

# AI DATA CENTRE DEVELOPMENT IN ALBERTA

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The growth in artificial intelligence (AI) has not only opened up new horizons in computing and workforce innovations, but has provided unique business opportunities in its surrounding infrastructure. Much like cloud service providers and cryptocurrency mining operations, AI requires significant power and data storage to perform its operations. However, the scale of power and storage needed for AI is of another order of magnitude than operations we have experienced before. As compared to a traditional Google search, a ChatGPT request requires nearly 10 times more electricity.<sup>[1]</sup> To meet the demands of the industry, data centres of a greater size and capacity will be needed to keep pace with AI.

Five predominant things are needed to facilitate the development of AI data centres:

1. Land
2. Construction
3. Power
4. Technology
5. Investment

Having an abundance of the above, the Province of Alberta is well positioned for the development of new AI data centres. Between 2018 and 2023, Alberta has experienced a 7.7% annualized growth in data centres based on government calculations. Last year, these data centres generated approximately \$1.3B in revenue.

## 1. Land

For data centres of the size and scale needed for AI, acquiring sufficient and suitable land for development is a necessary first step. However, not all land is created equal.

The climate of the area, particularly for an AI data centre can be a key consideration in land acquisition. Data centres are, simply put, a network of computers and when computers process data, they use power and produce heat. As a result, these large data centres often require a significant amount of cooling to allow them to operate effectively. Cooling and ventilation systems account for anywhere between 30 and 55 percent of data centre power consumption.<sup>[2]</sup> A location with a cooler climate promises to significantly reduce the costs of cooling data centres. While Alberta's cold winters and brief summers may be the ire of locals, but it provides

a promising opportunity for data centres to operate with reduced costs and increased efficiency.

Beyond the climate of a region, the geological and meteorological stability of an area could dictate which land is most appropriate for such developments. The footprint of data centres will need to be large to accommodate the increased scale of AI, and thus the risks to infrastructure ought to be considered. Even minor disruptions from storms and natural disasters can lead to major losses and costs to data centres. Alberta has one of the highest availability rates of industrial real estate for lease in all of North America and it enjoys a relatively stable geological and meteorological environment. Alberta experiences comparatively few earthquakes and the Alberta Energy Regulator has no recorded damage from an earthquake in the province.<sup>[3]</sup> Further, the province experiences a comparably low number of storm events.

Much like any land development project, AI data centre developers must consider size, location zoning and permitting, along with the proposed project's proximity and accessibility to other necessary resources and services such as transmission lines, utility and infrastructure services, broadband networks, skilled labour and more.

McMillan's Corporate Real Estate Group is well-suited to help to navigate these complexities and development decisions.

## **2. Construction**

A skilled trade workforce and affordable resources will be of prime importance for the construction of AI data centres. Much like any construction project, whether through the design and planning phase or the final construction phases, a stable workforce will be needed to carry out the tasks at hand. With a growing population and a growing construction sector, Alberta has an available and skilled workforce to meet the demand.<sup>[4]</sup> With virtually all the top-tier engineering and construction firms represented in Alberta, there is not only the skill set to design and build, but a history of impressive engineering developments from which to grow. Alberta has a long history of building complex, multi-billion-dollar infrastructure projects with success and AI data centres could be the next area of focus for this core competency.

Canada is fortunate to be a resource rich country and has a well-developed industry in extraction and fabrication of these resources for use in construction and other industries. But beyond the resources needed to construct the building itself, final development of an AI data centre will require IT infrastructure to be operational. While discussed further below, it warrants mentioning that Canada has a supply of the critical minerals needed for the hardware components of AI data centres. With federal and provincial initiatives in place to support the extraction and development of these resources,<sup>[5]</sup> Canada and Alberta could be a one-stop shop for the construction of AI data centres where raw resources are extracted, refined and manufactured into the products needed to both construct and equip an AI data centre, be it the steel struts in the building

shell or the microchips in the servers.

