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# Electricity in Demand: Labour Market Insights

**FACTSHEET FOR QUEBEC  
2023-2028**



# Quebec Outlook

## STRUCTURE OF THE ELECTRICITY MARKET

**Hydro-Québec, a fully integrated Crown Corporation, manages most of the electricity that is generated, transmitted, and distributed in Quebec.**

While the province regulates generation, the utility focuses on promoting large hydro facilities, leaving smaller projects, i.e., those under 50 megawatts (MW), to the private sector and renewable energy developers. Hydro-Québec's production arm is obligated to supply its distribution arm with up to 165 TW hours/year (referred to as the "heritage pool") for provincial customers at a regulated price. Competition exists in the wholesale market for distribution requirements beyond the heritage pool. An independent agency, the *Régie de l'énergie* oversees the regulation of electricity transmission and distribution.

The 2023-2028 Implementation Plan of Quebec's 2030 Plan for a Green Economy includes a \$3.54 billion investment in renewable energy and a commitment to modernize electricity infrastructure by installing smart grids, microgrids, and energy storage systems.





## ELECTRICITY GENERATION BY FUEL TYPE

**The largest source of electrical generation in Quebec is hydro power, which comprises just over 90% of the province's total (see *Figure 1, panel A*).**

Wind power is the next leading source of generation, at 7%. In Canada, the largest contributor to the country's electrical generation capacity is also hydro power, at 58%, followed by natural gas and nuclear, with shares of 14% and 13%, respectively (*Figure 1, panel B*).

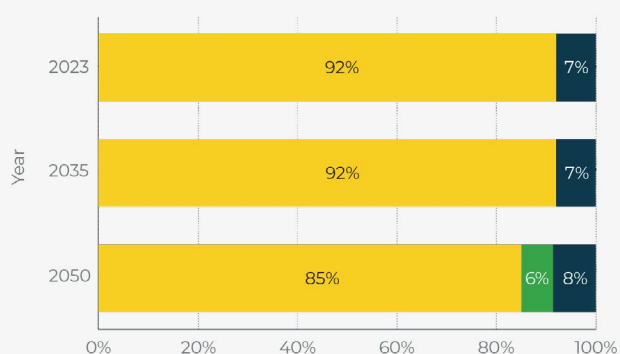
Looking ahead, a recent report from the Canada Energy Regulator (CER) sets out a potential path and corresponding provincial energy mixes that could enable Canada to achieve a net zero greenhouse gas (GHG) emissions electricity grid by 2035, and economy-wide net zero GHG emissions by 2050. Under the CER "Canada net zero" scenario, the country's electricity generation, in terms of gigawatt hours (GWh), is set to more than double over the next 27 years. A smaller but still significant increase is expected in Quebec (47%). This will likely put severe pressure and strong demands on the sector's capacity to transmit and distribute the greater volume of electricity — necessitating upgrades and investments in infrastructure and human resources.



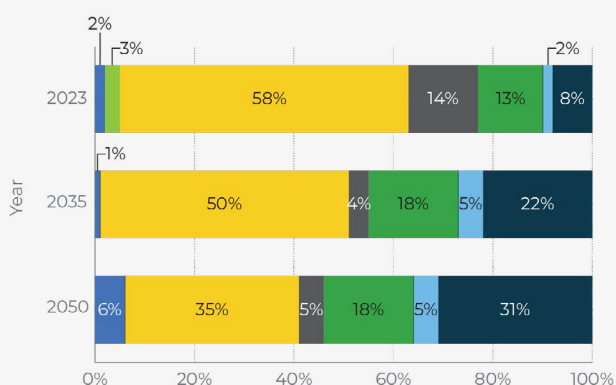


**Figure 1. Shares of electricity generation by source and year (2023, 2035 and 2050), net zero scenario (%)**

**Panel A: Quebec**



**Panel B: Canada**



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

**Note:** The "Net zero" scenario comprises an energy mix and growth path for electricity generation that will enable Canada to achieve a net-zero electricity grid by 2035, and net-zero GHG emissions by 2050.

Due to rounding, figures may not add to 100.

