Byte by byte: Navigating key construction risks on data center projects

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Data centres are a crucial part of modern digital infrastructure, facilitating cloud computing, artificial intelligence, and global data storage. As demand for data processing increases, the construction of large-scale data centres is accelerating. Canada, with its cool climate, vast and accessible land mass, and stable energy supply, has become a key location for these projects.

However, the development and operation of data centres present unique challenges. These large, complex projects involve multiple stakeholders and face regulatory challenges and supply chain uncertainties. Below, we explore some of the primary legal risks associated with mega data centre construction.

Risk structures in mega data centre projects

Mega data centre projects differ from traditional infrastructure projects due to their specialized requirements. Unlike traditional large scale infrastructure projects, data centres require specialized expertise in areas such as electrical infrastructure, cooling systems, and cybersecurity. Given the complexity involved, risk allocation is a critical aspect of project planning.

One of the primary challenges in these projects is the difficulty of relying on a single contractor. Due to the technical nature of data centres, multiple specialists must collaborate to deliver project components. This decentralized approach makes it essential to establish clear contractual agreements that define risk allocation, performance expectations, and dispute resolution mechanisms.

Project delivery models in data centre projects

To manage the complexity of risk allocation in these type of projects, a number of delivery models may be appropriate, including Engineering, Procurement, and Construction Management (EPCM), Design Build, Early Contractor Involvement and Design Bid Build. The risk profile of the project and the willingness of stakeholders to accept, share or transfer risk will be a driving factor in the delivery model selected. Each

model should be considered carefully and assessed to determine which model will be commercially acceptable to those involved.

Each delivery model presents its own advantages and challenges. For example, EPCM contracts offer flexibility in engaging consultants and suppliers and can support more effective risk allocation by assigning responsibilities to the parties best suited to manage them. Design Build may streamline delivery through a single point of responsibility, while Early Contractor Involvement can improve constructability and cost certainty early in the project. Regardless of the model selected, a robust contractual framework is essential to manage relationships between various contractors and vendors effectively.

Key construction considerations

Intellectual property

Data centre projects often involve proprietary technologies such as engineering and architectural designs, custom software, and vendor-specific cooling and security solutions. Contracts should specify ownership rights for design and software elements, licensing terms for third-party technology, and measures to ensure operational control and flexibility.

Data security and regulatory compliance

Given the sensitive nature of data stored in these centres, strong security and regulatory compliance measures are essential. Contractual frameworks must address physical security, cybersecurity liability provisions for vendors in case of data breaches, and data requirements to comply with privacy laws.

Energy supply and regulatory challenges

Data centres are energy-intensive operations that require a reliable and consistent supply of power and frequently also water for cooling. Developers must navigate several key considerations related to energy sourcing and regulatory compliance. This includes:

- Obtaining access to the electrical grid and understanding the timelines for interconnection with utility providers are critical to ensure timely access to power. Alberta's Electric System Operator, the organization responsible for operating Alberta's power grid, has recently provided an update on the data centre connection process, including background on data centre applications, an overview of challenges, and a path forward.
- Securing the necessary permits for high-capacity energy consumption is essential, as are approvals to divert water for use in cooling systems.
- As the industry faces increasing pressure to reduce its carbon footprint, adopting energy-efficient designs and integrating renewable energy sources is increasingly important.

Alberta, in particular, presents unique opportunities and challenges for data centre construction due to its deregulated electricity market. Recent changes in legislation now allow industrial users, including data centres, to generate their own power and export any surplus electricity to the electricity grid.[1] However, the regulatory guidelines in

Alberta regarding grid interconnections are still evolving and major changes to the energy market and transmission policy are currently being finalized. Prospective and current industry participants should stay up to date on these changes.

Supply chain disruptions

Global supply chain disruptions impact the construction of data centres, which rely on specialized components. These disruptions can lead to fluctuating material costs, extended lead times for critical equipment, and labor shortages for installation and commissioning. Legal strategies to mitigate these risks within the selected project delivery model must be explored, as well as alternative procurement strategies to diversify suppliers and reduce reliance on single-source vendors.

Commissioning and performance testing

The commissioning process of a data centre ensures that all systems in the data centre work as intended. This includes performance testing of electrical and cooling systems, establishing acceptance criteria with penalties for non-compliance, and ensuring long-term operational efficiency through warranties and maintenance obligations.

Looking ahead

Canada, particularly Alberta, is well-positioned to capitalize on the growing data centre market. The Alberta Government recognizes the sector's potential in its broader economic diversification strategy, as outlined in Alberta's AI data centre strategy, Powering the Future of Artificial Intelligence, published in December 2024. With global data centre demand expected to triple by 2030, Alberta stands to capture a potential C$75-billion to C$100-billion economic opportunity.

By proactively addressing critical legal and construction considerations, developers can reduce risks, optimize costs, and ensure long-term project success in an increasingly competitive landscape. As regulatory frameworks evolve and industry demand intensifies, a well-structured legal and contractual approach will be essential to mitigating risks and ensuring successful project execution. BLG's Construction Group and Energy Group are available to provide guidance on navigating these complexities. Reach out to your lawyer or any of the key contacts below for assistance.

Footnote

[1] *Electricity Statutes Amendment Act*, SA 2022, c 8.

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