts, etc.) among medical professionals. On average, health care employment increased at an annual rate of 2.5% over the period 2012-2021, largely exceeding the 0.9% recorded for the Canadian economy. In addition to strong labour demand, limited training seats for health professionals and difficult working conditions have constrained labour supply, leading to significant labour shortages in the industry. In 2021, health care services had a ratio of 0.3 unemployed worker for every vacant position, compared to an average of 1.0 for the overall economy (when excluding unemployed not classified in any specific industry). More precisely, this ratio was 0.5 for ambulatory health care, 0.4 for nursing and residential care and 0.2 for hospitals. The significant gap observed between output and employment growth over the past ten years reflected a declining trend in productivity averaging 0.7% annually. However, the concept and measurement of productivity in public health care may differ from the other sectors of the economy where goods and services are traded and more easily valued in monetary terms. Indeed, health care providers implemented several measures to improve efficiencies and lower costs over the past decade, but these changes were not reflected in the productivity numbers due to the large gains in employment. Examples of such measures include a greater focus on primary care, prevention and home care services. That said, there are still some difficulties to embrace new technologies in health care services, as evidenced by the ongoing use of paper records at the offices of some family physicians and the continued use of fax machines.

Over the projection period, output growth in the industry will continue to be driven by the recovery in the backlog of “non-essential” care treatments caused by the pandemic. A growing and aging population will also keep driving health care costs up, compelling provincial governments to increase health care funding. The commitment of many provinces to reduce wait times at emergency rooms as well as for surgical procedures and specialized treatments is expected to boost government spending and output growth in health care. The federal pledge for universal dental care is an additional factor expected to increase demand and support output and employment growth in the industry. Real GDP is projected to increase at an average pace of 2.1% annually from 2022 to 2031, a slight acceleration from the previous ten years. Employment growth, however, is projected to slow marginally, averaging 2.2% per year, but still exceeding the rate projected for the Canadian economy (+1.4%). Job creation will be constrained by labour

shortages in high demand occupations (such as doctors and nurses) and fiscal challenges in provinces. Indeed, the gradual slowdown in Canada's labour force growth is expected to put downward pressures on employment and real GDP growth across the country, which in turn will reduce growth in government revenues, thus limiting the capacity of governments to increase expenditures, including spending on health care services. In such a context, health care providers are expected to keep developing innovative approaches and implement new labour-saving ways of delivering services, leading to a better outlook for productivity. While productivity is projected to edge down by 0.1% annually on average over the period 2022-2031, most of the decline is expected to occur in 2022, reflecting adjustments to a post-pandemic environment. From 2023 to 2031, productivity growth is expected to resume but remain weak, which is nevertheless a notable improvement compared with the negative declining trend recorded over the past decade.

New models of services delivery could include the expansion of the private sector involvement in the provision of health care services, the growing use of home care for terminally ill patients, and the consideration of permitting nurses and pharmacists to perform services that used to be exclusively provided by doctors. E-health and other alternative delivery models enhanced by technology are also playing an important role in almost all processes, including patient registration, data monitoring, lab tests and self-care tools. Smartphones and tablets are gradually replacing conventional monitoring and recording systems, and people are now given the option of undergoing a consultation in the privacy of their homes. Permitting patients to access their medical files through a secure app, talking or texting with healthcare providers, and using e-consultation with some health specialists are a few of the ways to improve virtual care and potentially reduce wait times. Services are being taken out of hospital walls and integrated with user-friendly accessible devices. In addition to implementing procedures and technology to improve efficiency in the delivery of health care services, providers will continue to take steps to contain costs in the system. Such initiatives include, for example, sending patients home the same day following joint replacement surgeries. By receiving follow-up care at home, those patients are far less expensive than those staying overnight in a hospital. The increased use of midwives in some provinces and shorter hospital stays following birth are other measures that will continue to lower costs in the system. Those initiatives are crucial over the long term, given the growing pressures anticipated on public health care funding brought by demographic changes.

