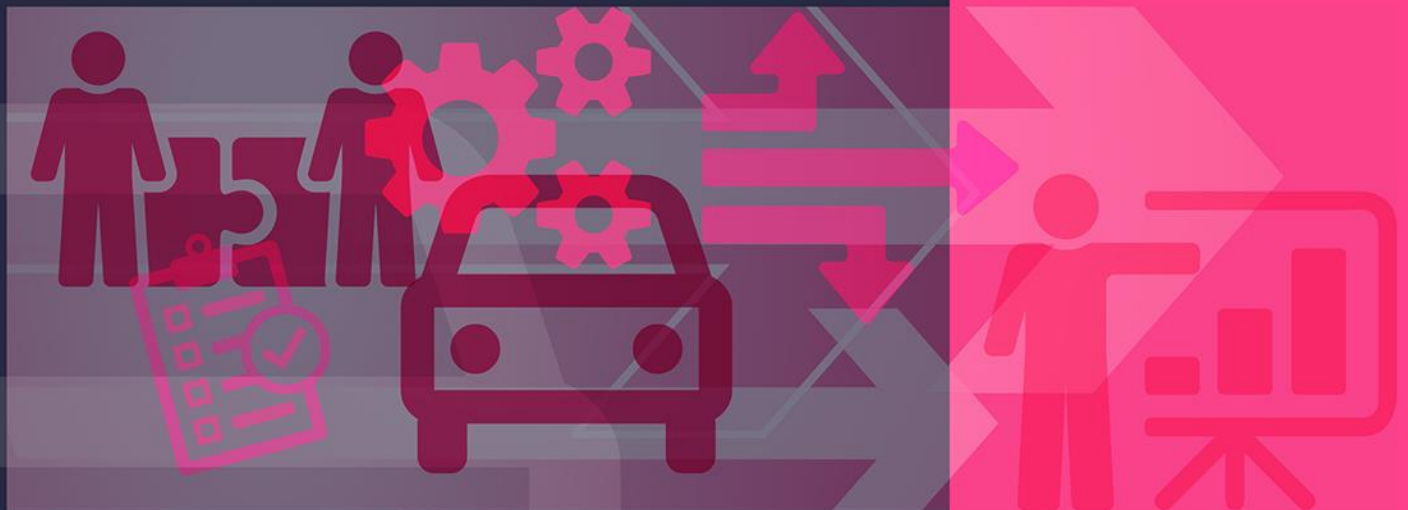


LABOUR MARKET FORECASTS FOR THE AUTOMOTIVE PRODUCTION SECTOR:

The impacts of expanded and
decreased production in Québec



The project is a collaboration of the Canadian Skills Training and
Employment Coalition, Prism Economics and Analysis, and the
Automotive Policy Research Centre.

March 2021

futureautolabourforce.ca

THIS PAPER was prepared for the Auto Labour Market Information (LMI) Project, now known as the *Future of Canadian Automotive Labourforce (FOCAL) Initiative*.

The goal of the project is to help stakeholders better understand the automotive labour market. The Project will create industry-validated, regional, occupational supply and demand analyses and forecasts and skill profiles for skilled trades and other key skilled occupations in the FOCAL Automotive Production Industry, which includes vehicle assemblers, parts manufacturers and technology companies that supply the industry. The project will also examine various labour market trends in the sector and facilitate discussions among stakeholders about how to address any forecasted skills shortages and other labour market challenges. The planned outcome of the project is enhanced regional labour market information that will support colleges, employers, policy makers and other stakeholders in taking practical steps to address skills shortages and other labour market challenges in the automotive sector.

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(FOCAL) Initiative, futureautolabourforce.ca

Canadian Skills Training and Employment Coalition, cstec.ca

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TABLE OF CONTENTS

Executive Summary	4
Background	4
Introduction	9
Impact of COVID-19 on Automotive Industry	11
Provincial Automotive Industry Employment Outlook	12
Provincial Automotive Industry Hiring Requirement Outlook	14
Provincial Automotive Industry New Entrants Outlook	17
Provincial Automotive Industry Recruitment Gap Outlook	19
Provincial Automotive Industry Recruitment Gap Rankings	23
Recruitment Gap Size Rankings	23
Recruitment Gap Share Rankings	25
Conclusion	27
Appendix	28

List of Figures

FIGURE 1. The FOCAL Automotive Production Industry in Canada	6
FIGURE 2. Industry Groups in the FOCAL Automotive Production Industry	7
FIGURE 3. Occupation Groups in the FOCAL Automotive Production Industry	8
FIGURE 4. National Motor Vehicle Production (Units), 2000-2030	9
FIGURE 5. National Industrial Capacity Utilization Rates, 2010-2020	10
FIGURE 6. Provincial Automotive Industry Employment Outlook, 2022-2030	12
FIGURE 7. Provincial Automotive Hiring Requirement (HR) Outlook, 2021-2030	14
FIGURE 8. Provincial Automotive New Entrants (NE) Outlook, 2021-2030	17
FIGURE 9. Provincial Automotive Recruitment Gap (RG) Outlook, 2021-2030	19
FIGURE 10. Provincial Automotive Industry Recruitment Gap Outlook, Baseline Scenario, 2021-2030	20
FIGURE 11. Provincial Automotive Industry Recruitment Gap Outlook, Production Scenario #1, 2021-2030	20
FIGURE 12. Provincial Automotive Industry Recruitment Gap Outlook, Production Scenario #2, 2021-2030	21

List of Tables

TABLE 1. Provincial Automotive Industry Employment by Scenario, 2030	13
TABLE 2. Provincial Automotive Industry Hiring Requirement (HR) Outlook, 2021-2030.....	16
TABLE 3. National Commercial Vehicle Production (Units), 2022-2030.....	16
TABLE 4. Provincial Automotive Industry New Entrants (NE) Outlook, 2021-2030	18
TABLE 5. Provincial Automotive Industry Recruitment Gap (RG) Outlook, 2021-2030.....	22
TABLE 6. Provincial Automotive Industry Recruitment Gap Size Rankings, Top 10 Occupations, Baseline Scenario, 2021-2030.....	23
TABLE 7. Provincial Automotive Industry Recruitment Gap Size Rankings, Top 10 Occupations, Production Scenario #1, 2021-2030	24
TABLE 8. Provincial Automotive Industry Recruitment Gap Size Rankings, Top 10 Occupations, Production Scenario #2, 2021-2030	24
TABLE 9. Provincial Automotive Industry Recruitment Gap Share Rankings, Top 10 Occupations, Baseline Scenario, 2021-2030.....	25
Table 10. Provincial Automotive Industry Recruitment Gap Share Rankings, Top 10 Occupations, Production Scenario #1, 2021-2030.....	25
TABLE 11. Provincial Automotive Industry Recruitment Gap Share Rankings, Top 10 Occupations, Production Scenario #2, 2021-2030.....	26
TABLE 12. Detailed Provincial Automotive Industry Hiring Requirement Outlook, Baseline Scenario, 2021-2030	28
TABLE 13. Detailed Provincial Automotive Industry New Entrants Outlook, Baseline Scenario, 2021-2030.....	29
TABLE 14. Detailed Provincial Automotive Industry Recruitment Gap Outlook, Baseline Scenario, 2021-2030	31
TABLE 15. Detailed Provincial Automotive Industry Hiring Requirement Outlook, Production Scenario #1, 2021-2030	32
TABLE 16. Detailed Provincial Automotive Industry New Entrants Outlook, Production Scenario #1, 2021-2030	33
TABLE 17. Detailed Provincial Automotive Industry Recruitment Gap Outlook, Production Scenario #1, 2021-2030	35
TABLE 18. Detailed Provincial Automotive Industry Hiring Requirement Outlook, Production Scenario #2, 2021-2030	36
TABLE 19. Detailed Provincial Automotive Industry New Entrants Outlook, Production Scenario #2, 2021-2030	38
TABLE 20. Detailed Provincial Automotive Industry Recruitment Gap Outlook, Production Scenario #2, 2021-2030	39

EXECUTIVE SUMMARY

The FOCAL project team published baseline labour market forecasts for Quebec's FOCAL Automotive Production Industry in Spring 2020. This report expands the scope of that work by exploring detailed provincial labour market forecasts for scenarios where national motor vehicle production, consisting of light-duty vehicles, buses, and heavy-duty trucks, either increases (upside) or decreases (downside) by 20% from the baseline forecast. Labour market outlooks are contrasted between the baseline and alternative production scenarios, in the process offering valuable insights for industry players, policymakers, and other key stakeholders. Highlights of the report's outlooks include:

- Employment in Quebec's FOCAL Automotive Production Industry is projected to range from an estimated 14,800 workers by 2030 in the downside scenario to 18,230 workers in the upside scenario. In the baseline scenario, employment was projected to reach 16,570 workers by 2030. Unsurprisingly, the largest impacts are seen within the vehicle assembly industry group, where employment ranged from 19% above to 20% below the baseline by 2030. Significant employment impacts are also projected for vehicle parts manufacturing but are limited by the high rate of exports in these industries, as well as for other primary automotive suppliers associated with metals.
- Labour demand, referred to as hiring requirement in this report, is projected to range from an estimated 3,840 workers between 2021 and 2030 in the downside scenario to 7,690 workers in the upside scenario. In the baseline scenario, hiring requirement was projected to total 5,710 workers over the forecast period. The largest relative increase in hiring requirement was seen for the engineering & technical and management & administration occupation groups at +53%. The largest relative decrease in hiring requirement was seen for the skilled trades occupation group at -39%.
- New entrants, meaning individuals entering the industry's workforce for the first time, are projected to range from an estimated 700 workers between 2021 and 2030 in the downside scenario to 1,070 workers in the upside scenario. In the baseline scenario, new entrants were projected to total 840 workers over the forecast period. 54% of new entrants are projected to join the sector's workforce between 2026 and 2030 in the baseline scenario; this figure is 60% in the upside scenario but only 47% in the downside scenario.
- Excess labour demand, referred to as the recruitment gap in this report, is projected to range from an estimated 3,140 workers between 2021 and 2030 in the downside scenario to 6,620 workers in the upside scenario. In the baseline scenario, the recruitment gap was projected to total 4,860 workers over the forecast period. The largest relative increase in recruitment gap was seen for the engineering & technical occupation group at +59%. The largest relative decrease in recruitment gap was seen for the production and skilled trades occupation groups at -40%.
- The top-ranked occupations by recruitment gap size are similar between the baseline and alternative production scenarios, with the magnitude of recruitment gaps being the primary difference between scenarios. Motor vehicle assemblers, inspectors and testers (NOC 9522) has the largest recruitment gap in each case. The top-ranked occupations by recruitment gap share are also similar between the baseline and both alternative production scenarios and are mostly comprised of skilled trades, managerial roles, and technical occupations.

BACKGROUND

This report summarizes provincial labour market forecast scenarios for the FOCAL Automotive Production Industry. The forecast model projects and quantifies trends in labour demand and supply for the industry over the forecast period from 2021 to 2030. The forecast model uses a combination of data sources to generate labour market outlooks. Workforce estimates were based on a two-pronged approach, which consisted of analyzing establishment-level data (“bottom up”) and tracing industry production through the economy (“top down”).

The “bottom up” approach used a database originally built by the Automotive Policy Research Centre (APRC) through industry contacts, company websites, industry literature and other sources of publicly available data to identify individual employers in each region’s FOCAL Automotive Production Industry. This database added complexity to the forecast model by providing regionally-specific employment distributions across industries at a level of detail beyond what is available through government statistics. The “top down” approach tracked inter-industry transactions through Statistics Canada’s input-output tables, allowing for each industry’s contributions to employment and output for the FOCAL Automotive Production Industry to be defined.

This analysis broadens the definition of automotive manufacturing to include producers in the supply chain that have previously been classified in non-automotive industries. Industries traditionally thought of as automotive manufacturing are referred to by FOCAL as Vehicle Assembly and Parts Manufacturing; this includes two sub-categories of vehicle assembly (NAICS 3361) and eight sub-categories of vehicle parts manufacturing (NAICS 3363). Thirty-two additional industries are collectively defined as Other Primary Automotive Suppliers, since a portion of their sales go to traditional automotive industries. The degree of connection between these suppliers and traditional automotive industries varies significantly. For instance, nearly half of sales for the foundries and hardware manufacturing industries are to traditional automotive industries. Other industries, particularly those related to electronics manufacturing and professional services, sell less than 5% of their output to traditional automotive industries. These industries are included as Other Primary Automotive Suppliers because of their strategic importance to the sector.

The FOCAL Automotive Production Industry brings together Vehicle Assembly and Parts Manufacturing and Other Primary Automotive Suppliers to create a new entity that more accurately reflects the importance of automotive manufacturing to the Canadian economy. Figure 1 illustrates this broader definition of automotive manufacturing in terms of its primary components and its place within the Canadian economy. Figure 2 provides a diagram of the industry groups used in this report, with each industry listed alongside its classification code (i.e., NAICS) and the proportion of its sales that go to traditional (“core”) automotive industries. While both figures illustrate the national FOCAL Automotive Production Industry, each region has a distinct supply chain dependent on the businesses producing goods and/or services there. For example, the Quebec model of the FOCAL Automotive Production Industry includes the production of diesel engines (NAICS 3336) as this is a critical part of the supply chain for heavy-duty truck and bus assembly in the province. The definition of the FOCAL Automotive Production Industry has been adjusted for some regions to reflect this fact.

