careers in energy™

Central Canada's Energy Workforce

Regional Labour Market Outlook to 2035

Photo courtesy of Enbridge

February 2024

Canada

Funded in part by the Government of Canada's Sectoral Workforce Solutions Program

Table of Contents

List of Figures and Tables

Figures

Tables

Key Insights

Central Canada's energy industry fuels North America's economy

Central Canada plays a vital role in providing fuel to North America's economy as its momentum for producing low-carbon fuel continues building. Canada's energy industry relies on the region's finance, insurance and real estate, and manufacturing sectors, annually supporting over 100,000 indirect jobs.

An integrated energy system and workforce

Central Canada's energy industry is becoming increasingly integrated and so is its workforce. Foundational technology, equipment, skills and expertise used to process crude oil into value-added products are being expanded and applied to develop new low-carbon energy sources. Many qualifications required by the region's emerging energy sectors already exist within its established energy sectors.

Responding to the emissions challenge

As Central Canada's energy industry responds to the need for affordable and secure energy, it is simultaneously advancing sustainable practices and investing in low-carbon energy sources and adopting leading-edge technologies to achieve emissions-reduction goals.

Increase in quality energy jobs

Diversifying Central Canada's energy industry increases the number of quality jobs in emerging sectors. Transferable foundational skills and expertise across sectors provide job security, opportunities for career growth and horizontal career pathways while offering fair and competitive wages. Energy careers make meaningful contributions to society with their key role in ensuring a secure, affordable and low-carbon energy supply.

Two scenarios for Canada's energy future

Careers in Energy (CIE) evaluated two scenarios to project a potential range of workforce requirements to 2035. Many variables influence Canada's future energy workforce, such as uncertainty for how new energy sources will be scaled and the pace emissions-reduction technologies will be deployed. This outlook for Central Canada's energy labour market reflects the following scenarios:

Current Measures

Based on investment and development leading to energy production and carbon sequestration *most likely* to occur based on announced plans, policies and programs as of July 2023.

Opportunity

Based on investment and development leading to energy production and carbon sequestration that could *realistically* occur if competitive policies, programs, incentives and economic conditions are in place.

By the numbers

6,500

people are directly employed by Central Canada's energy industry

105,500

indirect jobs across Central Canada are sustained annually to support industry's operations supply chain

5,400

indirect jobs are created across the economy for every $1 billion spent on capital projects

6 Canadian energy sectors are included in this outlook:

conventional exploration and production (E&P), energy services, pipelines, petroleum refining, low-carbon hydrogen and biomass-based fuels

81 occupations

are included in Careers in Energy's (CIE) labour market modelling system

130 to 330

direct jobs are projected to be added between 2022 and 2035

2,350

Central Canadian energy workers are eligible to retire over the forecast period

2.4x

energy industry pays 2.4x the Canadian average total compensation

2,500 to 2,700

net hiring requirements are projected over the forecast period, if Central Canada's energy industry fills all job openings created by industry activity and retirements

1

Meeting the Challenge for Sustainable Fuel

Central Canada will continue playing a vital role in **supplying accessible, affordable and secure refined petroleum products while expanding its production of low-carbon fuels.**

Like the rest of Canada's energy industry, the Central region is tasked with a dual mandate of growing production to meet energy demand across North America, while simultaneously pursuing a low-carbon future. Petroleum products refined in Canada's Central region will remain a vital source of reliable and affordable energy—even as momentum builds for producing low-carbon fuels.

Ontario and Quebec directly employ about 6,500 energy workers[1], majority of which are responsible for developing and delivering refined petroleum products to help fuel North America's economy. Another 11,500 Central Canadian residents are directly employed by the oil and gas sector outside the region.[2] Rotational work arrangements in the oil sands and energy services sectors offer opportunities for these energy workers to remain residents of Central Canada while working quality jobs in other energy-producing parts of the country.

In addition, about 105,500 indirect jobs are sustained annually in Central Canada to support the industry's operations supply chain. As a hub for the finance, insurance and real estate and manufacturing sectors, the region plays a critical role in the development of Canada's sustainable energy system. Another 5,400 indirect jobs are created for every $1 billion spent on energy capital projects.[3]

Central Canada's energy industry is now responding to the challenge of meeting increased demand while advancing sustainable practices and investing in low-carbon energy sources. Leveraging its expertise in processing crude oil to create value-added products, the region is building a low-carbon future that includes biomass-based fuels and low-carbon hydrogen.

We're already seeing billions of dollars of investments from our members towards made-in-Canada lower-carbon fuels, with the potential to significantly reduce emissions and create sustainable, well-paying jobs throughout the value chain.[4] - Bob Larocque, President, Canadian Fuels Association

Expanding Canada's energy industry labour market outlook

This report provides an overview of energy workforce projections for Central Canada from 2022 to 2035, driven by the region's petroleum refining sector, investment in oil and natural gas production, low-carbon energy sources and new technology and emissions-reduction initiatives.

To more accurately reflect Canada's changing energy system, Careers in Energy (CIE) expanded its labour market modelling system beyond established oil and gas sectors, including exploration and production (E&P), oil sands, energy services, pipelines and petroleum refining. Canada's emerging energy sectors—liquefied natural gas (LNG), low-carbon hydrogen, biomass-based fuels and carbon capture and storage (CCS)—have been included for the first time as part of the national energy direct employment outlook (Figure 1). For this regional outlook, CCS and LNG export are not included, with the former being in the early exploration stage and the latter not under development in Central Canada at this time.

Emerging energy sources and technologies contribute to decarbonization in Canada and offer nearer-term national and global solutions, particularly for hard-to-electrify sectors. While electrification—using low- or no-carbon power generation technologies as the energy source—is a significant strategy for reaching net-zero, it is not a universal option. For energy-intensive industrial sectors such as oil and gas production, heavy-duty transportation, and cement and steel manufacturing, electricity is not technically or financially feasible.[5] Established and emerging sectors working together to provide low-carbon energy solutions will contribute to a more robust and dynamic job market in Canada.

