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Canadian Occupational Projection System 2017 Projections

Industrial Scenario 2017-2026

December 2017

Employment and Social Development Canada
Emploi et Développement social Canada

Canada

Outline

- **Historical and Projected Trends in Real GDP, Employment and Productivity by Aggregate Sector***
- **Projections for Real GDP, Employment and Productivity in the Primary, Manufacturing and Services Industries***
- **Comparisons of Employment Projections across Industries**

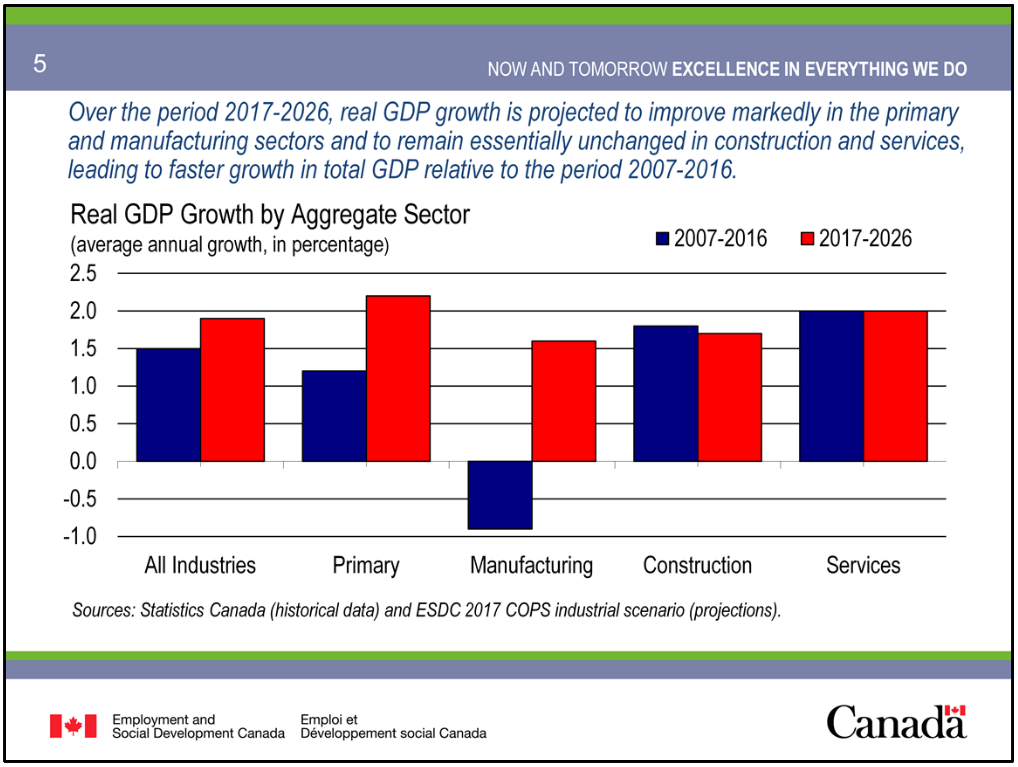
**NOTE: The four aggregate sectors of the economy are the primary, construction, manufacturing and services sectors. The construction sector is covered in the first and last sections of the presentation.*

Introduction

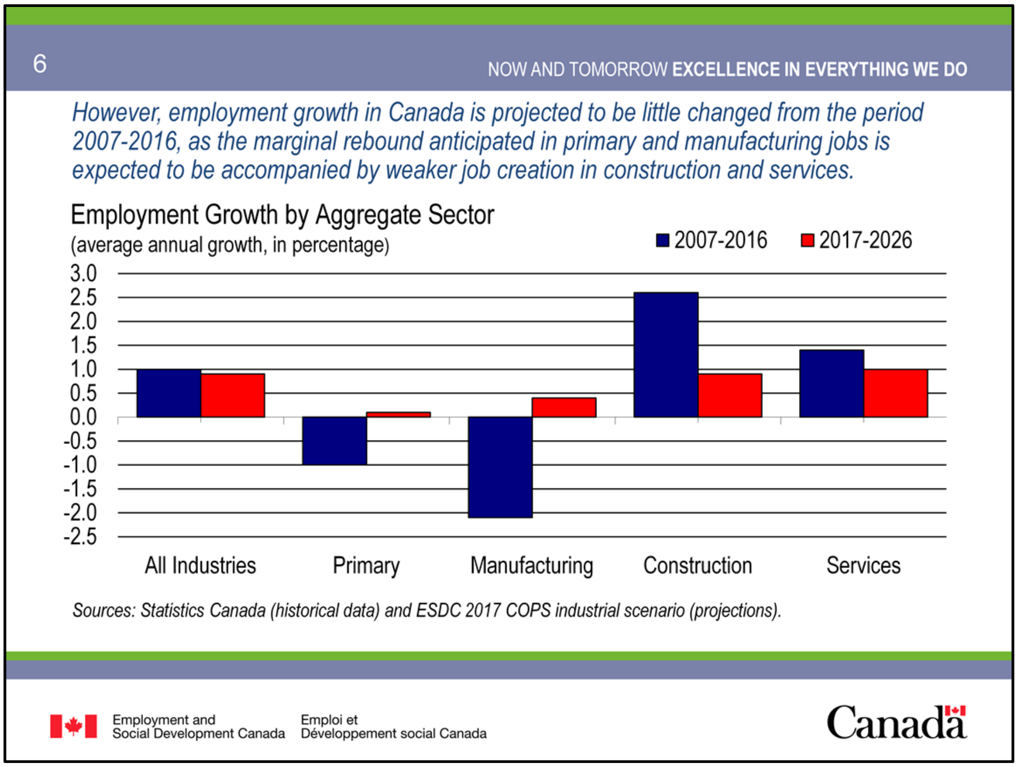
Changes in external and domestic drivers of aggregate demand are projected to lead to changes in the pace of growth of industrial output and employment, which in turn affect occupational labour demand over the period 2017-2026.

See presentation titled: Macroeconomic Scenario 2017-2026

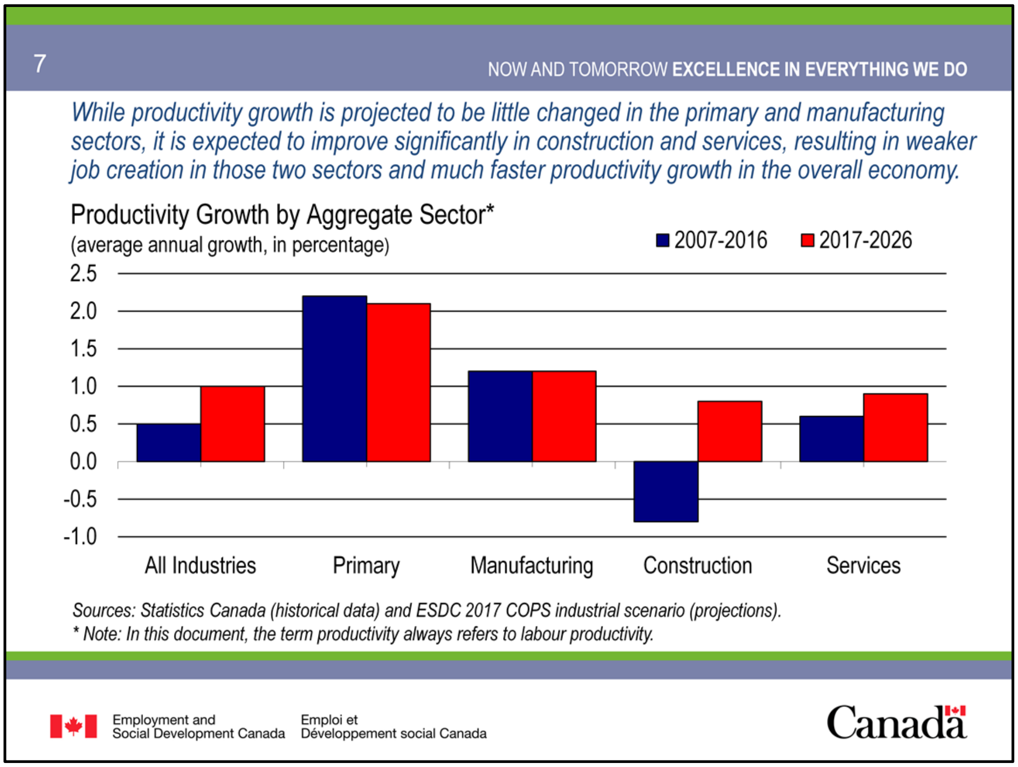
Historical and Projected Trends in Real GDP, Employment and Productivity by Aggregate Sector



