



# BRITISH COLUMBIA 2022 LABOUR MARKET OUTLOOK



WorkBC

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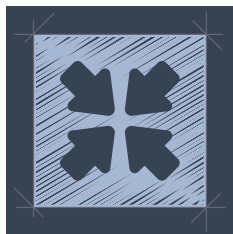


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## INTRODUCTION

In B.C.'s Skills for Jobs Blueprint: Re-Engineering Education and Training, we said we would get and use better data to drive decisions. This B.C. Labour Market Outlook (the Outlook) is that data. Presented by the Ministry of Jobs, Tourism, and Skills Training and Responsible for Labour (the Ministry), the Outlook provides labour market demand and supply trends to 2022.

With the anticipated investment and activity related to LNG, the Ministry contracted KPMG to produce labour market forecasts for the LNG sector. The resulting LNG workforce occupation forecasts are added as a supplementary analysis of workforce needs in the Outlook and are aimed at providing a better understanding of the skills needs for this new sector. This Outlook report includes two major parts:

**THE FIRST PART** provides the labour market outlook based on an economic scenario without LNG; and **THE SECOND PART** highlights the findings of the LNG workforce occupation forecasts.

Reliable and up-to-date data give us the information we need to make the best decisions for education and industry. While information on labour market-trends will serve educators, counsellors, students and their families, it can also serve as a compass for the unemployed and underemployed, who can fill jobs immediately.

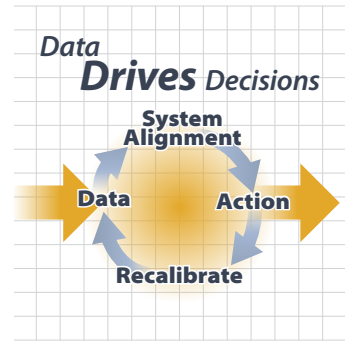
This data is based on the B.C. Labour Market Scenario Model (the Model) which was developed in 2009. The Model incorporated demographic changes, industry growth, major projects and other relevant information. Both the Model and the KPMG LNG labour market forecasts have been vetted by our industry partners to ensure the validity of the information. The Labour Market Priorities Board has also endorsed the relevance of both forecasts as the foundation for program and funding decisions across government ministries.

We committed to publishing up-to-date labour market information each quarter for priority sectors. These updates will be based on this annual report and will include information on changing economic and labour market conditions.



Finally, our decision-making needs to be responsive. This means two streams of action. Firstly, as our economy grows, the data will change as a result. As the data change, government decision-making will reflect those changes. Secondly, we will track and report on the outcomes of decisions made. For example, this data is already driving the realignment of funding to programs for high-demand occupations at post-secondary institutions. These funds will be re-directed again if programs do not meet measurable outcomes that align with labour market needs.

Students, and all British Columbians, deserve to be employed, industry deserves a reliable workforce and British Columbians deserve a growing economy. This information is an important tool for that future.



2012-2022 LABOUR MARKET OUTLOOK-HIGHLIGHTS	
<b>TOTAL JOB OPENINGS</b>	<b>1 MILLION</b>
Openings due to confirmed or planned economic activities	985,100
» Retirements	669,800 (68%)
» Economic Growth	315,400 (32%)
Additional LNG job openings	UP TO 100,000
Job openings requiring post-secondary training	763,400 (78%)
<b>SUPPLY NEEDS</b>	
▶ New entrants	425,320 (45%)
▶ Net in-migration	300,820 (32%)
▶ Other mobility	216,750 (23%)





## B.C. LABOUR MARKET Outlook

This section of the report provides labour market demand and supply forecasts for B.C. and its regions to 2022, based on output from the B.C. Labour Market Scenario Model (the Model). This forecasting work is conducted in consultation with BC Stats and the Ministry of Finance. The occupational forecast in this section does not incorporate potential LNG projects.

The Model was developed by the Province in 2009 to improve labour market decision-making. Information from the Model helps citizens, employers and government to forecast occupation demand and supply. The Outlook seeks to identify significant labour market trends, based on statistical data, assumptions, and consultation with industry and other stakeholders. Within particular occupations and regions there may be unique conditions that are not captured in the analysis. Assumptions and conditions may also change over time. Thus, despite best efforts, actual conditions may differ from those presented in the Outlook.

Over **ONE MILLION** total job openings are expected in B.C. to 2022, including **985,000** from economic activity already confirmed or planned, as well as up to **100,000** jobs from the expected **LNG** activity.

The Model is updated every year. Improvements are incorporated into each cycle. Details of changes for the cycle are provided in Appendix 3. Key Model outputs, demand and supply by occupation, are determined using two sets of models. The first set of models contains seven regional macroeconomic models and the second set contains seven regional occupational demand and supply models. Occupations are defined based on the three-digit National Occupational Classification (NOC) from Employment and Social Development Canada.

### KEY DATA SOURCES

#### ECONOMIC AND LABOUR MARKET PROJECTIONS:

- ▶ 2013/2014–2015/2016 Budget and Fiscal Plan: June 2013 Update (B.C. Ministry of Finance)

#### ECONOMIC ACCOUNTS:

- ▶ B.C. Economic Accounts (Statistics Canada)

#### MAJOR PROJECTS INFORMATION:

- ▶ Major Projects Inventory (B.C. Ministry of Jobs, Tourism, and Skills Training and Responsible for Labour)

#### POPULATION ESTIMATES AND PROJECTIONS:

- ▶ BC Stats

#### LABOUR FORCE INFORMATION:

- ▶ Labour Force Survey (Statistics Canada)
- ▶ National Household Survey 2011 (Statistics Canada)

*Funding for the Model has been provided by the Canada-British Columbia Labour Market Agreement and the Province of British Columbia.*

# B.C. LABOUR MARKET *Outlook*

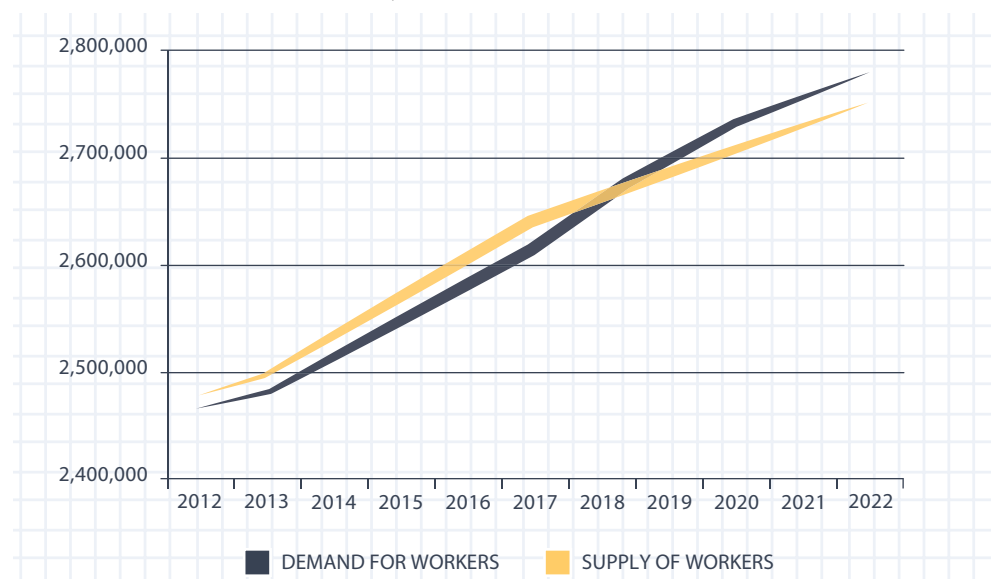
## (CONTINUED)

The seven development regions include Vancouver Island / Coast, Mainland / Southwest, Thompson-Okanagan, Kootenay, Cariboo, North Coast and Nechako, and Northeast.

The BC Labour Market Outlook incorporates economic projections provided in the BC Ministry of Finance Budget and Fiscal Plan (June 2013 Budget Update). The key economic indicators in the June Budget Update cover the period 2012 to 2017, which includes information available as of June 14, 2013. The Outlook reflects a prudent approach to forecasting economic growth. The growth incorporates the impacts of the major projects that are currently underway or confirmed over the outlook period. The projections provided in the Outlook are meant to reflect general expected trends over the medium to long term. As such, the weak employment growth observed in 2013 should not have a material impact on the medium to long term labour market outlook.

### A TIGHT LABOUR MARKET IS EXPECTED IN B.C. FROM 2019–2022

**CHART 1:** *Demand and supply of workers to 2022*



- ▶ Overall, labour demand is expected to grow faster than labour supply in B.C. As a result, tight labour market conditions, where the demand for workers surpasses the supply of workers, are expected in the later part of the outlook period, starting in 2019.
- ▶ Over the ten-year outlook period to 2022, demand for workers is expected to out-grow the labour force by 42,250 workers.