Occupational scope

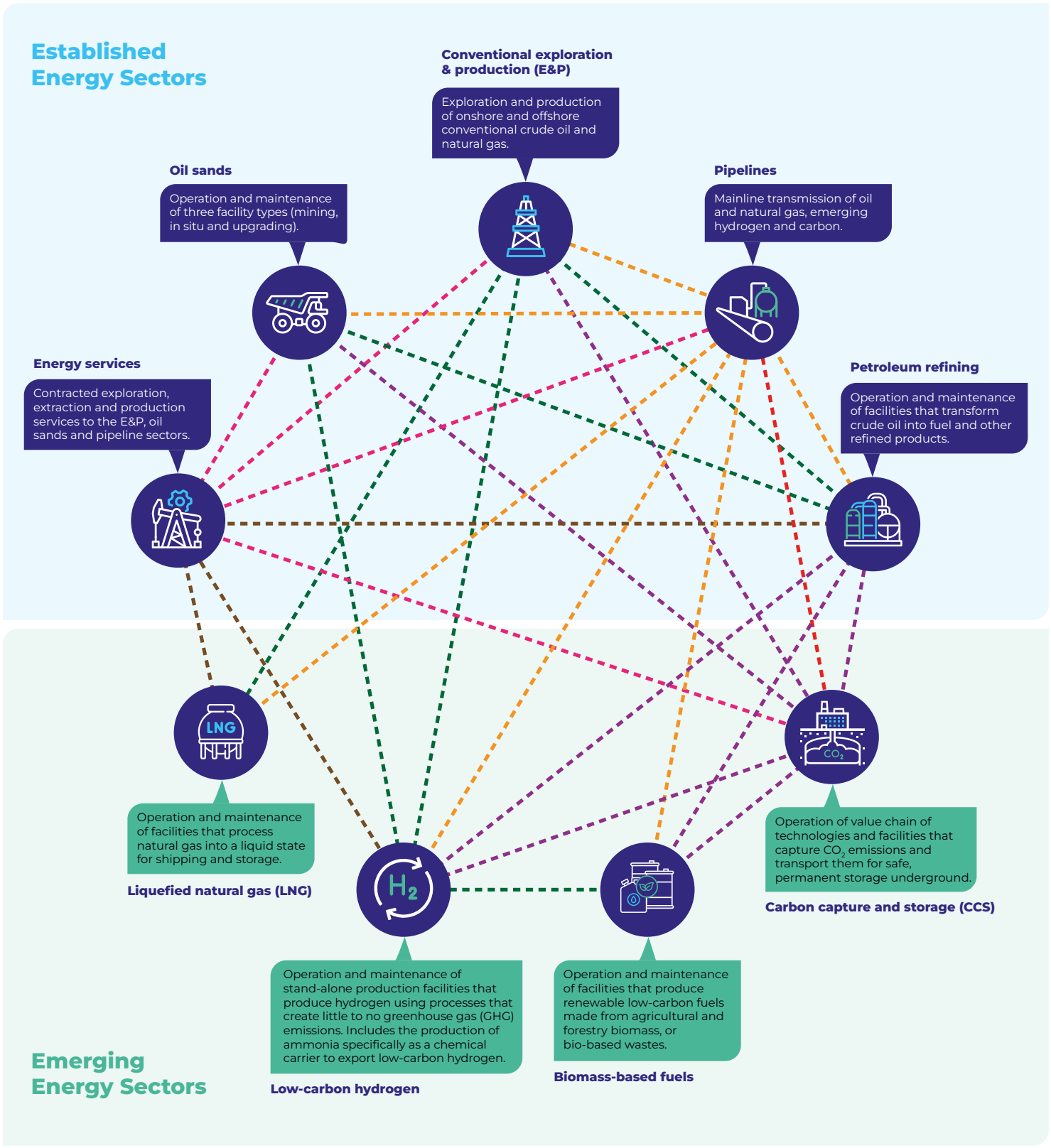
CIE's labour market modelling system includes 81 occupations as represented by the National Occupational Classification (NOC)[6] system. Workforce projections are for those directly hired by companies[7] involved in the forecasted production, operation and maintenance of in-scope sectors.[8]

National and other regional reports available

This report complements the *National Labour Market Outlook to 2035* and regional reports: Western Canada and Atlantic Canada. Data, including workforce projections by year, region, sector and occupation, can be found online at CareersinEnergy.ca

Photo courtesy of Enbridge

Figure 1: Expanded sector scope of Careers in Energy's labour market modelling system



Legend

- **Transport product:** required to transport product to customer
- **Transport CO_2:** specific to CCS
- **Feedstock:** produces raw materials required for energy source production
- **Feedstock production:** key role in producing feedstock
- **Emissions reduction:** energy source or technology that support reducing emissions
- **Contracted service:** equipment, technology and workforce required for production process

2

Outlook Scenarios: Current Measures and Opportunity

Given variables that will influence Canada's future energy workforce, such as uncertainty for how new energy sources will be scaled and the pace emissions-reduction technologies will be deployed, **CIE used a scenario approach for projecting workforce requirements to 2035.**

CIE evaluated two scenarios to project a potential range of workforce requirements to 2035.[9]

- **Current Measures**, based on investment[10] and development leading to energy production and carbon sequestration *most likely* to occur based on announced plans, policies and programs as of July 2023 (Figure 2).
- **Opportunity**, based on investment and development leading to energy production and carbon sequestration that could *realistically* occur if competitive policies, programs, incentives and economic conditions are in place (Figure 2).

Scenario assumptions report available

Find detailed information on CIE's scenario approach and underlying assumptions online at CareersinEnergy.ca