Under the scenario outlined by the CER, there is expected to be little or no change in the energy mix used to generate electricity in Quebec by 2035. This is primarily a result of hydro power's dominance in Quebec's electricity market. This contrasts with the situation in Canada as a whole, where the share of wind and solar electricity generation would need to double to reach a net zero electricity grid by 2035 (with coal and coke production being phased out entirely over the period).



**However, between 2035 and 2050, the net zero scenario assumes that Quebec will introduce some nuclear generation capacity.** The amount of electricity generated from wind power would also grow beyond 2035, albeit modestly. At the national level, the share of hydro-generated electricity will fall by over 20 percentage points by 2050, while wind power would increase to just over 30% (Figure 1, panel B). Within this time horizon and scenario, the share of electricity generated with natural gas would fall to 5% at the national level while solar power would grow only modestly.

Over the forecasted time horizon, in addition to considerable shifts in the shares of fuels used to generate power, there will be important increases in the absolute amount of electricity generated by different sources (Table 1).

**In the case of Quebec, however, the anticipated growth in electricity generation between 2023 and 2035 is limited, i.e., only solar is expected to see strong growth (23% per year on average).**

In contrast, over the same period, Canada's increase in electricity generation is expected to come primarily from wind, solar and nuclear. Over the period from 2035 to 2050, increases in electricity generation in Quebec will be strongest in nuclear (growing from 0) and solar.

Over the same period, the percentage increases in the volume of electricity generated in Canada are projected to be largest among biomass/geothermal (9% average growth per year), followed by wind (5% average growth per year).





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

Energy Source	Quebec			Canada		
	2023	2035	2050	2023	2035	2050
<b>Nuclear</b>	0	0	20,191 (100%)	82,425	164,478 (5.9%)	249,972 (2.8%)
<b>Hydro/wave/tidal</b>	195,807	261,503 (2.4%)	266,719 (0.1%)	376,053	467,766 (1.8%)	474,316 (0.1%)
<b>Wind</b>	14,323	20,099 (2.9%)	23,659 (1.1%)	53,498	207,476 (12.0%)	425,064 (4.9%)
<b>Natural gas</b>	263	0	0	90,568	32,851 (-8.1%)	62,772 (4.4%)
<b>Solar</b>	30	365 (23.3%)	875 (6.0%)	11,060	44,914 (12.4%)	74,699 (3.4%)
<b>Biomass/geothermal</b>	1,565	1,567 (0.0%)	1,744 (0.7%)	10,224	18,446 (5.0%)	71,889 (9.5%)
<b>Oil</b>	593	322 (-5.0%)	348 (0.5%)	1,606	670 (-7.0%)	1,004 (2.7%)
<b>Coal &amp; coke</b>	-	-	-	19,594	-	-
<b>Total</b>	<b>212,580</b>	<b>283,855 (2.4%)</b>	<b>313,535 (0.7%)</b>	<b>645,028</b>	<b>936,600 (3.2%)</b>	<b>1,359,716 (2.5%)</b>

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

**Note:** In relation to 2035, the figures in parenthesis refer the average compound annual growth in electricity generation anticipated for that energy source between 2023 and 2035. The figures in the 2050 column 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.

