The background of the cover is a scenic photograph of a rocky shoreline with a dense forest of tall evergreen trees. The sky is bright blue with scattered white clouds. The water in the foreground is dark and reflects the sky and trees.

ONTARIO'S CROSS-SECTORAL AND MULTIDISCIPLINARY ENVIRONMENTAL WORKFORCE: A SNAPSHOT OF EMPLOYMENT AND HIRING NEEDS TO 2033

MARCH 2024

ACKNOWLEDGEMENTS

This study was funded by the Government of Canada’s Sectoral Workforce Solutions Program. We are greatly appreciative of the support.

We acknowledge the data or research expertise provided by Prism Economics and Analysis, Gartner TalentNeuron, Statistics Canada, Employment and Social Development Canada, as well as other sources and resources.

We would also like to thank those who have provided ongoing advice and feedback regarding our research through ECO Canada’s National Advisory Committee.

Funded by the Government
of Canada’s Sectoral Workforce
Solutions Program



The opinions and interpretations in this publication are those of the author and do not necessarily reflect those of the Government of Canada.

DISCLAIMER

© 2024 ECO Canada

All rights reserved. The information and projections contained herein have been prepared with data sources ECO Canada has deemed to be reliable. ECO Canada makes no representations or warranties that their labour market estimates are error-free and therefore shall not be liable for any financial or other losses or damages of any nature whatsoever arising from or otherwise relating to any use of its information.

The use of any part of this publication is subject to the Copyright Act. The content may be referenced for general, educational, research, or media purposes with the following citation: Source (or “adapted from”): ECO Canada (2024). www.eco.ca.

To help others benefit from the information presented in this report, individuals or organizations are encouraged to download a copy directly from ECO Canada's website.

For comments or questions, contact: Research@eco.ca.

TABLE OF CONTENTS

Acknowledgements	2
Disclaimer	3
Ontario’s Environmental Job Outlook Snapshot	5
Total environmental workforce	5
Core environmental workforce	6
Introduction	7
SPOTLIGHT: The Environmental Workforce Defined	8
Composition of the Environmental Workforce in Ontario	10
Top Occupations	10
Top Industries	12
Top Specializations	14
SPOTLIGHT: The Rise of Green Marketing	15
Looking Forward: Environmental Hiring Needs in the Next Decade	16
Top Industries	18
Top Occupations	21
Top Specializations	22
Core Environmental Workforce Net Hiring Requirements	23
SPOTLIGHT: Save on Energy	26
Appendix A: Methodology	28
Job Share Analysis	28
Estimating and Forecasting Environmental Labour Force Dynamics	29
Challenges and Limitations	31
Appendix B: 100 Top Occupations – EnviroShare, Environmental Employment in 2024 and Net Hiring Requirements to 2033	32

ONTARIO'S ENVIRONMENTAL JOB OUTLOOK SNAPSHOT

Ontario's transition to a resource-efficient, low-carbon economy requires a thriving environmental workforce across all industries, regions and occupations.

TOTAL ENVIRONMENTAL WORKFORCE

The **total environmental workforce** includes core environmental workers (those who require environmental-specific knowledge, skills and competencies) and workers employed by environmental goods and services organizations.

We estimate that

1 IN 16 WORKERS

in Ontario are part of the total environmental workforce.



500,250

Environmental workers in 2024 (**6%** of Ontario's workforce)

+ **55,970**

Net new jobs by 2033 (**11%** growth from 2024)

+ **125,780**

Job openings due to retirements (**69%** of net job openings)

181,750

Net job openings to 2033 (**36%** of 2024 environmental employment)

TOP INDUSTRIES

Public administration
(**31,030 net job openings**)

Professional, scientific and technical services
(**29,960**)

Health care and social assistance
(**24,480**)

TOP SPECIALIZATIONS

Sustainability
(**84,400 net job openings**)

Environmental Health and Safety
(**75,940**)

Natural Resource Management
(**74,910**)

TOP OCCUPATIONS

Administrative officers
(**5,580 net job openings**)

Civil engineers
(**5,050**)

Professional occupations in business management consulting
(**4,850**)

CORE ENVIRONMENTAL WORKFORCE

Core environmental workers require environmental-specific knowledge, skills and competencies.

TOP CORE OCCUPATIONS

Administrative officers
(5,580 net job openings)

Civil engineers
(5,050)

Professional occupations
in business management
consulting
(4,850)

154,090 Core environmental workers
in 2024 (**31%** of Ontario's
environmental workforce)

+ **12,280** New jobs by 2033
(**8%** growth from 2024)

+ **39,640** Job openings due to
retirements by 2033
(**76%** of net job openings)

51,920 Net job openings to 2033
(**34%** of 2024 core
environmental employment)



INTRODUCTION

Ontario has witnessed a strong recovery post-pandemic, with substantial real GDP growth of 3.7% and strong economic expansion leading to a record level of employment in 2022. At the same time, the unemployment rate retreated to the record low of 5.6% that was observed pre-pandemic.¹

Ontario's real GDP growth is anticipated to slow to just under 1% in 2023, weighed down by a reduction in consumer spending, inflationary pressure, and higher interest rates.² Ongoing economic challenges for the province include geopolitical instability, labour shortages and inflation.³

Ontario is the leading province in generating new low-carbon transition companies, signaling the potential for economic growth and job creation and demonstrating investor confidence in the province.⁴ In addition, Ontario contains the largest inventory of building stock for low-carbon retrofitting in Canada. The province also has some of the strongest existing policy frameworks and financing tools for retrofitting existing infrastructure. Investment in low-carbon retrofits will require a skilled and growing workforce, as well as an accessible supply chain to source low-carbon products and materials.⁵

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 Ontario environmental labour demand outlook to 2033 provides employment and hiring projections for the province overall and by industry, occupation, and environmental areas of specialization.

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 Ontario to reach a sustainable, prosperous, inclusive and equitable future.

1 Stokes Economic Consulting, 2023

2 Ibid.

3 <https://occ.ca/wp-content/uploads/2023-Ontario-Economic-Report.pdf>

4 <https://climateinstitute.ca/wp-content/uploads/2022/05/Provincial-summary-EN.pdf>

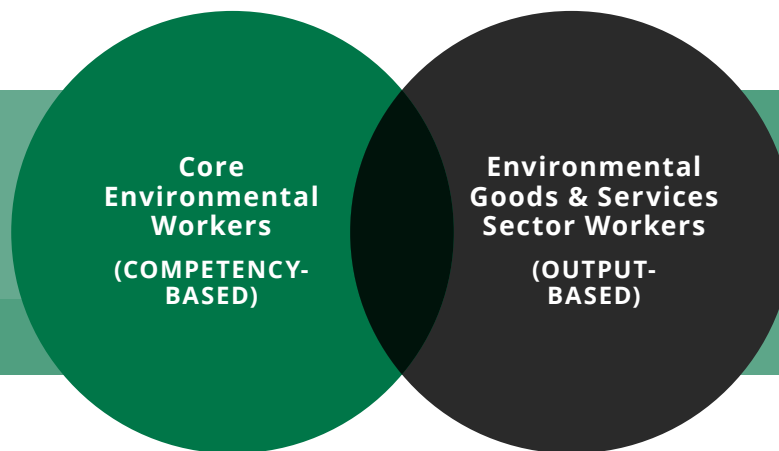
5 [Green-Retrofit-Economy-Study-20220602.pdf \(delphi.ca\)](https://www.deloitte.ca/~/media/press-releases/2022/06/green-retrofit-economy-study-20220602.pdf)



SPOTLIGHT: THE ENVIRONMENTAL WORKFORCE DEFINED

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).