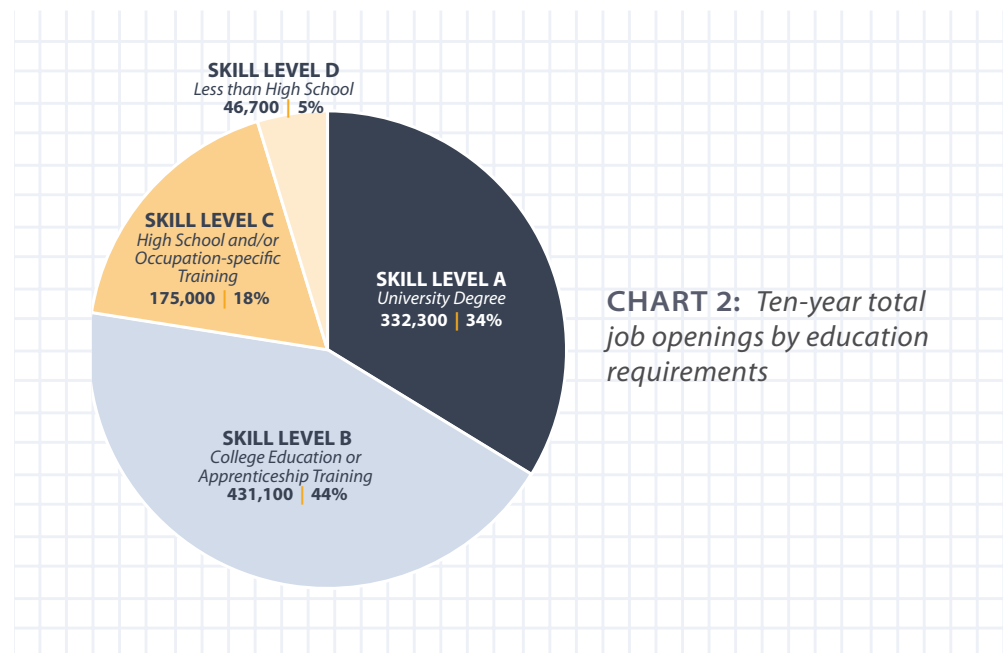




## EDUCATION *and* TRAINING NEEDS

*More than three quarters of projected job openings to 2022 will require some post-secondary education.*

- ▶ Of the 985,100 projected job openings to 2022, 44 per cent are expected in Skill Level B, which normally requires a college diploma or trade certificate. Combined with the job openings expected in Skill Level A (34 per cent), which normally requires a university degree, more than three quarters of the forecasted job openings over the coming decade will require post-secondary education and training.
- ▶ Currently, approximately 70 per cent of the labour force in B.C. has some post-secondary education.
- ▶ The lists of top in-demand occupations normally requiring training are provided in Appendix 2.



- ▶ Management occupations are grouped in Skill Level A, although it is recognized that requirements for management occupations can vary in education and experience.
- ▶ Each occupation covered in this analysis is classified to skill level based on the most recent historical patterns for education and skills training requirements.



# COMPONENTS of LABOUR SUPPLY

*One-third of workers expected to fill projected job openings in B.C. to 2022 are migrants.*

Both migrants and new labour market entrants (those who leave the school system and enter the labour market for the first time) are important components of new labour supply and add to the labour pool each year. Given the aging population challenge facing B.C. and the decreasing number of new entrants to the labour market over the forecast period, B.C. will rely more on migrants as a source of new labour supply. Migrants to B.C. that arrive during the forecast period are expected to fill one-third of the total projected job openings in the province to 2022.

**Note:** Migrants refer to those who come from outside of B.C., including those from out of country.

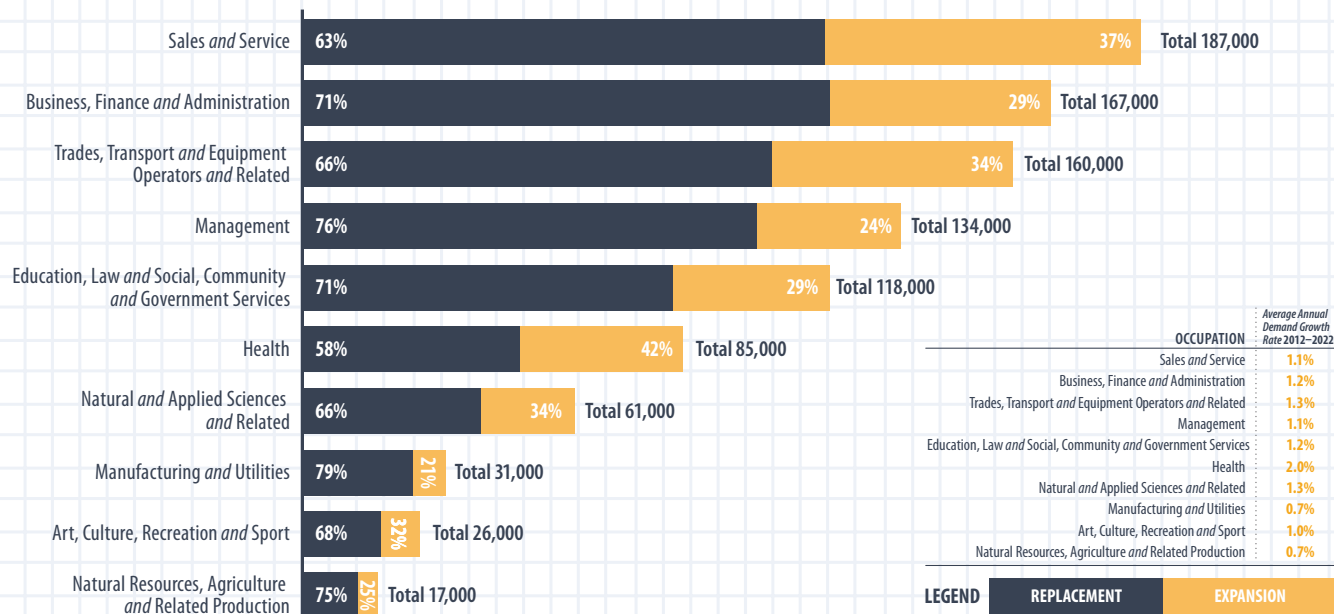




# OCCUPATIONAL OUTLOOK

*Over half of projected job openings for all occupation groups to 2022 are to replace retiring workers.*

**CHART 3: Ten-year total job openings by occupational group**



- ▶ The three occupation groups with the most expected job openings are:
  1. Sales and Service Occupations (187,000 openings)
  2. Business, Finance and Administration Occupations (167,000)
  3. Trades, Transport and Equipment Operators and Related Occupations (160,000)
- ▶ These three occupation groups account for 52 per cent of total projected job openings in B.C. over the ten-year projection period to 2022.

# OCCUPATIONAL OUTLOOK (CONTINUED)

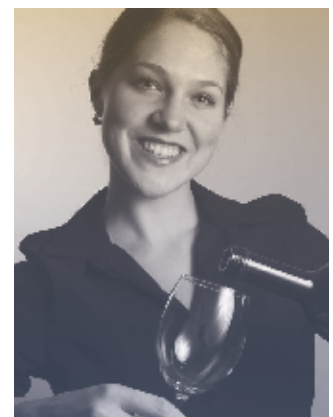
## OCCUPATIONS *with the* HIGHEST NUMBER of JOB OPENINGS

SKILL LEVEL	NOC	OCCUPATION	TOTAL PROJECTED JOB OPENINGS TO 2022	WAGE*
<b>A</b>	062	Retail and wholesale trade managers	28,000	\$25.00
	301	Professional occupations in nursing	25,300	\$36.50
	403	Secondary and elementary school teachers and educational counsellors	24,900	\$33.00
<b>B</b>	122	Administrative and regulatory occupations	30,800	\$23.10
	421	Paraprofessional occupations in legal, social, community and education services	23,700	\$20.70
	124	Office administrative assistants – general, legal and medical	21,200	\$21.60
<b>C</b>	642	Retail salespersons	32,000	\$14.00
	751	Motor vehicle and transit drivers	30,300	\$23.40
	141	General office workers	28,400	\$18.00
<b>D</b>	673	Cleaners	31,900	\$17.00
	671	Food counter attendants, kitchen helpers and related support occupations	12,100	\$11.00
	661	Cashiers	11,300	\$11.80

\*2013 BC Median Hourly Wage

- ▶ Three occupation groups are anticipated to grow at a faster pace than the provincial annual average growth rate of 1.2 per cent:
  1. Health Occupations (2.0 per cent)
  2. Trades, Transport and Equipment Operators and Related Occupations (1.3 per cent)
  3. Natural and Applied Sciences and Related Occupations (1.3 per cent)

SKILL LEVEL	DEFINITION
<b>A</b>	University Degree
<b>B</b>	College Education or Apprenticeship Training
<b>C</b>	High School and/or Occupation-specific Training
<b>D</b>	Less than High School

