PEMBINA Institute

From Principles to Practice

Making data centre development work for Canadians

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Summary

Canada has set five principles for responsible data centre development: projects should create lasting local benefits, pay the electricity costs they create, limit water use and environmental harm, share clear information about local impacts, and bring strategic value to Canada.

The next challenge is implementation. This report outlines how governments, regulators, utilities and communities can use the principles as a common foundation for ensuring data centres deliver the outcomes Canadians need. Governments should set clear and measurable expectations while allowing projects to meet them in different ways.

No single electricity rate, energy resource or implementation approach will be enough. The strongest approaches will advance several principles at once, allowing Canada to expand its digital capacity while protecting electricity customers, communities and the environment.

Canada has set the direction

Canada took an important first step toward defining what responsible data centre growth should look like on September 3, 2026, when the federal government released Canada's Responsible Data Centre Development Principles, establishing a shared national starting point for a sector that is increasingly important to artificial intelligence, cloud computing, research, financial services and other parts of Canada's digital economy.[1] Canada currently relies heavily

[1] Government of Canada, "Canada's Responsible Data Centre Development Principles." https://ised-isde.canada.ca/site/ised/en/canadas-responsible-data-centre-development-principles

on compute, cloud and data storage infrastructure located outside the country, making more capacity in Canada a question of economic opportunity, security and resilience.

Under the five principles, data centres must:

- create lasting local benefits
- avoid shifting electricity costs to Canadians
- minimize water use and environmental impacts
- be transparent about local impacts
- bring strategic value to Canada.

These principles should also guide how data centre growth is considered within Canada's national electricity strategy.[2] As a major source of new demand, data centres will affect how much new electricity supply and grid infrastructure Canada needs, who pays for it, and whether the system remains affordable, reliable and low-carbon.

Canada now has a common direction. The next challenge is implementation.

That work will happen largely through provincial and territorial policy, electricity regulation and utility practices, and through municipal, Indigenous and other local planning and approval processes. The federal principles are intended to complement and guide those existing processes rather than replace them.

Canadian provinces are already taking different approaches from one another. Hydro-Québec has proposed a new, higher electricity rate for large data centres.[3] Alberta, meanwhile, is prioritizing data centre projects that pair electricity demand with new electricity generation built to serve their needs.[4] Both approaches address important challenges. But a rate structure alone does not determine environmental performance, local benefits or grid reliability, just as

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[2] Government of Canada, *Powering Canada Strong: A National Strategy for an Electrified Canadian Economy* (2026). https://natural-resources.canada.ca/energy-sources/electricity-infrastructure/powering-canada-strong-national-strategy-electrified-canadian-economy

[3] Hydro-Quebec, "A new rate for data centres and a rate adjustment for blockchains to reflect the value of renewable electricity," media release, February 19, 2026. https://news.hydroquebec.com/news/press-releases/all-quebec/hydro-quebec-proposing-regie-energie-new-rate-large-data-centres-adjustment-rate-cryptographic-use-applied-blockchains.html?

[4] Government of Alberta, *Data Centre Regulation,* 117/2026. https://kings-printer.alberta.ca/1266.cfm?page=2026_117.cfm&leg_type=Regs&isbncln=9780779862924&display=html

bringing new generation does not determine whether a project protects affordability, minimizes environmental impacts or creates lasting value for its host community.

The opportunity is to use Canada's five principles as a shared foundation, then turn them into clear expectations and practical actions. Done well, this can protect affordability, reliability and safety for electricity customers while supporting economic development in host communities and greater data sovereignty for Canada.

Turning Canada's five principles into practice

1. Data centres must create lasting local benefits

Large projects can generate substantial economic activity. But the size of the investment and the number of construction jobs do not tell us what will remain in a community after construction ends.

Canada's principles point to jobs, skills training and apprenticeships, local and Indigenous procurement, tax contributions, infrastructure investments, research partnerships and access to computing power as potential benefits. They also call for early engagement with host communities and Indigenous rights holders.[5]

Putting this principle into practice means looking beyond headline investment figures and asking what lasting value the project will leave behind.

Provinces, territories and host communities could require projects to:

- Assess and demonstrate the lasting local benefits a project will provide, including permanent jobs, tax revenues and other long-term economic benefits.
- Cover municipal infrastructure and service costs needed because of the development, rather than leaving host communities to absorb them.
- Support local workforce development and training, including opportunities for local people to move into permanent jobs.
- Use tools such as community benefit agreements and local investment funds to support local priorities, infrastructure and other lasting value.

