

EHRC  **RHIEC**

ONTARIO **POWER**
GENERATION

Canada



Electricity in Demand: Labour Market Insights

**FACTSHEET FOR ONTARIO
2023-2028**



Ontario Outlook

STRUCTURE OF THE ELECTRICITY MARKET

Ontario's hybrid electricity market integrates regulatory and competitive elements.

Established in 1998 by the Electricity Act of Ontario, an independent operation entity was formed to ensure grid reliability and facilitate the wholesale electricity market. It is responsible for determining how much electricity is needed across the province as well as which generators should increase and decrease production. Electricity demand and supply are balanced, while instructions are provided to dispatchable generators and loads in five-minute increments. Generators with contracts receive fixed prices, monthly revenue guarantees and/or guaranteed floor prices.

Regulating all participants in Ontario's electricity sector, the overseeing body manages a diverse range of entities, such as generators, transmitters, distributors, wholesalers, and retailers operating in the province.





ELECTRICITY GENERATION BY FUEL TYPE

Currently, Ontario’s largest fuel source for electricity generation is nuclear power, which accounts for just over half (51%) of the province’s total (see *Figure 1, panel A*).

Hydro and wind power are the next leading sources of generation. In comparison, the source that fuels most of Canada’s current electrical generation is hydro power, at 58%, whereas the corresponding shares of natural gas and nuclear power are 14% and 13%, respectively (*Figure 1, panel B*).

Looking ahead, a recent report from the Canada Energy Regulator (CER) sets out one potential path and corresponding provincial energy mixes that could enable Canada to achieve a net zero greenhouse gas (GHG) emissions electricity grid by 2035 and realize economy-wide net zero GHG emissions by 2050 (recognizing that there are multiple paths and different energy mixes that could result in achieving these goals).

Under the CER “Canada net zero” scenario, electricity generation in terms of gigawatt hours (GWh) is set to more than double over the next 27 years in Canada. In Ontario, it is expected to more than triple. This will put severe pressure and strong demands on the sector’s capacity to transmit and distribute a growing supply of electricity — necessitating upgrades and investments in infrastructure and human resources to respond to the demand.

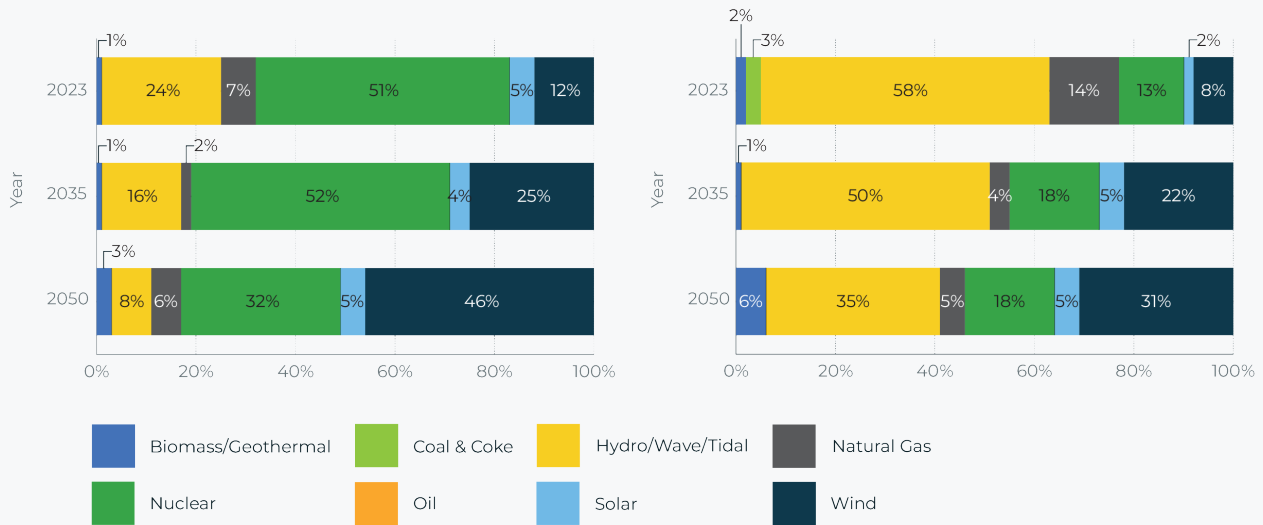




Figure 1. Shares of electricity generation by source and year (2023, 2035, and 2050), net zero scenario (%)

Panel A: Ontario

Panel B: Canada



Source: Canada Energy Regulator, Canada's Energy Future Data Appendices.

