Executive Summary

Overview

Abundant clean power at competitive rates gives Canada a critical advantage in the global race for investment. Yet that advantage is not guaranteed—provinces can sustain and build on it only if governments act now to prepare the electricity grid for what is coming. While electricity is primarily—and rightfully—provincial responsibility, the expansion of Canada's electricity systems is also increasingly a national economic issue with national implications, and one that calls for co-operation.

This report maps where Canadian electricity systems—across planning processes, market design, and policy—are leading internationally and where targeted action can put Canada ahead. Well-designed systems drive both investment in the electricity system to deliver low-cost power and even larger investment in industry that consumes that power.

At this moment of geopolitical instability and trade disruption, Canada's governments are rightly focused on nation-building projects and export diversification. Expanding the country's clean electricity systems is a critical enabler of both.

Action is also increasingly urgent. After years of stagnation, electricity demand is already rising sharply, driven by electrification and unprecedented demand from new sectors such as artificial intelligence. Costs of quick-to-build renewable electricity technologies—including solar panels, wind turbines, and batteries—have fallen dramatically over the past decade. But electricity infrastructure, markets, and policies are heavily regulated and optimized for yesterday's technologies, which leaves Canada vulnerable to missing out on the full scope of investment opportunities ahead. This inertia requires decisive government action to overcome.

This report examines how Canadian provinces can expand clean electricity generation quickly and reliably while maintaining competitive rates for industrial users. Our analysis benchmarks four Canadian provinces (Ontario, Alberta, Quebec, and British Columbia) against six international jurisdictions (Germany, United Kingdom,

Norway, New South Wales, Washington, and Texas), and compares across six dimensions: energy planning, planning for flexibility, transmission planning, electricity procurement, industrial rate modernization, and climate policy certainty. Together, these metrics assess a jurisdiction's preparedness to attract investment in wind, solar, and battery projects that supply electricity, as well as the industrial projects that demand it.

Drawing on those findings, this report identifies how the federal government can support provinces as they seek to deliver low-cost power and compete for international capital. Two subsequent publications will identify what each of the four Canadian provinces can do to enhance their own competitiveness.

Findings

Several insights emerge from our analysis:

Like many international peers, Canadian electricity systems are underplanning for industrial growth. Regulatory frameworks are better designed to guard against overbuilding electricity systems than to recognize the economic cost of underbuilding when demand is rising. Our analysis shows that, even if only half of current electricity grid connection requests from large industrial projects proceed, most Canadian provinces will be left with significant gaps to their electricity plans, and risk constraining future industrial growth. System operators in Ontario and Quebec are closest to planning for the industrial demand in their queues over the next decade. British Columbia recently upgraded its plan, though some gap remains. Alberta has the largest gap but also has a structural strength: as an open electricity market, private generators could respond to new demand quickly if the system plan anticipates growth and the surrounding services generators need (including transmission and reliability).

Canada's hydro-led jurisdictions have a competitive advantage in system flexibility. System flexibility is essential for a modern grid to maintain competitive electricity rates. This becomes more important as electricity demand and peak demand grow, and as more variable generation is added to the system. Hydro-led jurisdictions such as B.C. and Quebec start from a position of advantage—their reservoirs can flex across hours, days, and seasons to balance supply and demand. In contrast, non-hydro jurisdictions such as Alberta and Ontario need to proactively build system flexibility rather than inherit it. Canada's international non-hydro peers are already doing this,

expanding flexible capacity (through batteries and connections to neighbouring grids) faster than their peak demand has grown.

Canadian provinces can invest in transmission to avoid wasting large amounts of electricity as their renewables shares grow. Adequate planning for transmission is essential with more decentralized wind and solar on the grid. Adding solar and wind power without sufficient grid infrastructure risks wasting electricity. International peers show that high shares of wind and solar can be integrated without substantial waste when system operators plan, permit, and build both transmission and system flexibility in advance. In some Canadian provinces, however, transmission investment is lagging. In Alberta, for example, transmission has not kept up with growing wind and solar additions.