This study presents estimates for environmental employment and net hiring requirements in Ontario from 2024 to 2033. Our labour demand outlook integrates multiple sources of data:

- Online job postings from 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 Organization 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 2023 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 list of 100 top occupations for environmental workers.



COMPOSITION OF THE ENVIRONMENTAL WORKFORCE IN ONTARIO

Roughly **1 in 16** workers in Ontario (500,250) are in an environmental role in 2024. About **154,100** (or **31%**) are core environmental workers.

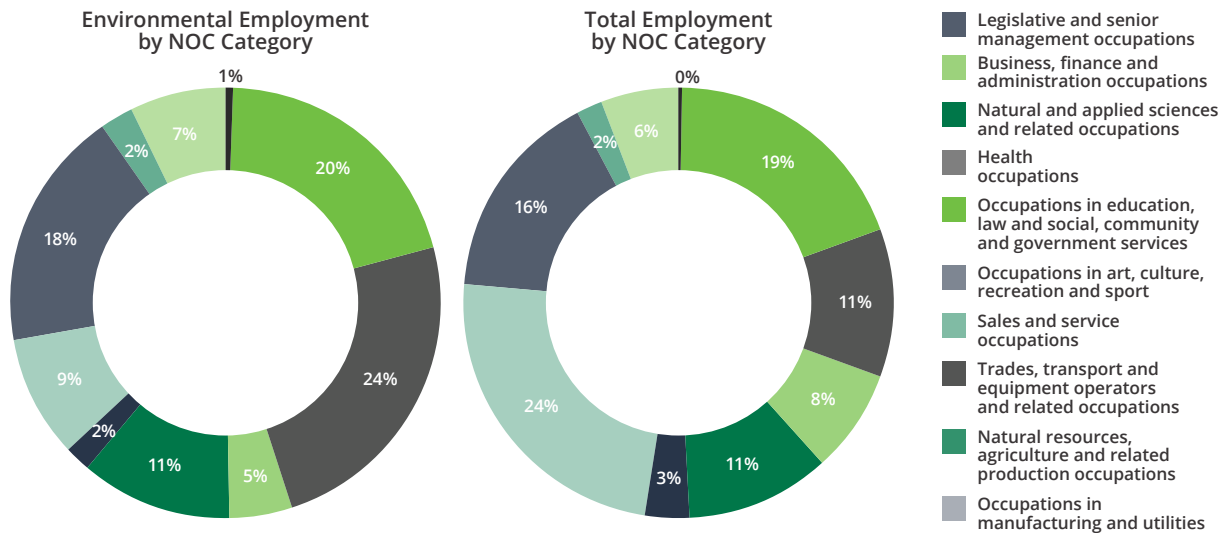
TOP OCCUPATIONS

The job families⁶ with the most environmental workers are:

- Natural and applied sciences and related occupations (**120,300**)
- Business, finance and administration occupations (**101,700**)
- Trades, transport and equipment operators and related occupations (**90,500**)

Nearly a quarter of environmental workers are in Natural and applied sciences and related occupations, a job family that includes scientists, engineers, engineering technologists and technicians, and information technology specialists, while comprising only 11% of Ontario's total workforce. Business, finance and administrative occupations comprise another **20%** of Ontario's environmental workforce.

In contrast, Sales and service occupations make up 24% of Ontario's total workforce but only **9%** of the environmental workforce.



6 1-digit National Occupational Code (NOC). For more information, visit <https://noc.esdc.gc.ca/>.

The top occupations⁷ for environmental employment are completely different than the top occupations by environmental employment share:

- Professional occupations in advertising, marketing and public relations (**26,340**), Home building and renovation managers (**15,440**) and Civil engineers (**12,920**) round out the top three occupations for environmental employment.
- The highest environmental employment shares are observed for Forestry professionals (**90%**), Water and waste treatment plant operators (**83%**) and Forestry technologists and technicians (**72%**).

Except for Professional occupations in advertising, marketing and public relations and Home building and renovation managers, all of the occupations listed above involve core environmental workers (i.e., those in roles requiring environmental-specific competencies).



7 5-digit National Occupational Code (NOC). For more information, visit <https://noc.esdc.gc.ca/>.

TOP INDUSTRIES

In 2024, the largest industry employer of environmental workers is the Professional, scientific and technical services sector, representing 14% of the total number of environmental workers in Ontario (**70,870** workers). The Public administration sector employs another 13% of Ontario's environmental workers.

Industries and Occupations Crosscut

Industries interact with environmental objectives in different ways, thereby requiring different environmental workers to achieve the desired results. As such, the top occupations employed in Ontario's key industries are very different. For instance, industrial millwrights and managerial roles are more frequently observed under the umbrella of Manufacturing. In contrast, Professional, scientific and technical services has a larger proportion of engineers. The Utilities sector has notable needs for Water and waste treatment plant operators and Power engineers and power system operators.

Table 1

Top Occupations by Industry

Industry (NAICS)	Environmental Employment in 2024	Industry Share of Environmental Employment in 2024	Top occupations (based on environmental employment)
All industries	500,250	100%	<ul style="list-style-type: none"> Professional occupations in advertising, marketing and public relations (26,300) Home building and renovation managers (15,400) Civil engineers (12,900)
Professional, scientific and technical services (54)	70,870	14%	<ul style="list-style-type: none"> Civil engineers (7,300) Professional occupations in advertising, marketing and public relations (3,700) Other professional engineers (3,400)
Public administration (91)	66,630	13%	<ul style="list-style-type: none"> Other managers in public administration (7,000) Firefighters (3,100) Police officers (except commissioned) (3,000)
Manufacturing (31)	61,290	12%	<ul style="list-style-type: none"> Manufacturing managers (7,900) Supervisors, motor vehicle assembling (2,200) Construction millwrights and industrial mechanics (1,800)
Construction (23)	53,280	11%	<ul style="list-style-type: none"> Home building and renovation managers (15,300) Construction managers (6,300) Electricians (except industrial and power system) (3,100)