FIGURE 1. The FOCAL Automotive Production Industry in Canada

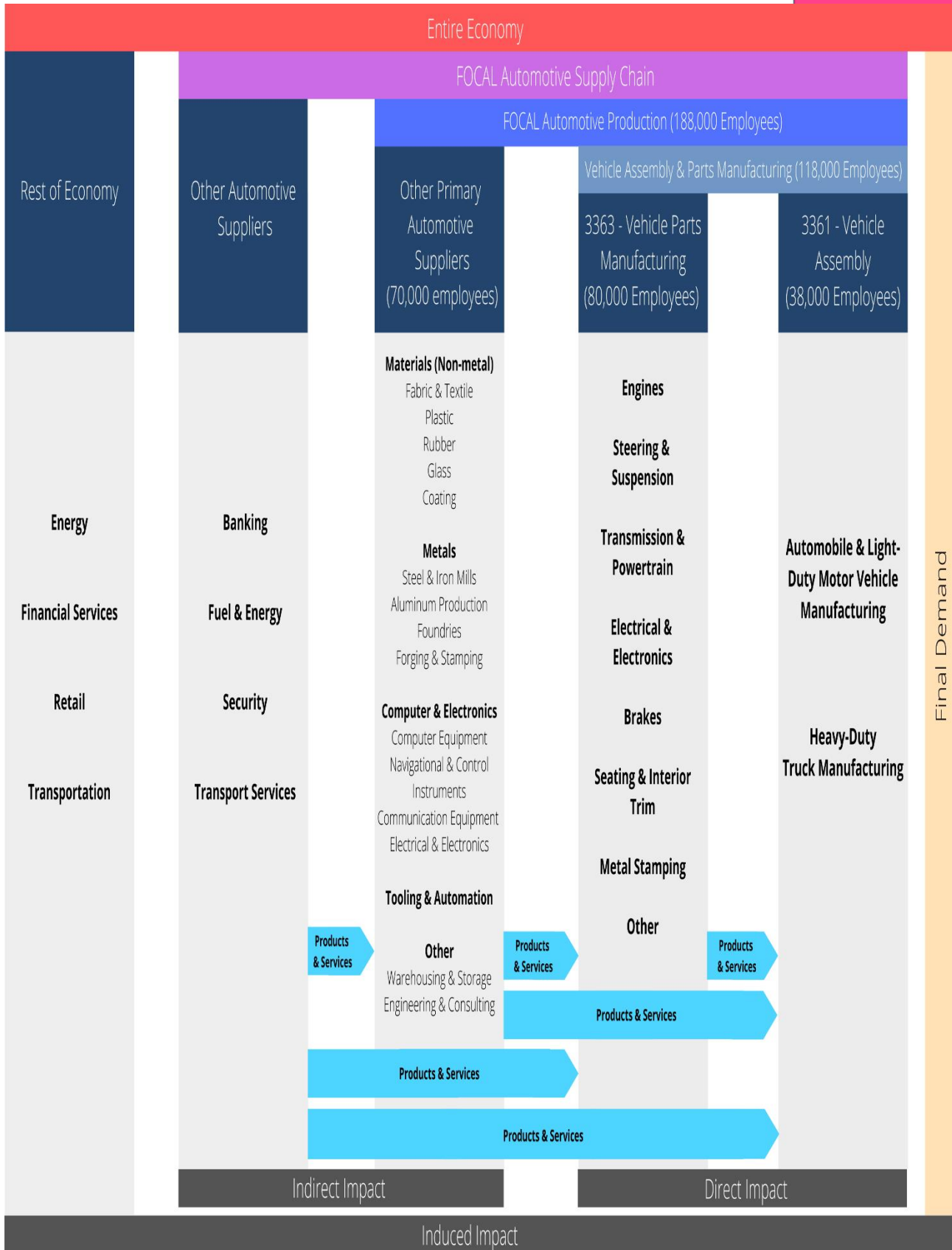
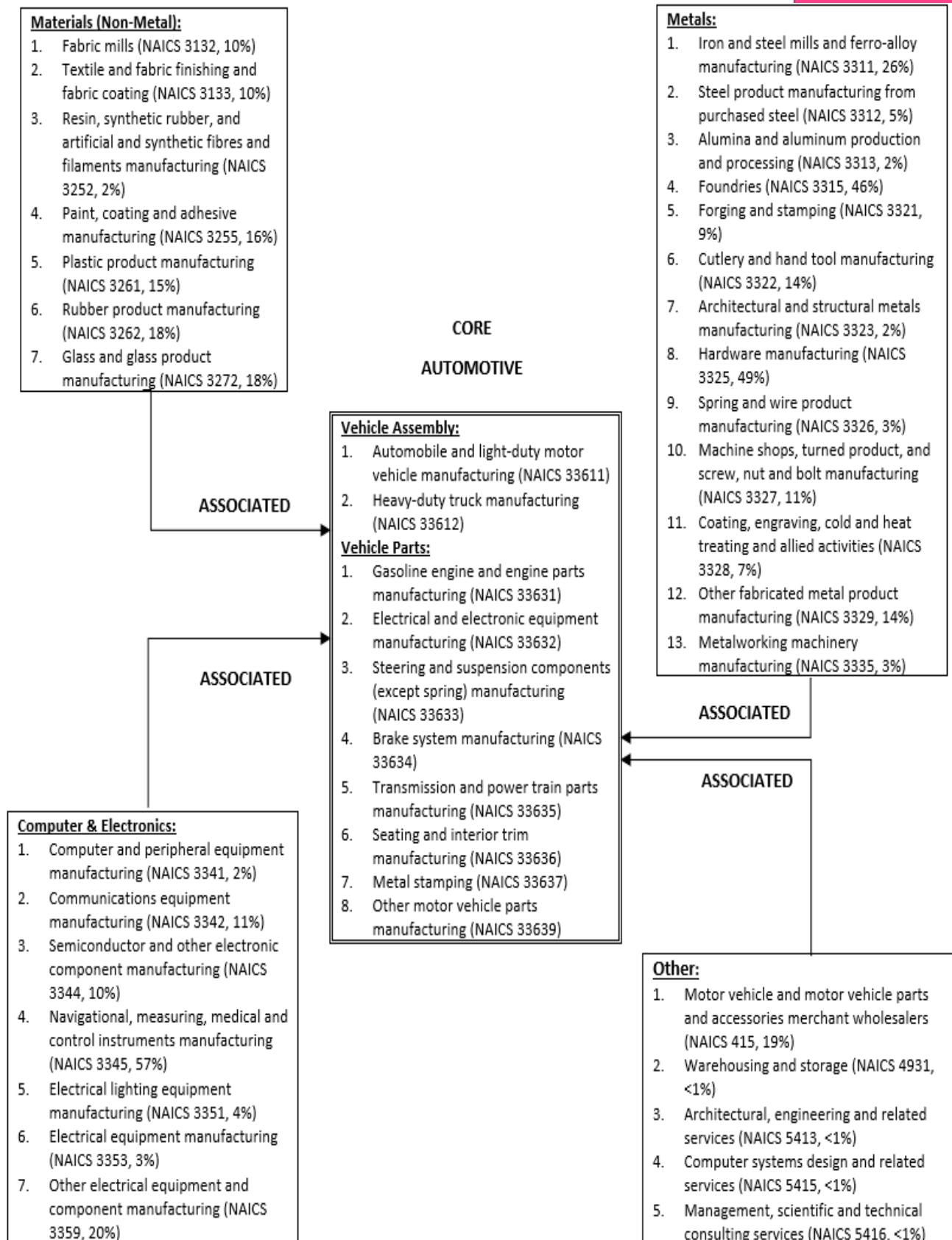


FIGURE 2. Industry Groups in the FOCAL Automotive Production Industry



In addition to providing labour market outlooks for the FOCAL Automotive Production Industry as a whole, the forecast model also provides comprehensive projections for a set of key occupations that play distinct and important roles in the industry' workforce¹. Forecasts were developed for the following occupations, categorized below based on the nature of their role in the workforce:

FIGURE 3. Occupation Groups in the FOCAL Automotive Production Industry

Management & Administration

Senior managers – construction, transportation, production and utilities (NOC 0016)
 Engineering managers (NOC 0211)
 Computer and information systems managers (NOC 0213)
 Manufacturing managers (NOC 0911)
 Human resource professionals (NOC 1121)

Engineering & Technical

Shippers and receivers (NOC 1521)
 Production logistics coordinators (NOC 1523)
 Mechanical engineers (NOC 2132)
 Electrical and electronics engineers (NOC 2133)
 Industrial and manufacturing engineers (NOC 2141)
 Metallurgical and materials engineers (NOC 2142)
 Computer engineers (except software engineers and designers) (NOC 2147)
 Information systems analysts and consultants (NOC 2171)
 Database analysts and data administrators (NOC 2172)
 Software engineers and designers (NOC 2173)
 Computer programmers and interactive media developers (NOC 2174)
 Mechanical engineering technologists and technicians (NOC 2232)
 Industrial engineering and manufacturing technologists and technicians (NOC 2233)
 Electrical and electronics engineering technologists and technicians (NOC 2241)
 Industrial instrument technicians and mechanics (NOC 2243)
 Computer network technicians (NOC 2281)
 Information systems testing technicians (NOC 2283)

Skilled Trades

Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations (NOC 7201)
 Machinists and machining and tooling inspectors (NOC 7231)
 Tool and die makers (NOC 7232)
 Welders and related machine operators (NOC 7237)
 Electricians (except industrial and power system) (NOC 7241)
 Industrial electricians (NOC 7242)
 Contractors and supervisors, mechanic trades (NOC 7301)
 Construction millwrights and industrial mechanics (NOC 7311)
 Automotive service technicians, truck and bus mechanics and mechanical repairers (NOC 7321)
 Material handlers (NOC 7452)
 Transport truck drivers (NOC 7511)

Production

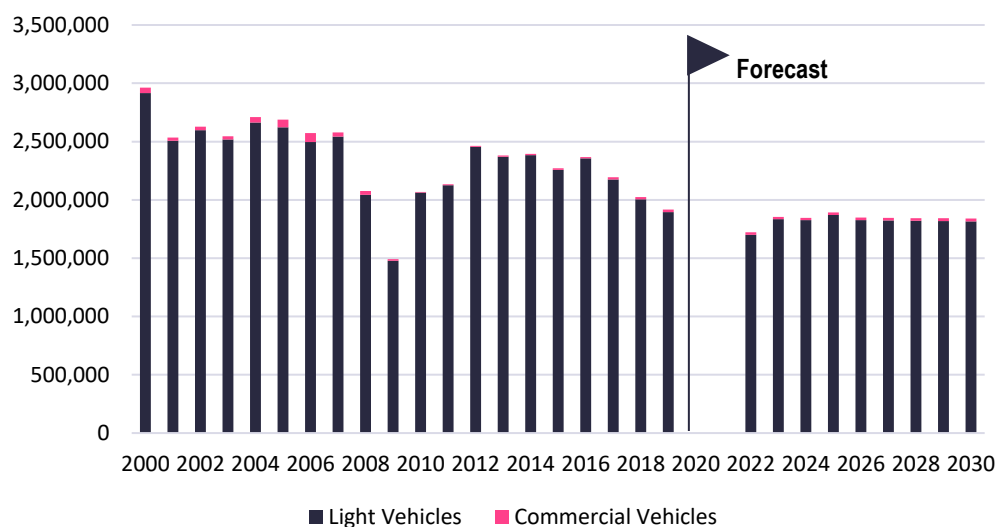
Supervisors, motor vehicle assembling (NOC 9221)
 Supervisors, electronics manufacturing (NOC 9222)
 Supervisors, electrical products manufacturing (NOC 9223)
 Supervisors, furniture and fixtures manufacturing (NOC 9224)
 Supervisors, other mechanical and metal products manufacturing (NOC 9226)
 Supervisors, other products manufacturing and assembly (NOC 9227)
 Foundry workers (NOC 9412)
 Metalworking and forging machine operators (NOC 9416)
 Machining tool operators (NOC 9417)
 Plastics processing machine operators (NOC 9422)
 Motor vehicle assemblers, inspectors and testers (NOC 9522)
 Electronics assemblers, fabricators, inspectors and testers (NOC 9523)
 Mechanical assemblers and inspectors (NOC 9526)
 Plastic products assemblers, finishers and inspectors (NOC 9535)
 Industrial painters, coaters and metal finishing process operators (NOC 9536)
 Other labourers in processing, manufacturing and utilities (NOC 9619)

¹ For details on the process of selecting key occupations for this project, please refer to the "Post-Secondary Education Report" published by the FOCAL project team in October 2019.

INTRODUCTION

The FOCAL project team has already examined the labour market impacts for Quebec’s FOCAL Automotive Production Industry, resulting in a set of baseline provincial labour market forecasts for the industry². These forecasts assumed total vehicle assembly output in Canada remains relatively stable over the next decade, as seen in Figure 4. Total motor vehicle production, including both light (i.e., passenger or light-duty vehicles) and commercial (i.e., buses and heavy-duty trucks) vehicles, consisted of 1.92 million units in 2019. In the baseline forecast scenario, national total motor vehicle production was projected to fall to 1.72 million units in 2022 before rebounding to a peak of 1.89 million in 2025³. Production levels were then projected to remain stable in the range of 1.85 million units between 2026 and 2030. National production of commercial vehicles totaled approximately 21,700 units in 2019 and was anticipated to see steady growth in the baseline scenario, rising by an average of 2.0% annually to roughly 23,900 units by 2030.