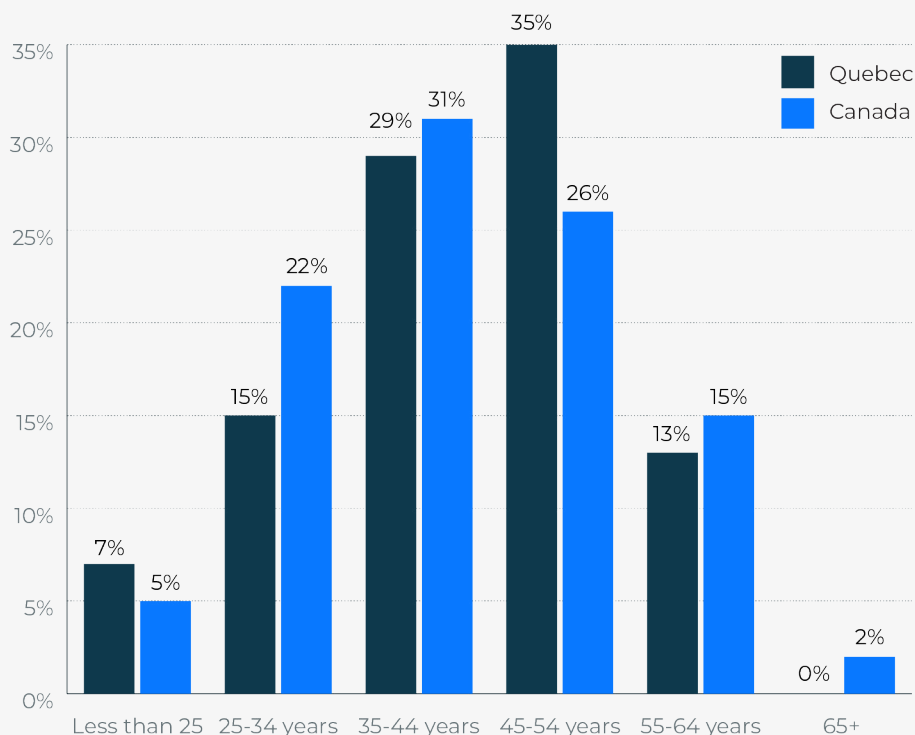


## AGE DISTRIBUTION OF THE WORKFORCE

Within the electricity sector, the age profile of Quebec's workers is slightly different than the corresponding situation for Canada (*Figure 2*).

Quebec has a smaller share of workers aged 55 years and over (approximately 13%) than Canada. However, Quebec's share of workers 45-54 years of age is significantly larger – suggesting that age-related pressures will adversely impact the province's workforce over the coming decade. This will likely be compounded by the fact that Quebec also has a smaller share of workers under the age of 35.

**Figure 2. Age Distribution (%), 2022**



Source: Statistics Canada, Labour Force Survey, 2022.



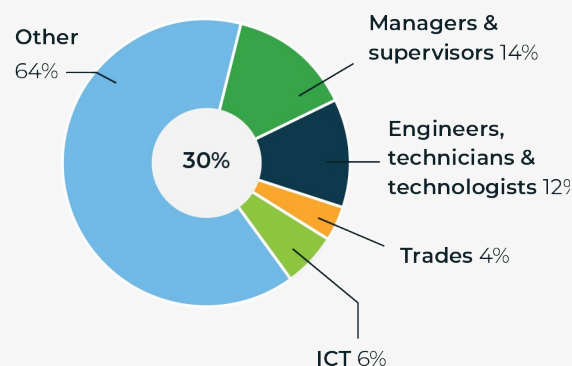
## DISTRIBUTION OF FEMALE EMPLOYMENT

**Figure 3 highlights that in Quebec, the share of women in the electricity sector's workforce is relatively high, i.e., 30% compared to 27% in Canada.**

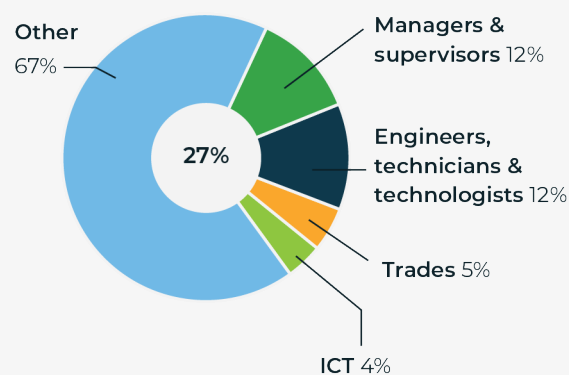
In terms of the distribution of employment, women are concentrated in *Other corporate* occupations in both Quebec and Canada (64% and 67%, respectively). Only 6% and 4% of women in Quebec's and Canada's electricity sector are employed in *ICT* occupations. Further, only 4% and 5% of women in Quebec's and Canada's electricity sector are employed in *Trades* occupations. Compared to Canada, Quebec's electricity sector workforce has a larger share of women employed in the *Management & supervisors* occupational group.

**Figure 3. Distribution of female employment by occupational group**

**Panel A: Quebec, 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 EHC's *Electricity in Demand: Labour Market Insights 2023–2028* for information regarding the occupations covered in each of these broad groups.