Industry (NAICS)	Environmental Employment in 2024	Industry Share of Environmental Employment in 2024	Top occupations (based on environmental employment)
Health care and social assistance (62)	47,790	10%	<ul style="list-style-type: none"> Registered nurses and registered psychiatric nurses (9,200) Light duty cleaners (3,700) Professional occupations in advertising, marketing and public relations (3,000)
Utilities (22)	16,770	3%	<ul style="list-style-type: none"> Water and waste treatment plant operators (1,700) Power engineers and power systems operators (1,400) Utilities managers (1,000)
Other services (except public administration) (81)	15,230	3%	<ul style="list-style-type: none"> Professional occupations in advertising, marketing and public relations (3,600) Automotive service technicians, truck and bus mechanics and mechanical repairers (1,100) Contractors and supervisors, mechanic trades (900)
Real estate and rental and leasing (53)	13,660	3%	<ul style="list-style-type: none"> Facility operation and maintenance managers (3,800) General building maintenance workers and building superintendents (1,800) Property administrators (1,700)
Arts, entertainment and recreation (71)	10,040	2%	<ul style="list-style-type: none"> Professional occupations in advertising, marketing and public relations (1,500) Registrars, restorers, interpreters and other occupations related to museum and art galleries (900) Conservation and fishery officers (500)
Mining, quarrying, and oil and gas extraction (21)	4,570	1%	<ul style="list-style-type: none"> Underground production and development miners (700) Geological and mineral technologists and technicians (500) Managers in natural resources production and fishing (300)

TOP SPECIALIZATIONS

The top specializations for environmental employment in Ontario are:

- Sustainability (**246,510**)
- Natural Resource Management (**215,370**)
- Fisheries and Wildlife (**203,790**)

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

Figure 1

Environmental Employment by Specialization, 2024





SPOTLIGHT: THE RISE OF GREEN MARKETING

Green marketing involves genuine efforts by businesses to promote products and services as environmentally friendly. Companies adopting green marketing practices incorporate sustainability into their operations, production, and supply chains. This can include the use of eco-friendly materials, energy-efficient processes, and a commitment to reducing their overall environmental impact. Green marketing aims to attract and appeal to consumers who prioritize sustainability, fostering a positive image and building brand loyalty through authentic environmental stewardship.

ECO Canada monitors trends in job postings for environmental workers across Canada. Our most recent job posting analysis⁸ reveals that from 2021 to 2023 there were more than 1,000 environmental job ads each year for Professional occupations in advertising, marketing and public relations and 40% of all job ads in this occupation reflected a demand for environmental workers in 2023.

Our outlook for this occupation suggests that this trend will continue.

We estimate that

1 IN 5 WORKERS

in this occupation are in environmental roles and project **20,400** net job openings for environmental workers in this occupation through 2033 across Canada.

.....
ROUGHLY 63% OF THOSE JOB OPENINGS WILL BE IN ONTARIO (12,910)
.....

.....
15% WILL BE IN BRITISH COLUMBIA (3,150)
.....

.....
AND 13% IN ALBERTA (2,750)
.....



8 <https://eco.ca/research-and-resources/environmental-job-market-trends/>

LOOKING FORWARD: ENVIRONMENTAL HIRING NEEDS IN THE NEXT DECADE

Investment in the innovation and adoption of new low-carbon technologies, emission reduction strategies (e.g., retooling automotive manufacturing plants, public transit investment, phase-out of coal at steel plants), development of a hydrogen strategy, improving waste management practices and moving towards a circular economy, and low-carbon retrofits to existing infrastructure, will contribute to the rise of Ontario's green economy.

Our employment forecast indicates growth for the province's environmental workforce until at least 2033, with an estimated average annual growth rate of 1.2%, in line with the estimated average annual growth rate of 1.4% for total employment. Approximately **55,970 net new environmental jobs will be added in the next decade**. Roughly 60% of expansion demand is expected to be concentrated in the next five years. The rate of growth is anticipated to be slightly tempered in the latter half of the decade.

Figure 2

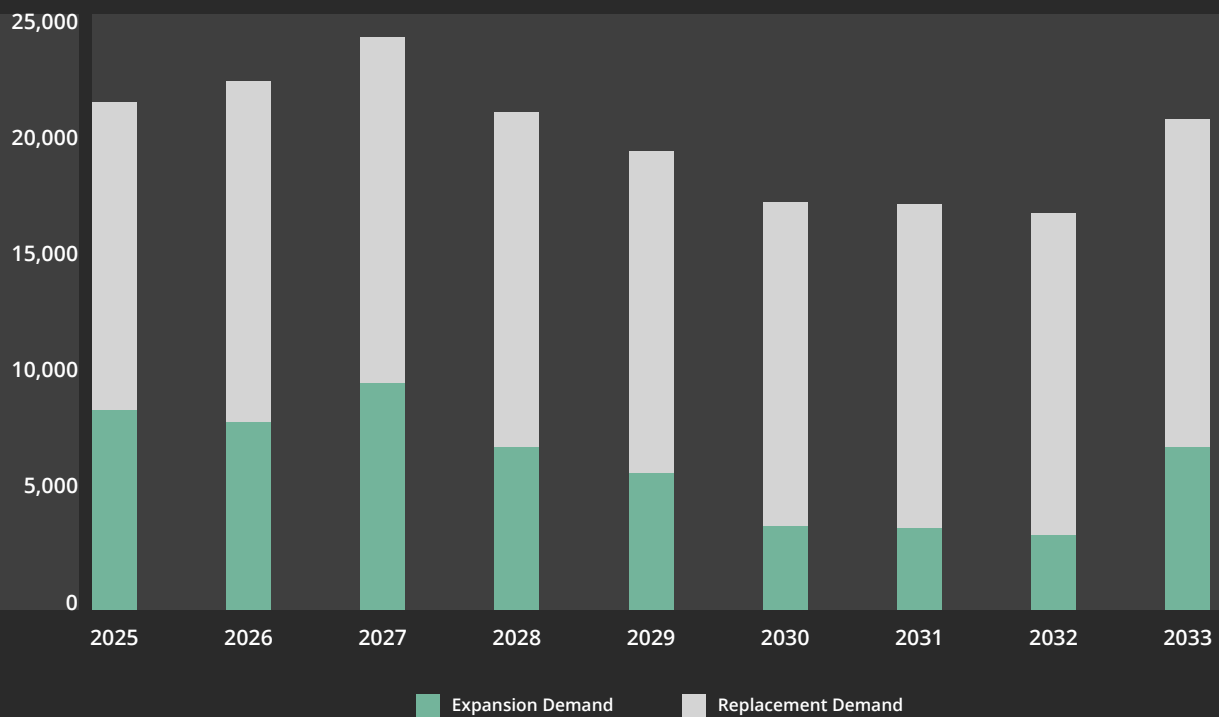
Environmental Employment in Ontario, 2024 to 2033



When expansion demand is combined with replacement demand, we estimate that **181,750 net environmental job openings will need to be filled by 2033**. This hiring number equates to 36% of 2024 environmental employment and provides a career stream for new and existing talent. A cause for concern in the medium to longer term is Ontario’s aging population. This trend is also prevalent in the environmental workforce, where our forecast shows an estimated 25% of the current environmental workforce will be retiring over the next 10 years. Employers must engage and develop both new and experienced workers to meet labour demand through 2033.