Note: "Net-zero" refers to CER's "Canada net zero" scenario and reflects an energy mix for electricity generation that could enable Canada to achieve a net-zero electricity grid by 2035, and net-zero GHG emissions by 2050.

Under this net zero scenario, the share of electricity generated by wind power would more than double in Ontario by 2035, reaching 25% and surpassing hydroelectricity. Meanwhile, the share of electricity generated from nuclear sources would remain steady to 2035. This may still underrepresent nuclear power in the province given recent developments with refurbishing existing plants and the deployment of small modular reactor (SMR) technology. Even under this scenario where the share of nuclear remains steady, given the anticipated increase in electricity, nuclear power generation will still rise (see Table 1 below). The patterns in Ontario broadly mirror what will be required at the national level to achieve these goals – i.e., the growing importance of wind for electricity generation – but for Canada as a whole, solar power will also need to double to achieve a net zero electricity grid by 2035. Electricity generation from coal and coke production was phased out in Ontario in 2015.



Wind power generation would continue to grow beyond 2035, eventually surpassing the share of nuclear power and fueling just under half (46%) of Ontario's electricity generation by 2050. By 2050, the shares of nuclear- and hydro power would both significantly decline (*Figure 1, panel A*) relative to other sources of electricity in the mix. Natural gas's share of generation is expected to fall by 4 percentage points between now and 2035, but rise to 6% by 2050 whereas biomass/geothermal power will contribute less than 5% of Ontario's electrical generation. Electricity generation from solar power will remain at around 5% in the province in the coming years.

Under this scenario, at the national level, the share of hydro-generated electricity will fall by over 20 percentage points by 2050, while wind power could increase to just over 30% (*Figure 1, panel B*).

Within this time horizon and scenario, the share of electricity fueled by natural gas could fall to 5% at the national level while solar power would grow only modestly. In addition to significant shifts in the fuel mix, it is expected that the total volume of electricity generated will increase substantially.

The amount of electricity generated by some fuel sources will rise dramatically, relative to their current levels (*Table 1*). For instance, between 2023 and 2035, the largest increases in Ontario's electricity output in percentage terms will come from wind (11% average growth per year), followed by nuclear (close to 5% average growth per year).

Between 2035 and 2050, growth in electricity generation will be fastest in biomass/geothermal and natural gas (albeit from comparably low levels).





Table 1. Anticipated changes in electricity generation (GWh) by fuel source under a net zero scenario (volumes and compound annual %), 2023–2050

Energy Source	Ontario			Canada		
	2023	2035	2050	2023	2035	2050
Nuclear	77,398	131,845 (4.5%)	164,080 (1.5%)	82,425	164,478 (5.9%)	249,972 (2.8%)
Hydro/wave/tidal	36,254	41,504 (1.1%)	40,331 (-0.2%)	376,053	467,766 (1.8%)	474,316 (0.1%)
Wind	18,077	64,147 (11.1%)	233,900 (9.0%)	53,498	207,476 (12.0%)	425,064 (4.9%)
Natural gas	11,364	5,094 (-6.5%)	31,665 (13%)	90,568	32,851 (-8.1%)	62,772 (4.4%)
Solar	8,081	9,721 (1.6%)	24,484 (6.4%)	11,060	44,914 (12.4%)	74,699 (3.4%)
Biomass/geothermal	1,480	1,758 (1.4%)	16,892 (16.3%)	10,224	18,446 (5.0%)	71,889 (9.5%)
Oil	85	14 (-14.1%)	7 (-4.5%)	1,606	670 (-7.0%)	1,004 (2.7%)
Coal & coke	0	0	0	19,594	-	-
Total	152,740	254,083 (4.3%)	511,359 (4.8%)	645,028	936,600 (3.2%)	1,359,716 (2.5%)

Source: Canada Energy Regulator, Canada's Energy Future Data Appendices.

Note: Figures in parenthesis for 2035 refer the average compound annual growth in electricity generation anticipated for that energy source between 2023 and 2035. For those in the 2050 column, they refer to the average compound annual growth anticipated between 2035 and 2050. "Net-zero" refers to CER's "Canada net zero" scenario and reflects an energy mix scenario for electricity generation that could enable Canada to achieve a net-zero electricity grid by 2035, and net-zero GHG emissions by 2050.

