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LABOUR MARKET INFORMATION

Alberta's Cross-sectoral and Multidisciplinary Environmental Workforce: A Snapshot of Employment and Hiring Needs to 2030

August 2022

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Alberta Environmental Job Outlook Snapshot

The province's transition to a low carbon economy requires a thriving environmental workforce across all industries, regions and many occupations.

96,100
Environmental workers in 2020
(3,800 or 4%⬇ from 2019)

+28,100
Net new jobs by 2030
(29% of 2020 employment)

+29,700
Job openings due to retirements
(30% retirement rate)

57,800 Environmental net job openings to 2030

TOP INDUSTRIES

1. Professional, scientific and technical services **(18,600 jobs)**
2. Construction **(6,400 jobs)**
3. Manufacturing **(4,300 jobs)**

TOP SPECIALIZATIONS

1. Water Quality **(26,700 jobs)**
2. Sustainability **(25,700 jobs)**
3. Air Quality **(24,200 jobs)**

TOP OCCUPATIONS

1. Civil engineers **(3,700 jobs)**
2. Inspectors in public and environmental health and occupational health and safety **(2,200 jobs)**
3. Geoscientists and oceanographers **(1,800 jobs)**

Priority solutions

- **Improve under-representation of select groups**
- **Upskilling, reskilling, and future-proofing the workforce**
- **Learning and development that meets future demand**

Introduction

The past few years have been incredibly challenging and frustrating for Alberta and Albertans. The province has been hit hard with a protracted oil and gas downturn, environmental disasters, geopolitical issues, a reputational crisis, a novel but global pandemic, and social and political unrest.

Alberta's economic woes peaked in 2020. The province's GDP contracted by 8.2%—following Northwest Territories (-10.4%) but by far the highest across all provinces.[1] Unemployment rates reached as high as 15.3% and disadvantaged some regions and demographic groups.[2]

The year 2021 was welcomed by many. Alberta's economic and job recovery were swift and steep with many hard-hit industries regaining what they had lost in the last year. GDP improved by 5.1%, employment surpassed pre-pandemic levels, and the unemployment rate dropped to 7.5% by December 2021.[3]

Alberta has more to look forward to—the province is expected to lead real GDP growth in 2022 and 2023.[4] And yet, many questions and uncertainties remain.

- What will it take to sustain this growth?
- Can or should the province diversify its economy?
- Are the province's industries prepared to answer the calls for a net-zero economy?
- How will the province overcome uneven and long-term unemployment?
- What jobs will grow or emerge in the context of a digital, diversified, and low-carbon economic transformation?

Canada, along with many nations across the globe, is calling for a more responsible and sustainable way toward economic growth. This report intends to shed light on where environmental jobs and talent exist today and where new opportunities lie ahead for the remainder of this decade.

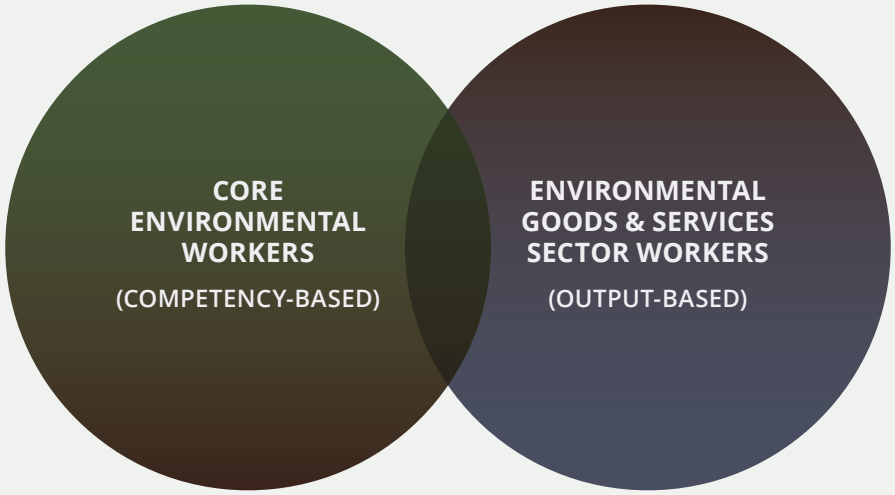
Our Alberta environmental labour demand outlook to 2030 kicks off with a review of how this decade started and follows with our employment and hiring projections for the province overall and by industry, occupation, and environmental areas of specialization. This report closes with recommended workforce solutions, such as drawing from unemployed and underemployed workers, to meet hiring needs and bridge labour and skill shortages.

The data and insights from this report can help inform business, policy, program, and career decisions. It can help bust myths and reveal opportunities for industries, employers, government, communities, academia, and individuals. After all, environmental talent in every industry and discipline will be essential for Alberta to reach a sustainable, prosperous, inclusive and equitable future.

SPOTLIGHT: Defining Environmental Jobs and Our Approach

Canada's environmental workforce drives or supports the goals of natural resource management, environmental protection, and sustainability. Our definition includes:

- Core environmental workers (i.e., those in roles requiring specialized environmental competencies) regardless of industry, and
- Those directly employed within the environmental goods and services firms, regardless of occupation.



A Chief Sustainability Officer and Remediation Specialist working in oil and gas; a Conservation Officer in government; a Water and Wastewater Treatment Operator in utilities; an Energy Auditor and Environmental Engineer in construction; and an Environmental Advisor, Accountant, and Human Resource Advisor working in an environmental consulting firm are all included in our definition (see our Career Profiles to explore over 100 roles that are part of Canada's growing environmental workforce).

We also classify environmental workers according to 13 key environmental specializations or sub-sectors, from Air Quality to Fisheries & Wildlife, Natural Resource Management, and Environmental Education & Training (see our sector model for the complete list of specializations/sub-sectors).

SPOTLIGHT: Defining Environmental Jobs and Our Approach Continued

This study presents estimates for environmental employment and net hiring requirements in Alberta from 2020 to 2030. Our labour demand outlook integrates multiple sources of data:

- Online job postings from Gartner's TalentNeuron,
- Statistics Canada's Census and Labour Force Survey,
- Employment and Social Development Canada's Canadian Occupational Projection System,
- GDP growth in accordance with an average of long-term growth forecasts published by the Parliamentary Budget Office, the Department of Finance Canada, and the Organisation for Economic Co-operation and Development (OECD), and
- Sectoral trends for industries within this framework are provided by Stokes Economics.

Environmental employment is estimated by identifying the 2020 EnviroShare—the proportion of environmental workers compared to all workers at the occupational level—and applying these to forecasted employment data. **Net hiring requirements** are derived by combining jobs created from employment growth (expansion demand) and jobs that become available as workers retire (replacement demand).

Numbers have been rounded in many cases for readability.

Refer to Appendix A for more information about our labour demand forecast and Appendix B for a sample list of occupations included in our study, including those mapped to core environmental workers.

Looking Back: Environmental Employment at the Height of the COVID-19 Pandemic

Nationally during the COVID-19 pandemic, environmental employment grew by 5% (+34,500 jobs) while total employment declined by 5% (-993,400)—spurring the notion that the green workforce is pandemic-proof. Sadly, we did not see the same trajectory for Alberta and other oil-producing regions.

As Canada's 4th largest provincial environmental employer, Alberta saw total and environmental employment levels dip to 2.2M and 96.1K, respectively as COVID-19 measures and the oil and gas downturn persisted. However, environmental employment declined at a smaller pace (-4%) compared to total employment in Alberta (-8%).

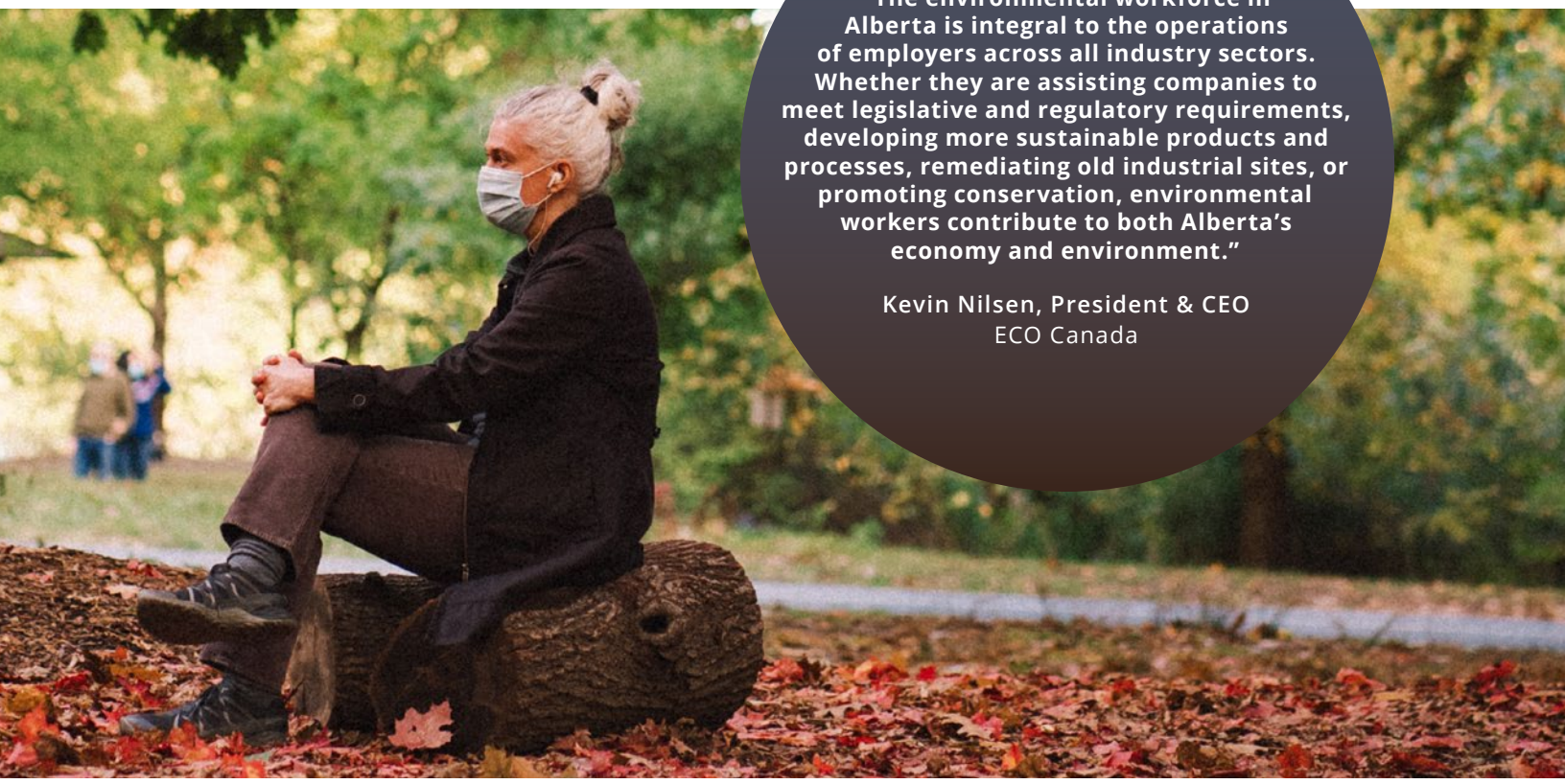
	CANADA			ALBERTA		
	2019	2020	Variance	2019	2020	Variance
Total Employment	19,112,200	18,118,800	-5%	2,343,000	2,164,400	-8%
Environmental Employment	**655,400**	**689,900**	**5%**	**99,900**	**96,100**	**-4%**
EnviroShare	3.4%	3.8%		4.3%	4.4%	