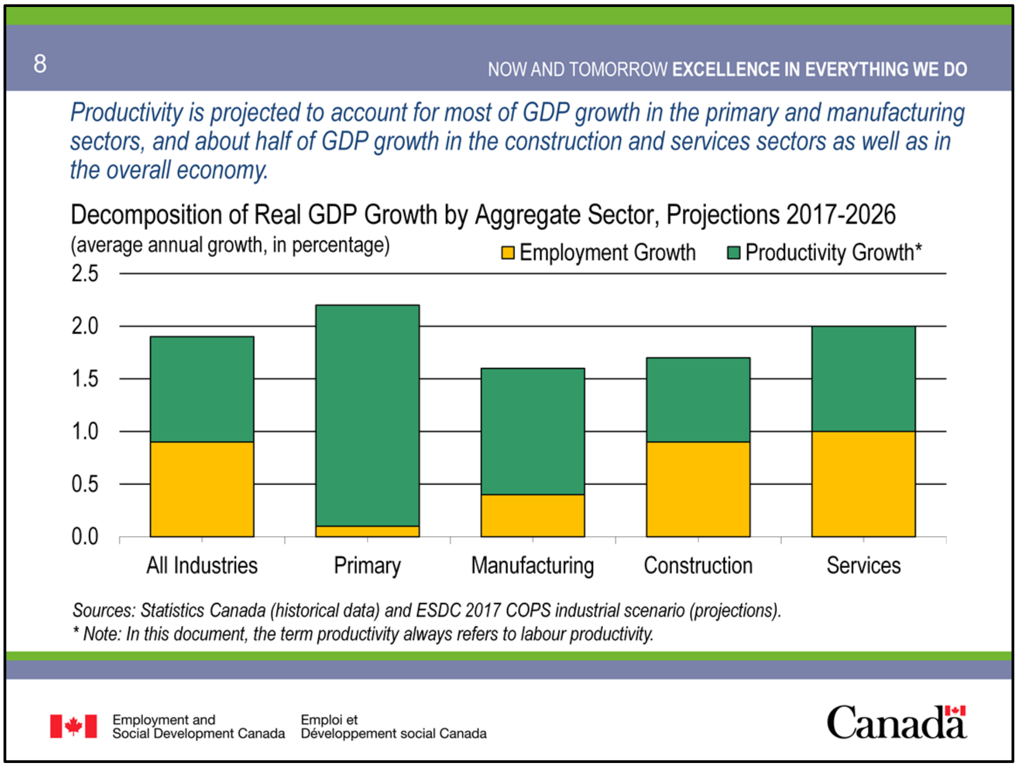
- The acceleration projected in total real GDP growth over the period 2017-2026 reflects faster output growth in the primary sector and a solid recovery in manufacturing production. Output growth in construction and services is expected to remain essentially unchanged from the period 2007-2016.
- In the primary sector, the acceleration projected in output growth is primarily driven by renewed growth in support activities for oil extraction as energy-related investment is expected to bounce back with the gradual recovery in crude oil prices. Higher production capacity in mining and non-conventional oil extraction and renewed growth in forestry's output, due to stronger housing activity in the United States, are also expected to contribute to faster real GDP growth in the primary sector.
- The projected recovery in manufacturing production is stimulated by stronger growth in foreign demand, particularly from the United States where growth in household consumption and business investment is expected to accelerate due to solid labour market conditions and the need to increase production capacity. The relatively low value of the Canadian dollar and better access to the European market through the Comprehensive Economic Trade Agreement (CETA) are also expected to contribute to faster growth in Canadian exports of manufactured products, although the renegotiation of the North American Free Trade Agreement (NAFTA) represents a downside risk to the outlook.
- Output growth in the construction sector is projected to be similar to the past ten years, as stronger growth in non-residential investment is expected to be accompanied by weaker growth in residential investment. Energy-related construction projects are expected to pick up progressively following a period of major investment cutbacks in oil and gas engineering structures, while commercial, industrial and institutional building construction are projected to benefit from stronger growth in non-residential building investment. However, the gradual decline in household formation and further increases in mortgage rates are expected to lower investment in new housing, restraining construction activity in Canada and leaving renovation spending as the only source of growth in residential investment.
- Output in the services sector is also projected to increase at the same pace as the past ten years. Growth in output is expected to be primarily driven by business services and health care and by the fact that population aging is expected to increase the share of services and lower the share of goods in consumer spending.



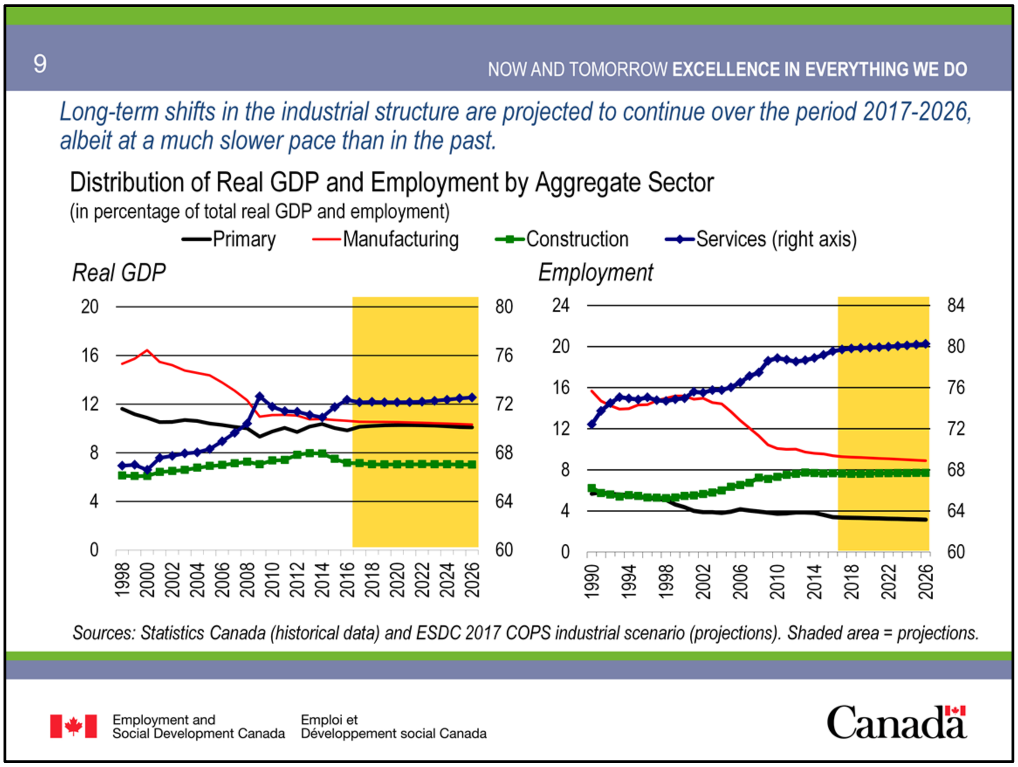
- Over the period 2017-2026, employment is expected to stabilize in the primary sector, rebound modestly in manufacturing, and keep growing in construction and services, albeit at a much slower pace than during the period 2007-2016. The resulting rate of growth in total employment is projected to average 0.9% annually, compared to 1.0% in the previous ten years.
- After contracting significantly from 2007 to 2016, employment in the primary sector is expected to stabilize over the projection period, as a result of faster growth anticipated in real GDP. More specifically, employment is expected to keep growing in mining, oil and gas extraction, partly recover from recent job losses in support activities for mining, oil and gas, and continue to contract in agriculture, fishing and forestry, but not as severely as in the previous ten years. Net job creation for the entire sector is projected to be marginal, averaging 0.1% annually.
- The recovery anticipated in manufacturing output is expected to result in modest employment gains after many years of significant declines. Job creation in this sector will continue to be constrained by automation and the desire of manufacturers to improve their competitiveness on foreign and domestic markets in response to increased international competition, particularly from China. Manufacturing employment is projected to advance at an average annual rate of 0.4% over the period 2017-2026, remaining well below its historical peak of 2004.
- Employment growth in the construction sector is expected to weaken substantially despite little change anticipated in output growth. Employment in this sector is projected to increase at an average pace of 0.9% annually, down from 2.6% over the period 2007-2016. Weaker job creation in construction reflects a major turnaround in productivity (as illustrated on page 7).
- Employment growth is also projected to weaken in the services sector despite the fact that output growth is expected to remain identical as in the previous ten years. Employment in this sector is projected to increase at an average pace of 1.0% annually, compared to 1.4% over the period 2007-2016. Weaker job creation in services reflects the need to strengthen productivity growth in response to the deceleration anticipated in overall labour force growth. Indeed, with the gradual tightening of the labour market in Canada, employers are expected to replace labour by capital wherever possible.



- Over the projection period, productivity growth is expected to return to positive territory in construction, accelerate significantly in services, and remain essentially unchanged in the primary and manufacturing sectors. The resulting pace of growth in productivity for the overall economy is projected to be twice as fast as in the previous ten years, primarily stimulated by much stronger growth anticipated in machinery and equipment (M&E) investment, including investment in a wide range of new applications enabled by technological progress.
- The primary sector is expected to keep showing the strongest growth in productivity. However, the source of growth is expected to shift from agriculture, forestry and fishing towards mining, oil and gas industries. Indeed, after showing negative growth for several years, productivity in mining, oil and gas industries has started to strengthen significantly in recent years and this trend is expected to amplify over the projection period (see page 14 for more details on the drivers of productivity growth in the primary industries).
- In the manufacturing sector, productivity growth should continue to be driven by automation, as employment in this sector is largely composed of routine tasks that can be increasingly performed by advanced robotics. Other technologies such as augmented reality, 3D printing and Internet of Things (IoT) are also transforming manufacturing operations.
- Most of the turnaround anticipated in productivity for the construction sector is projected to come from the residential component. Indeed, population aging is expected to lead to a shift in the composition of housing starts from single-unit homes to multiple-dwellings (apartments and condominiums). Because multiple-dwellings are more capital intensive and require less labour by unit of output, productivity is projected to increase markedly in the construction sector.
- In the services sector, the significant acceleration anticipated in productivity growth is driven by rapid advances in digital and cognitive technologies, such as mobile applications, smart systems, machine learning, artificial intelligence and autonomous transport. Those technologies are expected to boost productivity and increase the number of tasks that could potentially be automated across a wide range of occupations, including human-centric jobs or those requesting a higher level of education.



- Productivity growth is expected to account for 96% of real GDP growth in the primary sector over the period 2017-2026, compared to 75% in manufacturing, 50% in services and 47% in construction. For the overall economy, this ratio is expected to be 53%.
- The large shares of GDP growth attributable to productivity in the primary and manufacturing sectors reflect the fact those two sectors are generally more capital intensive and strongly exposed to international competition and globalization. Productivity allows firms to lower production costs and improve competitiveness on foreign and domestic markets.
- Inversely, the lower shares of GDP growth attributable to productivity in the construction and services sectors reflect the fact those two sectors are generally more labour intensive. They are also largely oriented towards the domestic market and less exposed to international competition and import penetration.