In contrast, over the period 2023 to 2035, Canada's increased level of electricity generation is expected to primarily come from solar and wind (12% average growth per year) as well as nuclear (6% average growth per year). For the period 2035 to 2050, percentage increases in electricity generation in Canada are largest among biomass/geothermal (more than 9% average growth per year), followed by wind (5% average growth per year).

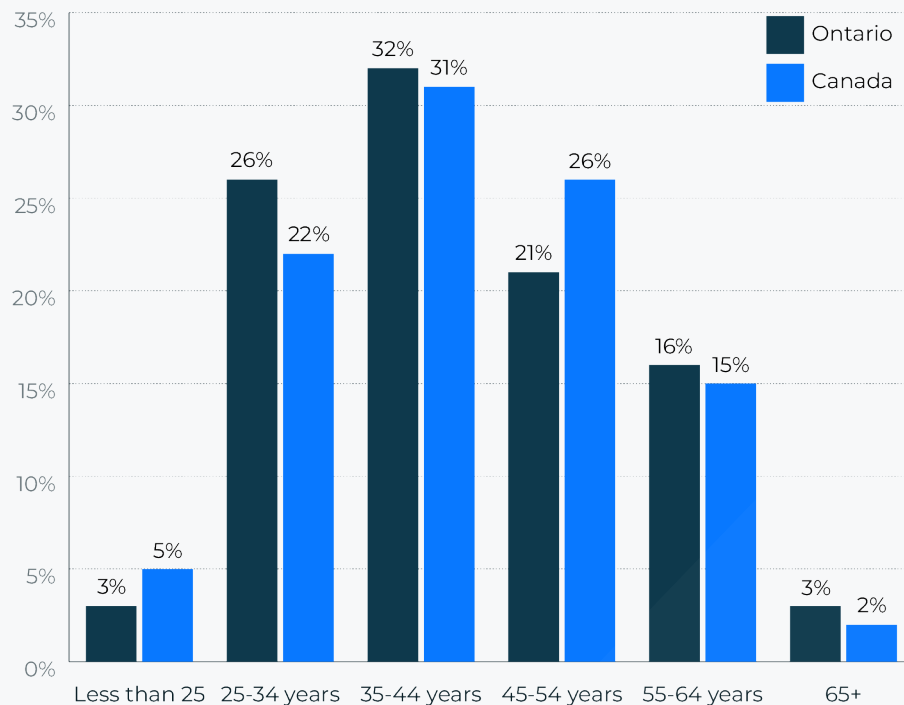


AGE DISTRIBUTION OF THE WORKFORCE

Within the electricity sector, the age profile of Ontario's workers resembles the situation at the national level.

However, Ontario's share of workers aged 55 years of age and over in 2022, at nearly one in five (19%), is slightly higher than the national average of 17% (Figure 2). Conversely, however, Ontario has higher shares of workers 25-34 and 35-44 years of age than Canada as a whole. Together, these two age groups constitute more than half of the electricity sector's workforce, in both Ontario and Canada.

Figure 2. Age Distribution of employment in the Electricity Sector (%), 2022



Source: Statistics Canada, Labour Force Survey, 2022.



DISTRIBUTION OF FEMALE EMPLOYMENT

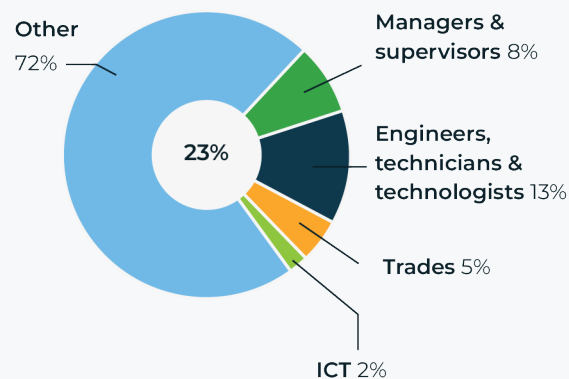
In Ontario, the share of women in the electricity sector's workforce, at 23%, is slightly lower than the corresponding figure for Canada as a whole, which is 27% (Figure 3).

In terms of the distribution of female employees across occupational groups, women are overwhelmingly concentrated in *Other corporate professional* occupations in both Ontario and Canada (72% and 67%, respectively).

