2022 Canadian Energy Efficiency Scorecard: Provinces and Territories

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Efficiency Canada

Carleton University

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Table of contents

Tables

Figures

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Brendan Haley is Efficiency Canada's Director of Policy Research. He has a PhD in Public Policy from Carleton University, a Master of Environmental Studies from York University, and a Bachelor of Science in Economics from Dalhousie University. Before joining Efficiency Canada on a full-time basis in September 2018, Brendan was a Banting Postdoctoral Fellow at Dalhousie University.

Annabelle Linders joined Efficiency Canada as an Assistant Policy Research Analyst intern from January to August 2022. She is currently pursuing a Bachelor of Public Affairs and Policy Management at Carleton University, specializing in communication and technology policy.

Executive summary

Efficiency Canada's fourth annual Energy Efficiency Scorecard assesses policy and outcomes realized within the 18-month window between January 2021 and June 2022. This assessment window allows us to accommodate calendar and fiscal reporting periods, and to capture more recent policy developments introduced or implemented by provincial and territorial governments in the first half of 2022. We release it alongside our online policy database, available at https://database.efficiencycanada.org, which includes qualitative descriptions of the various policy contexts across Canada. We produce the Scorecard and database to inform and inspire leadership among policymakers and energy efficiency professionals.

There were several important federal and provincial developments in 2021 that will impact energy efficiency in the years to come. Most notably, perhaps, was the official release of the federal government's 2020 model building codes. Though it is too early for any province to have yet adopted the new codes, our Scorecard shows that only a few provinces have put in place plans to adopt the new codes on accelerated timelines. The federal government also released its 2030 Emissions Reduction Plan, which included (among other things) a plan to create a building code adoption acceleration fund, increased support for energy management systems in small and medium enterprises, and revised timelines for a light-duty zero-emission vehicle mandate.

At the provincial level, aggregate energy savings and program spending figures show a rebound from 2020 levels. Several provinces are also in the process of updating their energy efficiency plans for the next three to five years. For the first time, we were able to include the Yukon in our full analysis of energy efficiency policy outcomes and policy, and we continue to work toward full inclusion of Northwest Territories and Nunavut in future years.

Below, we briefly outline the methodological changes made for our 2022 Scorecard and highlight the overall results of our analysis.

Methodology

The 2022 Scorecard retains the overall scope and structure of previous reports. We track 54 metrics across 17 topics and categorize them within five policy areas: energy efficiency programs, enabling policies, buildings, transportation, and industry. We continue to score

provinces out of a total of 100 points; top-scoring thresholds in each metric represent best-in-class benchmarks and best practice policy. Most topics include both "outcome" metrics, which measure the performance of a jurisdiction (such as energy savings achieved, or number of energy efficiency-related certifications), and "policy" metrics based on a qualitative yes/no assessment. Some metrics include both policy and outcome components and are thus "mixed". In general, we applied more weight to outcome metrics. Table 1 lists points available by metric type.

Table 1. Points available by metric type

Metric type	Points available
Policy	42.0
Outcome	48.5
Mixed	9.5
Total	100.0

Maximum scores for each metric represent "stretch" goals; they reflect best-in-class policies and performance consistent with the ambition needed to grapple with climate change, energy poverty, and productivity challenges, while meeting national policy goals. We encourage readers to think of a score of 100 points as a stretch goal or a summit to strive for. Scores should not be interpreted as percentage grades. For a complete list of policy areas, topics, and metrics weighting, see Table 5.

This year's Scorecard introduces two new program metrics (compensation for public interest intervenors; and fuel switching policies and programs), a revised approach to tracking building code commitments and adoption, and a new metric tracking provincial appliance and equipment standards. The addition of these new metrics, coupled with the evolution of scoring adjustments to date, necessitated a slight rebalancing in the weighting of several metrics throughout the Scorecard. The goal in reweighting is to make the minimum number of adjustments so as to retain overall balance across policy areas (reflecting energy efficiency potential as indicated in the 2018 IEA/NRCAN report), while also reflecting trends in energy efficiency policies, programs, and strategies.

Accordingly, adjustments to metric weighting this year include the following:

- The **energy efficiency programs** policy area increased two points to incorporate two new metrics, bringing the total to 40 points. The efficiency targets metrics were slightly reorganized, leading to a reduction in weight of one point.

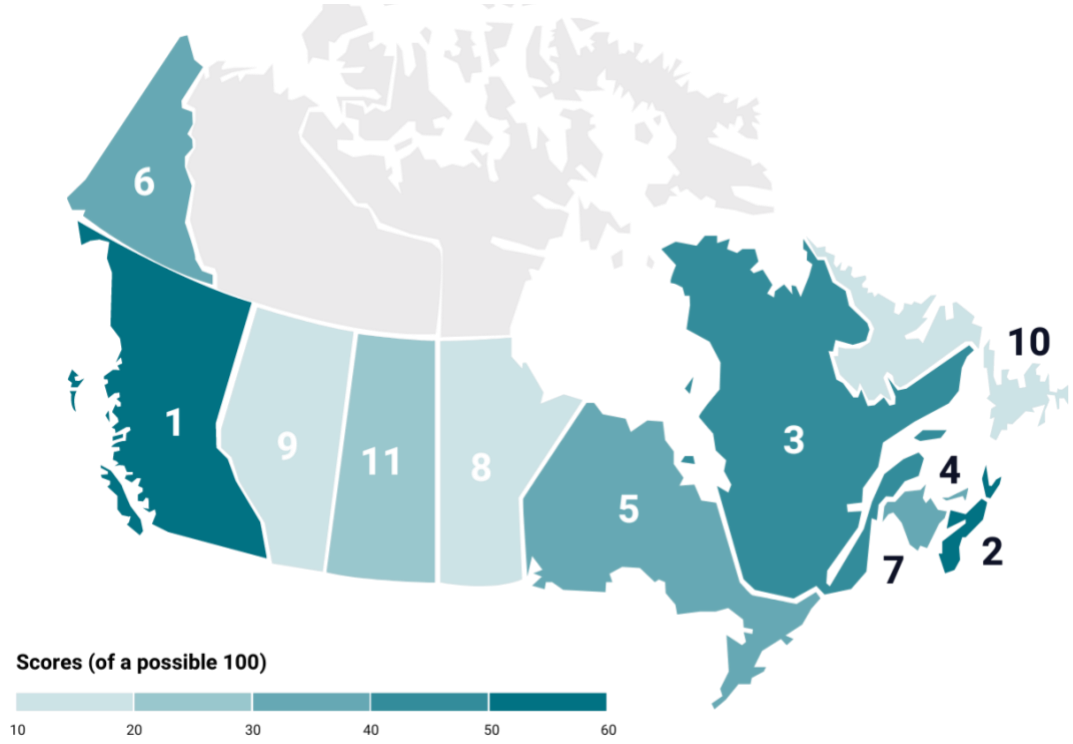
- The **enabling policies** section was reduced by one point in total, comprising a reduction of a half point for use of carbon pricing revenues (which should be captured by the per capita spending metric), as well as a reduction of a half point for conservation voltage reduction (for which there appears to be little change year over year).

- The b**uildings** policy area was increased in weighting by two points to accommodate a revised approach to building code commitments and adoption timelines, and a new metric for appliance and equipment standards. Consequently, we reduced the retrofit code metric by a half point since there appears to be little action at the provincial level on this item (outside British Columbia).

- **Transportation** was reduced by three and a quarter points, to bring it closer in line with the section weighting for buildings. Consequently, we reduced points for zero-emissions vehicle mandate by one point; electric vehicle incentives for consumers by a half point; BEV/PHEV registrations by one point; support for public/private electric vehicle charging infrastructure, specifically the prioritize Level 3 charging sub-metric, by a half point; and availability of public DC fast charging stations, by a quarter point.

- **Industry** underwent no change in weighting, though we combined the former two industry section metrics, support for energy management and EnMS/SEM program results, into one metric. Total available points remain the same.

Overall results



This year, British Columbia, Nova Scotia, and Québec retain the top three spots, though Nova Scotia narrowly surpassed Quebec to take second place. British Columbia continues to lead in enabling policies and buildings. Québec again places first in transportation, as well as industry this year. Nova Scotia's strong performance in the programs section boosted it to first in that policy area, and second place overall.

Prince Edward Island and Ontario traded places. Prince Edward Island improved its performance in the programs area, and its net zero energy ready buildings by 2030 commitment helped to boost it slightly ahead of Ontario (which also improved in electricity savings).

For the first time, we have included Yukon in the Scorecard, which scored in the middle of the pack. Alberta fell below Manitoba. Saskatchewan fell back to last place in part because of the province's decrease in energy efficiency programs scoring.

The table below shows scores for each province by policy area. We depict ranking changes in parentheses. Due to adjustments made to topics and metrics, changes in specific policy areas and in overall score may not be directly comparable with previous scores.

Table 2. Overall scoring results*							
Rank	Province/ territory	Programs (40 points)	Enabling (16 points)	Buildings (19.5 points)	Transport (17.25 points)	Industry (7 points)	Total (100 points)
1 (-)	BC	15	13	10	13	5	55
2 (+1)	NS	21	13	4	7	5	50
3 (-1)	QC	12	9	5	15	6	48
4 (+1)	PE	20	4	5	8	4	39
5 (-1)	ON	10	12	6	6	5	39
6 (~)	YT	18	6	5	7	0	35
7 (-1)	NB	10	9	2	6	4	30
8 (-)	MB	11	9	2	3	4	29
9 (-2)	AB	2	7	2	3	5	19
10 (+1)	NL	7	5	2	3	1	17
11 (-1)	SK	1	9	3	3	1	16

**Scores rounded to the nearest whole number. Totals might not sum due to rounding.*
~This is the first year that Yukon has been included in the scoring.

***Note:** The names of the Canadian provinces and territories are abbreviated throughout this report using the postal abbreviation: Alberta (AB), British Columbia (BC), Manitoba (MB), New Brunswick (NB), Newfoundland and Labrador (NL), Northwest Territories (NT), Nova Scotia (NS), Nunavut (NU), Ontario (ON), Prince Edward Island (PE), Quebec (QC), Saskatchewan (SK), Yukon (YT).*

Canada-wide savings and spending

In our previous Scorecard, we found a declining trend in national energy savings, which had peaked in 2017. Data for the 2021 program year suggests this trend has been reversed – net annual incremental energy savings rebounded 30.5% over 2020 levels, hitting a total of 18.7 petajoules (see Figure 1 below). The largest jump was seen in electricity savings, which increased by just over 3 petajoules, or 48% over 2020 levels. Natural gas savings also increased by approximately 1.3 petajoules, or 19%. As was the case last year, electricity savings in Ontario are the principal reason for the reversal, though savings also jumped substantially in Alberta. Energy efficiency program spending (Figure 2), on the other hand, remained at levels roughly equivalent to those in 2020, and still below the peak in 2018.

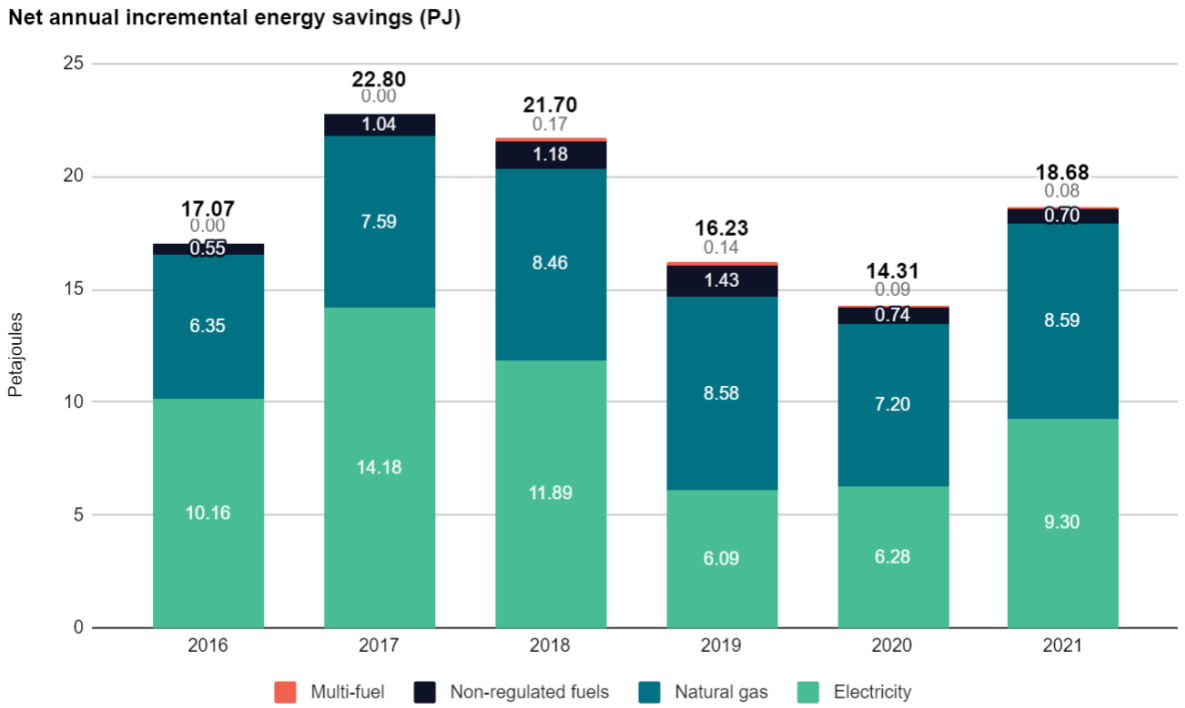


Figure 1. Net annual incremental energy savings (PJ), 2017-2021

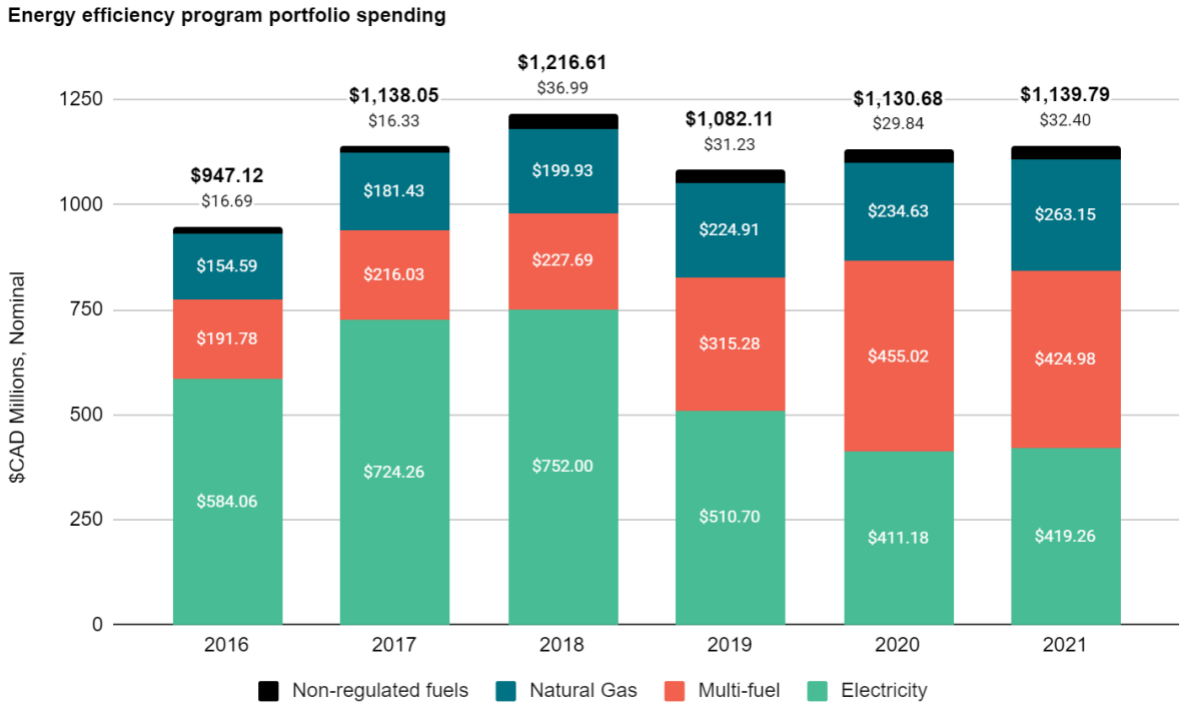


Figure 2. Energy efficiency program spending ($CAD millions), 2017-2021

Provincial/territorial strengths and opportunities

In each Scorecard, we highlight key trends and observations for each province. Below you will find a discussion for each province and Yukon. This includes major events over the past year and context setting, as well as strengths and opportunities highlighted for each province. These highlights allow us to also discuss policy plans and more recent events that were outside of the timeline for scoring.

We base both strengths and opportunities for improvement on a combination of Scorecard findings and our understanding of provincial policy contexts. Opportunities for improvement are a combination of areas where a province might score relatively lower and/or where the province is poised to take advantage of existing strengths. We also try to avoid constantly repeating the same opportunities each year, for a given province. These are highlights and not exclusive recommendations; we encourage readers to drill down into specific topic areas as well as previous years' highlights to understand a given province's relative performance and policy mix and to find ideas for policy actions to improve energy efficiency in each jurisdiction.

Table 3. Provincial strengths and opportunities

Province/territory	Strengths	Opportunities
AB	Building codes	Low-income energy efficiency
	Industrial energy efficiency	Energy labelling
		Utility demand side management
BC	Strong climate plan	Mission-oriented energy efficiency
	Zero carbon building code commitment	Deliver on "right to be cool"
	Municipal empowerment	
MB	Efficiency Manitoba Innovation Fund	High performance building codes
	New Indigenous programs	Fuel switching policy
NB	Smart meters coverage	Energy efficiency resource standard
	Energy efficiency research	Low-income program funding

		Compensation for intervenors
NL	Electrification planning Low-income program potential	Data availability and evaluation Certified Energy Managers
NS	Low-income program spending Peak electricity demand savings	Energy efficiency resource standard Net zero building codes Performance-based utility regulation
ON	Demand response	Expand energy efficiency programs Net zero building codes Fuel switching
PE	Program savings Transportation	Target higher energy savings
QC	Fuel switching policy and programs Public transit funding	Building performance standards Regulate heating equipment
SK	Building science research	Net zero building codes Electricity savings programs
YT	Program savings and spending Indigenous energy efficiency Net zero building codes commitment	Evaluation of program savings

Federal policy recommendations

In each year's Scorecard we consider the role of federal policy in supporting better provincial energy efficiency performance. This year we identify five areas for action:

1. **Expand scale and scope of low-income energy efficiency:** Many provincial programs cannot prioritize objectives aimed at supporting low-income Canadians because their mandates are energy savings and fuel specific; not directly connected to net zero emission goals; and placed under restrictive cost-benefit screens that fail to consider

societal and environmental benefits. The federal government can help fill these gaps by earmarking at least $2 billion towards low-income energy efficiency in Canada that is accessible to all low-income homeowners and renters, including the millions who cannot take on the additional debt burdens required by active retrofit programs and who don't live in subsidized housing – the current focus of federal low-income energy efficiency efforts.

2. **Mandate efficient and zero-carbon heating:** To meet our net zero emission goals, space and hot water heating systems must all become at least 100% efficient. In addition to using incentives to help build the scale and cross-country harmonization of zero-carbon ready heating equipment via incentives, the federal government should require energy efficient and zero-carbon ready performance from all new heating systems in Canada.
3. **Define net zero building performance standards:** To reach net zero emissions, we need large buildings to not only benchmark and disclose energy efficiency and greenhouse gas emission performance, but we also need to make a minimum level of performance mandatory, so these buildings provide the right services, such as adequate cooling, to occupants and tenants in a net zero emissions future. The development of a federal Green Building Strategy offers an opportunity to the federal government to define net zero emission performance for different building types, climate zones, etc.
4. **Integrate with provincial programs to "crowd in" more funding:** When the federal government introduces a new energy efficiency program into the market it must consider its impact on existing provincial and utility programs to avoid making it difficult for utilities to claim savings that result from their investments, which makes them less cost-effective. Federal programs should be co-ordinated in such a way as to complement provincial programs and encourage higher investment from utilities and other levels of government. The federal government should be focused on achieving gross economywide savings and be willing to attribute savings to provincial utility programs if this results in an overall expansion of energy efficiency.
5. **Create targets and expectations for provinces:** The effectiveness of the federal Green Building Strategy and larger net zero emissions plan is highly dependent on provincial policy actions in public utility regulation, building code adoption, skilled trades certification, and municipal agency to set bylaws. As such, when the federal government provides climate action funds to provinces, it should consider presenting clear

expectations for regulatory and policy changes that provinces need to implement if Canada is to achieve net zero emissions. This way, federal funds and policy supports can be more clearly directed toward specific policies, timelines, and structural market transformation, and citizens know what they should expect from their policymakers.