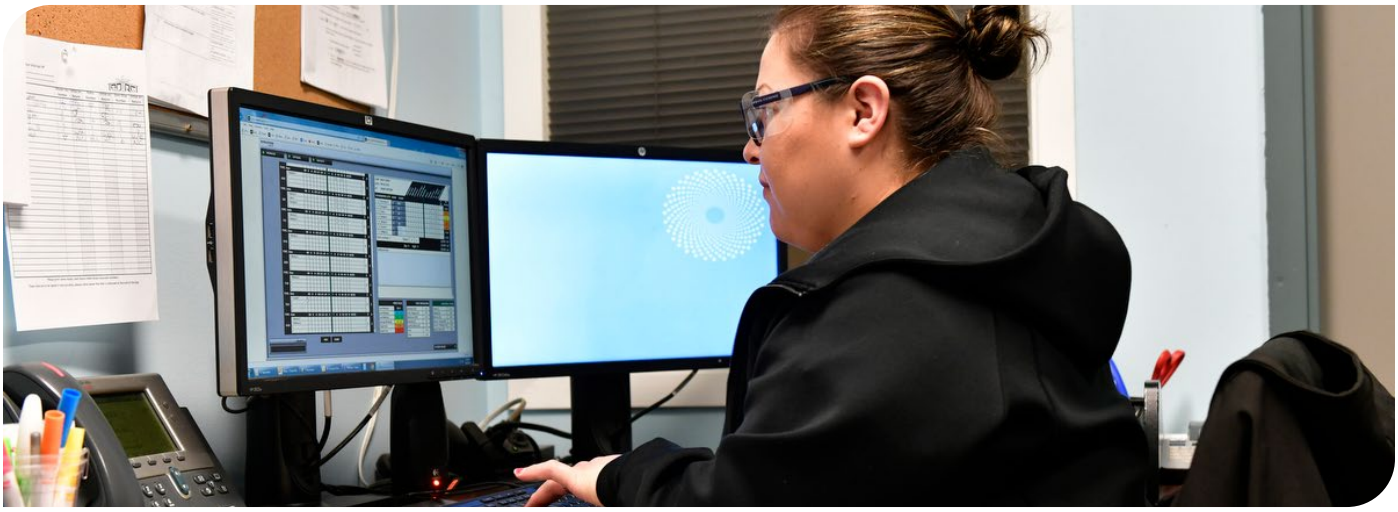
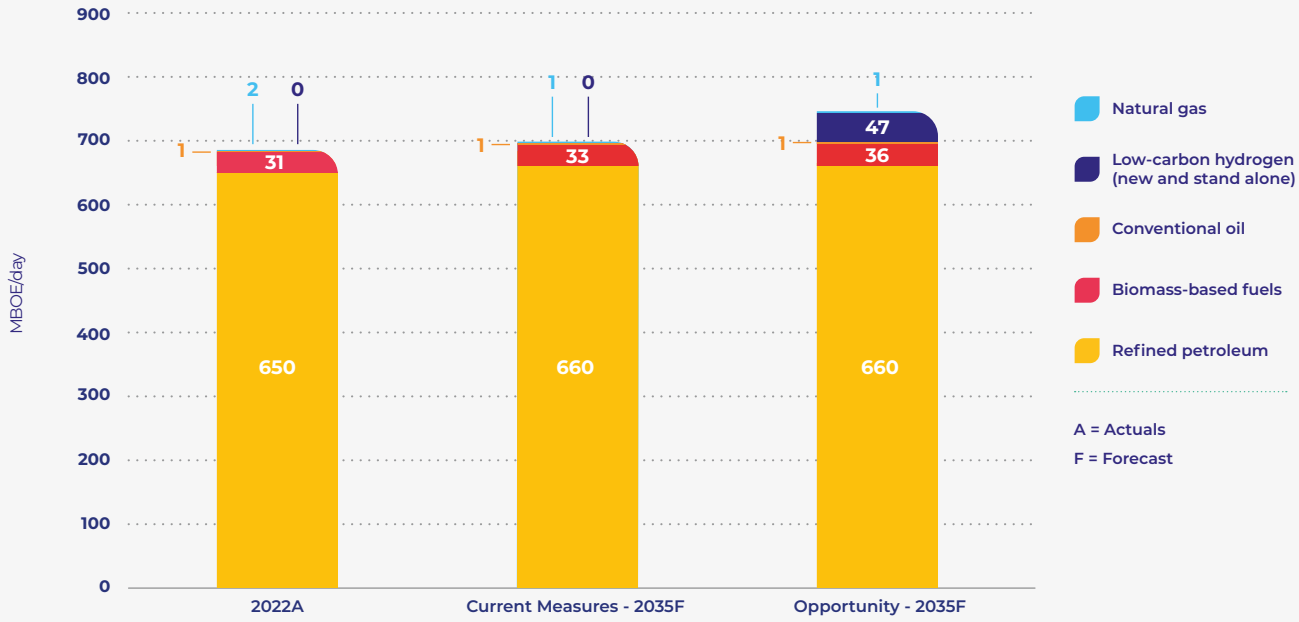


Photo courtesy of Cenovus

Figure 2: Central Canada's production by energy sector, 2022 and both scenarios in 2035

In thousands of barrels of oil equivalent per day (MBOE/day)



Building on Central Canada's energy strengths

This employment outlook for Central Canada aligns with its regional strengths including petroleum refining, pipeline transportation, natural gas storage and marketing hub, and development of energy decarbonization pathways including biomass-based fuels and low-carbon hydrogen.

Central Canada scenario assumptions

Natural gas production decreases

Central Canada is not a major producer of oil and natural gas. Regardless of scenario, oil production is projected to remain relatively stable and natural gas production decreases over the forecast period as the region looks to diversify to other energy sources.

Major natural gas trading hub located in Ontario

While not a significant producer of natural gas, Ontario is home to one of North America's major natural gas trading hubs and pricing benchmarks, the Enbridge Gas Dawn Hub. Dawn receives conventional and renewable natural gas (RNG) from multiple supply pipelines and has about 30% of Canada's underground natural gas storage capacity. It serves markets in Eastern Canada and Northeastern US.[11]

Refining petroleum remains stable

Production of refined petroleum products in Central Canada is expected to remain stable in both scenarios over the forecast period. The region is home to seven of Canada's 15 refineries—five in Ontario, two in Quebec—accounting for 44% of the country's petroleum refining capacity.[12] It is projected to remain a significant producer with enhanced focus on reducing emissions generated from the refining process. Emissions reductions are expected to be realized by co-processing the end-use petroleum products with biomass-based fuels to create lower-carbon fuels.

Important role in delivering North America's fuel

Central Canada's role in distributing liquid fuel is equally important as its role as a petroleum refining hub. Thousands of kilometres of pipelines move refined petroleum products, such as gasoline and diesel, to Eastern Canada and into the US.[13]

Blending biofuels and refined petroleum products is a primary topic right now. Our members who provide most of the transportation fuel in Canada, up to about 95 per cent are coming up with ways to have more biofuels in the fuel mix in order to meet compliance obligations.[14] - David Schick, VP Western Canada, Innovation and Regulatory Affairs, Canadian Fuels Association

Biomass-based fuels for transportation grow

Central Canada's well-established biomass-based fuels industry accounted for 68% of Canada's production in 2020.[15] The **Current Measures Scenario** projects growth in biomass-based fuels to support Canada's transportation sector. Reducing emissions with biomass-based fuels is anticipated to be more feasible than electrification for heavy transport and aviation, as they can be converted into liquid transportation fuels equivalent to fossil-based fuels. Additional biomass-

based fuels production forecast in the **Opportunity Scenario** will depend on implementation of policies, programs and incentives to attract investment.

Unique biorefinery will use low-carbon hydrogen to produce biomass-based fuel

Varennes Carbon Recycling, located in Varennes, QC, will convert carbon in non-recyclable waste and residual forest biomass into a new generation of value-added biofuels and commonly used chemicals. The plant incorporates one of the world's largest electrolyzers, enabling the use of renewable hydrogen and oxygen in its proprietary thermochemical process. The project is projected to create more than 500 jobs during construction.[16]

Low-carbon hydrogen production leverages abundant renewable electricity

Central Canada is already piloting the use of low-carbon hydrogen to reduce emissions in the transportation and building heating sectors and as an industrial feedstock. The region's abundant hydroelectricity offers the opportunity to develop standalone low-carbon hydrogen production facilities using electrolyzer technology. Given the costs associated with developing such projects, low-carbon hydrogen is only included in the **Opportunity Scenario** that assumes policies, programs and incentives are in place to attract necessary investment.