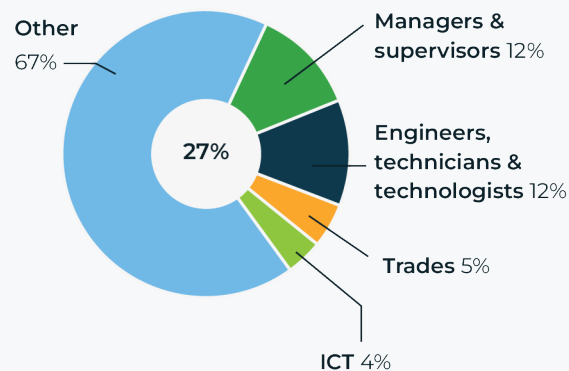
Relative to Canada, Ontario's electricity sector workforce has a smaller share of women employed in the *Management & supervisors* and *ICT* occupational groups. Only 2% and 4% of women employed in Ontario's and Canada's electricity sector work in *ICT* occupations.

Figure 3. Distribution of female employment by occupational group

Panel A: Ontario, 2022



Panel B: Canada, 2022



Source: Statistics Canada, Labour Force Survey, 2022.

Note: The figures in the centre of the charts indicate the share of female workers in the entire electricity sector workforce. See Appendix A of EHRC's *Electricity in Demand: Labour Market Insights 2023–2028* for information regarding the occupations covered in each of these broad groups.

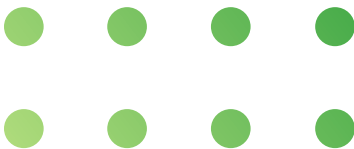


DIVERSITY, EQUITY AND INCLUSION

Efforts to increase Diversity, equity, and inclusion (DEI) are pivotal to the success of the electricity sector's human resources strategy.

The sector, like others, benefits significantly from a diverse workforce, as it brings a wider array of perspectives, ideas, and innovative solutions than would otherwise exist. However, according to 2021 Census, the electricity sector workforce in Ontario and Canada is less diverse than the broader economy:

- **Indigenous peoples:** Close to 4% of workers in Ontario's electricity sector identified as Indigenous peoples, lower than the national figures for the electricity sector at 5% (the latter which is on par with the share of Indigenous peoples working across all sectors of the economy at 5%).
- **Persons with disabilities:** According to the EHRC Employer survey almost 1% of Ontario's electricity sector identified as persons with disabilities, similar to the national level.
- **Racialized groups:** A little more than 24% of workers in Ontario's electricity sector identified as being from a racialized group, higher than the national figures for the electricity sector at close to 22% (but lower than the share of racialized groups working across all sectors of the economy at 26%).
- **Immigrants:** A little more than 22% of workers in Ontario's electricity sector were immigrants, higher than the national figures for the electricity sector at 18% (but considerably lower than the share of immigrants working across all sectors of the Canadian economy at 29%).
- **Gender diverse people:** EHRC survey revealed that about 1.1% of the electricity sector employees in Ontario identify as gender diverse, contrasting with the national rate of 2%.





LEVEL OF EDUCATIONAL ATTAINMENT

Educational attainment is relatively high in Canada's electricity sector workforce, with more than one in three workers (37%) having attained a Bachelor's degree or above (*Figure 4*).

The comparable figure for Ontario is somewhat lower, at 31%. In both Ontario and Canada, educational attainment is high across the main occupational groups that constitute the electricity sector's workforce:

- **Managers & supervisors:** In Ontario, 92% of *Managers & supervisors* have at least a post-secondary or trades certificate or diploma compared to 94% in Canada. The share of *Managers & supervisors* with at least a bachelor's degree in Ontario is 45% compared to just over half in Canada.
- **Trades:** Among this occupational group, approximately 92% have at least a post-secondary or trades certificate or diploma or higher (with 17% having a bachelor's degree or more). In Canada, the corresponding figures are 87% with at least a post-secondary or trades certificate or diploma and 15% having a bachelors' degree or more.
- **Engineers, technologists and technicians:** 70% of Ontario's workers within this occupational group hold a bachelor's degree or above (the corresponding figure in Canada is 63%).
- **ICT:** The educational attainment of ICT workers in the electricity sector is similar across Ontario and Canada with 99% having some post-secondary education or higher.

