# G7 POWER SYSTEMS SCORECARD

## COUNTRY PROFILE: CANADA[1]

**May 2024**

## Synopsis

**OVERALL COUNTRY SCORE: 264/400**

Canada, with its significantly clean electricity grid and low-carbon capacity, is well positioned to further decarbonise its grid. Canada is on track to phase out coal fired generation by 2030, however, there is significant new unabated gas fired generation being proposed in some provinces.

The upcoming Clean Electricity Regulations, Canada's goal of 90% non-emitting generation by 2030, Canada's large emitter trading systems, and federal funding for clean energy investments are crucial for achieving a net zero grid by 2035. While some provinces are also taking action and have announced targets for adding renewable capacity, others such as Alberta have been taking steps that deter renewables deployment. Provinces reliant on gas fired generation in particular can benefit from the reliability and affordability of a decarbonised grid. They need to increase their renewable energy share, expand transmission, enhance storage, promote end use flexibility, and improve energy efficiency.

### Headline message – Benchmarks 1–2 (Section 1: Infrastructure/Energy mix)

**SCORE: 81/120**

Canada has one of the lowest emission power mixes in the world thanks to its large hydropower capacity, with over 80% of generation coming from renewable sources or nuclear power. Variable renewables have ramped up in recent years and, though the solar and wind pipeline is smaller than in most G7 countries, given the significant existing clean base, the pipeline puts the country broadly on track to 90% non-emitting electricity by 2030.

The deployment of solar and wind will be especially crucial for provinces without sufficient hydropower resources, in particular Alberta and Nova Scotia. Disappointingly, Alberta – the province that had led the country in wind and solar growth – is now the sole province that is taking active steps to limit the growth of wind and solar.

[1] To see the whole Scorecard, including the scoring methodology, visit **https://www.e3g.org/g7-power-systems-scorecard**

### Headline message – Benchmarks 3–5 (Section 2: Policies/Targets)

**SCORE: 183/280**

Canada's upcoming Clean Electricity Regulations are a key part of Canada's commitment to work towards a net zero grid by 2035. The funding measures announced by the federal government will also play a key role in realising this target. However, Canada's federative system of electricity means that provinces are largely responsible for their own electricity systems. Therefore, they need to step up their efforts to align with Canda's net zero grid by 2035 target. In particular, provinces with significant emitting gas fired generation – Alberta, Saskatchewan and Ontario – need to do more to reduce emissions.

Action is also needed at the provincial level to increase the share of renewable energy in the electricity mix across the country. Provinces can optimise their systems and reduce the overall cost of decarbonisation via transmission expansion, storage, digitalisation, promoting end use flexibility, retrofitting, and energy efficiency.

## Benchmark 1: Reducing fossil fuel reliance

**SCORE: 35/60**

Canada is home to a significantly clean electricity grid with 110 $gCO_2$/kWh emission intensity. Although the overall share of installed fossil fuel electricity is small, some regions rely significantly on fossil fuels to generate electricity, and a significant amount of new gas fired generation is proposed in numerous provinces. In 2022, gas and coal fired electricity accounted for 68.7% and 13.3% of Alberta's total electricity generation. During the same year, gas fired electricity supplied nearly 46.4% and coal fired assets supplied nearly 34.5% of Saskatchewan's electricity.[2] Canada also has a small yet significant share of other low-carbon capacity like nuclear on its grid.

### 1.1 New unabated coal and gas power plants in planning or construction

**SCORE: 4/15**

Canada doesn't have any new coal power projects in the pipeline and is on track to phase out coal fired power by 2030. However, around 6.3 GW of new unabated gas capacity is in development (half of it already in construction),[3] which would grow the existing gas fleet by about 25%.

[2] NRCan Electricity Generation Shares data for 2022.

[3] Global Energy Monitor, February 2024, **Global oil and gas plant tracker**

### 1.2 Share in electricity generation: fossil fuels

**SCORE: 12/15**

Fossil fuels generate 17.39% of Canada's total electricity.

### 1.3 Share in electricity generation: non-renewable low-carbon tech

**SCORE: 4/15**

Nuclear makes up 12.89% of Canada's electricity generation. About half of that fleet is nearing end of life, and refurbishments have been announced for many, though increased reliance on gas fired power is often looked to as the interim power option.

### 1.4 Carbon intensity of power index

**SCORE: 15/15**

Canada's carbon intensity of power index is 53.6, based on IEA's $CO_2$ emission intensity, which indexed at 100 in year 2000.

Data from Environment and Climate Change Canada (ECCC) indicates that Canada's national electricity GHG intensity is 110 $gCO_2$/KWh.[4]

## Benchmark 2: Ramping up renewables

**SCORE: 46/60**

As of 2023, 67.4% of Canada's electricity was generated by variable and non-variable RES. With this strong head start, Canada is in a good position to decarbonise its grid by adding more wind, solar, storage and other non-emitting sources.

### 2.1 Share of variable RES in electricity generation

**SCORE: 3/15**

Variable RES make up 6.6% of total power generation, with 5.7% provided by wind and 0.9% by solar power.[5]

### 2.2 Share of other RES in electricity generation

**SCORE: 14/15**

[4] ECCC Data Catalogue, May 2024, **Annex 13 Electricity Intensity**

[5] Ember, **Electricity data explorer** (accessed May 2024)

The total share of non-variable RES in electricity generation is 61.7%. The dominant generation source is hydropower with 60.4%, with biomass contributing a further 1.29%.[6]

### 2.3 Variable RES pipeline capacity vs country's announced target

**SCORE: 14/15**

Canada does not have a specific, legislated target for variable RES generation but is aiming for 90% non-emitting generation on the grid by 2030. The current wind power capacity is bound to almost double, and utility-scale solar capacity to increase by a factor of six between today and 2030. Despite some uncertainty in the renewables project pipeline, the projects that are already further towards reaching the construction stage will enable Canada to reach its 2030 target of 90% clean electricity.

Some provinces, such as Ontario, are planning to procure more wind and solar (and battery storage), and the federal government has several incentives in place to support wind and solar deployment. Alberta – the province that had led the country in wind and solar growth – is now the sole province that is taking active steps to limit the growth of wind and solar.

### 2.4 Average permitting time for VRE

**SCORE: 15/15**

Average permitting wait time for RES was 180 days, including 1 year of preparation time, and up to 6 months' wait time for a decision on an application.

## Benchmark 3: Adapting the power systems to high-RES share

**SCORE: 85/120**

The primary challenge in the country is the work remaining for provincial jurisdictions with significant fossil fuel generation, to put in place provincial plans and measures to adapt to a grid that is predominantly powered by non-emitting sources.

The share of variable RES is growing, albeit at different rates, across the country. Several provinces have abundant hydro that can serve as long-term storage.