Finally, the permitting process and regulatory burdens of construction must be considered when deciding to undertake the development of an AI data centre. A streamlined regulatory process can provide greater certainty when approaching a construction project and ensure projects are completed on time and on budget. With the speed at which AI is growing, a quick response in development is needed to meet demand. Alberta's red tape reduction initiative is reducing regulatory barriers and streamlining processes to reduce regulatory hurdles to development.<sup>[6]</sup> Alberta's regulators have experienced some challenges in regulating large data centres with the boom of cryptocurrency mining; however, in recent years there has been some additional guidance from regulators that may reduce the regulatory uncertainty.<sup>[7]</sup>

McMillan's Construction & Infrastructure, and Regulatory Groups have the expertise and the insight to help your business navigate the construction and regulatory industry in Alberta and across the country.

### **3. Power**

AI data centres will require a large and stable power supply. It will be important identify an affordable power supply able to meet the facilities' needs and to locate the facility near transmission lines with sufficient capacity to deliver the power. Given the heavy power requirements for AI data centres, developers will likely need to bring their own power to the table and some creative solutions will need to be considered in securing sufficient and reliable energy to fuel these projects.

The first step will be to enter into a power purchase agreement (PPA) with a power producer. In Alberta, the power market is open and competitive, and negotiations for such agreements would be with independent power producers (rather than a Crown corporation as might be the case in most other provinces). A key consideration in when securing the supply for a project is the generation/fuel source. Alberta has the capacity to produce power from a variety of sources, and the availability of green energy offerings is growing.<sup>[8]</sup> In recent years, companies such as Amazon and RBC have negotiated renewable energy PPA to power local operations and data centres, while supporting the construction of some of the country's largest renewable energy projects.<sup>[9]</sup>

Next, connection agreements would be needed, both to inject the contracted power generation onto the grid, and then for the AI data centre to withdraw that energy from the grid. With power needs potentially in the hundreds of thousands of megawatts (depending on the size and number of facilities), upgrades to the power grid are bound to be needed. There are opportunities both within these agreements and at regulatory hearings to determine, how the significant costs of upgrades to the power grid should be apportioned as between the specific data centre consumer and all other electricity users.

Finally, a transmission service agreement may be negotiated to bring the power from the producer to the AI data centre. Alberta's transmission system is a designated monopoly with assigned transmission facility owners by region with the exception of specific competitive process projects approved by the regulator.<sup>[10]</sup> Further, negotiated agreements will need to meet regulatory approval to finalize the process.

McMillan's Power and Energy Groups has the expertise necessary to help negotiate these agreements for your business in compliance with the regulatory regimes in place.

#### **4. Technology**

The technological capacity needed to develop AI data centres is both in resources and workforce. The technological resources needed include the computing component powered by critical minerals as already mentioned above, but also technological innovation in the systems and infrastructure which support the computing core of an AI data centre. The opportunity to innovate with HVAC systems and efficient cooling systems abound and could bring a meaningful cost savings to an AI data centre.

Outside of the building itself, technological capacity is needed with respect to the network access and service to which the AI data centre would connect. Without a fast and reliable network service, the data centre will likely have reduced capacity and be more vulnerable to outages, disruptions and service credits to its customers. Geographies and markets with multiple network or internet service providers would allow for more business opportunities and competitive pricing and give organizations looking to develop AI data centres an advantage in negotiating prices and services. With the Alberta Broadband Strategy targeting the delivery of high-speed internet access across the province by 2027, steps have already been taken to ensure that the funds and infrastructure are in place to facilitate consistent and competitive access for internet services to AI data centres.