Introduction

This report is Efficiency Canada's fourth provincial/territorial Energy Efficiency Scorecard; within it, we evaluate provincial and territorial energy efficiency policy and outcomes realized between January 2021 and June 2022. We release it alongside an updated database of provincial and territorial energy efficiency policies, freely available at database.efficiencycanada.org. We produce both the Scorecard and database to inform and inspire leadership among policymakers and energy efficiency professionals.

Each of our scorecards builds on the previous edition, and with each we work to improve on our transparent and comprehensive methodology. In the chapters that follow, we share insights into our methods for collecting information on a wide-range of energy efficiency-related topics, and our approach to normalizing and benchmarking this information across highly varied provinces with unique energy system contexts. We offer informative, comparative summaries of provincial policies and energy efficiency achievements. Finally, we rank the provinces and territory on their respective efforts to improve energy efficiency.

Our publicly available policy database is a useful companion to the Scorecard. It summarizes key policy areas in each province and helps highlight provincial best practices. The database also includes provincial administrative models, cost-effectiveness testing methods, and policy frameworks for appliance and equipment standards. The database is searchable by jurisdiction and policy area, allowing users to easily compare developments across Canada.

In this introduction, we provide a thorough discussion of the methodological approach and principles that guide the production of the Scorecard and outline the scoring results for 2021 provincial/territorial policy and energy efficiency achievements.

Methodology

We base our Scorecard upon three sources of information: An information request issued to provincial government representatives, utilities, and energy efficiency program administrators in May/June 2022; our own independent desk research, both to verify or clarify information received in the request, or to address issues not covered in the request; and publicly available data sets provided by government agencies such as Statistics Canada and Natural Resources Canada (NRCan).

This year, we developed and distributed two respective information requests as Microsoft Excel documents: one for policymakers, and the other for utilities and energy efficiency program administrators. This change was based on respondent feedback and allowed us to ask only the questions that were applicable to the two respective groups of respondents. In addition to the information request, we also developed and distributed a program workbook (a Microsoft Excel document). The aim of the workbook was to gather more information at the program level (e.g., a list of programs, savings, spending, and targets). The documents were organized as follows:

Policymakers:

- Information request: seven sections (planning and administration, energy efficiency programs, enabling policies, buildings, workforce development, appliance and equipment standards, and industry), covering 27 topics.
- Program workbook: three sections (programs, targets, and outcomes), covering 12 topics

Utilities and energy efficiency program administrators:

- Information request: five sections (planning and administration, energy efficiency programs, enabling policies, buildings, and industry), covering 21 topics.
- Program workbook: four sections (programs, targets, outcomes, and utility operational data), covering 14 topics.

Some topics include multiple questions, and some questions include sub-questions. We distributed the respective information request and programs workbook to different contacts in each province, though in some instances provincial respondents worked together to return a joint request.

Respondents replied throughout the summer, and we compiled, analyzed, and evaluated them as we received them. We circulated a draft report with initial findings to information request respondents and subject-matter-expert advisors in September 2022 for peer review and a final accuracy check. We revised the Scorecard based on this feedback and prepared the final report for release in the fall of 2022.

Note that this year we did not ask about transportation in the information request and programs workbook. This is because we collaborated with Electric Mobility Canada who developed and distributed a transportation-specific information request with support from Dunsky Energy and Climate Advisors.

Time period covered

This Scorecard captures energy efficiency policies and performance in the most recent year (12 months) for which complete data is available. For most indicators, this period occurs within the 18-month window following January 2021. This window is longer than one year for two reasons: we need to accommodate program administrators on fiscal year reporting periods (typically ending March 31); and we allow a policy implementation grace period of six months into year two. This helps to ensure that our Scorecard reflects a current picture of the energy efficiency policy landscape in the year it is published.

Figure 1 below summarizes the period coverage of the Scorecard. For reference, "Scorecard year" is the year of the data we report (2021, in this report), and "production year" is the version year of the published Scorecard (this is the 2022 Scorecard).

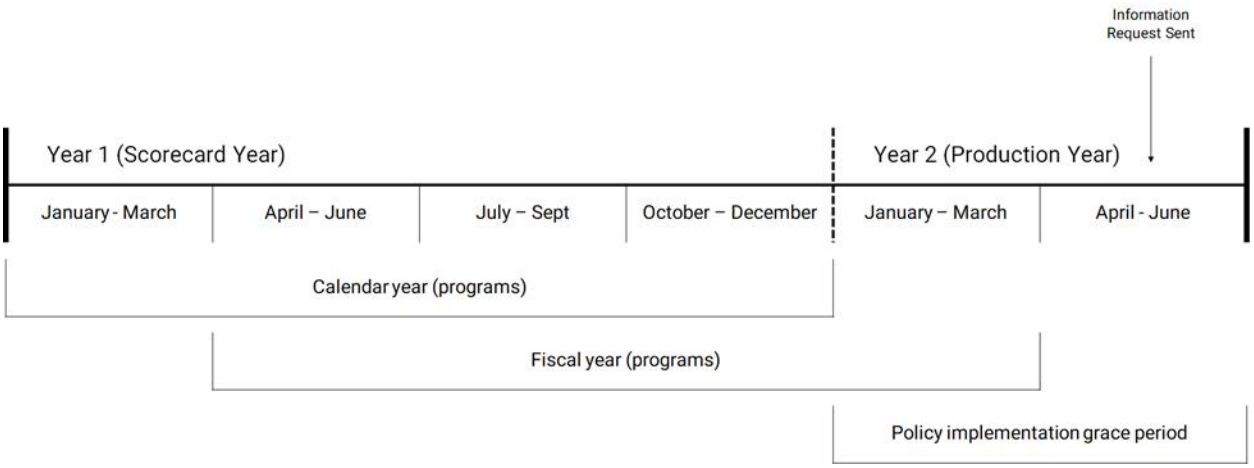


Figure 3. Scorecard coverage period

In previous years, we have issued our information request to program administrators and governments in April of year two. However, a consequence has been that select program administrators on fiscal year reporting periods have been unable to report year one verified program data within our production period. For those administrators, we have reported prior year data instead. Beginning in 2021, in consideration of the implications of comparing 2019 data for select program administrators with 2020 data for the others, we delayed our

information request by one month in the hope we would be able to capture year one data for all program administrators. This was successful and the same timeline followed in 2022. Therefore, all program data reported in this report are 2021 data.

In cases where we obtained data from third parties, we used the latest information available or over a series of years that best fit the context of the metric being tracked. For instance, some information came from the 2016 Canadian Census, while Statistics Canada's energy demand data so far only runs to 2020. When tracking research and development expenditures, pilot projects, and building code compliance studies, we used a longer time frame consistent with the period over which such activities normally unfold, to ensure a relevant and up-to-date analysis.

This report also tracks qualitative policy indicators for each jurisdiction surveyed via yes or no questions on the presence of specific policies, such as a particular building code or a provincial carbon price. To receive full points on such metrics, the respective policy must have been active or implemented within the above 18-month window. We awarded partial points in some cases, for example if a province cancelled a policy, or reported planned activities that it has not yet implemented. Should a province cancel a policy earlier in our time period, we may award no points.

Topics and scoring

This Scorecard tracks 54 separate metrics, representing 17 topics across energy efficiency programs, enabling policies, buildings, transportation, and industry. Total scoring is out of 100 points. We encourage readers to think of a score of 100 points as "summiting a mountain that all provinces can climb." Full points represent a stretch goal that we can strive towards. The scores are not percentage grades. We provide an overview of the policy areas, topics and scoring weights in Table 4.

Our choice of topics, metrics, and scoring methodology reflects the following considerations:

- **Measurable:** Could we objectively measure policy performance?
- **Comparable:** Were the policy areas relevant and replicable across provinces?
- **Actionable:** Could provinces improve outcomes and/or add to the policy mix?
- **Data availability**: Could we access either quantitative or qualitative data?
- **Consensus:** Was there general agreement on the importance of this policy area?

- **Capacity:** Do we have the financial and human resources necessary to analyze information in time?

Most topics include both "outcome" metrics, which measure the performance of a jurisdiction (such as energy savings achieved, or number of energy efficiency-related certifications), and "policy" metrics based on a qualitative yes/no assessment. Some metrics include both policy and outcome components and are thus "mixed". In general, we applied more weight to outcome metrics. Maximum scores for each metric represent "stretch" goals; they reflect best-in-class policies and performance consistent with the ambition needed to grapple with climate change, energy poverty, and productivity challenges, while meeting national policy goals.

Table 4. Points available by metric type

Metric type	Points available
Policy	42.0
Outcome	48.5
Mixed	9.5
Total	100.0

We use the energy savings potential of policy areas — as identified in a 2018 IEA/NRCan efficiency potential study — to inform their relative weighting.[1] This study found that the largest proportion of potential savings by 2050 comes from buildings (28%), followed by transportation (25%). The researchers identified a further 12% of the potential savings in the industrial sector (excluding the mining, oil and gas sector, which accounted for 21% of potential savings). They identified the remaining 14% of savings in "other" sectors, including energy supply and agriculture.

This year's Scorecard introduces two new program metrics (compensation for public interest intervenors; and fuel switching policies and programs), a revised approach to tracking building code commitments and adoption, and a new metric tracking provincial appliance and equipment standards. The addition of these new metrics, coupled with the evolution of scoring adjustments to date, necessitated a slight rebalancing in the weighting of several metrics throughout the Scorecard. The goal in reweighting is to make the minimum number of adjustments so as to retain overall balance across policy areas (reflecting energy efficiency potential as indicated in the 2018 IEA/NRCAN report), while also reflecting trends in energy efficiency policies, programs, and strategies.

[1] International Energy Agency and Natural Resources Canada, "Energy Efficiency Potential in Canada to 2050," Insight Series 2018 (Paris: International Energy Agency, 2018).

Accordingly, adjustments to metric weighting this year include the following:

- The **energy efficiency programs** policy area increased two points to incorporate two new metrics, bringing the total to 40 points. The efficiency targets metrics were slightly reorganized, leading to a reduction in weight of one point.

- The **enabling policies** section was reduced by one point in total, comprising a reduction of a half point for use of carbon pricing revenues (which should be captured by the per capita spending metric), as well as a reduction of a half point for conservation voltage reduction (for which there appears to be little change year over year).

- The **buildings** policy area was increased in weighting by two points to accommodate a revised approach to building code commitments and adoption timelines, and a new metric for appliance and equipment standards. Consequently, we reduced the retrofit code metric by a half point, since there appears to be little action at the provincial level on this item (outside British Columbia).

- **Transportation** was reduced by three and a quarter points, to bring it closer in line with the section weighting for buildings. Consequently, we reduced points for zero-emissions vehicle mandate by one point; electric vehicle incentives for consumers by a half point; BEV/PHEV registrations by one point; support for public/private electric vehicle charging infrastructure, specifically the prioritize Level 3 charging sub-metric, by a half point; and availability of public DC fast charging stations, by a quarter point.

- **Industry** underwent no change in weighting, though we combined the former two industry section metrics, support for energy management and EnMS/SEM program results, into one metric. Total available points remain the same.

In addition to the above, we changed the evaluation and scoring methodology and weighting of some metrics within these topic areas. We detail these revisions in the relevant sections below.

We believe this scoring approach is transparent and offers valuable insights into areas of provincial policy strength. However, we also caution that this assessment is unique to Canada; readers should not compare provincial scores with those of states in the American Council for an Energy-Efficiency Economy (ACEEE) scorecard. Comparison on individual metrics may be

instructive, however. An example is a comparison of state and provincial program savings and targets we previously published.[2]

In future reports, we will continue adjusting the allocation of points to reflect emerging trends in energy efficiency and updates in the policy landscape. We therefore ask readers to view the Scorecard as an evolving indicator, and not a standardized index.

Table 5. Policy areas, topics, and metrics weighting	
Energy efficiency programs	**40**
Program savings	18
Program spending	10
Equity and inclusion	4.5
Resource planning and targets	7.5
Enabling policies	**16**
Financing and market creation	3.5
Research, development and demonstration and program innovation	3
Energy management capacity	3
Training and professionalization	3
Grid modernization	3.5
Buildings	**19.5**
Building codes	12
Labelling, benchmarking and disclosure	6
Appliances and equipment standards	1.5
Transportation	**17.5**

[2] Alyssa Nippard and Annabelle Linders, James Gaede, Brendan Haley, "Benchmarking Canadian Province and American State Energy Efficiency Program Savings and Spending" (Ottawa, ON: Efficiency Canada, Carleton University, 2022), https://www.efficiencycanada.org/wp-content/uploads/2022/05/FINAL-US-Canada-Scorecard-Comparison.pdf.

Zero-emission vehicles	6.5
Transport electrification infrastructure	6
Active transportation	2
Public transportation	3
Industry	**7**
Industrial energy management programs	7
Total	**100**

Scope and limitations

The Scorecard focuses on provincial policies and outcomes. We do not consider the role of federal policy except where it might enable provincial action. Similarly, our scoring excludes local government activity, except where provincial actions might enable or impede municipal efficiency initiatives, such as project funding through local improvement charges and/or Property Assessed Clean Energy (PACE) programs.

Nevertheless, important local government policies might be in place, especially if there is a provincial policy leadership vacuum. We suggest those interested in local government energy efficiency policies and programs consult the QUEST Smart Energy Communities Benchmark, which tracks policy areas such as local transportation and land use planning that complement our provincial focus.[3]

The Scorecard measures policy best practices and performance, not overall energy intensity. We also focus more on the role of governments and other public organizations (e.g., efficiency program administrators) rather than the private sector. However, public policy and the private sector are intertwined, and we report indicators where private sector actors contribute to public policy success, and/or where policy influences the private sector. For instance, private sector actors are involved in electric vehicle charging, the decision to acquire training and certifications, and financing. In future editions, we aim to work alongside organizations like ACEEE to seek out reliable information on the private sector's contribution to energy savings.

[3] "Smart Energy Communities Benchmark," QUEST, 2020, https://smartenergycommunities.ca/.

The Scorecard's transportation section focuses primarily on the integration of private transport with buildings and grids. We track progress in vehicle electrification and novel policy areas such as the development of EV-ready building codes. We focused on electrification and passenger vehicle efficiency to align with the largest efficiency potential identified in the IEA/NRCan national potential study noted above. A broader set of policies and indicators could include freight transport, and urban design. The QUEST Smart Cities Benchmark and the Pembina Institute's work on freight transport provide more information on these policy areas.[4]

Several of the chapters below include discussion of future considerations for improved benchmarking, scoring, and information collection. Data limitations prevent scoring in some metrics (e.g., appliance and equipment standard impacts, energy management system participation rates); we discuss these in more detail where applicable. We also used data sets that helped illuminate the state of play in areas such as university-based R&D. At times, we used such data for scoring or provided it for illustrative purposes only.

Overall results

This year, British Columbia, Nova Scotia, and Québec retain the top three spots, though Nova Scotia narrowly surpassed Quebec to take second place. British Columbia continues to lead in enabling policies and buildings. Québec again places first in transportation, as well as industry this year. Nova Scotia's strong performance in the programs section boosted it to first in that policy area, and second place overall.

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[4] Lindsay Wiginton et al., "Fuel Savings and Emissions Reductions in Heavy-Duty Trucking: A Blueprint for Further Action in Canada" (Calgary, AB: Pembina Institute, April 2019), https://www.pembina.org/reports/freightclimateblueprints.pdf.

The table below shows scores for each province by policy area. We depict ranking changes in parentheses. Due to adjustments made to topics and metrics, changes in specific policy areas and in overall score may not be directly comparable with previous scores.

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5 (-1)	ON	10	12	6	6	5	39
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7 (-1)	NB	10	9	2	6	4	30
8 (-)	MB	11	9	2	3	4	29
9 (-2)	AB	2	7	2	3	5	19
10 (+1)	NL	7	5	2	3	1	17
11 (-1)	SK	1	9	3	3	1	16

**Scores rounded to the nearest whole number. Totals might not sum due to rounding.*
~This is the year that Yukon has been included in the scoring.

Note: *The names of the Canadian provinces and territories are abbreviated throughout this report using the postal abbreviation: Alberta (AB), British Columbia (BC), Manitoba (MB), New Brunswick (NB), Newfoundland and Labrador (NL), Northwest Territories (NT), Nova Scotia (NS), Nunavut (NU), Ontario (ON), Prince Edward Island (PE), Quebec (QC), Saskatchewan (SK), Yukon (YT).*

Energy efficiency in the territories

Canada's territories have historically presented a challenge for tracking and benchmarking energy efficiency policy and outcomes. In previous years, we have excluded the territories in our regular scoring due to data limitations and the unique context of their energy systems. Despite our best efforts and those of our contacts in each territory, we have struggled to acquire the data and information necessary to score each territory alongside the provinces. This is in part due to resource constraints both at Efficiency Canada and in the territories. However, in some cases, it is also a consequence of less standardized reporting practices in the territories, or to our lack of contacts with access to the information needed to calculate our metrics. Additionally, the smaller populations, colder climates, more decentralized energy and

transportation systems, and varying governance arrangements can produce metric results quite different than those observed in the provinces, leading to concerns about the comparability between the territories and the provinces.

Nevertheless, for the first time we were able to include Yukon in the Scorecard benchmarking alongside provinces due to additional data collection work. Yukon led natural gas and non-regulated fuels savings metric as well as program spending and showed strong support for building retrofits through pilots and financing programs. Note that some data limitations still exist. For example, we used Canadian Urban Transit Association (CUTA) data to track public transit funding, ridership, and fleet electrification. CUTA reports territorial data only as a cumulative total rather than per respective territory. We also lack information for the Grid Modernization topic in the Enabling Policies section. Please see the provincial/territorial highlights section or read through the main body of the Scorecard for greater detail on energy efficiency in Yukon.

Northwest Territories and Nunavut are not included in our 2022 Scorecard benchmarking. Instead, we discuss energy efficiency in these territories separately below. Where quantitative analysis was possible for Northwest Territories, we compare the territory's performance against the Canadian average and/or the performance of other provinces/territories. Please note that significant information gaps and limitations remain and that readers should consider these comparisons for illustrative purposes only. Quantitative analysis is not possible for Nunavut due to the limitations associated with data availability. Instead, we offer a qualitative discussion.

Northwest Territories

The Arctic Energy Alliance (AEA) reported electricity, and natural gas and non-regulated fuel program savings in its 2021-2022 annual report.[5] Savings are not evaluated by an independent third party. Electricity savings results were assumed to be gross savings and as such we applied our standard net-to-gross ratios as used for the provinces. Electricity sales data were collected from Northwest Territories Power Corporation's 2020-2021 NTPC Annual Report of Finances.[6] As electricity sales are based on the previous year's sales figures, we assumed a 1%

[5] Arctic Energy Alliance, "2021/2022 Annual Report" (Northwest Territories: Arctic Energy Alliance, 2022), https://aea.nt.ca/about/annual-reports/.

[6] Northwest Territories Power Corporation, "Northwest Territories Power Corporation Annual Report of Finances 2020-21," n.d., 2020–21,

load growth rate for 2021. Based on these data, the territory saved 0.54% of annual domestic sales in 2021. This is similar to the Canadian average of 0.53%. As per the AEA's annual report, the Energy Efficiency Incentive Program achieved the highest total electricity savings out of all energy efficiency programs in the territory in 2021.

To calculate the natural gas and non-regulated fuel savings metric, we use Statistics Canada's end-use demand figures for natural gas plant liquids and refined petroleum products in the residential, public administration, commercial and other institutional, and industrial (minus oil and gas) sectors.[7] The Northwest Territories achieved 0.18% natural gas and non-regulated fuel savings, which would rank the territory second to last place in our benchmarking. The territory's Energy Efficiency Incentive Program is reported to have avoided the largest annual amount of fossil fuel consumption at 3,100 GJ.

The Northwest Territories continue to achieve impressive per capita spending on energy efficiency programs and supporting activities, at $87.22 per capita in 2021. This is more than three times the Canadian average and, when compared to the provinces and territories, falls only below Yukon, which spent $128.55 per capita. The AEA reported that COVID-19 continues to affect some energy efficiency programs and participation, however the number of incentives awarded has increased since last year.

We evaluated low-income efficiency program spending based on the Specified Income Home Winterization Program. This program provides homeowners with the supplies, knowledge, and other resources to winterize their homes and save on heating fuel. It also provides LED light bulbs, low-flow shower heads, and faucet aerators to reduce the consumption of electricity and water. The Government of the Northwest Territories Department of Infrastructure and the Government of Canada funded this $330,000 program in 2021. It is based on a community partnership, under which five community organizations partnered with the AEA. Each community partner hired a community liaison worker on a temporary contract to ground the project in the community, raise awareness and capacity around winterization, and support local

https://www.nwtpublicutilitiesboard.ca/sites/nwtpub/files/attachments/2020-21%20NTPC%20Annual%20Report%20of%20Finances.pdf.