Temporary suspensions in environmental monitoring, along with reduced investments and activity within the petroleum industry, contributed to the green job losses. After all, the oil and gas extraction sector's spending on environmental protection activities was the second largest in 2019.[5] Construction, one of the top users of clean technologies in 2019[6], also experienced a significant decline in activity and employment levels, particularly for resource-related activities.

Spikes in other environmental initiatives helped temper the environmental employment declines seen in 2020:

- Energy diversification and electrification
- Emissions reduction
- Site rehabilitation
- Nature-based solutions
- Climate change mitigation and adaptation
- Cleantech exports
- COVID-19 research and vaccine development

Consequently, the proportion of environmental to total employment—or EnviroShare—increased to 4.4% in 2020 from 4.3% in 2019. Even more interesting is that Alberta's year-over-year EnviroShare is higher than the national EnviroShare of 3.8% in 2020, which increased from 3.4% in 2019. The transition to a net-zero economy and the greening of the workforce are well underway; and, regardless of the ups and downs in the job market, Alberta's key industries are at the forefront of this transformation.



"The environmental workforce in Alberta is integral to the operations of employers across all industry sectors. Whether they are assisting companies to meet legislative and regulatory requirements, developing more sustainable products and processes, remediating old industrial sites, or promoting conservation, environmental workers contribute to both Alberta's economy and environment."

Kevin Nilsen, President & CEO
ECO Canada

SPOTLIGHT: Composition of the Environmental Workforce in Alberta

Roughly 1 in 23 workers in Alberta (96,100) were in an environmental role in 2020. About 39,600 or 41% were core environmental workers.

Top Occupations

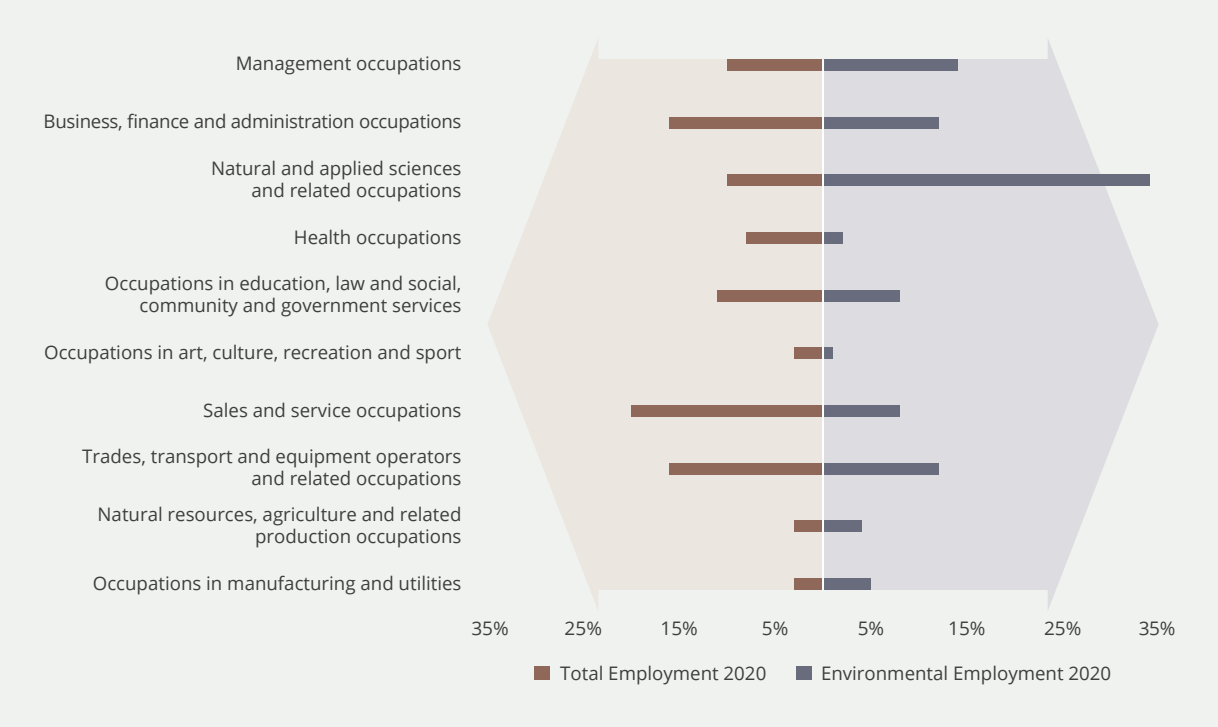
More than one-third of environmental workers were in Natural and applied sciences and related occupations, a job family that includes scientists, engineers, engineering technologists and technicians, and information technology specialists. Management occupations comprise another 14% of Alberta's environmental workforce while comprising only 10% of Alberta's total workforce.

THE TOP JOB FAMILIES IN THE ENVIRONMENTAL WORKFORCE WERE:

- Natural and applied sciences and related occupations **(32,400)**
- Management occupations **(13,500)**
- Trades, transport and equipment operators and related occupations **(11,700)**
- Business, finance and administration occupations **(11,100)**

SPOTLIGHT: Composition of the Environmental Workforce in Alberta Continued

At the 4-digit NOC, the top occupations for environmental employment are completely different than the top occupations by environmental employment share:



- Civil engineers **(4,300)**, Petroleum engineers **(3,400)** and Inspectors in public and environmental health and occupational health and safety **(3,100)** round out the top three occupations for environmental employment.
- The highest environmental employment shares are observed for Meteorologists and climatologists **(64.2%)**, Lumber graders and other wood processing inspectors and graders **(62.8%)** and Water and waste treatment plant operators **(58.7%)**.

Except for Lumber graders and other wood processing inspectors and graders, all of the occupations listed above involve core environmental workers (i.e., those in roles requiring environmental-specific competencies).

Refer to Appendix B for a sample list of 4-digit NOC's with the corresponding 2020 employment estimates and EnviroShare.

SPOTLIGHT: Composition of the Environmental Workforce in Alberta Continued

Top Industries

The largest industry employer of environmental workers in 2020 was Professional, scientific and technical services, reflecting **more than a quarter** of the total number of environmental workers in Alberta **(25,500 workers)**. This industry also has the highest environmental employment share at **14.6%**. As an industry which is heavily reliant on the knowledge and experience of its workers to deliver value to clients and end-users, the sector will require qualified environmental workers to reach environmental and business objectives.

Manufacturing **(8,600** and **6.9%)** and Mining, quarrying and oil and gas extraction (**8,600** and **6.8%**) are also among the top industries for both environmental workers and EnviroShare.

Industries and Occupations Crosscut

The top occupations employed in Alberta's key industries are very different. For instance, under the umbrella of Construction, equipment operators and managerial roles are more frequently observed. In contrast, Professional, scientific and technical services sees a larger proportion of engineers and specialists. The Utilities sector, which has the 2nd highest environmental employment share **(9.0%)** among all industries, has notable needs for Electrical power line and cable workers **(230)** and Water and waste treatment plant operators **(220)**. Industries interact with environmental objectives in different ways thereby requiring different environmental workers to achieve the desired results.

SPOTLIGHT: Composition of the Environmental Workforce in Alberta Continued

Table 1

Top Occupations (4-digit NOC) by Industry (2-digit North American Industry Classification System or NAICS)

Industry (NAICS)	Environmental Employment Share in 2020	Environmental Employment in 2020	Top Occupations (based on environmental employment)
All industries	**4.4%**	**96,100**	• **Civil engineers (4,260)** • **Petroleum engineers (3,410)** • **Inspectors in public and environmental health and occupational health and safety (3,210)**
Professional, scientific and technical services (54)	14.6%	25,500	• Civil engineers (3,120) • Information systems analysts and consultants (1,010) • Inspectors in public and environmental health and occupational health and safety (1,000)
Utilities (22)	9.0%	1,900	• Electrical power line and cable workers (230) • Water and waste treatment plant operators (220) • Oil and gas well drillers, servicers, testers and related workers (90)
Manufacturing (31-33)	6.9%	8,600	• Forestry professionals (500) • Manufacturing managers (410) • Senior managers – construction, transportation, production and utilities (360)
Mining, quarrying and oil and gas extraction (21)	6.8%	8,600	• Petroleum engineers (2,210) • Oil and gas well drillers, servicers, testers and related workers (540) • Contractors and supervisors, oil and gas drilling and services (470)
Public administration (91)	5.6%	5,800	• Police officers (except commissioned) (580) • Firefighters (450) • Forestry professionals (320)
Administrative and support, waste management and remediation services (56)	5.4%	3,800	• Water and waste treatment plant operators (260) • Inspectors in public and environmental health and occupational health and safety (220) • Landscaping and grounds maintenance labourers (210)
Agriculture, forestry, fishing and hunting (11)	4.4%	2,300	• Managers in agriculture (1,680) • Forestry professionals (120) • Logging machinery operators (60)
Construction (23)	4.3%	9,300	• Heavy-duty equipment mechanics (670) • Construction managers (660) • Home building and renovation managers (640)

SPOTLIGHT: Composition of the Environmental Workforce in Alberta Continued

Top Specializations

THE TOP SPECIALIZATIONS FOR ENVIRONMENTAL EMPLOYMENT IN THE PROVINCE ARE:

- Sustainability **(39,400)**
- Energy **(37,900)**
- Natural Resource Management **(35,100)**

Note: A worker or job could be mapped to one or more specializations or sub-sectors.