[5] "Canada's Responsible Data Centre Development Principles."

There are already examples of companies linking investments that support data centre growth with wider community benefits. Google's Steel River solar and battery project in Arkansas, which will support nearby data centres, includes a US$5 million commitment to local energy-affordability programs and school energy efficiency projects.[6] Microsoft's 250 MW Portage Solar Project in Wisconsin, which helps offset electricity used by its Mount Pleasant data centre, includes a US$20 million charitable fund. The fund supports under-resourced communities and communities disproportionately affected by pollution. The project also supports local broadband, workforce training and ecological restoration programs.[7]

These examples demonstrate that data centre development projects can also create lasting value for the communities hosting and affected by them.

2. Data centres must not shift electricity costs to Canadians

Protecting ratepayers means more than charging a data centre for the power line that physically connects it to the grid. It means ensuring households and existing businesses do not pay higher electricity rates for the wider system costs created by the project.

Protecting taxpayers also means ensuring those costs are not simply moved off electricity bills and onto government budgets through rebates, subsidies, direct funding for electricity infrastructure or other forms of support to keep rates low. This may protect ratepayers from an immediate increase, but the cost has not disappeared. It has been shifted to taxpayers.

The federal principles state project-driven electricity system costs should not be shifted to households and existing businesses. They specifically identify new generation, transmission, substations and grid upgrades needed because of the development. Projects must also protect reliability and, where required, contribute new supply, infrastructure, storage or demand flexibility to the utility system.[8]

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[6] Google, "Our largest solar and battery storage project ever," media release, July 14, 2026. https://blog.google/innovation-and-ai/infrastructure-and-cloud/global-network/steel-river-arkansas/?

[7] National Grid Renewables, "National Grid Renewables Signs Power Purchase Agreement with Microsoft," media release, October 1, 2024. Available at https://www.prnewswire.com/news-releases/national-grid-renewables-signs-power-purchase-agreement-with-microsoft-302264661.html

[8] "Canada's Responsible Data Centre Development Principles."

Kari Hyde, "The data centre energy debate is missing half the story," *Canada's National Observer,* June 5, 2026. Available at https://www.pembina.org/op-ed/data-centre-energy-debate-missing-half-story

One example is Québec, which dictates that new data centres requiring more than 5 megawatts (MW) pay an average price of approximately 13 cents per kilowatt-hour, roughly double the rate currently paid by other large electricity users.[9] Hydro-Québec says the proposal is intended to ensure these businesses cover the costs associated with their high electricity demand while limiting impacts on other electricity customers.

A dedicated rate can be an important tool. But protecting electricity customers should be about more than deciding who pays after costs have been created. Good planning should also avoid unnecessary costs in the first place. Data centre development may therefore require:

- Electricity rates that reflect the actual cost of serving a very large customer, including differences based on when and where it uses electricity.
- Requirements for projects to pay for the connection, transmission and distribution investments needed because of their development.
- Protection for ratepayers and taxpayers if expected data centre demand is delayed, reduced or never arrives after electricity infrastructure has been built.
- Locating projects where the electricity system already has capacity, or using lower-cost solutions that can avoid or delay conventional grid expansion.
- Requiring data centres to demonstrate that they can reduce their demand when the electricity system is under pressure, where doing so could reduce infrastructure or connection costs.
- Allowing data centres to provide additional services to the electricity system when those services offer measurable value and meet clear performance requirements.

TransAlta's proposed Keephills data centre development in Alberta illustrates the opportunity to use existing energy and industrial infrastructure. The site already offers transmission, natural gas and water infrastructure, on-site generation, appropriate zoning, and cooling infrastructure. The proposed project could begin at approximately 230 MW and potentially scale to 1 gigawatt (GW).[10]

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[9] Hydro-Quebec, "A new rate for data centres."

[10] TransAlta, "TransAlta Enters Memorandum of Understanding for Data Centre Development at Keephills Site with Potential to Scale Up to 1 GW," media release, February 27, 2026. https://transalta.com/newsroom/transalta-enters-memorandum-of-understanding-for-data-centre-development-at-keephills-site-with-potential-to-scale-up-to-1-gw

This type of strategic siting can make better use of infrastructure that already exists rather than duplicating it elsewhere. However, Keephills also illustrates why no single implementation approach is enough on its own. While the location may offer infrastructure and connection advantages, the project's proposed reliance on natural gas generation raises concerns under the third principle of minimizing environmental impacts. Strategic siting should therefore be considered in parallel with how a project is powered and whether it advances the other federal principles.