FIGURE 4. National Motor Vehicle Production (Units), 2000-2030



Source: International Organization of Motor Vehicle Manufacturers (2000-2019); LMC Automotive (2022-2030).

As a result of this production forecast and similar projections for North American vehicle production, provincial FOCAL Automotive Production Industry employment, including commercial vehicle assembly and parts manufacturing as well as other primary automotive suppliers, was projected to rise from an estimated 14,650 workers to 16,570 workers over the forecast period. Nationally, labour market challenges for the FOCAL Automotive Production Industry in the baseline scenario were primarily driven by the need to replace retirements from the industry’s aging workforce, with relatively little hiring resulting from industry growth. Replacement demand was also the primary driver of hiring in the baseline forecast for Quebec, although industry growth contributed as well.

² These forecasts and all other content produced by the FOCAL project team can be found at <https://www.futureautolabourforce.ca/>.

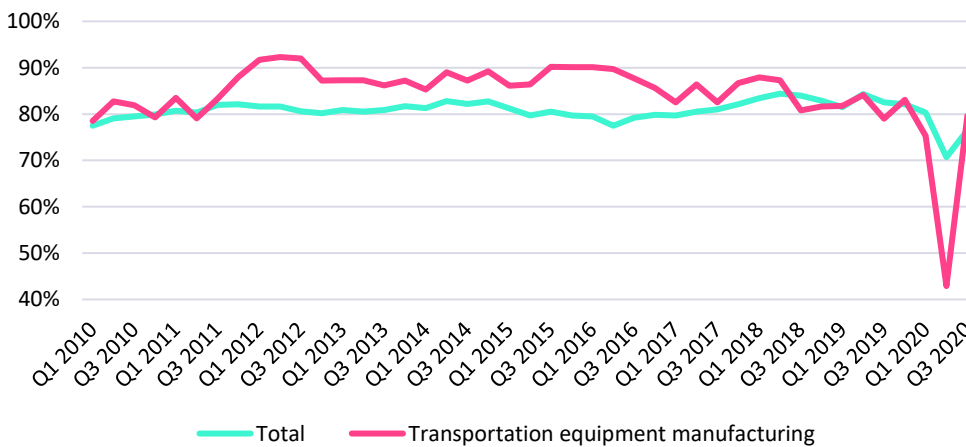
³ Due to uncertainty regarding the impact of COVID-19, forecasts of production have been withheld for 2020 and 2021. Please refer to the “Impact of COVID-19 on Automotive Industry” section for more details.

This report expands the scope of analysis by considering how a change in the forecasts for light & commercial vehicle assembly would affect the baseline scenario outlooks for labour demand and supply in Quebec. Two additional forecast scenarios were constructed using the following vehicle assembly output assumptions:

1. National light & commercial motor vehicle production will be 20% higher than the baseline forecast by 2030 (“Production Scenario #1” or “Upside Scenario”)
2. National light & commercial motor vehicle production will be 20% lower than the baseline forecast by 2030 (“Production Scenario #2” or “Downside Scenario”)

The 20% figure was selected by the FOCAL project team based on a review of historic changes in year-to-year production levels and is intended to simulate the addition of one or more new assembly plants. As seen in Figure 4, swings of a similar magnitude are not out of the ordinary; total motor vehicle production fell by 14% in 2001 and by 19% and 28% in the recession years of 2008-09, while 2010 saw a 39% increase as production rebounded post-recession and 2012 saw a 15% rise over the year prior. Commercial vehicle production saw even larger swings, falling by over 80% between 2008 and 2010 and more recently rising by nearly 50% from 2016 to 2017. Additionally, industrial capacity utilization rates for Canada’s transportation equipment manufacturing sector, which includes vehicle assembly and parts manufacturing, have been between 80% and 85% in most quarters since the start of 2016 (Figure 5), meaning the 20% figure also works as a proxy for increasing production at existing assembly plants. Capacity utilization rates provide a measure of the intensity with which industries use their production capacity by calculating the percentage of actual output (i.e., real GDP) to potential output (i.e., capital stock). Notably, capacity utilization rates for transportation equipment manufacturing plummeted in the second quarter of 2020 as COVID-19 forced facilities to shut down and/or significantly reduce their operations. However, capacity utilization rates in the sector have returned to a level only moderately below pre-pandemic levels as of Q3 2020.

FIGURE 5. National Industrial Capacity Utilization Rates, 2010-2020



Source: Statistics Canada, Table 16-10-0109-01.

Both forecast scenarios include an additional assumption related to vehicle parts manufacturing. In the upside scenario, vehicle parts manufacturing output is set to increase by 10% from the baseline forecast by 2030. In the downside scenario, vehicle parts manufacturing output is set to decrease by 10% from the baseline forecast by 2030. These figures reflect the fact that a sizeable share of Canadian vehicle parts manufacturing output is exported, primarily for use in the U.S. and Mexico, meaning shifts in domestic vehicle production will only impact a portion of the total business activity related to parts. Data from Statistics Canada’s input-output tables indicate that exports accounted for over 60% of

Canada's vehicle parts manufacturing output in 2015³. Because the volume of import leakages fluctuates on an annual basis, a conservative estimate of 50% was assumed as the portion of parts manufacturing output that is dependent on trade. For this reason, only half of the change to vehicle production levels was applied to vehicle parts manufacturing in each scenario, resulting in the 10% assumption. Both the vehicle and parts-related assumptions were validated during stakeholder consultation sessions.

In each scenario the adjustments to light & commercial vehicle assembly and parts manufacturing are implemented linearly over the course of the forecast period rather than as a single year shock. This was done in order to understand how the labour force will react to these changes over time. A separate study detailing the employment and output impacts of a single year shock to either vehicle production or parts exports, entitled "*The Importance of the FOCAL Automotive Production Industry*", has also been prepared by the FOCAL project team as a complement to this report.

This report follows the structure of the provincial baseline forecast profile for Quebec. The five main sections each describe a different component of the provincial labour market forecast, including employment, hiring requirements, new entrants, and recruitment gaps (with rankings). In each section, outlook projections are provided for both alternative production scenarios and compared with the previously published baseline scenario estimates. A brief conclusion summarizes the major insights for stakeholders gained from this exercise. Detailed occupational tables of hiring requirements, new entrants, and recruitment gaps are provided for all three scenarios in an appendix following the report's conclusion.

Impact of COVID-19 on Automotive Industry

COVID-19 has had significant consequences for the Canadian economy over the past year, with many businesses permanently closing and a massive surge in unemployment claims. COVID-19's impact has also been felt in the automotive industry, as automakers declared temporary closures of all Canadian assembly plants in March 2020. The automotive industry showed tremendous leadership and flexibility in responding to the crisis, even as vehicle production was temporarily halted. Manufacturers across the supply chain quickly pivoted from producing automotive parts to repurposing their operations to the production of critical medical equipment and supplies.

The vehicle production forecasts discussed in the preceding section were developed prior to the COVID-19 outbreak. Although vehicle production eventually resumed, actual production levels in 2020 and 2021 are likely to be much different than previously expected due to the temporary shutdown and additional workplace healthy and safety measures. Short-term forecasts should therefore be interpreted with caution. Our project team has decided to withhold estimates and forecasts of total motor vehicle production (as seen in Figure 4) and industry employment (as seen in Figure 6) for 2020 and 2021 as an acknowledgment of the current level of uncertainty surrounding the industry. However, forecasts of labour market conditions for 2021 are still presented in aggregate with the 2022-2025 period elsewhere in the report.

Due to the nature of the downturn and the experience gained during the 2008-09 recession, we believe COVID-19 will not have long-term impacts on labour supply and demand for the FOCAL Automotive Production Industry. The provincial forecasts presented in this report extend out to 2030; at the time of writing, our project team remains confident they present a reliable picture of labour market dynamics for the industry. We will continue to monitor the impact of COVID-19 on the industry going forward and adjust our research scope as needed.

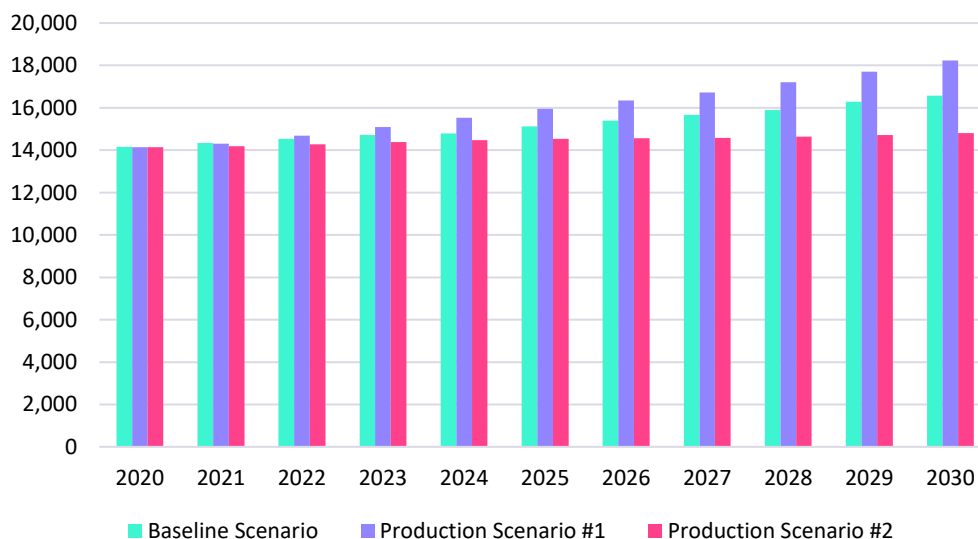
³ Exact estimates can be obtained from Statistics Canada's Symmetric Input-Output Tables (2015).

PROVINCIAL AUTOMOTIVE INDUSTRY EMPLOYMENT OUTLOOK

Figure 6 illustrates employment outlooks for the baseline, upside (i.e., Production Scenario #1), and downside (i.e., Production Scenario #2) scenarios between 2022 and 2030. While employment levels are similar between the baseline and upside scenarios through 2025, differences in long-term growth trends create a sizable employment gap over the 2026-2030 period. In the baseline scenario, FOCAL Automotive Production Industry employment is expected to experience a consistent growth trend of 1.6% annually over the forecast period, rising to 16,530 workers by 2030.

The upside scenario follows a similar pattern but features stronger employment growth, particularly in the latter half of the decade. Overall, average annual growth of 2.6% is projected, leading to FOCAL Automotive Production Industry employment of 18,240 by 2030, equivalent to a 10% increase in employment compared to the baseline scenario. In contrast, the downside scenario projects low growth over the forecast period, particularly in the years between 2026 and 2030. Overall, average annual growth of just 0.5% is expected, leading to FOCAL Automotive Production Industry employment of 14,790 by 2030, equivalent to an 11% decrease in employment compared to the baseline scenario.

FIGURE 6. Provincial Automotive Industry Employment Outlook, 2022-2030



Although total employment is 10% larger in the upside scenario and 11% smaller in the downside scenario, employment changes are not spread evenly among the industry groups that comprise the FOCAL Automotive Production Industry. These divergent outcomes are driven by the strength of the economic linkages between industries, the role of imports, and assumptions regarding changes in the productivity of workers over the forecast period. In both scenarios, the level and change in employment in the Other Primary Suppliers industries capture only the proportion of their activity that is tied to vehicle assembly and/or parts manufacturing (see Figure 2). Table 1 breaks down the change in 2030 employment between scenarios by industry group.

Commercial vehicle assembly, as expected, saw the largest percentage change in employment in the upside scenario, growing 19% from the baseline. Vehicle parts manufacturing, which employed the most workers of any industry group in the baseline scenario, saw an employment gain of nearly 700 workers in the upside scenario. While this is nearly the same gain as was seen for assembly, it represents only an 8% increase over the baseline for parts manufacturing. Among Other Primary Automotive Suppliers, the metals industry group saw strong employment growth of 11% between scenarios. This industry group includes manufacturers of diesel engine & power transmission equipment and motor vehicle hardware, both of whom make a significant proportion of their sales to traditional automotive manufacturing industries in Quebec. The high sales volume reflects the prominence of heavy-duty truck manufacturing, as opposed to automobile and light-duty motor vehicle manufacturing, in Quebec. The remaining industry groups, including non-metal materials (2%), computer & electronics (2%), and other (3%), saw lower employment growth, in part because they include industries with relatively weaker economic linkages to Quebec’s traditional automotive manufacturing industries.

Similar outcomes are seen for the downside scenario, with vehicle assembly employment falling 20% and vehicle parts manufacturing employment declining by 8%. In this scenario, the metals industry group sees employment contract by 13%, reflecting a decline in the volume of sales to Quebec’s traditional automotive manufacturing industries from manufacturers associated with this group. Employment changes for the non-metal materials (-5%), computer & electronics (-3%), and other (-4%) industry groups also mirror those seen in the upside scenario. Employment changes are slightly larger for all groups in the downside scenario due to the additional impact of assumed productivity gains, which mean fewer workers will be required to produce the same output over time. Overall, the scenarios illustrate how employment can rise or fall as a result of alternative production assumptions.