Figure 3

Environmental Net Hiring Requirements to 2033



Where will hiring come from?

TOP INDUSTRIES

The largest hiring demand for environmental workers will come from the Public administration sector (**31,030** net job openings) followed by the Professional, scientific and technical services sector (**29,960**), Health care and social assistance (**24,480**), Construction (**20,970**), and Manufacturing (**20,970**).

Table 3

Net Hiring Requirements for Environmental Workers to 2033, by Industry

Industry (NAICS)	Environmental Employment in 2024	Expansion Demand 2024-2033	Replacement Demand 2024-2033	Net Hiring Requirements 2024-2033	Net Hiring Requirements as a % of Environmental Employment in 2024
All Industries	500,250	55,970	125,780	181,750	36%
Public administration (91)	66,630	12,660	18,370	31,030	47%
Professional, scientific and technical services (54)	70,870	13,550	16,410	29,960	42%
Health care and social assistance (62)	47,790	12,550	11,930	24,480	51%
Construction (23)	53,280	6,430	14,540	20,970	39%
Manufacturing (31)	61,290	-4,290	15,770	11,480	19%
Real estate and rental and leasing (53)	13,660	4,090	4,860	8,950	66%
Finance and insurance (52)	23,220	3,270	5,160	8,430	36%
Educational services (61)	27,090	1,350	6,140	7,490	28%
Administrative and support, waste management and remediation services (56)	15,460	1,820	3,830	5,660	37%
Wholesale trade (41)	16,880	1,050	4,180	5,230	31%
Other services (except public administration) (81)	15,230	1,600	3,540	5,140	34%
Retail trade (44)	20,420	-20	5,040	5,020	25%

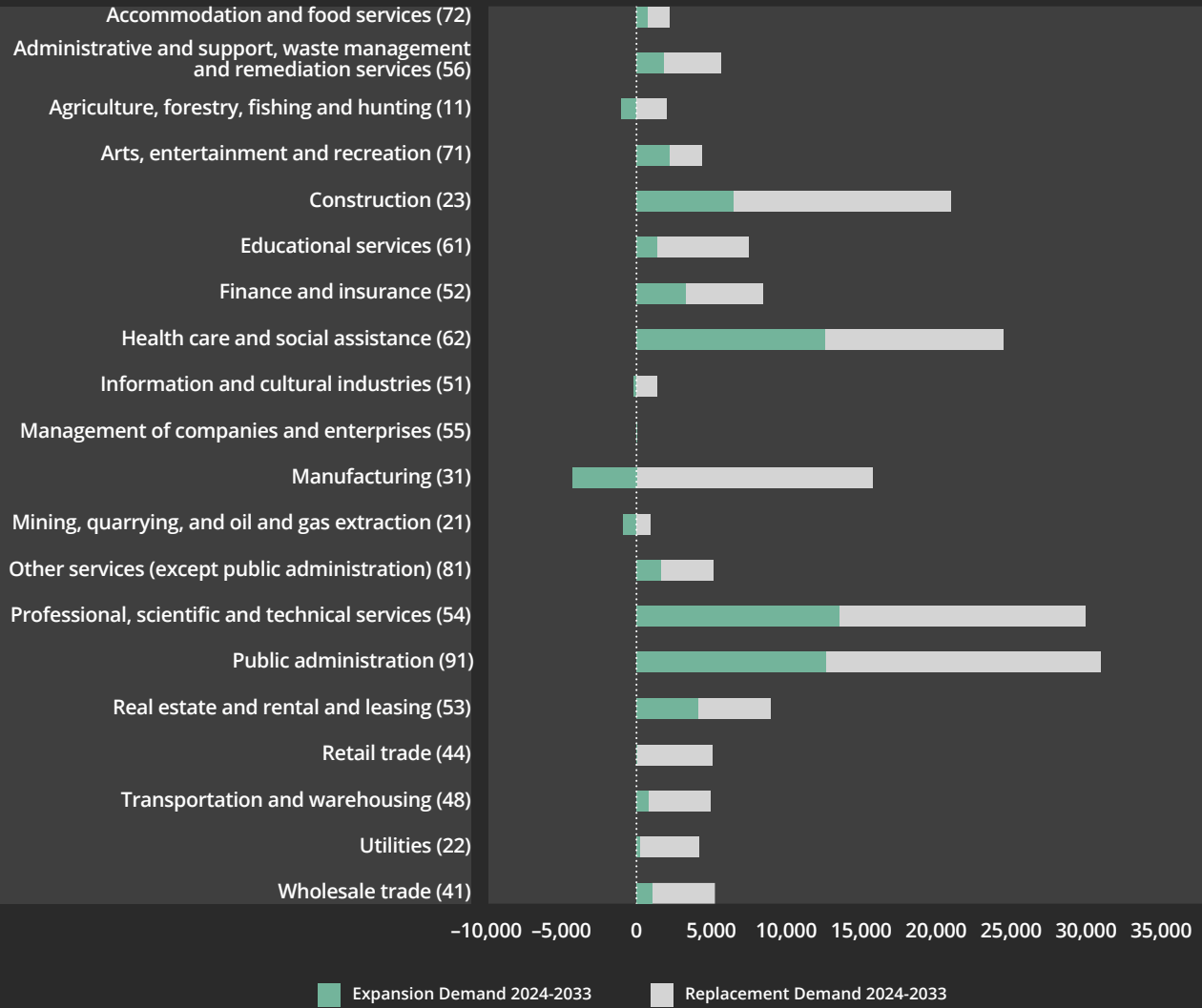
Industry (NAICS)	Environmental Employment in 2024	Expansion Demand 2024-2033	Replacement Demand 2024-2033	Net Hiring Requirements 2024-2033	Net Hiring Requirements as a % of Environmental Employment in 2024
Transportation and warehousing (48)	15,950	780	4,140	4,920	31%
Arts, entertainment and recreation (71)	10,040	2,180	2,190	4,370	44%
Utilities (22)	16,770	230	3,960	4,180	25%
Accommodation and food services (72)	6,050	750	1,420	2,170	36%
Information and cultural industries (51)	7,560	-170	1,400	1,230	16%
Agriculture, forestry, fishing and hunting (11)	7,440	-1,010	1,980	970	13%
Management of companies and enterprises (55)	70	30	0	30	43%
Mining, quarrying, and oil and gas extraction (21)	4,570	-880	930	50	1%