There are two separate uses for demand flexibility. They may rely on some of the same tools, but they serve different purposes.[11]

The first is **reducing the project's own impact on the electricity system**. Flexible or conditional connections, shifting computing tasks to another time or location, energy storage, on-site generation and contracted capacity can reduce the amount of firm electricity capacity — the amount of electricity it must be able to draw from the grid at any time — a project requires. This affects how much infrastructure the utility must plan and build to serve the facility.

For example, a facility that could otherwise require 120 MW of firm capacity might use storage and workload shifting so the electricity system only needs to guarantee 100 MW. That could reduce infrastructure needs or allow the project to connect sooner without compromising reliability.

The second is **providing an additional service to the electricity system beyond the conditions of the project's connection**. The same facility might commit to reduce its demand below that 100 MW level when called on by a utility or system operator. It could also adjust its electricity use within seconds or minutes to help keep supply and demand balanced. In this case, the data centre is not simply limiting the infrastructure needed to serve its own operations. It is providing a service that helps operate the wider electricity system.

Where utilities or system operators rely on these services, the amount, speed, duration and availability of the response must be clearly defined, measured and verified.

[11] "The data centre energy debate is missing half the story,"

Ireland demonstrates how several electricity-related requirements can work together. Its connection policy requires data centres to provide enough generation, storage capacity or a combination of the two to match the maximum amount of electricity they expect to draw from the grid at one time. They also require renewable electricity (see below). System operators separately consider whether the local electricity network has enough capacity to connect the project.[12]

3. Data centres must minimize water use and environmental impacts

Electricity supply is only one part of a data centre's environmental footprint. Facility design and operation determine how efficiently electricity is used, what cooling systems are required and how much water is consumed. Location can affect land, local air quality, noise and competing demands for local resources. Backup generation, equipment replacement and eventual decommissioning create additional impacts over the life of a facility.

The federal principles call for minimized freshwater consumption, consideration of local resource constraints and priority for lower-impact technologies and practices, including efficient water technologies, waste-heat recovery and low-emission energy sources.[13]

Ireland, for example, requires new data centres to meet at least 80% of their annual demand with additional renewable electricity generated in Ireland.[14] While not every Canadian jurisdiction needs to copy this requirement, they can set clear expectations for how data centre electricity demand will be served and the emissions it will create, while allowing projects to use different approaches to meet them.

Practical approaches could include:

- Strong facility and energy efficiency expectations, including efficient computing equipment and cooling systems.
- Limits on emissions from the electricity used by data centres, including requirements for some or all demand to be met with additional low-emissions electricity.

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[12] Commission for Regulation of Utilities (Ireland), "The CRU Publishes its Decision on New Electricity Connection Policy for Data Centres," December 12, 2025. https://www.cru.ie/about-us/news/the-cru-publishes-its-decision-on-new-electricity-connection-policy-for-data-centres/?

[13] "Canada's Responsible Data Centre Development Principles."

[14] "The CRU Publishes its Decision on New Electricity Connection Policy for Data Centres."

- Corporate power purchase agreements and other contracts that help bring new low-emissions electricity onto the system from other sites.
- Combinations of generation, storage and other resources located on-site or elsewhere that better match electricity supply with when the facility needs it.
- Water use requirements that reflect local conditions, including closed-loop and water-efficient cooling and consideration of competing demands on local water supplies.
- Siting and assessment of land, air quality, noise and other material environmental impacts.
- Planning for impacts over the facility's full life, including backup generation, equipment replacement, electronic waste, recycling and decommissioning.

4. Data centres must be transparent about local impacts and accountable for their commitments

Host communities and decision-makers cannot properly assess a major project without clear information about what is being proposed. They also need to know how project commitments will be tracked and enforced.

Canada's principles call for early and transparent engagement, project-appropriate and independently verifiable information about expected impacts, and tracking of material commitments over time.[15]

The European Union provides one example of standardized reporting. Data centres with an installed information technology power demand of at least 500 kilowatts must report annually to a European database. Required information includes energy and water use, renewable energy, waste heat and other measures of environmental performance.[16] This creates a consistent record that can be used to track performance across facilities and over time.

[15] "Canada's Responsible Data Centre Development Principles."