TABLE 1. Provincial Automotive Industry Employment by Scenario, 2030

Industry Group	Baseline Scenario	Production Scenario #1	Empl. Change (%)	Production Scenario #2	Empl. Change (%)
Vehicle Assembly	3,710	4,410	+19%	2,950	-20%
Vehicle Parts Mfg.	8,430	9,110	+8%	7,780	-8%
Materials (Non-Metals)	750	780	+4%	710	-5%
Metals	2,070	2,290	+11%	1,800	-13%
Computer & Electronics	920	940	+2%	890	-3%
Other	690	710	+3%	660	-4%
TOTAL	16,570	18,240	+10%	14,790	-11%

PROVINCIAL AUTOMOTIVE INDUSTRY HIRING REQUIREMENT OUTLOOK

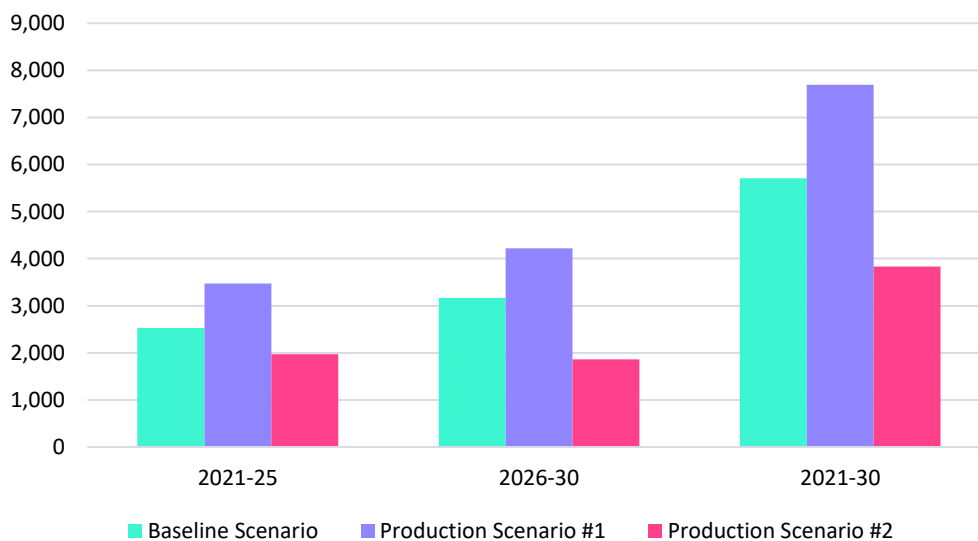
Hiring requirement represents the demand for labour across employers in the FOCAL Automotive Production Industry. Estimated hiring requirements cover the needs of all employers within Vehicle Assembly and Parts Manufacturing industries, but only the portion of employment connected with these traditional industries for employers in Other Primary Automotive Suppliers industries. Hiring requirements consist of two components:

1. **Replacement demand** – labour demand driven by the need to replace workers exiting the FOCAL Automotive Production Industry workforce due to retirement or death⁶
2. **Expansion demand** – labour demand driven by output growth in the FOCAL Automotive Production Industry (referred to as retraction demand when negative)

The provincial outlook for replacement demand in each scenario is driven by provincial demographic projections, mortality rates, and annual changes in labour force participation rates by age-year. The provincial outlook for expansion/retraction demand is driven by forecasts of motor vehicle production and exports.

Changes in production levels have clear impacts on labour demand in the FOCAL Automotive Production Industry, as seen in Figure 7:

FIGURE 7. Provincial Automotive Hiring Requirement (HR) Outlook, 2021-2030



In the baseline scenario, Quebec’s FOCAL Automotive Production Industry was projected to require 5,710 new workers between 2021 and 2030. 2,350 workers were expected to be needed in the near-term (i.e., between 2021 and 2025), compared with 3,170 workers in the medium to long-term (i.e., between 2026 and 2030). The total projected hiring requirement

⁶ This measure of replacement demand does not account for workers exiting as part of turnover.

during the forecast period represented 39% of the province's FOCAL Automotive Production Industry employment as of 2019.

In the upside scenario, Quebec's FOCAL Automotive Production Industry is projected to require 7,690 new workers between 2021 and 2030. 3,470 workers are expected to be needed in the near-term, compared with 4,220 workers in the medium to long-term. The total projected hiring requirement during the forecast period represents 53% of the province's FOCAL Automotive Production Industry employment as of 2019.

In the downside scenario, Quebec's FOCAL Automotive Production Industry is projected to require 3,840 new workers between 2021 and 2030. 1,970 workers are expected to be needed in the near-term, compared with 1,860 workers in the medium to long-term. The total projected hiring requirement during the forecast period represents 26% of the province's FOCAL Automotive Production Industry employment as of 2019.

Overall, the cumulative nature of hiring requirements means they present a much wider range of outcomes between scenarios than were seen for the employment outlooks. The impact of the production assumptions in each scenario are observed in changes to labour demand in each forecast year, which are then added together to determine the total hiring requirement for the forecast period. The total hiring requirement in the upside scenario is 35% larger than that of the baseline. In the downside scenario, total hiring requirement is 33% smaller than the baseline.

Hiring requirements can also be examined by occupation group for each scenario to gain insights into which types of work would be most affected by a change in expected production. As production levels change over time, causing industry growth (upside scenario) or contraction (downside scenario), the forecast model reacts to these changes by drawing in the needed labour force through adjustments to occupation-level unemployment rates. Occupations where unemployment levels have historically been low will have fewer industry workers to draw from in the upside scenario, leading to greater increases in hiring from outside the industry relative to the baseline. The opposite effect is observed in the downside scenario, where low unemployment results in greater decreases in labour demand. These impacts, coupled with differences in retirement rates based on the age profiles of occupations by industry, lead to distinct impacts between occupation groups in each scenario.

In the baseline scenario, the proportion of total hiring requirement to current employment was highest among skilled trades (39%) and management & administration occupations (37%). These occupation groups have among the highest shares in the upside scenario as well at 53% and 54% respectively. *However, engineering & technical occupations saw the largest relative increase in hiring requirement, rising 53% from the baseline (510) to the upside (780) scenario. This group, which includes various engineering disciplines and occupations related to computer software and hardware, is primed to play a critical role in driving growth for the FOCAL Automotive Production Industry.* These occupations also tend to have relatively low unemployment rates when compared with other groups which contributes to their strong growth. This is also true of management & administration occupations, which saw hiring requirement increase by 53% as well. The smallest relative increase in hiring requirement was seen for the group capturing all other occupations in the workforce, which grew only 27% from the baseline. This category includes occupations that are less strongly associated with automotive manufacturing and thus are less affected by changes in output.

Labour demand for skilled trades saw the largest decline in hiring requirement between the baseline and downside scenarios, falling by 39%, followed closely by production workers at 36%. These occupations account for the largest share of employment in commercial vehicle assembly and parts manufacturing industries and are dependent on output from these industries to generate labour demand. *Notably, hiring requirement for management & administration occupations declined by only 17%. This was the smallest decrease of any occupation group and may reflect the seniority of these positions as well as their function within businesses.* Management occupations have higher retirement rates due to the typical age profile for these roles, which require significant professional experience, meaning that replacement workers will still be needed even in the event of industry contraction. The ‘other’ occupation group saw a below-average 32% decline, providing further evidence of its stability with respect to output changes.

TABLE 2. Provincial Automotive Industry Hiring Requirement (HR) Outlook, 2021-2030

Occupation Group	Baseline Scenario	Share of 2019 Emp.	Production Scenario #1	HR Change (%)	Production Scenario #2	HR Change (%)
Management & Administration	360	37%	550	+53%	300	-17%
Engineering & Technical	510	32%	780	+53%	350	-31%
Skilled Trades	1,010	39%	1,320	+31%	620	-39%
Production	1,350	36%	1,900	+41%	870	-36%
Other	2,480	43%	3,140	+27%	1,690	-32%
TOTAL	5,710	39%	7,690	+35%	3,840	-33%

Most of the total hiring requirement change in each scenario occurs as a result of shifts in expansion/retraction demand. Projections of expansion/retraction demand for Quebec are strongly tied to the forecasts of national commercial vehicle production in each scenario. As seen in Table 3, the alternative production assumptions result in increasingly different production levels over the course of the forecast period. While expansion/retraction demand accounts for an estimated 2,430 workers over the forecast period in the baseline scenario, this figure rises to 4,100 workers in the upside scenario; new job openings are created as the industry grows due to rising production levels. Conversely, expansion/retraction demand is largely absent in the downside scenario, as declining production is projected to result in low growth for the FOCAL Automotive Production Industry, especially over the latter half of the forecast period. Overall, expansion/retraction demand in the downside scenario is estimated at just 660 workers between 2021 and 2030.

TABLE 3. National Commercial Vehicle Production (Units), 2022-2030

Scenario	2022	2023	2024	2025	2026	2027	2028	2029	2030
Baseline Scenario	20,400	20,900	20,500	21,000	21,500	21,900	21,900	22,900	23,900
Production Scenario #1	21,300	22,100	23,000	23,800	24,700	25,600	26,500	27,500	28,500
Production Scenario #2	19,700	19,600	19,500	19,500	19,400	19,300	19,200	19,100	19,100

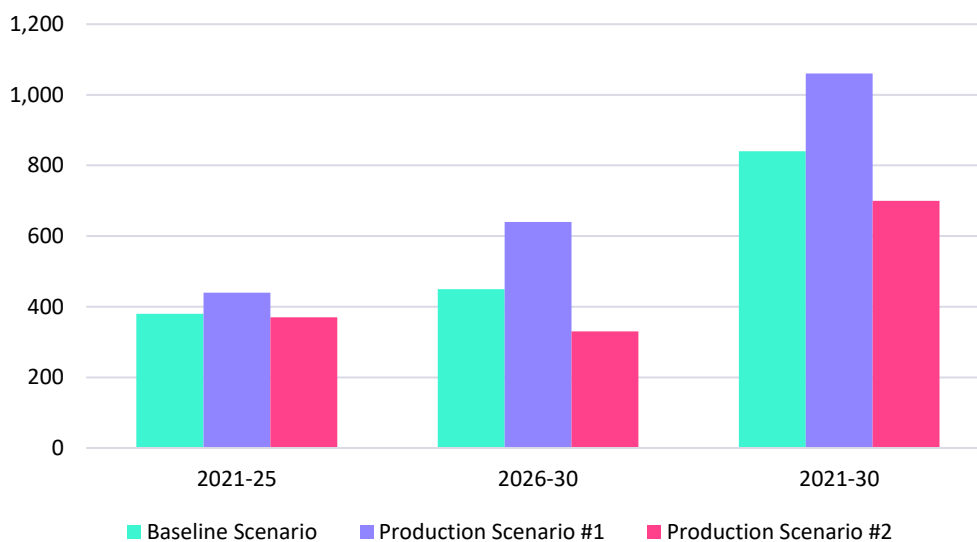
Source: Canadian Skills Training & Employment Coalition; LMC Automotive

PROVINCIAL AUTOMOTIVE INDUSTRY NEW ENTRANTS OUTLOOK

In order to meet hiring requirements, employers in Quebec’s FOCAL Automotive Production Industry must be able to recruit new entrants to the workforce. New entrants are defined as individuals between the ages of 15 and 30 who are entering the workforce for the first time. Forecasts of new entrants to the provincial FOCAL Automotive Production Industry are based on the industry’s historic share of new entrants, as well as provincial projections of changes in the labour force over time, including labour force participation by age-year and workforce by age-year and occupation.

The alternative production scenarios illustrate how supply dynamics in the labour market for the FOCAL Automotive Production Industry are impacted by changes in output, as seen in Figure 8:

FIGURE 8. Provincial Automotive New Entrants (NE) Outlook, 2021-2030



In the baseline scenario, Quebec’s FOCAL Automotive Production Industry was expected to recruit 840 new entrants to its workforce between 2021 and 2030, based on the industry’s historic rate of entry. The forecast for new entrants was relatively evenly split between the 2021-2025 (46%) and 2026-2030 (54%) periods. The projected number of new entrants across all occupations was equivalent to 6% of estimated FOCAL Automotive Production Industry employment in 2019 but was lowest for management & administration roles; these occupations rely the least on new entrants due to the experience typically required for these positions.

In the upside scenario, industry growth generates new job openings which act as a signal of opportunity for individuals entering the workforce, thereby attracting additional new entrants. This occurs because the forecast model reacts to industry growth by drawing in additional labour, leading to lower unemployment rates which increase the share of new entrants allocated to the industry. The result is an 26% increase in the projection for new entrants over the forecast period. The impact on new entrants builds over the forecast period as the industry continues to grow, with 60% of new entrants projected to enter the workforce between 2026 and 2030. The projections for new entrants by occupation group range from no change between scenarios for the management & administration group to a 33% increase for the engineering & technical group. Both the skilled trades (+14%) and production (+28%) groups are expected to see relatively lower growth in new entrants. Recruitment and retention issues with youth employment in automotive manufacturing, as outlined by the FOCAL project team⁴, limit gains for these occupations even in this optimistic scenario.

In the downside scenario, industry contraction leads to job losses which in turn push new entrants away from the industry. The same mechanism that attracts new entrants in the upside scenario has the opposite effect in this case; job losses lead to higher unemployment rates that reduce the share of new entrants allocated to the industry. This results in a 17% decrease in the projection for new entrants over the forecast period. The impact of contraction on new entrants is strongest towards the end of the forecast period. Specifically, just 47% of the total projection for new entrants occurs in the years between 2026 and 2030. The projection for new entrants for the management & administration occupation group is once again unchanged between the scenarios, while the skilled trades (-29%) and production (-16%) are expected to see the largest declines for reasons outlined above.