- Long-term shifts in the industrial structure of the Canadian economy are projected to continue over the period 2017-2026, albeit at a much slower pace than during the previous two decades.
- In terms of real GDP and employment, the relative importance of the services sector is expected to increase marginally, with average growth rates in real output and employment slightly exceeding those of the overall economy. By 2026, the services sector is projected to account for 73% of total production and 80% of overall employment.
- The remaining three sectors (primary, construction and manufacturing) would account for 27% of total output and 20% of overall employment by the end of the projection period.
    - The relative importance of the primary sector is projected to increase in terms of production but to decline in terms of employment.
    - In comparison, the share of the construction sector is projected to contract somewhat in terms of production and to remain unchanged in terms of employment.
    - The relative importance of the manufacturing sector in production and employment is expected to keep declining, albeit at a much slower pace than the previous ten years. Smaller declines reflect the solid recovery projected in manufacturing output and a modest increase in the number of manufacturing workers.

The employment distribution is projected to shift somewhat further towards the services sector, which is expected to account for 88% of total job creation between 2016 and 2026.

Employment by Aggregate Sector
(in thousands, percentage share of total employment in brackets)

Sectors	1996	2006	2016	2026 (Projection)	Change 2016-2026
Primary	710.3 *(5.3%)*	681.7 *(4.2%)*	616.2 *(3.4%)*	621.1 *(3.1%)*	+4.9 *(0.3%)*
Manufacturing	1,924.5 *(14.3%)*	2,102.2 *(12.8%)*	1,694.8 *(9.4%)*	1,753.8 *(8.9%)*	+59.0 *(3.6%)*
Construction	711.9 *(5.3%)*	1,068.5 *(6.5%)*	1,386.8 *(7.7%)*	1,518.3 *(7.7%)*	+131.5 *(8.0%)*
Services	10,073.9 *(75.1%)*	12,545.2 *(76.5%)*	14,383.7 *(79.5%)*	15,825.4 *(80.3%)*	+1,441.7 *(88.1%)*
Total	13,420.1 *(100.0%)*	16,397.6 *(100.0%)*	18,081.5 *(100.0%)*	19,718.7 *(100.0%)*	+1,637.2 *(100.0%)*

Sources: Statistics Canada (historical data) and ESDC 2017 COPS industrial scenario (projections).

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- The sectoral distribution of employment is projected to shift somewhat further towards the services sector.
  - Employment in the services sector is projected to increase by 1.4 million between 2016 and 2026, significantly less than during the previous ten years (+1.8 million). With 15.8 million workers by the end of the projection period, this sector is expected to account for 80.3% of total employment, up from 79.5% in 2016.
  - In the construction sector, employment is projected to expand by 132,000 between 2016 and 2026, compared to 318,000 in the previous ten years. The sector is expected to employ more than 1.5 million workers by 2026, accounting for 7.7% of overall employment, the same proportion as in 2016.
  - After falling by 407,000 between 2006 and 2016, employment in the manufacturing sector is projected to rebound modestly (+59,000) over the projection period. With slightly less than 1.8 million workers in 2026, this sector is expected to account for 8.9% of total employment, its lowest share on record since labour force data were first published in 1976.
  - In the primary sector, employment is projected to pick up marginally (+4,900) between 2016 and 2026, following a decrease of 66,000 between 2006 and 2016, with most of the losses recorded after the oil price shock of 2014. The sector is expected to employ 621,000 workers by the end of the projection period, accounting for 3.1% of overall employment in 2026, down from 3.4% in 2016.
  - The services sector is projected to account for 88% of total job creation between 2016 and 2026, followed distantly by construction (8.0%), manufacturing (3.6%), and the primary sector (0.3%).

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Only small shifts are projected in the employment distribution at the detailed industry level.

Top- and Bottom-Three Industries in terms of Employment
(in thousands, percentage share of total employment in brackets)

COPS industrial classification is composed of 42 industries.

	2006		2016		2026 (Projection)	
Top-Three Industries	Retail Trade	2,017 *(12.3%)*	Retail Trade	2,068 *(11.4%)*	Health Care	2,221 *(11.3%)*
	Health Care	1,335 *(8.1%)*	Health Care	1,835 *(10.2%)*	Retail Trade	2,138 *(10.8%)*
	Construction	1,069 *(6.5%)*	Construction	1,387 *(7.7%)*	Construction	1,518 *(7.7%)*
Bottom-Three Industries	Fishing, Hunting and Trapping	26 *(0.2%)*	Fishing, Hunting and Trapping	15 *(0.1%)*	Fishing, Hunting and Trapping	13 *(0.1%)*
	Forestry and Logging	63 *(0.4%)*	Forestry and Logging	48 *(0.3%)*	Forestry and Logging	47 *(0.2%)*
	Mining	64 *(0.4%)*	Printing and Related Activities	59 *(0.3%)*	Printing and Related Activities	51 *(0.3%)*

Sources: Statistics Canada (historical data) and ESDC 2017 COPS industrial scenario (projections).

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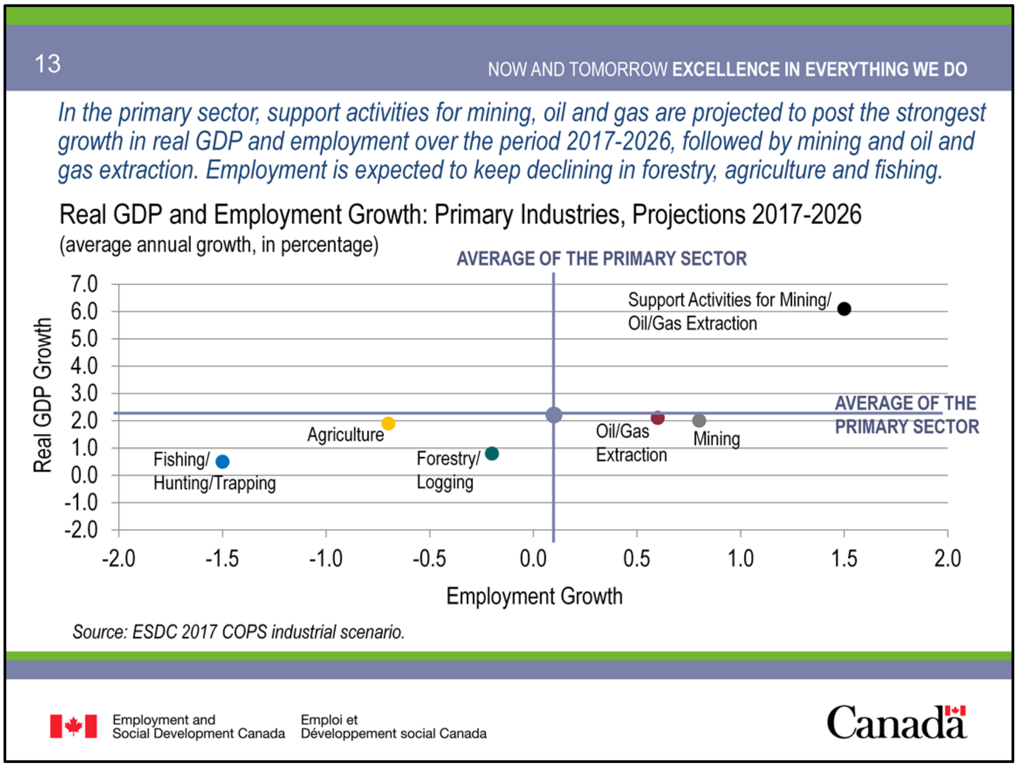
- The distribution of employment among the 42 industries covered by COPS is projected to be little changed between 2016 and 2026.
- The three largest employers are projected to remain the same, although the first and second positions are expected to be reversed:
  - Health care is projected to become the largest employer with 2.2 million workers by 2026, surpassing retail trade by 83,000 workers. Construction is expected to remain in third position with 1.5 million workers.
  - With a total of 5.9 million workers by the end of the projection period, those three industries are expected to account for 30% of overall employment.
- The smallest employers are also projected to remain unchanged, with fishing, hunting and trapping; forestry and logging; and printing and related activities as the bottom-three industries:
  - By 2026, those three industries are expected to account for only 0.7% of total employment with 51,000 workers in printing and related activities, 47,000 in forestry and logging, and 13,000 in fishing, hunting and trapping.

Projections for Real GDP, Employment and Productivity in the Primary, Manufacturing and Services Industries



- After being severely affected by major investment cutbacks in the energy sector in recent years due to the sharp decline in crude oil prices, support activities for mining, oil and gas extraction are expected to recover progressively over the projection period, boosting production and employment growth in this industry well above the primary sector average.
- In comparison, output and employment growth in mining and in oil and gas extraction is projected to be much more moderate. Most of the growth in output is expected to come from the oil sands and the fact that several mining projects are entering in their production phase. However, conventional oil production is projected to decline slightly, while natural gas production is expected to be dampened by quickly rising production and competition from U.S. producers resulting from shale gas extraction. Job creation in those industries is expected to be constrained by renewed growth in productivity.
- Subdued growth projected in fishing and forestry's output is expected to be accompanied by further declines in employment. After the U.S. housing market recovers, growth in forestry's output is projected to weaken as demographic factors should dampen the outlook for housing starts in North America. The reduction anticipated in annual allowable cuts (AAC) in several provinces and anaemic growth in the paper manufacturing industry are also expected to weigh on forestry's output. In the fishing industry, supply constraints resulting from various quotas and moratorium imposed on different fish species are the main factors expected to restrain production. The declines projected in forestry and fishing's employment reflect additional gains in productivity and the increasing difficulty to attract new workers due to youth out-migration from rural and coastal communities.
- Employment in agriculture is also expected to keep declining, although output growth is projected to be in line with the primary sector average, primarily driven by demand for global food consumption and the growing use of biofuels. Difficulties to attract domestic workers due to the seasonal nature of the industry, its rural location, low wages and long hours have resulted in greater utilization of foreign temporary workers in agriculture activities.