[16] European Commission, *Commission Delegated Regulation (EU) 2024/1364 on the first phase of the establishment of a common Union rating scheme for data centres*, May 14, 2024. https://eur-lex.europa.eu/eli/reg_del/2024/1364/oj/eng

Implementation could include:

- Standardized disclosure of key project impacts, including expected timing, scale and growth in electricity demand, water use, land requirements, municipal infrastructure and service needs and other material local effects.
- Clear information about project ownership, operations and development plans.
- Disclosure of material project changes where changes in size, electricity demand, water use or operations could alter previously assessed impacts.
- Reporting on actual performance against commitments once facilities are operating.
- Accessible information and ongoing engagement to support local planning, emergency preparedness and responses to operational concerns.
- Clearly defined processes for communities to raise concerns, report potential non-compliance and understand how responsible authorities will respond.

Transparency should not end once a project receives approval. If commitments about electricity demand, water consumption, local investment or other impacts contributed to the original decision, communities and decision makers should be able to see whether those commitments are being met.

Material commitments should be included in enforceable approval conditions or agreements. These should identify who is responsible for reporting and monitoring, what corrective action will be required and what consequences may apply if commitments are not met. Provinces and territories should establish minimum accountability requirements and ensure that an identified authority has the mandate and tools needed to enforce them.

5. Data centres must bring strategic value to Canada

Canada is not pursuing domestic data centre capacity simply to add another category of industrial electricity demand. The federal principles link data centre development to more computing power located in Canada, secure and reliable digital services, Canadian innovation, and the ability of Canadian businesses and researchers to build and grow here. Facilities that handle sensitive data or support public services and critical infrastructure are also expected to

protect data under Canadian law, meet cybersecurity requirements, keep services running during disruptions and ensure Canadians have reliable access.[17]

TELUS's Sovereign AI Factory in Rimouski, Québec, provides one example. In this case, "sovereign" means the data and computing infrastructure remain in Canada and are subject to Canadian control and legal protections. The facility is managed by Canadian teams and gives Canadian organizations access to high-performance computing needed to develop and operate artificial intelligence systems. [18]

Projects can demonstrate strategic value to the country by:

- Expanding computing and data capacity in Canada and reducing reliance on infrastructure located outside the country.
- Keeping sensitive data, public services and strategically important computing activities under Canadian law and control.
- Improving access to computing capacity for Canadian researchers, businesses and innovators.
- Building lasting Canadian expertise, businesses and supply chains.
- Strengthening Canada's ability to maintain access to critical digital services during emergencies and other disruptions.

Not every project will deliver strategic value in the same way. But that value should not be assumed simply because a data centre is built in Canada. Proponents should identify the strategic need their project will serve and demonstrate how the resulting benefits will remain available to Canadians over time. Provinces and territories should consider those benefits alongside the electricity, water, land and infrastructure the project requires.

This creates an important test for governments considering data centre development projects: **What lasting value will Canada receive in return?**

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[17] "Canada's Responsible Data Centre Development Principles."

[18] TELUS, "Sovereign AI Factory." https://www.telus.com/en/business/medium-large/ai/sovereign-ai-factory

Government of Canada, "Government of Canada and TELUS advance work to build sovereign AI infrastructure," media release, May 11, 2026. https://www.canada.ca/en/innovation-science-economic-development/news/2026/05/government-of-canada-and-telus-advance-work-to-build-sovereign-ai-infrastructure.html

Set clear expectations without prescribing the solution

Canada's five principles establish the outcomes responsible data centre development should deliver. Governments should set clear and measurable requirements for those outcomes without requiring every project to use the same technology or approach.

This distinction matters because electricity systems and local conditions vary significantly across Canada. As well, requirements designed around a specific technology or resource available or preferred today may need to be rewritten as technologies, costs and electricity systems evolve.

Alberta provides a useful example. The province's Data Centre Regulation prioritizes large projects paired with new generation built to support their electricity needs.[19] The objective is reasonable: very large new demand should arrive with resources capable of supporting it and should not compromise reliability or affordability.