[7] Statistics Canada, "Table 25-10-0029-01: Supply and Demand of Primary and Secondary Energy in Terajoules, Annual," Government of Canada, 2020, https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2510002901.

employment. The total value of incentives across the program in 2021 was $42,000: 105 energy efficiency kits were distributed at an average incentive of $400.

The Government of the Northwest Territories and Environment and Climate Change Canada offer funding support for large scale emission reduction projects through the GHG Grant Program. The program accepts government, commercial, and industrial applications annually and will remain open until March 2024. There is no maximum for which an applicant may apply. Eligible projects include building energy retrofits and fuel switching.

The Northwest Territories currently follows the 2015 National Building Code but have not adopted a National Energy Code for Buildings at the territorial level. Rather, action on the latter appears to have been taken at the municipal level in Yellowknife. With the release of the 2020 Model Codes, Yellowknife has again led the territory by immediately adopting Tier 1 of both the NBC and NECB into bylaw. The territory has set an adoption date of March 2024 for the same levels. A similar timeline has been set by most provinces.

The AEA launched the Electric Vehicle Incentive Program in June 2020, which provides support for the purchase of electric vehicles (EV) and Level 2 charging station installation (up to $500). This program is available in four communities that are served by hydroelectricity. The number of rebates provided tripled in 2021, the program's second year. A total of 18 rebates (which supported the purchase of 16 EVs and installation of 10 charging stations) were provided totalling $85,000 with an average rebate value of $4,700. Fifteen of the rebates were awarded within the community of Yellowknife. In Summer 2022, the federal and territorial governments announced plans to install one Level 3 and 72 Level 2 electric vehicle charging stations by 2024.

Nunavut

Under the Nunavut Housing Corporation's Home Renovation Program, participants can receive a forgivable loan to cover the cost of materials, freight, and labour, to a maximum contribution of $65,000, depending on household income, and provided that any amount exceeding $50,000 is used specifically for energy efficient improvements.

Uptake of the Greener Homes program was slowed in Nunavut by the need for energy auditors as there were none in the territory. In response, Arctic Renewables Society trained a cohort of local energy auditors with funding provided in part by the federal government.

Work on the Nunavut Arctic College Student Residence Deep Energy Retrofit demonstration project in Iqaluit was completed in December 2021. Qikiqtaaluk Properties Incorporated partnered with NRCan to demonstrate the feasibility of deep retrofits in Northern Canada. The project aimed to reduce energy consumption by more than 50%. The federal government provided $2.1 million of the $4.44 million required.[8] Measurement and verification of energy savings will seek to confirm projected energy savings.

Inuit-led companies like the Nunavut Nukkiksautiit Corporation have been unable to move forward with community renewable generation projects while the Qulliq Energy Corporation (QEC) has worked to finalize an independent power producer policy that would inform power purchase agreements. On Sept. 6, 2022, QEC announced it has received interim ministerial approval to begin accepting Independent Power Producer technical feasibility study applications from Inuit organizations, Inuit-owned organizations and hamlets. These applications are conditional on cabinet's approval of the utility's amended IPP Policy. At time of writing, the utility is accepting feedback on the latest draft of the IPP policy. Information available online does not indicate whether the final policy submitted to cabinet (which QEC aims to put forward by end of year) will be made public.

Increased data reporting and transparency would support long-term energy efficiency planning and program administration in Nunavut. Program administrators should understand the territorial context and what differences may exist in the way homes are used in the arctic. When seeking to administer a residential energy efficiency program, clear communication of the benefits of energy efficiency and its relevance in the arctic would support larger behavioural change. The territorial government could play an important role in further developing energy efficiency programs and policy, and robust collaboration with Inuit governance would allow for programs to integrate traditional knowledge and meet community values.

[8] Natural Resources Canada, "Nunavut Arctic College Student Residence Deep Energy Retrofit," May 27, 2019, https://www.nrcan.gc.ca/science-and-data/funding-partnerships/funding-opportunities/current-investments/nunavut-arctic-college-student-residence-deep-energy-retrofit/21957.

Energy efficiency programs

Energy efficiency programs secure energy savings through various strategies such as audits, retrofits, training for building tradespeople, "people-centred"[9] or behavioural efficiency strategies, and customized industrial programs. Natural gas and electric utilities, governments and government agencies, and energy efficiency utilities or third parties such as Efficiency Nova Scotia and efficiencyPEI administer these programs.[10]

These entities generally develop and deliver programs under a regulatory framework that recognizes efficiency as an energy-system resource on par with power plants, wind turbines, transmission lines, and similar infrastructure. Efficiency resources, however, often provide energy services at a much lower cost and at lower risk than new sources of supply,[11] and deliver numerous co-benefits such as improved comfort, more income in the local economy, and reduced energy poverty.

For this year's scorecard, we collected information and allocated scores for the following policy areas or metrics:

- **Program savings** (eighteen points total)
    - Net annual incremental savings from electricity efficiency programs (nine points)
    - Net annual incremental savings from natural gas and/or non-regulated fuels efficiency programs (six points)

[9] Karen Ehrhardt-Martinez and John A. Laitner, "Rebound, Technology and People: Mitigating the Rebound Effect with Energy-Resource Management and People-Centered Initiatives," in *ACEEE Summer Study on Energy Efficiency in Buildings*, 2010, 7–76.

[10] For a discussion of the evolution in program administration, see Brendan Haley et al., "From Utility Demand Side Management to Low-Carbon Transitions: Opportunities and Challenges for Energy Efficiency Governance in a New Era," *Energy Research & Social Science* 59 (January 2020).

[11] Ron Binz et al., "Practicing Risk-Aware Electricity Regulation" (CERES & Regulatory Assistance Project, 2014), https://www.ceres.org/resources/reports/practicing-risk-aware-electricity-regulation-2014-update?report=view; Annie Gilleo, "New Data, Same Results – Saving Energy Is Still Cheaper than Making Energy," American Council for an Energy Efficient Economy, December 1, 2017, https://www.aceee.org/blog/2017/12/new-data-same-results-saving-energy.

    - Electricity capacity savings (three points)

- **Program spending** (ten points total)
    - Efficiency program portfolio spending per capita, all fuels (ten points)
- **Supporting equity and inclusion** (four and a half points total)
    - Low-income program spending (two points)
    - Indigenous program spending (two points)
    - Compensation for public interest intervenors (a half point)

- **Efficiency resource planning** (seven and a half points total)
    - Long-term energy efficiency resource policies (one point)
    - Electricity savings targets (two and a half points)
    - Natural gas/non-regulated fuels savings targets (two points)
    - Fuel switching programs and policy (two points)

We weigh electricity more heavily than natural gas/non-regulated fuel (NRF) savings because these programs typically have greater energy savings potential (following ACEEE methodology).[12]

However, compared to the U.S. scorecard, we place relatively greater weight on natural gas and NRF savings compared to electricity because Canadian provinces with lower-carbon electricity systems may choose to prioritize fossil fuel savings or fuel switching/strategic electrification to meet climate goals.

[12] U.S. figures show electricity programs typically achieve three times the primary energy savings of natural gas programs. Weston Berg et al., "The 2020 State Energy Efficiency Scorecard" (Washington, DC: American Council for an Energy-Efficient Economy (ACEEE), December 2020).

Table 7. Energy efficiency programs scoring summary					
Province/territory	Program savings (18 points)	Program spending (10 points)	Equity and inclusion (4.5 points)	Resource planning (7.5 points)	Score (40 points)
NS	7.25	6.5	4.25	3	21
PE	5.75	8.5	2.5	2.75	19.5
YT	5	10	2.25	1	18.25
BC	4.75	5	1.75	3	14.5
QC	4.5	4	0.25	3.5	12.25
MB	5	2.5	0.5	3.25	11.25
ON	5.75	2	1	1.5	10.25
NB	3.25	3.5	1	2	9.75
NL	2.75	1	0.5	2.5	6.75
AB	2	0	0	0	2
SK	1.25	0	0	0	1.25

Canada-wide savings and spending

In our previous Scorecard, we found a declining trend in national energy savings, which had peaked in 2017. Data for the 2021 program year suggests this trend has been reversed – net annual incremental energy savings rebounded 30.5% over 2020 levels, hitting a total of 18.7 petajoules (see Figure 4 below). The largest jump was seen in electricity savings, which increased by just over 3 petajoules, or 48% over 2020 levels. Natural gas savings also increased by approximately 1.3 petajoules, or 19%. As was the case last year, electricity savings in Ontario are the principal reason for the reversal, though savings also jumped substantially in Alberta. Energy efficiency program spending (Figure 5), on the other hand, remained at levels roughly equivalent to those in 2020, and still below the peak in 2018.

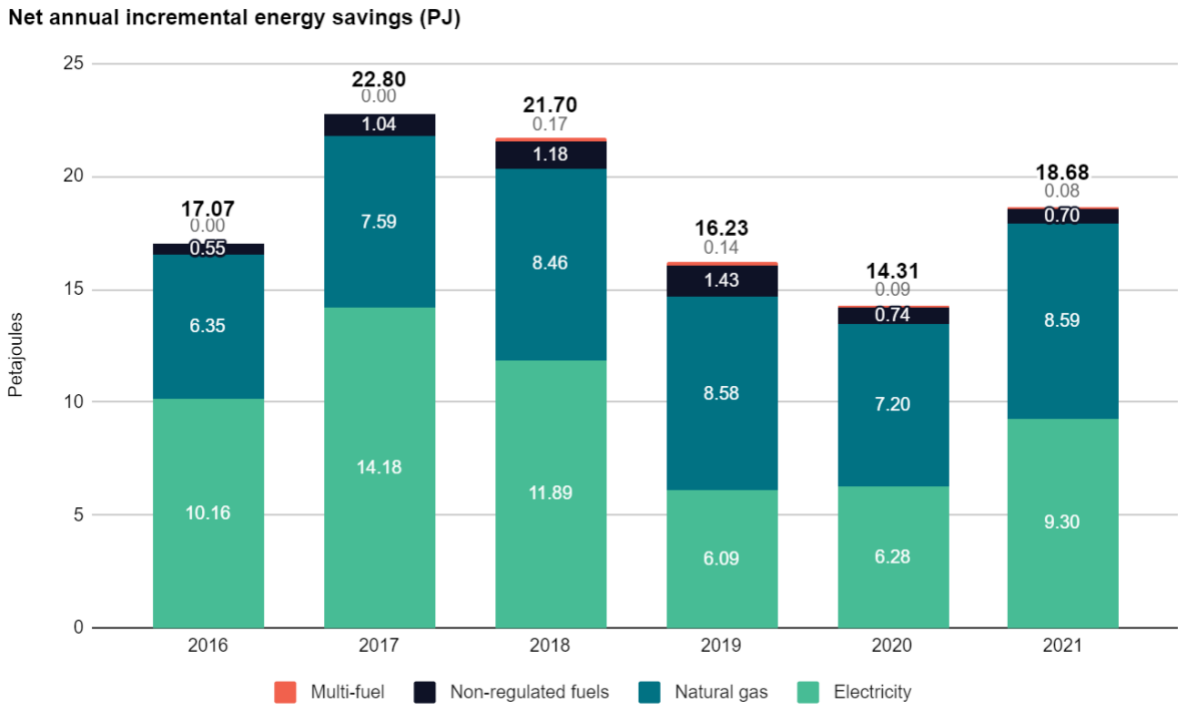

Figure 4. Net annual incremental energy savings (PJ), 2017-2021

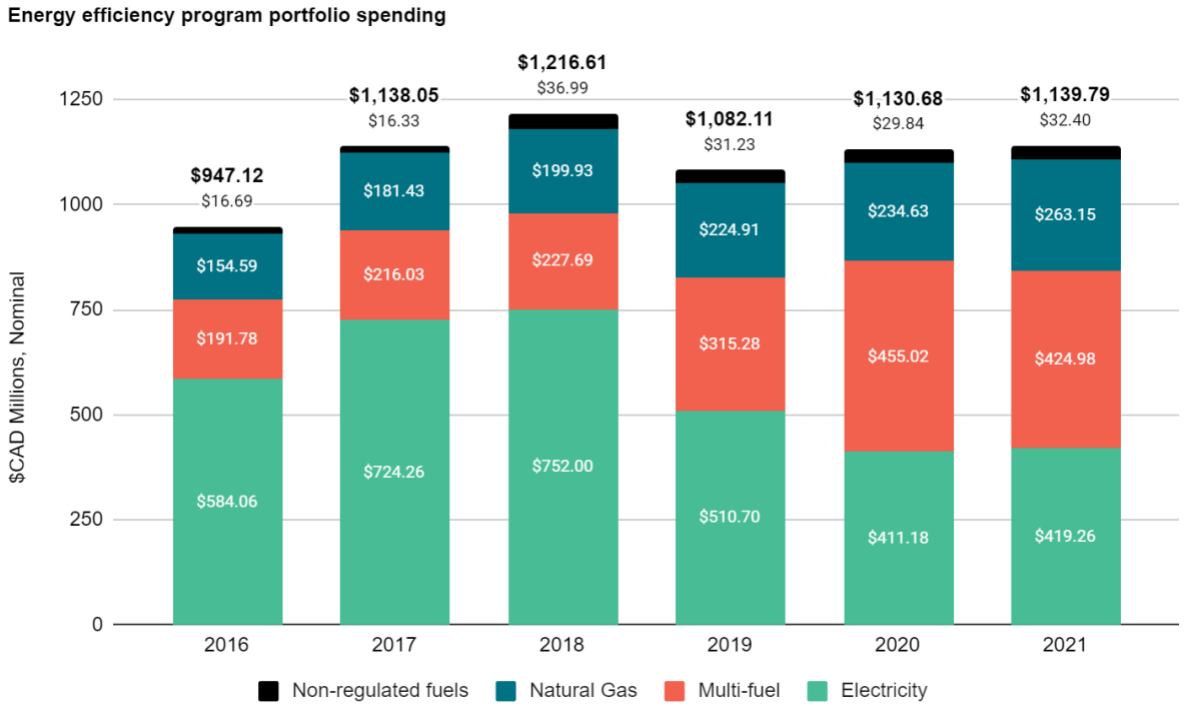

Figure 5. Energy efficiency program spending ($CAD Millions), 2017-2021

Program savings

Our Scorecard tracks net incremental energy savings from electricity, natural gas and non-regulated fuels (e.g., propane, heating oil, wood), and electricity capacity savings programs across Canada.

Incremental savings are those realized in the year a program was run and exclude cumulative savings from measures undertaken or installed in previous years. "Net" savings refer to those directly attributable to program activities, including "spillovers" that can occur when program activities promote greater participation, and exclude savings from free riders or weather.[13]

The savings presented below exclude savings from related activities, which include codes and standards, rate design, distributed generation or load displacement, innovation and research and development, transportation fuel savings programs, and demand response. For electricity savings reported at the generation level, we adjusted figures using the average line loss factor provided by respondents to convert savings to the meter level. In instances where respondents only reported gross savings, we adjusted figures using Canadian average net-to-gross ratios of 87.2% for electricity, 82.8% for natural gas, and 80.2% for non-regulated fuels savings (based on estimates from data received from respondents).[14] We provide further details on scoring methodology in the subsections below.

Electricity efficiency programs

We scored net annual incremental electricity savings at the meter level as a percentage of domestic electricity sales on an eight-point scale, with savings exceeding 2.5% as the top threshold. Canadian jurisdictions that reach this level of energy savings will capture significant economic benefits, according to a 2018 economic impact study produced for Clean Energy

[13] Free riders are energy efficiency program participants who would have taken energy saving actions on their own without inducement from the program. Spillover refers to additional energy savings that occur because a program participant implements additional measures beyond those targeted by the program, or due to non-participants engaging in energy savings activities because of the program's influence.

[14] We calculated NTG values using net and gross figures provided by the following respondents between 2016 and 2019. Electricity: Efficiency Nova Scotia, IESO, Newfoundland Power, Newfoundland and Labrador Hydro, and Energy Efficiency Alberta. Natural gas: Énergir, SaskEnergy, and Energy Efficiency Alberta. Non-regulated fuels: Energy Efficiency Alberta. We excluded Enbridge-provided net and gross values from the natural gas calculation as outliers (averaging 43.9% between 2016 and 2018).

Canada and Efficiency Canada.[15] In past years, leading U.S. states have met or exceeded this top threshold, and discussions of aggressive electricity savings suggest a target of 3% a year.[16] We awarded provinces an additional point if an independent third-party has evaluated their net savings figures, and half points if only some of the claimed energy savings were evaluated by a third party.

[15] Dunsky Energy Consulting, "The Economic Impact of Improved Energy Efficiency in Canada: Employment and Other Economic Outcomes from the Pan-Canadian Framework's Energy Efficiency Measures" (Vancouver, BC: Clean Energy Canada and Efficiency Canada, April 3, 2018).

[16] C Neme and J Grevatt, "The Next Quantum Leap in Efficiency: 30 Percent Electric Savings in Ten Years" (Montpelier, VT: Regulatory Assistance Project, 2016).

Table 8. Electricity savings scoring methodology		
Savings as a % of domestic sales (>=)	Score	Evaluated by a third party
2.50%	8	
2.34%	7.5	
2.19%	7	
2.03%	6.5	
1.88%	6	
1.72%	5.5	
1.56%	5	
1.41%	4.5	
1.25%	4	+1
1.09%	3.5	
0.94%	3	
0.78%	2.5	
0.63%	2	
0.47%	1.5	
0.31%	1	
0.16%	0.5	

Table 9. Net incremental electricity savings (2021)

Province	Savings (GWh)	Domestic end-use sales (GWh)	Savings % of domestic sales	*2020-2021 % Points change*	Third-party evaluation (1 point)	Score (8 + 1pts)
NS	100.8	10,196.00	0.98%	*0.12%*	Yes	4
PE*~	12.8	1,473.30	0.86%	*0.11%*	Yes	3.5
ON	972.8	129,137.57	0.75%	*0.48%*	Yes	3
BC	281.1	56,912.00	0.49%	*-0.02%*	Yes	2.5
MB	94.5	22,573.00	0.42%	*0.17%*	Yes	2
NL	28.4	9,203.60	0.31%	*-0.06%*	Yes	2
AB~	245.5	41,674.45	0.59%	*0.49%*	No	1.5
QC	809.3	175,229.00	0.46%	*-0.02%*	Partially	1.5
NB	38.5	13,274.00	0.29%	*-0.18%*	Yes	1.5
YT*	0.6	454.50	0.14%	*0.04%*	No	0
SK	0	23,300.10	0.00%	*0.00%*	N/A	0
Total	2,584.26	483,427.52	0.53%	*0.17%*	-	-

** 2021 sales figures with 1% load growth assumed; PE sales are an estimate based on recorded MECL sales as 90% of provincial total*

~ Some gross savings converted to net savings using estimate of 0.872 NTG

We derived savings and sales data from program administrator annual reporting and/or utility regulatory documents, as well as through our information requests to utilities and program administrators. Figures do not include data from smaller utilities. Values for previous years savings are updated with revised values from our information requests, if provided. We provide a list of program administrators/utilities reporting savings and sales in Appendix A, and savings data in GWh per program administrator in Appendix C.

Net incremental electricity savings from provincial programs in 2021 remained roughly equivalent to levels in 2020. Both Ontario and Alberta saw relatively large increases in savings as a percentage of domestic electricity sales, though whether this trend continues remains to be seen. The IESO began the first year of its new 2021-2024 Conservation and Demand Management framework, yet most of the reported savings in Ontario are from projects originally committed to under previous conservation frameworks. In Alberta, most savings came from a new program from business administered by Emissions Reduction Alberta, though it has nearly exhausted its initial $55 million in funding.[17]

Natural gas and/or non-regulated fuels efficiency programs

This Scorecard combines program savings from natural gas and non-regulated fuels (NRFs) such as heating oil, propane, diesel, and wood into a single metric. Atlantic provinces use very little natural gas in buildings, and as such do not typically operate programs targeting natural gas savings (the exception being New Brunswick). Conversely, other Canadian provinces use proportionally much fewer NRFs than the Atlantic provinces. Combining natural gas and non-regulated fuels into a single metric allows us to compare provinces with different contexts.