Specializations and Occupations Crosscut

Top specializations vary by occupation, with Site Assessment and Reclamation, Natural Resource Management and Waste Management appearing in the top five for Civil engineers, Petroleum engineers, Inspectors in public and environmental health and occupational health and safety, and Information systems analysts.

The top specializations for each occupation:

- **71%** of Civil engineers contribute to Water Quality
- **42%** of Petroleum engineers work in Site Assessment and Reclamation
- **80%** of Inspectors in public and environmental health and occupational health and safety work in Environmental Health and Safety
- **48%** of Information systems analysts and consultants contribute to Sustainability

SPOTLIGHT: Composition of the Environmental Workforce in Alberta Continued

Table 2

Top Occupations by Environmental Specialization

Specialization or Sub-sector	2020 Environmental Employment	Top Occupations (based on environmental employment in 2020)
Sustainability	39,400	• Civil engineers (2,850) • Petroleum engineers (1,400) • Inspectors in public and environmental health and occupational health and safety (1,380)
Natural Resource Management	35,100	• Civil engineers (2,630) • Inspectors in public and environmental health and occupational health and safety (1,480) • Forestry professionals (1,180)
Environmental Health & Safety	34,200	• Inspectors in public and environmental health and occupational health and safety (2,490) • Civil engineers (2,240) • Petroleum engineers (1,020)
Site Assessment & Remediation	34,100	• Civil engineers (2,670) • Inspectors in public and environmental health and occupational health and safety (1,500) • Petroleum engineers (1,440)
Waste Management	33,500	• Civil engineers (2,950) • Inspectors in public and environmental health and occupational health and safety (1,440) • Natural and applied science policy researchers, consultants and program officers (1,300)
Fisheries & Wildlife	30,700	• Civil engineers (2,240) • Inspectors in public and environmental health and occupational health and safety (1,420) • Petroleum engineers (1,020)
Water Quality	28,900	• Civil engineers (3,010) • Inspectors in public and environmental health and occupational health and safety (1,470) • Construction managers (870)
Policy & Legislation	17,800	• Civil engineers (1,420) • Inspectors in public and environmental health and occupational health and safety (940) • Natural and applied science policy researchers, consultants and program officers (860)
Communications & Public Awareness	7,900	• Natural and applied science policy researchers, consultants and program officers (1,300) • Civil engineers (710) • Inspectors in public and environmental health and occupational health and safety (540)
Research & Development	5,500	• Natural and applied science policy researchers, consultants and program officers (860) • Civil engineers (800) • Inspectors in public and environmental health and occupational health and safety (590)
Education & Training	5,400	• Natural and applied science policy researchers, consultants and program officers (860) • Civil engineers (730) • Inspectors in public and environmental health and occupational health and safety (580)

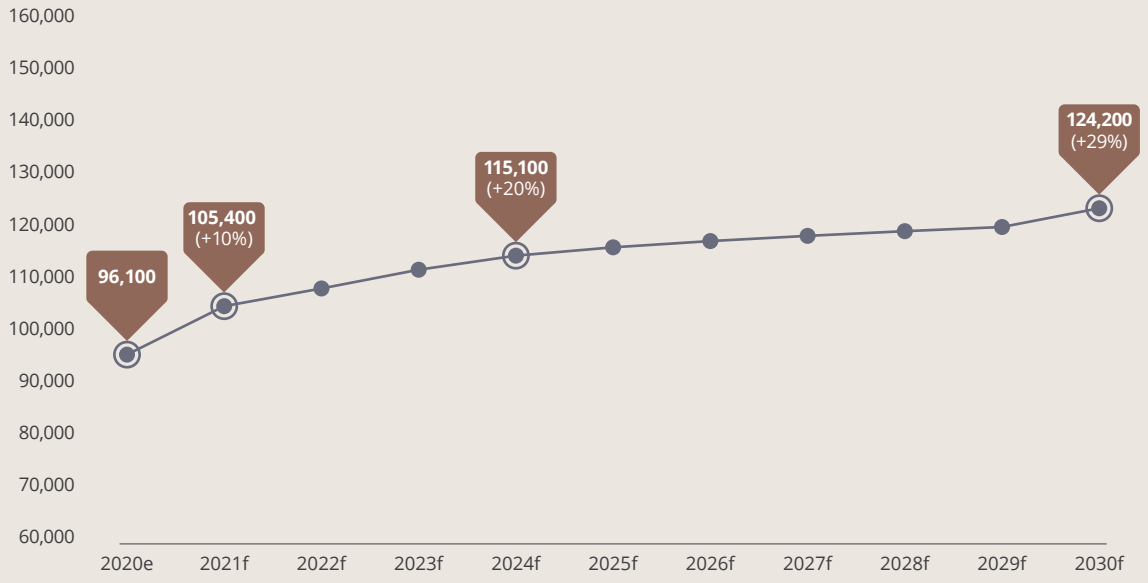
Looking Forward: Environmental Hiring Needs in the Next Decade

Alberta, the province with the deepest economic contraction in 2020, is on pace to post the biggest expansion of 2021 and possibly beyond. Uncertainty remains, but Alberta's favourable economic outlook bodes well for many businesses, communities and individuals.

Our employment forecast indicates a slightly steeper growth for the province's environmental workforce to 2030, with an estimated 2.9% year-over-year growth in environmental employment—compared to only 2.5% annual growth for overall employment. Approximately **28,100 net new environmental jobs** will be added in the next decade, with about 70% of expansion demand generated in the first five years. The short-term spike in expansion demand is indicative of a quick job recovery following the impact of the pandemic and oil price collapse.

Figure 1

Environmental Employment in Alberta, 2020 to 2030

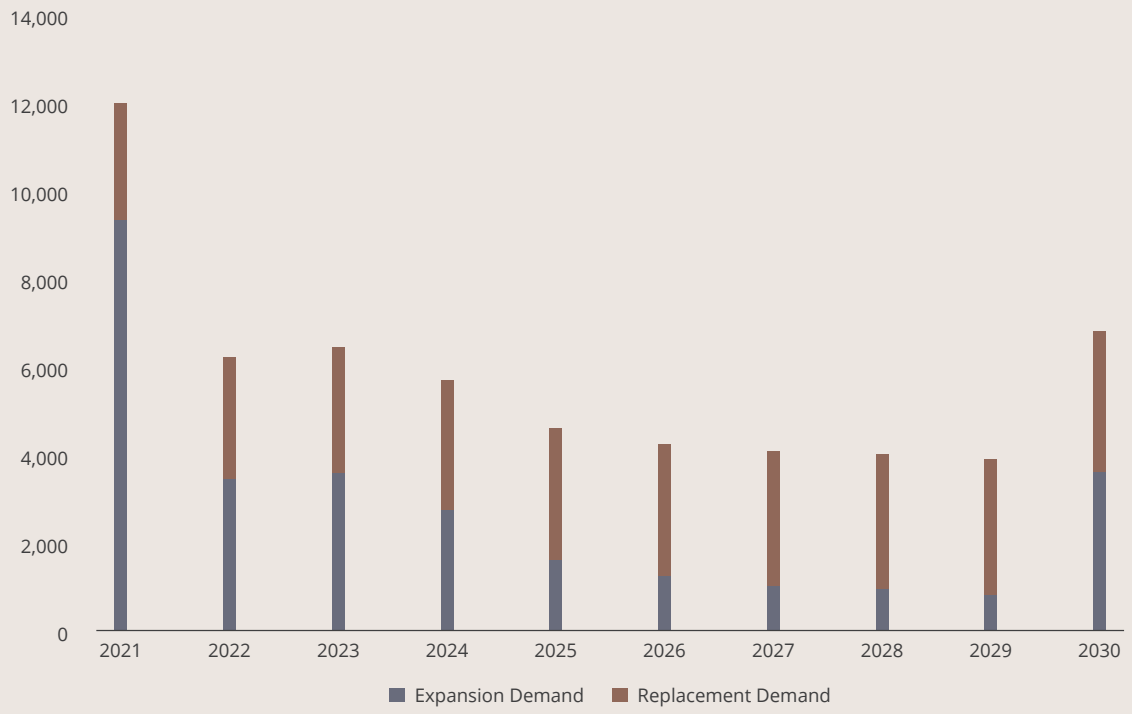


Investments in Environmental, Social, and Governance (ESG) and sustainability initiatives, emissions reduction technologies (e.g., Carbon Capture and Storage), hydrogen production, energy management, energy-efficient buildings and transportation, cleantech manufacturing, lifecycle management and the circular economy, ecotourism, and the reduction or elimination of single-use plastics, will contribute to the rise of Alberta's green economy.

When expansion demand is combined with replacement demand, we estimate that **57,800 net environmental job openings will need to be filled by 2030**. This hiring number equates to over 60% of 2020 employment and provides a career stream for new and existing talent. A cause for concern in the medium to longer term is Alberta's aging population. This trend is also prevalent in the environmental workforce where we could see over 30% of the current workforce retire in the next 10 years. Employers must engage and develop both new and experienced workers to meet labour demand through 2030.