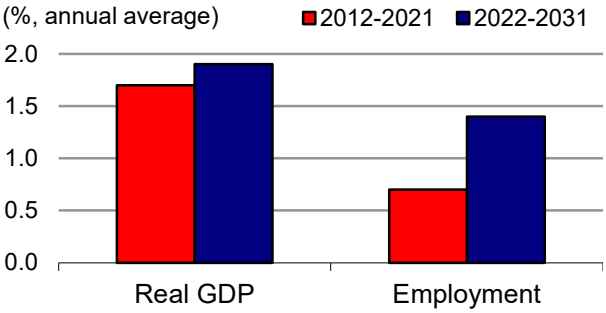
Social Assistance (NAICS 6241; 6242; 6243; 6244)

This industry comprises establishments primarily engaged in providing social assistance such as counselling, welfare, youth protection, community housing, vocational rehabilitation and childcare. It is composed of four segments: individual and family services, which include child and youth services and services for the elderly and persons with disabilities; community food and housing, and emergency and other relief services; vocational rehabilitation services, such as job counselling, job training and work experience to unemployed or underemployed persons and persons with disabilities; and child day-care services, including pre-kindergarten educational programs. Individual and family services along with child day-care services are the two largest segments of the industry, accounting for 53% and 39% of employment respectively in 2021. The remaining share of employment (8%) is evenly split between the other two segments. The 4-digit

NAICS breakdown for GDP is not available. Overall, the industry employed 514,200 workers in 2021, with a workforce primarily composed of women (85%) and characterized by a significant concentration of part-time workers (22%). Employment is distributed almost proportionately to population: 32% in Ontario, 29% in Quebec, 14% in British Columbia, 11% in Alberta, and 14% in the remaining provinces. Key occupations (4-digit NOC) include:

- Early childhood educators and assistants (4214)
- Social and community service workers (4212)
- Home support workers, housekeepers and related occupations (4412)
- Social workers (4152)
- Family, marriage and other related counsellors (4153)
- Managers in social, community and correctional services (0423)
- Social policy researchers, consultants and program officers (4164)
- Cooks (6322)
- Registered nurses and registered psychiatric nurses (3012)
- Employment counsellors (4156)
- Instructors of persons with disabilities (4215)

Real GDP and Employment Growth Rates in Social Assistance



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Social assistance is a central component of Canada's welfare state. It comprises a set of need-based, last-resort income programs for Canadians who require support for a variety of reasons, including financial difficulties during bad economic times. As a result, many components of social assistance are inversely related to negative fluctuations in Canada's economy. Demographic trends also have a significant impact on demand for social assistance, particularly for services provided to child, youth and the elderly. During and shortly after the recession of 2008-2009, the output grew at an accelerating pace as the slump in the economy forced many Canadians to seek welfare in response to the rise in unemployment, while solid growth in the number of children aged 1 to 4 increased the demand for child day-care services. The output advanced at a more moderate pace from 2011 to 2015, reflecting better economic conditions and much weaker growth in early childhood population, before accelerating significantly from 2016 to 2019. During those four years, higher unemployment in the oil-producing provinces (following the oil price shock) boosted demand for welfare and job counselling services, while faster growth in children and youth population (aged 5 to 17) stimulated demand for individual and family services. Greater awareness regarding mental illness, more frequent family breakups, and the gradual increase in the dependency ratio resulting from population aging also contributed to raise demand for various social assistance services over the past decade or so.

However, the industry's output fell by 7.1% in 2020, as many child day-care centers and other establishments providing social assistance were temporarily closed during the first year of the COVID-19 pandemic, while displaced workers and low-income individuals were able to use the Canada Emergency Response Benefit (CERB) as an alternative to traditional forms of assistance. As parents returned to work, children returned to day-care, and individuals using CERB shifted to requiring different forms of support, the output in social assistance strongly rebounded in 2021 (+6.3%), recovering a large part of its losses. The resulting pace of growth in the industry's real GDP averaged 1.7% annually over the entire period 2012-2021, compared to a more moderate

pace of 0.7% for employment. After peaking in 2015, employment declined significantly in 2016 and remained essentially unchanged in 2017-2018, reflecting lower labour demand in child day-care services, mostly in Quebec and Ontario, as a result of program reforms, the stagnation in early childhood population, and the decision by the Ontario government to introduce full-time kindergarten for four- and five-years old. Following a notable rebound in 2019, the industry's employment collapsed in 2020 (-9.7%) in response to the strong decline in output, before recouping most of its losses in 2021 (+8.2%). The significant gap observed between output and employment growth over the past decade reflected an upward trend in productivity, which increased by 1.0% annually, recording all the gains from 2016 to 2021. Fiscal constraints forced many provincial governments to restrain labour costs in social programs and implement innovative approaches to increase the efficiency of delivering services, resulting in output growth exceeding employment growth, particularly after 2015.