[6] Ember, **Electricity data explorer** (accessed May 2024)

However, to fully take advantage of this – along with variable RES – Canada needs greater inter-provincial transmission capacity. A collaborative, inter-jurisdictional effort is needed to promote grid development.

The federal government has announced various initiatives to support RES, including the Clean Electricity Regulations (key for Canada's commitment to work towards a net zero grid by 2035) and the investment tax credits. However, provinces, who are largely responsible for planning and delivering their own electricity systems, have been lagging. This is especially true for provinces with high share of fossil fuel electricity. For instance, a 7-month long moratorium, and ongoing uncertainty post moratorium, has disrupted RE development in Alberta, at least in the short-term. Alberta and Saskatchewan have also pushed back against the Clean Electricity Regulations, without proposing reasonable alternatives. Therefore, provinces should commit to achieving net zero grids by 2035 and set explicit renewable energy and storage targets. This will send a signal to the markets and the system planners to chart pathways to achieve net zero grids.

### Context for Benchmark 3

In Canada, electricity is a provincial jurisdiction and there is no national planning body or grid operator. There are provincial regulators, system operators and generators, with different provinces having varying degrees of deregulation. The federal government can play a limited function in terms of providing funding support, capacity building, convening, approving certain projects, and collaborating on interties.

Historically, federal policies like the coal phase-out, combined with provincial policies, have significantly reduced emissions in the electricity sector. Currently, the federal government is finalising the Clean Electricity Regulations. However, it is receiving significant pushback from the provinces, some of whom in-part are arguing that the federal government is overstepping its jurisdiction.

Our assessment focuses on federal action and the action of two provinces – Alberta and Ontario – that have significant fossil fuel in their generation mix and a high potential for RES. In some cases, we also provided a score for other provinces, where data was on hand.

Alberta has a deregulated energy-only market where generation and distribution are fully deregulated and transmission planning is done by the system operator.

Ontario also has a deregulated market, however most of the electricity is still procured by the system operator.

### 3.1 Policies to limit curtailment to a minimum that ensures optimal RES capacity utilisation

**SCORE: 12/15**

There are no federal policies targeting curtailment at the moment and no curtailment data is available at national level. Overall curtailment rates are very low in most of Canada's provinces due to large shares of flexible generation, notably hydro and gas.

#### Provinces

In 2020, Ontario curtailed 2,621 GWh of wind and solar, representing 17% of total variable generation. In 2021, it curtailed 1,289 GWh,[7] representing 12% of total variable generation. The majority of the curtailment in Ontario is caused by inflexibility of nuclear: 56% of Ontario's electricity generation comes from nuclear plants,[8] which are typically difficult to dispatch down. While there is no way of knowing for sure, it is likely that wind and solar curtailment is done as a last resort after all other flexible generation – including gas, hydro, and imports – have been ramped down and all export options have been maxed out. The Ontario Society of Professional Engineers welcomed Government of Ontario's decision to offer low overnight prices for charging electric vehicles,[9] which it believes will help stimulate new demand for currently curtailed electricity, and reduce the need to run some peaker gas plants. Ontario recently completed the largest clean energy storage procurement in Canadian history which will help reduce this curtailment.

The Market Surveillance Administrator (MSA) monitors wind and solar curtailment in Alberta. In its Q3 2023 report, the MSA identified a significant increase in curtailment rates year-over-year, increasing by a factor of five between Q3 2022 (8.4 GWh) and Q3 2023 (43.9 GWh). In Q2 2023, curtailment was an estimated 41.8 GWh.[10] Relative total generation, curtailment in Q2 2022 was less than 0.1%, rising to 0.4% in 2023. The increase in wind and solar curtailment in Alberta is driven by an increase in transmission congestion, as

[7] IESO, **Year-end data 2021** (webpage, accessed May 2024)

[8] Canada Energy Regulator, June 2017, **Market snapshot: Canada's nuclear energy output ranked 6th in the world**

[9] Ontario Society of Professional Engineers, March 2022, **Policy win – The Government of Ontario is investigating options for a new ultra-low overnight electricity rate**

[10] Market Surveillance Administrator, November 2023, **Quarterly Report for Q3 2023**

renewables are being deployed faster than anyone – including the system operator – had predicted. This issue is likely to persist, and potentially worsen, if transmission planning and buildout does not accelerate.

Alberta and Ontario can take further steps to modernise their electricity grids to improve their flexibility and reduce curtailment. This can be achieved through several methods, such as procurement of energy storage capacity, including long-duration storage; expanding import and export capabilities with neighbouring provinces and states; and implementation of energy efficiency programs and demand side management programs. A 2023 analysis by Pembina Institute of a decarbonised Alberta electricity grid found a significant reduction in curtailment would be achieved by doubling the intertie capacity between Alberta and British Columbia (an increase of 1,100 MW). In fact, expanded export capability would eliminate 2,119 GWh of wind curtailment (5% of total AB wind generation) and 108 GWh of solar curtailment (4% of total AB solar generation).

### 3.2 Active steps by the national grid operator to plan for short spells of 100% RE power

**SCORE: 11/15**

The provinces of Quebec, British Columbia, Newfoundland and Labrador, and Manitoba, already run their grids with nearly 100% hydroelectric power. No system operator in Canada that operates at the provincial level has set explicit plans for managing short periods of 100% wind and solar power. However, several provinces are planning on adding significant amounts of wind and solar capacity to their grids (see indicator 3.7 for more details). Therefore, these provinces have significant experience with accommodating a high share of firm renewables on their grids. However, as the share of variable renewables energy rises, they may face new challenges.

Further, the system operators in Alberta[11] and Ontario[12] have both investigated the impact of a net zero emissions grid and raised several reliability concerns without specific pathways to address them.

Provinces that do not yet have 100% renewable grids can take two actions to do advance planning for managing short periods of 100% renewable power. First, they can formally commit to achieving net zero grids by 2035 in line with the federal net zero grid target, and expand mandates of key institutions like system

[11] Pembina Institute, July 2022, **Pembina Institute response to AESO Net-Zero Emissions Pathways Report**

[12] Pembina Institute, May 2023, **Exploring Ontario's pathways to net-zero electricity**

operators and utilities to follow suit.[13] Second, they can set explicit variable renewable energy targets and instruct provincial regulators and system operators to prepare provincial electricity systems to be able to accommodate high shares of variable renewable energy, or import renewable energy from neighbouring provinces or states.