Figure 2

Environmental Net Hiring Requirements to 2030



Where will hiring come from?

Top Industries

The largest growth will come from the Professional, scientific and technical services sector **(10,500 new environmental jobs)** followed by Construction **(3,400)**, Transportation and Warehousing **(2,000)**, Administrative and support, waste management and remediation services **(1,400)**, and Manufacturing **(1,400)**.

Some of the smaller industry employers will see above-average growth rates, led by Arts, entertainment and recreation (101% growth), Accommodation and food services (55%), Transportation and warehousing (52%), Real estate and rental and leasing (47%), and Wholesale trade (42%).

Table 3

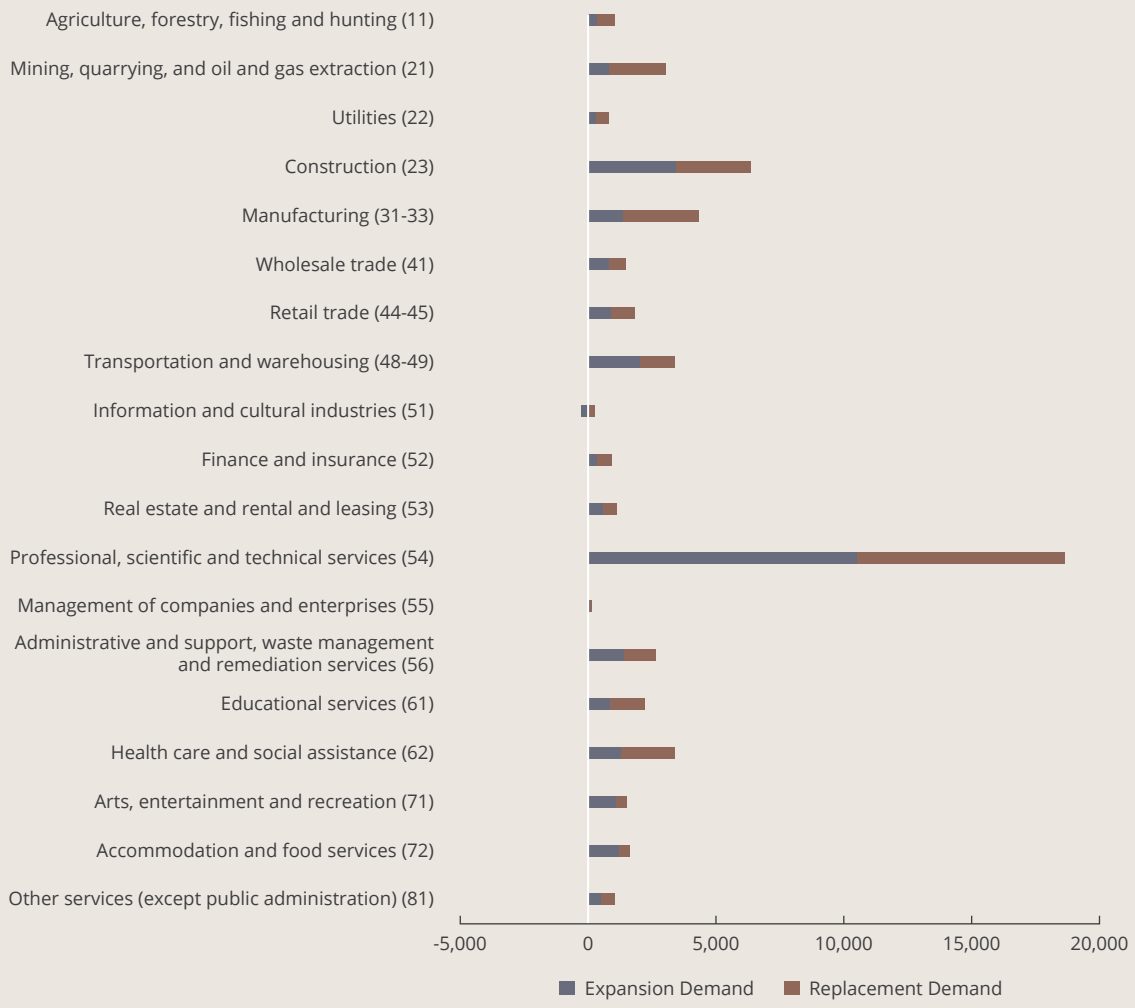
Environmental Net Hiring to 2030, by Industry

Industry	2020 Environmental Employment	Expansion Demand to 2030	Replacement Demand to 2030	Net Hiring Requirements to 2030	% of 2020 Employment
All Industries	**96,100**	**28,100**	**29,700**	**57,800**	**60%**
Agriculture, forestry, fishing and hunting (11)	2,300	350	700	1,050	45%
Mining, quarrying, and oil and gas extraction (21)	8,600	780	2,200	2,980	35%
Utilities (22)	1,900	290	500	790	42%
Construction (23)	9,300	3,430	2,900	6,330	68%
Manufacturing (31)	8,600	1,360	3,000	4,360	51%
Wholesale trade (41)	1,900	800	700	1,500	79%
Retail trade (44)	3,200	860	1,000	1,860	58%
Transportation and warehousing (48)	3,800	2,000	1,400	3,400	90%
Information and cultural industries (51)	1,300	-260	200	-60	-1%
Finance and insurance (52)	2,300	320	600	920	40%
Real estate and rental and leasing (53)	1,200	580	500	1,080	90%
Professional, scientific and technical services (54)	25,500	10,510	8,100	18,610	73%
Management of companies and enterprises (55)	200	40	100	140	70%
Administrative and support, waste management and remediation services (56)	3,800	1,390	1,300	2,690	71%
Educational services (61)	4,400	860	1,300	2,160	49%
Health care and social assistance (62)	6,700	1,280	2,100	380	50%
Arts, entertainment and recreation (71)	1,100	1,080	400	1,480	135%
Accommodation and food services (72)	2,100	1,180	500	1,680	80%
Other services (except public administration) (81)	1,800	490	600	1,090	61%
Public administration (91)	5,800	790	1,600	2,390	41%

While some industries will experience high expansion demand through 2030, others, like Mining, quarrying, and oil and gas extraction, may undergo significant replacement demand due to an aging workforce.

Figure 3

Environmental Net Hiring Requirements to 2030, by Industry



Construction and Manufacturing are the 2nd and 3rd largest industries for both environmental replacement demand and environmental net hiring to 2030.

- Construction replacement demand is **46%** of net hiring requirements **(6,400)**
- Manufacturing replacement demand is **69%** of net hiring requirements **(4,300)**

Top Occupations

Net hiring requirements are highest for:

- Civil engineers **(3,700 jobs)**,
- Inspectors in public and environmental health and occupational health and safety **(2,200)**, and
- Geoscientists and oceanographers **(1,800)**

Table 4

Environmental Net Hiring Requirements, by Occupation

Occupation (NOC)	2020 EnviroShare	2020 Environmental Employment	Expansion Demand to 2030	Replacement Demand to 2030	Net Hiring Requirements to 2030	% of 2020 Employment
All occupations	**4.4%**	**96,100**	**28,100**	**29,700**	**57,800**	**60%**
Civil engineers (2131)	46.9%	4,260	2,450	1,220	3,670	86%
Inspectors in public and environmental health and occupational health and safety (2263)	38.6%	3,120	1,140	1,040	2,180	70%
Geoscientists and oceanographers (2113)	33.3%	820	1,300	520	1,820	222%
Construction managers (0711)	13.1%	1,460	1,080	580	1,660	114%
Contractors and supervisors, oil and gas drilling and services (8222)	18.6%	1,700	1,070	540	1,610	95%

Refer to Appendix B for the Top 100 occupations based on the net hiring requirements to 2030.

Top Specializations

The top three specializations for expansion demand are the same as the top three for 2020 employment:

- Sustainability **(12,980)**
- Energy **(12,350)**
- Natural Resource Management **(11,880)**

Energy diversification will drive change for Alberta and Albertans and involve multiple industry sectors. At the same time, Alberta is still rich in natural resources, and the management and responsible development of our agricultural, forest, oil and gas, and other resources will be a key focus for current and future generations.

The top three specializations for replacement demand are:

- Water Quality **(16,170)**
- Air Quality **(15,320)**
- Sustainability **(12,700)**

Net hiring requirements are highest for:

- Water Quality **(26,700)**
- Sustainability **(25,680)**
- Air Quality **(24,160)**

Table 5

Environmental Net Hiring Requirements, by Environmental Specialization

Specialization or Sub-sector	2020 Environmental Employment	Expansion Demand to 2030	Replacement Demand to 2030	Net Hiring Requirements to 2030
Air Quality	24,520	8,840	15,320	24,160
Water Quality	28,880	10,530	16,170	26,700
Site Assessment & Remediation	34,120	10,850	8,070	18,920
Waste Management	33,500	11,590	9,490	21,080
Environmental Health & Safety	34,150	10,520	10,580	21,100
Energy	37,870	12,350	10,870	23,220
Fisheries & Wildlife	30,710	10,600	12,230	22,830
Natural Resource Management	35,080	11,880	9,900	21,780
Sustainability	39,440	12,980	12,700	25,680
Education & Training	5,350	2,060	1,730	3,790
Research & Development	5,530	1,940	1,830	3,770
Policy & Legislation	17,820	5,210	5,540	10,750
Communications & Public Awareness	7,940	2,480	2,440	4,920

SPOTLIGHT: Orphan Well Reclamation

Alberta's Site Rehabilitation Program (ASRP)

- An Alberta government program funded in part by the Government of Canada
- Provides grants to oil field service contractors to perform well, pipeline, and oil and gas site closure and reclamation work
- Up to $1 billion in funding was available
- Allocation of funds ended in March 2022 but projects are still under way

Key Challenges related to ASRP[7]

- The ASRP is a short-term fix, but it's a long-term issue
- Workers have left the sector due to volatility
- The industry lacks appeal for youth and new entrants
- Need to build the capacity of Indigenous communities to be a true partner

Long-term Considerations

- Work continues and is likely steady under the Orphan Well Association
- Could provide job stability for oil and gas service workers if planned around the seasonality and cyclicality of work (i.e., during periods of downtime)
- Could attract new talent, such as youth, seeking work that contributes to a positive environmental outcome

Primary well-servicing occupations involved in site rehabilitation

- Contractors and supervisors, oil and gas drilling and services (NOC 8222)
- Oil and gas well drillers, servicers, testers and related workers (NOC 8232)
- Oil and gas drilling, servicing and related labourers (NOC 8615)

SPOTLIGHT: Orphan Well Reclamation Continued

Two crosscuts were prepared to better understand employment needs and trends for these roles for site rehabilitation: within the *Site Assessment & Reclamation* (SAR) sub-sector and within the *Administrative and support, waste management and remediation services* industry (NAICS 56).