TABLE 4. Provincial Automotive Industry New Entrants (NE) Outlook, 2021-2030

Occupation Group	Baseline Scenario	Share of 2019 Emp.	Production Scenario #1	NE Change (%)	Production Scenario #2	NE Change (%)
Management & Administration	10	1%	10	0%	10	0%
Engineering & Technical	90	6%	120	+33%	80	-11%
Skilled Trades	140	5%	160	+14%	100	-29%
Production	250	7%	320	+28%	210	-16%
Other	350	6%	450	+29%	300	-14%
TOTAL	840	6%	1,070	+26%	700	-17%

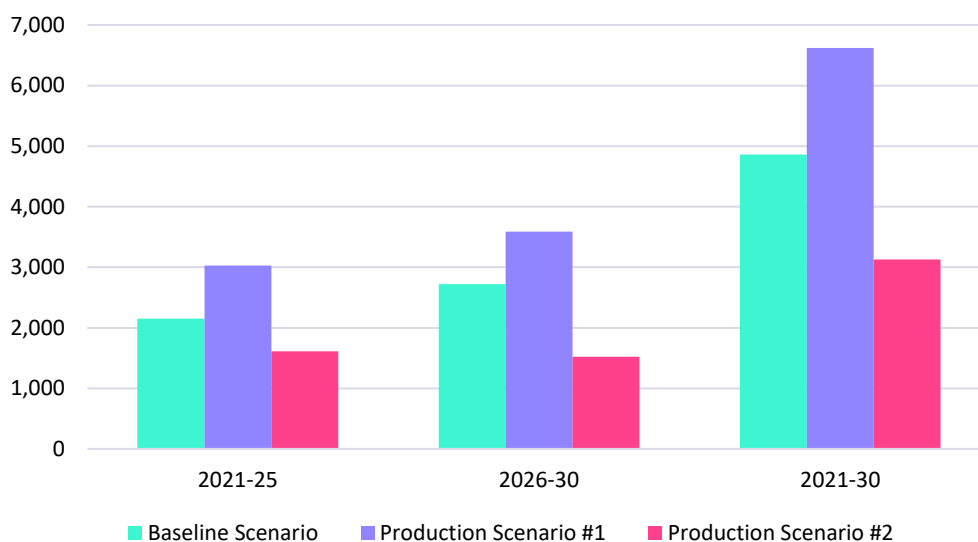
⁴ For details, please refer to the “Youth Employment in Canada’s Automotive Manufacturing Industry” trend report published by the FOCAL project team in June 2020.

PROVINCIAL AUTOMOTIVE INDUSTRY RECRUITMENT GAP OUTLOOK

Recruitment gaps are a measure of the excess demand that exists in the labour market after accounting for in unemployment and other supply. In the baseline and alternative production scenarios, recruitment gaps are calculated by subtracting projections of new entrants from the hiring requirement outlooks seen above. It should be noted that recruitment gaps could therefore be significantly higher if the industry fails to recruit new entrants at historic levels.

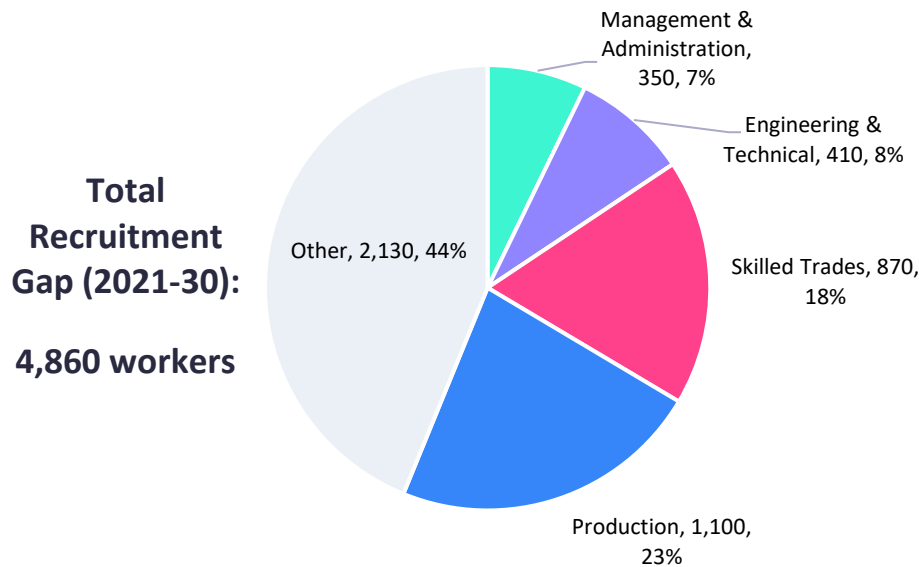
The outlook for recruitment gaps in the FOCAL Automotive Production Industry vary significantly between scenarios, as seen in Figure 9:

FIGURE 9. Provincial Automotive Recruitment Gap (RG) Outlook, 2021-2030



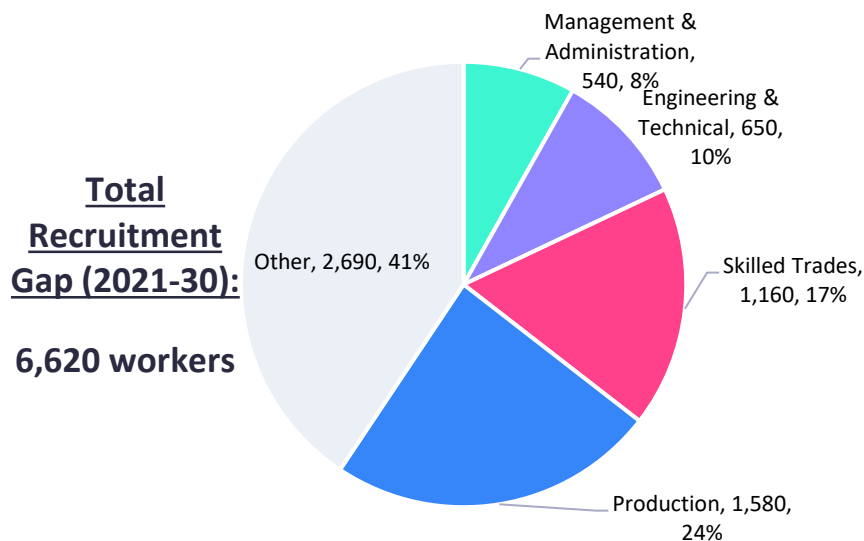
In the baseline scenario, Quebec’s FOCAL Automotive Production Industry was projected to face a recruitment gap of 4,860 workers during the forecast period. A recruitment gap of 2,150 workers was projected between 2021 and 2025, with a further shortfall of 2,720 workers expected between 2026 and 2030. Employers in the province would need to hire the equivalent of 33% of their current workforce over the forecast period to meet labour demand, even after accounting for new entrants. Among the primary occupation groups in the industry, the recruitment gap was expected to be largest for production workers (23% of total) followed by skilled trades (18%).

FIGURE 10. Provincial Automotive Industry Recruitment Gap Outlook, Baseline Scenario, 2021-2030⁵



In the upside scenario, Quebec’s FOCAL Automotive Production Industry is projected to face a recruitment gap of 6,620 workers during the forecast period. This is equal to a 36% increase from the baseline. Employers in the province would need to hire the equivalent of 45% of their current workforce over the forecast period to meet labour demand, even after accounting for the addition of new entrants to the workforce. Among the primary occupation groups in the industry, the recruitment gap is expected to be largest for workers outside the most common roles (41% of total) followed by production workers (24%).

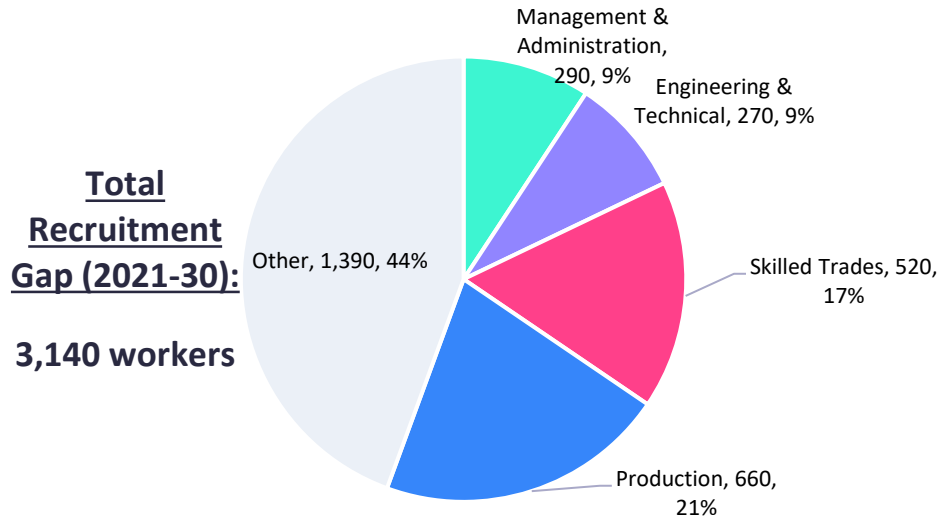
FIGURE 11. Provincial Automotive Industry Recruitment Gap Outlook, Production Scenario #1, 2021-2030



⁵ Please note that the shares seen in this figure represent each occupation group’s recruitment gap as a proportion of the total recruitment gap.

In the downside scenario, Quebec’s FOCAL Automotive Production Industry is projected to face a recruitment gap of 3,140 workers during the forecast period. This is equal to a 35% decrease from the baseline. *Employers in the province would need to hire the equivalent of 21% of their current workforce over the forecast period to meet labour demand, even after accounting for lower activity and the addition of new entrants to the workforce.* Among the primary occupation groups in the industry, the recruitment gap is expected to be largest for workers outside the most common roles (44% of total) followed by production workers (21%).

FIGURE 12. Provincial Automotive Industry Recruitment Gap Outlook, Production Scenario #2, 2021-2030



Taken together, the baseline and alternative production scenarios reveal the severity of the labour market challenges that employers in the FOCAL Automotive Production Industry may face going forward. Specifically, the downside scenario illustrates that recruitment gaps could persist even if domestic production levels decline over the next decade, while the upside scenario indicates that labour supply may be a limiting factor that hinders the industry’s potential for growth. This analysis makes it clear that recruiting and retaining qualified personnel should be a primary concern for the industry’s key stakeholders.

Trends in recruitment gap outlooks by occupation group, detailed below, follow those observed for hiring requirements in Table 2. In the baseline scenario, recruitment gap as a proportion of current employment was highest for management & administration occupations at 36%, followed by skilled trades at 33%. Engineering & technical and management & administration are projected to see the most significant recruitment gap growth of any occupation groups in the upside scenario. Recruitment gaps for each group saw increases of over 50% from the baseline. Both groups also saw strong growth in hiring requirements in the upside scenario. Production workers saw the next largest growth at over 40%, while skilled trades saw their recruitment gap grow by over 30%. Recruitment gap growth for all occupation groups is driven primarily by the need to hire new workers as the industry grows.

Production workers and skilled trades are projected to see the most significant recruitment gap contraction of any occupation groups in the downside scenario. Recruitment gaps for each group saw decreases equal to 40% from the baseline. However, retirements are still a major driver of replacement demand for these occupations, leading to a recruitment gap of over 500 workers for each group despite the decrease in production severely limiting industry growth. Results from the downside scenario also highlight the importance of labour supply availability to minimizing recruitment gaps, even when production levels are well below current levels. Both the engineering & technical group and management & administration occupation groups saw declines in their recruitment gaps that were much smaller than the increases observed in the upside scenario. The former saw its recruitment gap shrink by 34% while the latter saw a 17% decrease. Engineering & technical group and management & administration occupations also have the lowest total projections of new entrants across all three scenarios. Although labour demand is reduced in the downside case, the low expected levels of new entrants still leave recruitment gaps for these groups.

TABLE 5. Provincial Automotive Industry Recruitment Gap (RG) Outlook, 2021-2030

Occupation Group	Baseline Scenario	Share of 2019 Emp.	Production Scenario #1	RG Change (%)	Production Scenario #2	RG Change (%)
Management & Administration	350	36%	540	+54%	290	-17%
Engineering & Technical	410	26%	650	+59%	270	-34%
Skilled Trades	870	33%	1,160	+33%	520	-40%
Production	1,100	30%	1,580	+44%	660	-40%
Other	2,130	37%	2,690	+26%	1,390	-35%
TOTAL	4,860	33%	6,620	+36%	3,140	-36%

PROVINCIAL AUTOMOTIVE INDUSTRY RECRUITMENT GAP RANKINGS

Ranking recruitment gaps at the level of individual occupations can illustrate specific areas of the workforce that are expected to face more severe challenges in recruiting and retaining qualified workers. In order to understand the full scope of these challenges, occupations were ranked in two distinct ways.

First, occupations were ranked by recruitment gap size, meaning the total number of workers comprising each occupation’s projected provincial recruitment gap between 2021 and 2030. This *absolute* ranking method identifies occupations that will require the largest number of hires to meet labour demand, even after accounting for new entrants. Next, occupations were ranked by recruitment gap share, meaning the total number of workers comprising each occupation’s projected provincial recruitment gap between 2021 and 2030 divided by estimated provincial employment for that occupation in 2019. This *relative* ranking method identifies occupations that will need to replace a relatively high proportion of existing workers to meet labour demand, even after accounting for new entrants.

Every key occupation was ranked using both methods, excluding those occupations with insufficient provincial employment. The top ten occupations using each ranking method are presented for the baseline and alternative production scenarios in the following sections. Recruitment gaps and employment shares for all occupations in each scenario can be found in the Appendix (see Tables 14, 17, and 20).