Over the projection period, output growth in social assistance is projected to accelerate marginally relative to the past decade, as the industry continues to recover from the pandemic and keeps expanding. Despite low fertility rates, demand for child day-care services is expected to increase significantly in the coming years, stimulated by the implementation of the Canada-wide early learning and childcare system which aims to reduce the average fee to 10$ per day for children under the age of five in all provinces and territories by 2026 (except in Quebec where a similar program already exists). Strong inflation and higher mortgage rates are also expected to push demand for social assistance, as rising food prices and lower housing affordability may drive more people to use community food and housing services, particularly in the short to medium term. Moreover, additional growth in population aged 5 to 17 is projected to increase demand for individual and family services, while further increases in the dependency ratio resulting from an aging population is expected to increase demand for social services provided to the elderly. Massive retirements of baby-boomers from the labour market are also projected to restrain growth in disposable income over the longer term, and those who have not managed to save enough to fund their retirement years may require financial support.

On average, real GDP in social assistance is projected to increase at an annual rate of 1.9% over the period 2022-2031. The slight acceleration in output growth relative to the previous decade and weaker gains in productivity are expected to lead to faster growth in employment, averaging 1.4% per year, with significant gains in the first half of the projection period. Overall, productivity is expected to increase at a slower pace of 0.5% annually, primarily reflecting a steep decline in 2022 (post-pandemic adjustments) and the fact that output growth will be largely driven by the highly labour-intensive segment of child day-care services during the next decade. That said, additional pressures on public finances will continue to support the need to increase productivity. Indeed, the gradual slowdown in Canada's labour force growth is expected to constrain employment and real GDP growth across the country, which in turn will reduce growth in government revenues, thus limiting the capacity of governments to increase expenditures, including spending on social services. In such a context, the industry is expected to keep developing innovative approaches and implement new labour-saving ways of delivering services, leading to additional growth in productivity.

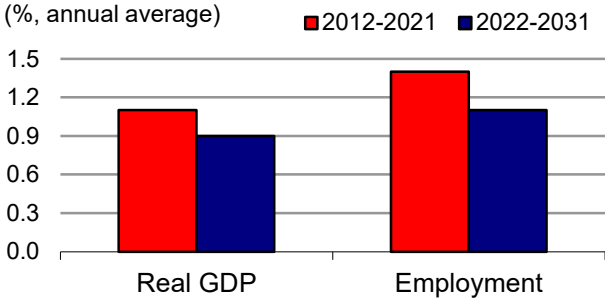
Public Administration (NAICS 9111-9119; 9121-9129; 9131-9139; 9141; 9191)

Public administration comprises establishments primarily engaged in activities of a governmental nature at the federal, provincial, territorial, regional, municipal and local levels. It covers legislative activities, taxation, national defence, public order and safety, immigration services, foreign affairs and international assistance, and the administration of government programs. The industry includes not only public servants, but also members of the Canadian armed forces, policemen and firefighters. The federal administration is the largest of the five segments, accounting for 40% of production and 42% of employment in 2021 (excluding full time members of the Canadian armed forces), followed by local, municipal and regional administration (31% of production and employment), and provincial and territorial administration (25% and 26%). Aboriginal administration along with international and other extra-territorial administration account for the remaining share of production and employment (4% and 1%). Overall, public administration employed 1.1 million workers in 2021, distributed proportionately to population: 38% in Ontario, 24% in Quebec, 13% in British Columbia, 10% in Alberta, and 15% in the remaining provinces and territories. The workforce is evenly split between men (51%) and women (49%) and benefits from much higher wages than the national average, partly attributable to high unionization rates (76%). Given the wide variety of activities, key occupations (4-digit NOC) include a mix of:

Police officers (4311)
Employment insurance, immigration, border services and revenue officers (1228)
Government managers (0411-0414)
Social policy researchers, consultants and program officers (4164)
Firefighters (4312)
Information systems analysts and consultants (2171)
Financial auditors and accountants (1111)
Correctional service officers (4422)
Lawyers and Quebec notaries (4112)
Computer programmers and interactive media developers (2174)
Security guards and related security service occupations (6541)
User support technicians (2282)
Natural and applied science policy researchers, consultants and program officers (4161)
Public works and maintenance labourers (7621)
Purchasing agents and officers (1225)
Civil engineers (2131)
Senior government managers and officials (0012)
Economists and economic policy researchers and analysts (4162)
Executive assistants (1222)
Financial managers (0111)
Construction inspectors (2264)
Inspectors in public and environmental health and occupational health and safety (2263)
Health policy researchers, consultants and program officers (4165)
Urban and land use planners (2153)
Civil engineering technologists and technicians (2231)
Correspondence, publication and regulatory clerks (1452)
Survey interviewers and statistical clerks (1454)
Probation and parole officers (4155)
Database analysts and data administrators (2172)
Program officers unique to government (4168)
Court officers and justices of the peace (1227)
Data entry clerks (1422)
By-law enforcement and other regulatory officers, n.e.c. (4423)
Biologists and related scientists (2121)
Biological technologists and technicians (2221)
Legislators (0011)
Court clerks (1416)
Engineering inspectors and regulatory officers (2262)
Agricultural and fish products inspectors (2222)
Translators, terminologists and interpreters (5125)
Technical occupations in geomatics and meteorology (2255)
Mathematicians, statisticians and actuaries (2161)
Judges (4111)
Physicists and astronomers (2111)
Meteorologists and climatologists (2114)