In the Site Assessment & Reclamation sub-sector:

- Contractors and supervisors, oil and gas drilling and services rises 19.0% (from 1,310 in 2021 to 1,560 in 2030)
- Oil and gas well drillers, servicers, testers and related workers rises 8.2% (from 320 in 2021 to 340 in 2030)
- Oil and gas drilling, servicing and related labourers rises 9.3% (from 85 in 2021 to 95 in 2030)

In Administrative and support, waste management and remediation services:

- Contractors and supervisors, oil and gas drilling and services rises 17% (from 110 in 2021 to 120 in 2030)
- Oil and gas well drillers, servicers, testers and related workers rises 23% (from 110 in 2021 to 140 in 2030)
- Oil and gas drilling, servicing and related labourers rises 29% (from 35 in 2021 to 45 in 2030)

Additional federal and provincial funding for the program would increase environmental employment in these occupation-industry crosscuts over the later part of the forecast period.

From Here to There: Talent Strategies to Meet Environmental Labour Demand

Our 2021 national outlook report and sector studies reveal that talent gaps are anticipated and already exist in some pockets.[8] These include:

- Legislators and senior management
- Engineering inspectors and regulatory officers & Inspectors in public and environmental health and occupational health and safety; Non-destructive testers and inspection technicians
- Utilities equipment operators and controllers (including Water and wastewater treatment plant operators)
- Physical and life sciences professionals
- Construction managers; Construction millwrights and industrial mechanics
- Electrical and electronics engineers; Aerospace engineers and Other professional engineers, n.e.c.
- Architects; Landscape architects; Urban and land use planners & Land surveyors
- Forestry technologists and technicians & Conservation and fishery officers; Agricultural and fish products inspectors
- Managers in manufacturing and utilities
- Contractors and supervisors, mining, oil and gas

A variety of skills are also in high demand. These range from technical, personal and interpersonal skills such as knowledge of environmental policies and legislation, green literacy, digital literacy, project management, critical thinking, communication and a positive attitude.

In its latest occupational outlook, Alberta has noted a few occupations with a forecasted labour shortage of more than 3,000 workers by the year 2030:

- Construction trades helpers and labourers
- Information systems analysts and consultants
- Administrative assistants
- Home building and renovation managers
- General office support workers
- Accounting technicians and bookkeepers
- Petroleum engineers

Additionally, the province expects a shortage of Registered nurses and registered psychiatric nurses over the next two years.[9]

It is for these reasons that we embarked on the development of an environmental talent strategy for Alberta. In February 2022, we brought together representatives from industry associations, employers, governments, academia, equity-seeking organizations, and economic groups to craft and prioritize strategic solutions. Recommended solutions were organized into nine groupings with examples of actions that could be taken and organizations that need to be involved, reflecting the unique needs of Alberta's green economy.

Strategic Talent Solutions

New or underutilized talent sources

1. **Improve under-representation of select groups**
   - Provide end-to-end support to remove barriers around supply attraction, integration and retention
   - Address workplace barriers to increase inclusiveness and representation of diverse groups from junior through to senior career levels
2. **Transitioning workers from other sectors**
   - Identify and describe pathways into growing environmental occupations and facilitate successful transitions. This could apply to military and newcomer transitioners and subject matter experts that can benefit from employment and training support for intermediate workers. This is an "under-serviced" group that often has more advanced interpersonal and soft skills valuable for companies to retain

3 Career awareness and industry attraction

- Broad campaigns to elevate the profile of the sector and jobs and promote careers
- Targeted campaigns to enhance understanding and perceptions of the sector to help fill emerging and critical occupations and increase industry appeal. Newcomers are more likely to be trained and oriented to traditional roles and may not sufficiently appreciate the opportunities in the environmental sector.
- Cultural assumptions about the environmental sector need to be challenged
- Career awareness activities for a sector are more effective when done collaboratively rather than competitively
- There is an ongoing need to develop occupational information as current occupations are evolving to meet sustainability requirements. For example, the evolving permitting process increasingly exposes planners to regional issues, community members and climate change concerns

Workforce retention and development

4 Improved retention and productivity

- Help employers build capacity by developing promising practices, tools and resources
- Support employees who may be facing unplanned absences while retaining them and maintaining their productivity and performance
- Help employers respond to shifts in the expectations of field vs. office employees and balance these with getting the work done. This relates to hours required to get a project done, working remotely versus hybrid working arrangements and demands of people for "remote-work" only jobs. Career awareness products and development approaches can better reflect the nuanced nature of environmental roles by including information on role expectations and exploring experiential learning opportunities to increase workers' exposure to work requirements
- Retention of trades workers needs to recognize their impact in completing complex processes such as building commissioning and recommissioning. These will be severely impacted if skilled trades are unavailable

5 Career development and pathways

- Career pathways to inform education and career decisions, both for new careers and jobs and existing jobs that require skill upgrading. It is difficult to find employers who can speak to new careers and skills at a granular level to inform educational programming
- Develop experiential learning opportunities for careers and job seekers
- Develop occupational standards to support career awareness and highlight entry points, all of which help with worker assessment and recognition and support planning for professional development

6 Succession planning/ knowledge retention

- Document and promote talent management best practices and lessons learned for capacity building and knowledge retention for employers

7 Upskilling, reskilling, and future-proofing the workforce

- Promote lifelong learning and support the development of workplace-based training to diversify the skills of existing workers
- Online training - build and promote digital literacy to increase participation in learning
- Remove education barriers, especially financial support, to obtain credentials and post-secondary education (e.g., micro loans)

Long-term, structural issues – greater influence on future workers

8 Learning and development that meets future demand

- Increase the capacity of the education system to support in-demand and growing occupations. This requires on-the-ground industry representatives to work hand in hand with education partners
- "Future-proofing" the workforce requires a different approach to career training compared to traditional methods and is more likely to include learners from cross-disciplinary skill sets. The process by which post-secondary educational institutions develop new diploma programs with Alberta Advanced Education could be streamlined so that it is more responsive to the rapidly evolving nature of the energy and environmental ecosystem and its workforce requirements. For example, accreditation processes for Norquest College's Energy Management Diploma involved the requirement to cite jobs and titles that graduates would work in. This did not recognize that there are multiple jobs where titles are currently unknown and that participants of the program were generally skilled and experienced individuals wanting to build on their existing roles
- Micro-credentials, adding and highlighting environmental curriculum to existing programs and promoting that these are good occupations are a responsive way to address many skills needs

9 Assessing and recognizing competency/transferability

- Learning how to assess and map the competencies of every worker regardless of their level to determine their value and advancement pathways and address skills gaps

Prioritizing the Solutions

The following shows the priority solutions identified by the session participants. Prioritization was determined through voting, with participants using the below criteria to indicate the top three solutions to best leverage opportunities and address challenges:

Importance
Solution provides value to the sector; addresses a critical problem; and consequences of not addressing the problem are significant.

Urgency
Issue needs to be dealt with as soon as possible through a solution or immediate action.

Impact
Benefits and long-term effects of the solution to the issue(s).

Opportunity/ Availability
Availability of programs, initiatives, or funding that can be adapted or leveraged to address the solution. Solutions considered available are those that are "low hanging fruit" or having "best practices".

Half of participants voted for:

1. **Improve under-representation of select groups**
2. **Upskilling, reskilling, and future-proofing the workforce**
3. **Learning and development that meets future demand**

Futher discussions of the top three solutions resulted in action ideas and suggestions of who needed to be involved as partners, leaders or participants.

Under-representation of select groups

- **Bridging programs** have been a strong strategy to get immigrants into industry
  - Tech industry doing a really good job at this and creating awareness of their efforts. Nobody is talking about environmental jobs.
  - Need to increase awareness of environmental careers and include messages that reinforce the value/impact of the sector to relate to values of job seekers. Career advisors are another important audience.
  - Develop bridging programs that incorporates training to prepare for environmental occupations, ensuring there is significant partnerships with industry as well as other NFP organizations that offer similar or complementary services
  - Utilize mentorship to complement bridging

- **Specific barriers to entry** exist for environmental sectors including knowledge of the industry and roles and opportunities available and pathways to entry.
  - Support employer awareness of barriers to entry and different accommodations that may be needed such as transportation, different approaches to learning to reflect varying learning styles and work ethics.
  - Provide potential job-seekers with information on careers, entry points and training requirements
- **Small businesses represent a unique opportunity** as they often have greater flexibility to meet the unique needs of this workforce. Finding a niche for underrepresented groups may help keep people in sector longer
  - Support small businesses to create opportunities for under-represented workers with programs such as mentorship and soft-skill building
  - Enable small organizations to work in hubs/networks to collaborate and provide peer support to create opportunities and "taking a risk" with underrepresented communities
  - ECO Canada's mentorship program – could be a tool to mentor underrepresented groups and support liaising with industry