Recruitment Gap Size Rankings

In the baseline scenario, the top-ranked occupation by recruitment gap size was motor vehicle assemblers, inspectors and testers (NOC 9522), with a projected recruitment gap of 360 workers between 2021 and 2030. A number of skilled trades - including construction millwrights & industrial mechanics (NOC 7311), tool & die makers (NOC 7232), and industrial electricians (NOC 7242) - also had large projected recruitment gaps. A similar set of occupations also appears at the top of the ranking in both alternative production scenario, albeit with significant differences in the magnitudes of their recruitment gaps. For instance, motor vehicle assemblers, inspectors and testers (NOC 9522) is still the top-ranked occupation in both cases, with a recruitment gap of 590 workers in the upside scenario but only 280 workers in the downside scenario. Of note, automotive service technicians, truck and bus mechanics and mechanical repairers (NOC 7321), which had the sixth-largest recruitment gap in the baseline scenario, is absent from the top ten occupations in both scenarios.

TABLE 6. Provincial Automotive Industry Recruitment Gap Size Rankings, Top 10 Occupations, Baseline Scenario, 2021-2030

Rank	Occupation	2021-2030	Share of 2019 Emp.
1	Motor vehicle assemblers, inspectors and testers (NOC 9522)	360	28%
2	Mechanical assemblers and inspectors (NOC 9526)	330	36%
3	Welders and related machine operators (NOC 7237)	240	35%
4	Manufacturing managers (NOC 0911)	210	36%

5	Construction millwrights and industrial mechanics (NOC 7311)	160	49%
6	Automotive service technicians, truck and bus mechanics and mechanical repairers (NOC 7321)	130	32%
7	Machinists and machining and tooling inspectors (NOC 7231)	120	31%
8	Material handlers (NOC 7452)	110	32%
9	Senior managers - construction, transportation, production and utilities (NOC 0016)	110	47%
10	Other labourers in processing, manufacturing and utilities (NOC 9619)	100	32%

TABLE 7. Provincial Automotive Industry Recruitment Gap Size Rankings, Top 10 Occupations, Production Scenario #1, 2021-2030

Rank	Occupation	2021-2030	Share of 2019 Emp.
1	Motor vehicle assemblers, inspectors and testers (NOC 9522)	590	44%
2	Mechanical assemblers and inspectors (NOC 9526)	350	49%
3	Manufacturing managers (NOC 0911)	310	52%
4	Welders and related machine operators (NOC 7237)	300	48%
5	Construction millwrights and industrial mechanics (NOC 7311)	200	66%
6	Machinists and machining and tooling inspectors (NOC 7231)	180	47%
7	Mechanical engineers (NOC 2132)	170	35%
8	Material handlers (NOC 7452)	170	46%
9	Senior managers - construction, transportation, production and utilities (NOC 0016)	160	64%
10	Electronics assemblers, fabricators, inspectors and testers (NOC 9523)	160	78%

TABLE 8. Provincial Automotive Industry Recruitment Gap Size Rankings, Top 10 Occupations, Production Scenario #2, 2021-2030

Rank	Occupation	2021-2030	Share of 2019 Emp.
1	Motor vehicle assemblers, inspectors and testers (NOC 9522)	280	21%
2	Manufacturing managers (NOC 0911)	160	26%
3	Electronics assemblers, fabricators, inspectors and testers (NOC 9523)	130	63%
4	Welders and related machine operators (NOC 7237)	120	19%
5	Construction millwrights and industrial mechanics (NOC 7311)	110	36%
6	Senior managers - construction, transportation, production and utilities (NOC 0016)	100	40%
7	Machinists and machining and tooling inspectors (NOC 7231)	100	26%
8	Material handlers (NOC 7452)	90	24%
9	Electrical and electronics engineers (NOC 2133)	80	56%
10	Mechanical assemblers and inspectors (NOC 9526)	80	11%

Recruitment Gap Share Rankings

In the baseline scenario, the top-ranked occupation by recruitment gap share was electronics assemblers, fabricators, inspectors & testers (NOC 9523), with a recruitment gap equal to over 80% of current occupational employment. In the upside scenario, this occupation has the second largest share at 78%, behind only electrical and electronics engineers (NOC 2133) at 82%. In the downside scenario it is also the top-ranked occupation but with only a 60% share of 2019 employment. Overall, the top-ranked occupations are broadly similar in all three scenarios and are mostly comprised of skilled trades, managerial roles, and technical occupations. This provides evidence of the potentially severe recruiting challenges for occupations that require certification and/or professional experience, and that these challenges could persist whether the FOCAL Automotive Production Industry grows or shrinks over the next decade. Of note, computer and information systems managers (NOC 0213) is among the top-ranked occupations in the downside scenario but is absent from the baseline list.

TABLE 9. Provincial Automotive Industry Recruitment Gap Share Rankings, Top 10 Occupations, Baseline Scenario, 2021-2030

Rank	Occupation	2021-2030	Share of 2019 Emp.
1	Electronics assemblers, fabricators, inspectors and testers (NOC 9523)	60	82%
2	Electrical and electronics engineers (NOC 2133)	80	73%
3	Construction millwrights and industrial mechanics (NOC 7311)	160	49%
4	Senior managers - construction, transportation, production and utilities (NOC 0016)	110	47%
5	Contractors and supervisors, mechanic trades (NOC 7301)	20	41%
6	Shippers and receivers (NOC 1521)	90	40%
7	Electrical and electronics engineering technologists and technicians (NOC 2241)	40	39%
8	Tool and die makers (NOC 7232)	40	36%
9	Manufacturing managers (NOC 0911)	210	36%
10	Mechanical assemblers and inspectors (NOC 9526)	330	36%

Table 10. Provincial Automotive Industry Recruitment Gap Share Rankings, Top 10 Occupations, Production Scenario #1, 2021-2030

Rank	Occupation	2021-2030	Share of 2019 Emp.
1	Electrical and electronics engineers (NOC 2133)	110	82%
2	Electronics assemblers, fabricators, inspectors and testers (NOC 9523)	160	78%
3	Construction millwrights and industrial mechanics (NOC 7311)	200	66%
4	Senior managers - construction, transportation, production and utilities (NOC 0016)	160	64%
5	Contractors and supervisors, mechanic trades (NOC 7301)	40	61%
6	Tool and die makers (NOC 7232)	50	55%
7	Machining tool operators (NOC 9417)	90	52%
8	Manufacturing managers (NOC 0911)	310	52%
9	Shippers and receivers (NOC 1521)	120	51%
10	Mechanical assemblers and inspectors (NOC 9526)	350	49%

TABLE 11. Provincial Automotive Industry Recruitment Gap Share Rankings, Top 10 Occupations, Production Scenario #2, 2021-2030

Rank	Occupation	2021-2030	Share of 2019 Emp.
1	Electronics assemblers, fabricators, inspectors and testers (NOC 9523)	130	63%
2	Electrical and electronics engineers (NOC 2133)	80	56%
3	Senior managers - construction, transportation, production and utilities (NOC 0016)	100	40%
4	Contractors and supervisors, mechanic trades (NOC 7301)	20	38%
5	Construction millwrights and industrial mechanics (NOC 7311)	110	36%
6	Machining tool operators (NOC 9417)	60	33%
7	Shippers and receivers (NOC 1521)	70	31%
8	Computer and information systems managers (NOC 0213)	10	28%
9	Tool and die makers (NOC 7232)	30	27%
10	Manufacturing managers (NOC 0911)	160	26%

CONCLUSION

This report provides several key findings related to labour market conditions in Quebec's FOCAL Automotive Production Industry:

First, changes in domestic motor vehicle production can have major impacts on employment in the industry. While the baseline scenario projected provincial employment of an estimated 16,570 workers by 2030, employment in the alternative production scenarios ranged from 18,240 workers in the upside scenario to 14,790 workers in the downside scenario. Employment impacts were most significant for Quebec's traditional automotive manufacturing industries, including vehicle assembly and parts manufacturing, as well as for other primary automotive suppliers associated with metals.

Second, these employment outlooks lead to different levels of forecasted hiring requirement (i.e., labour demand). In the baseline scenario, hiring requirement from employers in the industry was projected to total an estimated 5,710 workers over the 2021-2030 forecast period. In the upside scenario, labour demand rises to 7,690 workers, a 35% increase from the baseline. The largest relative increase was seen for the engineering & technical and management & administration occupation groups at 53% from the baseline. The former, which includes various engineering disciplines and occupations related to computer software and hardware, is primed to play a critical role in driving growth for the FOCAL Automotive Production Industry. In the downside scenario, labour demand falls to 3,840 workers, a 33% decrease from the baseline. The largest relative decrease was seen for the skilled trades occupation group at 39% from the baseline. While most occupation groups saw hiring requirement fall by 30% or more in this case, it declined by only 17% for management & administration occupations. This was the smallest decrease of any occupation group and may reflect the seniority of these positions as well as their function within businesses.

Third, labour supply dynamics are also impacted by changes in production and export levels. In the baseline scenario, employers in the industry were projected to recruit an estimated 840 new entrants (i.e., individuals between 15 and 30 years old entering the workforce for the first time) over the forecast period based on historic trends. The forecast for new entrants rises to 1,070 workers (+26%) in the upside scenario and falls to 700 workers (-17%) in the downside scenario. Trends in the forecasts of new entrants for each alternative production scenario reflect how industry growth, or lack thereof, can influence the availability of labour supply over time. In the baseline scenario, 54% of the total projected new entrants occur between 2026 and 2030; this figure is 60% in the upside scenario but only 47% in the downside scenario.

Fourth, each forecast scenario projects a recruitment gap (i.e., hiring requirements less new entrants) in the industry, though the magnitude of the gap differs. In the baseline scenario, employers were projected to face a recruitment gap estimated at 4,860 workers over the forecast period. In the upside scenario, the recruitment gap rises to 6,620 workers, a 36% increase from the baseline. The largest relative increase was seen for engineering & technical occupations at 59% from the baseline. In the downside scenario, the recruitment gap falls 3,140 workers, a 35% decrease from the baseline. The largest relative decrease was seen for the production workers and skilled trades occupation groups at 40% from the baseline. The persistence of the recruitment gap, even in the scenario where production levels experience a significant decline, illustrates the severity of the labour market challenges employers in the industry may face going forward.

APPENDIX

The following tables include detailed data on projected hiring requirements, new entrants and recruitment gaps at the level of individual occupations (4-digit NOC). A separate table is provided for of the baseline and alternative production scenarios. Note that summing the data for individual occupations may not equal the corresponding data for occupational groups presented in the profile due to rounding.

TABLE 12. Detailed Provincial Automotive Industry Hiring Requirement Outlook, Baseline Scenario, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	2,540	3,170	5,710	40%
0016 Senior managers - construction, transportation, production and utilities	50	60	110	47%
0211 Engineering managers	10	10	20	34%
0213 Computer and information systems managers	<10	10	10	32%
0911 Manufacturing managers	90	120	210	36%
1121 Human resources professionals	10	10	20	38%
1521 Shippers and receivers	50	60	100	48%
1523 Production logistics co-ordinators	10	20	30	29%
2132 Mechanical engineers	50	70	120	24%
2133 Electrical and electronics engineers	40	40	80	76%
2141 Industrial and manufacturing engineers	10	10	20	22%
2142 Metallurgical and materials engineers	<10	<10	<10	N/A
2147 Computer engineers (except software engineers and designers)	<10	<10	<10	N/A
2171 Information systems analysts and consultants	<10	<10	<10	N/A
2172 Database analysts and data administrators	<10	<10	<10	N/A
2173 Software engineers and designers	<10	<10	<10	N/A
2174 Computer programmers and interactive media developers	10	10	10	21%
2232 Mechanical engineering technologists and technicians	20	30	50	28%
2233 Industrial engineering and manufacturing technologists and technicians	10	20	30	27%
2241 Electrical and electronics engineering technologists and technicians	20	20	40	42%
2243 Industrial instrument technicians and mechanics	<10	<10	<10	N/A
2281 Computer network technicians	<10	<10	10	21%
2283 Information systems testing technicians	<10	<10	<10	N/A
7201 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	10	20	30	31%
7231 Machinists and machining and tooling inspectors	60	80	140	38%
7232 Tool and die makers	20	20	40	40%
7237 Welders and related machine operators	130	170	310	44%
7241 Electricians (except industrial and power system)	<10	<10	<10	N/A
7242 Industrial electricians	<10	10	10	24%

7301 Contractors and supervisors, mechanic trades	10	10	20	42%
7311 Construction millwrights and industrial mechanics	70	90	160	51%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	60	80	140	37%
7452 Material handlers	50	70	120	36%
7511 Transport truck drivers	10	10	20	32%
9221 Supervisors, motor vehicle assembling	40	60	100	31%
9222 Supervisors, electronics manufacturing	<10	<10	<10	N/A
9223 Supervisors, electrical products manufacturing	<10	<10	<10	N/A
9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A
9226 Supervisors, other mechanical and metal products manufacturing	10	10	10	20%
9227 Supervisors, other products manufacturing and assembly	<10	<10	10	34%
9412 Foundry workers	<10	<10	10	23%
9416 Metalworking and forging machine operators	10	10	20	24%
9417 Machining tool operators	20	30	60	38%
9422 Plastics processing machine operators	20	20	40	37%
9522 Motor vehicle assemblers, inspectors and testers	200	250	450	36%
9523 Electronics assemblers, fabricators, inspectors and testers	30	40	70	86%
9526 Mechanical assemblers and inspectors	170	210	390	42%
9535 Plastic products assemblers, finishers and inspectors	10	10	20	37%
9536 Industrial painters, coaters and metal finishing process operators	20	30	50	29%
9619 Other labourers in processing, manufacturing and utilities	60	70	130	41%
Other occupations	1,110	1,370	2,480	45%