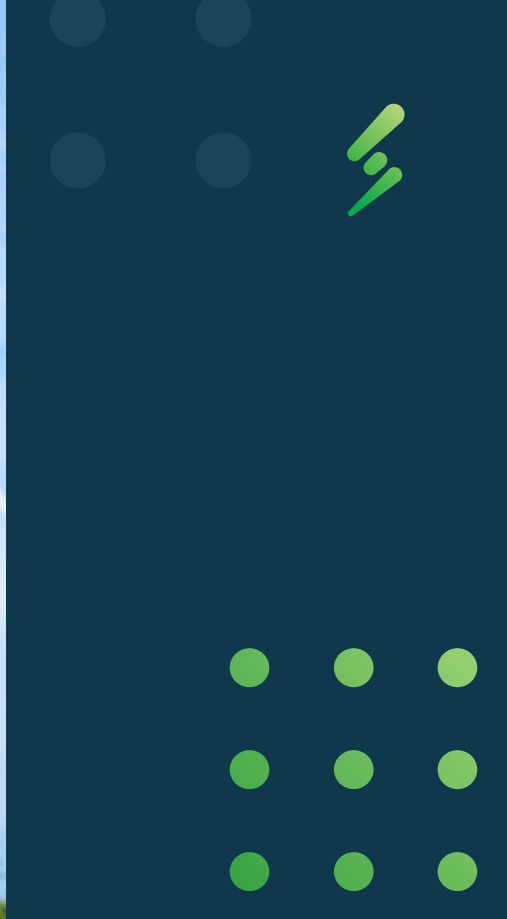
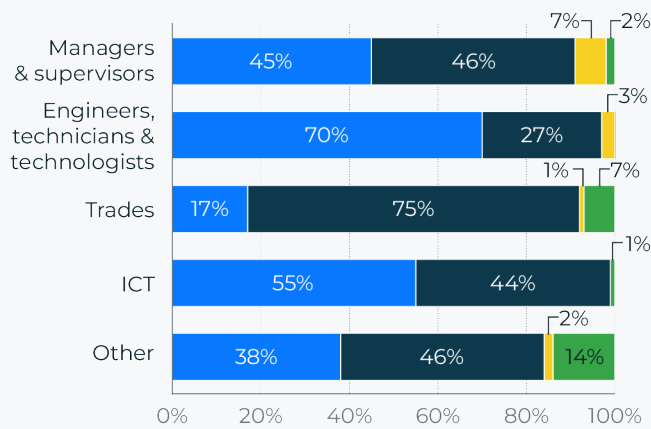
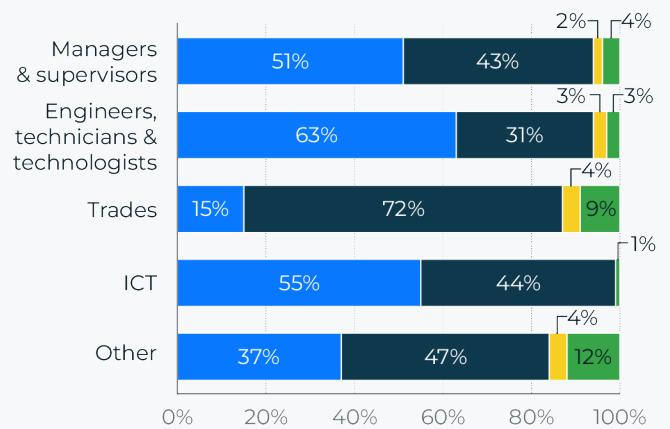


Figure 4. Educational attainment by occupational group

Panel A: Ontario, 2022



Panel B: Canada, 2022



Source: Statistics Canada, Labour Force Survey, 2022.



EMPLOYMENT PROFILE AND RECENT TRENDS

The distribution of employment across the four occupational groups is relatively consistent across Ontario and Canada (*Table 2*).

However, Ontario has a slightly smaller share of *Managers & supervisors* (6.6%) and *ICT* (4%), and a greater share of *Trades* (30.9%).

Table 2. Employment shares in the electricity sector by occupational group and region (%), 2022

Occupational Group	Ontario		Canada	
	Volume	%	Volume	%
<i>Managers & supervisors</i>	3,000	6.6	9,800	8.9
<i>Engineers, technologists & technicians</i>	6,000	13.3	16,500	14.9
<i>Trades</i>	13,900	30.9	29,600	26.8
<i>ICT</i>	1,800	4.0	6,700	6.0
<i>Other corporate professionals</i>	20,400	45.2	48,100	43.4
Total	45,000	100	110,700	100

Source: Statistics Canada, Labour Force Survey, 2022.