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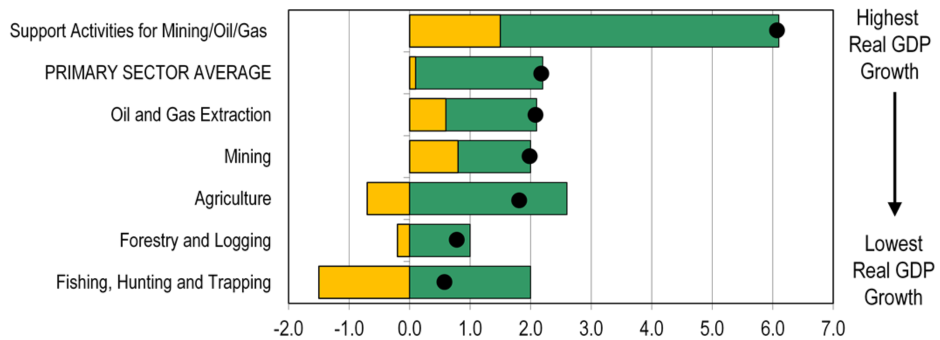
Productivity is expected to account for the totality of GDP growth in agriculture, forestry and fishing, and most of GDP growth in the three industries related to mining, oil and gas extraction.

Decomposition of Real GDP Growth: Primary Industries, Projections 2017-2026

(average annual growth, in percentage) Employment Growth Productivity Growth* Real GDP Growth



*Source: ESDC 2017 COPS industrial scenario. * Note: The term productivity refers to labour productivity.*

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- Productivity growth is expected to account for the totality or most of GDP growth in the primary industries over the period 2017-2026.
- In agriculture, forestry and fishing, productivity is expected to be driven by further consolidation, mechanization and computerization of operations. Technological innovations include the use of drones to survey crops and land area, dairy cow self-milkers, precision seeding equipment, and nautical and hydraulic lifting equipment.
- The development of new wood-based products, such as biofuels, biochemicals and biopolymers, is also expected to increase the value added and boost productivity in the forestry industry.
- Productivity in industries related to mining, oil and gas extraction is driven by the fact that the production capacity in oil sands is increasing while becoming less labour intensive and the fact that several mining projects are moving from the construction to the production phase.
- Technological innovations are also expected to boost productivity in those industries due to major developments in hydraulic fracturing and horizontal directional drilling techniques, GPS surveying, three-dimensional data maps, airborne technologies, remote-operated equipment, automated loading and transportation systems, robotics and seismic mapping and imaging.

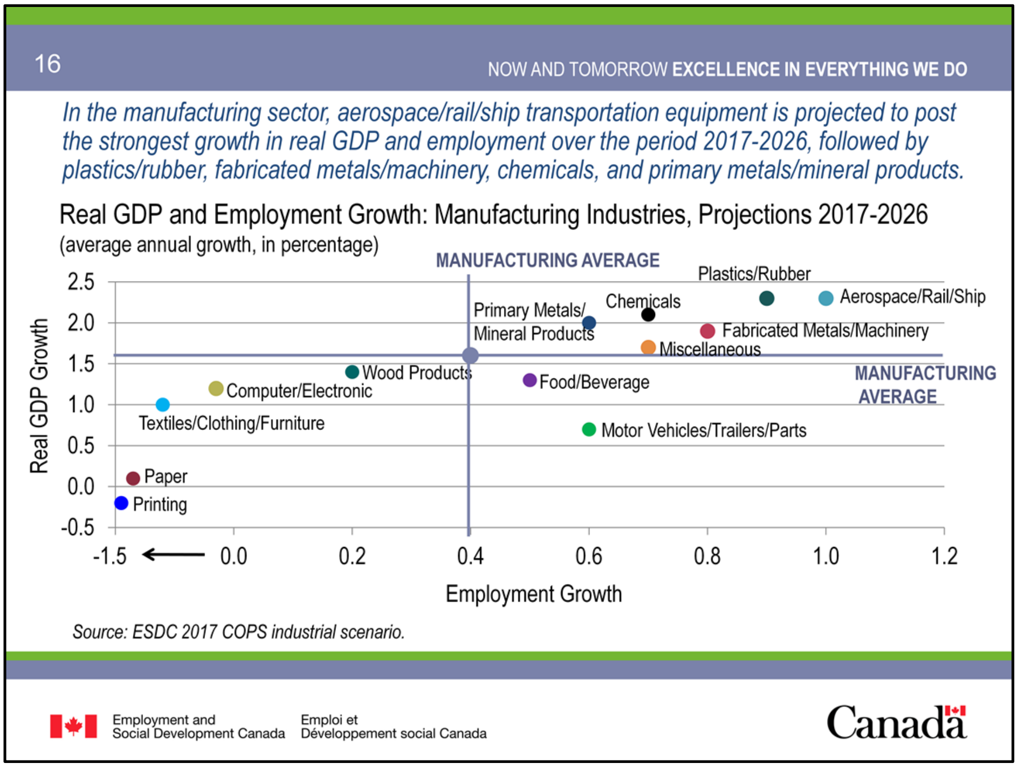
The three industries related to mining, oil and gas extraction are projected to account for the totality of net job creation in the primary sector.

Projected Change in Employment: Primary Industries
(in thousands)

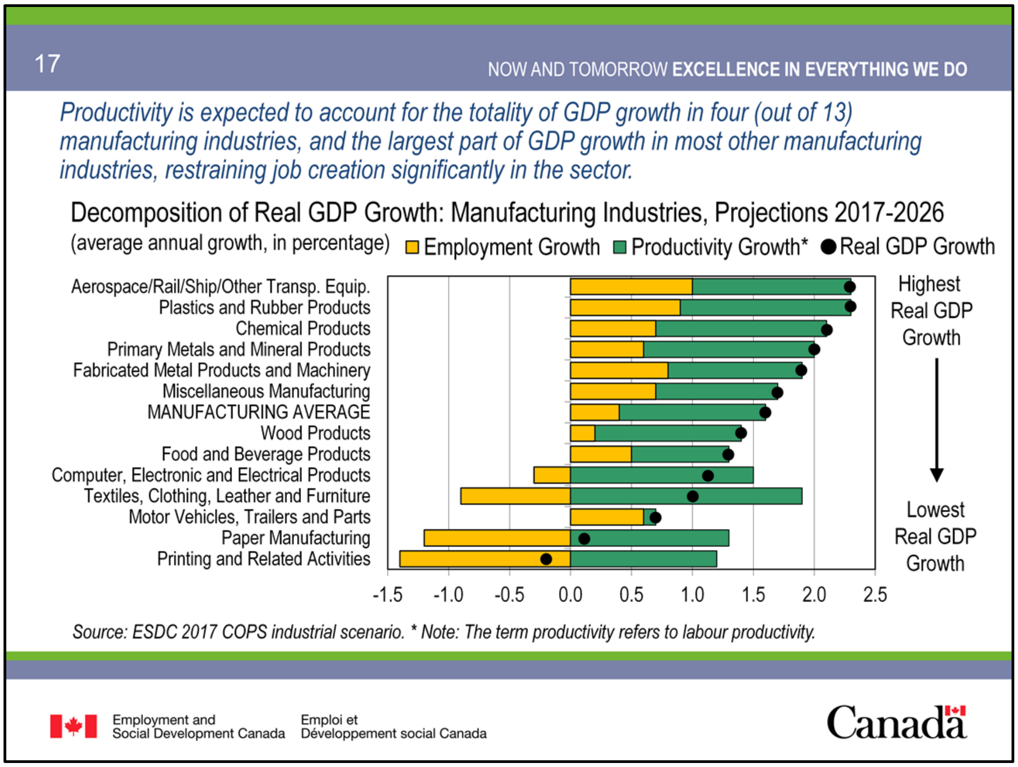
Rank	Industry	Employment		Average Annual Growth	Cumulative Change
		2016	2026		
1	Support Activities for Mining/Oil/Gas	93.2	108.2	+1.5%	+15.0
2	Mining	79.2	85.6	+0.8%	+6.4
3	Oil and Gas Extraction	91.4	97.1	+0.6%	+5.7
4	Forestry and Logging	48.1	47.0	-0.2%	-1.1
5	Fishing, Hunting and Trapping	14.9	12.7	-1.5%	-2.2
6	Agriculture	289.4	270.5	-0.7%	-18.9
	TOTAL - PRIMARY SECTOR	616.2	621.1	+0.1%	+4.9

Sources: Statistics Canada (historical data) and ESDC 2017 COPS industrial scenario (projections).

- In the primary sector, employment gains in industries related to mining, oil and gas extraction are projected to be largely offset by additional losses in forestry, fishing and agriculture, resulting in net job creation of only 4,900 between 2016 and 2026.
- Support activities for mining, oil and gas are expected to experience the largest gains in employment, up by 15,000, while agriculture is expected to experience the deepest losses, down by 18,900.
- Employment in support activities for mining, oil and gas is expected, however, to remain significantly below its historical peak of 2013 (i.e. prior to the oil price shock of 2014).



- Most of Canada's manufacturing industries rely on exports and are exposed to international competition. Consequently, global and U.S. economic conditions, exchange rates, trade agreements, import penetration and globalisation strongly influence the performance of those industries.
- Aerospace, rail, ship and other transportation equipment is projected to post the strongest growth in output and employment. This industry is expected to benefit from rising global demand for commercial and business aircraft, particularly from the emerging markets. Increased road congestion and environmental concerns are also expected to sustain world demand for transit systems, including rail.
- Plastics and rubber products, fabricated metals and machinery, chemical products, and primary metals and minerals products (such as bricks, glass, iron, steel) are also projected to post above average growth in production and employment, partly reflecting stronger investment growth in machinery and equipment (M&E) in North America and additional growth in construction activity.
- Paper manufacturing and printing activities are projected to post the weakest growth in output and employment, primarily because the increasing use of electronic media should continue to restrain demand for paper and printed materials. Additional job losses are expected in these two industries.
- Production and employment growth in textiles, clothing, leather and furniture as well as in computer, electronic and electrical products is expected to be constrained by the intensification of foreign competition and the shift in production to low-cost producers. Employment is also expected to keep declining in these two industries.
- Output and employment growth in wood products are expected to return to positive territory, primarily supported by the ongoing recovery in residential investment in the United States.
- In food and beverage products, production and employment growth is projected to be in line with the manufacturing average as healthy growth in foreign demand is expected to offset some of the weakness anticipated in domestic demand due to demographic factors.
- Output growth in motor vehicles, trailers and parts is expected to be constrained by foreign competition, notably from Mexican producers who benefit from generous government subsidies and low wage costs. But weak gains anticipated in productivity are expected to result in some job creation.