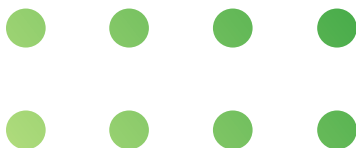


# DIVERSITY, EQUITY AND INCLUSION

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

As is the case in other sectors of the economy, the electricity sector 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 the 2021 Census, Quebec's and Canada's electricity sector workforces are less diverse than is the case at the national economy-wide level.

- **Indigenous peoples:** Close to 3% of workers in Quebec's electricity sector identified as Indigenous, which is lower than the national figure for the electricity sector, at 5% (the latter 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 Quebec's electricity sector identified as persons with disabilities, similar to the national level.
- **Racialized groups:** A little more than 11% of workers in Quebec's electricity sector identified as being from a racialized group, significantly lower than the national figures for the electricity sector, at close to 22%. Both figures are lower than the share (26%) of racialized groups working across all sectors of the Canadian economy.
- **Immigrants:** A little more than 11% of workers in Quebec's electricity sector are immigrants, considerably lower than the national figure for the electricity sector at 18% (both of which trail the share of immigrants working across all sectors of the economy in Canada at 29%).
- **Gender diverse people:** EHRC survey revealed that less than 1% of the electricity sector employees in Quebec identify as gender diverse, lower than the national level for the electricity sector (2%).





## LEVEL OF EDUCATIONAL ATTAINMENT

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

**The comparable figure for Quebec is somewhat higher at 41% (Figure 4).**

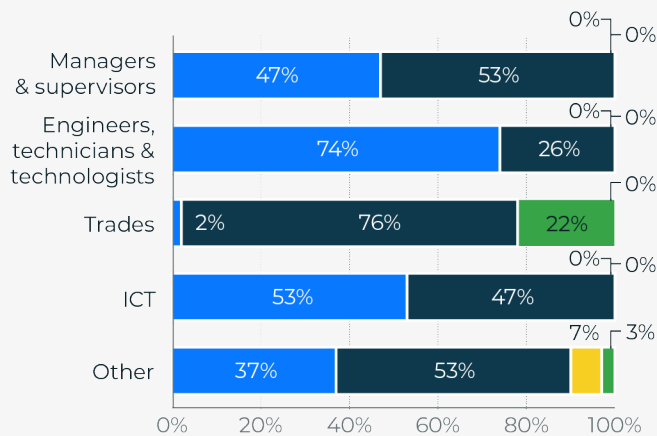
In both Quebec and Canada, the educational attainment of those who work in the electricity sector's main occupational groups is also generally high.:

- **Managers & supervisors:** In Quebec, all *Managers & supervisors* have at least some post-secondary education or trades certificate or diploma, compared to 94% in Canada. The share of *Managers & supervisors* with at least a bachelor's degree in Quebec is 47%, whereas the corresponding figure for Canada is just over half.
- **Trades:** Among this occupational group, approximately 78% have at least a post-secondary or trades certificate or diploma or higher (with 2% having a bachelor's degree or more). In Canada, the corresponding figures are 87%, with at least 15% having a bachelors' degree or more.
- **Engineers, technologists and technicians:** Nearly three-quarters (74%) of the province'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 Quebec's electricity sector is comparable to that of Canada.

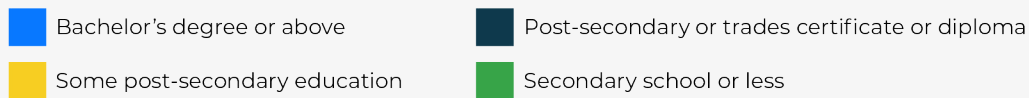
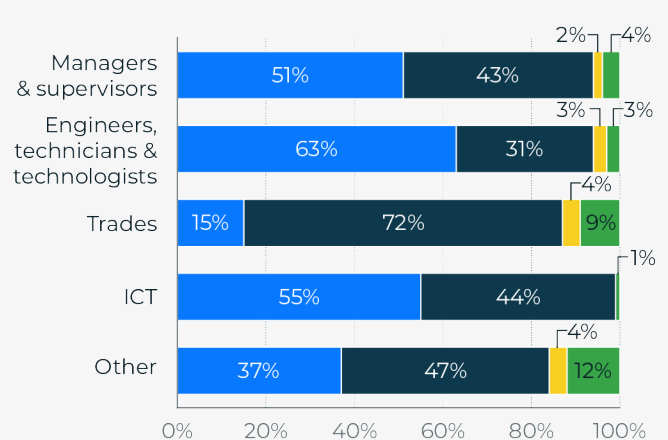


**Figure 4. Educational attainment by occupational group**

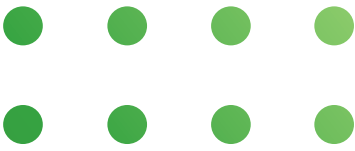
**Panel A: Quebec, 2022**



**Panel B: Canada, 2022**



Source: Statistics Canada, Labour Force Survey, 2022.