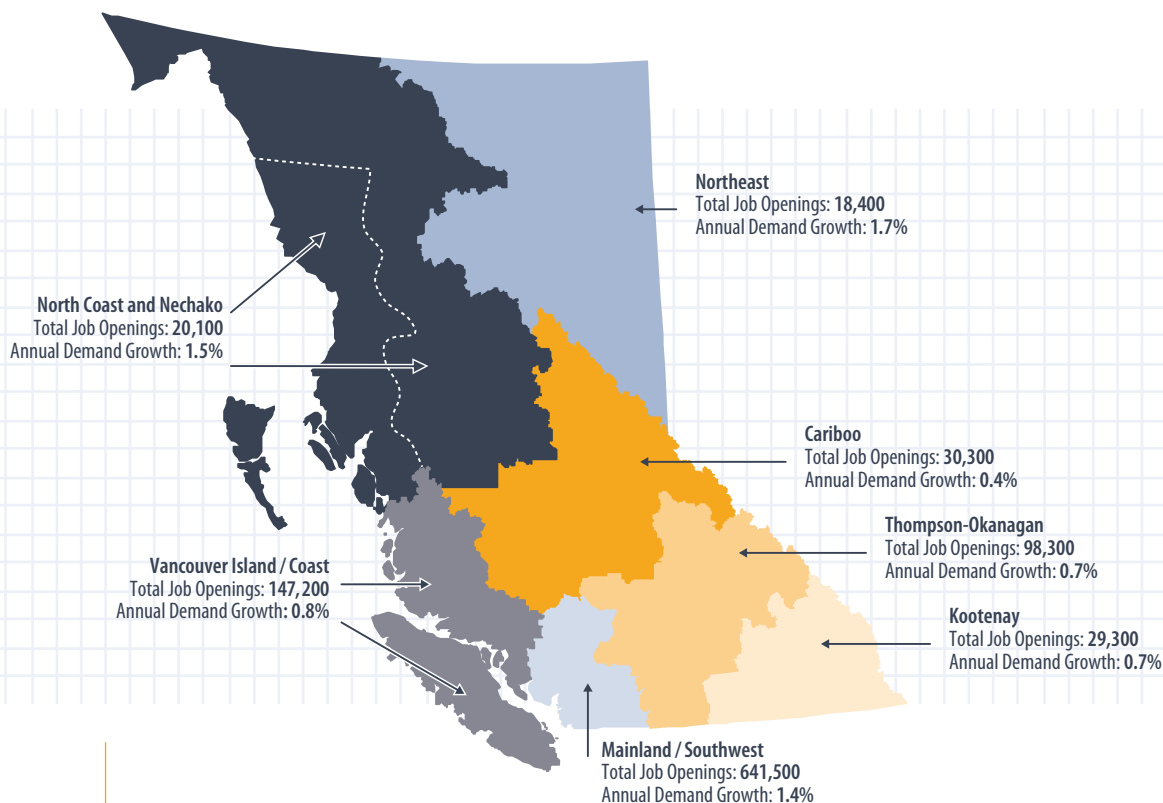




## REGIONAL OUTLOOK

*Almost two-thirds of projected job openings in British Columbia to 2022 are expected in the Mainland / Southwest region.*

**CHART 4:** Ten-year total job openings and average annual growth in demand for workers



- ▶ The three largest regions — Mainland / Southwest, Vancouver Island / Coast and Thompson-Okanagan — are expected to account for 90 per cent of total projected job openings in B.C. over the ten-year period to 2022.
- ▶ Almost two-thirds (65 per cent) of total job openings in B.C. are expected in the Mainland / Southwest region. Of all projected job openings in the Mainland / Southwest region, 37 per cent are new jobs.
- ▶ Over the outlook period, three regions are expected to experience growth in demand for workers above the provincial average of 1.2 per cent annually: Northeast (1.7 per cent), North Coast and Nechako (1.5 per cent) and Mainland / Southwest (1.4 per cent).
- ▶ Although the Northeast and North Coast and Nechako regions are expected to have the highest annual demand growth, they are expected to have the lowest number of total job openings because they are the two smallest regions by employment.



# VANCOUVER ISLAND/COAST

The **Vancouver Island/Coast** development region is expected to have 147,200 job openings to 2022, with 23 per cent of them being expansion demand and 77 per cent to replace retiring workers. The relatively high replacement demand is mainly a result of the older age profile of the region.

The occupations that are predicted to post the largest number of job openings are

also very large occupations by employment in the region. This is also the case for other regions.

Demand for workers in the region is expected to grow by 0.8 per cent annually on average. The five occupations forecasted to expand fastest in the region are:

▶ **Optometrists, chiropractors and other health diagnosing and treating professionals (2.3 per cent per year on average);**

▶ **Professional occupations in nursing (2.3 per cent);**  
 ▶ **Therapy and assessment professionals (2.2 per cent);**  
 ▶ **Managers in health care (2.2 per cent); and**  
 ▶ **Assisting occupations in support of health services (2.2 per cent).**

These five occupations are all health-related as the Health Care and Social Assistance industry is the top growth industry in the region.

## OCCUPATIONS with the HIGHEST NUMBER of JOB OPENINGS

SKILL LEVEL	NOC	DESCRIPTION	EXPANSION	REPLACEMENT	TOTAL JOB OPENINGS	WAGE*
<b>A</b>	301	Professional occupations in nursing	2,280	3,220	5,500	\$36.50
	062	Retail and wholesale trade managers	990	3,940	4,930	\$25.00
	403	Secondary and elementary school teachers and educational counsellors	830	3,250	4,080	\$33.00
<b>B</b>	421	Paraprofessional occupations in legal, social, community and education services	2,130	2,800	4,930	\$20.70
	122	Administrative and regulatory occupations	820	4,000	4,820	\$23.10
	124	Office administrative assistants – general, legal and medical	650	2,700	3,350	\$21.60
<b>C</b>	642	Retail salespersons	1,740	4,070	5,810	\$14.00
	141	General office workers	1,470	3,650	5,120	\$18.00
	341	Assisting occupations in support of health services	2,070	2,690	4,760	\$21.00
<b>D</b>	673	Cleaners	840	3,730	4,570	\$17.00
	661	Cashiers	750	1,150	1,900	\$11.80
	671	Food counter attendants, kitchen helpers and related support occupations	860	540	1,400	\$11.00

\*2013 BC Median Hourly Wage



- ▶ The region has the second largest employment in the province.
- ▶ The unemployment rate is below the provincial average.
- ▶ The age profile is substantially older relative to that of B.C. overall.
- ▶ Labour force participation is lower than that of the province as a whole.
- ▶ Retail and Wholesale Trade, Health Care and Social Assistance, Construction, and Public Administration are the largest industries by employment.

# MAINLAND/SOUTHWEST

The **Mainland/Southwest** development region is expected to have 641,500 job openings over the 10-year outlook period, with 37 per cent being expansion demand and 63 per cent to replace retiring workers. The region accounts for 65 per cent of the total job openings in the province.

Demand for workers is expected to grow by 1.4 per cent per year on average. The five occupations forecasted to expand fastest in

the region are:

- ▶ *Mine service workers and operators in oil and gas drilling (2.9 per cent annually on average);*
- ▶ *Underground miners, oil and gas drillers and related occupations (2.8 per cent);*
- ▶ *Contractors and supervisors, mining, oil and gas (2.5 per cent);*
- ▶ *Managers in natural resources production and fishing (2.3 per cent); and*

- ▶ *Optometrists, chiropractors and other health diagnosing and treating professionals (2.0 per cent).*

Over the forecast period, strong employment growth in the Mining, and Oil and Gas industries in northern B.C. is expected. Due to the smaller size of the local labour supply in northern B.C., significant employment growth is expected to be filled by workers permanently residing in Mainland/Southwest.

## OCCUPATIONS *with the* HIGHEST NUMBER of JOB OPENINGS

SKILL LEVEL	NOC	DESCRIPTION	EXPANSION	REPLACEMENT	TOTAL JOB OPENINGS	WAGE*
<b>A</b>	062	Retail and wholesale trade managers	5,260	12,380	17,640	\$25.00
	403	Secondary and elementary school teachers and educational counsellors	2,100	12,480	14,580	\$33.00
	111	Auditors, accountants and investment professionals	4,980	9,470	14,450	\$31.50
<b>B</b>	122	Administrative and regulatory occupations	6,390	13,770	20,160	\$23.10
	421	Paraprofessional occupations in legal, social, community and education services	5,970	7,420	13,390	\$20.70
	124	Office administrative assistants – general, legal and medical	4,290	8,990	13,280	\$21.60
<b>C</b>	642	Retail salespersons	9,380	11,740	21,120	\$14.00
	751	Motor vehicle and transit drivers	6,290	12,660	18,950	\$23.40
	141	General office workers	6,880	10,420	17,300	\$18.00
<b>D</b>	673	Cleaners	6,900	13,320	20,220	\$17.00
	671	Food counter attendants, kitchen helpers and related support occupations	4,570	3,540	8,110	\$11.00
	661	Cashiers	3,820	3,530	7,350	\$11.80

\*2013 BC Median Hourly Wage



- ▶ More than 60 per cent of the workers in the province are employed in the region.
- ▶ The unemployment rate is close to the provincial average.
- ▶ The population is slightly younger relative to the province as a whole.
- ▶ Compared to B.C. overall, labour force participation is slightly higher.
- ▶ Retail and Wholesale Trade, Health Care and Social Assistance, Manufacturing, and Professional, Scientific and Technical Services are the largest industries by employment.

# THOMPSON-OKANAGAN

The **Thompson-Okanagan** development region is expected to have 98,300 job openings over the forecast period. Most of these job openings (80 per cent) are to replace retiring workers, and the other 20 per cent are due to expansion demand. Relatively high replacement demand is mainly a result of the older age profile of the region combined with an expected lower than average growth in demand for workers.

Demand for workers in the region is expected to grow by 0.7 per cent each year on average. The five occupations forecasted to expand fastest in the region are:

- ▶ **Optometrists, chiropractors and other health diagnosing and treating professionals (2.0 per cent annually on average);**
- ▶ **Professional occupations in nursing (2.0 per cent);**
- ▶ **Managers in health care (2.0 per cent);**

- ▶ **Assisting occupations in support of health services (2.0 per cent); and**
- ▶ **Physicians, dentists and veterinarians (1.9 per cent).**

These top growth occupations are all health-related as the Health Care and Social Assistance industry is the top growth industry in the region. A similar situation is expected in Vancouver Island / Coast and in Kootenay.