- Productivity growth is expected to account for the totality or the largest part of GDP growth in most manufacturing industries over the period 2017-2026. This reflects the fact that employment in those industries is largely composed of routine tasks that can be increasingly automated with new applications enabled by technological progress. The faster pace of growth anticipated in machinery and equipment (M&E) investment is expected to increase the amount of capital and technology available per worker, boosting productivity.
- Some of the most innovative technologies that are expected to transform manufacturing operations and improve productivity over the projection period are:
    - Advanced robotics: the introduction of sophisticated sensors and highly adaptable functional robotic equipment in order to improve human and machine interaction to make complex parts of the assembly process faster, easier and safer.
    - Augmented reality: the introduction of text, graphic, audio and other virtual instructions superimposed onto goggles, allowing operators to perform complex tasks step-by-step and improve the accuracy and timing of these tasks, while being notified of quality risks or shortcomings of present-day devices on the assembly line.
    - 3D printing: the production of solid objects from digital designs in a precisely determined shape using multiple layers of plastic, resin or other materials in order to develop prototypes, reduce the design-to-production cycle and lower operating costs.
    - Internet of Things (IoT): the power of the Internet to link machines, sensors, computers and humans and develop new ways of collecting, processing and analyzing information to deliver higher-quality, more durable and reliable products.
- Motor vehicles, trailers and parts are the only manufacturing industry where productivity is not projected to account for the majority of GDP growth. This situation primarily reflects chronic under-investment over the past several years due to fierce competition from Mexico. NAFTA renegotiations also represent a risk to automakers' investment and production on Canadian soil over the projection period.

Metal fabrication and machinery along with food and beverage products are expected to account for 60% of net job creation in the manufacturing sector.

Projected Change in Employment: Manufacturing Industries (in thousands)

Rank	Industry	Employment		Average Annual Growth	Cumulative Change
		2016	2026		
1	Fabricated Metal Products and Machinery	270.1	291.2	+0.8%	+21.1
2	Food and Beverage Products	286.7	300.8	+0.5%	+14.1
3	Motor Vehicles, Trailers and Parts	151.7	161.0	+0.6%	+9.3
4	Plastics and Rubber Products	91.0	99.9	+0.9%	+8.9
5	Aerospace, Rail, Ship and Other Transp. Equip.	84.9	93.4	+1.0%	+8.5
6	Primary Metals and Mineral Products	131.1	139.2	+0.6%	+8.1
7	Miscellaneous Manufacturing	107.3	114.9	+0.7%	+7.6
8	Chemical Products	94.9	101.7	+0.7%	+6.8
9	Wood Products	122.2	124.7	+0.2%	+2.5
10	Computer, Electronic and Electrical Products	106.6	103.8	-0.3%	-2.8
11	Paper Manufacturing	60.2	53.4	-1.2%	-6.8
12	Printing and Related Activities	59.2	51.5	-1.4%	-7.7
13	Textiles, Clothing, Leather and Furniture	128.9	118.3	-0.9%	-10.6
	TOTAL – MANUFACTURING SECTOR	1,694.8	1,753.8	+0.3%	+59.0

Sources: Statistics Canada (historical data) and ESDC 2017 COPS industrial scenario (projections).

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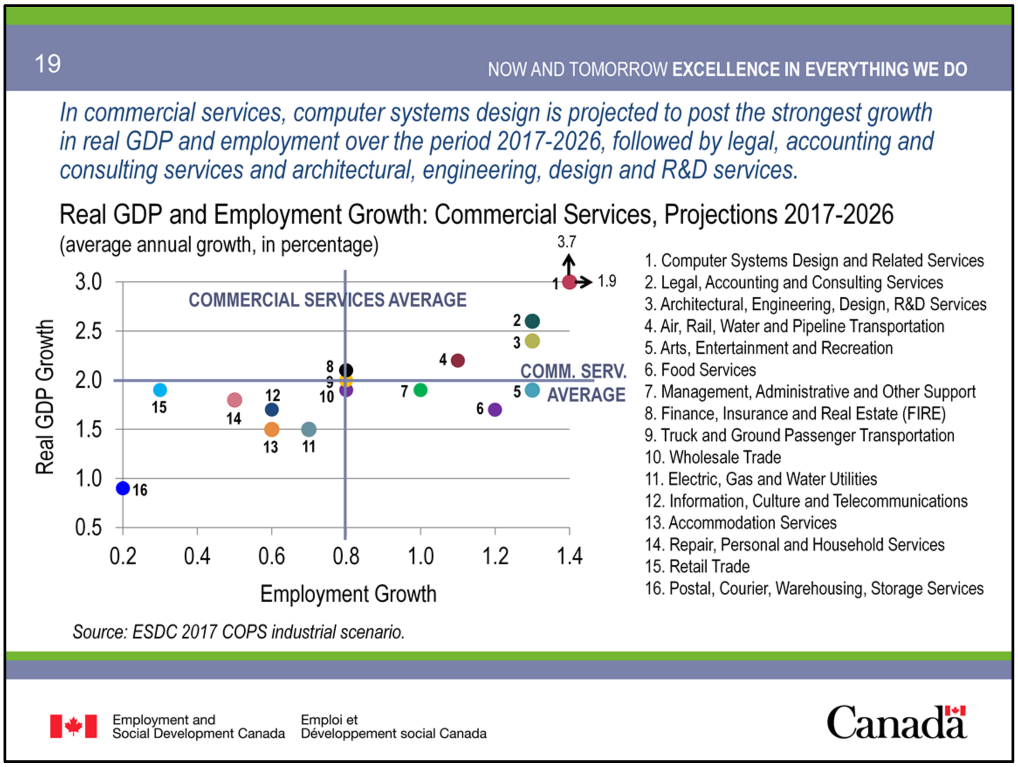
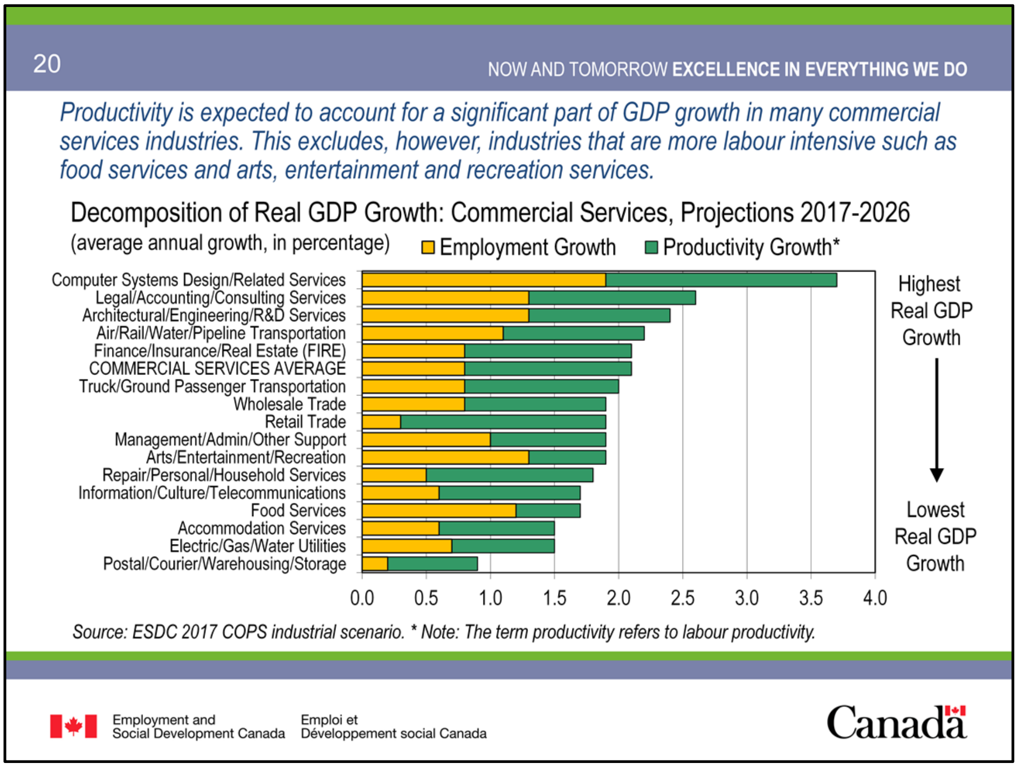
- Among the thirteen manufacturing industries, employment is projected to increase in nine industries and decline in four industries, resulting in net job creation of 59,000 in the overall manufacturing sector between 2016 and 2026.
- Industries expected to experience the strongest gains in employment (in terms of number) are not necessarily those expected to show the strongest growth rates in employment (in terms of percentage). This is because the size of employment differs significantly across the industrial breakdown, with industries having a much larger number of workers than others.
- As a result, fabricated metals and machinery along with food and beverage products are expected to account for 60% of net job creation in the manufacturing sector.
- Total employment in the sector is projected, however, to remain well below its historical peak of 2004, with a deficit of about 540,000 jobs by 2026.



- Most of Canada's commercial services industries rely on the domestic market, with consumer spending and business activity as the main drivers of demand for such services. Tourism activity is also a key driver for some specific services (transportation, accommodation, food, entertainment).
- Computer systems design and related services are projected to post the strongest growth in output and employment over the period 2017-2026. This industry is expected to benefit from rapid technological innovations and the need for firms across a wide range of sectors to continually upgrade their IT infrastructure to remain competitive. Cyber security, cloud-based platforms, big data, Internet of Things, video game development, virtual and augmented reality, machine learning and artificial intelligence, fintech/insurtech and blockchains represent a multitude of growth opportunities.
- Legal, accounting and consulting services and architectural, engineering, design and R&D services are also projected to post above average growth in production and employment, benefiting from the increasing trend in business-to-business outsourcing; growing demand for professional advice on planning, logistics, mergers, acquisitions, environmental regulations and implementation of new technologies; faster growth in non-residential building and engineering construction; and renewed growth in corporate profits, manufacturing production, M&E investment, and R&D spending.
- While output growth in most other commercial services is expected to gravitate around the average, employment growth is expected to be more scattered. This implies that productivity growth differs significantly across industries, with those posting above average employment growth being more labour intensive, and those posting below average employment growth being less labour intensive.
- For example, retail trade is projected to post among the lowest growth in employment, although growth in output is projected to be close to the average. This means that productivity growth in this industry is expected to be strong (the second strongest across all commercial services industries).
- Postal, courier, warehousing and storage services are projected to post the weakest growth in output and employment. Indeed, postal and courier services will continue to be affected by the growing use of e-mail, electronic billing and online advertising. However, the growing demand for parcel delivery and warehousing services resulting from the increased adoption of e-commerce by households and businesses should help to support continued expansion in he industry.