## EMPLOYMENT PROFILE AND RECENT TRENDS

**Examining the distribution of employment across the four occupational groups reveals some notable differences between Quebec and Canada (*Table 2*).**

Relative to the national average, the share of ICT workers (11.5%) in Quebec is considerably higher (6% in Canada), whereas the share of employment in Trades (17.3%) is significantly lower (26.8% in Canada).

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

Occupational Group	Quebec		Canada	
	Volume	%	Volume	%
<i>Managers &amp; supervisors</i>	2,600	10.6	9,800	8.9
<i>Engineers, technologists &amp; technicians</i>	3,600	14.3	16,500	14.9
<i>Trades</i>	4,300	17.3	29,600	26.8
<i>ICT</i>	2,900	11.5	6,700	6.0
<i>Other corporate professionals</i>	11,500	46.2	48,100	43.4
<b>Total</b>	<b>24,900</b>	<b>100</b>	<b>110,700</b>	<b>100</b>

**Source:** Statistics Canada, Labour Force Survey, 2022.

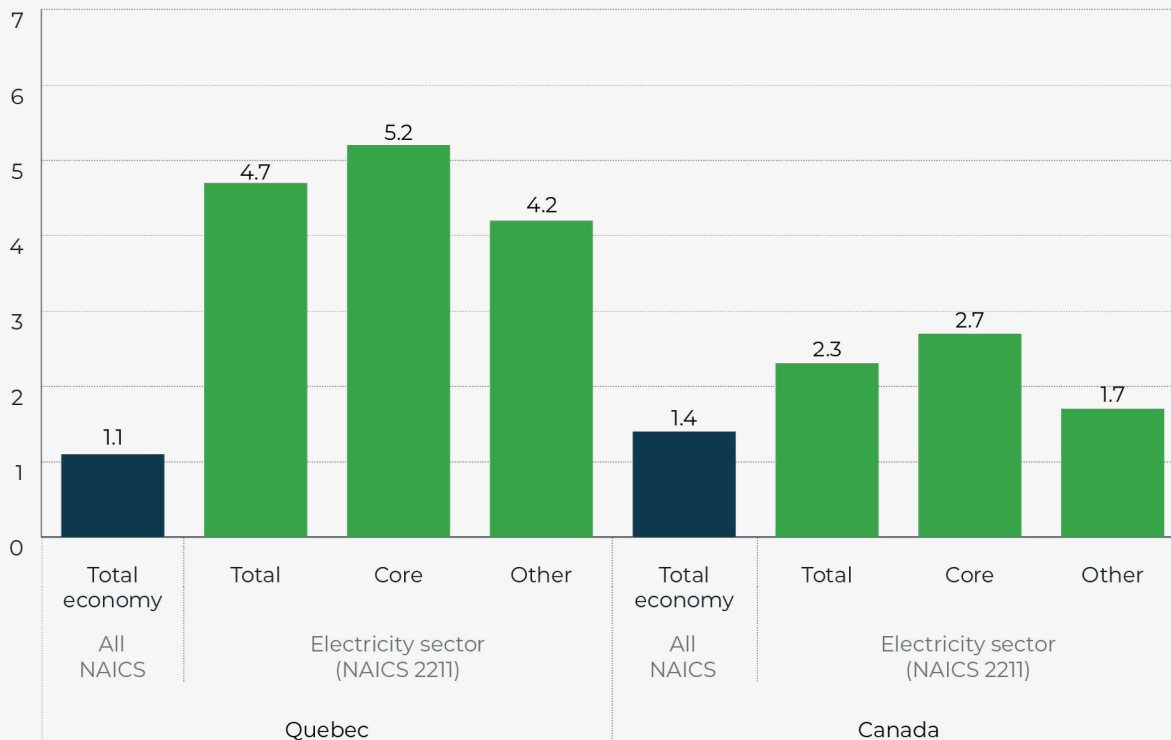
**Note:** Figures are rounded to the nearest 100.