Upskilling, reskilling, and future-proofing the workforce

- **Keeping pace with the evolution in marketplace**, including environmental sector, is critical through upskilling and training and R&D. Technology development is a key driver of training needs.
  - Companies can do this by working with organizations such as Mitacs, AB Innovates and universities
- **Regulations need to be better understood** and more consistent changes in regulations across the board are needed
  - Impacted organizations may not be fully aware of regulatory changes
  - Connecting and partnerships with regulatory bodies is the best way to obtain an early indication of changes so that skill development can be proactive
- **Career pathway development and transition support for the intermediate cohort**. These workers are skilled at what they do and may be doing difficult work. Over time, the sector loses these people, or they get stuck in one role. Companies do not have the operational flexibility to give people time to implement a transition plan to, for example, move from the field to the office. Smaller employers may not be able to do workforce planning, understand future needs and talent risks and undertake future-proofing. Intermediate workers have technical experience but often need soft skills development for communication, organizational skills, professionalism, etc.
  - Support companies in the creation of transition plans to improve awareness of new/alternative positions and their requirements and how to implement them to future-proof their companies and retain their employees
  - Support (time and money) is needed to give them opportunities to transition
  - Program elements include: mentoring, raising awareness around funding to support training, e.g., Canada Jobs Grant

- **Building community** amongst environmental services firms and other types of companies is needed to keep each other abreast of what's going on, reach a common understanding of needs and have a stronger voice with policy makers. A voice with policy makers is important to create an awareness of the magnitude/impact of their decisions on environmental actions or developments. e.g., Planners Institute previously worked with government to increase their awareness of the impact of their decisions.
  - Regular dialogue between companies and industries can improve results and encourage collaboration amongst competitors, e.g., an employee sharing program to address talent shortages
  - Need an organization to host regular engagement meetings and create a community for environmental services firms, e.g., Environmental Services Association of Alberta (ESSA) has brought environmental services groups together and created a mechanism for collaboration. This included helping policymakers to understand the context for their decisions and policies
  - Funding and support to establish a hub of small organizations that can collaborate to create opportunities.
  - Not-for-profits have specific needs and potential benefits to reach out to other NFPs to find ways to share information and collaborate. Alberta Real Estate Foundation was cited as an example of an organization that provides funding grants that could be an opportunity
- **A formal mechanism for keeping up with skill and competency requirements** as they adjust over time
  - includes currency on technology and regulatory changes. SHRED funding has helped in the past and needs to be more robust with a longer window
  - ECO is working to revamp competency profiling by bringing it down to the role level and using this information to create a competency dictionary, with regular maintenance and updating of the roles
- **Mentoring programs** to increase access to and participation. Companies don't know they are an option, what they are and how to utilize them.
  - Provide mentoring programs, promote their availability and provide a structure to support participation

Learning and development that meets future demand

- **Concrete plans to achieve "net-zero by 2050"** are needed by companies to support the development of training and careers
  - Need resources and support to come up with concrete goals to achieve climate goals and related talent planning

- **Development of talent pipelines for the environmental services sector** (e.g., consulting firms) is needed as they are feeding grounds for core environmental services companies. As new industries and types of environmental services expand so too does the need for trained people. Skilled and experienced workers are often pulled from the environmental services sector and this affects the efficiency of the sector as a whole. Critical training programs of colleges and other PSEs are tied to market cycles and disruptions: as enrollment decreases then programs are cancelled until demand picks up. Need a long-term pipeline view and actions to recognize we are placing increasing demands on the same pool of talent.
  - PSEs need greater structural stability over the long-term to keep the training and talent and pipeline going sufficiently to feed environmental services
  - Wage funding for hiring new grads
  - Upskilling for intermediate cohort

Leveraging organizations and resources to move forward with the solutions

A few organizations and resources were cited by participants as opportunities to advance the priority solutions:

- Energy Management Diploma at NorQuest launched last Fall – developed in collaboration with diverse energy industry stakeholders (oil and gas, utility providers, renewables, etc.)
- Bow Valley College – Directions for Immigrants
- Calgary and Edmonton Regional Immigrant Employment Councils – CRIEC and ERIEC; mentoring programs for immigrant professionals open to all professions
- Natural Resources Canada
- United Nations Association of Canada – Empowering Immigrant Women
- Canada Green Corps (CGC) Science and Technology Internship Program (STIP)
- Canada Land Reclamation Association (CLRA, Alberta Chapter
- Calgary Economic Development – for sectors of focus
- IRC (Indian Resource Council)
- Alberta Real Estate Foundation provides funding grants

Alberta has since launched its Alberta Recovery Plan and Alberta at Works initiatives, with a key focus on skills development. When supplemented by federal and industry-initiated programs, these labour market solutions could go a long way in ensuring there's an abundant supply of qualified environmental talent in the weeks, months and years to come.

Likewise, the convergence of economic, regulatory, social and technological trends—such as evolving environmental policies and legislation, the greening of businesses and lifestyles, geopolitics, and innovation—will continue to shape environmental talent needs in the decade ahead. A key input to developing and refining a provincial green talent strategy is to monitor these trends and other employment drivers to have an in-depth understanding of current and upcoming labour and skill needs.

Appendix A: Scope and Methodology for the Labour Demand Outlook

This report presents **environmental employment estimates from 2020 to 2030** as well as the forecasted net environmental job openings **(net hiring requirements)** in Alberta within the 10-year period that result from:

- the creation of new jobs **(expansion demand)**, and
- jobs that become available as people retire **(replacement demand)**.

Labour demand estimates are available at the aggregated level but also by:

1. **Occupation**, using the 2016 National Occupational Classification (NOC) at the 4-digit level.
   - **Core Environmental Workers**: workers requiring specialized environmental competencies, regardless of industry.
2. **Industry**, based on the 2017 North American Industry Classification System (NAICS) at the 2-digit level.
3. **Environmental specialization**, based on ECO Canada's sector model.

OCCUPATIONAL MAPPING

Environmental workers in Canada were mapped to 458 of 500 NOC's and of those, 60 were attributed to core environmental work. In Alberta, environmental workers were mapped to 326 NOC's and core workers were matched to 56 NOC's.

Our labour demand model begins with a textual analysis of online job postings to develop an estimate of how environmentally intensive different occupations are. This estimate, referred to as the "environmental job share" **(EnviroShare)**, is determined at the occupational and provincial/territorial levels, normalized using 2016 Census data, then applied to a long-term forecast of the demand for labour in the Canadian economy to project the number of environmental workers needed in the coming decade.

Estimating the share of environmental jobs in the Canadian economy

With at least 75% of job vacancies in Canada advertised on the web[10], online job posting data have emerged as a useful indicator of hiring needs and trends.

Over the last few years, companies have built large databases using online job search platforms. Our approach uses a dataset compiled by Gartner TalentNeuron, which includes data from sources such as Monster.ca, the Canada Job Bank, Emploi-Québec, WorkBC, BCJobs.ca, JobServe, ECO Job Board, as well as the job boards of individual companies.

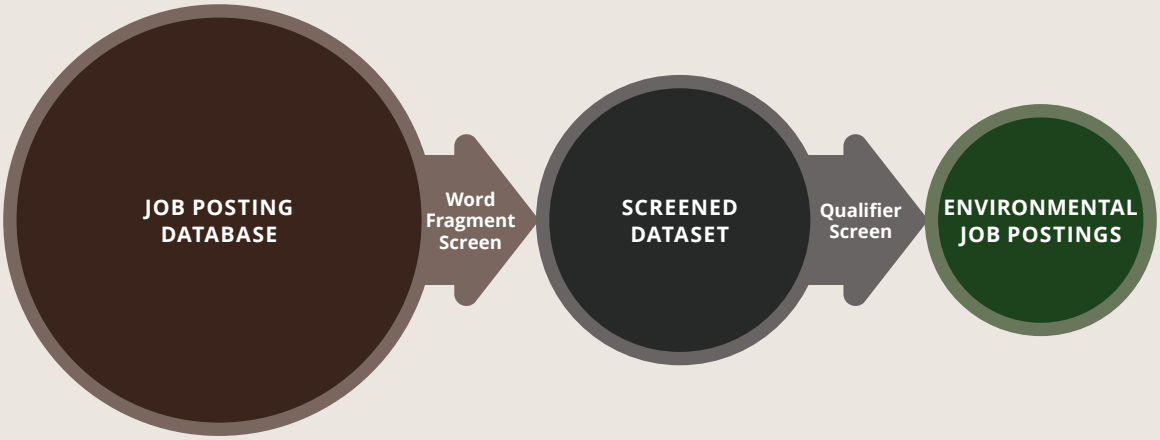
The TalentNeuron dataset includes information such as the full text of the job description (in French or English), job type (full-time versus part-time), location, level of desired education, and additional skills or certifications required for the position. TalentNeuron analyzes posting data to identify unique positions (to reduce the possibility of duplication over multiple sites) as well as the occupation of the position as defined by NOC. If key components of a NOC code or regional information were missing, these data were not included in the model as part of the analysis.

To identify jobs that have environmental components, the full database of job postings is searched for keywords. This filtering has two stages:

1. The entire TalentNeuron database is searched against a screening set of 124-word fragments that typically appear in English and French environmental job descriptions. Postings that pass the screening test are put in a screened dataset for further analysis.