During and shortly after the recession of 2008-2009, the various programs put in place by the federal and provincial governments in order to stimulate the economy boosted output and employment in public administration. However, lower tax revenues and increased public spending resulted in large fiscal deficits across all levels of governments. Starting in 2012, the federal and provincial governments announced plans to curtail growth in spending programs in order to balance their budgets, leading to slight declines in output and employment until 2015. The federal government was the most restrictive in terms of program spending in order to achieve a balanced budget by 2014-2015. While the federal administration was successful in achieving its goal, the situation deteriorated again following the collapse in crude oil prices, as weaker economic growth in Canada reduced growth in government revenues. In 2016, the federal government increased spending significantly to stimulate the economy and growth in public expenditures remain strong from 2017 to 2019, boosting output growth in public administration. This led to a substantial rebound in employment, which jumped by 104,000 from 2016 to 2019, recording most of the gains in federal and municipal administrations. However, output and employment slightly contracted in 2020, down by 1.4% and 0.8% respectively, as some services were closed or operated at reduced capacity at the onset of the COVID-19 pandemic, while hours of work were also lost by the time office employees fully transitioned to telework. With the reopening of government service centers, increased teleworking capabilities and a pandemic-fuelled hiring spree in the federal administration, output and employment strongly rebounded in 2021, up by 4.5% and 7.4% respectively. On average, real GDP in the industry increased at an annual rate of 1.1% over the entire period 2012-2021, compared to 1.4% for employment. Productivity fell significantly during the pandemic years, resulting in an average decline of 0.3% annually for the whole decade.

Real GDP and Employment Growth Rates in Public Administration



Sources: Statistics Canada (historical data) and ESDC 2022 COPS industrial projections.

Over the projection period, output growth in public administration is expected to moderate somewhat relative to the past decade, primarily reflecting a negative outlook in the short term. Indeed, after surging in 2021, the output is projected to contract in 2022 and 2023 as federal and provincial governments contend with large budget deficits resulting from the pandemic. Growth is expected to resume in 2024, but it is expected to remain modest, reflecting additional pressures on public finances resulting from demographic changes. Indeed, further declines anticipated in the overall participation rate due to population aging are projected to lower the pace of growth in the Canadian labour force over the long term, restraining employment and economic growth in the country, which in turn will affect growth in government tax revenues. Massive retirements of baby-boomers from the labour market are also expected to reduce the number of high earners in the Canadian economy and restrain growth in overall labour income. In addition to erode the federal and provincial tax bases, population aging will put further pressures on the health care system, limiting the ability to expand expenditures in government programs and public administration. This double-edged sword will most likely lead to a prolonged period of cost

containment for governments who already find themselves in delicate fiscal positions. On the positive side, the commitment of all levels of governments to address climate change and reduce emissions through various policies and programs is expected to support additional growth in output and further job creation in public administration.

The resulting pace of growth in real GDP is projected to average 0.9% annually from 2022 to 2031, a modest slowdown relative to the previous ten years. The pace of growth in employment is also projected to slow, averaging 1.1% per year. Overall, productivity is expected to keep declining by an additional 0.2% annually, but all the decline will occur in 2022-2023 in response to massive hiring of new employees in 2021, which is expected to continue in 2022 and, to a lesser extent, in 2023 (it takes some time before new employees become as productive as established employees). Starting in 2024, productivity growth is expected to resume and lead to more moderate gains in employment for the rest of the projection period. In addition to fiscal constraints, the weaker pace of growth anticipated in Canada's labour supply and the gradual tightening of the labour market are expected to induce governments to automate some of their operations and to keep implementing new labour-saving ways of delivering services, leading to further gains in productivity. With rapid advancements anticipated in cognitive technologies, government operations involving routine tasks (in occupations such as clerks, inspectors and program officers) are expected to become increasingly automated and performed by specialized software, smart systems and online applications. At the same time, operations involving non-routine tasks (in occupations such as researchers, analysts and scientists) are expected to become increasingly complemented and enhanced by big data analytics, artificial intelligence and machine learning.