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Project Insights Report

Powering AI: A Workforce Perspective

PARTNERS
Electricity Human Resources Canada

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Executive Summary

Artificial Intelligence (AI) is rapidly transforming the workforce across sectors by enabling systems to interpret data, learn from patterns, and generate insights. In Canada, this shift is expected to require significant workforce adaptation. While AI presents risks related to job automation, it also creates opportunities to improve productivity, enhance decision-making, and support new roles.

Canada's electricity sector is undergoing rapid digital transformation, with AI emerging as a key driver of operational efficiency, grid modernization, and increased electricity demand. To better understand these changes, Electricity Human Resources Canada conducted research to examine how AI is being adopted across the sector and the implications for workers. The study explored two key questions: How is AI impacting electricity sector jobs? How might workforce demand evolve as electricity consumption increases, particularly due to the growth of data centres?

The findings show that AI adoption is already widespread within the electricity sector. Nearly 90% of organizations surveyed reported using AI tools in at least one operational area, such as customer service, billing, or cybersecurity. Organizations primarily use AI to improve productivity and enhance customer experience, while also supporting broader sector goals such as energy forecasting and emissions tracking. Importantly, the research highlighted that AI is not eliminating jobs but transforming them. It is creating demand for new roles, and there is a growing need for hybrid skills that combine technical expertise, sector knowledge, and digital literacy.

However, the research also highlights several challenges with AI implementation. AI adoption is uneven across demographics and regions, and governance frameworks have not kept pace with technological uptake. While many organizations report using AI tools, only a small proportion have formal AI policies in place, raising concerns around cybersecurity, data privacy, and responsible implementation.

Overall, the findings emphasize that the successful integration of AI in Canada's electricity sector will depend on proactive workforce planning, inclusive training opportunities, and stronger governance frameworks. Collaboration among industry, educators, policymakers, and workers will be essential to ensure successful AI adoption supports a resilient, innovative, and inclusive energy workforce.

KEY INSIGHTS

1. Canada is facing an AI literacy and training gap. Only 24% of electricity workers indicated they have received some formal AI training.
2. AI is rapidly transforming operations within the electricity sector, enabling increased efficiency to support customer service, grid modernization and energy management.
3. 60% of employees in the electricity sector reported using AI tools, but only 34% of organizations have implemented AI policies.

The Issue

Artificial Intelligence (AI) refers to technology that has the ability to interpret external data, learn from patterns, and apply this knowledge. AI approaches can include generative models, natural language processing, computer vision, and reinforced learning to support generating new content and learning from the data provided.

With the significant growth and access to AI, there has been a profound impact across sectors. It is estimated that close to 42% of the Canadian workforce will need to reskill over the next three years to keep up with the growth of generative AI. Although there is a risk of job automation related to AI advancements, AI can also support increased employment opportunities and enhance productivity.

AI adoption has started to grow across sectors, but there continue to be gaps and challenges. Approximately 25% of people working in Canada report using generative AI tools such as ChatGPT or Microsoft Copilot, but there continues to be limited training and gaps in integration and understanding of the tool.

In addition, AI adoption has been uneven across sectors. Large organizations and high-margin sectors such as healthcare, finance, and legal have implemented and used AI to reduce costs and increase productivity, with well-documented results. However, there is untapped potential for AI in other sectors.

Canada's electricity sector is undergoing rapid digital changes, with AI emerging as a key factor in supporting this growth. AI is reshaping operations, job roles, skills requirements, and overall demand for electricity. These transitions will require the workforce to adapt and adopt innovative strategies. The success of Canada's evolving electricity sector will depend on how well organizations and leaders can understand AI and integrate intelligent systems.

What We Investigated

This research project by the Electricity Human Resources Council (EHRC) sought to understand how AI is being adopted across Canada's electricity sector and the implications for workers. Two fundamental research questions guided this project. First, what is the impact of AI on the jobs of electricity workers? Second, what are the new workforce growth requirements with the increasing demand for power, particularly from AI data centres?

The report identified workforce gaps in the electricity industry by assessing how AI-driven changes were affecting current roles and the new skills that would be required for evolving occupations. It also modelled the workforce needed to build additional electricity capacity associated with the growth of AI data centres and corresponding power demands. The project engaged diverse stakeholders, including industry leaders, regulatory bodies, unions, and educators, to examine the current and projected electricity workforce in relation to AI.

The EHRC's research activities included conducting stakeholder interviews with 20 different organizations and a nationwide survey with 59 employers; analyzing labour market trends as part of a broader environmental scan; leveraging workforce models; and hosting workshops to validate findings. The research also examined the challenges faced by equity-denied groups, ensuring the proposed solutions were inclusive and accessible.

The research results informed practical, evidence-based recommendations aimed at industry, policymakers, educators and unions. These recommendations are intended to equip them with the knowledge to develop sustainable workforce strategies and position Canada as a leader in AI- driven energy innovation.