Figure A1

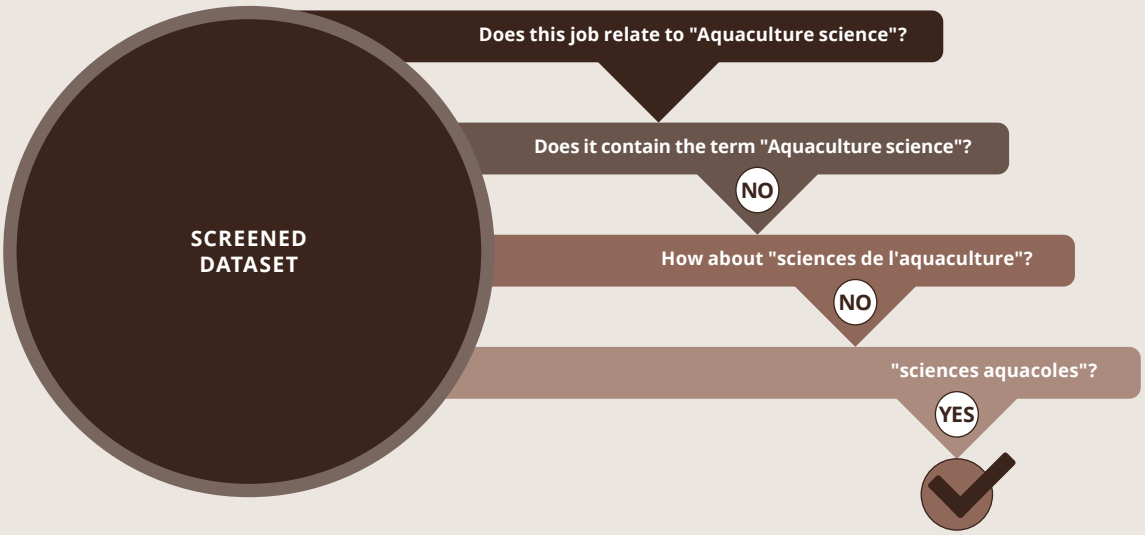
Identifying Environmental Job Postings



2. An additional set of 505 qualifying search terms are then applied to the job postings. Each search term is further associated with a list of variants to capture differences in language and terminology. For example, the qualifying term "aquaculture science" is associated with the following variant text strings: "aquaculture science", "sciences de l'aquaculture", and "sciences aquacoles". A job posting with at least one variant match is classified as having a positive match for the qualifying term "aquaculture science".

Figure A2

Refining and Qualifying Screened Dataset (Stage 2)



Each job listing is tested against each variant. Each unique position advertised is then given a score based on how many qualifying terms tested positive in job posts for that position. Job postings above a particular score threshold are classified as "environmental positions" for analysis and reporting.

"**EnviroShare**" is the share of all positions in the TalentNeuron database that are classified as environmental positions relative to those that were not identified as environmental. EnviroShare was calculated for each occupation and province or territory.

PROVINCIAL DATA FOR CIVIL ENGINEERS (NOC 2131) IS PRESENTED FOR ILLUSTRATIVE PURPOSES:

- **669** Total number of online environmental job postings in Alberta in 2020
- **1,257** Total number of online job postings in Alberta in 2020
- **53.3%** EnviroShare in 2020

Estimating the size of the environmental workforce

To estimate the current size of the environmental workforce, the environmental job shares from 2020 data were applied to published annual employment data from Statistics Canada, adjusted against 2016 Census data.

PROVINCIAL DATA FOR CIVIL ENGINEERS (NOC 2131) IS PRESENTED FOR ILLUSTRATIVE PURPOSES:

- **6,158** Total employed labour force in Alberta in 2020
- **53.3%** EnviroShare
- **3,221** Estimated environmental employment in 2020 + Adjustments

This approach may overstate the size of the environmental workforce, since it may be the case that the positions that are being hired for are more likely to be environmental jobs than the jobs which are not being listed. Since there is no baseline set of data to compare these results to, however, the extent of this issue is not quantifiable. It is expected that the continuance of this analysis to include additional years of data, given the large number of postings for each year, will continue to improve the representativeness of the dataset used to quantify occupations.

Environmental employment projections are also produced by occupation and by province or territory. Although many occupations see year-over-year increases in historical EnviroShare, we did not attempt to forecast a trend for changes in EnviroShare within occupations. Forecasting long-term trends based on such a small sample is too speculative to include in this analysis. It is our intention to conduct trends analysis in the future as more years of job posting data are available.

Estimating hiring demand

Our estimate of future hiring requirements for environmental workers includes expansion demand and replacement demand. Expansion demand is the number of new jobs that are estimated to be available as environmental activity increases over time and is determined by calculating the variance between 2020 and 2030 employment. Replacement demand is the number of job openings that result from current workers leaving the labour force and needing to be replaced.

PROVINCIAL DATA FOR WATER AND WASTE TREATMENT PLANT OPERATORS (NOC 9243) IS PRESENTED FOR ILLUSTRATIVE PURPOSES:

- **804** Estimated environmental employment in 2020
- **899** Estimated environmental employment by 2030
- **95** Expansion demand by 2030
- **238** Replacement demand by 2030
- **333** Net hiring requirements by 2030

Future trends in environmental labour demand were prepared by Prism Economics and Analysis. These forecasts have been developed to align with the following measures:

- M3 scenario for population growth and age distribution published by Statistics Canada
- Labour participation rates from the Canadian Occupational Projection System (COPS) model
- GDP growth in accordance with an average of long-term growth forecasts published by the Parliamentary Budget Office, the Department of Finance Canada, and the Organisation for Economic Co-operation and Development (OECD)
- Sectoral trends for industries within this framework provided by Stokes Economics
- Occupational distributions based on the industrial organization found in the 2016 Census and from industry trends in labour productivity seen in the Canadian economy from 2010 to 2016

The labour market forecast used for this analysis is a long-term forecast and reflects a consensus of projections regarding the growth of Alberta's economy.

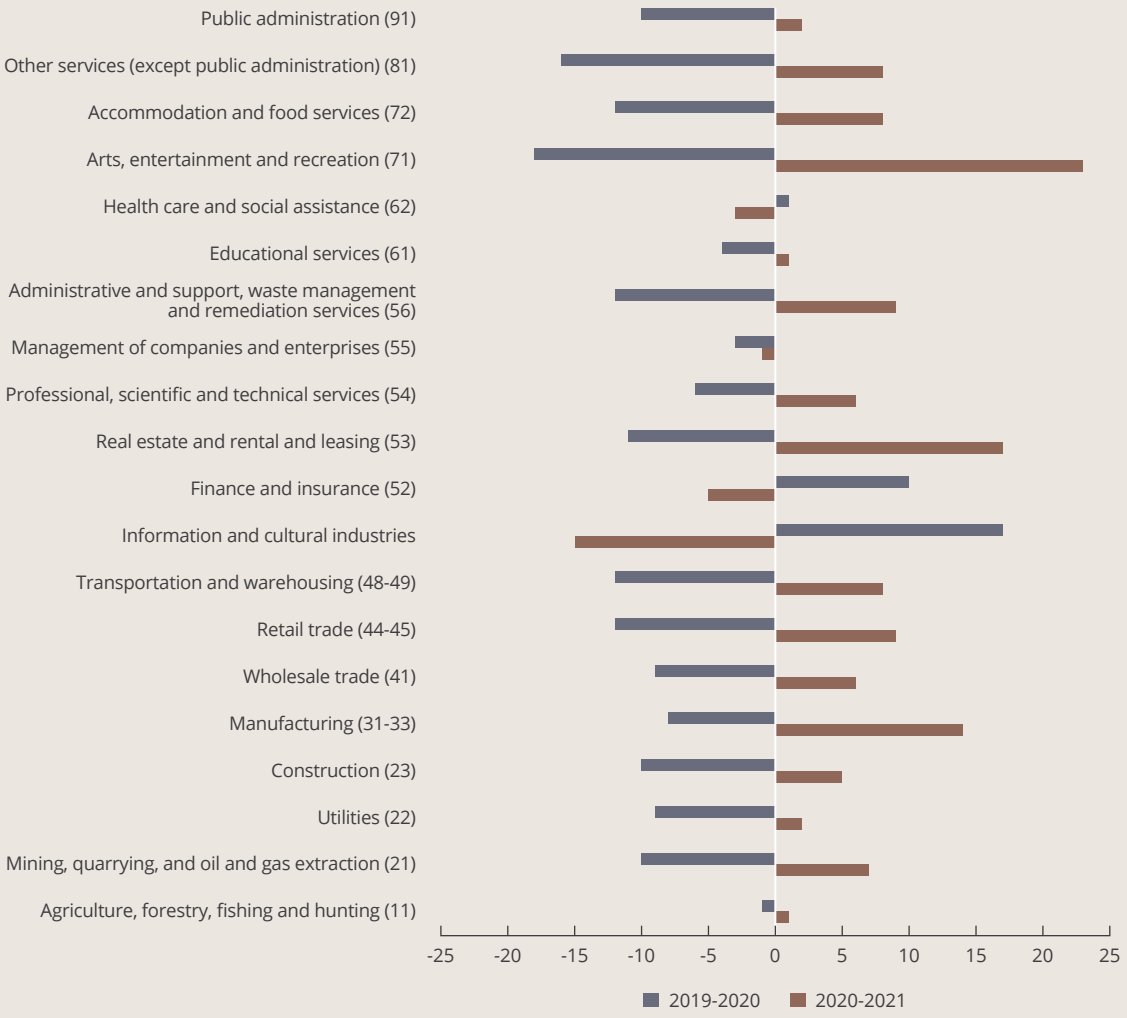
Baseline employment numbers for 2020 reflect the impact of the 2020 recession brought on by both COVID-19 and the collapse in energy prices.

The early part of the forecast period reflects the economic volatility created by COVID-19 and low oil prices. From 2019 to 2020, all but three industries experienced a decrease in total employment. The largest employment declines were observed in Arts, entertainment and recreation (-18%) and Other services (except public administration) (-16%). Employment fell 12% in the Accommodation and food services, Administrative support, waste management and remediation services, Transportation and warehousing and Retail trade industries. In contrast, employment in Information and cultural industries rose 17% during the period, the Finance and insurance industry showed 10% employment growth and Health care and social assistance experienced a small increase in employment (1%).

The following year exhibited employment growth in those sectors that had experienced declines. In some industries, employment growth from 2020 to 2021 exceeded the decline the previous year. Employment in the Arts, entertainment and recreation sector grew 23% (versus -18% the previous year), Real estate and rental and leasing grew 17% (versus -11%) and Manufacturing grew 14% (versus -8%). In other industries, the growth in employment from 2020 to 2021 did not fully offset the employment decline in 2019 to 2020.

Figure A3

Forecast Assumptions – Total Employment Growth in Alberta, 2019-2020 and 2020-2021



Stakeholder validation

We reviewed our model, inputs and outputs with key stakeholders at critical junctures of the project. This helped ensure stakeholder buy-in and support for our approach and resulting projections.