This metric is calculated by combining natural gas and non-regulated fuels annual incremental savings by province (in Terajoules), and dividing them by distribution deliveries of natural gas (residential, commercial/institutional, and industrial) and end-use demand for select non-regulated fuels (diesel fuel oil, natural gas liquids, light fuel oil, and wood/wood pellets) in the residential, commercial, public administration, and industrial-manufacturing end-use sectors.[18] The savings figures provided below include any savings from fuel switching toward lower carbon fuels.

Savings rates are scored on a five-point scale, using 1.75% savings over sales as the top threshold. A 2018 Canadian economic impact study, produced for Clean Energy Canada and Efficiency Canada, modelled this level of savings in its “aggressive” efficiency scenario.[19]

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[17] https://www.eralberta.ca/energy-savings-for-business/

[18] End-use energy data excludes non-energy uses, and is obtained from the following Statistics Canada tables: Statistics Canada, “Table 25-10-0059-01: Canadian Monthly Natural Gas Distribution, Canada and Provinces,” Government of Canada, 2019, https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2510005901.

[19] Dunsky Energy Consulting, “The Economic Impact of Improved Energy Efficiency in Canada: Employment and Other Economic Outcomes from the Pan-Canadian Framework’s Energy Efficiency Measures.”

Provinces receive up to one additional point if a third party evaluates the reported savings or adds another layer of oversight in addition to internal or third-party evaluation.

Table 10. Natural gas and non-regulated fuel savings scoring methodology

Savings as a % of domestic sales (>=)	Score	Evaluated by a third party
1.75	5	
1.58	4.5	
1.4	4	
1.23	3.5	
1.05	3	+1
0.88	2.5	
0.7	2	
0.53	1.5	
0.35	1	
0.18	0.5	

Table 11. Net incremental natural gas and non-regulated fuel savings (2021)						
Province	Natural gas + NRF savings (TJ)	End-use demand (2020) (TJ)	% of Demand	*% Points change*	Third-party evaluation (1 pt)	Score (5 + 1 points)
YT*	21.0	609	3.33%	*-1.17%*	No	5
QC*	3,037.33	407,253	0.74%	*-0.06%*	Partially	2.5
PE*	47.32	7,861	0.60%	*-0.26%*	No	1.5
NS	218.55	46,539	0.47%	*0.05%*	Yes	2
BC	1,154.22	268,418	0.43%	*0.22%*	Yes	2
MB	372.65	87,963	0.42%	*0.22%*	Yes	2
ON~	3,584.91	1,144,207	0.31%	*-0.03%*	Yes	1.5
NB	81.5	27,214	0.30%	*-0.12%*	Yes	1.5
AB*	826.90	372,300	0.22%	*0.17%*	No	0.5
SK	31.3	83,741	0.04%	*0.01%*	Yes	1
NL		24,453	0.00%	*0.00%*		
Total	9,375.68	2,470,559	0.38%	*0.02%*		

** Net savings for some respondents estimated using 0.828 and 0.802 net-to-gross ratios for natural gas and non-regulated fuels, respectively*

~ We note that Ontario natural gas programs have a low net-to-gross ratio compared to other jurisdictions. Gross savings were 0.81% of natural gas distribution deliveries in 2021.

We derived savings data from information requests to utilities and program administrators, and supplemented or verified the data via annual reports, utility regulatory documents, or other documents, and may not reflect true provincial totals (e.g., some smaller utilities are not included).

Values for previous years savings are updated with revised values from our information requests, if provided. A list of program administrators/utilities reporting savings is provided in Appendix A. We report savings data in gigajoules per program administrator in Appendix C.

We note that, though natural gas savings figures were reported to us for the CleanBC Industry Fund in 2021, we chose not to include these data in the table above. This was done because we could not ascertain whether the projects funded in 2021 were completed in 2021 or if each project included an energy efficiency improvement, and thus we were uncertain of their comparability with program savings in other provinces. However, the scale of reductions in natural gas consumption associated with these projects is significant – taking the reported total as gross savings, British Columbia would have easily placed first on this metric, saving 4.56% of provincial natural gas and non-regulated fuel demand.

Electricity capacity savings

Whereas energy savings are the reduction in the actual amount of energy consumed by a measure over a given period (and thus measured by energy content, e.g., megawatt hours), capacity savings are a reduction in the maximum (peak) demand for energy at a specific time (and thus measured in megawatts).

Energy efficiency programs deliver both energy and capacity savings. Like energy savings, capacity savings help reduce system costs and avoid outages and may enable utilities to defer or avoid investment in new supply or distribution infrastructure. Utilities can also operate demand response programs to deliver additional capacity savings, though these may not lead to any reduction in energy consumption.

For this year's Scorecard, we asked respondents to delineate electricity capacity savings from efficiency and demand response programs, and to provide the annual peak demand. In its 2020 edition of the Utility Scorecard, ACEEE scores utilities on peak demand reductions as a percentage of total peak demand from energy efficiency programs only, using a scale with a top threshold of 2%. It pegged the U.S. average at 0.81%.[20]

We scored this component with the same savings threshold as ACEEE for capacity savings from energy efficiency programs, but also award points for savings from demand response and similar capacity-focused initiatives, in recognition of its importance in managing grid constraints. These grid constraints are particularly relevant in the Canadian context. Some systems anticipate, or are experiencing, capacity constraints even though they experience bulk

[20] Grace Relf et al., "2020 Utility Energy Efficiency Scorecard" (Washington, D.C.: American Council for an Energy Efficiency Economy, 2020).

energy surpluses. Some regions are also aggressively deploying electric heat pumps, which can create peak power demands that demand side strategies can manage.

We give preference to capacity savings from energy efficiency programs in our scoring methodology because these programs deliver both energy and capacity benefits, as well as customer benefits. In addition, utilities do not face potential throughput disincentives from demand response, while they could face disincentives from strategies that reduce peak demands through targeted energy efficiency. This is the rationale for ACEEE's only scoring on energy efficiency program savings in its utility scorecard.

The scoring methodology is explained in the following table.

Table 12. Capacity savings scoring methodology

Efficiency programs		Related activities	
Capacity savings/peak demand (>=)	Score (energy efficiency)	Capacity savings/peak demand (>=)	Score (demand response & related activities)
2.00%	2	7%	1
1.75%	1.75		
1.50%	1.5	5%	0.75
1.25%	1.25		
1.00%	1	3%	0.5
0.75%	0.75		
0.50%	0.5	1%	0.25
0.25%	0.25		

Table 13. Capacity savings			
Province/territory	Capacity savings as a % of peak demand		Score (3 points)
	Efficiency programs	Demand response & related activities	
NS	1.40%	-	1.25
ON	0.49%	7.52%	1.25
MB	0.70%	4.34%	1.00
NL*	0.86%	0.91%	0.75
PE	0.87%	-	0.75
QC	0.23%	4.57%	0.5
BC*	0.38%	0.13%	0.25
NB	0.28%	0.14%	0.25
SK	-	1.81%	0.25
AB	-	0.05%	0
YT	-	-	0

** For jurisdictions with two or more electricity utilities reporting capacity savings, we score only on the utility with higher savings (Newfoundland Power, and BC Hydro)*

Program spending

The Scorecard tracks program spending, as well as savings. While spending coincides with savings, the addition of a spending indicator picks up on several other factors. For instance, jurisdictions with higher spending could be going after more expensive and difficult to reach energy savings. Program administrators could be engaging in activities like codes and standards advocacy, market transformation, and innovation (termed “enabling/supporting” below) that are not recorded in energy savings figures. Jurisdictions might also have different evaluation protocols that result in different savings figures, and thus tracking spending helps control for those differences.

We evaluate this metric on a 10-point scale, based on provincial program spending per capita across all fuels.[21] The top threshold is $100, based on observed U.S. and Canadian top performance, decreasing by a half point for every $5 reduction (e.g., $95 = 9.5 points; $90 = 9 points). In previous years, we scored program spending both by spending per capita and spending per end-use energy demand to control for any potential bias that could be introduced by either measure. However, the differences between these two indicators are minor and per capita spending is the most intuitive. Thus, we score only on per capita spending.

Table 14. Spending on efficiency programs and enabling/supporting activities, per capita

Province	Efficiency programs ($M)	Enabling/supporting ($M)	Total spending ($M)	Year-over-year change	Total spending per capita	Score (10 points)
YT	$4.51	$1.03	$5.54	-$2.90	$128.55	10
PE	$13.97	$0.18	$14.15	-$1.33	$85.27	8.5
NS	$65.40	$3.10	$68.50	$14.58	$68.58	6.5
BC	$214.41	$53.78	$268.19	$66.06	$51.09	5
QC	$314.54	$34.71	$349.25	-$26.97	$40.46	4
NB	$26.84	$2.97	$29.81	$8.91	$37.53	3.5
MB	$31.27	$7.90	$39.17	$13.43	$28.25	2.5
ON	$328.74	$3.88	$332.62	-$38.26	$22.30	2
NL	$6.31	$1.00	$7.31	-$3.15	$14.01	1
SK	$4.03	$1.44	$5.47	-$2.22	$4.63	0
AB	$13.53	$1.74	$15.27	-$23.23	$3.42	0
Total	$1,023.55	$111.72	$1,135.28	$4.91	$29.60	-

[21] Statistics Canada, “Table 17-10-0009-01: Population Estimates, Quarterly,” Government of Canada, 2020, https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000901.

Spending on energy efficiency programs and enabling and supporting activities did not change substantially since 2020, increasing only $4.91 million, or approximately 0.5%. This is despite significant growth in spending in British Columbia, from all three program administrators (FortisBC/FortisBC Energy, BC Hydro, and the provincial government CleanBC programs). This was offset by drops in spending in Alberta (mainly provincial government programs), Ontario (mostly on the electricity side), and Quebec (provincial government programs).

Equity and inclusion

Improving energy efficiency provides many more benefits than reducing the costs of energy systems — it improves living standards and comfort and, by extension, physical and mental health. Efficiency also reduces customer bills and pollutants associated with energy use, which provides indoor and outdoor environmental benefits. All these benefits — reduced consumer costs, coupled with improvements in health, thermal comfort, and well-being — are particularly beneficial to people from traditionally marginalized communities due to low income or settler colonial policies that negatively impact Indigenous Peoples.

Unfortunately, not all communities are able to enjoy these benefits equally. Barriers such as the upfront cost of the improvements, split incentives (e.g., between a building owner and its tenant), skepticism of governments or utilities that administer efficiency programs, and accessibility (in cases of remote communities, or where language barriers exist) may push energy efficiency improvements out of reach in some communities. While programs targeting traditionally underserved and hard-to-reach customers yield larger benefits, realizing them is often more capital-intensive and requires different outreach and engagement strategies. However, governments and energy efficiency program administrators across Canada must ensure that all may equally and inclusively share in the benefits that energy efficiency can provide.

Governments and program administrators need to invest extra effort and ingenuity to break down barriers to equity and inclusion. Actions could include:

- Legislating or requiring that efficiency programs target hard to reach or traditionally underserved communities, like low-income and Indigenous peoples.

- Including provisions in cost-effectiveness testing to allow for lower program-screening thresholds, inclusion of low-income program specific non-energy benefits, or exclusion from cost-effectiveness requirements and/or
- Establishing long-term funding stability for these programs.

In our Scorecard and online policy database, we track such policies and program spending for two communities: Canadians experiencing energy poverty, and Indigenous peoples and communities.

Low-income program spending

Energy poverty exists when high energy bills lead to inadequate energy services and social exclusion, preventing some households from gaining access to other necessities of life.[22] Our understanding of energy poverty is expanding, especially as we consider how to ensure all households can move toward net zero emission standards, and that households that might not pay an energy bill still experience inadequate energy services and vulnerabilities to negative health, extreme heat and extreme cold.

Previous scorecards benchmarked provincial spending on low-income energy efficiency programs against households in energy poverty, using a threshold based on households spending over 6% of household income on energy costs. This cutoff was determined by calculating twice the national median percentage expenditure on energy costs, at the time.[23] We previously used data from the 2016 census to benchmark program spending against total households in energy poverty.

In the 2022 Scorecard we have chosen to benchmark spending data against population data of individuals below the low-income measure (before tax) thresholds from the 2020 census.[24] The

[22] B. Boardman, *Fuel Poverty: From Cold Homes to Affordable Warmth* (London: Bellhaven Press, 1991), https://www.energypoverty.eu/publication/fuel-poverty-cold-homes-affordable-warmth.

[23] Maryam Rezaei, "Power to the People : Thinking (and Rethinking) Energy Poverty in British Columbia, Canada" (University of British Columbia, 2017), https://doi.org/10.14288/1.0351974.

[24] Statistics Canada, "Table 98-10-0102-01 Low-Income Status by Age, Gender and Year: Canada, Provinces and Territories, Census Metropolitan Areas and Census Agglomerations with Parts," July 13, 2022, https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=9810010201.

primary reason is due to availability of more up-to-date data from the new census, given that the energy poverty figures we could access this year are now six years old.

We wish to emphasize that the primary objective of energy efficiency programs should be to eliminate low-income barriers to accessing energy efficiency, and many of these barriers exist beyond Canadian low-income thresholds, which is why several programs define eligibility above typical low-income cutoffs.[25] The low-income measure presents a relatively expansive definition of low-income, comparable across jurisdictions, representing Canadians most in need. Programs might have eligibility requirements above this level because they recognize low-income barriers relevant for low-to-moderate income Canadians in their jurisdiction.

Table 15. Low-income efficiency program spending scoring methodology

Spending per individual (LIM-BT)	Score
$80	2
$70	1.75
$60	1.5
$50	1.25
$40	1
$30	0.75
$20	0.5
$10	0.25

Given that this denominator represents individuals, while our previous energy poverty data was households, the new metrics will be lower due to a larger denominator. Previously, our top threshold for low-income program spending was $125 per household, and in our portfolio program spending metric we use $100 per capita as the benchmark (though this includes spending on commercial and industrial programs). Data received for this Scorecard indicates that spending on residential programs across provinces and territories accounts for roughly 41% of total program spending, which would suggest a top benchmark of approximately $40 per individual for residential programming. However, given the need for program strategies to often pay full upgrade costs, and the social benefits of prioritizing energy efficiency to low-income households, we have chosen a top benchmark for this metric of $80 per individual. Note that these are not individual person or home upgrade costs. They are total provincial costs divided by total low-income

[25] Abhilash Kantamneni and Brendan Haley, “Efficiency for All: A Review of Provincial/Territorial Low-Income Energy Efficiency Programs with Lessons for Federal Policy in Canada,” March 30, 2022, https://www.efficiencycanada.org/low-income-report/.

population. We awarded a maximum of two points to provinces that exceed this threshold, and scaled points as shown in Table 15.

Results for this metric are shown below. We have included the year-over-year change figure by re-calculating the results from 2020 using the same population data as used for 2021.

Table 16. Low-income efficiency program spending (2021)

Province	Program spending ($ millions)	Spending per individual (LIM-BT)	Annual change in spending per individual	Score (2 points)
PE	$5.91	$232.56	$58.29	2
NS	$16.11	$91.60	$37.07	2
ON	$57.54	$31.43	-$6.94	0.75
NB	$4.20	$30.42	$3.62	0.75
BC	$14.98	$22.50	$4.09	0.5
MB	$3.40	$14.75	$1.00	0.25
NL	$1.03	$10.71	$5.91	0.25
YK	$0.03	$7.82	-	0
SK	$0.47	$2.49	$1.38	0
QC	$1.56	$1.23	-$3.01	0
AB	$0.00	$0.00	-$11.91	0
Total	**$105.23**	**$20.54**	**-$1.99**	

Overall, spending on low-income energy efficiency programs fell by roughly 9%, or about $10 million, from 2020 to 2021. This equates to approximately $2 less spending per low income person across Canada.

In New Brunswick's most recent Climate Plan (released in September 2022) the province seeks to increase support for low-income, Indigenous, and non-electric fuel programs. The plan

includes minimum dedicated annual funding amounts beginning in fiscal 2023-2024. Funding ranges from $10 million in the first year, to $25 million in fiscal 2026-2027 and each subsequent year.

Indigenous communities

Indigenous communities are using energy efficiency to achieve objectives such as greater energy sovereignty, local security, and economic well-being.[26] The Pan-Canadian Framework on Clean Growth and Climate Change (PCF) calls for the federal and provincial governments to work in partnership with Indigenous peoples to improve building standards and energy efficiency through building-renovation programs, in a manner that incorporates traditional knowledge and culture into building designs.[27] A specific focus on fostering Indigenous partnerships within energy efficiency policy strategies can be a pathway towards reconciliation, which is the responsibility of all Canadians.[28]

Energy efficiency portfolios should include a specific focus on working with relevant Indigenous Nations, for a number of reasons. The United Nations Declaration on the Rights of Indigenous peoples outlines the Indigenous right to free, prior, and informed consent for any energy project that impacts Indigenous Nations or their territories, including energy efficiency projects. In addition, policy approaches in support of Indigenous housing have historically proven inadequate and often counterproductive. As of 2016, one in five Indigenous people in Canada lived in a dwelling that was in need of major repairs.[29] Previous government-directed housing

[26] Nicholas Mercer et al., "'That's Our Traditional Way as Indigenous Peoples': Towards a Conceptual Framework for Understanding Community Support of Sustainable Energies in NunatuKavut, Labrador," *Sustainability* 12, no. 15 (January 2020): 6050, https://doi.org/10.3390/su12156050.

[27] Environment and Climate Change Canada, "Pan-Canadian Framework on Clean Growth and Climate Change: Canada's Plan to Address Climate Change and Grow the Economy." (Ottawa: Government of Canada, 2016), http://www.deslibris.ca/ID/10065393.

[28] Truth and Reconciliation Commission of Canada, "Honouring the Truth, Reconciling the Future: Summary of the Final Report of the Truth and Reconciliation Commission of Canada" (Truth and Reconciliation Commission of Canada, 2015), http://www.trc.ca/assets/pdf/Executive_Summary_English_Web.pdf.

[29] Statistics Canada, "Census in Brief: The Housing Conditions of Aboriginal People in Canada" (Ottawa, ON: Government of Canada, October 25, 2017), https://www12.statcan.gc.ca/census-recensement/2016/as-sa/98-200-x/2016021/98-200-x2016021-eng.cfm.

initiatives that did not include meaningful partnerships with Indigenous Peoples, failed to build housing that fit local community needs for operational affordability and up-keep, taking into account local climatic and demographic contexts.[30]

Our Scorecard tracks Indigenous-specific energy efficiency programs. These programs can build relationships with specific Nations and/or outreach to urban communities through organizations such as Friendship Centres. As with programs to combat energy poverty, we asked respondents to indicate whether legislative or regulatory requirements existed to develop programming in partnership with Indigenous peoples, whether provisions in cost-effectiveness testing procedures exist to remove regulatory barriers, and whether a stable, long-term funding arrangement exists to support these initiatives.

We also track spending on these programs as a performance indicator to evaluate the emphasis provincial-level energy efficiency program portfolios place on improving energy efficiency in Indigenous communities. To benchmark spending across provinces, we divide total spending reported in our information request by the number of individuals in each province reporting "Indigenous identity" in the 2020 census.[31] We awarded points based on the scale in Table 17.

Previous scorecards used $33 per Indigenous individual as the top benchmark, based on similar reasoning used to explain our revised approach for spending on low-income programming above. We noted that this was a somewhat conservative threshold for spending on Indigenous programs—in a program area likely to be heavily weighted toward homes. This year, to align with our approach on low-income spending, we are revising the top threshold to $40 per individual, which corresponds with a reasonable expectation for general residential programming. We note that this is a spending metric for the entire provincial Indigenous population, not a spending amount per program participant and thus, it is not a measure of the comprehensiveness of energy retrofits.

[30] Katie Hyslop, "BC First Nation Gets Active about Passive Housing," The Tyee (The Tyee, January 9, 2017), https://thetyee.ca/News/2017/01/09/First-Nation-Active-Passive-Housing/.

[31] Statistics Canada, "Indigenous Identity by Registered or Treaty Indian Status and Residence by Indigenous Geography: Canada, Provinces and Territories," Government of Canada, September 21, 2022, https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=9810026401. We note that some Indigenous individuals and Nations do not participate in the census for reasons such as not identifying as Canadian or seeing little benefit from providing the information.

Some important caveats: This metric only provides a partial view of Indigenous energy efficiency initiatives in Canada, as it only assesses provincial and/or program administrator spending. For instance, this approach would not capture Indigenous-led projects taking place without partnerships with provincial government agencies or program administrators.[32] We are also not capturing all energy efficiency upgrades supported by the federal government that do not involve a provincial-level government or utility partner. Furthermore, some program administrators note that Indigenous people may also benefit from income targeted programming. The kinds of programs assessed in this metric are those that are specifically for Indigenous peoples or communities, which we suggest is a best practice to ensure programs partner with Indigenous Nations and help meet community needs and aspirations.