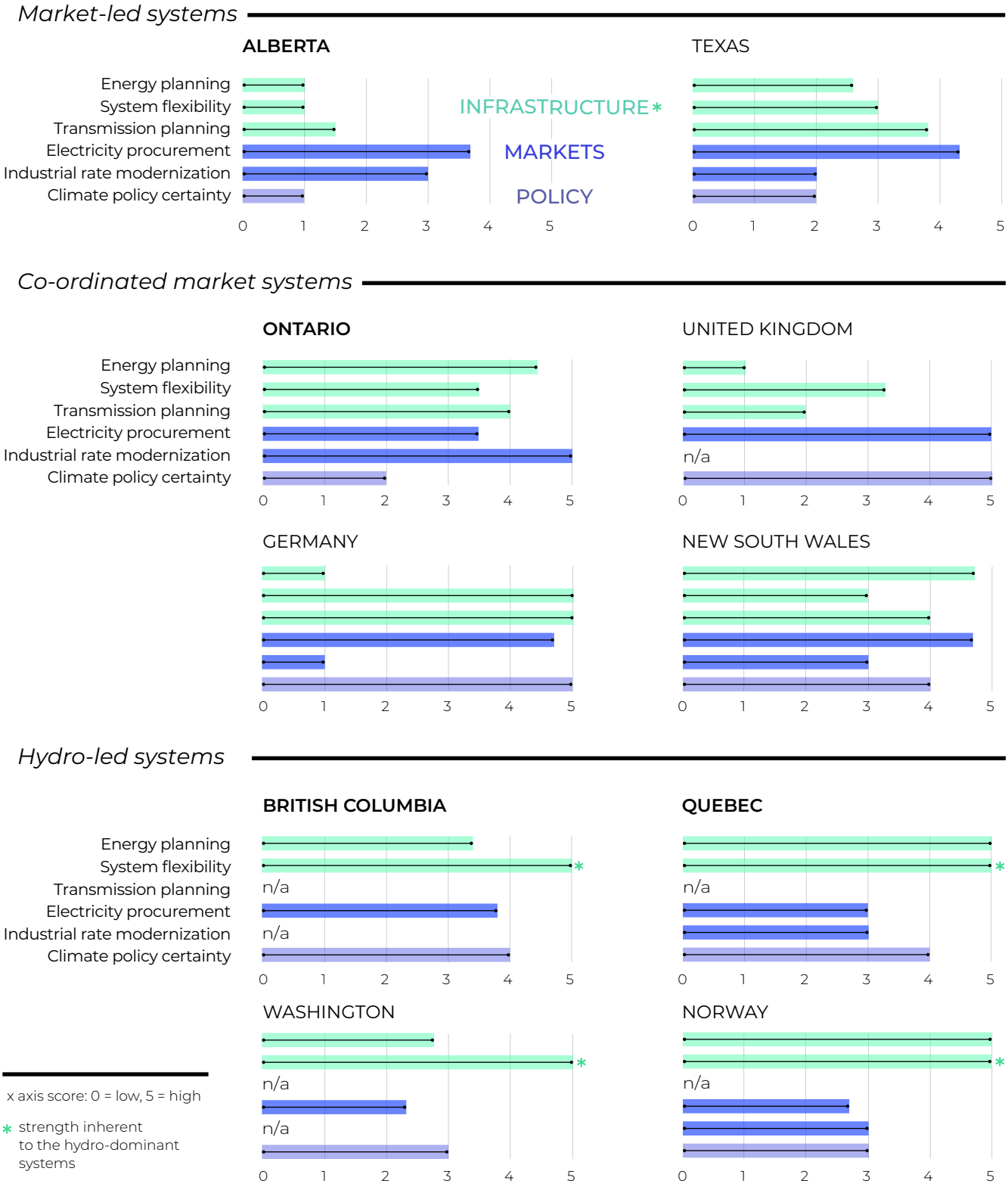
Improving procurement and market access are major opportunities for Canadian jurisdictions. Investors in wind, solar, and battery projects look for clear entry pathways for their projects, bankable revenue models, and scalable access to customers. While Alberta's market-led system has natural advantages for market access, provinces such as B.C. and Quebec would benefit from continuing their recent efforts towards more predictable competitive procurement schedules over longer timelines.

Canadian provinces have a head start on industrial demand flexibility. Industrial investors want competitive electricity costs in both the near- and long-term. Well-designed incentives for reducing or shifting peak demand can lower bills for participating customers and reduce system costs. Canadian markets such as Quebec, Ontario, and Alberta already use such tools more than many international peers, but there is still room for growth in this undertapped potential across all provinces, especially as industrial demand grows.

Climate policy certainty varies across Canada. Unpredictable policy changes can weaken investor confidence and make jurisdictions less competitive for clean-energy capital. Hydro-rich provinces such as B.C. and Quebec generally offer stronger and more durable clean-electricity policy signals through legislation, and in Quebec's case linkage to California's carbon market. In line with the majority of international peers, all four Canadian provinces have implemented industrial carbon pricing. Alberta's new agreement with the federal government could improve investor certainty in the long-term path for its carbon pricing but at the cost of weaker incentives to invest in electrification and low-carbon electricity.

Figure A illustrates provincial results relative to international peers.

Jurisdictions need to focus on improving different conditions to be prepared for the future grid



Recommendations

We make the following four recommendations for Canada's federal government (subsequent publications will identify recommendations at the provincial level):

1 • The federal government should support new co-operative processes for inter-provincial energy planning focused on information-sharing and goal-setting in the short-term and new intergovernmental institutions in the longer-term. Regional co-ordination must be provincially anchored if progress is to occur on the ground, but provincial leadership can be supported by a practical federal-provincial framework that creates a shared evidence base (including on electricity implications of federal strategies on sectors such as artificial intelligence and critical minerals), and supports fair distribution of costs and benefits.

2 • The federal government should selectively deploy the national balance sheet to support anticipatory grid build-out to realize nationwide benefits. Projects that deliver net benefits for Canada as a whole have a reasonable case for federal funding and risk-sharing. Canada should scale up existing successful financing solutions, such as the Canada Infrastructure Bank, while ensuring equitable access, including via Indigenous loan guarantees and capacity-building resources. Direct federal funding beyond risk-sharing will sometimes be justified to fund transmission (for example, when national benefits are high but place undue cost on local ratepayers). A national test could support more consistent application of such federal support, recognizing the range of national economic and security benefits.

3 • To build long-term policy certainty for clean electricity investors, the federal government should move forward with flexible Clean Electricity Regulations that anchor expectations for new supply to be predominantly clean. Doubling Canada's grid by 2050 requires investors, utilities, and supply chains to make long-term commitments today. Strong, flexible Clean Electricity Regulations that recognize a real but limited role of gas in peak management can be durable enough to provide the planning horizon investors need to choose Canada as the destination for their clean electricity capital.

4 • The federal government should make electricity system flexibility a strategic priority across programs and use federal investment tools to scale industrial demand flexibility. Specifically, the federal government should embed flexibility as a priority in existing federal electricity, infrastructure, and innovation programs, such as electricity Investment Tax Credits, Smart Renewable and Electrification Pathways Program, and Canadian Infrastructure Bank investments. It should also wield tax tools such as capital cost allowances to mobilize investment in clean behind-the-meter solutions such as on-site storage and controls that enable users to shift their demand away from peak periods. Together, these measures would give industrial electricity users greater choice in how they manage their energy use, while reducing pressure on the grid.