## OCCUPATIONS *with the* HIGHEST NUMBER of JOB OPENINGS

SKILL LEVEL	NOC	DESCRIPTION	EXPANSION	REPLACEMENT	TOTAL JOB OPENINGS	WAGE*
<b>A</b>	301	Professional occupations in nursing	1,160	1,900	3,060	\$36.50
	403	Secondary and elementary school teachers and educational counsellors	600	2,200	2,800	\$33.00
	062	Retail and wholesale trade managers	250	2,540	2,790	\$25.00
<b>B</b>	122	Administrative and regulatory occupations	460	2,540	3,000	\$23.10
	421	Paraprofessional occupations in legal, social, community and education services	1,060	1,630	2,690	\$20.70
	124	Office administrative assistants – general, legal and medical	460	1,910	2,370	\$21.60
<b>C</b>	141	General office workers	790	2,490	3,280	\$18.00
	751	Motor vehicle and transit drivers	510	2,580	3,090	\$23.40
	642	Retail salespersons	340	2,530	2,870	\$14.00
<b>D</b>	673	Cleaners	880	2,770	3,650	\$17.00
	671	Food counter attendants, kitchen helpers and related support occupations	1,050	780	1,830	\$11.00
	661	Cashiers	260	850	1,110	\$11.80

\*2013 BC Median Hourly Wage



- ▶ The region employs the third most workers in B.C.
- ▶ The unemployment rate is slightly above the provincial average.
- ▶ The population is older relative to B.C. as a whole.
- ▶ Labour force participation is lower than the provincial participation rate
- ▶ Retail and Wholesale Trade, Health Care and Social Assistance, Construction, and Accommodation and Food Services are the largest industries by employment.

# KOOTENAY

The **Kootenay** development region is expected to have 29,300 job openings to 2022, including 80 per cent to replace retiring workers and 20 per cent through expansion. The proportion of job openings due to replacement demand is relatively high as this region has an older age profile and the expected growth in demand for workers is lower than average.

Demand for workers in the region is expected to grow

by 0.7 per cent annually on average. The five occupations forecasted to expand fastest in the region are:

- ▶ *Therapy and assessment professionals (2.4 per cent annually on average);*
- ▶ *Professional occupations in nursing (2.4 per cent);*
- ▶ *Physicians, dentists and veterinarians (2.4 per cent);*
- ▶ *Assisting occupations in support of health services (2.3 per cent); and*

- ▶ *Paraprofessional occupations in legal, social, community and education services (2.0 per cent).*

Most of these top growth occupations are health-related as the Health Care and Social Assistance industry is the top growth industry in the region. A similar situation is expected in Vancouver Island / Coast and in Thompson-Okanagan.

## OCCUPATIONS *with the* HIGHEST NUMBER of JOB OPENINGS

SKILL LEVEL	NOC	DESCRIPTION	EXPANSION	REPLACEMENT	TOTAL JOB OPENINGS	WAGE*
<b>A</b>	403	Secondary and elementary school teachers and educational counsellors	310	810	1,120	\$33.00
	062	Retail and wholesale trade managers	80	960	1,040	\$25.00
	301	Professional occupations in nursing	400	560	960	\$36.50
<b>B</b>	421	Paraprofessional occupations in legal, social, community and education services	390	490	880	\$20.70
	122	Administrative and regulatory occupations	140	740	880	\$23.10
	124	Office administrative assistants – general, legal and medical	170	600	770	\$21.60
<b>C</b>	751	Motor vehicle and transit drivers	200	970	1,170	\$23.40
	441	Home care providers and educational support occupations	310	690	1,000	\$17.90
	341	Assisting occupations in support of health services	440	550	990	\$21.00
<b>D</b>	673	Cleaners	330	960	1,290	\$17.00
	861	Harvesting, landscaping and natural resources labourers	110	260	370	\$18.00
	661	Cashiers	60	300	360	\$11.80

\*2013 BC Median Hourly Wage



- ▶ The region employs over three per cent of workers in B.C.
- ▶ The unemployment rate is below the provincial average.
- ▶ The population is substantially older compared to the overall population in B.C.
- ▶ Labour force participation is lower than that of the province overall.
- ▶ Retail and Wholesale Trade, Health Care and Social Assistance, Construction, and Forestry, Fishing, Mining, Oil and Gas are the largest industries by employment.



# CARIBOO

The **Cariboo** development region is expected to have 30,300 job openings over the forecast period. Most of these job openings (87 per cent) are to replace retiring workers, and 13 per cent are due to expansion demand. Cariboo is expected to have the slowest growth in demand for workers across regions.

Demand for workers is expected to grow by 0.4 per cent each year on average. The five occupations forecasted to expand fastest in

the region are:

- ▶ **Masonry and plastering trades (3.0 per cent annually on average);**
- ▶ **Other construction trades (2.9 per cent);**
- ▶ **Carpenters and cabinetmakers (2.5 per cent);**
- ▶ **Crane operators, drillers and blasters (2.5 per cent); and**
- ▶ **Contractors and supervisors, industrial, electrical and construction trades and related workers (2.5 per cent).**

These top growth occupations are all trade occupations as Construction is forecast to be the fastest growing industry in the region.

**Note:** Other construction trades include roofers and shinglers, glaziers, insulators, painters and decorators (except interior decorators), and floor covering installers.

## OCCUPATIONS with the HIGHEST NUMBER of JOB OPENINGS

SKILL LEVEL	NOC	DESCRIPTION	EXPANSION	REPLACEMENT	TOTAL JOB OPENINGS	WAGE*
<b>A</b>	403	Secondary and elementary school teachers and educational counsellors	170	960	1,130	\$33.00
	301	Professional occupations in nursing	410	640	1,050	\$36.50
	062	Retail and wholesale trade managers	-30	750	720	\$25.00
<b>B</b>	731	Machinery and transportation equipment mechanics (except motor vehicle)	70	1,140	1,210	\$31.00
	421	Paraprofessional occupations in legal, social, community and education services	450	660	1,110	\$20.70
	724	Electrical trades and electrical power line and telecommunications workers	260	700	960	\$32.00
<b>C</b>	751	Motor vehicle and transit drivers	200	1,550	1,750	\$23.40
	141	General office workers	210	760	970	\$18.00
	341	Assisting occupations in support of health services	340	500	840	\$21.00
<b>D</b>	673	Cleaners	80	960	1,040	\$17.00
	761	Trades helpers and labourers	230	290	520	\$21.00
	861	Harvesting, landscaping and natural resources labourers	140	180	320	\$18.00

\*2013 BC Median Hourly Wage



- ▶ Employment accounts for less than four per cent of the total employment in the province.
- ▶ The unemployment rate is below the provincial average.
- ▶ The population is slightly younger, compared to the overall population in B.C.
- ▶ Labour force participation rates are higher than that of the province overall.
- ▶ Retail and Wholesale Trade, Manufacturing, Health Care and Social Assistance, and Forestry, Fishing, Mining, Oil and Gas are the largest industries by employment.

# NORTH COAST *and* NECHAKO

The North Coast and Nechako development region is expected to have 20,100 job openings over the forecast period, with 35 per cent expansion demand and 65 per cent to replace retiring workers. The region is expected to have the second highest average annual growth in demand for workers across regions. This is partially driven by multiple major projects that are either currently under development or planned in the region.

Demand for workers is expected to grow by 1.5 per cent per year on average. The five occupations forecasted to expand fastest in the region are:

- ▶ **Heavy equipment operators (2.7 per cent annually on average);**
- ▶ **Plumbers, pipefitters and gas fitters (2.4 per cent);**
- ▶ **Masonry and plastering trades (2.4 per cent);**
- ▶ **Other construction trades (2.4 per cent); and**

- ▶ **Contractors and supervisors, industrial, electrical and construction trades and related workers (2.4 per cent).**

These top growth occupations are all trade occupations as the Construction industry is one of the fast-growing industries in the region.

**Note:** Other construction trades include roofers and shinglers, glaziers, insulators, painters and decorators (except interior decorators), and floor covering installers.

## OCCUPATIONS *with the* HIGHEST NUMBER of JOB OPENINGS

SKILL LEVEL	NOC	DESCRIPTION	EXPANSION	REPLACEMENT	TOTAL JOB OPENINGS	WAGE*
<b>A</b>	071	Managers in construction and facility operation and maintenance	170	350	520	\$36.90
	403	Secondary and elementary school teachers and educational counsellors	30	450	480	\$33.00
	301	Professional occupations in nursing	150	270	420	\$36.50
<b>B</b>	122	Administrative and regulatory occupations	200	390	590	\$23.10
	727	Carpenters and cabinetmakers	220	300	520	\$22.00
	731	Machinery and transportation equipment mechanics (except motor vehicle)	150	320	470	\$31.00
<b>C</b>	751	Motor vehicle and transit drivers	300	520	820	\$23.40
	141	General office workers	190	320	510	\$18.00
	441	Home care providers and educational support occupations	110	290	400	\$17.90
<b>D</b>	673	Cleaners	160	280	440	\$17.00
	761	Trades helpers and labourers	150	160	310	\$21.00
	861	Harvesting, landscaping and natural resources labourers	110	90	200	\$18.00

\*2013 BC Median Hourly Wage



- ▶ The region is one of the smallest by employment, accounting for less than two per cent of the employment in B.C.
- ▶ The unemployment rate is close to the provincial average.
- ▶ The population is younger compared to the B.C. overall.
- ▶ Labour force participation is higher than that of the province overall.
- ▶ Retail and Wholesale Trade, Manufacturing, Construction, and Health Care and Social Assistance are the largest industries by employment.

# NORTHEAST

The **Northeast** development region is expected to have 18,400 job openings over the forecast period, with 41 per cent expansion demand and 59 per cent to replace retiring workers. The region is expected to have the fastest growth in demand for workers largely driven by expected strong growth in the Oil and Gas industry.