- Productivity growth is expected to account for a significant part of GDP growth in many commercial services industries over the period 2017-2026. Because those industries are the largest employers of the Canadian economy, the weaker pace of growth anticipated in the working-age population will force businesses to strengthen productivity and eventually replace labour by capital in response to the gradual tightening of the labour market.
- Rapid advances in digital and cognitive technologies are expected to support productivity and alleviate some of the labour market pressures resulting from demographic factors. Major developments in on-line and mobile applications, smart systems, artificial intelligence, machine learning and autonomous transport are expected to increase the number of tasks that could potentially be performed or complemented by technology across a wide range of services occupations, including human-centric jobs or those requesting a higher level of education.
- For example, e-commerce, e-banking, and on-line insurance and housing services have improved productivity and restrained labour demand in retail trade and finance, insurance and real estate services over the past decade. This trend is expected to amplify over the projection period with new applications arisen from advanced technologies, such as inventory software, warehouse robotics, automated on-line customer support (chatbots), smart price tags (that can be changed in real time), indoor positioning and detection systems (beacon technology), fintech, insurtech, blockchain transactions, artificial and virtual agents, etc.
- The advent of digital platforms supporting the on-demand economy such as Airbnb and Uber, and the growing use of streaming platforms such as Netflix and Spotify, are also transforming the ways services are provided. Those platforms are challenging the traditional ways of delivering services, particularly in the accommodation, transportation and cultural industries.
- A number of commercial services industries remain, however, less subject to technological disruptions as they are generally more labour intensive. Food services and arts, entertainment and recreation services are characterized by a large number of human-centric jobs that are unlikely to be performed or complemented by technology. Head cooks, artists and professional athletes are relevant examples.

Food services are expected to create the largest number of jobs in commercial services, followed by FIRE, legal/accounting/consulting and management/administrative/support services.

Projected Change in Employment: Commercial Services (in thousands)

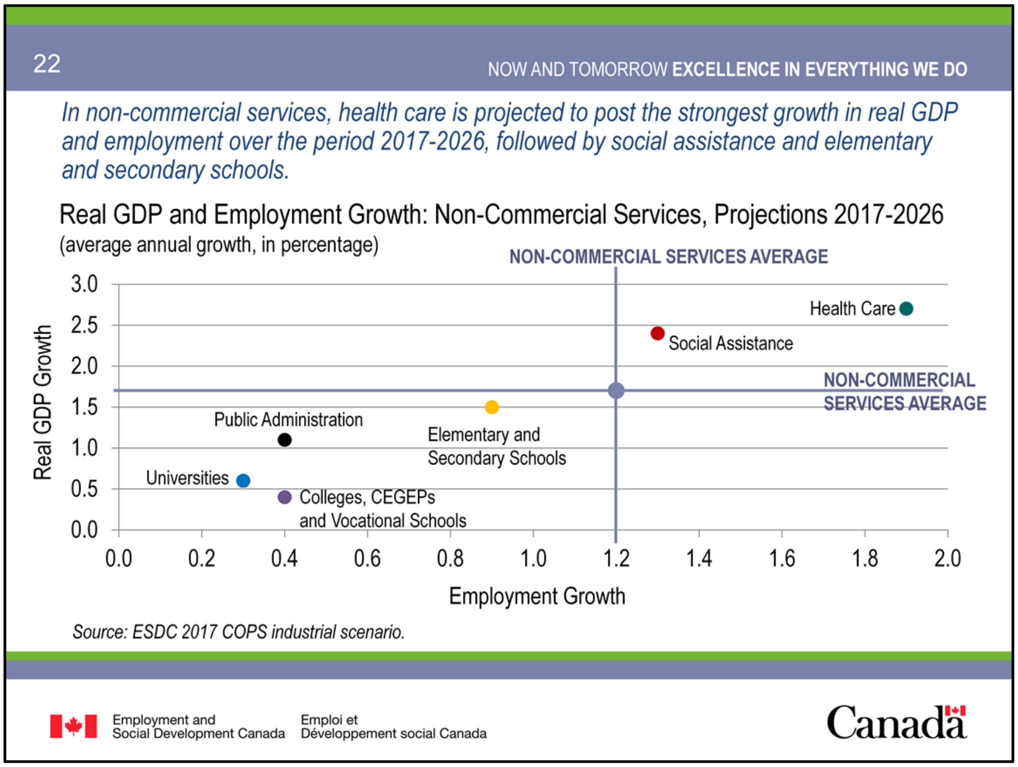
Rank	Industry	Employment 2016	Employment 2026	Average Annual Growth	Cumulative Change
1	Food Services	1,019.7	1,147.6	+1.2%	+127.9
2	Finance, Insurance and Real Estate (FIRE)	1,127.0	1,219.8	+0.8%	+92.8
3	Legal, Accounting and Consulting Services	651.5	741.2	+1.3%	+89.7
4	Management, Administrative and Other Support	766.4	848.7	+1.0%	+82.3
5	Computer Systems Design and Related Services	346.1	418.1	+1.9%	+72.0
6	Retail Trade	2,067.8	2,139.0	+0.3%	+71.2
7	Wholesale Trade	678.1	735.7	+0.8%	+57.6
8	Arts, Entertainment and Recreation	424.3	481.4	+1.3%	+57.1
9	Architectural, Engineering, Design, R&D Services	396.1	448.8	+1.3%	+52.7
10	Truck and Ground Passenger Transportation	473.3	511.6	+0.8%	+38.3
11	Repair, Personal and Household Services	774.9	811.9	+0.5%	+37.0
12	Air, Rail, Water and Pipeline Transportation	251.6	280.3	+1.1%	+28.7
13	Information, Culture and Telecommunications	358.1	378.6	+0.6%	+20.5
14	Accommodation Services	193.0	204.4	+0.6%	+11.4
15	Electric, Gas and Water Utilities	137.2	146.8	+0.7%	+9.6
16	Postal, Courier, Warehousing, Storage Services	182.5	186.0	+0.2%	+3.5
	TOTAL - COMMERCIAL SERVICES	9,847.6	10,699.9	+0.8%	+852.5

Employment and Social Development Canada / Emploi et Développement social Canada

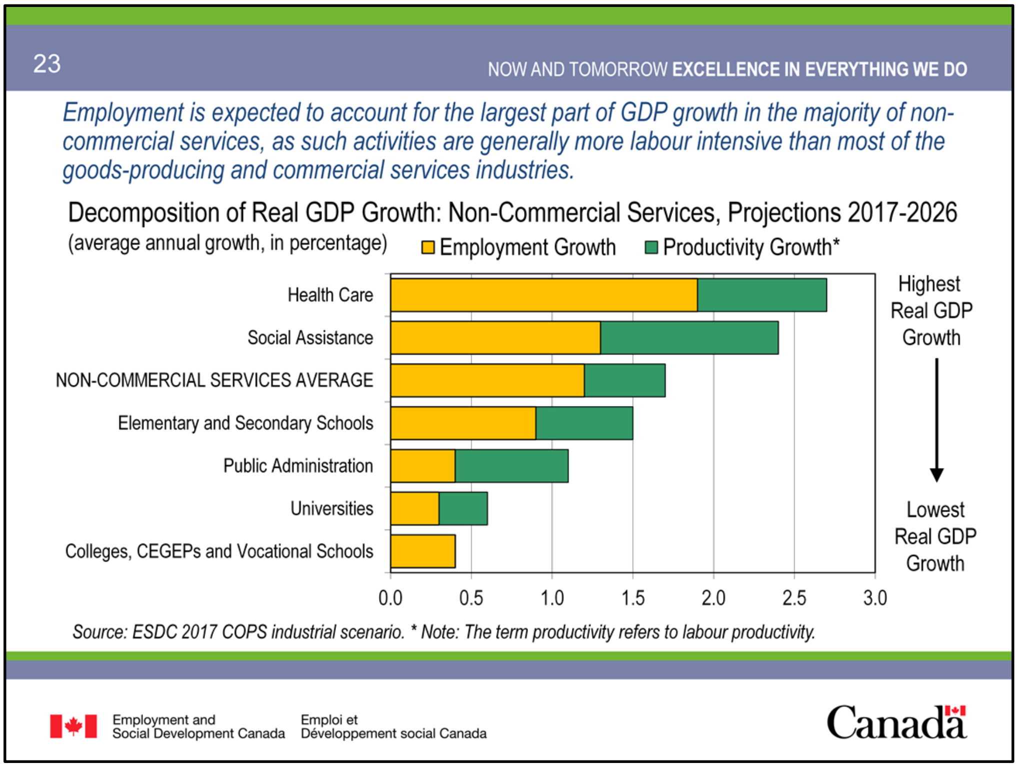
Sources: Statistics Canada (historical data) and ESDC 2017 COPS industrial scenario (projections).

Canada

- Employment is projected to increase in all sixteen commercial services industries between 2016 and 2026, resulting in the creation of about 853,000 jobs.
- Industries expected to experience the strongest gains in employment (in terms of number) are not necessarily those expected to show the strongest growth rates in employment (in terms of percentage). This is because the size of employment differs significantly across the industrial breakdown, with industries having a much larger number of workers than others.
- As a result, food services are expected to create the highest number of jobs, followed by finance, insurance and real estate; legal, accounting and consulting services; and management, administrative and other support services. Those four industries alone are projected to account for almost half (46%) of total job creation in commercial services by 2026.
- It is also worth noting that the relatively small computer systems design and related services industry is expected to create about the same number of jobs as the very large retail trade industry.