North America's first hydrogen blending project

Enbridge Gas has blended low-carbon hydrogen into its natural gas distribution network since January 2022, reducing the carbon footprint of about 3,600 customers in Markham, ON. The operation stores surplus electricity generated from the Markham Power-to-Gas facility as pure hydrogen and blends it with natural gas to create a lower-carbon energy source without impacting costs, reliability or safety.[17]

Photo courtesy of CAPP

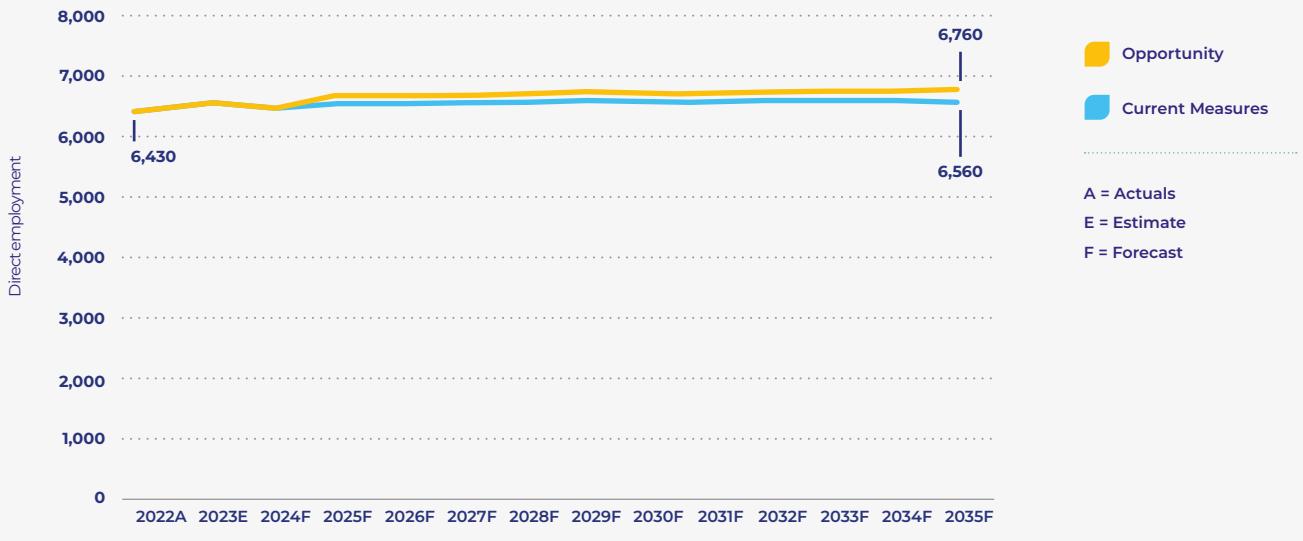
3

Central Canada Labour Market Outlook to 2035

Central Canada's expanded energy industry is **projected to generate between 130 and 330 direct jobs** between 2022 and 2035.

In 2022, the baseline year for this outlook, in-scope sectors accounted for 6,430 direct jobs across Central Canada. It is anticipated **130 new jobs will be generated by industry activity under the Current Measures Scenario** for a total of **6,560 direct jobs** by 2035. If the greater investment, production and industry activity assumptions are realized, **330 new jobs will be generated in the Opportunity Scenario**, for a total of **6,760 direct jobs** (Figure 3).

Figure 3: Direct employment by year, by scenario, 2022-2035



Workforce projections for the **Current Measures** and **Opportunity Scenarios** look very similar until 2024, when differences in employment growth come from jobs generated in emerging sectors.

Established energy sectors are not projected to generate a significant number of new jobs (Table 1). In the **Current Measures Scenario**, established sectors account for fewer than 100 new employment opportunities.. In the **Opportunity Scenario**, minimal job growth in refining, convention E&P and energy services is offset by job losses in the pipelines sector.

Diversification of Central Canada's energy industry is expected to focus on leveraging its strength in biomass-based fuels production, generating jobs in both the **Current Measures** and **Opportunity Scenarios**. If policies and programs are in place to attract investment, low-carbon hydrogen production is forecast to create jobs in the **Opportunity Scenario**.

Table 1: Direct employment and new jobs by sector, by scenario, 2022-2035

	Sector	Direct employment in 2022A	Current Measures		Opportunity	
			Employment in 2035F	# and % change	Employment in 2035F	# and % change
	TOTAL	**6,430**	**6,560**	**130 (2%)**	**6,760**	**330 (5%)**
Established energy sectors	Conventional E&P	60	70	10 (14%)	70	10 (14%)
	Energy services	50	60	10 (20%)	60	10 (20%)
	Pipelines	1,830	1,810	-20 (-1%)	1,760	-70 (-4%)
	Petroleum refining	3,350	3,400	50 (1%)	3,400	50 (1%)
Emerging energy sectors	Biomass-based fuels	1,140	1,220	80 (1%)	1,330	190 (17%)
	Low-carbon hydrogen	minimal*	minimal*	minimal*	140	140 (all new jobs)

* The small number of workers working in these emerging sectors in 2022 were not quantified in this outlook.
Numbers may not add up due to rounding

Photo courtesy of Enbridge

Energy jobs are quality jobs

Pay, hours of work, future prospects, hard work, job content, interpersonal relationships and skills alignment are seven essential factors that emerge as indicators of job quality, or what is considered a "good" job.[18]

Energy jobs demonstrate many of these qualities.

- **Greater job security and opportunities for career growth as the diversification of Canada's energy industry will rely heavily on similar occupations, skills and expertise of the established energy workforce to deploy emerging energy sources and emissions-reduction technologies.**
- **Opportunities to make meaningful contributions to society as the globe looks to decarbonize while addressing growing demand for affordable, accessible energy.**
- **Workers seek fair and competitive pay that reflects and recognizes the value of their skills, experience and ensures financial stability.**

Jobs in the energy industry are the highest paying amongst Canada's largest sectors. In 2022, established and emerging energy sectors included in CIE's outlook paid an average total compensation of $173,760—2.4x more than the national average of $72,640.[19]

Image courtesy of Air products and Chemicals, Inc.