Demand for workers is expected to grow by 1.7 per cent per year on average. The five occupations

that are forecast to expand fastest in the region are:

- ▶ **Other construction trades** (3.3 per cent annually on average);
- ▶ **Carpenters and cabinetmakers** (3.2 per cent);
- ▶ **Crane operators, drillers and blasters** (3.1 per cent);
- ▶ **Occupations in food and beverage service** (3.0 per cent); and
- ▶ **Food counter attendants, kitchen helpers and related support occupations** (3.0 per cent).

These top growth occupations are trade and food service occupations as the region is expected to have strong growth in the Construction and Accommodation and Food Services industries, in addition to the Oil and Gas industry.

**Note:** Other construction trades include roofers and shinglers, glaziers, insulators, painters and decorators (except interior decorators), and floor covering installers.

## OCCUPATIONS with the HIGHEST NUMBER of JOB OPENINGS

SKILL LEVEL	NOC	DESCRIPTION	EXPANSION	REPLACEMENT	TOTAL JOB OPENINGS	WAGE*
<b>A</b>	403	Secondary and elementary school teachers and educational counsellors	250	460	710	\$33.00
	062	Retail and wholesale trade managers	140	420	560	\$25.00
	082	Managers in agriculture, horticulture and aquaculture	70	300	370	\$20.00
<b>B</b>	122	Administrative and regulatory occupations	210	400	610	\$23.10
	131	Finance, insurance and related business administrative occupations	210	370	580	\$22.60
	724	Electrical trades and electrical power line and telecommunications workers	210	240	450	\$32.00
<b>C</b>	751	Motor vehicle and transit drivers	270	720	990	\$23.40
	752	Heavy equipment operators	280	330	610	\$28.90
	141	General office workers	190	280	470	\$18.00
<b>D</b>	673	Cleaners	290	350	640	\$17.00
	761	Trades helpers and labourers	290	120	410	\$21.00
	661	Cashiers	150	140	290	\$11.80

\*2013 BC Median Hourly Wage



- ▶ The region is one of the smallest by employment, accounting for less than two per cent of the employment in B.C.
- ▶ The region has the lowest unemployment rate in the province.
- ▶ The Northeast has the youngest population across all regions.
- ▶ Labour force participation is the highest in the province.
- ▶ Retail and Wholesale Trade, Construction, Forestry, Fishing, Mining, Oil and Gas, and Health Care and Social Assistance are the largest industries by employment.



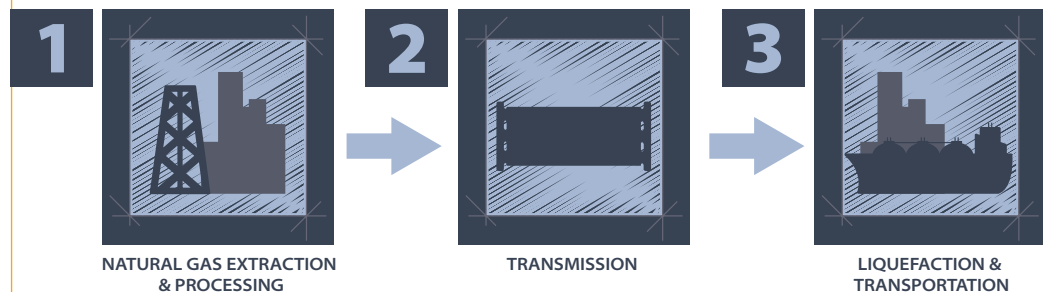
# BC LNG WORKFORCE OCCUPATION *Forecast*

## OVERVIEW

The Liquefied Natural Gas (LNG) sector is an important emerging industry in British Columbia. In order to support labour market planning and investments that will ensure B.C.'s workforce is equipped to meet the future needs of the sector, the government of B.C. contracted KPMG to develop occupational workforce projections for the LNG sector in the province.

The LNG workforce projections show demand for occupations in the LNG sector for construction and operations between 2014 and 2023 under two investment scenarios. The construction period relates to building the infrastructure that the LNG plants would require, while the operations period relates to the running of the plants once the construction period has been completed. Workforce demand projections were based on direct input from industry proponents including: Pacific Northwest LNG, Fortis BC, Apache Corporation, Shell Canada, BG Group, Spectra Energy Transmission, Chevron, Woodfibre, Imperial Oil, Progress Energy Resources Corp, Petroleum Human Resources Council, Petroleum Services Association Canada, and the BC Natural Gas Workforce Strategy Committee.

LNG activities are divided into three streams: **NATURAL GAS EXTRACTION AND PROCESSING** (upstream), **PIPELINE TRANSMISSION** (midstream), and **LIQUEFACTION AND TRANSPORTATION** (downstream).





# BC LNG WORKFORCE OCCUPATION *Forecast* (CONTINUED)

## KEY FINDINGS

A scenario with five LNG plants and a total production capacity of 82 Million Tonnes Per Annum would generate a total sector investment of \$175 billion.

The projections show two peaks of workforce needs in 2018 and 2022.

In this scenario, up to 100,000 jobs would be created between 2015 and 2023:

- ▶ 58,700 direct and indirect construction jobs at the height of the construction phase in 2018, including 31,700 direct construction jobs and 27,000 indirect construction jobs.

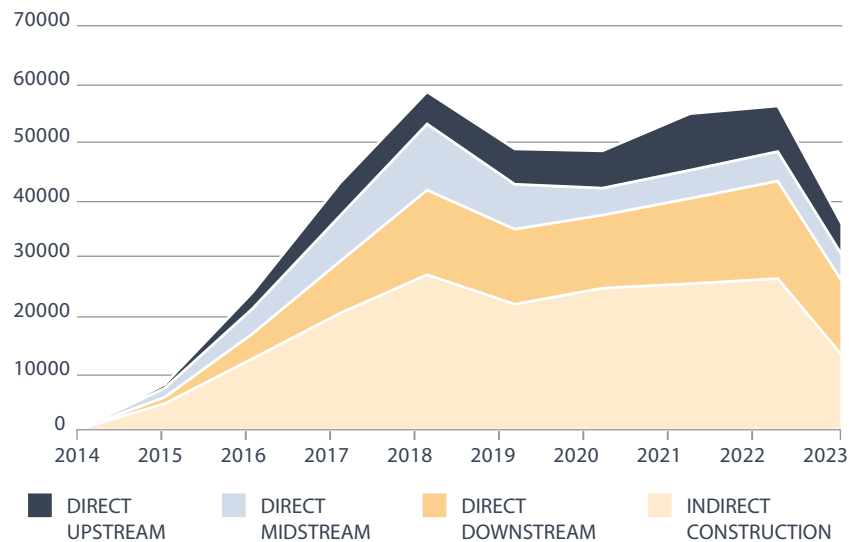
**TABLE 1:** *Estimated direct and indirect construction workforce demand 2014-2023 (FTEs)*

YEAR	DIRECT DOWNSTREAM	DIRECT MIDSTREAM	DIRECT UPSTREAM	DIRECT	INDIRECT	DIRECT AND INDIRECT TOTAL
2014	0	0	0	0	0	0
2015	1,100	1,560	690	3,300	4,500	7,900
2016	4,340	4,310	2,800	11,400	12,300	23,800
2017	9,060	7,870	5,700	22,600	20,200	42,800
2018	14,690	11,420	5,540	31,700	27,000	58,700
2019	13,090	7,780	6,180	27,000	21,700	48,800
2020	12,720	4,660	6,470	23,900	24,600	48,500
2021	14,780	4,910	9,830	29,500	25,400	54,900
2022	16,840	5,160	7,920	29,900	26,300	56,200
2023	11,410	4,260	4,430	20,100	8,100	28,200



## BC LNG WORKFORCE OCCUPATION *Forecast* (CONTINUED)

**CHART 5:** *Estimated direct and indirect construction workforce demand 2014-2023 (FTEs)*



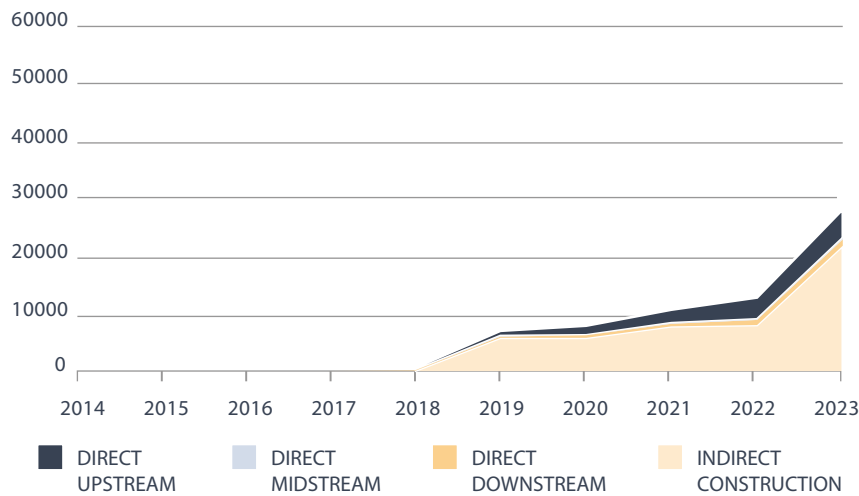
- 23,800 permanent direct and indirect jobs for operations by the end of the forecasting period, including 5,300 direct new permanent jobs that will be created to support operations across all LNG sectors.

**TABLE 2:** *Estimated direct and indirect operations workforce demand 2014-2023 (FTEs)*

YEAR	DIRECT DOWNSTREAM	DIRECT MIDSTREAM	DIRECT UPSTREAM	DIRECT	INDIRECT	DIRECT AND INDIRECT TOTAL
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	80	20	380	500	0	500
2019	160	50	770	1,000	4,900	5,800
2020	300	70	1,360	1,700	4,900	6,600
2021	440	100	1,950	2,500	6,500	9,000
2022	700	130	3,170	4,000	6,700	10,700
2023	920	150	4,210	5,300	18,500	23,800

# BC LNG WORKFORCE OCCUPATION *Forecast* (CONTINUED)

**CHART 6:** *Estimated direct and indirect operations workforce demand 2014-2023 (FTEs)*



- Up to 13,000 induced jobs as a result of households having more income.