However, the discussion about how to meet that requirement has sometimes been narrower. In March 2026, an Alberta government minister told a legislative committee that natural gas was currently the only technology capable of meeting the 99.999% reliability sought by very large artificial intelligence data centres — in other words, providing power with virtually no interruptions. It was stated that wind and solar paired with current battery technology could not meet that requirement.[20]

That is where separating the required performance from the technology used to provide it becomes key. If projects must provide enough electricity, perform dependably and protect affordability and reliability, they should be assessed against measurable requirements for those outcomes. Natural gas may be one pathway. Another project may be able to provide comparable performance by combining renewable generation, storage, backup generation that can operate when needed, and the ability to shift computing tasks to a different time or facility. This

[19] Deirdre A. Sheehan et al., "Alberta's data centre regulations: guidance on power generation for large load facilities," *Osler, Hoskin & Harcourt LLP*, June 30, 2026, https://www.osler.com/en/insights/updates/albertas-data-centre-regulations-guidance-on-power-generation-for-large-load-facilities/

[20] Legislative Assembly of Alberta, *Standing Committee on Alberta's Economic Future*, March 17, 2026, 18. https://docs.assembly.ab.ca/LADDAR_files/docs/committees/EF/legislature_31/session_2/20260317_1900_01_ef.pdf

technology-neutral approach is the one recommended by the Pembina Institute for Alberta's bring-your-own-generation framework.

Other jurisdictions will face the same choice. For example, the Australian Energy Market Commission has recommended that large data centres bring additional low-emissions electricity backed by storage or other dependable resources, pay the grid costs created by their projects, operate flexibly and connect efficiently. Requirements can differ based on the project's size and its impact on the electricity system.[21]

The policy discipline for provinces and territories should be straightforward: Define the outcome, establish a credible and measurable requirement, and allow different pathways to meet it.

Choose implementation approaches that advance more than one principle

Canada's five principles should not become five separate checklists. Many of the strongest implementation approaches can support several outcomes at once:

- **Energy efficiency** lowers electricity use and infrastructure needs, reduces environmental impacts and can help protect electricity customers from unnecessary costs.
- **Strategic siting** can use existing grid and industrial infrastructure, reduce new infrastructure costs, shorten connection timelines and limit impacts on land and communities.
- **Storage** can support low-emissions electricity, reduce how much electricity the grid must be ready to provide at any time and provide services that support reliability.
- **Demand flexibility** can reduce electricity use when demand is highest, lower electricity infrastructure and system costs and support reliability.

[21] Australian Energy Market Commission, "Data centres to bring clean, firm energy, be flexible and pay their way, AEMC advises Ministers," media release, August 5, 2026. https://www.aemc.gov.au/news-centre/media-releases/data-centres-bring-clean-firm-energy-be-flexible-and-pay-their-way-aemc-advises-ministers?

- **Community benefit agreements and local investment funds** tied to new energy infrastructure can help bring new electricity supply onto the system while supporting local affordability, schools, workforce development and other community priorities.
- **Early engagement and transparent planning** can help communities and decision makers consider electricity and water needs, land, municipal infrastructure, environmental impacts and local benefits together, while creating a foundation for accountability.
- **Investments in Canadian computing capacity, expertise and supply chains** can expand access to computing power for Canadian businesses and innovators while creating lasting economic benefits and strengthening digital sovereignty and resilience.

The table below shows how implementation approaches can advance multiple principles when they are carefully designed and implemented. Actual contribution will depend on the project and local circumstances.

Implementation approach	Lasting local benefits	Electricity costs and reliability	Environmental impacts	Transparency and accountability	Strategic value
Energy efficiency		✓	✓		
Strategic siting	✓	✓	✓		✓
Storage		✓	✓		
Demand flexibility		✓	✓		
Community benefit agreements and local investment funds tied to project	✓	✓	✓	✓	
Early engagement and transparent planning	✓	✓	✓	✓	
Investments in Canadian computing capacity, expertise and supply chains	✓				✓

No single approach determines whether data centre development is responsible. Governments should look across the five principles and ask whether project choices can advance several outcomes at the same time, rather than solving one problem by creating another.

Canada now has a common national foundation for responsible data centre growth. The next step is to turn these principles into clear expectations, assign responsibility for delivering those requirements and track whether the promised outcomes are achieved. Provinces and territories will need to work with proponents, regulators, system operators, utilities, municipalities, Indigenous rights holders and host communities to put those requirements into practice.

Each data centre project should be assessed as a whole. Does it pay the costs it creates and protect electricity-system reliability? Does it limit water use and environmental harm? Is it transparent about its impacts and accountable for its commitments? Will it create lasting benefits for host communities and strategic value for Canada?

If these questions guide decisions from the first proposal through the full life of a facility, data centre growth can expand Canada's digital capacity without shifting costs and risks to Canadians. It can support host community priorities, strengthen Canada's digital sovereignty and contribute to an affordable, reliable and low-carbon electricity system. That is how Canada can turn its Responsible Data Centre Principles into practice and build public trust in the growth of this sector.