- Canada's non-commercial services industries largely consist of government and para-public services. Such services strongly rely on public finance and demographic factors.
- Health care is projected to experience the strongest growth in output and employment over the period 2017-2026, in response to the growing demand from an aging population as many baby-boomers will be entering in their costliest health care years. The commitments of many provinces to reduce wait times for medical care and surgeries are also expected to boost government spending, output and job creation in health care institutions, although labour shortages in high demand occupations represent significant challenges.
- Social assistance is also projected to post above average growth in production and employment Continued growth anticipated in youth population (0-17) is expected to result in additional demand for child day-care and family services, while population aging is expected to increase demand for elderly care services and senior citizen centres.
- Output and employment growth in elementary and secondary schools is expected to be primarily driven by the faster pace of growth anticipated in population aged 5 to 17. In contrast, demand for post-secondary education is expected to be constrained by the projected decline in population aged 18 to 25, resulting in weaker growth in output and employment for colleges, CEGEPs, vocational schools and universities. That said, the growing demand for higher educated and skilled workers across the economy should continue to push up enrolment rates in post-secondary education.
- In public administration, growth in output and employment is projected to be lowered by fiscal constraints. Population aging is expected to erode the federal and provincial tax bases, while simultaneously putting further pressures on the health care system, limiting the ability to expand expenditures in government programs and public administration. In addition to the moderate pace of growth anticipated in output, the need to improve efficiency and productivity growth in the government machinery is expected to restrain job creation in public administration.



- With the exception of public administration, employment growth is expected to account for the largest part of GDP growth in non-commercial services over the period 2017-2026, as such activities are generally more labour intensive than most of the goods-producing and commercial services industries.
- The measurement of output and productivity in non-commercial services also differs from the other sectors of the economy where goods and services are traded and more easily valued in monetary terms. Consequently, the term productivity in the government and para-public sectors is often associated with improved efficiency and effectiveness of an activity.
- Nevertheless, productivity (or efficiency) is projected to account for a notable part of GDP growth in most non-commercial services. The weaker pace of growth anticipated in the working-age population, combined with fiscal constraints, will force governments and para-public institutions to improve effectiveness and implement new labour-saving ways of delivering services, particularly in health care where labour shortages are expected to persist.
- New models of services delivery 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 provided by doctors. Technology is also playing an important role in almost all processes, including patient registration, data monitoring, lab tests and self-care tools. Smartphones and tablets are starting to replace conventional monitoring and recording systems, and people are now given the option of undergoing a full consultation in the privacy of their homes. Services are being taken out of hospital walls and integrated with user-friendly accessible devices.
- In educational services, productivity (or efficiency) can be influenced by factors such as the ratio of students per teacher, the availability of on-line courses and e-learning applications for post-secondary education, or access to computers in elementary and secondary schools.
- In public administration, fiscal challenges are the main factors expected to lead to the creation of more efficient models to improve government program management and public services delivery.

Health care alone is projected to account for two-thirds of job creation in non-commercial services, followed distantly by elementary and secondary schools and social assistance.

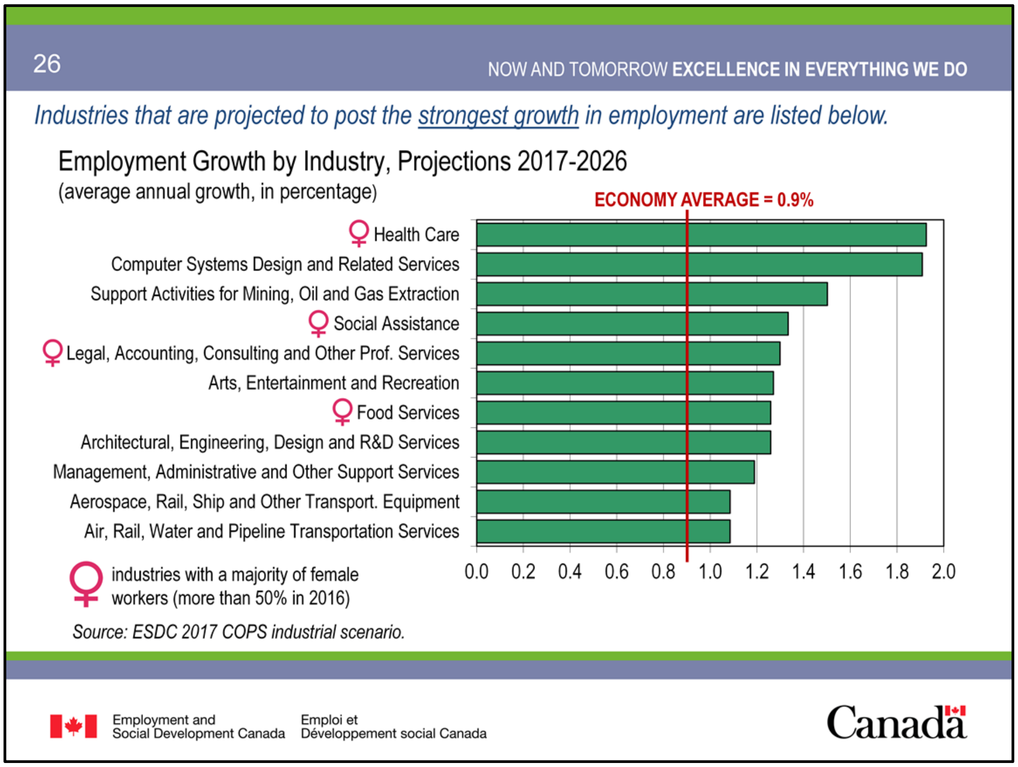
Projected Change in Employment: Non-Commercial Services
(in thousands)

Rank	Industry	Employment		Average Annual Growth	Cumulative Change
		2016	2026		
1	Health Care	1,835.5	2,215.5	+1.9%	+380.0
2	Elementary and Secondary Schools	755.9	830.6	+0.9%	+74.7
3	Social Assistance	503.9	575.6	+1.3%	+71.7
4	Public Administration	926.9	969.3	+0.4%	+42.4
5	Colleges, CEGEPs and Vocational Schools	246.8	255.5	+0.4%	+8.7
6	Universities	267.2	275.	+0.3%	+7.9
	TOTAL - NON-COMMERCIAL SERVICES	4536.2	5121.6	+1.2%	+585.4

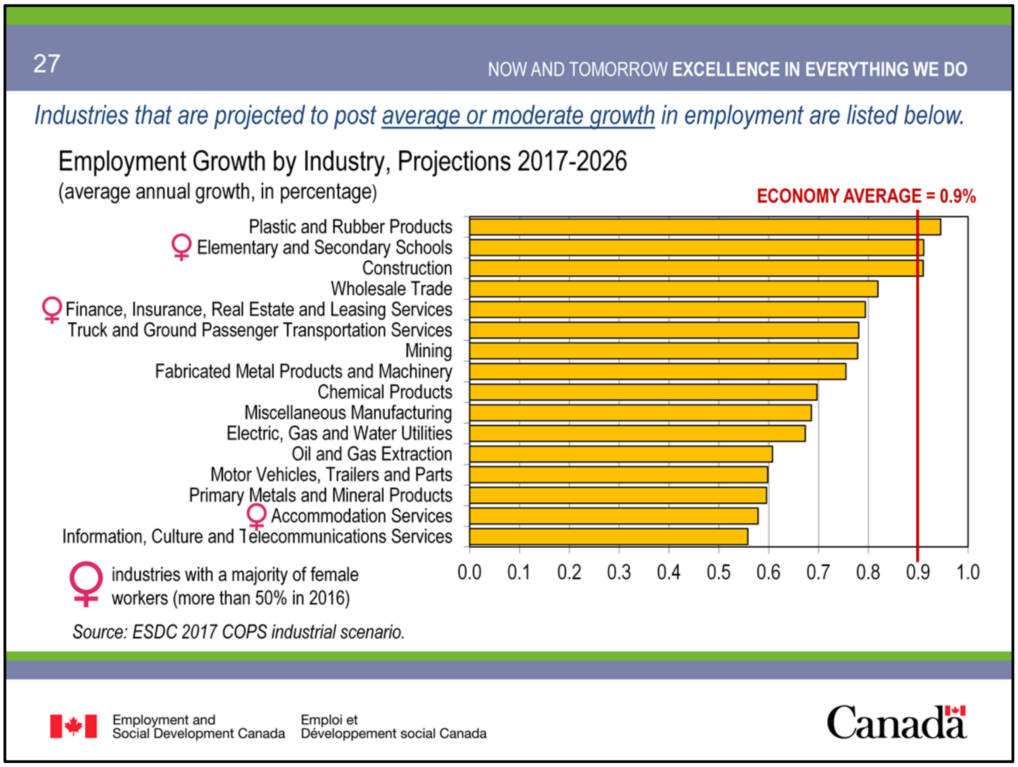
Sources: Statistics Canada (historical data) and ESDC 2017 COPS industrial scenario (projections).

- Employment is projected to increase in all six non-commercial services industries between 2016 and 2026, resulting in the creation of about 585,000 jobs.
- Health care is expected to experience the highest growth rate and the largest gains in employment (+380,000), accounting for almost two-thirds of total job creation in non-commercial services.
- Elementary and secondary schools and social assistance are expected to be distant followers with the creation of about 75,000 and 72,000 jobs, respectively.