Five industries are projected to see negative expansion demand between 2024 and 2033. For these industries, net hiring requirements are projected to be driven entirely by replacement demand. These industries include:

- Manufacturing environmental employment is expected to contract by **4,290** jobs and incur replacement demand of **15,770** jobs
- Agriculture, forestry, fishing and hunting environmental employment is expected to contract by **1,010** jobs and incur replacement demand of **1,980** jobs
- Mining, quarrying, and oil and gas extraction environmental employment is expected to contract by **880** jobs and incur replacement demand of **930** jobs
- Information and cultural industries environmental employment is expected to contract by **170** jobs and incur replacement demand of **1,400** jobs
- Retail trade environmental employment is expected to contract by **20** jobs and incur replacement demand of **5,040** jobs

Figure 4

Environmental Net Hiring Requirements to 2033, by Industry



TOP OCCUPATIONS

Net hiring requirements are highest for:

- Professional occupations in advertising, marketing and public relations (**12,910** job openings)
- Home building and renovation managers (**8,600**)
- Other managers in public administration (**6,230**)

Table 4

Environmental Net Hiring Requirements, by Occupation

Occupation (NOC)	EnviroShare in 2023	Environmental Employment in 2024	Expansion Demand 2024-2033	Replacement Demand 2024-2033	Net Hiring Requirements 2024-2033	Net Hiring Requirements as a % of Environmental Employment in 2024
All Occupations	6%	500,250	55,970	125,790	181,760	36%
Professional occupations in advertising, marketing and public relations (11202)	23%	26,340	8,930	3,980	12,910	49%
Home building and renovation managers (70011)	23%	15,440	3,370	5,240	8,600	56%
Other managers in public administration (40019)	50%	7,000	3,040	3,190	6,230	89%
Administrative officers (13100)	10%	8,290	2,670	2,910	5,580	67%
Civil engineers (21300)	57%	12,920	2,230	2,820	5,050	39%

Refer to [Appendix B](#) for 100 occupations with the greatest environmental net hiring requirements to 2033.

TOP SPECIALIZATIONS

The top three specializations for expansion demand differ slightly from the top three for 2024 employment:

- Environmental Health & Safety (**26,350** job openings)
- Sustainability (**22,250**)
- Natural Resource Management (**21,100**)

The top three specializations for replacement demand are:

- Sustainability (**62,150** job openings)
- Natural Resource Management (**53,820**)
- Fisheries & Wildlife (**51,120**)

Net hiring requirements are highest for:

- Sustainability (84,400)
- Environmental Health & Safety (75,940)
- Natural Resource Management (**74,910**)

Table 5

Environmental Net Hiring Requirements, by Environmental Specialization

Specialization	Environmental Employment in 2024	Expansion Demand 2024-2033	Replacement Demand 2024-2033	Net Hiring Requirements 2024-2033
Sustainability	246,510	22,250	62,150	84,400
Environmental Health & Safety	188,320	26,350	49,590	75,940
Natural Resource Management	215,370	21,100	53,820	74,910
Fisheries & Wildlife	203,790	20,780	51,120	71,900
Energy	197,650	20,820	49,640	70,470
Water Quality	164,700	16,950	41,870	58,820
Site Assessment & Reclamation	157,840	16,930	39,770	56,700
Waste Management	157,950	16,370	40,000	56,370
Air Quality	132,300	14,590	33,630	48,220
Policy & Legislation	68,450	9,330	17,700	27,020
Education & Training	34,000	2,590	7,890	10,480
Communications & Public Awareness	25,050	3,050	5,550	8,600
Research & Development	19,130	1,590	4,100	5,680

CORE ENVIRONMENTAL WORKFORCE NET HIRING REQUIREMENTS

The EnviroShare for core environmental workforce occupations (i.e., those roles requiring specialized environmental competencies) is **17%**, as opposed to **6%** for all occupations. The three occupations with the highest EnviroShares (Forestry professionals, Water and waste treatment plant operators and Forestry technologists and technicians) are also employers of core environmental workers.

The three occupations with the highest number of core environmental workers vary from the overall environmental workforce, including:

- Civil engineers (**12,920** workers)
- Construction managers (**9,220**)
- Other professional engineers (**8,800**)

Looking ahead to 2033, the highest net hiring requirements for core environmental workers are expected to be for Administrative officers (**5,580** job openings), Civil engineers (**5,050**), and Professional occupations in business management consulting (**4,850**).

The core environmental occupations in Ontario with the largest increases in new jobs include Administrative officers (**2,670** jobs), Professional occupations in business management consulting (**2,670**), and Civil engineers (**2,230**). Job decreases are projected for Manufacturing managers (**-1,100** jobs), Computer and information systems managers (**-510**), Construction managers (**-340**), Engineering managers (**-300**) and Other professional engineers (**-130**).

As a result of retirements, deaths, and provincial outmigration Administrative officers (**2,910**), Civil engineers (**2,820**), and Manufacturing managers (**2,300**) are predicted to see the greatest replacement demand among core environmental workers.



Table 6*Environmental Net Hiring Requirements, by Top Core Environmental Occupation*

Occupation (NOC)	Environmental Employment in 2024	Expansion Demand 2024-2033	Replacement Demand 2024-2033	Net Hiring Requirements 2024-2033	EnviroShare in 2023
Administrative officers (13100)	8,290	2,670	2,910	5,580	10%
Civil engineers (21300)	12,920	2,230	2,820	5,050	57%
Professional occupations in business management consulting (11201)	5,970	2,660	2,190	4,850	9%
Contractors and supervisors, mechanic trades (72020)	4,970	1,020	1,830	2,850	19%
Mechanical engineers (21301)	4,970	1,820	940	2,760	23%
Construction millwrights and industrial mechanics (72400)	3,390	1,120	1,150	2,270	10%
Facility operation and maintenance managers (70012)	3,820	770	1,450	2,220	26%
Police officers (except commissioned) (42100)	2,980	1,110	1,080	2,190	11%
University professors and lecturers (41200)	3,530	750	1,270	2,010	12%
Construction managers (70010)	9,220	-340	2,210	1,870	25%
Human resources professionals (11200)	2,820	1,130	620	1,750	6%
Firefighters (42101)	3,260	580	1,150	1,730	20%
Other professional engineers (21399)	8,800	-130	1,860	1,730	51%
Electrical and electronics engineers (21310)	2,800	830	670	1,500	20%
Civil engineering technologists and technicians (22300)	2,160	940	550	1,490	35%