Emerging sectors become a greater percentage of energy workforce

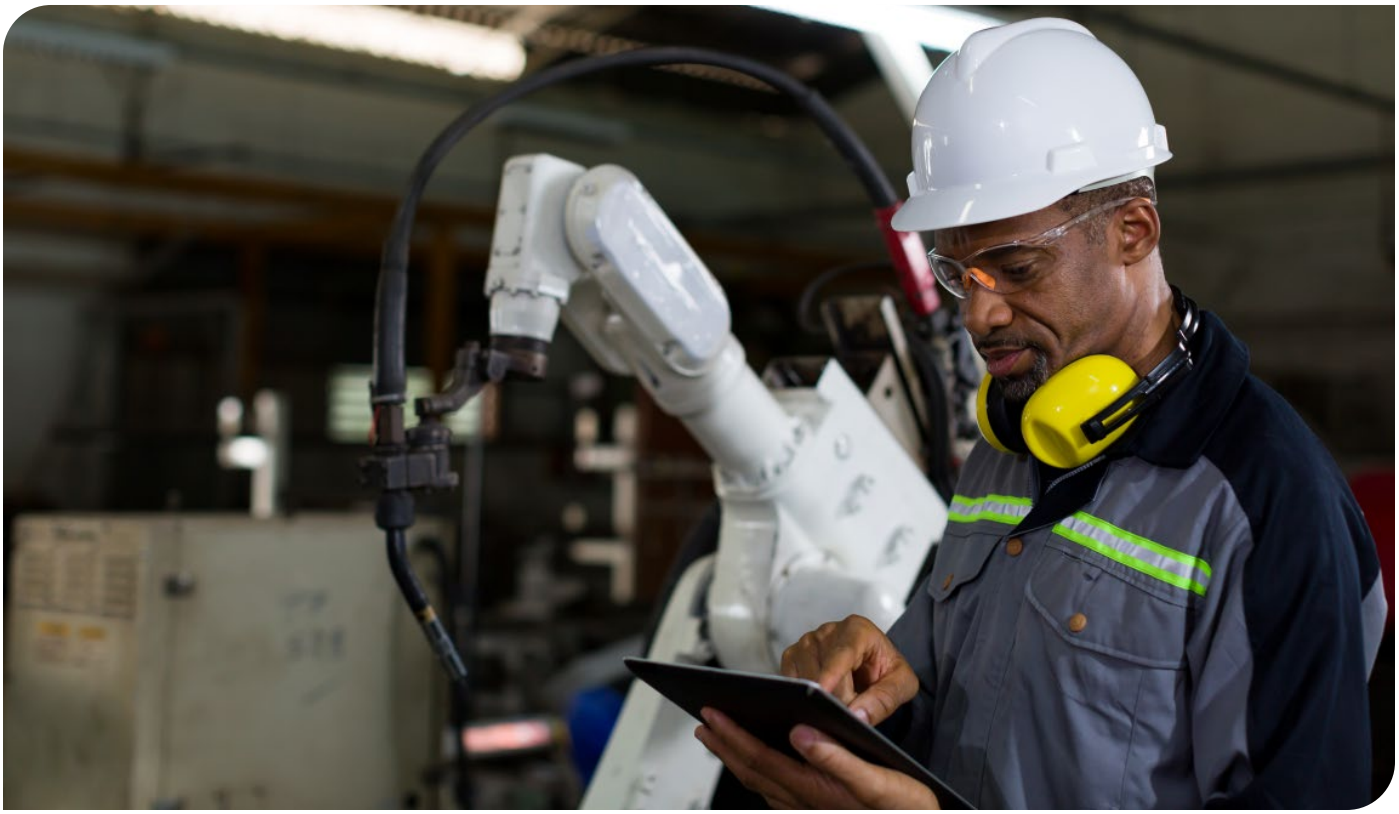
Over the forecast period, emerging sectors outperform established sectors in job growth while also increasing their percentage of the overall energy workforce.

In 2022, emerging sectors made up 18% of Central Canada's direct energy employment. The **Current Measures Scenario** projects they will account for 67% of new jobs and increase their percentage of the total workforce to 19% by 2035. The **Opportunity Scenario** forecasts emerging sectors will account for 100% of new jobs and 22% of the total workforce by 2035 (Figure 4).

Access detailed data on CIE's interactive dashboard

Find all information and data from this labour market outlook—including projections by year, sector and occupation online at CareersinEnergy.ca

Figure 4: New jobs and percentage of workforce, established and emerging sectors, by scenario, 2022-2035



4

Net Hiring Requirements

Photo courtesy of Enbridge

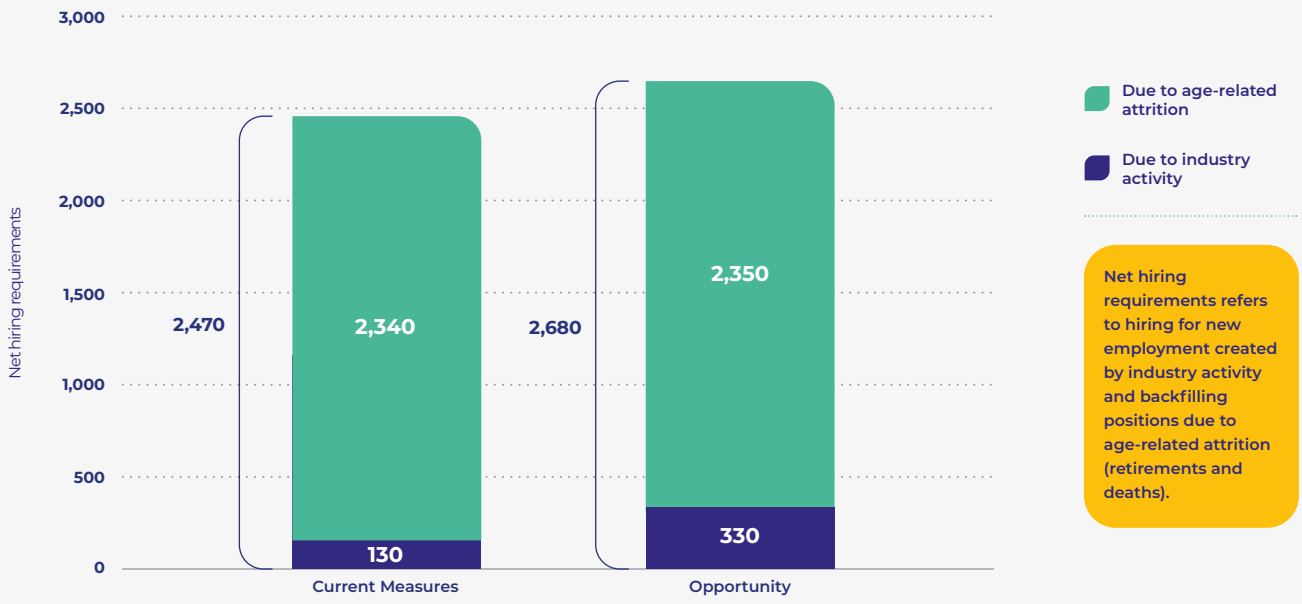
Based on annual age-related attrition rates, approximately **2,350 energy workers in Central Canada are eligible to retire** over the forecast period to 2035.

Hiring for age-related attrition outpaces industry activity

By contrast, industry activity is expected to drive hiring of between 130 and 330 workers, depending on the scenario. Job vacancies due to age-related attrition significantly outpace those generated by industry activity in the region and are projected to be the key driver of hiring across Central Canada's energy industry.

If Central Canada's energy industry replaces all job openings created by age-related attrition, those, combined with industry activity, could result in **net hiring requirements of between 2,470 and 2,680 jobs** over the forecast period, depending on the scenario (Figure 5).