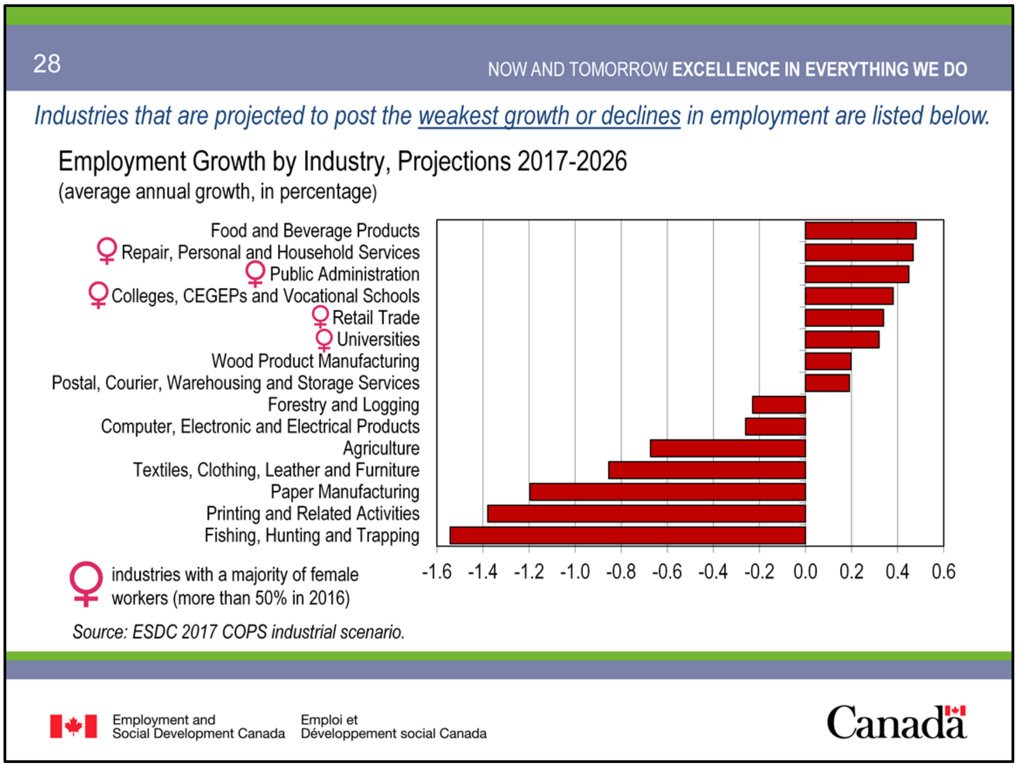
Comparisons of Employment Projections across Industries



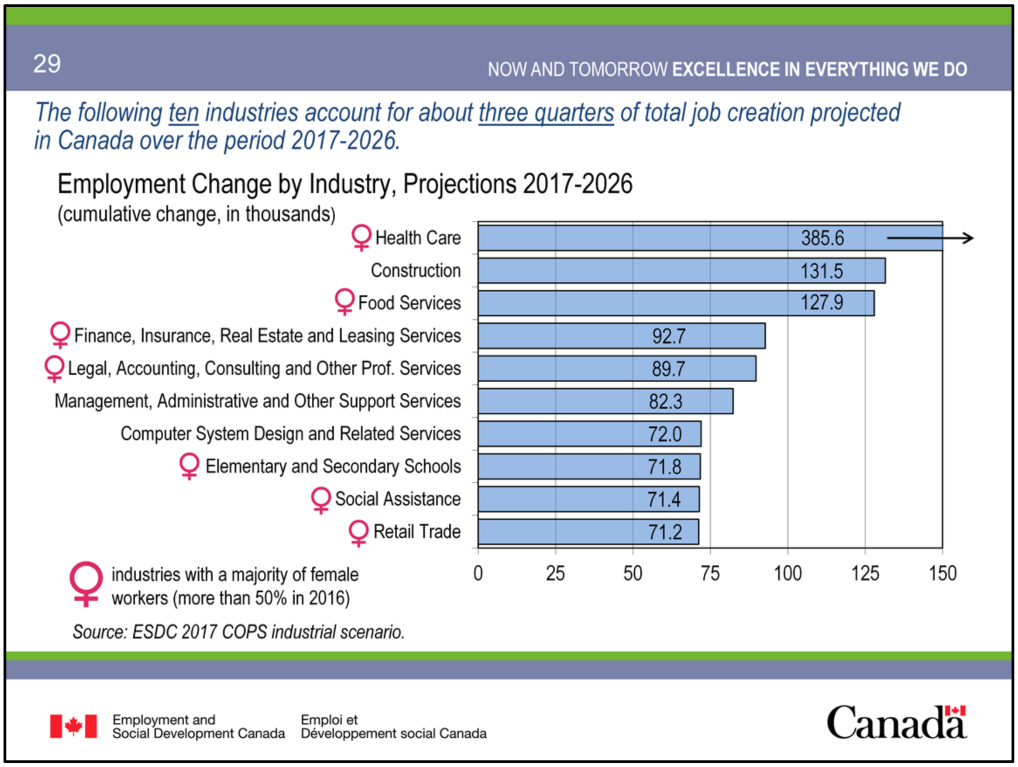
- Most of the industries projected to post the strongest growth in employment (i.e. above 1.0% annually) are also those projected to post the strongest growth in production. Below are some of the key drivers expected to support output and job creation in those industries:
  - Growing demand for health care due to population aging;
  - Rapid technological innovations and the need for businesses to continuously upgrade their IT infrastructure to remain competitive;
  - The gradual pickup anticipated in crude oil prices and energy-related investment;
  - Growing demand for social assistance, particularly child day-care and family services due to additional growth in youth population (aged 0-17), as well as elderly care and social services for senior citizen due to population aging;
  - Increased demand for professional advice on planning, logistics, mergers, acquisitions, environmental regulation and implementation of new technologies;
  - The rising number of retired baby-boomers that are expected to have more time to spend on leisure activities, including arts, entertainment and recreation services;
  - Growing demand for food services, particularly from health care institutions and tourism activity;
  - Faster growth in non-residential building and engineering construction; and renewed growth in corporate profits, manufacturing production, M&E investment, and R&D spending;
  - The growing number of firms across the economy that choose to outsource administrative functions in order to remain focused on their core activities and increase operation efficiency;
  - Global demand for commercial and business aircraft, particularly from the emerging markets, and sustained demand for transit systems (including rail) as a result of increased road congestion and environmental concerns;
  - Growing demand for the transportation of goods by water and rail due to the faster pace of growth anticipated in international trade and stronger demand for air transportation, particularly from American travellers visiting Canada (low Canadian dollar and strong U.S. labour market).



- Most of the industries projected to post average or moderate growth in employment (i.e. between 0.6% and 1.0% annually) are also those projected to post average or moderate growth in production.
- This group includes six manufacturing industries and six commercial services industries. It also includes elementary and secondary schools; construction; mining; and oil and gas extraction industries.
- In addition to moderate growth in production, job creation in those industries is expected to be restrained by the following factors:
  - The need to lower labour costs and increase productivity in manufacturing industries in response to the intensification of global competition;
  - The need to find new ways of delivering services and replace labour by capital wherever possible in response to the gradual weakening anticipated in labour force growth in Canada;
  - Structural changes in construction activity, more specifically the shift in the composition of housing starts from single-unit homes to multiple-dwellings which are more capital intensive and require less labour by unit of output;
  - The fact that several mining projects are moving from the construction to the production phase;
  - The fact that production capacity in oil sands is increasing while becoming less labour intensive;
  - Increased automation and rapid advances in digital and cognitive technologies.



- Most of the industries projected to post the weakest growth or declines in employment (i.e. below 0.5% annually) are also those projected to post the weakest growth in production.
- This group is largely composed of manufacturing and non-mineral primary industries that have experienced a stagnation or a declining trend in output and/or employment over the past several years, such as wood products, textiles, clothing, furniture, paper, printing, agriculture, forestry and fishing. Such industries are expected to face similar challenges than those experienced in the last decade, including:
    - the intensification of foreign competition and the shift in production to low-cost producers;
    - lower demand for paper and printed materials due to the growing use of electronic media;
    - timber and fish supply constraints (allowable annual cuts and quotas on fish species);
    - the end of the softwood lumber agreement with the U.S. (imposition of new tariffs);
    - difficulties to attract workers in agriculture and out-migration from rural/fishing communities.
- Output and employment growth is also projected to be weak in a number of commercial and non-commercial services industries. The main factors expected to weigh on those industries are:
    - additional pressures on public finance due to demographic changes (public administration);
    - significant declines projected in population aged 18-25 (colleges and universities);
    - slower pace of growth anticipated in the consumption of goods (retail trade);
    - growing use of e-mail, electronic billing and online advertising (postal/courier services).



- Among the 42 industries covered by COPS, 10 industries account for about three quarters of total job creation projected in Canada over the period 2017-2026.
- Future changes in the level of employment by industry can be decomposed in two components:
  - The rate of growth projected in employment for the industry;
  - The current number of workers in the industry (i.e. the size of the industry).
- This means that the ten industries expected to create the largest number of jobs are not necessarily those expected to show the strongest growth rates in employment.
- For example, the retail trade industry is expected to create a significant number of jobs, despite the weak rate of growth projected in employment (page 28). This simply reflects the large size of this industry relative to other industries. The same arguments apply for construction; finance, insurance and real estate; and elementary and secondary schools which are all expected to post substantial gains in employment, despite moderate growth in employment (page 27).

Gender Analysis

- The projections cannot be performed by gender, but the historical data provide the distribution of men and women in industrial and occupational employment.
- The data show that female workers are mostly concentrated in services. This is because women are more likely than men to work in services-producing industries, while men are more likely to work in goods-producing industries.
- In 2016, 87% of female workers were operating in services, compared to 63% for male workers. Inversely, 37% of male workers were operating in the primary, manufacturing or construction industries, compared to 13% for female workers.
- Among the twelve industries with a majority of female workers, four industries are expected to post strong growth in employment (page 26), three are expected to post moderate growth in employment (page 27), and five are expected to post weak growth in employment (page 28).
- However, among the ten industries expected to create the highest number of jobs (page 29), seven industries are dominated by female workers, as women tend to operate in industries with a large number of workers.

Industrial Summaries

For more details on the historical and future performance of the 42 industries covered by COPS, including key drivers of GDP, employment and productivity growth, please consult the Industrial Summaries available on the COPS website http://occupations.esdc.gc.ca/sppc-cops/