At peak construction in 2018, the following ten occupations are expected to have highest direct workforce demand for construction and operations combined:

**TABLE 3:** *Direct workforce demand of the top ten occupations 2018 (FTEs)*

OCCUPATION	DEMAND
Construction trades helpers and labourers	11,800
Steamfitters and pipefitters	3,800
Welders	2,200
Concrete finishers	1,500
Transport truck drivers	1,500
Carpenters	1,400
Heavy equipment operators	1,110
Gas fitters	1,100
Purchasing agents and officers	875
Crane operators	800

Steady state operations employment is not reached over the ten-year forecasting period. Once all five LNG plants are in full production by 2027, the steady state direct workforce demand for operations is expected to be 8,000 to 9,000 jobs.





## CONCLUSION

From 2010 to 2013, the B.C. economy and labour market experienced moderate gains and while uncertainty remains about the strength of future growth, the labour market is expected to improve in the coming years. Tight labour market conditions for B.C. overall are expected in the second half of the forecast period starting in 2019.

Over the outlook period to 2022, over one million job openings are expected across the province including the expected LNG activity. At the same time, the number of workers needed will gradually become greater than the number of workers available.

The demographic profile of the province continues to influence the dynamics of the labour market. With relatively modest growth in new job creation, over two-thirds (68 per cent) of projected job openings will be to replace retiring workers. The population of the province is expected to continue to age, and the number of new entrants from within B.C. that join the workforce for the first time is expected to decline slightly over the forecast period. Migrants from outside the province will be an increasingly important source of new labour supply.

A key assumption of the Model is that the regions of the province will be able to attract migrants to meet labour market needs. If regions are unable to attract migrants at the predicted levels, then labour market pressures will be more intense. As a result, in addition to increasing participation rates, enhancing productivity and ensuring the most responsive education and training systems possible, migration is expected to become an increasingly important means to address B.C.'s anticipated labour market shortages.

### **WE LOOK FORWARD TO CONTINUING TO IMPROVE THE OUTLOOK.**

*We welcome your thoughts on those aspects of the Outlook that are most valuable, as well as those that can be improved as we continue to build a reliable labour market information system for our province and its diverse regions.*

### **PLEASE CONTACT US AT:**

*[workbcinformation@gov.bc.ca](mailto:workbcinformation@gov.bc.ca)*



# APPENDIX 1: Provincial Labour Market Outlook Summary Data

	BRITISH COLUMBIA	MAINLAND / SOUTHWEST	VANCOUVER ISLAND / COAST	THOMPSON-OKANAGAN	KOOTENAY	CARIBOO	NORTH COAST and NECHAKO	NORTHEAST
<b>Total Projected Job Openings 2012-2022</b>	<b>985,100</b>	<b>641,500</b>	<b>147,200</b>	<b>98,300</b>	<b>29,300</b>	<b>30,300</b>	<b>20,100</b>	<b>18,400</b>
<b>Expansion 2012-2022</b>	<b>315,400</b>	<b>237,500</b>	<b>33,900</b>	<b>19,800</b>	<b>5,700</b>	<b>4,000</b>	<b>7,100</b>	<b>7,400</b>
<b>Replacement 2012-2022</b>	<b>669,800</b>	<b>404,100</b>	<b>113,300</b>	<b>78,600</b>	<b>23,500</b>	<b>26,300</b>	<b>13,000</b>	<b>10,900</b>

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>All Occupations: BRITISH COLUMBIA</b>											
<b>Demand</b>	<b>2,465,100</b>	<b>2,481,200</b>	<b>2,513,000</b>	<b>2,547,100</b>	<b>2,582,400</b>	<b>2,617,500</b>	<b>2,662,200</b>	<b>2,699,100</b>	<b>2,733,300</b>	<b>2,759,500</b>	<b>2,780,500</b>
<b>Supply</b>	<b>2,478,900</b>	<b>2,496,600</b>	<b>2,531,900</b>	<b>2,567,500</b>	<b>2,604,100</b>	<b>2,640,900</b>	<b>2,664,200</b>	<b>2,687,000</b>	<b>2,709,500</b>	<b>2,732,900</b>	<b>2,752,000</b>
<b>Supply less Demand</b>	<b>13,800</b>	<b>15,300</b>	<b>18,900</b>	<b>20,400</b>	<b>21,700</b>	<b>23,400</b>	<b>2,000</b>	<b>-12,100</b>	<b>-23,900</b>	<b>-26,500</b>	<b>-28,400</b>
<b>All Occupations: MAINLAND / SOUTHWEST</b>											
<b>Demand</b>	<b>1,538,900</b>	<b>1,556,500</b>	<b>1,578,500</b>	<b>1,606,000</b>	<b>1,629,200</b>	<b>1,652,600</b>	<b>1,685,600</b>	<b>1,716,700</b>	<b>1,742,900</b>	<b>1,763,000</b>	<b>1,776,400</b>
<b>Supply</b>	<b>1,552,500</b>	<b>1,586,100</b>	<b>1,603,600</b>	<b>1,625,800</b>	<b>1,652,900</b>	<b>1,680,900</b>	<b>1,700,200</b>	<b>1,716,400</b>	<b>1,730,700</b>	<b>1,745,600</b>	<b>1,756,100</b>
<b>Supply less Demand</b>	<b>13,600</b>	<b>29,600</b>	<b>25,100</b>	<b>19,700</b>	<b>23,700</b>	<b>28,300</b>	<b>14,600</b>	<b>-200</b>	<b>-12,200</b>	<b>-17,400</b>	<b>-20,300</b>
<b>All Occupations: VANCOUVER ISLAND / COAST</b>											
<b>Demand</b>	<b>393,400</b>	<b>392,700</b>	<b>395,200</b>	<b>398,600</b>	<b>403,700</b>	<b>409,000</b>	<b>411,100</b>	<b>413,400</b>	<b>416,700</b>	<b>421,700</b>	<b>427,300</b>
<b>Supply</b>	<b>393,200</b>	<b>386,000</b>	<b>391,700</b>	<b>397,400</b>	<b>400,700</b>	<b>403,700</b>	<b>404,300</b>	<b>407,700</b>	<b>412,300</b>	<b>417,400</b>	<b>422,600</b>
<b>Supply less Demand</b>	<b>-200</b>	<b>-6,700</b>	<b>-3,500</b>	<b>-1,200</b>	<b>-3,000</b>	<b>-5,300</b>	<b>-6,800</b>	<b>-5,700</b>	<b>-4,400</b>	<b>-4,300</b>	<b>-4,700</b>
<b>All Occupations: THOMPSON-OKANAGAN</b>											
<b>Demand</b>	<b>275,000</b>	<b>273,000</b>	<b>273,100</b>	<b>274,200</b>	<b>277,200</b>	<b>281,900</b>	<b>289,400</b>	<b>292,200</b>	<b>294,200</b>	<b>294,400</b>	<b>294,800</b>
<b>Supply</b>	<b>275,700</b>	<b>269,100</b>	<b>273,800</b>	<b>276,600</b>	<b>279,000</b>	<b>281,800</b>	<b>284,300</b>	<b>286,300</b>	<b>288,500</b>	<b>290,300</b>	<b>292,000</b>
<b>Supply less Demand</b>	<b>700</b>	<b>-3,900</b>	<b>800</b>	<b>2,400</b>	<b>1,800</b>	<b>-200</b>	<b>-5,100</b>	<b>-5,900</b>	<b>-5,700</b>	<b>-4,100</b>	<b>-2,700</b>
<b>All Occupations: KOOTENAY</b>											
<b>Demand</b>	<b>80,800</b>	<b>80,100</b>	<b>80,900</b>	<b>81,800</b>	<b>82,700</b>	<b>82,900</b>	<b>83,200</b>	<b>83,900</b>	<b>84,900</b>	<b>85,700</b>	<b>86,500</b>
<b>Supply</b>	<b>80,600</b>	<b>79,500</b>	<b>80,800</b>	<b>81,600</b>	<b>82,500</b>	<b>83,100</b>	<b>83,300</b>	<b>83,900</b>	<b>84,700</b>	<b>85,800</b>	<b>86,800</b>
<b>Supply less Demand</b>	<b>-200</b>	<b>-700</b>	<b>-100</b>	<b>-200</b>	<b>-200</b>	<b>300</b>	<b>100</b>	<b>x</b>	<b>-200</b>	<b>x</b>	<b>300</b>
<b>All Occupations: CARIBOO</b>											
<b>Demand</b>	<b>92,400</b>	<b>92,500</b>	<b>93,400</b>	<b>94,300</b>	<b>95,400</b>	<b>95,800</b>	<b>96,200</b>	<b>96,100</b>	<b>96,100</b>	<b>96,100</b>	<b>96,300</b>
<b>Supply</b>	<b>91,600</b>	<b>91,000</b>	<b>91,600</b>	<b>92,100</b>	<b>92,700</b>	<b>93,300</b>	<b>93,800</b>	<b>94,100</b>	<b>94,300</b>	<b>94,700</b>	<b>95,000</b>
<b>Supply less Demand</b>	<b>-800</b>	<b>-1,500</b>	<b>-1,800</b>	<b>-2,300</b>	<b>-2,700</b>	<b>-2,500</b>	<b>-2,400</b>	<b>-2,000</b>	<b>-1,700</b>	<b>-1,400</b>	<b>-1,400</b>
<b>All Occupations: NORTH COAST and NECHAKO</b>											
<b>Demand</b>	<b>42,800</b>	<b>44,200</b>	<b>48,300</b>	<b>47,600</b>	<b>49,300</b>	<b>50,200</b>	<b>51,100</b>	<b>50,500</b>	<b>51,400</b>	<b>50,400</b>	<b>49,900</b>
<b>Supply</b>	<b>43,900</b>	<b>43,200</b>	<b>46,600</b>	<b>49,200</b>	<b>51,200</b>	<b>52,700</b>	<b>52,800</b>	<b>52,200</b>	<b>51,600</b>	<b>50,900</b>	<b>50,100</b>
<b>Supply less Demand</b>	<b>1,100</b>	<b>-1,100</b>	<b>-1,600</b>	<b>1,600</b>	<b>1,900</b>	<b>2,500</b>	<b>1,700</b>	<b>1,700</b>	<b>300</b>	<b>500</b>	<b>300</b>
<b>All Occupations: NORTHEAST</b>											
<b>Demand</b>	<b>41,800</b>	<b>42,200</b>	<b>43,700</b>	<b>44,500</b>	<b>45,000</b>	<b>45,200</b>	<b>45,500</b>	<b>46,300</b>	<b>47,200</b>	<b>48,200</b>	<b>49,200</b>
<b>Supply</b>	<b>41,400</b>	<b>41,800</b>	<b>43,800</b>	<b>44,800</b>	<b>45,200</b>	<b>45,500</b>	<b>45,600</b>	<b>46,300</b>	<b>47,300</b>	<b>48,400</b>	<b>49,400</b>
<b>Supply less Demand</b>	<b>-400</b>	<b>-500</b>	<b>100</b>	<b>300</b>	<b>300</b>	<b>400</b>	<b>x</b>	<b>x</b>	<b>100</b>	<b>200</b>	<b>200</b>