Figure 5: Central Canada net hiring requirements forecast, by scenario, 2022-2035



Near-term risk of an aging workforce in some sectors and occupational groups

The pipelines, petroleum refining and biomass-based fuels sectors will face significant workforce retirements (Table 2). Over time, shifting skill requirements due to the adoption of digital solutions such as automation, remote monitoring, artificial intelligence (AI) and machine learning (ML) may decrease urgency to replace retiring workers. However, industry may not be able to implement digital solutions at the same pace as the growing talent gap nor will technological solutions be possible for all labour shortages.

Table 2: Central Canada net hiring requirements (NHR) by sector, by scenario, 2022-2035

	Sector	Current Measures			Opportunity		
		Industry activity	Age-related attrition	NHR	Industry activity	Age-related attrition	NHR
	TOTAL	**130**	**2,340**	**2,470**	**330**	**2,350**	**2,680**
Established energy sectors	Conventional E&P	10	20	30	10	20	30
	Energy services	10	20	30	10	20	30
	Pipelines	-20	600	580	-70	600	530
	Petroleum refining	50	1,260	1,310	50	1,260	1,310
Emerging energy sectors	Biomass-based fuels	80	440	520	190	440	630
	Low-carbon hydrogen	minimal*	minimal*	minimal*	140	10	150

Numbers may not add up due to rounding

Photo courtesy of Enbridge

CIE's labour market modelling system provides projections for net hiring requirements at an occupational level. Table 3 lists the occupational groups projected to have the greatest net hiring requirements to 2035.

Table 3: Central Canada net hiring requirements (NHR) by occupational group, by scenario, 2022-2035

Sector	Current Measures			Opportunity		
	Due to industry activity	Due to age-related attrition	NHR	Due to industry activity	Due to age-related attrition	NHR
TOTAL	**130**	**2,340**	**2,470**	**330**	**2,350**	**2,680**
Facility operations	40	680	720	110	660	770
Trades	10	280	290	40	280	320
Technical sales, procurement, supply chain and logistics	20	240	260	50	220	270
Engineers	10	210	220	20	210	230
Technicians and technologists	10	130	140	20	130	150
Business and operations support	10	130	140	10	130	140
Information technology	5	80	85	10	80	90
Transport and heavy equipment operators	10	80	90	10	80	90
Energy drilling, servicing and field operations	10	60	70	5	60	65
Geoscientists	0	10	10	0	10	10

Numbers may not add up due to rounding

Occupational groups projected to experience the greatest net hiring requirements include:

- **Facility operations occupations** will be required to produce and transport low-emission fuels such as low-carbon hydrogen and biomass-based fuels. These complex facilities will use state-of-the-art processing technologies and transportation infrastructure similar to those already found in established energy sectors. Specific occupations include:
  - Manufacturing and utilities managers
  - Facility operation and maintenance managers
  - Petroleum, gas and chemical processing and utilities supervisors
  - Central control, process and plant operators
  - Utilities equipment operators and controllers
  - Processing, manufacturing and utilities labourers
- **Trades occupations** will be required across all energy-producing facilities and pipelines to ensure efficient and safe operations. Specific occupations include:
  - Plumbers, pipefitters and gas fitters
  - Construction millwrights and industrial mechanics
  - Industrial electricians
  - Industrial instrumentation technicians and mechanics
- **Technical sales and procurement occupations** will grow, driven by the need to diversify customers for Central Canada's low-carbon energy sources and develop new supply chains to produce biomass-based fuels and low-carbon hydrogen. Specific occupations include:
  - Technical sales
  - Materials handlers
  - Supply chain logistics, tracking and scheduling coordination occupations
  - Transport truck drivers
- **Engineers** will continue playing a vital role in designing and delivering sustainable energy production as well as implementing emissions-reduction initiatives. Specific occupations include:
  - Engineering managers
  - Chemical engineers
  - Mechanical engineers

One big challenge is engineers. Everyone is looking for engineers.[20] - France Bélisle, Mayor of Gatineau and Chair, Quebec Union of Municipalities (UMQ)

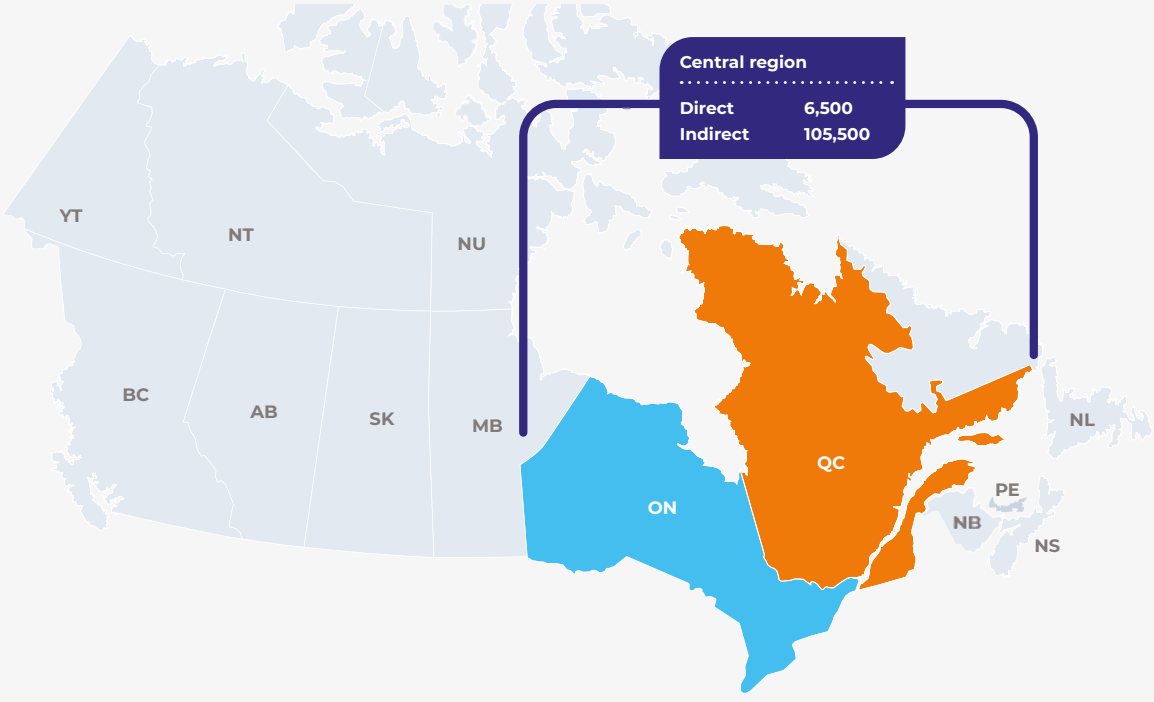
There is a huge demand in the skilled trades, as skilled trade workers are retiring faster than they're being replaced. According to the Ontario government, the average age of a skilled trade worker in Ontario is 47, but average ages can be as high as in the late 50s in some industries.[21] - Ian Howcroft, CEO, Skills Ontario

5

Indirect Employment

In addition to jobs directly hired for the production, operation and maintenance of CIE's in-scope energy sectors, **over 100,000 jobs are generated across the Central Canadian economy** in sectors providing goods and services to industry's operations supply chain and capital projects.