Table 17. Efficiency program spending – Indigenous peoples/communities, scoring methodology

Spending per individual (>=)	Score
$40.00	2
$35.00	1.75
$30.00	1.5
$25.00	1.25
$20.00	1
$15.00	0.75
$10.00	0.5
$5.00	0.25

[32] Indigenous Clean Energy, “Accelerating Transition: Economic Impacts of Indigenous Leadership in Catalyzing the Transition to a Clean Energy Future across Canada,” June 2020.

Table 18. Indigenous peoples efficiency program spending (2020)				
Province	Indigenous program spending ($ millions)	Indigenous program spending per individual with Aboriginal identity	*Annual change in program spending ($ millions)*	Score (2 points)
YT	$0.70	$79.46	-	2
NS	$2.55	$48.64	$25.53	2
BC	$5.97	$20.57	$11.18	1
PE	$0.04	$13.00	$5.70	0.5
NB	$0.32	$9.61	$7.91	0.25
ON	$1.94	$4.77	-$4.77	0
MB	$0.48	$2.02	$1.03	0
SK	$0.10	$0.53	$0.22	0
QC	$0.06	$0.29	$0.29	0
AB	-	$0.00	$0.00	0
NL	-	$0.00	-$0.66	0
Total	**$8.01**	**$4.51**	**-$0.07**	

Table 19. Summary of energy efficiency programming/initiatives for Indigenous communities			
Province/territory	Legislative/ regulatory requirements	Dedicated long-term funding	Description of program(s) and initiatives
AB	No	No	N/A
BC	No	Yes	BC Hydro & FortisBC - Indigenous Communities Conservation Program (ICCP), includes salary support and training for energy champion positions; support for planning and policy development to assist communities to advance their energy and climate change goals as well as funding for community-led residential retrofit projects to support in-house energy management expertise for a number of Indigenous communities, Nation Alliances, and organizations that serve Indigenous communities (i.e., Aboriginal Housing Management Association). Included in BC Hydro's DSM as a dedicated program, for both integrated and non-integrated areas. Expenditures are approved in regulatory proceedings using 40% TRC adder - the same as low-income programming. Additional enhanced rebates and support are available through FortisBC for heating equipment maintenance, new home construction, community-building upgrades, and others. The province has a First Nations Clean Energy Fund (not exclusively energy efficiency); CleanBC Communities Fund (not only First Nations); CleanBC Indigenous Community Energy Coach Program & Heat Pump Incentive; and Indigenous Clean Energy Initiative (includes energy efficiency projects)
MB	Yes	Yes	Regulation directs that, if practical, at least 5% of budget for DSM is allocated to low-income or hard-to-reach customers, which includes Indigenous populations. The current three-year plan dedicates 6% of electricity funding and 30% of natural gas funding for these customer segments.

			Efficiency Manitoba created an Indigenous Energy Efficiency Working Group to work with First Nations communities, tribal councils, and the Manitoba Métis Foundation. The group provides feedback to assist in the design, delivery and implementation of Efficiency Manitoba's indigenous programming. Programs include First Nation Insulation and Direct Install program; Indigenous Small Business Program; Indigenous Community Energy Efficiency program; Métis Energy Efficiency Offers. Many programs aim to hire within local communities. The Indigenous Community Energy Efficiency Program offers financial and technical support for communities to hire and train an Energy Efficiency Advocate to facilitate participation in Efficiency Manitoba's energy efficiency programs. The program provides two years of funding to eligible communities to hire a Community Energy Efficiency Advocate who is expected to work a minimum of 30 hours a week. Funding is $40,000 a year for the duration of the two-year program. The Advocate is employed by the community and is expected to work closely with Efficiency Manitoba staff to understand and improve energy efficiency actions in the community.
NB	No	No	Some programs funded by the Low-Carbon Economy Fund provide higher incentives for Indigenous peoples. NB Power works with Indigenous communities to facilitate program participation, efficiency learning, and skills and capacity. The First Nations Affairs team at NB Power provides a central point of contact and consultation with First Nation inquiries, though not strictly for efficiency-related matters Recent legislative amendments to the Electricity Act will establish an Energy Efficiency Fund that, among other things, funds First Nations Programs. It will have an annual minimum amount of funding provided. Additional funding may be requested through the Climate Change Fund.
NL	No	No	NL Hydro has no dedicated program. The Isolated Communities Energy Efficiency program serves remote diesel-system communities which includes Indigenous communities in

			Labrador. The program provides residential and commercial direct installation with a focus on community knowledge and capacity building and hiring and training local representatives.
NS	No	Yes	Efficiency Nova Scotia administers the Mi'kmaw Home Energy Efficiency Project (MHEEP) (launched in 2018). This program is delivered in partnership with each community, works with community-preferred contractors where possible, and has been endorsed by the Assembly of Nova Scotia Mi'kmaw Chiefs. The program is funded through the 2020-2022 DSM plan, with support from the federal government and the province until March 2023. The 2023-2025 DSM Plan includes expansion of services to Mi'kmaw communities.
ON	Yes	Yes	The September 2020 Ministerial Directives set out requirements for on-reserve First Nations programming as a primary objective of the 2021-2024 CDM Framework. In July 2021, the IESO relaunched three programs under the 2021-24 CDM Framework that had been offered under the 2019-2020 Conservation Interim Framework, but which were suspended due to COVID-19 and community closures in 2020. These programs were the First Nations Conservation Program, Conservation on the Coast, and the Remote First Nations Energy Efficiency Pilot Program. In 2021, the latter became a fully-fledged program, and the IESO launched the First Nations Community Building Retrofit Program. The income-eligible Energy Affordability Program also serves grid-connected Indigenous communities. IESO also delivers a suite of energy support programs outside of CDM frameworks to assist Indigenous communities with community energy planning, building community capacity, and/or hiring Community Energy Champions. Enbridge does not offer dedicated Indigenous community programming, though support is included within its income-qualified programs. Enbridge works with band councils on various matters, including permission to deliver energy efficiency programs (specifically, the Home Winterproofing Program), which is delivered by an Indigenous-owned company.
PE	No	No	efficiencyPEI partnered with Abegweit and Lennox Island First Nations to provide free energy audits and retrofit including equipment and envelope upgrades. Additional energy

			efficiency upgrades were available to First Nations Communities through the Home Comfort program.
QC	No	No	There are no dedicated Indigenous community energy efficiency programs offered in Québec.
SK	No	No	In 2021/2022 SaskPower partnered with two Peter Ballantyne Cree Nation communities for the installation of behind-the-meter home energy monitoring kits to increase the understanding of the occupants' energy use and needs. Other initiatives included support hiring Community Power Reps and offering energy conservation and efficiency workshops.
YT	No	Yes	Three programs are funded by a combination of territorial support and the Low Carbon Economy Fund through March 2024 and provide retrofit rebates of up to 75% for Yukon First Nations. The programs include the Good Energy Program; the Community Institutional Energy Efficiency Program which provides financial and technical support to First Nations and municipalities to complete major energy upgrades to community buildings, and the First Nation Energy Efficiency Program which provides support for home retrofits. The Independent Power Production Policy has no end date. The goal of this policy is to support the participation of Independent Power Producers, including Yukon First Nations and communities, in the development and expansion of environmentally sound and affordable electrical supply options now and into the future, while respecting the integrity of the existing electrical system. One of the objectives of the policy is to provide Yukon First Nations with opportunities to participate in the Yukon economy, obtain economic benefits, and develop economic self-reliance.

Compensation for public interest intervenors

Energy efficiency programs are typically strongly influenced by utility regulatory institutions. Most provinces have quasi-judicial utility boards that regulate electricity and/or natural gas utilities, which also approve demand side management plans and oversee energy planning processes (e.g., Integrated Resource Plans) where energy efficiency can be considered as an alternative to supply side resources.

These are political processes with the ability for interested parties to “intervene”. An intervention is a resource intensive process, requiring access to legal representation as well as expert witnesses who present evidence before utility board hearings. Large energy customers and governments are usually well represented, yet public interest and not-for-profit organizations face significant barriers. These environmental, low-income, and customer representatives are often the strongest advocates for energy efficiency programs. To promote fair and balanced democratic proceedings it is a best practice to provide full compensation to public interest, not-for-profit interveners.

This is a new metric in the Scorecard. We asked about the rules and procedures for public interest intervenor compensation and participation in our information request. Any jurisdiction that can award cost to a not-for-profit intervener, without undue barriers, receives 0.25 points. A jurisdiction with a dedicated environmental advocate with guaranteed costs and automatic standing at proceedings similar to the role of a customer or public advocate in some jurisdictions received 0.5 points.

Table 20. Compensation provided to non-profit/public intervenors		
Province/ territory	Description	Score (0.5 points)
BC	Non-profit and public interveners to British Columbia Utilities Commission proceedings may receive financial assistance in accordance with the BCUC Participant Assistance/Cost Award (PACA) Guidelines	0.25
MB	The Manitoba Public Utilities Board (PUB) provides intervener costs funding to eligible participants in proceedings pursuant to section 56 of The Public Utilities Board Act, with the hearing applicant being required to reimburse the PUB for these costs. Interveners must apply for intervenor status in the proceeding. Following the Board's approval of an Intervener Application, the intervenor is required to file a detailed cost estimate. Once the hearing ends, the intervenor applies for a final costs award along with supporting documentation, including detailed invoices. The PUB provides a maximum fee schedule for the proceeding. Further details can be found on the PUB website at http://www.pubmanitoba.ca/v1/about-pub/pubs/int-cost-policy-gra.pdf	0.25
NL	Intervenors are permitted under S.90 of the Public Utilities Act to apply for a recovery of costs incurred during participation in a proceeding, with the utility providing reimbursement. The Public Utilities Board thus has the authority and discretion to award costs in a proceeding before the Board, however the request by the intervenor must demonstrate, among other things, that the intervention occurred in an efficient and meaningful manner and contributed to the Board's understanding of the issues.	0.25
NS	For public intervenors, compensation is provided for reasonable costs incurred. This compensation is provided by the relevant applicant in each case. Historically, non-profit intervenors have at certain times had their costs compensated by the regulator. In Nova Scotia, the public intervenors include the Consumer Advocate and the Small Business Advocate. In certain historical cases, costs of non-profits have been recovered through the applicant, by order of the NSUARB	0.25
ON	Compensation to intervenors for natural gas proceedings is provided through a cost awards process to intervenors deemed eligible for their involvement in a proceeding by the Ontario Energy Board (OEB). When filing cost awards, intervenors are governed by the OEB Practice Direction on cost awards accessible on the OEB website. For consultations, there are typically set activities and maximum hours for which intervenors may make a claim.	0.25

QC	The Régie de l'énergie determines compensation for intervenors for their representation at hearings (http://www.regie-energie.qc.ca/regie/FraisInterv/Regie_GuidePaiementFrais%202020_janvier2020.pdf)	0.25
YT	An intervener to a Board hearing may apply to recover hearing costs according to the rules outlined in the Board's "Scale of Costs". Applications are considered under Section 32 of the Rules of Practice and Section 56 of the Public Utilities Act. Presenters, government agencies, and private firms with a financial interest in the proceeding are not eligible for compensation.	0.25
AB	-	0
NB	Compensation is not provided to non-profit/public intervenors	0
PE	A voluntary Electrical Efficiency and Conservation Advisory Group, consisting of community stakeholders, exists but no compensation for participation in this group is provided.	0
SK	Not applicable	0

Resource planning and targets

Energy efficiency targets give program administrators and energy system managers clear direction. They reinforce the concept of efficiency as a quantifiable energy resource, the potential size of which can be identified in advance (i.e., through resource planning), and then pursued through a portfolio of energy efficiency programs and related activities.

That said, the question of what constitutes a "target" is less straightforward. At a high level, a target is an ambitious objective that pushes program administrators to achieve more energy savings than they might otherwise have captured. In the United States, ACEEE tracks energy efficiency resource standards (EERS), which are described as "quantitative, long-term energy savings target[s] for utilities," wherein "utilities must procure a percentage of their future electricity and natural gas needs using energy efficiency measures, typically equal to a specific percentage of their load or projected load growth."[33] According to ACEEE, states with EERS

[33] American Council for an Energy Efficient Economy (ACEEE), "Energy Efficiency Resource Standards," State and Local Policy Database, 2020, https://database.aceee.org/state/energy-efficiency-resource-standards.

policies achieve on average three to four times the level of savings of those without an EERS.[34] Our review of the most recent relevant state policies suggests that legislators or utility regulators typically establish EERS.

We fairly assume that the presence of a target is likely to lead to more energy savings than its absence. But what if this target, set 'outside' the utility or program administrator, i.e., by government or the utility regulator, amounts to less than what potential studies suggest is possible or traditionally achieved? Alternatively, what if this long-term target, initially considered ambitious, is over time shown to be considerably short of what the true potential for energy savings was when it was made? What happens if program administrators miss their targets (i.e., in what sense are they mandatory)?

Due to the complicated nature of energy efficiency targets, we distinguish between two main types in the 2022 Scorecard. These are:

1. **Long-term energy efficiency resource policies.** Long-term (greater than five years) energy savings targets that are either economywide (not applicable to a specific fuel) or that specify targets for electricity and natural gas/non-regulated fuels, and that are set either in legislation or a utility regulatory board ruling.
2. **Specific savings targets.** Energy savings targets for electricity, natural gas, and/or non-regulated fuels, electrification or fuel neutral targets achieved by programs (i.e., not based on economy-wide energy intensity) that are set by the utility or program administrator and/or negotiated and approved as part of a demand-side management planning process with a planning cycle period of two to five years.

Long-term energy efficiency resource policies

The core objective of an energy savings target is to achieve higher savings than would have otherwise been accomplished in its absence. If legislated or rooted in a concrete and actionable energy/climate change plan, they also communicate political support for energy efficiency. Accordingly, a strong "target" would be a level of savings at the top of the benchmarks set in the

[34] Maggie Molina and Marty Kushler, "Policies Matter: Creating a Foundation for an Energy-Efficient Utility of the Future" (Washington, DC: American Council for an Energy-Efficient Economy (ACEEE), June 9, 2015), https://aceee.org/policies-matter-creating-foundation-energy.

program savings scoring and/or a clear planning rule that clearly maximizes energy efficiency opportunities before considering supply side resources, such as a regulatory requirement to pursue all cost-effective energy efficiency resources. For such a policy, we would award a full point, however our research shows that no such policy yet exists in Canada.

This leaves long-term savings targets set either in legislation, a regulatory planning rule, or in a concrete and actionable energy/climate change plan. Our scoring for target policies such as these is as follows:

- 0.25 points for a planning rule or target in legislation
- 0.25 points more, if the planning rule is long-term (e.g., 5 years or more)
- 0.25 points more, if the rule is long-term with clear performance accountability for savings achievement (i.e., an organization or program administrator is responsible for specific savings or market transformation goals).
- 0.25 points more, if the long-term target clear maximizes all energy efficiency opportunities and drives savings above business-as-usual levels.

This metric is therefore worth up to one point in total.

Table 21. Long-term energy efficiency resource policies		
Province	Description	Score (1 point)
MB	The Efficiency Manitoba Act legislates long term energy efficiency savings targets over 15 years (2020-2035) of minimum net annual electricity savings at least equal to 1.5% of electricity consumption in the immediately preceding year, and minimum net annual natural gas savings equal to 0.75% of natural gas consumption in the immediately preceding year. Any shortfalls and surpluses in annual net savings carry forward over the 15-year period to reach cumulative annual percentage savings equal to 22.5% for electricity and 11.25% for natural gas.	0.75
QC	Government directive 537-2017 directed Transition énergétique Québec to create a plan that improves energy efficiency at least 1% per year, on average, and to reduce consumption of petroleum products by 5%. The resulting TEQ 2018-2023 Master Plan targeted an “economywide” improvement in energy efficiency by about 1.2% per year, on average, and a reduction of petroleum use of 12% in 2023, relative to 2013. In 2022, this plan was extended to 2026. The Master Plan is an important policy tool in the province’s 2030 Energy Plan, which targets energy efficiency improvements of 15% and a reduction in petroleum use of 40% by 2030, from a 2013 base year.	0.5
BC	Under the Utilities Commission Act, British Columbia utilities are required to consider cost-effective demand-side measures first, and to explain to the regulator why subsequently proposed supply-side investments could not be met with demand-side management. The 2019 Energy Statutes Amendment Act removed BC Hydro’s former exemption from this requirement.	0.25

Aside from these select target setting policies, program administrators in most jurisdictions in Canada operate in a similar manner. A program administrator or utility first proposes energy efficiency savings targets and associated spending budgets to the regulatory board as part of a demand-side management plan that usually covers three to five years. The regulator and intervening stakeholders then assess the plan to consider issues such as cost-effectiveness, rate and bill impacts, and social equity. After a period of quasi-judicial review by the board, and potential negotiation with intervening parties, the regulator approves a plan. Each year, the

program administrator or utility reports progress on achieving these plans to the regulatory board, and/or sometimes a provincial government ministry, for oversight and approval.

As in previous years, we assess these plans by evaluating the targeted net annual incremental energy savings as a percentage of projected domestic sales (averaging both over the planning period reported by the program administrator) and score them using the same savings rate thresholds as in our program savings metrics above. We also award a quarter point for provinces able to provide targets for three or more years into the future.

Electricity savings targets

Provinces are awarded up to two and half points for electricity savings targets, based on the scale provided in Table 22.

Table 22. Electricity savings targets scoring methodology

Approximate annual incremental electricity program savings as % of sales (>=)	Score
2.50%	2.25
2.22%	2
1.94%	1.75
1.66%	1.5
1.38%	1.25
1.10%	1
0.82%	0.75
0.54%	0.5
0.26%	0.25

Savings targets provided here are for efficiency programs only. Though some jurisdictions include savings from related activities in their demand-side management plans, we do not include these in our metric.

We award an additional quarter point for targets provided for three or more years into the future. (Note: we provide savings targets including codes and standards, for those jurisdictions that count them as part of their target, for illustrative purposes).

Table 23. Electricity programs savings targets

Province/territory	Years covered (0.25 points)	Avg annual program savings/sales (2.5 points)	Target including related activities, enabling and supporting	Score (2.5 points)
NS	2022	1.10%		1
PE	2022-2024	0.74%		0.75
ON	2022-2024	0.56%		0.75
MB	2022	0.71%	1.51%	0.5
NB	2022-2025	0.47%		0.5
BC	2022-2024	0.45%	1.09%	0.5
QC	2022-2028	0.45%		0.5
NL	2022-2025	0.36%		0.5
AB	2022-2023	0.15%		0
SK	2022	0.02%		0
YT				0

Natural gas/non-regulated fuels savings targets

In keeping with our natural gas and non-regulated fuels savings metric above, we combined targets for natural gas and non-regulated program savings targets per province. The savings targets cover programs only (excluding codes and standards, though we provide these for informational purposes in jurisdictions that include these within their domestic targets). We used the same natural gas/non-regulated fuels denominator as in the savings metric above but assumed no load growth (due to observed flat or declining demand in non-regulated fuels). We based scoring on the same threshold values used in the savings metric as well, with a maximum available score of 1.75 points, plus an additional 0.25 points for provinces able to provide savings targets for three or more years into the future.

Table 24. Natural gas and non-regulated fuels savings targets scoring methodology	
Annual Incremental natural gas/NRF savings as % of sales (>=)	Score (1.75 points)
1.75%	1.75
1.50%	1.5
1.25%	1.25
1.00%	1
0.75%	0.75
0.50%	0.5
0.25%	0.25

Table 25. Natural gas /non-regulated fuels savings targets				
Province/ territory	Years covered	Avg annual savings/end-use demand*	Target including codes and standards	Score (2 points)
QC	2022-2024	0.48%	-	0.5
BC	2022	0.44%	-	0.25
MB	2022	0.39%	0.59%	0.25
ON~	2022-2027	0.36%	-	0.25
AB	2022-2023	0.11%	-	0
SK	2022-2026	0.08%	-	0
NB	-	-	-	0
NL	-	-	-	0
NS	-	-	-	0
PE	-	-	-	0
YT	-	-	-	0

** We use the same combination of natural gas and non-regulated fuel end-use demand to estimate savings target rates as we do in our evaluation of incremental program savings, regardless of whether the program administrator reported targets for one or both fuels. This is why Manitoba's target does not match its legislated savings target for natural gas only of 0.75%.*

~ Natural gas savings targets in Ontario are based on prior year performance at the program level rather than identified for multiple years ahead. As such, we have not awarded the province a quarter point for long-term planning. The figure shown here is an approximation based on 2021 savings and spending, proposed budgets for 2023-2027, and a productivity factor of 2%. The actual performance targets could vary.