### 3.3 Effective policies to ramp up electricity storage

**SCORE: 12/15**

#### Federal

Government of Canada has taken some steps in recent years on storage broadly. The 2022 Fall economic statement saw the government announce a 30% investment tax credit for investments into clean technologies.[14] The Government of Canada announced a 15% clean electricity investment tax credit for investments in clean energy projects, including storage – battery storage, pumped hydro storage, and compressed air – in budget 2023.[15] This budget also renewed funding for programs like Smart Renewables and Electrification Pathways Program (SREP)[16] and Canada Infrastructure Bank,[17] which supports energy storage projects. SREP has already committed to provide funding to support 2,300 MWh of energy storage capacity.[18]

Finally, Canada has significant hydroelectricity capacity spread across a few provinces. There is a recognition at the federal level that Canada's hydro capacity can serve as long-term storage.[19] Federal government can help unlock hydro power as long-duration energy storage by connecting hydro rich provinces like British Columbia with solar and wind rich provinces like Alberta, by way of promoting interjurisdictional coordination on inter-provincial transmission.

#### Provinces

Alberta's energy-only electricity market structure does not generally incentivise storage development. This is highlighted in the Alberta Electric System

[13] Pembina Institute, September 2023, **Supporting grid infrastructure investments and committing to a net-zero grid**

[14] Department of Finance, 2022, **Fall economic statement 2022**

[15] Government of Canada, last modified March 2023, **Budget 2023 – A made-in-Canada plan: Strong middle class, affordable economy, healthy future**

[16] Government of Canada, **Smart Renewables and Electrification Pathways Program** (webpage, accessed May 2024)

[17] Natural Resources Canada, 2023, **Powering Canada Forward: Building a clean, affordable and reliable electricity system for every region in Canada**

[18] Ibid.

[19] Ibid.

Operator's Long-term Outlook reports, which forecast the province's energy storage capacity plateauing at 500 MW in the next few years.[20] Despite this, short-duration energy storage projects continue to dominate the AESO's project queue, showing upwards of 10x that amount applying for connection between now and 2026. In the past five years, Alberta has grown its energy storage fleet from 0 MW to 190 MW, all 1- to 2-hour lithium-ion batteries. Additionally, a 320 MW compressed air storage project with up to 48 hours of storage is currently undergoing the federal impact assessment process.[21]

In recent months, the Alberta government has also taken limited steps to support energy storage. In May 2022, the Electricity Statutes (Modernizing Alberta's Electricity Grid) Amendment Act, received royal assent. The Act includes a formal definition for energy storage in Alberta's regulatory framework and allows distribution and transmission facility owners to own and operate energy storage facilities, though only under certain conditions. The bill was proclaimed in March 2024.[22]

SaskPower, Saskatchewan's crown utility corporation, is planning to add nearly 400 MW of battery storage capacity by 2035.[23] SaskPower is currently in the process of adding the province's first battery storage system capable of providing 20 MW of load for up to 1 hour.[24] This project is funded in part by the Government of Canada.

Ontario has taken a leadership role in the Canadian energy storage space. In 2022, the Ontario government directed the province's Independent Electricity System Operator (IESO) to acquire a minimum of 1500 MW of electricity storage resources,[25] which represents the largest battery procurement in Canadian history, as part of a request for a total additional 4000 MW of capacity. The IESO took action towards this goal in 2023, announcing the procurement of 880 MW of energy storage from 15 different projects.[26] However, based on the available information, most of these projects provide only short-duration storage.[27]

[20] AESO, May 2024, **Long-term Outlook 2024**

[21] Government of Alberta, **Marguerite Lake compressed air energy storage** (webpage, accessed May 2024)

[22] McClennan Ross, March 2024, **Shifting currents: Modernizing Alberta's electricity grid**

[23] SaskPower, November 2023, **SaskPower response: Federal Clean Electricity Regulations**

[24] SaskPower, **Battery energy storage system** (webpage, accessed May 2024)

[25] Government of Ontario, October 2022, **Ontario building more electricity generation and storage to meet growing demand**

[26] Government of Ontario, September 2023, **Ontario celebrated indigenous leadership in clean energy storage**

[27] Northland Power, **Oneida – Canadian battery energy storage** (webpage, accessed May 2024)

The need for long-duration storage in Ontario has been identified. IESO's Pathways to Decarbonization report highlighted the need for deeper understanding of the role of long-duration storage and its potential to reduce reliance on gas.[28] Ontario then responded with the Powering Ontario's Growth plan, which committed to many no-regrets actions, including new and refurbished nuclear, upgrading hydro plants, announcing procurement of more wind, solar and storage, including long-duration storage, building more transmission capacity, and set a stronger target for energy conservation plus committed to develop a plan to accelerate energy conservation. Ontario has also limited all gas-fired generation contract end dates to 2040. A recent report prepared for Energy Storage Canada found that deploying up to 6 GW of long-duration energy storage (LDES) in 2032 could help address uncertainty around nuclear and hydrogen build-out and save ratepayers $11 to $20 billion over the storage's lifetime relative to the baseline scenario described in IESO's report.[29] The report recommends that IESO should start incorporating LDES into all future planning as an immediate no-regret move.
The rest of the hydro provinces will be able to utilise their hydro capacity as long-duration energy storage as they integrate greater shares of variable renewable energy into their energy mixes.

In conclusion, provinces that do not have significant hydro capacity can take advantage of long-duration battery storage by properly evaluating its benefits and modelling long-duration energy storage as part of future planning. They may also take advantage, through expanded transmission interties, of the inherent storage potential in neighbouring provinces' hydroelectric generation.

### 3.4 Effective policies to increase end use flexibility

**SCORE: 10/15**

#### Federal

Canada wants to achieve 600 petajoules of total annual energy savings by 2030 via adoption of energy efficiency codes, standards, and practices.[30] This is part of the country's target under Sustainable Development Goal 7. The Canadian federal government has taken limited steps toward achieving this target. Through its SREP program, the government has funded some demand

[28] IESO, December 2022, **Pathways to Decarbonization**

[29] Dunsky for Energy Storage Canada, January 2024, **Long duration energy storage (LDES) opportunity assessment**

[30] Government of Canada, **Sustainable Development Goal 7: Affordable and clean energy** (webpage, accessed May 2024)

management projects.[31] More recently, the federal government has been encouraging provincial regulators to enable greater end use flexibility by funding regulatory innovation research.[32]

Canada is also leading the International Smart Grid Action Network's work towards end use flexibility characterisation and grid utilisation.[33]

### Provinces

Some provinces have taken steps to enable end use flexibility. The most popular option is offering rate flexibility, though not all provinces offer this. Even in those that do, it is unclear what impact it has had on end use flexibility.