Figure 6: Central region direct employment and the indirect jobs supported by established energy sector operational spending, 2023



Source: Careers in Energy and Stokes Economics using Statistics Canada's Input-Output tables

These employment opportunities, referred to as the energy industry's "indirect jobs", are significant in numbers. In 2023, **105,500 indirect jobs** were supported in Central Canada from operational spending by established energy sectors (Figure 6). These indirect jobs are in sectors providing a broad range of goods and services required to sustain ongoing operations in conventional E&P, oil sands, energy services, pipelines and refineries. As the energy industry expands as projected in this outlook, the number of indirect jobs required to sustain operations is also expected to increase.

Indirect jobs generated by established energy sector operational spending span a variety of industries, including:

- Professional, scientific and technical services
- Wholesale and retail trade
- Finance, insurance, real estate, rental and leasing
- Administrative and support, waste management and remediation services
- Transportation and warehousing
- Manufacturing
- Repair construction
- Accommodation and food services
- Mining and quarrying
- Government services
- Utilities
- Information and culture

Energy-related construction drives thousands of jobs

An additional **5,400 indirect jobs** are created across the economy for every **$1 billion spent on developing and constructing energy infrastructure projects**.[22] Sectors that see the greatest employment benefit from the energy industry's capital project spending include:

- Oil and gas engineering construction
- Legal, accounting and architectural, engineering and related services
- Wholesale trade
- Machinery and fabricated metal manufacturing

The methodology used to determine the number of indirect jobs generated by energy spending relies on a historical relationship, so only indirect jobs associated with investment by established energy sectors can be estimated.[23] The relationship between investment in emerging energy sectors and generation of indirect jobs is yet to be determined.

Central Canada significant supplier of goods and services

Outside of Alberta, the largest supplier of goods and services to the oil sands is Ontario. More than 1,300 Ontario suppliers and nearly 600 Quebec-based businesses provide everything from steel pipe to high-tech software, which translates to jobs in both provinces.[24]

6

Labour Supply and Demand Analysis

Labour shortages in the energy industry returned with recovery from the impacts of COVID-19.

Tight labour market anticipated

CIE's labour market modelling system indicates labour shortages that affected the industry with the recovery from the COVID-19 pandemic and increased demand for energy are likely to continue.

Hiring due to industry activity and age-related attrition is projected to create a tight labour market for the duration of the forecast period to 2035. All in-scope occupations are forecast to experience a labour shortage.

A full labour supply and demand analysis can be found in the *National Labour Market Outlook to 2035* online at CareersinEnergy.ca

Photo courtesy of Canadian Association of Petroleum Producers (CAPP)

7

Conclusion: Central Canada Fuels Growth and Emissions Reductions

Photo courtesy of Enbridge

Looking ahead to 2035, Central Canada's energy industry will **need to manage dual priorities** of growing production to meet North American demand for refined petroleum products while addressing climate concerns.

Central Canada is expected to remain a significant producer of refined petroleum products and leverage its experience to expand its low-carbon fuels production, including biomass-based fuels and low-carbon hydrogen, as demand grows to meet industry compliance requirements and customers' desire for lower-emissions fuel alternatives.

Canada's second largest refinery is in Quebec

Valero's Jean Gaulin Refinery located in Lévis, QC is configured to mainly handle crude oil and major consumer products, such as gas, diesel, jet fuel, propane and heating oil. Valero Energy accounts for close to 70% of fuels consumed in Quebec, and more than 30% of fuels consumed in Eastern Canada. More than 99% of the electricity used at the refinery comes from renewable sources, including hydropower, wind, biomass and biogas. Providing quality, well-paying jobs, the refinery employs over 600 workers with an average base salary of $105,000.[25]

The region will continue to be the centre of Canada's financial, insurance and real estate, and manufacturing industries, playing a vital role in financing and equipping the energy industry's diversification and decarbonization efforts, and supporting over 100,000 indirect jobs annually.

Established energy sectors in Central Canada are not projected to be a significant source of new job creation while emerging sectors such as biomass-based fuels—and low-carbon hydrogen in the **Opportunity Scenario**—will create new opportunities. In addition to outperforming in job growth, emerging sectors will continue increasing their percentage of the total energy workforce.

Specific knowledge and skills may be required to work in Central Canada's emerging sectors, but many foundational core qualifications already exist within the current workforce. Reskilling and upskilling through short, competency-based learning opportunities, such as those offered through micro-credential programs, may be key to career resiliency for energy workers.

The impact of age-related attrition and need to address job vacancies due to retiring workers is significant and potential productivity risks of an aging workforce exist, especially in the petroleum refining, pipelines and biomass-based fuels sectors. Attracting and retaining talent in the energy industry may be challenged by competition from other industries.

To attract and retain talent, Central Canada's energy industry needs to continue focusing on:

- Advocating for its role as a leader in providing secure, stable and sustainable energy and solutions to global climate concerns.
- Strengthening the opportunity for talent to build resilient energy careers with flexible career paths, training and development opportunities, career mobility and succession planning.
- Implementing policies and programs for diverse, equitable and inclusive workplaces to enhance the ability to tap into under-utilized talent pools.

This *Regional Labour Market Outlook to 2035* is one of a number of tools and resources developed by CIE to build a roadmap that will support a robust energy sector for decades to come.

Dig deeper into regional labour market data

Find regional labour market information and data in CIE's regional labour market outlook reports online at CareersinEnergy.ca

Endnotes

[1] Careers in Energy and Stokes Economics, 2023 estimate for in-scope sectors.

[2] 2023 estimate. The number of rotational workers residing in Central Canada and working in other energy-producing regions estimated using Statistics Canada's 2023 Labour Force Survey annual data and CIE's projected employment in Central Canada in 2023.

[3] Careers in Energy and Stokes Economics using Statistics Canada Input-Output tables, 2023.