## Note:

1. Regional values may not add up to provincial values due to rounding.
2. The sum of expansion and replacement components of job openings may not add up to the total job openings due to rounding.
3. x = Small differences (less than 100) between supply and demand.

## DEFINITIONS

1. **Demand:** Total number of employed and normally unemployed workers. Normally unemployed workers refer to those who are transitioning between jobs, responding to seasonal fluctuations, or their skills do not match those required by employers.
2. **Supply:** The expected labour force, including those who are employed and those who are actively looking for a job.
3. **Supply less Demand:** The difference between Supply and Demand. A positive value indicates that Supply is greater than Demand.
4. **Expansion:** New job openings that arise due to economic growth. It is the difference between the Demand in 2022 and 2012.
5. **Replacement:** Job openings to fill positions that are generated through retirements and deaths from 2012 to 2022.
6. **Total Job Openings:** The sum of expansion and replacement job openings.
7. **New Entrants:** Persons aged 15-34 entering the labour force for the first time after leaving education system.
8. **Net In-Migration:** net in-migration from outside of B.C. This can be migration from other jurisdictions in Canada or from international sources.
9. **Other Mobility:** This group captures other types of mobility in the labour market, such as people changing occupations and people coming back to the labour force after a period of absence.



## APPENDIX 2: *Jobs in Demand: Top 60*

All jobs in the economy are categorized into 500 occupations. Projected labour market needs were compared to the projected labour supply for each occupation. The top occupations are largely determined by the expected cumulative job openings to 2022. Occupations that are expected to have an adequate supply of workers are not included. Job openings here incorporate both the Model results and LNG workforce needs. Job openings are created by people permanently leaving the labour force and creating a vacancy through retirements and deaths, and new jobs created through economic growth.

The lists include occupations that require training, broadly defined as a university degree (Skill level A), college or apprenticeship training (Skill level B), and high school and/or occupation-specific training (Skill level C). Skill Level D, or lower-skilled occupations, are excluded. Management occupations are included in Skill Level A. Skill levels are based on Statistics Canada's National Occupational Classification (NOC) system.

The Ministry of Health has identified the priority health professions in B.C. These occupations are presented separately from the top 60 lists of occupations that require training.

### PROVINCIAL PRIORITY HEALTH PROFESSIONS

- ▶ Audiologist
- ▶ Medical Laboratory Technologist
- ▶ Medical Radiation Technologist
- ▶ Occupational Therapist
- ▶ Physical Therapist
- ▶ Physician-General/Specialist
- ▶ Registered Nurse
- ▶ Registered Nurse – Specialty
- ▶ Speech Language Pathologist
- ▶ Ultrasonographer

### REPORT DESCRIPTIONS:

**List 1:** Top 60 occupations that require training – Post-Secondary Only

- ▶ Skill type 0\*, Skill level A and B

**List 2:** Top 60 occupations that require training

- ▶ Skill type 0\*, Skill level A, B and C

*\*In this report, management occupations are identified using their skill type ("0") to distinguish them from other Skill Level A occupations.*

# LIST 1: Top 60 occupations that require training – Post-Secondary Training Only

	NOC	OCCUPATION	JOB OPENINGS TO 2022	SKILL LEVEL
1	1241	Administrative assistants	17,600	B
2	1221	Administrative officers	17,500	B
3	7271	Carpenters	15,100	B
4	1111	Financial auditors and accountants	13,500	A
5	1311	Accounting technicians and bookkeepers	12,400	B
6	4212	Social and community service workers	10,100	B
7	4214	Early childhood educators and assistants	9,100	B
8	0711	Construction managers	8,400	O
9	7241	Electricians (except industrial and power system)	7,400	B
10	0631	Restaurant and food service managers	7,000	O
11	4021	College and other vocational instructors	6,900	A
12	7237	Welders and related machine operators	6,200	B
13	1224	Property administrators	5,300	B
14	4112	Lawyers	5,200	A
15	7252	Steamfitters, pipefitters and sprinkler system installers	4,900	B
16	7311	Construction millwrights and industrial mechanics	4,800	B
17	4011	University professors and lecturers	4,800	A
18	0016	Senior managers – construction, transportation, production and utilities	4,700	O
19	1122	Professional occupations in business management consulting	4,200	A
20	7312	Heavy-duty equipment mechanics	4,200	B
21	0712	Home building and renovation managers	4,200	O
22	0013	Senior managers- financial, communications and other business services	4,000	O
23	6321	Chefs	4,000	B
24	0714	Facility operation and maintenance managers	3,800	O
25	7251	Plumbers	3,700	B
26	2174	Computer programmers and interactive media developers	3,600	A
27	2131	Civil engineers	3,500	A
28	1123	Professional occupations in advertising, marketing and public relations	3,400	A
29	1225	Purchasing agents and officers	3,400	B
30	4311	Police officers (except commissioned)	3,400	B
31	4152	Social workers	3,300	A

	NOC	OCCUPATION	JOB OPENINGS TO 2022	SKILL LEVEL
32	5254	Program leaders and instructors in recreation, sport and fitness	3,300	B
33	1222	Executive assistants	3,000	B
34	4153	Family, marriage and other related counsellors	2,900	A
35	7205	Contractors and supervisors, other construction trades, installers, repairers and servicers	2,900	B
36	1242	Legal administrative assistants	2,800	B
37	1121	Human resources professionals	2,600	A
38	4163	Business development officers and marketing researchers and consultants	2,600	A
39	2133	Electrical and electronics engineers	2,500	A
40	2132	Mechanical engineers	2,400	A
41	7242	Industrial electricians	2,400	B
42	0731	Managers in transportation	2,300	O
43	0632	Accommodation service managers	2,300	O
44	7282	Concrete finishers	2,300	B
45	2241	Electrical and electronics engineering technologists and technicians	2,200	B
46	2263	Inspectors in public and environmental health and occupational health and safety	2,000	B
47	5121	Authors and writers	2,000	A
48	7231	Machinists and machining and tooling inspectors	1,900	B
49	7371	Crane operators	1,900	B
50	2253	Drafting technologists and technicians	1,800	B
51	4165	Health policy researchers, consultants and program officers	1,800	A
52	5242	Interior designers and interior decorators	1,800	B
53	7233	Sheet metal workers	1,700	B
54	9241	Power engineers and power systems operators	1,700	B
55	7253	Gas fitters	1,700	B
56	0211	Engineering managers	1,700	O
57	4312	Firefighters	1,700	B
58	6222	Retail and wholesale buyers	1,700	B
59	7204	Contractors and supervisors, carpentry trades	1,700	B
60	2264	Construction inspectors	1,600	B

## LIST 2: Top 60 occupations that require training

	NOC	OCCUPATION	JOB OPENINGS TO 2022	SKILL LEVEL
1	6421	Retail salespersons	32,700	C
2	7511	Transport truck drivers	18,000	C
3	1241	Administrative assistants	17,600	B
4	1221	Administrative officers	17,500	B
5	7271	Carpenters	15,100	B
6	1411	General office support workers	14,600	C
7	1111	Financial auditors and accountants	13,500	A
8	1414	Receptionists	13,200	C
9	1311	Accounting technicians and bookkeepers	12,400	B
10	6322	Cooks	10,200	B
11	4212	Social and community service workers	10,100	B
12	4214	Early childhood educators and assistants	9,100	B
13	0711	Construction managers	8,400	O
14	7521	Heavy equipment operators (except crane)	8,000	C
15	1431	Accounting and related clerks	7,800	C
16	6513	Food and beverage servers	7,800	C
17	6541	Security guards and related security service occupations	7,700	C
18	7452	Material handlers	7,600	C
19	7241	Electricians (except industrial and power system)	7,400	B
20	0631	Restaurant and food service managers	7,000	O
21	4021	College and other vocational instructors	6,900	A
22	7237	Welders and related machine operators	6,200	B
23	1224	Property administrators	5,300	B
24	4112	Lawyers	5,200	A
25	7252	Steamfitters, pipefitters and sprinkler system installers	4,900	B
26	7311	Construction millwrights and industrial mechanics	4,800	B
27	4011	University professors and lecturers	4,800	A
28	0016	Senior managers - construction, transportation, production and utilities	4,700	O
29	7294	Painters and decorators (except interior decorators)	4,400	B
30	4411	Home child care providers	4,300	C
31	7514	Delivery and courier service drivers	4,300	C