Ontario consumer electricity rates have varied depending on the time of use for many years. Electricity is more expensive during typical on-peak periods and less expensive during off-peak periods. There is also a third "mid-peak" rate for periods in between. The timing of typical on- and mid-peak periods switches depending on the season, and overnight hours and weekends are always off-peak. The goal of the time-of-use (TOU) pricing is to incentivise load shift to hours when demand is low and can be met with non-emitting generation.[34] A 2016 study found that TOU reduced electricity consumption during summer peak hours by between 1.18 and 2.27% in 2012, 2013, and 2014 following the full rollout of the program.[35]

In 2023, Ontario made another time-of-use option available to consumers called the Ultra-Low Overnight (ULO) price plan, which is targeted towards electric vehicle users. In exchange for higher on-peak rates, electricity consumers who opt into the ULO plan pay 67% less than regular TOU users during overnight off-peak hours. The goal of the ULO plan is to shift electric vehicle charging from on- or mid-peak hours to overnight hours when the load can be serviced with non-emitting resources.[36]

[31] Government of Canada, **Smart Renewables and Electrification Pathways Program** (webpage, accessed May 2024)

[32] Government of Canada, **Energy Innovation Program smart grid regulatory innovation capacity building call for proposals** (webpage, accessed May 2024)

[33] International Smart Grid Action Network, **Flexibility markets** (webpage, accessed May 2024)

[34] Ontario Energy Board, **Managing costs with time-of-use rates** (webpage, accessed May 2024)

[35] The Brattle Group for the Independent Electric System Operator, February 2016, **Analysis of Ontario's full scale roll-out of TOU rates – Final study**

[36] Government of Ontario, April 2023, **Ontario launches new Ultra-Low Overnight electricity price plan**

Alberta has shown limited initiative in enabling end use flexibility. The city of Grande Prairie is set to undergo a pilot program with ATCO for time-of-use electricity rates:[37] an option that is not yet available in the rest of the province. Similarly, FortisAlberta is conducting a pilot program for managed EV charging, which allows external control of consumer EV charging to manage peak demands. Alberta also allows industrial load to opt into a program for load shedding services that can be called upon by the system operator.[38]

In 2018, Yukon experimented with a residential demand response program that reduced the use of residential electric and hot water heating during winter demand peaks.[39]

Manitoba is also exploring time-of-use rates.[40]

British Columbia has a Peak Rewards program that rewards subscribing customers for allowing BC Hydro to remotely adjust their thermostat, EV charger, load controller, or battery energy storage system during peak events.[41]

Hydro Quebec has a dynamic rate option called Rate Flex D. During the winter, customers using this rate type pay below the base rate during off-peak hours, but they pay a significantly increased rate during peak demand events. During the rest of the year, consumers pay the regular base rate for electricity. Consumers are notified of an upcoming peak demand event one day in advance. Rate Flex D gives electricity consumers the opportunity to save money if they can manage their load during peak events, reducing grid stress.[42]

## 3.5 Effective policies to accelerate grid development

**SCORE: 8/15**

### Federal

The federal government has identified grid development as a priority and continues efforts to bring provinces together to develop regional interconnections. It also has some funding available in form of clean electricity

[37] ATCO, **Time of use rates** (webpage, accessed May 2024)

[38] AESO, **Load Shed Service for imports** (webpage, accessed May 2024)

[39] Natural Resources Canada, 2023, **Powering Canada Forward: Building a clean, affordable and reliable electricity system for every region in Canada**

[40] Global News, 30 January 2024, **Manitoba Hydro says new power generation, time of use rates and more are on the table**

[41] BC Hydro, **Peak Rewards** (webpage, accessed May 2024)

[42] Hydro Quebec, **Rate Flex D** (webpage, accessed May 2024)

investment tax credits,[43] funds available via the Smart Renewables and Electrification Pathways Program,[44] and loans available via the Canadian Infrastructure Bank.[45] According to Canada Energy Regulator modelling, achieving a net zero economy in Canada by 2050 will require an additional 3495 to 4983 MW of inter-provincial transmission capacity by 2035.[46] These modelled scenarios rely heavily on carbon capture, utilisation, and storage (CCUS) technologies; intertie capacity needs will be even higher in scenarios with limited CCUS use.

However, the challenge remains that provincial and territorial electricity grids are regulated and operated independently and are often optimised without interjurisdictional coordination. For this reason, there is momentum for provinces to continue grid planning in isolation from one another. Also, in some cases interconnections may provide more benefits to one province, territory, type of generator, or consumer group, giving other parties little motivation to support the project unless new market structures add financial incentives, or projects costs are divided proportionally to the benefits each participant will receive. The development of new interties with other jurisdictions can also threaten the economic viability of previous investments, leading to additional hesitation.

Further, provinces are not developing the grid infrastructure at a pace or scale needed to decarbonise the economy on Canada's stated timelines. Initiatives like the Northeast Grid Planning Forum[47] may help address some of the coordination challenges for this kind of medium- and long-term planning, but are in the early stages.

Additionally, the Minister of Energy and Natural Resources has established the Canada Electricity Advisory Council in May 2023, tasked with providing expert advice on electricity related topics.[48]

[43] Government of Canada, last modified March 2023, **Budget 2023 – A made-in-Canada plan: Strong middle class, affordable economy, healthy future**

[44] Government of Canada, **Smart Renewables and Electrification Pathways Program** (webpage, accessed May 2024)

[45] Natural Resources Canada, 2023, **Powering Canada Forward: Building a clean, affordable and reliable electricity system for every region in Canada**

[46] Data provided by the Canada Energy Regulator, July 2023.

[47] Acadia Center, February 2024, **The Northeast Grid Planning Forum: Uniting North Americans for our net zero future**

[48] Government of Canada, **The Canada Electricity Advisory Council** (webpage, accessed May 2024)

### Alberta

Under section 15 of Alberta's Transmission Regulation, the Alberta Electric System Operator (AESO) is required to ensure that, under normal operating conditions, the transmission system should allow 100% of in-merit generation to be dispatched.[49] However, the Ministry of Affordability and Utilities is now considering changes to this policy, including a stipulation that new transmission investments should only occur when the benefits outweigh the costs, or changing the threshold for "normal operating conditions", effectively increasing the threshold of allowable congestion above zero.[50] Due to the increasing risk of transmission congestion in the province, the AESO has updated its approval process, including an assessment of the impact of upcoming projects on the operations of existing transmission infrastructure. These cluster studies are intended to inform future grid upgrade projects.

### Ontario

The need for increased transmission capacity and early planning has been identified by both the Ministry of Energy[51] and the IESO.[52] Infrastructure for the east–west flow of electricity across the province is well developed and currently undergoing upgrades, but electricity flow from south to north is limited by the capacity of existing transmission lines. The Ministry of Energy has requested that the IESO identify options for the development of additional transmission corridors between the north and south to expand opportunities for electricity generation projects in Northern Ontario. The IESO is also planning additional transmission lines into downtown Toronto in anticipation of growing demand and the phasing out of a local gas generation plants.[53] The IESO's Pathways to Decarbonization report found that the costs of transmission build-out to achieve a decarbonised grid could range from $17 billion to $40 billion.[54] Concrete policies to accelerate this build-out have not been announced.