Note: Figures are rounded to the nearest 100.

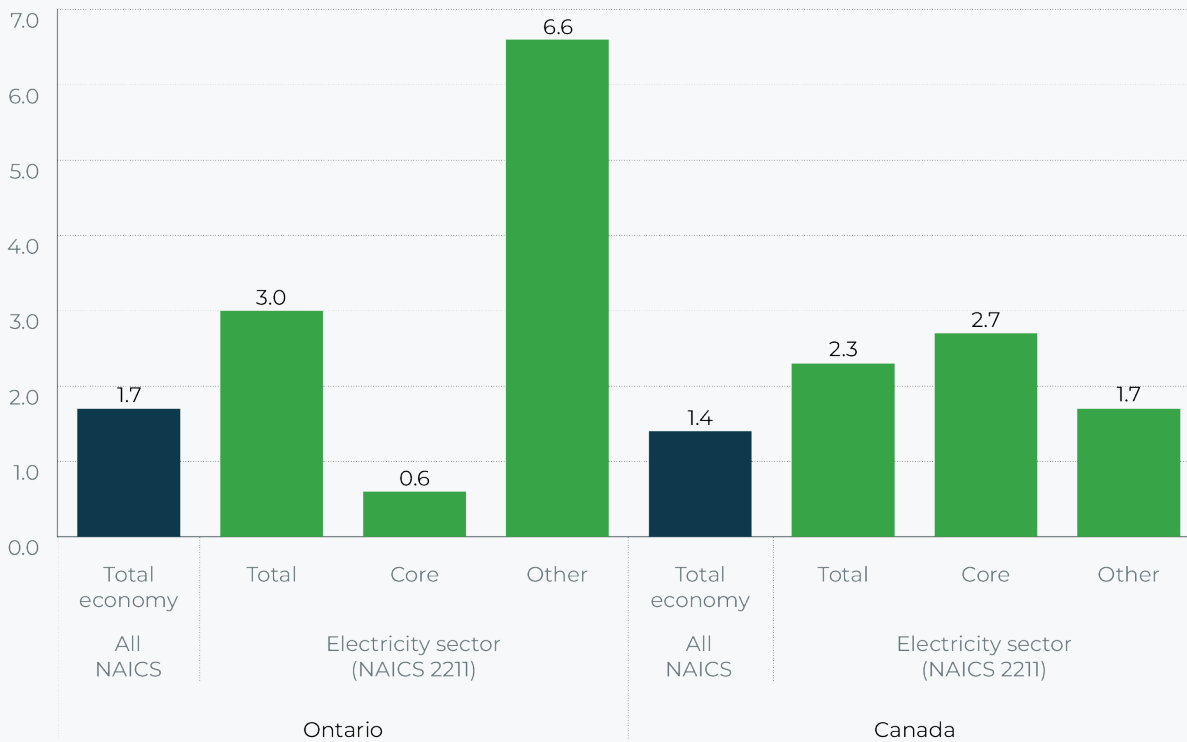


Over the past 5 years employment growth in Ontario's electricity sector has outpaced that of the overall economy (Figure 5).

Between 2017 and 2022, average annual employment growth in Ontario's electricity sector was 3.0%, nearly double the employment growth in all sectors of Ontario (1.7%). The employment growth in Ontario's electricity sector was also higher than the comparable figure for Canada's electricity sector, which was 2.3% per year between 2017 and 2022. Ontario's favourable employment conditions in the electricity sector were driven by job gains among the *Other corporate professional* occupations, which averaged 6.6% per year compared to 0.6% among the core group of occupations. In contrast, in Canada's electricity sector, employment growth among the core set of occupations was higher at 2.7% per year, compared to other occupations at 1.7%.



Figure 5. Average annual employment growth in Canada's electricity sector (%), 2017–2022



Source: Statistics Canada, Labour Force Survey, 2022.

Note: Core occupations refer to the group of 34 occupations that are central to the electricity sector (See Appendix A of EHRC's [Electricity in Demand: Labour Market Insights 2023–2028](#) for information regarding the occupations covered). "Other" refers to the remaining occupations covered in the electricity sector.