What We're Learning

AI is transforming operations in the electricity sector
Almost 90% of organizations reported implementing AI tools in at least one area of operations. The leading areas were customer service, public relations, billing, and cybersecurity. The primary goal of using AI was to enhance workforce productivity and improve customer experience. In addition, AI was also used to support sector goals and advancements. These included support for grid modernization, by using AI to forecast price changes, and for climate goals, with emission tracking and energy use forecasting.

The growth of data centers will impact labour requirements across the sector
Canada operates about 290 data centres, a number that continues to grow. Projections indicate that data centre energy usage could reach 14% of Canada's total power demand by 2030. Meeting this demand requires proactive workforce planning, including the reskilling of electricity workers and regional coordination to ensure the right skills and roles are developed.

AI is not eliminating jobs in the electricity sector but rather transforming them
There is optimism in the sector, as organizations are ready to adopt AI. A majority of organizations surveyed (87%) expect increased efficiencies. As AI is implemented, new skills will be required. New roles will likely emerge that focus on digital and data expertise in areas such as energy analytics, system integration, cybersecurity, and machine learning. Demand will grow for hybrid skills that combine technical expertise and sector knowledge with AI literacy. Digital literacy was ranked as the top skill needed for workers for effective AI implementation.

AI adoption is uneven across demographics and regions, highlighting the need for targeted and inclusive workforce strategies
Barriers to AI implementation persist for several populations. Immigrants, Indigenous peoples, and racialized workers often have limited access to AI-related roles despite showing strong familiarity with digital platforms. Addressing these disparities will require targeted training programs, inclusive outreach, and equity-focused hiring practices. Generational differences are also evident in the adoption of AI. Younger workers tend to be more digitally fluent. Older workers may require additional training but possess critical institutional knowledge that organizations risk losing as retirements accelerate and the focus on digital skills grows. Regional disparities are also an important factor. AI infrastructure, data centres, and related institutions are largely concentrated in urban areas, underscoring the need for tailored approaches that ensure equitable access and opportunities for workers in Northern and remote communities.

AI adoption is outpacing the governance and workforce support needed to manage it responsibly
While over 60% of organizations report using AI tools to a moderate extent, only 34% of organizations have implemented formal AI policies. This highlights a significant gap in governance as adoption accelerates. To foster trust, transparency, and cultural alignment as these systems are integrated, organizations must prioritize the development of AI policies and regulations that emphasize responsible design, involve employees, and maintain open dialogue. Organizations identify cybersecurity and data privacy as their primary concerns when using AI, which underscores the urgency of establishing clear guidelines to manage risks and support responsible AI use.

Why It Matters

AI is rapidly impacting the workforce across sectors and reshaping how work is performed. While Canada is well-positioned as a leader in AI policy, we continue to lag in successfully adopting and implementing AI into the workforce.

As Canada's electricity sector evolves, the success of AI implementation will depend on how well the sector can prepare people to lead, adapt and thrive with intelligent systems. The research findings show that AI can enhance productivity, sustainability and resilience in the sector, but only if there is investment in strong governance, inclusive training, upskilling and strategic workforce planning. Proactive leadership with a people-first approach and collaboration with workers, organizations, educators and policymakers will support successful AI integration and advance Canada's electricity sector.

To support the transition of AI, proactive and collaborative approaches are needed across educators, policymakers and governments. Expanded education and retention programs are required that integrate AI content and necessary digital skills into their curriculum. Clear and consistent guidelines for AI deployment and regulation are required that take into consideration the unique elements of each sector. This should focus on validation and oversight processes that continue to protect employees and organizations, while ensuring responsible AI use. As organizations adopt AI and develop policies, organizations that involve employees, maintain transparency, and build trust are more likely to see successful integration and face less resistance from workers.

State of Skills:
Unleashing AI into the Skills Development Ecosystem

FSC-supported AI tools have bolstered outcomes in skills matching, career development guidance, and recruitment. The overall effectiveness of these tools was underpinned by recognizing and mitigating the inherent bias and discrimination embedded into these technologies.

Read Thematic Report

AI integration could also further widen existing labour market inequities. Without targeted training and inclusive policies, populations could experience barriers to access AI-focused roles, particularly for immigrants, Indigenous peoples, racialized workers, and older employees. Across sectors, policymakers and sector leaders will need to ensure this remains a priority for people to transition into new AI-enabled roles rather than being excluded from them.

What's Next

Following the publication of this research, the EHRC hosted three regional webinars to launch the research findings and the report was distributed to key partners and associations within the sector.

Expanding on this work, the EHRC leveraged the research findings to dive further into labour market intelligence models that better outline the impact on the sector. EHRC has secured additional funds to continue this work on labour market intelligence, including AI and technology adoption within the electricity sector, over the next five years. In addition, EHRC has established new relationships with AI clusters in Canada, such as Mila in Quebec, Amii in Alberta and the Vector Institute in Toronto.

Have questions about our work? Do you need access to a report in English or French? Please contact communications@fsc-ccf.ca.

How to Cite This Report
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