In conclusion, Canada's federal government has a good level of focus on grid development to achieve a net zero grid, but provinces and territories are not consistently following suit. Greater collaboration between different levels of governments and between jurisdictions will help advance grid infrastructure development. Further, within each province and territory, system planners

[49] Government of Alberta, March 2024, **Alberta Regulation 86/2007: Electric Utilities Act**

[50] Bankes, N., November 2023, **Transmission policy in Alberta**, ABlawg

[51] Government of Ontario, 2023, **Powering Ontario's Growth: Ontario's plan for a clean energy future**

[52] IESO, December 2022, **Pathways to Decarbonization**

[53] Government of Ontario, 2023, **Powering Ontario's Growth: Ontario's plan for a clean energy future**

[54] IESO, December 2022, **Pathways to Decarbonization**

should plan for grid infrastructure development with the needs of a net zero economy in mind.

### 3.6 Effective policies to enable the required digitalisation of power systems

**SCORE: 12/15**

#### Federal

Federal government is taking a programmatic approach to prioritise digitalisation. Natural Resources Canada, a federal department, has identified grid digitalisation, specifically smart grids, as a priority in achieving Canada's decarbonisation goals. Since 2003, there has been $726m in public funding for Smart Grid R&D projects across the country including demand management, distributed energy resource management, EV integration grid monitoring and automation, microgrids, and energy storage.[55]

Some other federal programs that support grid modernisation include:

> Smart Renewables and Electrification Pathways Program ($922m over 4 years).[56]

> Energy Innovation Program ($52.9m per year).[57]

> Program of Energy Research and Development ($32m per year).

> Green Infrastructure Programs:[58] Smart Grid Program;[59] Energy Efficient Buildings RD&D Program;[60] EV Infrastructure Demonstrations Program;[61] Clean Energy for Rural and Remote Communities Program.[62]

#### Ontario

Ontario's electric system operator has a Smart Metering Entity,[63] which is responsible for the operation of the province's Meter Data Management and

[55] Natural Resources Canada, April 2022, **Smart Grid in Canada 2020–2021**

[56] Government of Canada, **Smart Renewables and Electrification Pathways Program** (webpage, accessed May 2024)

[57] Government of Canada, **Energy Innovation Program** (webpage, accessed May 2024)

[58] Government of Canada, **Green infrastructure programs** (webpage, accessed May 2024)

[59] Government of Canada, **Green Infrastructure Smart Grid Program** (webpage, accessed May 2024)

[60] Government of Canada, **Energy Efficient Buildings RD&D** (webpage, accessed May 2024)

[61] Government of Canada, **Electric Vehicle Infrastructure Demonstration (EVID) Program** (webpage, accessed May 2024)

[62] Government of Canada, **Clean Energy for Rural and Remote Communities Program** (webpage, accessed May 2024)

[63] IESO, **Smart Metering Entity** (webpage, accessed May 2024)

Repository. In 2014, Ontario had 4.8 million smart meters, accounting for 45% of all electricity consumed in Ontario.[64] More recent data indicates that Ontario has over five million smart meters.[65]

### Alberta

Alberta has limited smart metering in place. In light of the emergency grid alert at the start of 2024, experts have called on the government to do more to promote smart metering and to effectively utilise the smart meters to manage demand.[66]

### Other provinces and Canada

Nova Scotia recently joined British Columbia and Quebec in full smart meter rollouts.[67] Canada overall has 13.3 million smart meters based on the most recent estimates.[68]

## 3.7 Effective mechanisms or frameworks to prevent preferential treatment for fossil fuel-based generation over RES on the market

**SCORE: 13/15**

### Federal

In 2019, the Government of Canada implemented a national minimum price on $CO_2$ pollution, or carbon price.[69] The national carbon price started at $20/tonne in 2019, increasing annually by $10/tonne to $50/tonne in 2022. In 2020, Canada proposed to increase the price annually by $15/tonne starting in 2023, reaching a maximum of $170/tonne in 2030. Provinces and territories have been given the flexibility to implement their own pricing system to best suit their circumstances – as long as it aligns with the federal government's minimum stringency standards. This approach reflects learnings and leadership of provincial-level carbon policies, including Alberta's industrial carbon pricing system and Quebec's carbon levy put in place in 2007, and British Columbia's economy-wide carbon tax implemented in 2008. A recent study by the Canadian Climate Institute found that large-emitter trading systems, such as the federal carbon

[64] Ministry of Energy, December 2014, Chapter 3: Smart Metering Initiative, **2014 Annual Report of the Office of the Auditor General of Ontario**

[65] IESO, Smart Metering Entity – **Unlocking the value of Ontario's smart meters** (webpage, accessed May 2024)

[66] Global News, 4 February 2024, **Energy experts call for better smart meters to help reduce drain on electricity grid**

[67] Natural Resources Canada, April 2022, **Smart Grid in Canada 2020–2021**

[68] Ibid.

[69] Government of Canada, **The federal carbon pollution pricing benchmark** (webpage, accessed May 2024)

price, have been the most effective policy driver of emissions reductions in Canada.[70] Therefore, as the federal carbon price increases to $170/tonne by 2030, the business case for cleaner sources of electricity like wind, solar, and storage will continue to become stronger.

The Canadian federal government has set a goal of procuring 100% clean electricity for its buildings by 2025.[71] The government has signed several contracts across the country to procure clean energy.[72] These contracts are supporting local development of new wind projects, while promoting participation of local Indigenous communities.

Budget 2023 also saw the federal government announcing a 15% clean electricity investment tax credit for investments in wind, solar, etc.[73]

More recently, the federal government announced $175 million in support for 12 wind, solar, and smart grid projects in Alberta.[74] The funding, announced via the Smart Renewables and Electrification Pathways Program, will also support projects led by First Nations owned companies. In early 2023, Canada announced a $50 million investment in Oneida Energy storage project (250 MW) – an Indigenous-led project – in Ontario.[75]

Governments of Canada and Newfoundland and Labrador recently signed a Memorandum of Understanding (MOU) on offshore wind development.[76] The MOU will allow Newfound and Labrador to administer land tenure and life cycle regulation for offshore wind projects developed in an identified area. The agreement will allow Newfoundland and Labrador to control the speed of development and send a signal to investors.