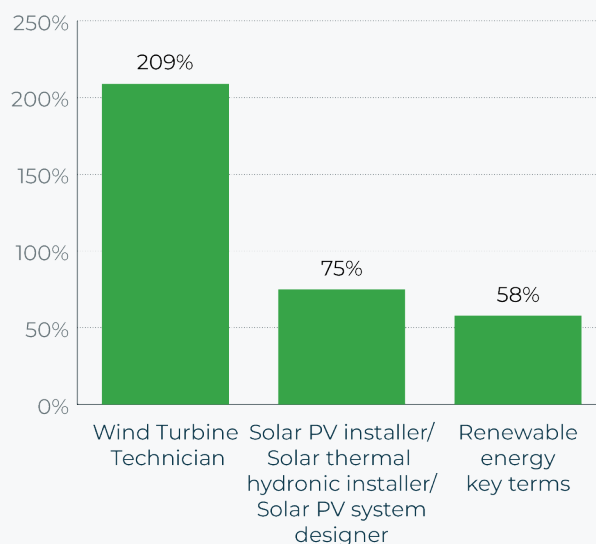
An important consideration in the context of employment patterns and the shift towards net zero is the critical role of renewable energy occupations.

However, official data on such jobs is not available as they tend to be captured by broader job titles within the National Occupational Classification system. At the same time, online job posting data from Vicinity Jobs, while not to be conflated with employment levels, can shed light on recent trends in terms of these specific job titles.

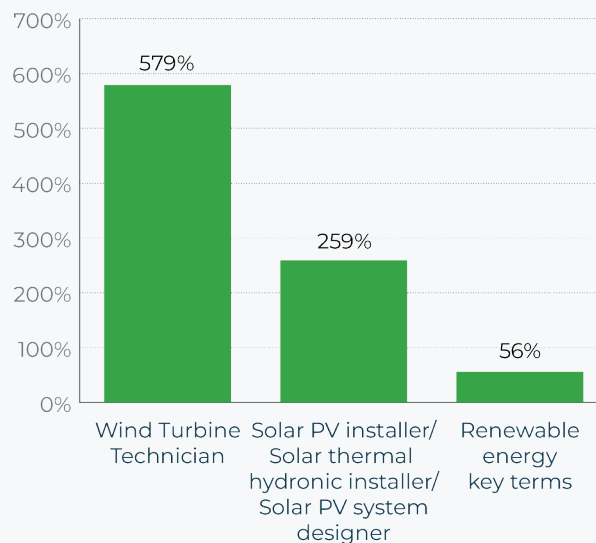
The growing demand for workers with specialized skills in the renewable energy sector is clearly evident: between 2018 and 2022, the number of online job postings in Ontario that contained the key phrases 'renewable energy,' 'solar power,' and/or 'wind power generation' increased by 58% (Figure 6, panel A). Additionally, in Ontario postings for Wind turbine technicians grew by over 200%, while those related to Solar PV installers and designers expanded by 75%. The corresponding Canada-wide figures are 56% growth over the period 2018 to 2022 in job postings with the same key phrases, 579% growth in Wind turbine technician job postings and 259% growth in Solar PV related job postings (Figure 6, panel B).

Figure 6. Online job postings for renewable energy and related occupations (%), 2018–2022

Panel A: Ontario



Panel B: Canada



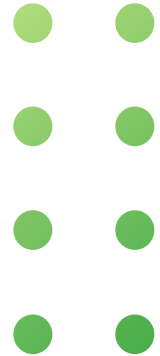
Source: Vicinity Jobs.



The EHRC Employer survey revealed that 44% of organizations operating in Ontario rely on hiring contractors (compared with 40% nationally) and 28% rely on consultants (similar to the national level). The increasing reliance on contracted work highlights the need for close monitoring of the demographic composition, including the age of this outsourced workforce.

As this workforce contingent ages, it becomes increasingly vital to strike a balance and not overly depend on external contractors.

Failing to address this potential risk could have significant implications for the stability and continuity of operations. It is imperative to carefully manage this aspect to ensure a sustainable and resilient workforce.