Occupation (NOC)	Environmental Employment in 2024	Expansion Demand 2024-2033	Replacement Demand 2024-2033	Net Hiring Requirements 2024-2033	EnviroShare in 2023
Lawyers and Quebec notaries (41101)	4,680	340	930	1,260	8%
Manufacturing managers (90010)	7,980	-1,100	2,300	1,210	14%
Natural and applied science policy researchers, consultants and program officers (41400)	1,810	790	400	1,190	12%
Engineering managers (20010)	5,570	-300	1,370	1,070	34%
Computer and information systems managers (20012)	5,920	-510	1,440	940	8%
Managers in social, community and correctional services (40030)	2,190	110	720	820	13%





SPOTLIGHT: SAVE ON ENERGY

FIRST NATIONS COMMUNITY BUILDING RETROFIT PROGRAM (FNCBRP)⁹

- Open to all on-reserve First Nations communities connected to Ontario's electricity grid
- Provides up to \$100,000 in funding, as well as technical support, to communities to improve the energy efficiency of commercial and institutional buildings to increase cost savings and reduce greenhouse gas emissions
- Onsite energy assessments and an audit report identifying energy efficiency projects in up to four facilities chosen by the participant
- A community benchmark report will be prepared to compare the energy use of these buildings with other similar buildings, to prioritize buildings for further assessment.
- Project support from Save on Energy's program delivery partner for identifying, engaging, and coordinating installation contractors.
- Applications will be accepted until **December 31st 2024**

KEY CHALLENGES RELATED TO (FNCBRP)

- Demonstrating a 'business case' of the long-term financial and community benefits of energy efficiency upgrades
- Identifying specific retrofit opportunities in buildings
- Identifying and securing contractors to purchase materials and/or install retrofit projects

LONG-TERM CONSIDERATIONS

- First Nations communities can reduce their carbon footprint while also creating local jobs and promoting economic growth
- Long-term savings for communities, while extending the life of community assets and increasing the overall safety and comfort of buildings
- Adopts a community-based solution to address climate change, requiring engagement, collaboration and leadership at a local level
- Opportunity to engage the local Indigenous environmental workforce
- Engage with youth leaders and elders to share knowledge related to climate change mitigation, including Traditional Ecological Knowledge

9 [First Nations Community Building Retrofit Program | Save on Energy](#)

PRIMARY OCCUPATIONS INVOLVED IN RETROFITTING EXISTING BUILDINGS

- Heating, refrigeration and air conditioning mechanics (NOC 72402)
- Electricians (except industrial and power system) (NOC 72200)
- Contractors and supervisors, electrical trades and telecommunications occupations (NOC 72011)

Ontario's construction industry is positioned to see substantial growth between 2024 and 2028. To better understand employment needs and trends for green retrofit activities over this period, a crosscut between the highlighted occupations and the construction industry was prepared.

IN THE CONSTRUCTION INDUSTRY:

- Heating, refrigeration, and air conditioning mechanics (NOC 72402) rises **5%** (from **1,400** in 2024 to **1,470** in 2028)
- Electricians (except industrial and power system) (NOC 72200) rises **16%** (from **3,120** in 2024 to **3,610** in 2028)
- Contractors and supervisors, electrical trades and telecommunications occupations (NOC 72011) rises **19%** (from **280** in 2024 to **340** in 2028)



APPENDIX A: METHODOLOGY

The purpose of this research is to estimate employment of, and project labour market requirements for environmental workers. This analysis estimates the demand for skilled trade workers in the environmental workforce using an analysis of quarterly job postings from a broad range of job posting boards provided by TalentNeuron.¹⁰ The process for doing so is two-fold: first, it identifies which job postings relating to each occupation (5-digit NOC) are for environmental positions using a keyword search. Second, it applies environmental shares to an industry and occupation model of the Canadian economy to develop an estimate of current and future labour dynamics for each occupation.

JOB SHARE ANALYSIS

The core dataset for the analysis is the job posting database, an aggregation of job postings collected from a broad array of job posting websites in French and English from across Canada, maintained by TalentNeuron. The data points collected from job listings include (but are not limited to):

- Job location (Province)
- 8-digit level 2010 O*NET-SOC occupation
- Posting company
- Job title
- Full text of the job listing

ECO Canada identifies postings for environmental positions by applying a filter of sentence fragments related to environmental activity to the TalentNeuron dataset. The text in each job posting is searched to see if each fragment can be found in the job posting and the results are tracked by post and fragment. Postings with enough matched fragments to meet a fragment-specific minimum match threshold are counted as matches for each linked area of focus.

¹⁰ For more information about TalentNeuron, visit <https://www.talentneuron.com/>.

Some further filtering is required on the job posting data before being used to compare to occupational employment data, however, since job posts in the TalentNeuron dataset are mapped to the 2010 O*NET-SOC occupation hierarchy, rather than the 5-digit 2021 NOC hierarchy. This does allow the potential for higher detail since the 8-digit O*NET-SOC has 1110 classifications compared to the 516 5-digit NOC codes. However, this hierarchy does not have unique mappings to the NOC hierarchy. We have developed a concordance which allows us to align O*NET-SOC many occupations to NOC occupations. Where no direct unique match is available we used additional text analysis to attribute occupations within environmental positions. In attributing totals to occupations, however, this approach is too computationally intensive and non-unique matches were distributed according to their distribution in the Canadian economy.

The research team also assigns individual job posts to industries using an algorithm based on the following rules in the following order:

- where a job post contains industry-specific language, it was assigned to that industry; and
- where the job post was posted by a company with a known industry categorization, the post is assigned to that company's industry.

In cases where the company posting the job ad is a federally registered corporation, it is categorized into an industry based on its name and NAICS classification in the national corporation register. Some small businesses are classified based on identifiers within the business name (for example, a posting company called "AAA plumbing" would be classified within the Plumbing, heating and air-conditioning contractors NAICS).

ESTIMATING AND FORECASTING ENVIRONMENTAL LABOUR FORCE DYNAMICS

The environmental workforce is defined in this analysis as the environmental share of jobs¹¹ times the number of jobs for each occupation (5-digit NOC) and province/territory. To estimate this share, the research team compares characteristics of identified environmental positions with their prevalence in TalentNeuron's full database. This allows the researchers to estimate an occupation and province/territory-specific share of total positions linked to each environmental area of focus. The result is the EnviroShare, a province/territory and occupation-specific proportion of employment considered to be environmental.¹²

11 This measure reflects the proportion of positions advertised online that indicate that either the employer engages in the production/provision of environmental goods/services or the job requires environmental-related knowledge, skills or aptitudes. This is used as a proxy for the proportion of current employment with these characteristics and may overstate the true environmental employment share if the newly advertised positions reflect an increase in the demand for environmental work.

12 For example, suppose that the total number of job postings for NOC 21300 (Civil engineers) in Ontario in the current period is 4,000 and the number of job postings that are considered to be environmental within that NOC and region is 800. Then the enviroshare is 20%.