[4] Canadian Fuels Association. (2023a, June 29). *Clean fuel regulations are key to decarbonizing Canada's Transportation Sector*. https://www.canadianfuels.ca/news-commentary/clean-fuel-regulations-are-key-to-decarbonizing-canadas-transportation-sector/

[5] Workforce requirements for Canada's electricity sector are produced by Electricity Human Resources Council (EHRC). EHRC. (2023). *Electricity in Demand: Labour Market Insights 2023-2028*. https://electricityhr.ca/wp-content/uploads/2023/10/EHRC_LMIReport-EN-2.pdf

[6] Statistics Canada uses the National Occupational Classification (NOC) system to identify and categorize jobs (occupations) based on the training, education, experience and responsibilities they require. Statistics Canada. (2023, September 14). *Introduction to the National Occupational Classification (NOC) 2021 version 1.0*. Statistics Canada. https://www.statcan.gc.ca/en/subjects/standard/noc/2021/introductionV1#a1

[7] Investment in the in-scope sectors will generate further indirect employment opportunities across other industries such as engineering, finance and insurance, fabrication, accommodation and transportation. Analysis of indirect employment associated with the in-scope sectors can be found on page 22 and 23.

[8] Construction workforce is not included in this forecast, although it is recognized that expanding Canada's energy system will require significant new infrastructure. Construction workforce is a critical component to seeing necessary builds being completed on-time and on-budget. Workforce projections for Canada's construction workforce can be found at BuildForce: https://www.buildforce.ca/en

[9] Scenarios were developed with guidance of an Energy Scenarios Working Group and in consultation with industry which helped fine-tune energy production assumptions from a variety of sources including Canada Energy Regulator, Environment and Climate Change Canada, and Rystad Energy.

[10] CIE's labour market model takes capital and operational expenditures into account for the conventional exploration and production, oil sands and energy services sectors. Further details can be found in the methodology report online at CareersinEnergy.ca

[11] Enbridge. (n.d.). *The Dawn Hub: Reliability. liquidity. security*. https://www.enbridgegas.com/storage-transportation/doing-business-with-us/our-dawn-facility

[12] Canadian Fuels Association. (2023, March 2). *Fuel production*. https://www.canadianfuels.ca/our-industry/fuel-production/

[13] Ven Venkatachalam, V. (2022, June 10). *The impact of oil and gas on Ontario's economy*. https://madethecanadianway.ca/the-impact-of-oil-and-gas-on-ontarios-economy/#:~:text=Thousands%20of%20kilometres%20of%20pipelines,contributes%20to%20the%20provincial%20economy

[14] Duhatschek, P. (2023, July 12). *Demand for biofuels sparks Canadian boom. but will U.S. subsidies pull investment south?* CBCnews. https://www.cbc.ca/news/canada/calgary/canada-biofuel-production-us-ira-1.6903008#:~:text=In%20recent%20years%2C%20much%20of,does%20Canada%27s%20canola%20processing%20sector

Endnotes

[15] University of Minnesota Duluth, Bureau of Business and Economic Research for Advance Biofuels Canada. (2021, January 15). *Economic Impact of Current and 10-Year Projections of Biofuels Production in Canada*. Economic Impact of Current and 10-Year Projections of Biofuels Production in Canada.pdf (umn.edu)

[16] Recyclage Carbone Varenne. (2023, October 30). *Varennes Carbon Recycling: A biofuel plant for a green economy*. https://rcv-vcr.com/

[17] Enbridge Inc. (n.d.). *Clean hydrogen enters the Markham Energy Mix*. https://www.enbridge.com/stories/2022/january/hydrogen-blending-project-enbridge-gas-cummins-operational-markham-ontario

[18] LMIC (2023, November 14). *What is a "good" job?* Labour Market Information Council. https://lmic-cimt.ca/what-is-a-good-job/

[19] Statistics Canada. Table 36-10-0489-05. Total compensation per job, by NAICS industry.

[20] CTVNews (2023, April 9). *Quebec municipalities struggling to cope with labour shortage*. https://montreal.ctvnews.ca/quebec-municipalities-struggling-to-cope-with-labour-shortage-1.6348189

[21] CTVNews. (2023, January 6). *Looking for a job or career change? these skills will be in high demand in 2023, experts say*. https://www.ctvnews.ca/business/looking-for-a-job-or-career-change-these-skills-will-be-in-high-demand-in-2023-experts-say-1.6220659

[22] Careers in Energy and Stokes Economics using Statistics Canada's Input-Output tables

[23] The methodology used to determine the indirect employment generated by investment in Central Canada's established energy industry is separate from CIE's modelling system used to determine direct employment. The economic impact analysis presented uses interprovincial, inter-industry input-output tables of the economy published by Statistics Canada to estimate the economic impacts (including employment impacts) of specific industry expenditures on other industries and across provinces.

[24] Oilgascanada. (2021, December 28). *10 things you probably didn't know about Canadian oil and natural gas*. Context Magazine by CAPP. https://context.capp.ca/articles/2021/10-things-you-probably-didnt-know-about-canadian-oil-and-natural-gas/

[25] Valero Energy Inc. (n.d.). *Jean Gaulin refinery*. https://www.energievalero.ca/en-ca/Operations/JeanGaulinRefinery and Valero Energy Inc. (2023). *Valero Front and Centre in Quebec's Future Energy Landscape*. [Brochure]

Acknowledgements and Disclaimer

The Careers in Energy division of Energy Safety Canada gratefully acknowledges the Government of Canada for the funding to undertake and complete this study.

Careers in Energy is also grateful for the time and expertise provided by the following organizations:

- Advanced Biofuels Canada
- Atlantica Centre for Energy
- Avatar Innovations
- Canadian Association of Energy Contractors (CAOEC)
- Canadian Fuels Association (CFA)
- Canadian Association of Geophysical Contractors (CAGC)
- Canadian Association of Petroleum Producers (CAPP)
- Carbon Management Canada (CMC)
- Enbridge Inc.
- Energy Futures Lab
- Enserva
- geoLOGIC systems Ltd.
- LNG Canada
- Myriad Consulting Inc.
- Pathways Alliance
- Precision Drilling Corporation
- Rystad Energy
- Shell Canada Ltd.
- Treeline Well Services LP.

Thank you to the following contributors who were essential to the development of this report:

- Creative Links International Inc.
- Stokes Economics
- Systematic Solutions Inc.
- Beanstalk Communications Inc.
- Mario Scaffardi Design Inc.

Copyright and Disclaimer

Published February 2024

For permissions requests or further inquiries, please contact:
Careers in Energy, a division of Energy Safety Canada

Phone:
403.516.8100

Email:
info@careersinenergy.ca

CareersinEnergy.ca

careers in™ energy

Division of Energy Safety Canada

About Careers in Energy

Careers in Energy, a division of Energy Safety Canada, is the leading authority on labour market information and trends in Canada's energy industry. We engage and inform people about careers in energy, removing barriers to information, addressing industry and worker needs, and providing the resources and tools needed to maintain and build a skilled energy workforce for today and tomorrow.

info@careersinenergy.ca

403.516.8100 or toll free 1.866.537.1230

150, 2 Smed Lane SE, Calgary, AB T2C 4T5

CareersinEnergy.ca

Canada Funded in part by the Government of Canada's Sectoral Workforce Solutions Program