**In the past 5 years, employment in Quebec’s electricity sector has grown more than the corresponding figure at the national level (Figure 5).**

Between 2017 and 2022, average annual growth in Quebec’s electricity sector was 4.7%, double the employment growth in Canada (2.3%). However, employment growth in Quebec’s total economy (1.1%) was lower than the comparable figure for Canada’s economy, at 1.4% per year between 2017 and 2022. The strong employment growth in Quebec’s electricity sector was driven by job gains among the core group of occupations, which averaged 5.2% per year compared to 4.2% among the other group of occupations. In contrast, in Canada’s electricity sector as a whole, employment growth among the core set of occupations was 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.



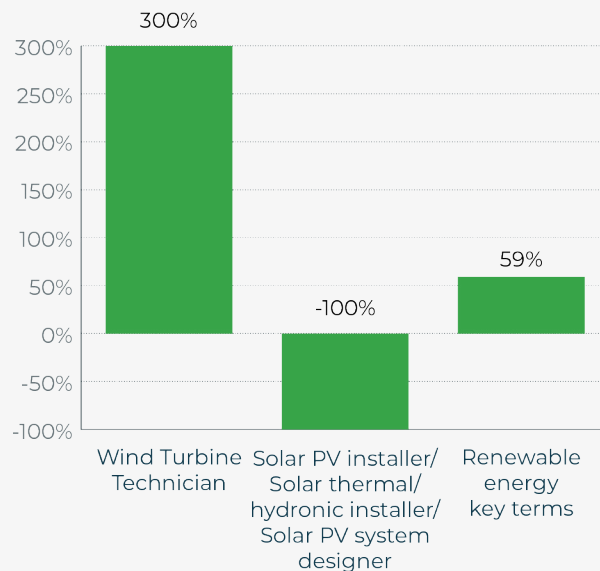
**An important consideration in terms of employment patterns and the shift towards net zero is the critical role of renewable energy occupations.**

There is a scarcity of official data on such jobs, since they are captured as part of broader occupations within the National Occupational Classification system. However, online job posting data from Vicinity Jobs, while not to be conflated with employment, can yield valuable insights on recent trends concerning these specific job titles.

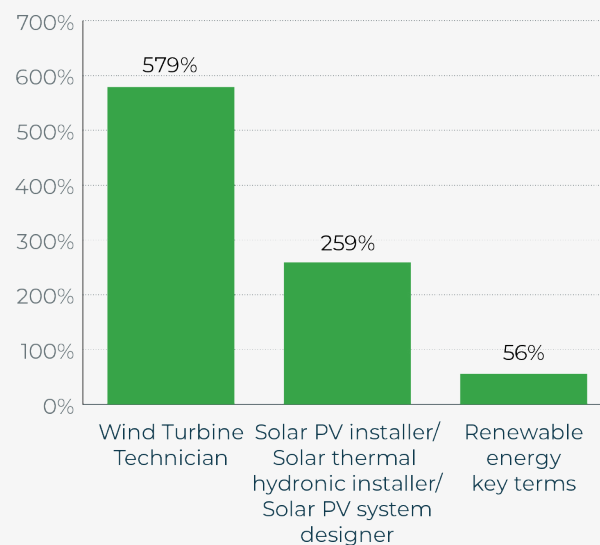
The growing demand for workers with specialized skills in the renewable energy sector is quite evident: Figure 6 illustrates that the number of online job postings in Quebec that contain the key phrases ‘renewable energy,’ ‘solar power,’ and/or ‘wind power generation’ increased 59% between 2018 and 2022. Additionally, postings for Wind turbine technicians grew by over 300%; however, those related to Solar PV installer fell by 100% (from a small number to 0). 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. Change in number of online job postings for renewable energy and related occupations (%), 2018–2022**

**Panel A: Quebec**



**Panel B: Canada**



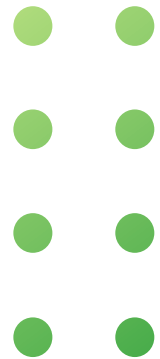
Source: Vicinity Jobs.