Mathematically, the job posting counts and the totals are both arranged in $p \times n$ matrices (**J** and **T**), where p is the number of provinces and n the number of 5-digit NOC occupations. The workforce share matrix (**W**) is a similar $p \times n$ matrix for each year and quarter calculated by:

$$W = J \odot T$$

To estimate the number of jobs, the research team uses quarterly occupational employment data from the Labour Force Survey (LFS). Each share is calculated with respect to the labour force composition within that quarter and then annualized based on a weighted average reflecting each quarter's contribution to the annual labour force. This data is augmented by projections from Census data where detailed occupation data was outside the survey. Employment estimates were organized into the same $p \times n$ matrix (**L**) for each year and quarter to create the Environmental Workforce (**E**):

$$E = W \odot L$$

For industry matches, the approach is somewhat more complicated. Industry-level job posting totals are not available within the TalentNeuron database. As such, the industry categorizations from the job posting analysis is counted within occupations, such that industry data is organized into an $in \times p$ matrix, where i is the number of two-digit NAICS industries and n the number of 5-digit NOC occupations. This matrix (**I**) is the share of each industry within the job posts for each 5-digit NOC and province/territory. The $in \times p$ Environmental Workforce by Industry matrix (**É**) is:

$$\dot{E} = E \odot I$$

The total size of the environmental workforce is be calculated as the grand sum of \dot{E} .

The research team projects future environmental employment by extending occupation and industry-level share trends over a labour market forecast provided by Prism Economics. That forecast is built on the macroeconomic model provided by Stokes Economics and deaths and retirement distributions based on the Canada Occupation Projection System ("COPS") forecast maintained by Employment and Social Development Canada, as well as Prism's computable general equilibrium model of occupational and industry labour dynamics.

Prism's model provides a forecast of **employment change** and **job replacement**, representing the labour demand for environmental jobs. The baseline jobs forecast will further be adjusted to reflect observed changes in environmental job shares over time. All variables are forecasted at the five-digit NOC and two-digit NAICS levels, in keeping with the underlying share estimates of environmental employment.

CHALLENGES AND LIMITATIONS

Job posting analysis provides us with an opportunity to collect large amounts of data about the demand for different types of workers. However, the methodology also has limitations:

- Not all jobs are posted online. The job posting database does not gather information about jobs that are hired through other means (e.g., signs in the window, temporary employment agencies, headhunters, union halls, etc.). This may be especially common for Red Seal Trades, as many opportunities are hired through word of mouth, personal connections, or union halls. As this is our first foray into environmental Red Seal Trades modelling, we have very little information about the impact that this may have on employment estimates and projections. To address this concern, we are incorporating information about the number of apprenticeships from the RAIS and certification skills requirements from Prism's CANTRAQ model.
- There is no standardized multiplier to adjust job posting data to actual labour market (employment) data. For example, job postings appear more frequently for certain occupations that have higher turnover rates. In this instance, a higher number of job postings does not translate directly into higher employment.
- The vendor job posting data collection processes and algorithms vary and are not systematically linked to Government of Canada hierarchies for occupations and industries. The quality of the job posting data mapping to NOC and NAICS varies with the processes and algorithms used. This impacts the quality of the employment estimates based on the job posting analysis.
- The number of job postings within a particular region of Canada can be very small. When the sample of job postings for an occupation is small, environmental shares are estimated with lower confidence levels and can vary widely from period to period.
- Hiring demand for environmental workers does not directly measure environmental work within the current labour force. Rather, it is a proxy for the environmental employment share. At the present time, given the growing interest in environmental activity throughout the economy, we assume that the share of job postings that are considered environmental is greater than the share of employment that is considered environmental. It is also reasonable to assume, however, that workers currently employed may be increasingly required to gain additional skills and knowledge related to environmental activity and would thereby be considered environmental workers.

A key assumption of ECO Canada's analysis is that job postings reflect the occupations at large. As such, we are planning on conducting further work to refine this methodology to take these issues into account.

APPENDIX B: 100 TOP OCCUPATIONS – ENVIROSHARE, ENVIRONMENTAL EMPLOYMENT IN 2024 AND NET HIRING REQUIREMENTS TO 2033

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

Occupation (NOC)	EnviroShare in 2023	Environmental Employment in 2024	Expansion Demand 2024-2033	Replacement Demand 2024-2033	Net Hiring Requirements 2024-2033
All Occupations	6%	500,250	55,970	125,790	181,760
Senior managers – financial, communications and other business services (0012)	9%	2,470	-380	1,060	680
Financial managers (10010)	7%	2,760	-70	780	710
Human resources managers (10011)	7%	1,660	-80	540	460
Other business services managers (10029)*	11%	930	210	280	490
Financial auditors and accountants (11100)	6%	6,070	-420	1,320	900
Financial and investment analysts (11101)	6%	2,680	930	490	1,420
Financial advisors (11102)	2%	820	340	200	540
Human resources professionals (11200)*	6%	2,820	1,130	620	1,750
Professional occupations in business management consulting (11201)*	9%	5,970	2,660	2,190	4,850
Professional occupations in advertising, marketing and public relations (11202)	23%	26,340	8,930	3,980	12,910
Supervisors, finance and insurance office workers (12011)	6%	1,190	460	390	840

Occupation (NOC)	EnviroShare in 2023	Environmental Employment in 2024	Expansion Demand 2024-2033	Replacement Demand 2024-2033	Net Hiring Requirements 2024-2033
Supervisors, supply chain, tracking and scheduling coordination occupations (12013)	5%	1,510	630	550	1,180
Executive assistants (12100)	7%	1,220	270	460	730
Procurement and purchasing agents and officers (12102)	10%	3,210	250	890	1,140
Conference and event planners (12103)	6%	850	340	200	540
Accounting technicians and bookkeepers (12200)	4%	2,860	40	940	980
Administrative officers (13100)*	10%	8,290	2,670	2,910	5,580
Property administrators (13101)	10%	2,260	-150	810	660
Payroll administrators (13102)	4%	820	270	300	570
General office support workers (14100)	4%	2,270	-40	610	580
Accounting and related clerks (14200)	3%	1,880	460	620	1,090
Shippers and receivers (14400)	3%	1,210	330	370	700
Dispatchers (14404)	7%	770	280	170	440
Engineering managers (20010)*	34%	5,570	-300	1,370	1,070
Computer and information systems managers (20012)*	8%	5,920	-510	1,440	940
Biologists and related scientists (21110)*	37%	4,530	-500	910	410
Forestry professionals (21111)*	90%	1,310	400	290	700
Information systems specialists (21222)	5%	6,030	2,010	1,550	3,550
Database analysts and data administrators (21223)	7%	2,320	430	400	830