Fuel switching policy

According to Natural Resources Canada's National Energy Use Database,[35] natural gas and heating oil accounted for approximately 60% of residential end-use energy consumption for space heating purposes, and approximately 72% for water heating, in 2019. Space heating and water heating together account for 96% of greenhouse gas emissions in commercial and institutional buildings, when emissions associated with off-site electricity generation are excluded. Switching to zero carbon fuels for building space and water heating is thus a critical component in meeting our national emission reduction goals.

Energy efficiency programs are a potentially highly valuable tool in promoting fuel switching, since the many of the technologies for water or space heating that would utilize zero-carbon fuels are also much more efficient than conventional furnaces or resistance electrical heating. However, there can be regulatory/policy barriers to fuel switching through demand-side management programs, particularly when these are ratepayer funded and when there are separate utility companies for natural gas and electricity. Nevertheless, provincial governments and utility regulatory boards can put in place rules and frameworks to facilitate the use of energy efficiency funds for fuel switching or develop and administer programs for efficient fuel switching with public funds.

In the 2022 Scorecard, we award up to two points to provinces with clear rules allowing the use of energy efficiency funds for fuel switching and that currently have fuel switching programs in the market. We are considering only programs directed at end-use demand in the residential, commercial, or industrial sectors (thus, excluding transportation), and only those that target

[35] Natural Resources Canada, "Energy Use Data Handbook Tables," Government of Canada, n.d., https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/menus/trends/handbook/tables.cfm.

energy savings through efficiency improvements (thus, excluding renewable energy generation programs). Partial points are awarded if rules regarding energy efficiency funds for fuel switching are unclear or contradictory, and partial points are awarded for programs supporting fuel switching that are not comprehensively deployed across the province. Finally, eligible types of fuel switching are those that facilitate switching to a zero-carbon ready fuel source, such as electricity, hydrogen, or renewable natural gas.

Table 26. Fuel switching policy and programs			
Province/territory	Rules regarding use of energy efficiency funds for fuel switching (1 point)	Programs supporting fuel switching (1 point)	Score (2 points)
BC	DSM regulations allow energy efficiency funds to be used to promote fuel switching. The Greenhouse Gas Reduction regulation also provides a viable pathway for utilities to offer fuel switching programs, and established a separate funding mechanism for measures targeting fuel switching. BC Hydro has established five-year targets for Electrification and GHG reductions along with a five-year Electrification Plan, which is separate from its energy efficiency programs. In addition, BC Hydro administers many of the Province's CleanBC electrification programs on behalf of the province. In these situations, the province fully funds the programs as well as BC Hydro's administrative costs. FortisBC's electric utility is currently completing an electrification potential study as a followup to the 2021 Conservation Potential Review, and is evaluating the cost effectiveness of a fuel switching offer in its electric service territory under the Greenhouse Gas Reduction regulation.	BC Hydro's electrification plan consists of three components: low carbon electrification, load attraction, and connecting customers. The low carbon electrification component supports electrification in industry, transportation, and buildings through studies, incentives, public awareness activities, education and training, research and pilots, and codes and standards. The province's CleanBC Better Buildings program supports fuel switching in commercial buildings through rebate programs for retrofits and new construction, free energy coaching, and connecting participants with qualified contractors. CleanBC Better Homes supports fuel switching through rebates for conversion of space and water heating to heat pumps, and rebates for electric service upgrades. The program includes a retrofit offer, new construction, and offers for harder-to-reach markets, such as Indigenous communities. Both programs under the CleanBC Program for Industry – the CleanBC Industry Fund and the CleanBC Industrial Incentive Program – facilitate decarbonization through fuel switching and other activities. The	2

		CleanBC Innovative Clean Energy Fund also supports innovative, pre-commercial decarbonization and fuel switching projects, including those related to BC's Hydrogen Strategy.	
NS	Electricity efficiency programs are funded through a Supply Agreement with NS Power, which is subject to approval by the Utility and Review Board (UARB). Non-electric programs are primarily funded by the provincial and federal governments, and are governed by fee-for-service agreements with the Province. There are no restrictions on using available funds for fuel switching.	Several Efficiency Nova Scotia programs provide support for fuel switching for non-electrically heated houses, including the Home Energy Assessment Program and Green Heat program (both through support of the federal LCEF), as well as the Affordable Multifamily Housing and Non-profits, and the Mi'kmaw Home Energy Efficiency project.	2
PE	Fuel switching and electrification are supported through funding provided to the department of Environment, Energy and Climate Action to deliver efficiency programs. The province's Pathway to Net zero framework prioritizes fuel switching through conservation, energy efficiency, and renewable energy sources.	efficiencyPEI offers several rebate programs that support fuel switching from non-regulated heating fuels to electricity. These include the Energy Efficiency Equipment program, which provides incentives for heat pumps, and a Free Heat Pump program that provides free mini-split heat pump installations for low-income clients.	2
QC	There are no restrictions on the use of energy efficiency funds to support electrification, though existing fuel switching programs are administered only by the provincial government. A regulation adopted in November 2021 restricts installation of oil heating in the residential sector, and similar regulations are planned for the commercial and industrial sectors, and for natural gas equipment.	In 2021, Hydro-Québec and Énergir submitted a proposal to the regulator in response to the decarbonization objectives of the 2030 Plan for a Green Economy to support dual fuel systems in the residential sector, with Hydro-Québec providing some compensation to Énergir for associated drops in natural gas sales. The province's Chauffez vert program provides support for replacing oil or propane space and water	2

		heating systems with electrical alternatives, though homes with natural gas systems are not eligible. The EcoPerformance program includes an implementation track for business that provides support for energy efficiency and GHG reduction projects, and conversion to green energy sources.	
NL	The most recent five-year Electrification, Conservation and Demand Management plan submitted by the utilities (and currently awaiting approval) includes initiatives to promote electrification, primarily in the transportation sector.	The provincial government has an oil to electric rebate initiative administered by NL Hydro. In the first year of the program, homeowners received rebates of $2,500 to help transition from oil to electric-based heating. In the second year of the program, the rebate was increased to $5,000.	2
MB	Part 1 of the Efficiency Manitoba Act defines the demand side management activities of Efficiency Manitoba to exclude initiatives that result in a switch from the use of one kind of fuel source to another if the switch increases greenhouse gas emissions. Section 8(3) of the Efficiency Manitoba Regulation permits savings associated with a fossil fuel other than natural gas to be attributed toward natural gas savings targets, so long as the savings result from space, water, or process heating upgrades, and did not result from switching from one fossil fuel to another. However, programs that increase electricity use decreases Efficiency Manitoba's claimed electricity savings and increases electricity sales, which creates a disincentive given Efficiency Manitoba fuel specific	Efficiency Manitoba offers incentive programs for air and ground source heat pumps. Program eligibility rules restrict incentives to existing homes and buildings currently served through a Manitoba Hydro electric rates class. However, the rules also suggest that homes/buildings heating by natural gas or non-regulated fuels may be eligible for rebates. The province also provides tax credits to property owners who install geothermal heat pumps manufactured in the province through the Green Energy Equipment Tax Credit program.	1.75

	targets based on savings as a percentage of the previous year's sales.		
NB	Government policy does not restrict fuel switching. Programs can include fuel switching as needed but is based more on the efficiency of the heating source than the fuel used at the moment.	Two municipal utilities (Saint John Energy and Perth Andover) offer heat pump rental programs. These programs remove the upfront cost barrier of purchasing the appliance.	1.5
YT	Utilities in Yukon were prohibited from offering rate-based demand side management programs between 2017 and 2020. In 2020, an order in council was passed that directed the Yukon Utilities Board to allow for rate-based demand side management programs. As of yet, the utilities have not yet introduced energy efficiency programs.	Support for fuel switching is provided by the territorial government's Good Energy rebate programs, which include heat pumps as eligible upgrades.	1
ON	Ontario's CDM and DSM frameworks are electricity and natural gas ratepayer-funded, respectively, and must result in reductions in kWh/MW of electricity and m3 of natural gas. Given that fuel switching can lead to increased demand for electricity or the change in status of a participant to no longer being a natural gas customer, this can restrict fuel switching. According to the OEB, DSM frameworks for natural gas are designed to reduce natural gas consumption and help customers with their bills, and thus does allow use of energy efficiency funds to support fuel switching for electrification and/or to reduce fossil fuel use if it is cost-effective. Enbridge interprets this to mean that DSM is intended to drive savings for natural gas		0.5

	customers only, and that they are not obliged to remove customers from the gas system or network. A final position on the issue is expected in the new DSM Framework anticipated for fall 2022.		
AB		The province's strategic energy management programs provided support for fuel switching, particularly from coal to natural gas.	0
SK			0

Enabling policies

Enabling policies refer to policies, regulations, and other activities that build supportive infrastructure and policy frameworks to advance provincial energy efficiency. They might cross several sectors and reinforce program strategies and other policy areas discussed in this Scorecard. Many of these policies are important for scaling up energy savings. They are also important to ensure the "energy efficiency resource" has the capacity to continuously renew itself and produce new energy savings opportunities as older strategies and technologies (e.g., lighting) mature.

For this policy area, we sought novel quantitative indicators to provide relevant snapshots of energy efficiency activity in the provinces and territories. Other policy areas are qualitative and based on policy. In some areas, the scorecard presents initial research in areas that deserve more consideration, and we present data to illuminate the policy area discussed.

We collected information and allocated scores for the following policy topics and metrics:

- **Financing and market creation** (three and a half points total)
    - Financing support programs (one point)
    - PACE legislation (one point)
    - Use of carbon price revenues (a half point)
    - Capital mobilization (one point)
- **Research, development and demonstration and program Innovation** (three points total)
    - Efficiency research funding (one point)
    - Innovation and RD&D funding and activities (one and a half points)
    - Research institutes and initiatives (a half point)
- **Energy management capacity** (three points total)
    - Certified energy managers (two points)
    - Community energy planning (one point)
- **Training and professionalization** (three points total)

    - Workforce readiness plans and strategies (one point)
    - Initiatives to improve energy literacy (one point)
    - Professionalization in energy efficiency programming (one point)
- **Grid modernization** (three and a half points total)
    - Advanced metering infrastructure (two points)
    - Non-wires alternatives (one point)
    - Conservation voltage reduction/volt-var optimization (a half point)

We provide summary scoring results for these topics in Table 27.

Table 27. Enabling policies scoring summary

Province/ territory	Financing (3.5 points)	RD&D (3 points)	Energy management capacity (3 points)	Training and professionalization (3 points)	Grid modernization (3.5 points)	Score (16 points)
BC	2.5	2.5	2.75	2.5	3	13.25
NS	3	2	3	2	2.75	12.75
ON	2.25	2.25	2.5	1.75	3.25	12
QC	3	2.5	0.75	0.75	2.25	9.25
NB	0.5	2.5	2.5	2	1.75	9.25
SK	2	3	1.25	0.75	2	9
MB	1.5	2.5	1.5	1.75	1.25	8.5
AB	1.25	2.25	1.5	0.75	1.25	7
YT	2	1.5	1	0.75	0.25	5.5
NL	1	1.75	0	0.5	1.25	4.5
PE	2	0.5	0.25	0.75	0.75	4.25

Financing and market creation

Energy efficiency programs mobilize private investment in energy efficiency improvements. The rate at which programs mobilize investment is referred to as the leverage ratio, which studies estimate can range from 1.4 to 2.2 times program expenditures.[36] Many programs leverage investment by providing incentives to individuals or businesses that reduce the up-front costs of new and more efficient technologies. That said, upfront costs are only one of several obstacles to private investment in energy efficiency. Other relevant barriers include high transaction costs that can be alleviated by innovative financing platforms, uncertainty about the risks, benefits, and potential return on investments in efficiency (particularly among potential financiers such as banks and credit unions), and the associated lack of ability or willingness of potential program participants to obtain third-party financing to cover the remaining costs of deeper energy efficiency improvements.[37]

Governments and program administrators have several options to address these barriers and mobilize private capital. For example, they can develop alternative repayment mechanisms for program participants, offer credit enhancements to incentivize private finance, issue bonds, or establish funds or trusts to support loan programs or efficiency projects. They can also create a specialized institution, such as a Green Bank. Governments can also use carbon pricing revenues to support institutionalized energy efficiency funding arrangements or loan programs.

Support for financing

Provincial governments can enable repayment mechanisms and credit enhancements to remove financing barriers to program participants and attract third-party financiers.[38] Repayment mechanisms address some specific challenges associated with energy efficiency

[36] International Energy Agency, "Market-Based Instruments for Energy Efficiency: Policy Choice and Design" (Paris: International Energy Agency, 2017), https://www.iea.org/reports/market-based-instruments-for-energy-efficiency.

[37] Energy and Mines Ministers' Conference, "Financing Energy Efficient Retrofits in the Built Environment" (Winnipeg, MB: Energy and Mines Ministers' Conference, August 2016), http://epe.lac-bac.gc.ca/100/201/301/weekly_acquisitions_list-ef/2016/16-41/publications.gc.ca/collections/collection_2016/rncan-nrcan/M4-122-2016-eng.pdf.

[38] The Atmospheric Fund (TAF) and Dunsky Energy Consulting, "Energy Efficiency Financing Tools for the Canadian Context," TAF Technical Guidance Note (Toronto, ON, March 2017).

investment by homeowners or building operators, such as the need for long-term lending, simplified purchase and repayment, and transferability of repayment obligations to the party who benefits from the initial investment. Options include on-bill financing, where the program administrator sources capital and administers program and loans repaid via customer bills; on-bill repayment, where third-party lender provides capital and underwrites loans with repayment through utility bills; or providing “soft loans” with lower interest rates or longer repayment terms.

Local improvement charges (LICs) or Property Assessed Clean Energy (PACE) financing, where loans are repaid through property taxes, are other prominent repayment mechanisms. They attach repayment to the building receiving the upgrades, thereby enabling a consistent repayment schedule, even if the building changes ownership. We review provincial policies on PACE programming in the following section.

Credit enhancements help de-risk energy efficiency investments to attract more private finance participation. Examples include:

- Loan loss reserves, which involve establishing a reserve fund to cover a portion of the losses incurred by lenders due to borrowing defaults
- Loan guarantees, under which a government or public agency acts as a guarantor of loans to consumers, thereby improving borrowing terms
- Interest rate buy-downs, an arrangement in which a government or public agency reduces the interest rate on private loans.

For this Scorecard, we awarded up to one point for provinces that were able to demonstrate the existence of repayment mechanisms and/or credit enhancements to support financing for energy efficiency improvements. Partial points may be awarded based on the terms of the program, the energy savings potential of the technologies supported, and the extent of support for energy efficiency in general. We have awarded a bonus half point where a province or territory’s financing program(s) offers greater financial access to comprehensive energy savings measures including via an interest rate below 4%, financing of $25,000 or greater, and/or a repayment term of ten years or greater.

We provide a summary of the results and scoring in Table 28.

Table 28. Energy efficiency financing support programs

Province/territory	Policy/program(s)	Description	Score (1 point + bonus 0.5 points)
BC	CleanBC Better Homes Low Interest Financing Program	The province's CleanBC Better Homes Low-Interest Financing Program offers financing for heat pumps ranging from $1,000 to $40,000, a 60-month amortization period, and interest rates between zero and 4.99%. Further details are available here: https://betterhomesbc.ca/rebates/financing/	1.5
	Heat Pump Loan Program (FortisBC)	FortisBC offers a Heat Pump Loan program to help customers upgrade from an electric furnace or baseboards to a high-efficiency air-source heat pump. Participants can borrow up to $6,500 at 1.9% interest repaid over a ten-year term. Further details are available here: https://www.fortisbc.com/rebates/home/air-source-heatpump-loan	
	Nelson BC EcoSave Program (Nelson Hydro)	Nelson Hydro Electric customers may use on-bill financing for energy efficiency retrofits that are eligible for rebates (including water conservation toilets). Other items and costs that provide a positive energy or water reduction may be approved by the EcoSave Program Manager. A loan of up to $16,000 may be repaid over a five or ten-year term with 3.5% fixed interest rate (subject to change at beginning of each year). Further details are available here: https://betterhomesbc.ca/rebates/nelson-ecosave/	

	Penticton BC Home Energy Loan Program (Penticton Electric)	Penticton Electric Utility customers may use on-bill financing for energy efficiency upgrades. A loan of up to $10,000 may be repaid over a ten-year term. The program ends Dec. 31, 2022. Further details are available here: https://betterhomesbc.ca/rebates/315-evaluation-discount-penticton-home-energy-loan-program-help/	
MB	Home Energy Efficiency Loan (Efficiency Manitoba/Manitoba Hydro)	Manitoba Hydro offers residential customers on-bill financing for energy efficient upgrades, including for technologies that may be eligible for Efficiency Manitoba incentive programs. The program offers loans of up to $7,500 ($10,000 to $20,000 for heat pumps and photovoltaic systems) at 4.8% for the first five years. Repayment terms range from five to 15 years depending on upgrade type. Further details are available at https://www.hydro.mb.ca/your_home/residential_loan/	1.5
	Energy Finance Plan (Manitoba Hydro)	Manitoba Hydro offers on-bill financing of up to $5,000 for gas and electrical systems upgrades to residential, farm, small commercial, and seasonal customers, at an interest rate of 6.75% over a maximum five-years term. Qualifying upgrades include conventional air source heat pumps, and electric and natural gas furnaces/boilers. Further details are available here: https://www.hydro.mb.ca/your_home/loans_financing/energy_finance_plan/	

	Energy Efficiency Assistance Program (Efficiency Manitoba)	Income qualified households who want to upgrade their standard or mid-efficiency furnace will receive a new high efficiency natural gas furnace for $9.50 per month for five years ($570 total), or $25 per month for five years ($1500 total) when upgraded from a mid-efficiency furnace. Further details are available here: https://efficiencymb.ca/my-home/energy-efficiency-assistance-program/	
NS	Multiple programs (Efficiency Nova Scotia)	Efficiency Nova Scotia worked with financial lenders to offer financing on approved credit for loans up to $25,000 and terms up to 5 years for Home Energy Assessment upgrades.	1.5
		Efficiency Nova Scotia has a Small Business Energy Solutions and Affordable Multifamily Renter pilot program which they run in co-operation with Nova Scotia Power to offer zero percent financing on the customer's utility bill.	
	Heat Pump Financing (NS Power)	Nova Scotia Power offers on-bill financing for heat pumps, with terms ranging from three to 12 years at an interest rate of 7%. Further details available at https://www.nspower.ca/your-home/energyproducts/heat-pumps/financing	
YT	Home Repair Program (Yukon Housing Corp.)	Yukon Housing Corporation offers a soft loan program called the Home Repair Program to help residents repair or upgrade their home, including upgrades that improve energy efficiency. The program is open to households with an income below $103,070. Loans are available up to $70,000 amortized up to 15 years in 5-year terms. Loans may be stacked with the Good Energy rebate program.	1.5

QC	SOFIAC	Fondaction and Econoler officially launched SOFIAC in January 2021. The Québec Ministry of Energy and Natural Resources supported this initiative with a startup grant of $ 5.5 million. SOFIAC offers commercial and industrial businesses a financing and technical support solution to help them modernize infrastructure to improve energy efficiency and use cleaner energy.	1.5
	Compétivert	The 2021-2026 Green Economy Plan contains a measure aimed at identifying the most promising forms of innovative financing and supporting their emergence. As such, loans of $50,000 or more are available through the Compétivert program to companies that operate in the province and develop, or adopt clean technologies and eco-responsible practices through including. Projects aimed at improving energy efficiency are eligible to apply.	
NL	takeCHARGE Program (NL Power & NL Hydro)	Both utilities offer on-bill financing up to $10,000 for efficiency upgrades including heat pumps and insulation. The interest rate is prime + 4% with terms of up to 60 months. Further details are available at https://takechargenl.ca/financing/	1
PE	Energy Efficiency Loan Program	The Energy Efficiency Loan Program provides financing for homeowners who are approved applicants under either of efficiencyPEI's Energy Efficient Equipment Rebate and Home Insulation Rebate programs. The maximum loan value is $10,000, with a fixed interest rate of 5% per annum and a seven-year term. An additional loan offer is available for solar photovoltaic systems.	1

SK	Appliance Financing (SaskEnergy)	SaskEnergy Network Members offer financing on natural gas appliances. Loan amounts range from $1,000 to $60,000, with one-to-five-year terms and up to a 15-year amortization period, but there is no on-bill repayment. In 2020-21, 525 participants accessed this financing totalling $3.9 M enabling more residents and companies to upgrade their natural gas equipment.	0.75
ON	Open Bill Access Program (Enbridge)	Enbridge provides a billing facility that allows third-party companies to utilize the utility bill to facilitate repayment of their charges related to products and services provided by these third parties. This service will end in 2023.	0.25
AB	-	-	0
NB	-	-	0

Based on the updated scoring evaluation, Saskatchewan and Ontario have been awarded a quarter rather than whole point. The extent to which the province's financing programs support and scale incentives for energy efficiency is unclear.