[70] Canadian Climate Institute, March 2024, **Industrial carbon pricing the top driver of emissions reductions, new analysis shows**

[71] Government of Canada, **2025 clean power commitment for federal buildings** (webpage, accessed May 2024)

[72] Government of Canada, **Clean electricity initiative** (webpage, accessed May 2024)

[73] Government of Canada, last modified March 2023, **Budget 2023 – A made-in-Canada plan: Strong middle class, affordable economy, healthy future**

[74] Government of Canada, September 2023, **Federal Government invests in 12 new wind, solar and smart-grid projects with Alberta Indigenous and industry partners**

[75] Government of Canada, **Ontario: Clean electricity snapshot** (webpage, accessed May 2024)

[76] Government of Canada, December 2023, **Governments of Canada and Newfoundland and Labrador sign Memorandum of Understanding to advance offshore wind power and good jobs**

### Provincial

Most provinces have a mixed history of progress procuring RE. However, despite a recent RE moratorium in Alberta, we have seen some momentum in other provinces with rounds of RE procurement in the last few years. In 2018, the Ontario government cancelled 758 renewable energy contracts.[77] However, in December of 2023, Ontario's Independent Electricity System Operator announced an upcoming cycle of long-term procurements targeting approximately 5000 MW of non-emitting generation meant to meet expected energy needs in 2029.[78]

In Alberta, renewables bid into the energy-only market at $0/MWh and are hence always dispatched when available (see indicator 3.1 on curtailment). The government of Alberta has set a target of achieving 30% renewable generation by 2030[79] and has run multiple rounds of renewable energy procurement[80] to contribute to achieving this target, saving the province $160 million in the process.[81] Unfortunately, Alberta's recent 7-month moratorium on RE project approvals and unclear new rules for RE development have disrupted its strong RE investment growth.

In Ontario, electricity from intermittent and self-scheduling renewable generators is purchased first because renewables are the least expensive source of supply. These generators are considered "price takers";[82] they must accept the market electricity price without setting a price of their own.

Nova Scotia has also set a target to offer leases for 5 GW of offshore wind energy by 2030.[83]

HydroQuebec is planning to add over 10,000 MW of new wind power generation by 2035.[84]

[77] CBC, 13 July 2018, **Ontario government cancels 758 renewable energy contracts, says it will save millions**

[78] IESO, December 2023, **Evaluating procurement options for supply adequacy**

[79] Alberta government, updated 1 January 2020, **Renewable Electricity Act**

[80] AESO, **REP results** (webpage, accessed May 2024)

[81] Calgary Herald, 25 October 2022, **Alberta made estimated $160m from Renewable Energy Program as power prices surged: U of C report**

[82] IESO, February 2014, **Introduction to Ontario's physical markets**

[83] Government of Nova Scotia, September 2022, **Province sets offshore wind target**

[84] HydroQuebec, n.d., **Action Plan 2035 – Towards a decarbonized and prosperous Quebec**

SaskPower recently completed a competitive process of selecting a developer to build a 100 MW solar facility.[85]

### 3.8 Electrification rate target and roadmap to support delivery

**SCORE: 7/15**

Canada's electrification targets vary by sector and region. For vehicles, Canada has set a 100% zero-emission vehicles target by 2035.[86] However, regarding buildings, Canada does not have an explicit target in place at the federal level, and most provinces have not set electrification targets for buildings. British Columbia has set a target to make all new buildings net zero by 2030.[87]

## Benchmark 4: Governance / International leadership

**SCORE: 62/80**

Thanks in part to the federal and provincial leadership, Canada is on track to phase out coal by 2030. Canada is also a leader and signatory on various international commitments, such as the Powering Past Coal Alliance. Over 80% of Canada's electricity is already non-emitting; albeit the proportion of non-emitting electricity varies across the country. Canada is also behind its peer nations when it comes to the deployment of variable renewable energy and storage.

To help Canada achieve a net zero grid by 2035, the Canadian federal government continues to rely on industrial emissions pricing, and has announced several new policy initiatives, including the upcoming Clean Electricity Regulations. However, there is a mixed response from the provinces. Some provinces are exploring pathways to deliver a net zero grid by 2035, and have plans to add significant amounts of variable renewable capacity (wind and solar). However, there has also been significant pushback from several provincial governments on draft Clean Electricity Regulations, and uncertainty about the future of industrial emissions pricing.

[85] SaskPower, January 2024, **SaskPower selects proponent for new 100-megawatt solar facility near Estevan**

[86] Government of Canada, December 2022, **Let it roll: The Government of Canada moves to increase the supply of electric vehicles for Canadians**

[87] Ministry of Environment and Climate Change Strategy, October 2021, **B.C. launches stronger climate plan for a better future**

### 4.1 2035 carbon neutral power system commitment adopted in national legislation

**SCORE: 9/10**

Canada has committed to a net zero grid by 2035 and is currently working to finalise its draft Clean Electricity Regulations and tax incentives,[88] which, together with industrial emissions pricing, will help Canada make progress toward a net zero grid. However, this commitment and the Clean Electricity Regulations are under active political challenge from some provinces, especially Alberta and Saskatchewan. Elements of industrial emissions pricing are also at political risk. Manitoba recently asked the provincial crown corporation to **plan** for a net zero grid by 2035.[89]

### 4.2 Global leadership on supporting power systems decarbonisation in developing countries

**SCORE: 10/10**

Canada has demonstrated international leadership in supporting energy transition. Most of the commitments that Canada has signed onto were part of announcements at the last three COPs.

Some examples include:

> Canada has doubled its climate finance contribution to $5.3 billion for the period of 2021 to 2026.[90]

> Canada was directly involved in establishing the Just Energy Transition Partnerships program (JETPs).[91] Most recently, Canada has been developing JETPs with communities in emerging economies.[92]

> Canada is a member of the Powering Past Coal Alliance. The country is also providing up to $1 billion under the Climate Investment Funds – Accelerated Coal Transition.[93]

[88] Government of Canada, August 2023, **Canada Gazette, Part I, Volume 157, Number 33: Clean Electricity Regulations**

[89] Minister of Finance, 2023, **Letter from Adrien Sala, Minister responsible for Manitoba Hydro, to Ben Graham, Chair, Manitoba Hydro-Electric Board**

[90] Government of Canada, **Canada's climate finance for developing countries** (webpage, accessed May 2024)

[91] Government of Canada, **COP27 summary of outcomes** (webpage, accessed May 2024)

[92] Government of Canada, November 2022, **Canada supports the global transition to clean and secure energy with investments to phase-out coal electricity around the world**

[93] Government of Canada, **Powering Past Coal Alliance: phasing out coal** (webpage, accessed May 2024)

> Canada is a signatory to the Paris Declaration on Carbon Pricing in the Americas,[94] which promotes economy wide carbon pricing as an instrument to take climate action. Canada is continuing to make a push on carbon pricing, including at COP26.[95]

> Canada is part of a partnership that supports the Least Developed Countries (LDC) 2050 Vision.[96] This partnership supports climate adaptation and resilience.

### 4.3 International commitments on power systems decarbonisation through alliances or networks such as the PPCA, Glasgow Coal to Clean Power Initiative etc.

**SCORE: 10/10**

Canada has made several international commitments through various alliances. Canada was a founding member and co-chair of the Powering Past Coal Alliance, through which it is encouraging and supporting the transition from unabated coal power generation to clean energy.