	NOC	OCCUPATION	JOB OPENINGS TO 2022	SKILL LEVEL
32	7312	Heavy-duty equipment mechanics	4,200	B
33	0712	Home building and renovation managers	4,200	O
34	1122	Professional occupations in business management consulting	4,200	A
35	0013	Senior managers – financial, communications and other business services	4,000	O
36	6321	Chefs	4,000	B
37	0714	Facility operation and maintenance managers	3,800	O
38	7251	Plumbers	3,700	B
39	2174	Computer programmers and interactive media developers	3,600	A
40	2131	Civil engineers	3,500	A
41	1123	Professional occupations in advertising, marketing & public relations	3,400	A
42	1225	Purchasing agents and officers	3,400	B
43	4311	Police officers (except commissioned)	3,400	B
44	5254	Program leaders and instructors in recreation, sport and fitness	3,300	B
45	4152	Social workers	3,300	A
46	6211	Retail sales supervisors	3,200	B
47	7441	Residential and commercial installers and servicers	3,100	C
48	7302	Contractors and supervisors, heavy equipment operator crews	3,100	B
49	7513	Taxi and limousine drivers and chauffeurs	3,000	C
50	1222	Executive assistants	3,000	B
51	4153	Family, marriage and other related counsellors	2,900	A
52	7205	Contractors and supervisors, other construction trades, installers, repairers and servicers	2,900	B
53	6332	Bakers	2,900	B
54	1242	Legal administrative assistants	2,800	B
55	4163	Business development officers ,marketing researchers and consultants	2,600	A
56	7284	Plasterers, drywall installers and finishers and lathers	2,600	B
57	1121	Human resources professionals	2,600	A
58	2133	Electrical and electronics engineers	2,400	A
59	2132	Mechanical engineers	2,400	A
60	7242	Industrial electricians	2,400	B

# APPENDIX 3: *Methodology and Assumptions*

## MODEL STRUCTURE AND METHODOLOGY

The B.C. Labour Market Scenario Model is a labour market forecasting system to generate a 10-year projection of occupation labour demand and supply for B.C. and its seven development regions.

The Model is composed of two sets of models: regional macroeconomic models and regional occupational models. The results of the regional models are rolled up to generate the provincial results.

### *Regional Macroeconomic Models:*

- ▶ Each of the seven regional macroeconomic models includes 15 industries that describe the entire economy. Industries are grouped using the 2007 North American Industry Classification System (NAICS) structure. Twenty industries (two-digit codes) in the NAICS are regrouped into 15 industries in the B.C. Labour Market Scenario Model:

1. Agriculture	11. Accommodation and Food Services
2. Oil and Gas	12. Education Services
3. Forestry, Mining, Fishing and Hunting (Other Primary Excluding Oil and Gas)	13. Health Care and Social Assistance
4. Manufacturing	14. Other Private Services (Repair and maintenance; Automotive repair and maintenance; Personal and laundry services; Religious, grant-making civic, and professional and similar organizations; and Private households)
5. Construction	15. Government Services
6. Utilities	
7. Transportation and Warehousing	
8. Wholesale and Retail Trade	
9. Finance, Insurance, and Real Estate	
10. Professional, Scientific and Managerial Services	

- ▶ There are two main components in each regional macroeconomic model: economic and demographic. The economic component links to the labour demand projections in the occupational model. The demographic component links to the labour supply projections in the occupational model.

### *Regional Occupational Models:*

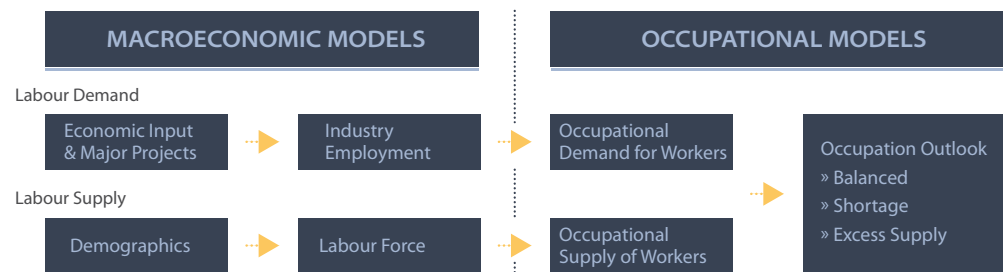
- ▶ Provide projected labour demand and supply for a total of 140 occupations at the 3-digit NOC level.
- ▶ Economic and industry growth as well as major projects drive labour demand in each region. Labour demand is determined by expected economic and industry performance, as well as labour productivity.
- ▶ Labour supply and its components of change are primarily driven by demographic shifts, economic performance and labour force participation rates.





## APPENDIX 3: Methodology and Assumptions (CONTINUED)

The diagram below illustrates how the models work. Labour market conditions for each occupation are determined by both labour supply and labour demand for that particular occupation.



### MODEL VALIDATION

- ▶ Industry intelligence and expertise from ministries, industry associations, professional groups, businesses, and other organizations are incorporated to validate the model approach, assumptions and results.
- ▶ Staff knowledge and internal research are also incorporated into Model development.
- ▶ The Conference Board of Canada reviewed the approach and methodology of the B.C. Labour Market Scenario Model and concluded it to be sound and *"The approach and methodology taken in developing the model is consistent with similar customized products developed by leading organizations conducting economic analysis and research."*

### KEY ASSUMPTIONS

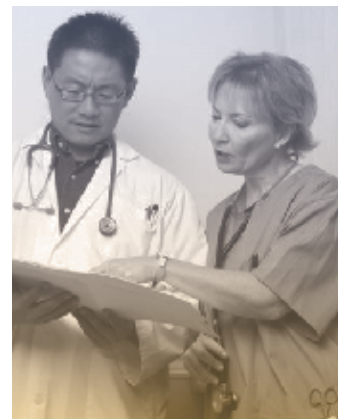
- ▶ **Macroeconomic indicators:** Assumptions on key economic indicators such as GDP, investment, income, capital stock and housing starts are incorporated into the Model. GDP and employment growth assumptions are consistent with the medium-term economic outlook in the B.C. Ministry of Finance Budget and Fiscal Plan 2013/14 – 2015/16, released in June 2013. Economic outlooks for B.C.'s major trading partners such as the U.S., Japan and European Union are incorporated.
- ▶ **Labour productivity:** Assumptions are made on the labour productivity growth for each industry.
- ▶ **Population:** Population projections (by region, including age and sex breakdown and components of population change) are consistent with BC Stats' population projections.
- ▶ **Labour force participation rate:** Assumptions are made on participation rate trends by age and sex. Overall labour force participation rates are expected to drop over the outlook period. However, the participation rate of women aged 55 and over is expected to increase.

## KEY ASSUMPTIONS (CONTINUED)

- ▶ **New entrants:** Age and sex-specific participation rates are used to calculate the number of new entrants to the labour market. New entrants are allocated to different occupations based on each occupation's historical demand share out of occupation demand for all occupations. The Model assumes that there will be no new entrants entering management and supervisory occupations as these occupations usually require several years of work experience.
- ▶ **Retirements and deaths:** Occupation-specific median retirement age and labour force age structure are used to derive the number of retirements from the labour force. Age and sex-specific death rates are used to calculate the number of deaths in the labour force.
- ▶ **Labour force adjustment:** It is assumed that: (1) Labour supply generally responds to labour demand, and in the long run, labour force for an occupation will be determined by the demand for the occupation; (2) Occupations need to compete with each other for new labour supply; and (3) If the share of an occupation in the economy is rising, so will its share of new entrants.

## MAJOR CHANGES IN THE CYCLE

- ▶ **Rebasing of Provincial Economic Accounts (PEA):** The new PEA were rebased to 2007 dollars and, as a result, all real variables are rebased from 2002 to 2007 with some model equations calibrated to use the new 2007 dollars data. At the time of updating, the available new PEA data were from 2007 to 2011, and these were linked to the old 2002 PEA data from 1981 to 2006. More recently released data, including back to 1981 and through 2012, will be incorporated in future updates.
- ▶ **Industries:** In the macroeconomic models, the Other Primary industry is broken down into (1) Oil and Gas, and (2) Forestry, Mining, Fishing and Hunting.
- ▶ **Labour force:** The macroeconomic models now include an estimate of the labour force by age and sex.
- ▶ **Net in-migration:** Net in-migration is further broken down to net international in-migration and net inter-regional in-migration. Net inter-provincial in-migration is the sum of net inter-regional in-migration for all seven regions.
- ▶ **Occupation-Industry employment matrix:** The current forecasting cycle uses an occupation-industry employment matrix based on the 2011 National Household Survey (NHS). In previous model cycles, the occupation-industry employment matrix was based on the 2006 Census.
- ▶ **National Occupational Classification (NOC):** Occupations are now coded with the 2011 version of the National Occupational Classification (NOC). In previous model cycles, occupations were coded using the NOC 2006.







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