TABLE 13. Detailed Provincial Automotive Industry New Entrants Outlook, Baseline Scenario, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	390	450	840	6%
0016 Senior managers - construction, transportation, production and utilities	<10	<10	<10	N/A
0211 Engineering managers	<10	<10	<10	N/A
0213 Computer and information systems managers	<10	<10	<10	N/A
0911 Manufacturing managers	<10	<10	<10	N/A
1121 Human resources professionals	<10	<10	<10	N/A
1521 Shippers and receivers	10	10	20	8%
1523 Production logistics co-ordinators	<10	<10	10	9%
2132 Mechanical engineers	10	10	20	4%
2133 Electrical and electronics engineers	<10	<10	<10	N/A
2141 Industrial and manufacturing engineers	<10	<10	10	5%
2142 Metallurgical and materials engineers	<10	<10	<10	N/A
2147 Computer engineers (except software engineers and designers)	<10	<10	<10	N/A
2171 Information systems analysts and consultants	<10	<10	<10	N/A
2172 Database analysts and data administrators	<10	<10	<10	N/A

2173 Software engineers and designers	<10	<10	<10	N/A
2174 Computer programmers and interactive media developers	<10	<10	10	10%
2232 Mechanical engineering technologists and technicians	10	10	20	10%
2233 Industrial engineering and manufacturing technologists and technicians	<10	<10	10	7%
2241 Electrical and electronics engineering technologists and technicians	<10	<10	<10	N/A
2243 Industrial instrument technicians and mechanics	<10	<10	<10	N/A
2281 Computer network technicians	<10	<10	<10	N/A
2283 Information systems testing technicians	<10	<10	<10	N/A
7201 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	<10	<10	<10	N/A
7231 Machinists and machining and tooling inspectors	10	10	20	6%
7232 Tool and die makers	<10	<10	<10	N/A
7237 Welders and related machine operators	30	40	60	9%
7241 Electricians (except industrial and power system)	<10	<10	<10	N/A
7242 Industrial electricians	<10	10	10	22%
7301 Contractors and supervisors, mechanic trades	<10	<10	<10	N/A
7311 Construction millwrights and industrial mechanics	<10	<10	10	2%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	10	10	20	4%
7452 Material handlers	10	10	10	4%
7511 Transport truck drivers	<10	<10	<10	N/A
9221 Supervisors, motor vehicle assembling	10	10	10	4%
9222 Supervisors, electronics manufacturing	<10	<10	<10	N/A
9223 Supervisors, electrical products manufacturing	<10	<10	<10	N/A
9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A
9226 Supervisors, other mechanical and metal products manufacturing	<10	<10	<10	N/A
9227 Supervisors, other products manufacturing and assembly	<10	<10	<10	N/A
9412 Foundry workers	<10	10	10	28%
9416 Metalworking and forging machine operators	<10	<10	<10	N/A
9417 Machining tool operators	<10	<10	<10	N/A
9422 Plastics processing machine operators	<10	<10	10	5%
9522 Motor vehicle assemblers, inspectors and testers	40	50	90	7%
9523 Electronics assemblers, fabricators, inspectors and testers	<10	<10	<10	N/A
9526 Mechanical assemblers and inspectors	30	30	60	6%
9535 Plastic products assemblers, finishers and inspectors	<10	<10	10	10%
9536 Industrial painters, coaters and metal finishing process operators	10	10	20	14%
9619 Other labourers in processing, manufacturing and utilities	10	20	30	9%
Other occupations	390	450	840	6%

TABLE 14. Detailed Provincial Automotive Industry Recruitment Gap Outlook, Baseline Scenario, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	2,150	2,710	4,860	34%
0016 Senior managers - construction, transportation, production and utilities	50	60	110	47%
0211 Engineering managers	10	10	20	34%
0213 Computer and information systems managers	<10	10	10	32%
0911 Manufacturing managers	90	120	210	36%
1121 Human resources professionals	10	10	10	29%
1521 Shippers and receivers	40	50	90	40%
1523 Production logistics co-ordinators	10	10	20	20%
2132 Mechanical engineers	40	60	100	20%
2133 Electrical and electronics engineers	40	40	80	73%
2141 Industrial and manufacturing engineers	10	10	20	18%
2142 Metallurgical and materials engineers	<10	<10	<10	N/A
2147 Computer engineers (except software engineers and designers)	<10	<10	<10	N/A
2171 Information systems analysts and consultants	<10	<10	<10	N/A
2172 Database analysts and data administrators	<10	<10	<10	N/A
2173 Software engineers and designers	<10	<10	<10	N/A
2174 Computer programmers and interactive media developers	<10	<10	10	10%
2232 Mechanical engineering technologists and technicians	10	20	40	18%
2233 Industrial engineering and manufacturing technologists and technicians	10	10	20	20%
2241 Electrical and electronics engineering technologists and technicians	20	20	40	39%
2243 Industrial instrument technicians and mechanics	<10	<10	<10	N/A
2281 Computer network technicians	<10	<10	<10	N/A
2283 Information systems testing technicians	<10	<10	<10	N/A
7201 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	10	20	30	30%
7231 Machinists and machining and tooling inspectors	50	70	120	31%
7232 Tool and die makers	20	20	40	36%
7237 Welders and related machine operators	110	140	240	35%
7241 Electricians (except industrial and power system)	<10	<10	<10	N/A
7242 Industrial electricians	<10	<10	<10	N/A
7301 Contractors and supervisors, mechanic trades	10	10	20	41%
7311 Construction millwrights and industrial mechanics	70	90	160	49%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	50	70	130	32%
7452 Material handlers	50	60	110	32%
7511 Transport truck drivers	10	10	20	32%
9221 Supervisors, motor vehicle assembling	40	50	90	27%
9222 Supervisors, electronics manufacturing	<10	<10	<10	N/A
9223 Supervisors, electrical products manufacturing	<10	<10	<10	N/A

9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A
9226 Supervisors, other mechanical and metal products manufacturing	10	10	10	20%
9227 Supervisors, other products manufacturing and assembly	<10	<10	10	31%
9412 Foundry workers	<10	<10	<10	N/A
9416 Metalworking and forging machine operators	<10	10	10	17%
9417 Machining tool operators	20	30	50	35%
9422 Plastics processing machine operators	20	20	30	32%
9522 Motor vehicle assemblers, inspectors and testers	160	200	360	28%
9523 Electronics assemblers, fabricators, inspectors and testers	30	40	60	82%
9526 Mechanical assemblers and inspectors	150	180	330	36%
9535 Plastic products assemblers, finishers and inspectors	10	10	20	27%
9536 Industrial painters, coaters and metal finishing process operators	10	20	30	16%
9619 Other labourers in processing, manufacturing and utilities	40	60	100	32%
Other occupations	950	1,180	2,130	38%

TABLE 15. Detailed Provincial Automotive Industry Hiring Requirement Outlook, Production Scenario #1, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	3,470	4,220	7,690	54%
0016 Senior managers - construction, transportation, production and utilities	70	90	160	64%
0211 Engineering managers	10	10	30	46%
0213 Computer and information systems managers	10	10	20	49%
0911 Manufacturing managers	140	180	320	52%
1121 Human resources professionals	10	10	30	52%
1521 Shippers and receivers	70	80	150	62%
1523 Production logistics co-ordinators	20	20	40	42%
2132 Mechanical engineers	90	110	200	41%
2133 Electrical and electronics engineers	50	60	120	86%
2141 Industrial and manufacturing engineers	20	20	40	35%
2142 Metallurgical and materials engineers	<10	<10	<10	N/A
2147 Computer engineers (except software engineers and designers)	<10	<10	<10	N/A
2171 Information systems analysts and consultants	<10	<10	<10	N/A
2172 Database analysts and data administrators	<10	<10	<10	N/A
2173 Software engineers and designers	<10	<10	10	22%
2174 Computer programmers and interactive media developers	10	10	30	32%
2232 Mechanical engineering technologists and technicians	30	40	70	44%
2233 Industrial engineering and manufacturing technologists and technicians	20	20	40	38%
2241 Electrical and electronics engineering technologists and technicians	30	40	80	46%

2243 Industrial instrument technicians and mechanics	<10	<10	<10	N/A
2281 Computer network technicians	10	10	10	30%
2283 Information systems testing technicians	<10	<10	<10	N/A
7201 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	20	30	50	48%
7231 Machinists and machining and tooling inspectors	100	120	220	55%
7232 Tool and die makers	30	30	60	60%
7237 Welders and related machine operators	170	200	370	60%
7241 Electricians (except industrial and power system)	<10	<10	10	32%
7242 Industrial electricians	<10	10	10	31%
7301 Contractors and supervisors, mechanic trades	20	20	40	63%
7311 Construction millwrights and industrial mechanics	90	110	200	68%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	70	90	160	49%
7452 Material handlers	80	100	180	51%
7511 Transport truck drivers	10	20	30	45%
9221 Supervisors, motor vehicle assembling	50	50	100	44%
9222 Supervisors, electronics manufacturing	<10	<10	10	33%
9223 Supervisors, electrical products manufacturing	<10	<10	<10	N/A
9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A
9226 Supervisors, other mechanical and metal products manufacturing	10	10	20	37%
9227 Supervisors, other products manufacturing and assembly	<10	<10	<10	N/A
9412 Foundry workers	10	10	20	38%
9416 Metalworking and forging machine operators	10	20	30	40%
9417 Machining tool operators	40	60	100	57%
9422 Plastics processing machine operators	20	30	50	38%
9522 Motor vehicle assemblers, inspectors and testers	320	410	720	54%
9523 Electronics assemblers, fabricators, inspectors and testers	80	90	170	82%
9526 Mechanical assemblers and inspectors	190	220	410	57%
9535 Plastic products assemblers, finishers and inspectors	10	10	20	27%
9536 Industrial painters, coaters and metal finishing process operators	30	30	60	42%
9619 Other labourers in processing, manufacturing and utilities	80	100	190	55%
Other occupations	1,420	1,720	3,140	57%

TABLE 16. Detailed Provincial Automotive Industry New Entrants Outlook, Production Scenario #1, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	440	630	1,070	8%
0016 Senior managers - construction, transportation, production and utilities	<10	<10	<10	N/A
0211 Engineering managers	<10	<10	<10	N/A
0213 Computer and information systems managers	<10	<10	<10	N/A
0911 Manufacturing managers	<10	<10	<10	N/A

1121 Human resources professionals	<10	<10	10	11%
1521 Shippers and receivers	10	10	20	10%
1523 Production logistics co-ordinators	<10	10	10	11%
2132 Mechanical engineers	10	20	30	6%
2133 Electrical and electronics engineers	<10	<10	10	4%
2141 Industrial and manufacturing engineers	<10	<10	10	6%
2142 Metallurgical and materials engineers	<10	<10	<10	N/A
2147 Computer engineers (except software engineers and designers)	<10	<10	<10	N/A
2171 Information systems analysts and consultants	<10	<10	<10	N/A
2172 Database analysts and data administrators	<10	<10	<10	N/A
2173 Software engineers and designers	<10	<10	<10	N/A
2174 Computer programmers and interactive media developers	<10	10	10	13%
2232 Mechanical engineering technologists and technicians	10	10	20	12%
2233 Industrial engineering and manufacturing technologists and technicians	<10	10	10	9%
2241 Electrical and electronics engineering technologists and technicians	<10	<10	10	3%
2243 Industrial instrument technicians and mechanics	<10	<10	<10	N/A
2281 Computer network technicians	<10	<10	<10	N/A
2283 Information systems testing technicians	<10	<10	<10	N/A
7201 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	<10	<10	<10	N/A
7231 Machinists and machining and tooling inspectors	10	20	30	8%
7232 Tool and die makers	<10	<10	<10	N/A
7237 Welders and related machine operators	30	40	70	11%
7241 Electricians (except industrial and power system)	<10	<10	<10	N/A
7242 Industrial electricians	<10	10	10	28%
7301 Contractors and supervisors, mechanic trades	<10	<10	<10	N/A
7311 Construction millwrights and industrial mechanics	<10	<10	10	2%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	10	10	20	5%
7452 Material handlers	10	10	20	5%
7511 Transport truck drivers	<10	<10	<10	N/A
9221 Supervisors, motor vehicle assembling	<10	10	10	5%
9222 Supervisors, electronics manufacturing	<10	<10	<10	N/A
9223 Supervisors, electrical products manufacturing	<10	<10	<10	N/A
9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A
9226 Supervisors, other mechanical and metal products manufacturing	<10	<10	<10	N/A
9227 Supervisors, other products manufacturing and assembly	<10	<10	<10	N/A
9412 Foundry workers	10	10	20	37%
9416 Metalworking and forging machine operators	<10	<10	10	9%
9417 Machining tool operators	<10	<10	10	4%
9422 Plastics processing machine operators	<10	<10	10	6%
9522 Motor vehicle assemblers, inspectors and testers	50	80	130	10%
9523 Electronics assemblers, fabricators, inspectors and testers	<10	<10	10	4%

9526 Mechanical assemblers and inspectors	20	30	60	8%
9535 Plastic products assemblers, finishers and inspectors	<10	<10	10	10%
9536 Industrial painters, coaters and metal finishing process operators	10	10	20	16%
9619 Other labourers in processing, manufacturing and utilities	20	20	40	11%
Other occupations	190	270	450	8%