Canada's other international commitments include:

> Canada was one of the original signatories under the Global Coal to Clean Power Transition at COP26.[97]

> Canada continues to support coal limiting initiatives through the Climate Investment Funds – Accelerating Coal Transition Program (CIP-ACT).[98]

> Canada, along with Australia, European Commission, and the United States, launched the Clean Energy Ministerial Battery Storage Initiative,[99] aimed at advancing development, deployment, and cost reduction of batteries through international cooperation and supporting global renewable energy deployment.

> At COP28, Canada became one of over 130 signatories of the Global Renewables and Energy Efficiency Pledge, who committed to work together

[94] Government of Canada, December 2017, **Paris Declaration on Carbon Pricing in the Americas**

[95] Government of Canada, **Canada's achievements at COP26** (webpage, accessed May 2024)

[96] Government of Canada, **COP27 summary of outcomes** (webpage, accessed May 2024)

[97] UN Climate Change Conference UK 2021, November 2021, **Global coal to clean power transition statement**

[98] Government of Canada, **COP27 summary of outcomes** (webpage, accessed May 2024)

[99] Clean Energy Ministerial, **Supercharging battery storage** (webpage, accessed May 2024)

to triple the world's installed renewable energy generation capacity and double the annual energy efficiency improvements by 2030.[100]

### 4.4 Net zero power system roadmap to drive delivery of 2035 commitment

**SCORE: 9/10**

The Canadian federal government has developed a suite of measures including emissions regulations,[101] financial incentives[102] and collaboration with provinces[103] to advance a net zero grid by 2035.

Several Canadian provinces (British Columbia, Manitoba, Ontario, Quebec, Newfoundland and Labrador, Prince Edward Island) are already over 90% non-emitting.[104] However, among provinces with significant electricity emissions, only Nova Scotia has made a commitment to achieve 80% total renewable energy by 2030,[105] and none have developed roadmaps for a clean grid.

No Canadian province has a roadmap in place for achieving net zero power by 2035. However, some are exploring potential pathways to implement a net zero grid by 2035. NB Power, New Brunswick's main utility company, conducted a study identifying 16 different pathways toward achieving a net zero grid by 2035.[106] New Brunswick government is planning to add 600 MW of small modular reactor nuclear power, 1400 MW of wind, and 200 MW of utility scale solar by 2035.[107] Along with other action such as energy efficiency and coal phase-out by 2030, New Brunswick's electricity system is expected to reach near zero emissions by 2035.[108] Manitoba is asking the province's crown utility, MB Hydro, to make plans for a net zero grid by 2035.[109]

[100] COP28 UAE, December 2023, **Global Renewables and Energy Efficiency Pledge**

[101] Government of Canada, August 2023, **Canada Gazette, Part I, Volume 157, Number 33: Clean Electricity Regulations**

[102] Government of Canada, last modified March 2023, **Budget 2023 – A made-in-Canada plan: Strong middle class, affordable economy, healthy future**

[103] Government of Canada, December 2023, **Governments of Canada and Newfoundland and Labrador sign Memorandum of Understanding to advance offshore wind power and good jobs**

[104] Canada Energy Regulator, September 2023, **Exploring Canada's energy future 2023**

[105] Nova Scotia Power, **Clean energy – Powering a green Nova Scotia, together** (webpage, accessed May 2024)

[106] NB Power, August 2023, **NB Power publishes 2023 IRP: Pathways to a net-zero electricity system**

[107] Government of New Brunswick, December 2023, **Powering our economy and the world with clean energy – Our path forward to 2035**

[108] Ibid.

[109] Minister of Finance, 2023, **Letter from Adrien Sala, Minister responsible for Manitoba Hydro, to Ben Graham, Chair, Manitoba Hydro-Electric Board**

### 4.5 Critical role of renewables, interconnection, and demand side measures reflected in country's energy security framework

**SCORE: 8/10**

The federal government has taken some action to support renewables, interconnections and demand side management. However, these solutions are not necessarily framed as energy security management measures. That said, in 2023, Canada and the United States created a joint Energy Transformation Task Force with the goal of advancing energy security in both countries.[110] During its one-year mandate, this task force aims to secure and strengthen opportunities and supply chains for renewable energy generation, electric vehicles, critical minerals, nuclear energy generation, and grid integration and resilience.

As explained under indicator 3.4, several provinces have introduced time-of-use pricing to support end use flexibility and to deal with demand. However, several provinces do not offer such a plan.

Provinces play a large role in planning and delivering activities related to grid development. While many recognise the need for greater grid infrastructure, they lack concrete policies to achieve these objectives. See indicator 3.5 for more details.

### 4.6 Unabated coal phase-out date and roadmap to support delivery

**SCORE: 10/10**

Canada has committed to a phase-out of unabated coal fired electricity by 2030.[111] This will support Canada's 2030 goal of 90% non-emitting electricity and its national climate change commitments.

Canada is on track to phase out unabated coal by 2030. Ontario was the first province to do so in North America in 2014. Alberta will have achieved this goal by the end of 2024. The rest of Canada will phase out unabated coal by 2030.

[110] Government of Canada, October 2023, **Deputy Prime Minister co-chairs meeting of Canada–U.S. Energy Transformation Task Force**

[111] Powering Past Coal Alliance, **Canada** (webpage, accessed May 2024)

### 4.7 Unabated gas phase-out date and roadmap to support delivery

**SCORE: 0/10**

As the federal carbon price increases to $170/tonne by 2030 (see indicator 3.7), the business case for unabated emissions from gas fired electricity generation will worsen. This, in turn, will drive investments in abatement technologies, such as carbon capture and storage, while incentivising an accelerated transition toward lower emission sources of electricity.

The proposed Federal Clean Electricity Regulations will add certainty to the process of phasing out unabated gas fired electricity when implemented in autumn 2024, while offering provincial systems several flexibility and reliability measures. Under this regulation, new gas fired assets will need to be abated starting in 2035. New gas plants, or those past the end of their economic life, can use carbon capture and storage, and other technologies to abate emissions and continue operating. There is also limited flexibility for gas fired peaking power plants to continue operating without emissions abatement.

Alberta and Saskatchewan are pushing back against the Clean Electricity Regulations arguing that gas is essential for their electricity systems. Alberta's premier has indicated that Alberta wants to build more base load gas capacity.[112] Saskatchewan is also adding new unabated gas fired assets.[113]

Lastly, Ontario recently procured some additional gas-fired capacity. Ontario's Independent Electricity System Operator (IESO) has stated that this new capacity is needed to maintain system reliability while several nuclear units are offline for planned refurbishments. Once these refurbishments are complete in 2033 and new, non-emitting technologies like storage and hydrogen have been tested, gas will no longer be needed.[114] Also, the IESO has conducted a feasibility study for phasing out gas fired electricity. Although the study yielded mixed results, nationally, it was a leading effort by a system operator to phase out gas.[115]

[112] Global News, 28 November 2023, **Feds won't challenge Alberta's Sovereignty Act as electricity providers unpack implications**

[113] SaskPower, **Planning and construction projects** (webpage, accessed May 2024)

[114] Government of Ontario, 2023, **Powering Ontario's Growth – Ontario's plan for a clean energy future**

[115] IESO, December 2022, **Pathways to Decarbonization**

### 4.8 2030 target for share of total RES in electricity generation

**SCORE: 6/10**

Canada's electricity is already about 83% emissions free, thanks to hydroelectric, nuclear, wind, solar, biomass, and tidal power generation.