Appendix B: Environmental Net Hiring Requirements to 2030, Top 100 Occupations

Occupations marked with an asterisk (*) have been mapped to core environmental workers.

Occupation (NOC)	2020 EnviroShare	2020 Environmental Employment	Expansion Demand to 2030	Replacement Demand to 2030	Net Hiring Requirements to 2030
All occupations	**4.4%**	**96,062**	**28,119**	**29,691**	**57,810**
Civil engineers (2131)*	46.9%	4,261	2,454	1,222	3,676
Inspectors in public and environmental health and occupational health and safety (2263)*	38.6%	3,116	1,138	1,040	2,178
Geoscientists and oceanographers (2113)*	33.3%	820	1,297	524	1,821
Construction managers (0711)*	13.1%	1,461	1,082	579	1,661
Contractors and supervisors, oil and gas drilling and services (8222)	18.6%	1,704	1,071	537	1,608
Power engineers and power systems operators (9241)	16.7%	684	846	430	1,276
Engineering managers (0211)*	20.8%	803	756	424	1,180
Heavy-duty equipment mechanics (7312)	7.1%	1,073	735	417	1,152
Managers in agriculture (0821)	7.4%	1,878	450	606	1,056
Light duty cleaners (6731)	4.7%	1,064	564	444	1,008
Contractors and supervisors, pipefitting trades (7203)	25.0%	427	670	246	916
Administrative officers (1221)*	5.7%	1,082	425	479	904
Electrical and electronics engineers (2133)*	21.5%	563	654	248	902
Senior managers - construction, transportation, production and utilities (0016)*	15.1%	1,058	247	622	869

Occupation (NOC)	2020 EnviroShare	2020 Environmental Employment	Expansion Demand to 2030	Replacement Demand to 2030	Net Hiring Requirements to 2030
Janitors, caretakers and building superintendents (6733)	4.7%	720	441	388	829
Other professional engineers, n.e.c. (2148)*	49.0%	1,547	334	489	823
Senior managers - health, education, social and community services and membership organizations (0014)*	46.7%	1,080	208	561	769
Financial auditors and accountants (1111)	5.0%	1,425	256	430	686
Other administrative services managers (0114)	13.4%	199	404	263	667
Technical occupations related to museums and art galleries (5212)	30.9%	196	509	147	656
Purchasing agents and officers (1225)	8.0%	624	343	265	608
University professors and lecturers (4011)*	10.6%	601	331	269	600
Information systems analysts and consultants (2171)	7.8%	1,936	137	463	600
Water and waste treatment plant operators (9243)*	58.9%	1,080	234	343	577
Retail and wholesale trade managers (0621)	3.0%	934	196	380	576
Supervisors, petroleum, gas and chemical processing and utilities (9212)	21.7%	709	226	319	545
Chemical engineers (2134)*	37.3%	897	230	290	520
Physicists and astronomers (2111)	17.1%	34	443	74	517
Civil engineering technologists and technicians (2231)*	26.2%	973	303	207	510
Construction millwrights and industrial mechanics (7311)*	5.7%	557	232	276	508
Sales and account representatives - wholesale trade (non-technical) (6411)	2.8%	635	266	229	495

Occupation (NOC)	2020 EnviroShare	2020 Environmental Employment	Expansion Demand to 2030	Replacement Demand to 2030	Net Hiring Requirements to 2030
Property administrators (1224)	7.4%	190	299	193	492
Maîtres d'hôtel and hosts/hostesses (6511)	9.2%	654	403	67	470
Automotive service technicians, truck and bus mechanics and mechanical repairers (7321)	4.5%	634	277	187	464
Biologists and related scientists (2121)*	24.5%	531	318	145	463
Architects (2151)*	17.9%	390	288	168	456
Professional occupations in advertising, marketing and public relations (1123)	8.2%	1,115	255	199	454
Technical sales specialists - wholesale trade (6221)	5.9%	1,007	154	286	440
Petroleum engineers (2145)*	32.1%	3,412	-199	633	434
Supervisors, railway transport operations (7304)	28.6%	499	238	193	431
Mechanical engineers (2132)*	17.2%	1,366	112	318	430
Underground production and development miners (8231)	12.3%	141	341	81	422
Oil and gas well drillers, servicers, testers and related workers (8232)*	5.3%	992	182	209	391
Retail salespersons (6421)	0.9%	445	270	110	380
Non-destructive testers and inspection technicians (2261)	15.0%	141	287	91	378
Chemical plant machine operators (9421)	22.8%	364	205	172	377
Contractors and supervisors, mechanic trades (7301)*	5.9%	719	105	264	369
Food and beverage servers (6513)	2.3%	424	303	58	361

Occupation (NOC)	2020 EnviroShare	2020 Environmental Employment	Expansion Demand to 2030	Replacement Demand to 2030	Net Hiring Requirements to 2030
Agricultural representatives, consultants and specialists (2123)	24.9%	287	275	78	353
Supervisors, supply chain, tracking and scheduling co-ordination occupations (1215)	5.1%	526	153	198	351
Landscaping and grounds maintenance labourers (8612)	5.8%	524	242	106	348
Professional occupations in business management consulting (1122)*	9.9%	1,417	-29	377	348
Heavy equipment operators (except crane) (7521)	4.3%	616	170	168	338
Lawyers and Quebec notaries (4112)*	3.9%	455	167	151	318
Home building and renovation managers (0712)	3.9%	690	90	222	312
Administrative assistants (1241)	1.9%	382	150	159	309
Financial managers (0111)	6.9%	375	141	162	303
Human resources professionals (1121)*	5.3%	446	189	112	301
Construction estimators (2234)	8.8%	298	187	112	299
Other business services managers (0125)*	15.8%	224	197	96	293
Transport truck drivers (7511)	1.1%	401	158	128	286
Material handlers (7452)	1.8%	301	189	90	279
Waterworks and gas maintenance workers (7442)	21.9%	341	159	116	275
Senior managers - financial, communications and other business services (0013)	5.8%	239	121	143	264
Bartenders (6512)	4.8%	140	231	28	259
Managers in social, community and correctional services (0423)*	4.8%	219	149	107	256

Occupation (NOC)	2020 EnviroShare	2020 Environmental Employment	Expansion Demand to 2030	Replacement Demand to 2030	Net Hiring Requirements to 2030
Other labourers in processing, manufacturing and utilities (9619)	3.6%	59	181	74	255
Accounting and related clerks (1431)	2.4%	304	147	106	253
Nurse aides, orderlies and patient service associates (3413)	1.8%	462	122	130	252
Food counter attendants, kitchen helpers and related support occupations (6711)	1.1%	358	196	52	248
Elementary and secondary school teacher assistants (4413)	2.6%	347	139	106	245
Financial and investment analysts (1112)	4.7%	199	183	57	240
Police officers (except commissioned) (4311)*	6.1%	633	90	149	239
Biological technologists and technicians (2221)*	12.3%	105	186	48	234
General office support workers (1411)	1.5%	208	111	119	230
Casino occupations (6533)	8.1%	104	166	60	226
Facility operation and maintenance managers (0714)*	5.9%	111	138	88	226
Plumbers (7251)	5.6%	353	165	60	225
Human resources managers (0112)	8.1%	262	106	117	223
User support technicians (2282)	6.2%	476	124	96	220
Industrial engineering and manufacturing technologists and technicians (2233)*	23.7%	633	80	139	219
Electricians (except industrial and power system) (7241)	3.5%	453	127	85	212
Metallurgical and materials engineers (2142)	12.9%	81	166	44	210
Urban and land use planners (2153)*	21.3%	507	58	150	208

Occupation (NOC)	2020 EnviroShare	2020 Environmental Employment	Expansion Demand to 2030	Replacement Demand to 2030	Net Hiring Requirements to 2030
Firefighters (4312)*	14.1%	561	80	124	204
Supervisors, forest products processing (9215)	14.8%	76	131	68	199
Industrial electricians (7242)	11.8%	667	13	185	198
Supervisors, finance and insurance office workers (1212)	4.7%	131	119	55	174
Accounting technicians and bookkeepers (1311)	1.3%	262	65	108	173
Geological and mineral technologists and technicians (2212)	15.7%	345	104	68	172
Administrators - post-secondary education and vocational training (0421)	10.0%	153	78	93	171
Computer programmers and interactive media developers (2174)	3.4%	541	75	94	169
Telecommunications installation and repair workers (7246)	4.2%	105	120	48	168
Economists and economic policy researchers and analysts (4162)	28.9%	755	65	102	167
Petroleum, gas and chemical process operators (9232)	3.7%	253	103	63	166
Welders and related machine operators (7237)	1.9%	162	119	46	165
Shippers and receivers (1521)	1.6%	156	110	52	162
Registered nurses and registered psychiatric nurses (3012)	0.7%	298	83	72	155
Process control and machine operators, food, beverage and associated products processing (9461)	8.4%	363	36	118	154
Railway conductors and brakemen/women (7362)	9.2%	128	99	53	152

Endnotes

1 Statistics Canada, Economic impacts of COVID-19 in the provinces and territories

2 Government of Alberta, Alberta Economic Dashboard: Unemployment Rate

3 Government of Alberta, Alberta Economic Dashboard: Unemployment Rate

4 TD Economics, Provincial Economic Forecast, 2022

5 Innovation, Science and Economic Development Canada, Environmental protection expenditures, 2019

6 Statistics Canada. Table 27-10-0369-01 Clean technology use, by industry and enterprise size

7 PetroLMI https://careersinenergy.ca/wp-content/uploads/2021/09/Workforce-Impacts-from-Alberta-Well-Closures-FINAL.pdf

8 ECO Canada, www.eco.ca

9 Government of Alberta, Job Market Forecasts

10 Refer to footnote on page 10 of our report entitled Environmental Jobs and Influence on Industry: A Key Segment of the Canadian Workforce https://eco.ca/new-reports/environmental-job-market-trends/

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