TABLE 17. Detailed Provincial Automotive Industry Recruitment Gap Outlook, Production Scenario #1, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	3,030	3,590	6,620	47%
0016 Senior managers - construction, transportation, production and utilities	70	90	160	64%
0211 Engineering managers	10	10	30	46%
0213 Computer and information systems managers	10	10	20	48%
0911 Manufacturing managers	140	170	310	52%
1121 Human resources professionals	10	10	20	41%
1521 Shippers and receivers	60	70	120	51%
1523 Production logistics co-ordinators	10	20	30	31%
2132 Mechanical engineers	80	90	170	35%
2133 Electrical and electronics engineers	50	60	110	82%
2141 Industrial and manufacturing engineers	20	20	30	29%
2142 Metallurgical and materials engineers	<10	<10	<10	N/A
2147 Computer engineers (except software engineers and designers)	<10	<10	<10	N/A
2171 Information systems analysts and consultants	<10	<10	<10	N/A
2172 Database analysts and data administrators	<10	<10	<10	N/A
2173 Software engineers and designers	<10	<10	10	21%
2174 Computer programmers and interactive media developers	10	10	20	19%
2232 Mechanical engineering technologists and technicians	20	30	50	31%
2233 Industrial engineering and manufacturing technologists and technicians	10	20	30	28%
2241 Electrical and electronics engineering technologists and technicians	30	40	70	43%
2243 Industrial instrument technicians and mechanics	<10	<10	<10	N/A
2281 Computer network technicians	<10	10	10	27%
2283 Information systems testing technicians	<10	<10	<10	N/A
7201 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	20	30	50	47%
7231 Machinists and machining and tooling inspectors	80	100	180	47%
7232 Tool and die makers	20	30	50	55%
7237 Welders and related machine operators	140	160	300	48%
7241 Electricians (except industrial and power system)	<10	<10	10	30%
7242 Industrial electricians	<10	<10	<10	N/A
7301 Contractors and supervisors, mechanic trades	20	20	40	61%

7311 Construction millwrights and industrial mechanics	90	110	200	66%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	70	80	140	44%
7452 Material handlers	70	90	170	46%
7511 Transport truck drivers	10	20	30	43%
9221 Supervisors, motor vehicle assembling	40	50	90	39%
9222 Supervisors, electronics manufacturing	<10	<10	10	31%
9223 Supervisors, electrical products manufacturing	<10	<10	<10	N/A
9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A
9226 Supervisors, other mechanical and metal products manufacturing	10	10	20	37%
9227 Supervisors, other products manufacturing and assembly	<10	<10	<10	N/A
9412 Foundry workers	<10	<10	<10	N/A
9416 Metalworking and forging machine operators	10	10	20	31%
9417 Machining tool operators	40	50	90	52%
9422 Plastics processing machine operators	20	20	40	32%
9522 Motor vehicle assemblers, inspectors and testers	270	330	590	44%
9523 Electronics assemblers, fabricators, inspectors and testers	80	80	160	78%
9526 Mechanical assemblers and inspectors	160	190	350	49%
9535 Plastic products assemblers, finishers and inspectors	<10	<10	10	17%
9536 Industrial painters, coaters and metal finishing process operators	20	20	40	26%
9619 Other labourers in processing, manufacturing and utilities	70	80	150	44%
Other occupations	1,240	1,450	2,690	49%

TABLE 18. Detailed Provincial Automotive Industry Hiring Requirement Outlook, Production Scenario #2, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	1,970	1,860	3,840	27%
0016 Senior managers - construction, transportation, production and utilities	50	50	100	41%
0211 Engineering managers	10	10	10	22%
0213 Computer and information systems managers	10	10	10	28%
0911 Manufacturing managers	80	80	160	27%
1121 Human resources professionals	10	10	10	25%
1521 Shippers and receivers	50	40	90	38%
1523 Production logistics co-ordinators	10	10	20	17%
2132 Mechanical engineers	30	30	60	13%
2133 Electrical and electronics engineers	40	40	80	59%
2141 Industrial and manufacturing engineers	10	<10	10	9%
2142 Metallurgical and materials engineers	<10	<10	<10	N/A
2147 Computer engineers (except software engineers and designers)	<10	<10	<10	N/A
2171 Information systems analysts and consultants	<10	<10	<10	N/A
2172 Database analysts and data administrators	<10	<10	<10	N/A

2173 Software engineers and designers	<10	<10	<10	N/A
2174 Computer programmers and interactive media developers	10	<10	10	12%
2232 Mechanical engineering technologists and technicians	10	10	20	12%
2233 Industrial engineering and manufacturing technologists and technicians	10	10	10	11%
2241 Electrical and electronics engineering technologists and technicians	20	20	50	28%
2243 Industrial instrument technicians and mechanics	<10	<10	<10	N/A
2281 Computer network technicians	<10	<10	10	14%
2283 Information systems testing technicians	<10	<10	<10	N/A
7201 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	10	10	20	21%
7231 Machinists and machining and tooling inspectors	60	60	120	31%
7232 Tool and die makers	10	10	30	30%
7237 Welders and related machine operators	80	80	160	26%
7241 Electricians (except industrial and power system)	<10	<10	<10	N/A
7242 Industrial electricians	<10	<10	<10	N/A
7301 Contractors and supervisors, mechanic trades	10	10	30	39%
7311 Construction millwrights and industrial mechanics	60	50	110	37%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	20	20	40	14%
7452 Material handlers	50	50	100	28%
7511 Transport truck drivers	10	10	20	21%
9221 Supervisors, motor vehicle assembling	<10	<10	<10	N/A
9222 Supervisors, electronics manufacturing	<10	<10	<10	N/A
9223 Supervisors, electrical products manufacturing	<10	<10	<10	N/A
9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A
9226 Supervisors, other mechanical and metal products manufacturing	<10	<10	10	10%
9227 Supervisors, other products manufacturing and assembly	<10	<10	<10	N/A
9412 Foundry workers	<10	<10	10	19%
9416 Metalworking and forging machine operators	10	10	10	20%
9417 Machining tool operators	30	30	60	36%
9422 Plastics processing machine operators	20	10	30	23%
9522 Motor vehicle assemblers, inspectors and testers	190	180	360	27%
9523 Electronics assemblers, fabricators, inspectors and testers	70	70	140	66%
9526 Mechanical assemblers and inspectors	60	50	110	16%
9535 Plastic products assemblers, finishers and inspectors	<10	<10	10	11%
9536 Industrial painters, coaters and metal finishing process operators	10	10	10	9%
9619 Other labourers in processing, manufacturing and utilities	60	50	110	33%
Other occupations	870	820	1,690	31%

TABLE 19. Detailed Provincial Automotive Industry New Entrants Outlook, Production Scenario #2, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	370	330	700	5%
0016 Senior managers - construction, transportation, production and utilities	<10	<10	<10	N/A
0211 Engineering managers	<10	<10	<10	N/A
0213 Computer and information systems managers	<10	<10	<10	N/A
0911 Manufacturing managers	<10	<10	<10	N/A
1121 Human resources professionals	<10	<10	<10	N/A
1521 Shippers and receivers	10	10	20	7%
1523 Production logistics co-ordinators	<10	<10	10	8%
2132 Mechanical engineers	10	10	20	4%
2133 Electrical and electronics engineers	<10	<10	<10	N/A
2141 Industrial and manufacturing engineers	<10	<10	<10	N/A
2142 Metallurgical and materials engineers	<10	<10	<10	N/A
2147 Computer engineers (except software engineers and designers)	<10	<10	<10	N/A
2171 Information systems analysts and consultants	<10	<10	<10	N/A
2172 Database analysts and data administrators	<10	<10	<10	N/A
2173 Software engineers and designers	<10	<10	<10	N/A
2174 Computer programmers and interactive media developers	<10	<10	10	9%
2232 Mechanical engineering technologists and technicians	10	10	10	8%
2233 Industrial engineering and manufacturing technologists and technicians	<10	<10	10	6%
2241 Electrical and electronics engineering technologists and technicians	<10	<10	<10	N/A
2243 Industrial instrument technicians and mechanics	<10	<10	<10	N/A
2281 Computer network technicians	<10	<10	<10	N/A
2283 Information systems testing technicians	<10	<10	<10	N/A
7201 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	<10	<10	<10	N/A
7231 Machinists and machining and tooling inspectors	10	10	20	6%
7232 Tool and die makers	<10	<10	<10	N/A
7237 Welders and related machine operators	20	20	40	7%
7241 Electricians (except industrial and power system)	<10	<10	<10	N/A
7242 Industrial electricians	<10	<10	10	17%
7301 Contractors and supervisors, mechanic trades	<10	<10	<10	N/A
7311 Construction millwrights and industrial mechanics	<10	<10	<10	N/A
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	10	<10	10	3%
7452 Material handlers	10	10	10	3%
7511 Transport truck drivers	<10	<10	<10	N/A
9221 Supervisors, motor vehicle assembling	<10	<10	10	3%
9222 Supervisors, electronics manufacturing	<10	<10	<10	N/A
9223 Supervisors, electrical products manufacturing	<10	<10	<10	N/A

9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A
9226 Supervisors, other mechanical and metal products manufacturing	<10	<10	<10	N/A
9227 Supervisors, other products manufacturing and assembly	<10	<10	<10	N/A
9412 Foundry workers	10	10	10	26%
9416 Metalworking and forging machine operators	<10	<10	<10	N/A
9417 Machining tool operators	<10	<10	10	3%
9422 Plastics processing machine operators	<10	<10	10	4%
9522 Motor vehicle assemblers, inspectors and testers	40	40	90	6%
9523 Electronics assemblers, fabricators, inspectors and testers	<10	<10	10	3%
9526 Mechanical assemblers and inspectors	20	20	30	5%
9535 Plastic products assemblers, finishers and inspectors	<10	<10	<10	N/A
9536 Industrial painters, coaters and metal finishing process operators	10	10	20	10%
9619 Other labourers in processing, manufacturing and utilities	10	10	30	8%
Other occupations	160	140	300	5%

TABLE 20. Detailed Provincial Automotive Industry Recruitment Gap Outlook, Production Scenario #2, 2021-2030

Occupation	2021-2025	2026-2030	2021-2030	Share of 2019 Emp.
All occupations	1,600	1,530	3,140	22%
0016 Senior managers - construction, transportation, production and utilities	50	50	100	40%
0211 Engineering managers	10	10	10	22%
0213 Computer and information systems managers	10	10	10	28%
0911 Manufacturing managers	80	80	160	26%
1121 Human resources professionals	<10	<10	10	17%
1521 Shippers and receivers	40	40	70	31%
1523 Production logistics co-ordinators	<10	<10	10	9%
2132 Mechanical engineers	20	20	40	9%
2133 Electrical and electronics engineers	40	40	80	56%
2141 Industrial and manufacturing engineers	<10	<10	10	5%
2142 Metallurgical and materials engineers	<10	<10	<10	N/A
2147 Computer engineers (except software engineers and designers)	<10	<10	<10	N/A
2171 Information systems analysts and consultants	<10	<10	<10	N/A
2172 Database analysts and data administrators	<10	<10	<10	N/A
2173 Software engineers and designers	<10	<10	<10	N/A
2174 Computer programmers and interactive media developers	<10	<10	<10	N/A
2232 Mechanical engineering technologists and technicians	<10	<10	10	4%
2233 Industrial engineering and manufacturing technologists and technicians	<10	<10	10	5%

2241 Electrical and electronics engineering technologists and technicians	20	20	40	26%
2243 Industrial instrument technicians and mechanics	<10	<10	<10	N/A
2281 Computer network technicians	<10	<10	<10	N/A
2283 Information systems testing technicians	<10	<10	<10	N/A
7201 Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	10	10	20	20%
7231 Machinists and machining and tooling inspectors	50	50	100	26%
7232 Tool and die makers	10	10	30	27%
7237 Welders and related machine operators	60	60	120	19%
7241 Electricians (except industrial and power system)	<10	<10	<10	N/A
7242 Industrial electricians	<10	<10	<10	N/A
7301 Contractors and supervisors, mechanic trades	10	10	20	38%
7311 Construction millwrights and industrial mechanics	50	50	110	36%
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	20	20	30	11%
7452 Material handlers	40	40	90	24%
7511 Transport truck drivers	10	10	20	21%
9221 Supervisors, motor vehicle assembling	<10	<10	<10	N/A
9222 Supervisors, electronics manufacturing	<10	<10	<10	N/A
9223 Supervisors, electrical products manufacturing	<10	<10	<10	N/A
9224 Supervisors, furniture and fixtures manufacturing	<10	<10	<10	N/A
9226 Supervisors, other mechanical and metal products manufacturing	<10	<10	10	10%
9227 Supervisors, other products manufacturing and assembly	<10	<10	<10	N/A
9412 Foundry workers	<10	<10	<10	N/A
9416 Metalworking and forging machine operators	10	<10	10	13%
9417 Machining tool operators	30	30	60	33%
9422 Plastics processing machine operators	10	10	20	19%
9522 Motor vehicle assemblers, inspectors and testers	140	140	280	21%
9523 Electronics assemblers, fabricators, inspectors and testers	70	60	130	63%
9526 Mechanical assemblers and inspectors	40	40	80	11%
9535 Plastic products assemblers, finishers and inspectors	<10	<10	<10	N/A
9536 Industrial painters, coaters and metal finishing process operators	<10	<10	<10	N/A
9619 Other labourers in processing, manufacturing and utilities	40	40	80	25%
Other occupations	710	680	1,390	25%