The EHRC Employer survey shows that 40% of organizations operating in Quebec's electricity sector utilize contractors (compared with 40% in Canada), while 40% use consultants (compared with only 24% in Canada). The increasing reliance on contractors highlights the need to closely monitor the demographic composition of the permanent workforce and pool of contractors.

***As this workforce contingent ages, it will become increasingly important to strike a balance, and avoid excessive dependence 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

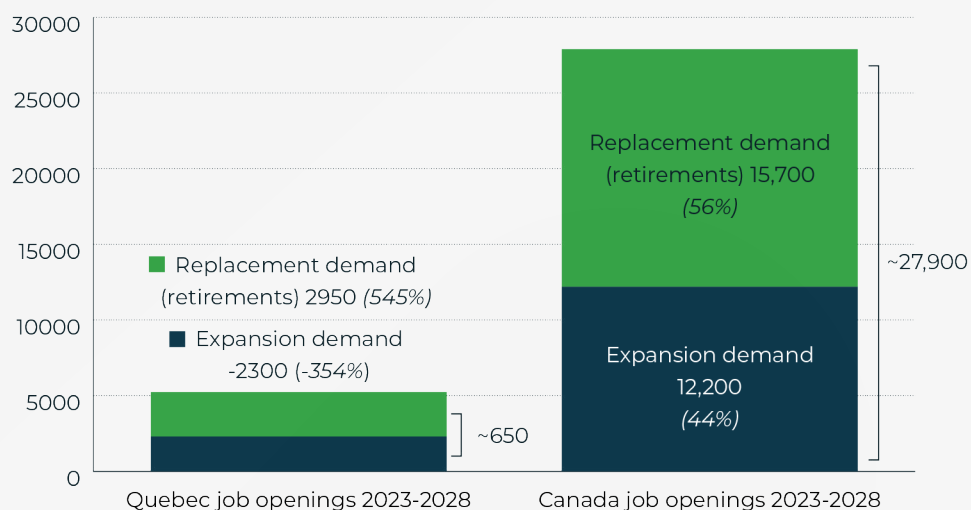
Leveraging the assumptions and data underpinning the long-term scenarios from the Canada Energy Regulator's *Canada's Energy Future 2023*, a forecast model has been developed to shed light on the potential employment implications for the electricity sector over the medium term under the path to net zero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

**Between 2023 and 2028, total job openings in Quebec's electricity sector are anticipated to grow by nearly 650, as Canada charts its path towards net-zero (Figure 7).**

This includes approximately 3,000 job openings that are expected to arise from replacement demand, i.e., from retirements. However, expansion demand is expected to contract, with a decrease of nearly 2,300 job openings from 2023 to 2028. For Canada, the number of job openings in the electricity sector associated with expansion demand are expected to be just over 12,000, while the total number of retirements or replacement demand is estimated at 15,700. For Canada as a whole, this yields a total of nearly 28,000 job openings in the sector from 2023 to 2028.



**Figure 7. Composition of demand for workers in the electricity sector, 2023–2028**



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

Between 2023 and 2028, the relative magnitudes of replacement and expansion demand will vary by occupational group (Table 3). In Quebec, the total number of job openings expected over the 2023–2028 period is driven by expansion demand in the *ICT* group of occupations and the need to fill job openings across all occupational groups resulting from retirement, i.e., replacement demand.

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, replacement demand is expected to exceed expansion demand, except in ICT occupations, over the forecast time horizon.***





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

Occupational Group	Quebec		Canada	
	Expansion demand	Replacement demand	Expansion demand	Replacement demand
<i>Managers &amp; supervisors</i>	-2,050	200	-2,100	1,200
<i>Engineers, technologists &amp; technicians</i>	0	450	1,200	1,900
<i>Trades</i>	-500	500	2,800	3,700
<i>ICT</i>	1,900	350	3,800	800
<i>Other corporate professionals</i>	-1,700	1,500	6,500	8,050
<b>Total</b>	<b>-2,300</b>	<b>2,950</b>	<b>12,200</b>	<b>15,650</b>

**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 on 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.