Occupation (NOC)	EnviroShare in 2023	Environmental Employment in 2024	Expansion Demand 2024-2033	Replacement Demand 2024-2033	Net Hiring Requirements 2024-2033
Computer systems developers and programmers (21230)	6%	860	370	140	510
Software engineers and designers (21231)	4%	2,480	450	310	760
Software developers and programmers (21232)	3%	2,160	810	360	1,170
Web developers and programmers (21234)	6%	760	370	80	450
Civil engineers (21300)*	57%	12,920	2,230	2,820	5,050
Mechanical engineers (21301)*	23%	4,970	1,820	940	2,760
Electrical and electronics engineers (21310)*	20%	2,800	830	670	1,500
Chemical engineers (21320)*	29%	1,610	250	410	660
Industrial and manufacturing engineers (21321)*	21%	2,070	160	330	490
Geological engineers (21331)*	43%	630	300	130	420
Other professional engineers (21399)*	51%	8,800	-130	1,860	1,730
Computer network and web technicians (22220)	11%	1,820	680	410	1,090
User support technicians (22221)	9%	4,390	1,840	1,010	2,840
Occupational health and safety specialists (22232)	42%	5,160	2,510	1,840	4,350
Construction inspectors (22233)	25%	1,860	-50	490	440
Civil engineering technologists and technicians (22300)*	35%	2,160	940	550	1,490
Mechanical engineering technologists and technicians (22301)*	11%	950	390	240	620

Occupation (NOC)	EnviroShare in 2023	Environmental Employment in 2024	Expansion Demand 2024-2033	Replacement Demand 2024-2033	Net Hiring Requirements 2024-2033
Electrical and electronics engineering technologists and technicians (22310)	14%	1,290	500	430	930
Registered nurses and registered psychiatric nurses (31301)	7%	9,580	1,850	1,960	3,810
Nurse aides, orderlies and patient service associates (33102)	2%	2,390	870	580	1,450
Other managers in public administration (40019)	50%	7,000	3,040	3,190	6,230
Managers in social, community and correctional services (40030)*	13%	2,190	110	720	820
Fire chiefs and senior firefighting officers (40041)*	35%	580	310	310	620
Lawyers and Quebec notaries (41101)*	8%	4,680	340	930	1,260
University professors and lecturers (41200)*	12%	3,530	750	1,270	2,010
Post-secondary teaching and research assistants (41201)	6%	2,120	780	180	960
College and other vocational instructors (41210)	5%	2,120	-30	510	490
Natural and applied science policy researchers, consultants and program officers (41400)*	12%	1,810	790	400	1,190
Social policy researchers, consultants and program officers (41403)	5%	1,940	520	420	940
Health policy researchers, consultants and program officers (41404)	18%	4,300	1,670	960	2,630

Occupation (NOC)	EnviroShare in 2023	Environmental Employment in 2024	Expansion Demand 2024-2033	Replacement Demand 2024-2033	Net Hiring Requirements 2024-2033
Police officers (except commissioned) (42100)*	11%	2,980	1,110	1,080	2,190
Firefighters (42101)*	20%	3,260	580	1,150	1,730
Paralegals and related occupations (42200)	13%	2,530	1,120	730	1,850
Social and community service workers (42201)	6%	2,900	1,260	700	1,960
Early childhood educators and assistants (42202)	2%	1,680	390	360	750
Retail and wholesale trade managers (60020)	5%	6,410	-550	2,260	1,710
Accommodation service managers (60031)	5%	930	450	500	940
Retail sales supervisors (62010)	1%	900	340	190	530
Cleaning supervisors (62024)	19%	2,650	740	700	1,430
Technical sales specialists - wholesale trade (62100)	7%	4,170	-370	960	580
Retail salespersons and visual merchandisers (64100)	1%	1,360	200	240	440
Sales and account representatives - wholesale trade (non-technical) (64101)	4%	3,740	1,430	1,010	2,440
Other customer and information services representatives (64409)	2%	1,620	240	330	570
Security guards and related security service occupations (64410)	5%	1,720	690	460	1,150
Store shelf stockers, clerks and order fillers (65102)	2%	1,620	750	290	1,040
Food counter attendants, kitchen helpers and related support occupations (65201)	1%	1,270	360	160	520
Light duty cleaners (65310)	7%	5,250	1,960	1,980	3,940

Occupation (NOC)	EnviroShare in 2023	Environmental Employment in 2024	Expansion Demand 2024-2033	Replacement Demand 2024-2033	Net Hiring Requirements 2024-2033
Janitors, caretakers and heavy-duty cleaners (65312)	5%	1,910	360	720	1,090
Construction managers (70010)*	25%	9,220	-340	2,210	1,870
Home building and renovation managers (70011)	23%	15,440	3,370	5,240	8,600
Facility operation and maintenance managers (70012)*	26%	3,820	770	1,450	2,220
Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations (72010)	15%	830	250	320	570
Contractors and supervisors, other construction trades, installers, repairers and servicers (72014)	5%	1,370	100	350	450
Contractors and supervisors, mechanic trades (72020)*	19%	4,970	1,020	1,830	2,850
Contractors and supervisors, heavy equipment operator crews (72021)	17%	3,450	-550	980	430
Supervisors, railway transport operations (72023)	58%	880	310	300	610
Supervisors, motor transport and other ground transit operators (72024)	13%	1,740	50	520	570
Electricians (except industrial and power system) (72200)	9%	4,440	60	820	870
Construction millwrights and industrial mechanics (72400)*	10%	3,390	1,120	1,150	2,270
Heavy-duty equipment mechanics (72401)	9%	1,210	450	300	750

Occupation (NOC)	EnviroShare in 2023	Environmental Employment in 2024	Expansion Demand 2024-2033	Replacement Demand 2024-2033	Net Hiring Requirements 2024-2033
Residential and commercial installers and servicers (73200)	3%	820	240	200	440
General building maintenance workers and building superintendents (73201)	14%	4,150	-390	1,450	1,060
Transport truck drivers (73300)	2%	2,160	470	700	1,170
Managers in agriculture (80020)	11%	4,290	-990	1,490	500
Landscaping and grounds maintenance labourers (85121)	4%	1,320	420	230	650
Manufacturing managers (90010)*	14%	7,980	-1,100	2,300	1,210
Supervisors, mineral and metal processing (92010)	41%	1,510	70	480	550
Supervisors, petroleum, gas and chemical processing and utilities (92011)	24%	1,560	360	570	940
Supervisors, food and beverage processing (92012)	10%	930	190	320	510
Supervisors, other mechanical and metal products manufacturing (92023)	13%	1,050	300	380	670
Chemical plant machine operators (94110)	18%	1,350	400	500	900



CONTACT US

...

ECO Canada
Suite 400, 105 12 Avenue SE
Calgary, Alberta T2G 1A1

P : 1-800-890-1924

E : research@eco.ca

W : eco.ca



@ecocanada

We are located in the heart of Calgary, Alberta, and have representatives located in Vancouver, Edmonton, Windsor and Halifax.

Visit our website or contact us for more information.