LABOUR MARKET OUTLOOK

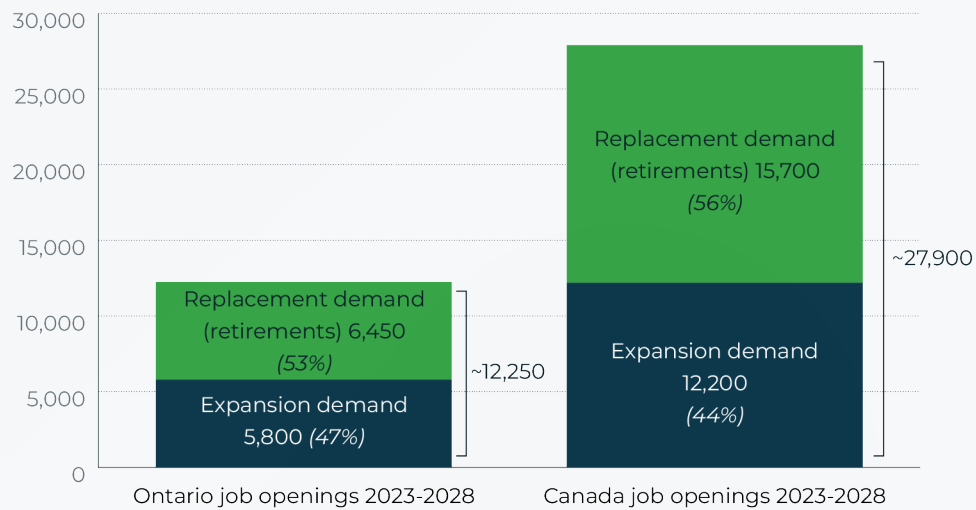
Leveraging the assumptions and data underpinning the long-term scenarios envisaged in the Canada Energy Regulator's *Canada's Energy Future 2023*, EHRC developed a forecast model to shed light on the potential medium term employment implications for the electricity sector under the path to net zero scenario.

Between 2023 and 2028, the number of job openings in Ontario's electricity sector are anticipated to exceed 12,000 (Figure 7).

This includes approximately 5,800 job openings due to expansion demand and an additional 6,450 that are expected to arise from replacement demand, i.e., from retirements. For Canada, the additional job openings associated with this expansion demand are just over 12,000 and the total number of retirements or replacement demand expected in the electricity sector is estimated at 15,700. Combined, in Canada the expansion demand and replacement demand are anticipated to result in a total of nearly 28,000 job openings in the sector over the period from 2023 to 2028.



Figure 7. Composition of demand for workers in Ontario's electricity sector under the path to net zero scenario, 2023–2028



Source: EHRC estimates based on Labour Force Survey, EHRC model 2023 and Canada Energy Regulator, Canada's Energy Future Data Appendices.

Note: Figures rounded to nearest 50. Expansion demand refers to the anticipated employment growth that occurs in the path to net-zero scenario. Replacement demand is estimated using occupation-specific retirement rates, weighted by each occupation's share of employment in the electricity sector in 2022. These estimates do not reflect openings that could result from the death or emigration of employees.

Between 2023 and 2028, the relative size of replacement and expansion demand varies by occupational group (Table 3). In Ontario, the total number of job openings expected over the 2023–2028 period is set to decline among *Managers & supervisors* and *Engineers, technologists & technicians* even when positive replacement demand is taken into account. Among the remaining occupational groups, expansion and replacement demand is expected to be robust.

At the national level, despite expected retirements in the order of 1,200 among *Managers & supervisors*, expansion demand is projected to decline (-2,100) over the forecast period, i.e., between 2023 and 2028. Across all other occupational groups, strong job openings are anticipated due to expansion demand and replacement demand.

Due to an aging workforce, with the exception of ICT occupations, replacement demand is set to exceed expansion demand over the forecast time horizon.



Table 3. Composition of demand for workers in Ontario's electricity sector under the path to net zero scenario by occupational group, 2023–2028

Occupational Group	Ontario		Canada	
	Expansion demand	Replacement demand	Expansion demand	Replacement demand
<i>Managers & supervisors</i>	-1,900	250	-2,100	1,200
<i>Engineers, technologists & technicians</i>	-1,300	550	1,200	1,900
<i>Trades</i>	3,350	1,900	2,800	3,700
<i>ICT</i>	1,200	250	3,800	800
<i>Other corporate professionals</i>	4,500	3,550	6,500	8,050
Total	5,800	6,450	12,200	15,650

Source: EHRC estimates based on Labour Force Survey, EHRC model 2023 and Canada Energy Regulator, Canada's Energy Future Data Appendices.

Note: Figures rounded to nearest 50. Expansion demand refers to the anticipated employment growth that occurs in the path to net-zero scenario. Replacement demand is estimated using occupation-specific retirement rates, weighted by each occupation's share of employment in the electricity sector in 2022. These estimates do not reflect openings that could result from the death or emigration of employees.