Local improvement charges/PACE

Local improvement charges (LICs) allow municipalities to amortize the costs of local infrastructure improvements through property taxes. Similarly, with Property Assessed Clean Energy (PACE) financing, a building owner repays the cost of an energy retrofit through their own property taxes. LIC/PACE financing arrangements are thus repayment mechanisms, with the added benefit that the cost of the improvement is transferable in the event the property is sold.

Though LIC/PACE financing are local government initiatives, provinces and other actors still have important roles to play in enabling and implementing them. Provincial governments must pass or amend legislation enabling municipalities to create these programs, and they can support or provide funding for the initial loan. Program administrators can co-ordinate their program offerings with municipal initiatives and help implement the efficiency improvements. Other third-party organizations can also provide funding or administrative and implementation services.

PACE is one of the strategies encouraged by the Federation of Canadian Municipalities' "Community Efficiency Financing (CEF)" initiative.[39] CEF is capitalizing local financing programs for home energy upgrades, as well as providing grants to study the feasibility and design of new local government PACE, on-bill repayment financing or direct lending programs.

We asked information respondents to outline provincial activities to enable or support LICs/PACE financing for energy efficiency, describe active LIC/PACE financing in their jurisdiction, and outcomes of any existing initiatives. We award up to one point to provinces that have passed PACE-enabling legislation and can demonstrate progress in establishing and maintaining active programs. We provide results in Table 29 below.

[39] "Community Efficiency Financing," Federation of Canadian Municipalities, 2020, https://fcm.ca/en/programs/green-municipal-fund/community-efficiency-financing.

Table 29. PACE enabling legislation and current program descriptions			
Province/ territory	Enabling legislation	Program descriptions	Score (1 point)
AB	Yes	The Clean Energy Improvement Program (CEIP) helps Alberta's property owners adopt energy efficiency and renewable energy upgrades. Between January 2019 and May 2022, 15 Alberta municipalities passed CEIP enabling bylaws. Three municipalities - Rocky Mountain House, Devon and Edmonton - established CEIP programs in 2021. The maximum financing available in these municipalities is the lesser of $50k, or a total loan amount for which the annual repayment is less than the property's assessed annual tax amount. Interest rates vary from 3.5% to 4% while Rocky Mountain House offers a blended rate where 69% of the loan is delivered at 0% and 31% at the ATB prime interest rate plus 1%. The maximum term for financing is equal to the lesser of 20 years or the effective useful life.	1
NS	Yes	PACE financing programs are available in more than 10 Nova Scotia municipalities. The provincial government offers financial support to assist municipalities in administering PACE programs and several organizations are now administering them on behalf of municipalities. Available loans range from $10,000 to $40,000 with ten-year terms. Interest rates vary from 1% to the municipality's cost to borrow +2%. Programs that us PACE financing include the Clean Foundation’s Clean Energy Financing, which was supported financially through the Federation of Canadian Municipalities Clean Efficiency Financing program; PACE Atlantic Community Investment Corporation and Switch Wolfville; and the Halifax Regional Municipality’s Deep Energy Retrofit Pilot program, which is using PACE financing building on the Solar City program.	1
ON	Yes	In 2021, Toronto homeowners were offered a low-interest loan of up to $75,000 through the Home Energy Loan Program (HELP) to cover the cost of home energy improvements. In July 2022 the program relaunched with loans of up to $125,000, interest rates between 0% and 3.73% and five to 20-year terms.	1

PE	Yes	In early 2021 efficiencyPEI, the City of Charlottetown, the Town of Stratford, and PACE Atlantic partnered together to implement the SWITCH program. While Stratford's program is now fully subscribed, Charlottetown is offering loans of up to $40,000 (or 15% of the property value) at zero percentage interest for energy efficiency upgrades over ten to 15-year terms.	1
SK	Yes	In 2021, the City of Saskatoon introduced the Home Energy Loan Program to support energy efficiency, renewable energy, and reduced water use. As of April 2022, the program reached capacity. New applications are put on a wait-list. The program offers loans of $1,000-$40,000 (and up to $60,000 if the project cuts energy use by 50%) over 5, 10, and 20-year terms with 1.68%, 2.23%, 2,72% interest rates respectively.	1
BC	No	The province allocated $2 million in economic recovery funding for the development and implementation of a PACE Roadmap and pilot program in September 2020. At the time of writing, the PACE Roadmap remains under development. The District of Saanich's Oil to Heat Pump Financing pilot program, with funding from the Federation of Canadian Municipalities and the Real Estate Foundation of BC, is now fully subscribed and accepting limited wait-list applications. The program offered $12,000 at zero percent interest over 10 years via property taxes.	0.5
YT	Yes	The Rural Electrification and Telecommunications (RET) program helps rural Yukon property owners get an alternate energy system (solar), telephone and internet service to their home. Funding for individual projects is limited to 25% of the assessed value of the property to a maximum $50,000, excluding group projects.	0.5
MB	-	-	0
NB	-	-	0
QC	-	-	0
NL	-	-	0

Use of carbon pricing revenues

The act of pricing carbon emissions through a carbon tax or a cap-and-trade market increases the cost of products and services associated with the use of fossil fuels, thereby incentivizing lower-carbon alternatives. Carbon pricing can help reduce market barriers to energy efficiency, partly by increasing the cost of fossil fuel-based energy and related products. This should improve the return on investment for many energy efficiency technologies and processes.[40]

Governments can also invest carbon-pricing revenue in energy efficiency programs and demonstration projects.[41] For example, in 2016 the Regional Greenhouse Gas Initiative (RGGI), a Northeastern U.S. cap-and-trade market, invested 55% of its revenues in energy efficiency programming.[42] According to the Regional Energy Efficiency Database administered by the Northeast Energy Efficiency Partnerships, the Lawrence Berkeley National Lab, and the U.S. Department of Energy, the RGGI's contribution to overall electricity efficiency program funding in 2017 ranged from just over 2% in Rhode Island to approximately 9% in New Hampshire. Further, the initiative contributed approximately 15% for natural gas program funding in Vermont.[43]

In October 2016, the Government of Canada announced a Pan-Canadian approach to carbon pricing. The federal plan went into effect on Jan. 1, 2019.[44] All Canadian provinces and territories now have a carbon price in place, though the type of system and administration

[40] Lisa Ryan et al., "Energy Efficiency Policy and Carbon Pricing," Energy Efficiency Series (Paris: IEA/OECD, 2011).

[41] Steven Nadel, "More States and Provinces Adopt Carbon Pricing to Cut Emissions," American Council for an Energy-Efficient Economy (ACEEE), January 3, 2019, https://aceee.org/blog/2019/01/more-states-and-provinces-adopt.

[42] "The Investment of RGGI Proceeds in 2016" (The Regional Greenhouse Gas Initiative, September 2018), https://www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI_Proceeds_Report_2016.pdf.

[43] Northeast Energy Efficiency Parternships, Lawrence Berkeley National Lab, and US Department of Energy, "Regional Energy Efficiency Database," 2017, https://neep.org/advanced-emv-forecasting-and-planning-solutions/regional-energy-efficiency-database.

[44] Environment and Climate Change Canada, "Pan-Canadian Approach to Pricing Carbon Pollution."

varies across jurisdictions (see Table 30 below).[45] In its 2021 Budget, the federal government committed to raise the floor carbon price to $170/tonne by 2030.

Table 30. Summary of carbon pricing system administration in Canada

Province/ territory	System type	Fuel charge administration	Industry system administration
AB	Carbon tax	Federal	Provincial
BC	Carbon tax	Provincial	Provincial
MB	Carbon tax	Federal	Federal
NB	Carbon tax	Provincial	Provincial
NL	Carbon tax	Provincial	Provincial
NS	Cap-and-trade	Provincial	Provincial
ON	Carbon tax	Federal	Provincial*
PE	Carbon tax	Provincial	Federal
QC	Cap-and-trade	Provincial	Provincial
SK	Carbon tax	Federal	Provincial/Federal
YT	Carbon tax	Federal	Federal
NT	Carbon tax	Territorial	Territorial
NU	Carbon tax	Federal	Federal

** Ontario's provincial system was implemented on January 1, 2022.*

[45] Steven Nadel, James Gaede, and Brendan Haley, "State and Provincial Efforts to Put a Price on Greenhouse Gas Emission" (Washington, D.C.: American Council for an Energy Efficiency Economy (ACEEE); Efficiency Canada, March 2, 2021), https://www.aceee.org/research-report/i2101; Environment and Climate Change Canada, "Carbon Pollution Pricing Systems across Canada," Government of Canada, October 23, 2018, https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work.html.

In Scorecard 2021, we looked only at the use of carbon pricing revenues to support energy efficiency improvements and awarded up to one point for clear and formalized procedures to manage proceeds in a way that benefits energy efficiency and/or to provinces that were able to indicate actual spending amounts from carbon pricing revenues for energy efficiency. In the 2022 Scorecard, we evaluated based on these same criteria, but decreased the value from one point to a half point. While spending per capita is already captured in the Programs section, this half point allows us to continue to recognize the most secure funding streams coming from carbon pricing revenues.

Discretion over the use of carbon pricing revenues is applicable only to provinces in which either or both fuel charges and industrial output-based pricing systems are provincially administered. Through 2021, only two provinces did not administer either a fuel charge or industry pricing system (Manitoba and Ontario), and as such made a policy choice to have no discretion over the use of carbon price revenues raised in their jurisdiction.

Revenues from systems administered by the federal government are returned to the provinces through various means. Approximately 90% of revenues from federal fuel surcharges are returned to individuals through federal income tax rebates The remaining 10% of revenues support energy efficiency improvements in small and medium sized enterprises and municipal buildings through the Climate Action Incentive Fund (CAIF).[46] The exact way proceeds from federally administered industrial output-based pricing systems in provinces that did not voluntarily adopt them are returned to the provinces has yet to be determined.

The remaining provinces did have discretion over the use of some portion of carbon pricing revenues in their jurisdiction. Table 31 summarizes the nature of this jurisdiction and provides a description of how funds are managed and, where applicable, allocations to energy efficiency.

[46] Environment and Climate Change Canada, “Climate Action Incentive Fund,” Government of Canada, September 15, 2020, https://www.canada.ca/en/environment-climate-change/services/climate-change/carbon-pollution-pricing-proceeds-programming/climate-action-incentive-fund.html.

Table 31. Dedicated energy efficiency funding from carbon price revenues		
Province/ territory	Description	Score (0.5 points)
NB	The province began collecting carbon pricing revenues on April 1, 2020. Proceeds go to reducing the burden on the natural gas utility and reduce income tax and provincial fuel tax. The remaining portion goes to a Climate Fund, administered by the province. The province reported $36 million in revenues in fiscal 2021-2022, of which the province estimates 25% went to supporting various energy efficiency-related programs and initiatives.	0.5
NS	The province deposits carbon pricing proceeds into a green fund, which is legislated to be used to reduce GHG emissions, mitigate social and economic impacts, or adapt to the impacts of climate change. In 2021, cap-and-trade auctions were held in June and November generating a total of $44.8M for use in fiscal year 2021-22. Of this total, 60% will be used to support a variety of renewable energy and energy efficiency programs. This includes $2M for the Affordable Multi-family Housing program, $8M for SolarHomes program, $8M for the Home Energy Assessment program, $2 million over three years for BIPOC and Mi'kmaq Energy Training Opportunities, $1.5M over 3 years for Industrial On-site Energy Managers, $1.5M over 2 years for Solar for Non-profits pilot, $1.5M over 3 years for an Off-oil Retrofit Incentive Pilot. Sustainable transportation funding includes $1M over 3 years for EV charging for multi-unit residential buildings, and $1.5M over 3 years for the “Next Ride” EV engagement campaign. This is in addition to funding from the 2020 auction that is described in Scorecard 2021, providing multi-year funding for small business, Affordable Housing Retrofits, HomeWarming and SolarHomes.	0.5
BC	BC launched the CleanBC Program for Industry in 2019, funded by the incremental carbon tax above $30 per tonne as paid by industry. There are two components: a CleanBC Industry Fund, which invests a portion of revenues into businesses working on emission reduction projects; and the CleanBC Industrial Incentive Program (CIIP), which reduces carbon tax costs for operators that can demonstrate world-leading emissions performance. Energy efficiency improvements are eligible under the Industry Fund, though the province does not track energy efficiency specific spending.	0.5

QC	All proceeds from the province's cap-and-trade system are transferred to the Electrification and Climate Change Fund (FECC), under the direct management of the Ministry of Environment and the Fight Against Climate Change. The FEEC partly funds the Quebec Master Plan for Energy Transition, Innovation and Efficiency, which addresses energy efficiency.	0.5
AB	Proceeds from Alberta's industrial pricing system go into the Technology Innovation and Emissions Reduction (TIER) fund. The regulation detailing TIER does not specify exactly how this fund is to be used, but the province has committed to using it to support emissions-reduction programs for industry. In its information request response to Efficiency Canada, the province indicated that TIER funding supports some energy efficiency programs remaining after the closure of Energy Efficiency Alberta. Municipal Climate Change Action Centre energy efficiency programs are funded through a combination of Alberta's previous carbon levy revenues and TIER funds.	0.25
SK	Proceeds from Saskatchewan's provincially administered industrial pricing system go to the Saskatchewan Technology Fund, which can be used by the government to support emissions-reduction projects in regulated facilities. The criteria for determining eligible projects has yet to be published, but will be released before the first due date for compliance payments. The compliance payments from large emitters under the provincial OBPS are due at the end of 2022.	0.25
YT	All carbon pricing revenues are returned via carbon rebates to business, residents, municipal governments and First Nations governments in the province. There are no specific carbon-rebate funded programs that support energy efficiency.	0
NL	Proceeds are used to offset reduced provincial fuel excise taxes.	0
PE	Proceeds go into general government revenue and are used to offset reduced provincial fuel excise taxes, to reduce costs for drivers and public transit users, and to support electric vehicle incentives.	0
ON	No jurisdiction over carbon pricing systems and associated revenues in 2021. On January 1, 2022, Ontario's Emission Performance Standards program replaced the federal output-based pricing system. The province has yet to announce how the proceeds from the program will be used.	0
MB	No jurisdiction over carbon pricing systems and associated revenues in 2021.	0

Capital mobilization

While both repayment mechanisms and credit enhancements use public policies to leverage private investment, governments can also take steps to mobilize private capital to support the programs themselves. For example, provincial governments might raise capital from bond markets by issuing green bonds to capitalize a loan program, a public energy efficiency project, or a municipal LIC program. A specialized institution, such as a "green bank", can be created to spur clean energy markets and provide financing functions. These functions might include aggregating projects and issuing securities, centralizing program coordination, offering soft loans, or providing credit enhancements. We award up to one point to provinces that have taken steps to mobilize capital through such initiatives.

Table 32. Capital mobilization

Province/ territory	Description	Score (1 point)
ON	The Ontario Financing Authority regularly issues green bonds, the proceeds of which are used to support projects in clean transportation, energy efficiency and conservation, clean energy and technology, forestry, agriculture, and land management, and climate adaptation and resilience. In 2021, the authority issued two bonds, raising a total of $4 billion. In 2020-2021, funds were used to support 19 energy efficiency and conservation projects, which accounted for approximately 21% of allocated funding.[47]	1
QC	Quebec has issued green bonds six times since its inaugural issue in February 2017. In May 2021, $500 million in green bonds were issued, of which $12.05 million were used to support energy efficiency projects. Projects have primarily focused on public transit, and targeted institutional investors. In addition, Épargne Placements Québec (an organization that issues savings and retirement products from the Quebec government) issues fixed-rate green bonds, intended for the retail market.	1

[47] Ontario Financing Authority, "2021 Green Bond Newsletter," December 2021, https://www.ofina.on.ca/pdf/2021_ontario_green_bond_newsletter_en.pdf.

Research and development, and program innovation

If Canada is to realize energy efficiency's full potential, the nation will need to continue research, development, and demonstration (RD&D) of novel energy efficiency technologies and experiment with innovative program designs and delivery methods. For the purposes of this report, RD&D and innovation activities span the range from fundamental or early-stage scientific and technology research to piloting and demonstration activities of proven technologies and/or program strategies that are novel to a jurisdiction. The latter could incorporate innovations in logistics, technologies, market design, and marketing and administration.

According to the International Energy Agency, between 2010 and 2021 energy efficiency RD&D averaged 19.6% of all energy-related RD&D expenditures by Canadian federal, provincial, and territorial governments. Although energy efficiency's share of annual RD&D expenditures has been rapidly increasing in recent years, for example from 22% in 2017 to 33.1% in 2020, 2021 saw a 4.5 percentage point decrease to an estimated 28.5%. It nevertheless remains first among other energy technologies in share of total RD&D expenditures (see Figure 3).[48]

[48] International Energy Agency, "Energy Technology RD&D Budgets," IEA Data Services, 2021, https://www.iea.org/statistics/rdd/.

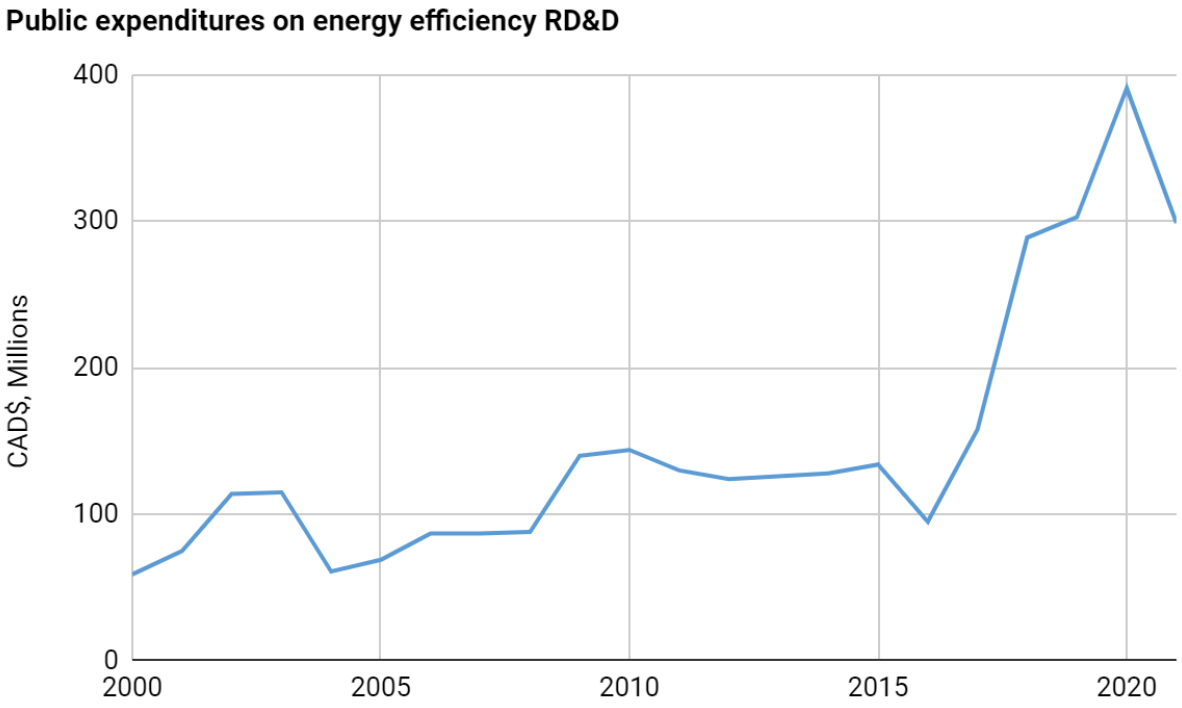

Figure 6. Public expenditures on energy efficiency RD&D

According to Statistics Canada's Research and Development in Canadian Industry (RDCI) survey, industry expenditures on all energy-related RD&D totalled $1.74 billion in 2020. Energy efficiency expenditures accounted for $397 million, or roughly 23% of the total — an increase of approximately 0.2 percentage points over 2019 and six percentage points over the 2018 that were last reported in the Scorecard.[49] Neither the IEA database nor the RDCI offer provincial breakdowns of RD&D expenditures, so we have provided this information for illustrative purposes only, and not for scoring.

To score provinces on their energy efficiency-related RD&D and innovation activities, we looked at three different metrics: Research funding for energy efficiency at universities and colleges; whether DSM program administrators had dedicated funds to support RD&D and program

[49] Statistics Canada, "Table 27-10-0347-01 Industrial Energy Research and Development Expenditures by Area of Technology, by Industry Group Based on the North American Industry Classification System (NAICS) and Country of Control," Government of Canada, 2020, https://doi.org/10.25318/2710034701-eng.

innovation; and the existence of dedicated research institutes, organizations, or provincially supported energy efficiency research projects.