Canada committed to tripling renewable energy by 2030 at COP28.[116] A few provinces have also set targets for the share of total RES in their electricity generation by 2030: Nova Scotia has commitment to achieve 80% total renewable energy by 2030,[117] whereas Alberta wants to generate at least 30% of its electricity from renewable energy sources by the same year.[118] At the national level, there is a non-legislated commitment to 90% non-emitting electricity generation by 2030.[119] Canada is also aiming for a net zero emitting grid by 2035 via the upcoming Clean Electricity Regulations.

Several provinces are planning to procure more RES. Further, it is likely that some provinces, such as British Columbia and Quebec, which are already above 90% non-emitting, will continue to support a clean grid in 2030 and beyond. See indicator 3.7 for more detail.

## Benchmark 5: Reducing energy waste

**SCORE: 36/80**

Canada has a mixed bag of support for reducing energy waste though its grids are overall efficient with low transmission line losses. The Canadian federal government has taken significant steps to support retrofit programs and announced programmatic support. However, there remains a pressing need for further action to accelerate the scale and scope of retrofitting initiatives. Particularly, more support is needed from the provinces, both in the form of setting their own targets, providing programmatic supports, and implementing other enabling policies.

[116] Government of Canada, **COP28 summary of outcomes** (webpage, accessed May 2024)

[117] Nova Scotia Power, **Clean Energy – Powering a green Nova Scotia, together** (webpage, accessed May 2024)

[118] Alberta government, updated 1 January 2020, **Renewable Electricity Act**

[119] Environment and Climate Change Canada, 2022, **2030 Emissions Reduction Plan**

### 5.1 Efficient policies to retrofit / renovate buildings

**SCORE: 10/20**

Between 2023 and 2027, the federal government is investing $200 million in the Deep Retrofit Accelerator Initiative (DRAI)[120] to support "retrofit accelerators" – organisations that identify, guide, fund, and build capacity for deep retrofit projects. Starting in 2022–2023, the federal government of Canada ran a Greener Neighbourhoods Pilot Program,[121] piloting the EnergieSprong aggregated deep retrofit model. Canada is developing a Green Buildings Strategy (GBS), which is aimed at reducing emissions and increasing resiliency of the built environment.[122] The goal of GBS is to "mobilize national action to transform markets and reduce costs to meet this goal."

### 5.2 National energy/power savings target

**SCORE: 8/10**

Canada is signatory to IEA's commitment to double the annual energy efficiency improvement rate to over 4%.[123]

There is no legislated national target for energy savings, energy efficiency or power savings. Most of Canada's provinces have adopted their own annual energy savings targets, mostly in the form of legislated commitments (e.g., Manitoba – 1.5% savings p.a. or Prince Edward Islands – 2% savings p.a), according to Efficiency Canada's database (last reviewed November 2022).[124] In addition, two provinces – Quebec and Manitoba adopted gas saving targets. Despite active provincial action on this issue, the improvement rates are overall below what's needed: Canada remains the G7 country with lowest annual energy efficiency improvements.[125]

### 5.3 Sufficient spending on energy efficiency programmes

**SCORE: 7/20**

The Canadian federal government has taken some steps toward energy efficiency, albeit mostly in the form of programmatic announcements. The

[120] Government of Canada, **Deep Retrofit Accelerator Initiative** (webpage, accessed May 2024)

[121] Government of Canada, **Greener Neighbourhoods Pilot Program** (webpage, accessed May 2024)

[122] Government of Canada, **The Canada Green Buildings Strategy consultation** (webpage, accessed May 2024)

[123] IEA, June 2023, **Energy Efficiency: The decade for action**

[124] Efficiency Canada, **Energy Efficiency Programs** (webpage, accessed May 2024)

[125] Alliance for an Energy Efficient Economy, March 2023, **Strategic plan for advancing energy efficiency across demand sectors by 2030**

Canada Greener Homes Grant, which recently expired, offered grants for retrofits.[126] Canada Greener Affordable Housing program provides funding to affordable housing providers for deep energy retrofits for existing multi-unit residential buildings.[127] On the other hand, the Canada Greener Homes Loan program provides interest-free loans worth up to $40,000 for eligible home retrofits.[128] Lastly, the Oil to Heat Pump Affordability program offers financial support to eligible home owners for switching from oil heating to heat pumps.[129]

### 5.4 High-quality appliance and equipment standards and labelling

**SCORE: 11/20**

The federal government sets efficiency standards for certain appliances and equipment. These standards apply to all specified products that are imported or shipped between provinces. Provinces and territories have the jurisdiction over products sold within their borders.

Federal regulations cover 58 products including household appliances, water heaters, heating and air conditioning equipment, lighting products, electronic products, commercial refrigeration, and other industrial or commercial equipment.[130] Additionally, five provinces have set their own regulations, which provide a varying amount of coverage. British Columbia is currently preparing Highest Efficiency Equipment Standards.[131]

The federal government also manages a labelling program called EnerGuide, which is mandatory for commonly residential appliances like washing machines, dryers, dishwashers, cooktops, ovens, and refrigerators. EnerGuide labels display the annual energy consumption of the labelled model compared to the consumption of the most and least efficient models in the same class, empowering consumers to make educated purchasing decisions.[132]

[126] Government of Canada, **Canada Greener Homes Grant** (webpage, accessed May 2024)

[127] Canada Mortgage and Housing Corporation, **Canada Greener Affordable Housing** (webpage, accessed May 2024)

[128] Government of Canada, **Canada Greener Homes Loan** (webpage, accessed May 2024)

[129] Government of Canada, **Oil to Heat Pump Affordability Program** (webpage, accessed May 2024)

[130] Government of Canada, **Energy efficiency regulations by province** (webpage, accessed May 2024)

[131] Pembina Institute, February 2024, **Submission to Highest Efficiency Equipment Standards Consultation in B.C.**

[132] Government of Canada, **The EnerGuide label** (webpage, accessed May 2024)

## About E3G

E3G is an independent climate change think tank with a global outlook. We work on the frontier of the climate landscape, tackling the barriers and advancing the solutions to a safe climate. Our goal is to translate climate politics, economics and policies into action.

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