To construct and operate a successful AI data centre, a talented workforce trained in tech will also be critical. With a tech talent pool in Alberta estimated to be more than 100,000 skilled resources, there is an available workforce for the industry.<sup>[11]</sup> And as the industry grows, the Targeted Enrolment Expansion program aims to continue to grow that workforce by adding more post-secondary spaces in tech.<sup>[12]</sup>

Once up and running, an AI data centre requires at a minimum industry standard security protocols and privacy practices in compliance with regulatory requirements to protect the data stored therein and the hardware on which it is stored. Protecting the security of an AI data centre goes further than simply protecting the data and physical assets inside the data centre. It is also important to ensure that steps are taken to minimize material downtime because downtime brings with it the risk of serious financial losses. The Uptime Institute found in 2022 that the total losses in more than 60% of all digital service outages were at least \$100,000 and 15% of outages resulted in total losses upwards of \$1 million.<sup>[13]</sup> When the outage affects other

businesses using a data centre, the data centre operator risks liability for those losses. With the right redundancies and contingencies in place, an AI data centre operator can materially mitigate those risks.

Cybersecurity and data breaches are some other risks faced by AI data centres and require robust privacy protocols to protect sensitive personal information. Operators of AI data centres need to ensure that they can comply with all relevant privacy legislation and guidelines for the industry because doing so will give customers of the data centre peace-of-mind that their data and records, are being protected as required. This will further help to reduce and mitigate liability from any breach which might arise. For Canadian businesses, there is a real advantage, and in many cases a requirement, to use data centres located in Canada to ensure that the business can comply with its data residency requirements, because they can ensure that their Canadian personal information and related data is being protected in accordance with Canadian privacy legislation.

McMillan's Technology Group has experience in this area and can provide advice as your business explores these opportunities.

## **5. Investment**

Finally, to bring all of this to fruition, investment is needed to develop AI data centres. A market with the right economic incentives can encourage investment and offset some of the construction and operating costs.

As with any large-scale development, a favourable tax structure will support long-term viability of AI data centres. Alberta businesses and residents enjoy the lowest overall taxes in Canada and are amongst the lowest in North America.<sup>[14]</sup> The combined federal and provincial business tax rate of Alberta is lower than that of 44 US States at 23%.<sup>[15]</sup> Coupled with the provincial government's efforts to help investors overcome barriers that create delay in development, this could make Alberta the jurisdiction of choice to develop an AI data centre.

To better understand the investment opportunities available in this area, contact McMillan's Cross-border Transactions and Investment into Canada and Tax Groups for advice tailored to your business' needs.

Your McMillan LLP AI Data Centres Team:

To discuss any of these issues further, or for expert advice on the development of AI data centres anywhere in Canada, please contact a member of our AI Data Centre service team:

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[1] [EPRI Home](#)

[2] [Data Center Cooling Costs & How To Reduce Them | Enconnex](#)

[3] [Earthquakes and Induced Seismicity | Alberta Geological Survey \(aer.ca\)](#)

[4] [Alberta's labour force is building back strong | alberta.ca](#)

[5] [Minerals strategy and action plan | Alberta.ca; Critical Minerals Infrastructure Fund - Canada.ca](#)

[6] [Red Tape Reduction - Supporting Alberta's construction sector](#)

[7] [Drilling Down on Crypto: AER Cryptocurrency Mining Bulletin and Information Request - McMillan LLP; Proposing a power plant application - AUC.](#)

[8] [CER – Market Snapshot: Corporate power purchase agreements add renewables in Alberta \(cer-rec.gc.ca\)](#)

[9] [Amazon selects Alberta to build 1st Canadian wind farm project | Globalnews.ca](#)

[10] [Guide to understanding Alberta's electricity market » AESO](#)

[11] [DTD - Alberta's Economy - Sector Snapshots - MASTER \(businesscouncilab.com\)](#)

[12] [Targeted enrolment expansion | Alberta.ca](#)

[13] [Uptime Institute's 2022 Outage Analysis Finds Downtime Costs and Consequences Worsening as Industry Efforts to Curb Outage Frequency Fall Short - Uptime Institute](#)

[14] [Lowest Corporate Tax Rate in Canada for Business | Invest Alberta](#)

[15] [Lowest Corporate Tax Rate in Canada for Business | Invest Alberta](#)

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### **A Cautionary Note**

The foregoing provides only an overview and does not constitute legal advice. Readers are cautioned against making any decisions based on this material alone. Rather, specific legal advice should be obtained.

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