Research funding

Though capacity varies across the country, research institutions in all provinces study energy resources, and energy efficiency is relevant across all the subcategories noted above. For this reason, we regard the share of energy RD&D that a given province devotes to efficiency as a measurement of energy efficiency research intensity or priority. The International Energy Agency takes the same approach when presenting energy efficiency RD&D expenditures.

The Natural Sciences and Engineering Research Council (NSERC), a federal government agency, funds academic research. It maintains an online award database that can be filtered by area of application. The database lists energy efficiency as a subset of a broader category of energy resources that also includes electrical energy, energy resource production, exploration, processing, distribution, and use, energy storage and conversion, nuclear energy, and oil, gas and coal. The database can supply a summary table of funding by year, area of application, and province.[50]

Overall, NSERC funding for energy efficiency totalled $7.5 million in 2020-2021, accounting for roughly 11.3% of the total $66.2 million in funding for energy-related research. It is important to note that NSERC funding does not represent all RD&D funding for energy efficiency in each province, but there is no publicly available data source for provincewide energy efficiency RD&D expenditures.

To benchmark across the provinces, relative to their internal research capabilities, we considered funding for energy efficiency research as a proportion of funding for all energy resources research. Given the seven subcategories of energy resources in the NSERC database, we award a full point for research funding to provinces that exceed an energy efficiency RD&D intensity rate of 14.29% (100%/7), three-quarters of a point for rates between 10.72% and 14.28%, a half point for 7.15% to 10.71%, and a quarter point for 3.58% to 7.14%. We award zero points to provinces where the share of funding for energy efficiency RD&D falls at or below 3.57% of overall funding.

[50] Natural Sciences and Engineering Research Council of Canada, “NSERC’s Awards Database,” Government of Canada, 2021, https://www.nserc-crsng.gc.ca/ase-oro/Results-Resultats_eng.asp.

Table 33. NSERC funding for energy efficiency					
Province/ territory	Total energy-related NSERC grants ($) (FY 2020/21)	Energy efficiency NSERC grants ($) (FY 2020/21)	EE research intensity	Year-over-year change EE grants	Score (1 point)
NB	$541,338	$386,838	71.5%	$20,735	1
SK	$1,549,749	$403,685	26.0%	$245,685	1
QC	$14,441,246	$2,993,699	20.7%	$786,612	1
ON	$20,613,091	$2,199,849	10.7%	-$176,550	0.5
MB	$1,010,361	$92,000	9.1%	-$106,395	0.5
BC	$6,736,633	$528,200	7.8%	-$3,533	0.5
NL	$789,012	$33,000	4.2%	-$23,000	0.25
AB	$19,105,959	$784,325	4.1%	-$452,282	0.25
NS	$1,170,853	$29,000	2.5%	$0	0
PE	$51,000	$0	0.0%	$0	0
YT	$200,000	$0	0.0%	*	0

**The 2021 Scorecard did not include Yukon's energy efficiency research intensity.*

New Brunswick's high research intensity value is due to a single large project at the University of New Brunswick, led by Prof. Eduardo Castillo-Guerra, investigating integrated dispatchable resources control systems in local electricity distribution networks. The large increase in funding for energy efficiency research in Saskatchewan is associated with several research projects being led by Prof. Carey Simonson at the University of Saskatchewan, looking at pathogen transfer in HVAC systems.

Innovation and RD&D funding and activities

While RD&D for emerging technologies is important, so too is experimentation with new program delivery models or methods, and piloting technological improvements or processes that, while not necessarily unproven, are nonetheless new to provincial energy systems.

Rigorous evaluation, measurement, and verification is an essential element to ensure DSM investments from regulated entities are justifiable and cost-effective. But experimentation with new programs and processes can be difficult to justify under these frameworks, as they could potentially fail to produce the desired outcomes. Accordingly, it is important that efficiency program administrators include dedicated funding to support experimentation, program innovation, and pilot projects.

We assessed the extent of program administrator and government investment in energy efficiency and program innovation and RD&D by considering three elements:

- The existence of dedicated innovation or enabling strategies funding that includes support for energy efficiency-related pilots and demonstrations
- Technologically-related pilot and demonstration projects carried out in 2021
- Program-related innovation activities, particularly pertaining to improvements in the scale and scope of building energy retrofitting.

We award provinces up to 0.5 points for evidence of each element. Partial points may be awarded for activities that are not directly related to these three elements.

Table 34 summarizes provincial funding and programs for energy efficiency RD&D and program innovation. With considerations for space, we note that this table may not refer to all energy efficiency-related innovation activities in each province, but we have tried to include activities with the most relevance to energy efficiency. The information received this year indicates that several provinces are pursuing pilots and demonstration projects in the broader area of smart grids and decentralized energy resources, but that may not be directly relevant to energy efficiency. We include these descriptions where provided, but award partial points unless direct evidence of support for energy efficiency was provided.

Table 34. Innovation and RD&D activities summary

Province/territory	Dedicated innovation funding (0.5 points)	Pilots & demonstrations (0.5 points)	Program innovation (0.5 points)	Score (1.5 points)
AB	Alberta Innovates funds research, development, and demonstration of new technologies to reduce the environmental footprint of many sectors in the province. There is no specific program or focus area on "energy efficiency", however Alberta Innovates reported that 100+ projects funded in 2021 included major components that reduce energy intensity of production.	The province launched a $50 million TIER economic recovery program, seeking shovel-ready projects to reduce GHG emissions. In 2020 it selected twenty-three projects, which included process improvements in the oil and gas industry that reduce energy consumption. In 2019, Emissions Reduction Alberta announced 11 projects selected under its Industrial Efficiency Challenge. Since then, one project (using flow-control devices to reduce energy intensity) has been completed, and two were cancelled, all others remain active.	Alberta Innovates and partners established the Green Buildings Technology Network, a network of test buildings for small and medium-sized construction firms to develop new innovations in energy-efficient construction through testing, commercializing and adoption of new products and technologies.	1.5
BC	The province maintained a Building Innovation Fund ($5m for fiscal year 2021-2022) to promote innovation in design, construction practices, systems, and	BC Hydro supported several pilot and demonstration programs in DSM, including trialling an online marketplace which allows customers to compare and evaluate products from multiple retailers	Beginning in 2022, FortisBC is conducting a two-year study to investigate the cost effectiveness and market development of Deep Energy Retrofit Pilots for residential and commercial buildings.	1.5

	materials/technologies. FortisBC included funding for an Innovative Technology program in its 2019-2022 DSM plan, alongside other funds such as the InnoTech program, and the Clean Growth Innovation Fund.	using metrics such as lifetime operating costs, energy use, and efficiency rating, as well as a university research partnership pilot that provides live energy data to customers, and assesses response to varying reward signals and direct load control events on home equipment. FortisBC launched commercial gas heat pump and residential gas heat pump pilot programs and launched a rebate program in 2021 to provide incentives for water and space heating applications of commercial gas heat pumps. The province's Innovative Clean Energy Fund co-funded an energy efficient-related pilot demonstration for the development of next-generation electrochromic window technologies.	BC Hydro is participating in several activities to support and facilitate the province's electrification objectives, in part through building energy retrofits. The province's clean buildings tax credit is a refundable income tax credit for qualifying retrofits that reduce the energy use intensity and improve the energy efficiency of eligible commercial and multi-unit residential buildings with four or more units. The retrofit must meet energy-use targets. The credit amount is five percent of qualifying expenditures incurred after Feb. 22, 2022, and before April 1, 2025, and must include a certificate from an architect, professional engineer or qualified Energy Advisor.

MB	Efficiency Manitoba's current three-year DSM Plan includes an Innovation and Research Fund that was allocated $2.14 million to provide funding for pilot projects and research partnerships. The fund was launched in 2021, with first enrolment providing $500,000 to support RD&D energy efficiency projects.	Pilots and demonstrations supported under the Efficiency Manitoba Innovation fund in 2021-22 include: · Embedded ground source heat pump heat exchanger piping in structural steel foundation piles · Net zero infill multi-unit residential building using a co-op funding model High performance building envelope on the exterior of a pre-engineered steel building that is free from thermal bridging		1.5
NS	Efficiency Nova Scotia includes an Enabling Strategies budget in its DSM plan. The budget can be used to support education and outreach, development and research, and other related activities.	Efficiency Nova Scotia is piloting two demand response (DR) programs in collaboration with Nova Scotia Power. One pilot involves direct control of domestic water heaters and the other is working with a third-party DR aggregator for Commercial and Industrial load curtailment. Pilots will run over the 2021/22 and 2022/23 winter seasons.	In 2021-2022 Efficiency Nova Scotia partnered with the City of Halifax on the design of a deep retrofit program which will be piloted in 2022. This pilot will test a facilitated approach to program delivery, wherein Efficiency Nova Scotia will manage all aspects of the retrofit. Efficiency Nova Scotia is conducting research with the province and NRCan examining the performance, cost, and practical considerations associated with whole-home advanced electric heating systems.	1.5

SK	The Saskatchewan Advantage Innovation Fund is managed by Innovation Saskatchewan to support technological innovations in core economic sectors, one of which is energy (though energy efficiency does not appear to be a specific focus). SaskEnergy has a dedicated budget for Technology Innovation, focused on energy savings and GHG reductions. The budget can be used for both end use energy efficiency and transportation, as well as fuel switching to low carbon fuels and reducing GHGs associated with the fuel itself	SaskEnergy collaborated with stakeholders to design and install a gas heat pump demo unit at a SaskEnergy building. They also supported the planning phase of a combined heat and power boiler demonstration project. The demo boiler units are expected to be installed in 2022.	SaskPower ran a pilot program with the Peter Ballantyne Cree Nation to provide free home retrofits in Southend, SK in FY2021. EnerGuide home audits were performed on each participating home. It provided valuable information around housing stock and housing upgrade needs in northern Saskatchewan. The learning from the pilot program was applied to the Northern First Nations Home Retrofit program, that launched in December 2021.	1.5
ON	Enbridge Gas' OEB approved DSM Plan includes funding of up to $2.5 million annually for Research, Development, Innovation, and Pilot Program related spending. The IESO manages the Grid Innovation Fund, which has supported conservation, demand management, and energy storage	In September 2021, the government introduced a new regulations authorizing a Community Net Metering (CNM) demonstration framework. The CNM model will allow a community to work together to integrate solar panels, solar parkades, electric vehicle chargers, green roofs, and other innovative elements to help lower energy costs for participating residents and businesses	Enbridge is investigating alternative forms of home energy evaluations through virtual audits to support energy literacy and/or be an alternative to in person audits in remote harder to reach regions. In 2021 the IESO Grid Innovation Fund and OEB Innovation Sandbox worked together to support projects that aimed	1.25

	projects. In 2021 the Grid Innovation Fund shifted all focus toward distributed energy resource projects. In partnership with the OEB Innovation Sandbox, there was a targeted call for submissions to support research and demonstration projects that would test the capabilities of Distributed Energy Resources (DERs) in providing services at both the local and provincial levels, and that would test new activities or business models where regulatory requirements may otherwise limit the effectiveness of DERs.	(though other energy efficiency improvements are not a focus in this program). This regulation provides a framework for arrangements involving a central customer who manages and operates several load facilities, renewable generation facilities, and any energy storage facilities participating in a CNM demonstration project. At this time there is only one authorized demonstration project, the West Five development in London, Ontario. Enbridge supported several pilot and demonstration activities in 2021, involving technologies such as cold climate heat pumps, hydronic heating systems, artificial intelligence, gas heat pump furnaces, and virtual energy audits.	to increase flexibility in the distribution system and mitigate constraints through DER, as well as demonstrate DER management software and telemetry.	
NL	-	In 2021, Newfoundland Power conducted a study on Heat Pumps to determine the energy and peak demand impacts in the Newfoundland climate zone. Due to a mild winter season, data collection was extended for another winter period.	In 2021, the Isolated Systems Community Efficiency Program began to utilize SimpTek's Energy Advisor platform, which links existing customer data with utility data. The platform will perform an energy analysis on customers to identify the top 10% energy consumers, who will	1

			then be provided with a customized plan to reduce their energy usage.	
QC	The Hydro-Québec Research Institute (IREQ) includes “energy use” as a core area of expertise. The Energy Technology Laboratory (LTE) in Shawinigan focuses on energy efficiency technological innovation. Hydro-Québec also includes an innovation budget in its energy efficiency planning. The provincial government administers the Technoclimat program, to encourage innovation in energy efficiency, renewables, bioenergy and GHG emission reductions. The Natural Gas Technologies Centre (NGTC), a non-profit organization focused on thermal energy, is doing similar work as IREQ. Énergir also administers an Innovation program that provides up to $25,000 for experimental projects, and up to $250,000 for demonstration projects.	Hydro-Québec launched a research program in 2021 to measure the power impact of underfloor heating in an industrial environment. The floor has been designed with a higher thermal mass in order to make the most power gain during winter heating peaks. The installation will undergo detailed measurement during the winter of 2022-2023.	With funding from the provincial government, a large-scale aggregation project (605 housing units) was launched in the northern village of Inukjuak. The project will convert oil heating to dual-energy heating systems primarily powered by electricity between 2021-2023.-	1

YT	-	In 2021, the province continued its pilot project to evaluate the process, costs, and energy savings associated with deep energy retrofits in Yukon. This program included enhanced incentives and reporting requirements for homeowners wishing to reduce their home's energy consumption by 40% or more. The outcomes of this program will inform future program delivery by providing improved guidance and to homeowners interested in deep upgrades. The province expanded the number of air-to-water and air-to-air heat pumps monitored under the heat pump monitoring pilot in 2021. The province is measuring the efficiency of these systems in northern climates.	A virtual assessment tool has been designed into an online rebate program application portal to allow homeowners to conduct a virtual assessment of their home, learn about recommended actions, and apply for rebates all in one location. This tool was officially launched in the summer of 2021.	1
NB	NB Power includes an Enabling Strategies budget in its DSM planning, which can be used for planning, evaluation, and market transformation.	NB Power has partnered with NRCan to gather cost and energy savings data on the feasibility of using heat pump water heaters in the province.	-	1
PE	-	-	-	0

Research institutes

The final category we consider in our assessment of provincial RD&D and innovation activities is the existence of research institutes or provincially supported research projects for energy efficiency technology. With this metric we aim to capture specific RD&D initiatives for which energy efficiency is a core research theme, to begin building a better understanding of Canada's energy efficiency innovation system.

We asked survey respondents to identify energy efficiency research institutes and provincially supported research projects, and to provide comments or clarification about activities in this area that we were able to identify through desk research. Where possible or applicable, we sought to verify that initiatives were indeed actively conducting or supporting RD&D or innovation activities for energy efficiency or had supported clearly related projects within the past five years. For provinces that had one or more such institutes or projects, we awarded a half point.

We attempted to restrict this list to institutes or projects with a clear connection to a provincial government or industry, thereby excluding research institutes or groups based at Canadian universities or colleges, innovation incubators or accelerator centres, venture capital or angel investor groups or businesses, federal government programs, or other national-level initiatives. We also excluded provincial government departments or programs with no clear evidence or identification of energy efficiency research support. In some cases, we awarded partial points if identified institutes or provincial projects did not focus on energy efficiency specifically but supported research on closely related issues.

The resulting list does not give a complete picture of energy efficiency innovation. We highlight Canada's energy efficiency research and innovation system as a fruitful area for further research.

Table 35. Research institutes and projects		
Province/ territory	Description	Score (0.5 points)
BC	FortisBC supported a 5-year smart energy research chair at the University of British Columbia Okanagan. With support from CANARIE, the University of Victoria has engaged in another phase of development of BESOS: a cloud-based portal of modular, reusable software components for researchers to perform integrated building and energy systems analysis. In 2015, the UBC Pacific Institute for Climate Solutions (PICS), a research collaboration between four British Columbia universities, launched the "Energy Efficiency in the Built Environment" project. PICS extended this project through 2021.	0.5
MB	The Building Efficiency Technology Access Centre (BETAC) at Red River college supports the building industry by helping clients address the challenges of designing and constructing durable, energy-efficient building envelopes, components, and assemblies in an environment with extreme conditions.	0.5
NS	In 2021 Efficiency Nova Scotia partnered with Nova Scotia Community College (NSCC) for the domestic hot water demand response pilot. NSCC conducted lab tests on water heaters before Efficiency Nova Scotia began field trials. Efficiency Nova Scotia commissioned research on the costs and participation barriers for deep energy retrofits (residential and BNI), to be completed later in 2022.	0.5
NB	The Smart Grid Innovation Network is a partnership between NB Power, the University of New Brunswick, and Siemens Canada that has supported RD&D in a number of smart grid related areas.	0.5
AB	Alberta Innovates is a provincial research and innovation agency. In 2021, the agency reported that 100+ active projects included major components that reduced energy intensity. These projects include green building technologies and smart grids.	0.5
NL	Over the past five years the Department of Tourism, Culture, Industry and Innovation has supported several efficiency-related research and	0.5

	development projects, including one on distributed smart thermostats.	
ON	The Ontario Energy Board's (OEB) Innovation Sandbox allows utilities and other energy sector companies to turn to OEB staff for information and customized regulatory guidance for new services and business models with demonstrable consumer benefits. The Independent Electricity System Operator (IESO) Grid Innovation Fund supports several collaborative research and development initiatives with industry and academia.	0.5
PE	efficiencyPEI, Holland College, and local service organization representatives began a two-year insulation research project for PEI specific island sandstone basement applications in 2022. efficiencyPEI supports a Network of Excellence member on a research project as part of a members agreement with the National Research Council.	0.5
QC	The Synchronex network of college scientific and technological experts includes an energy group that works with various research centres to offer integrated and innovative solutions to meet the needs of local businesses. The Hydro-Québec Research Institute (IREQ) includes “energy use” as a core area of expertise. The Energy Technology Laboratory (LTE) in Shawinigan focuses on energy efficiency technological innovation. Hydro-Québec also supports the Industrial Research Chair in Optimized Operation and Energy Efficiency: Towards High Performance Buildings, at Concordia University. The Natural Gas Technologies Centre (NGTC) does similar work as IREQ. The InnovÉÉ supports research and development related to electricity technologies in small and medium-sized businesses.	0.5
SK	In 2016, NSERC and SaskPower supported a 5-year Senior Industrial Research Chair in Smart Grid Technologies at the University of Saskatchewan. The Chair supervises the university’s Smart Grid and Energy Network Lab which conducts smart grids, power systems and renewable energy research. The University of Saskatchewan is working with Canadian companies, the City of Saskatoon, and international partners on heat pump/ventilation research.	0.5

YT	The Yukon government, both utilities, and Northern Energy Innovation have partnered on a multi-year study to assess the distribution grid impacts of increasing renewable heating (heat pumps, electric baseboards, and ETS systems) and electric vehicle charging. The territory has partnered with the Yukon Conservation Society, Yukon University, and Yukon Energy, to deliver their Electric Thermal Storage pilot project. This program aims to deploy 50 electric thermal storage devices in Yukon homes and monitor their effectiveness to provide capacity demand management and grid service.	0.5

Energy management capacity

Energy management broadly refers to the practice of tracking energy use in an organization or facility and putting in place plans to reduce consumption. According to Natural Resources Canada, typical energy management objectives include:

- Minimizing energy costs while maximizing building energy efficiency
- Achieving more comfortable work environments for building occupants
- Minimizing the environmental impact of a building's energy consumption.[51]

Our Industry chapter tracks programs for energy management and energy management systems for industry specifically — though many of them are also relevant to commercial and institutional energy users, including municipalities. A critical enabling component of energy management practices is the existence of sufficient professional capacity to develop them. Often, this entails hiring Certified Energy Managers — specialists trained in the technical practice of energy management, but who can also help to educate, raise awareness, and build motivation within organizations to reduce energy consumption. As in previous Scorecards, we track the population of Certified Energy Managers per province as a way of assessing this professional capacity.

[51] Natural Resources Canada, *Energy Management Training Primer* (Ottawa, ON: Government of Canada, 2016), http://epe.lac-bac.gc.ca/100/201/301/weekly_acquisitions_list-ef/2016/16-31/publications.gc.ca/collections/collection_2016/rncan-nrcan/M144-262-2015-eng.pdf.

In municipalities, energy managers can help develop organizational energy management strategies, which are useful in reducing municipal energy use and greenhouse gas emissions. These strategies are important components of the broader practice of community energy planning, which involves integrating energy use considerations in land-use and infrastructure planning processes and identifying opportunities for local energy solutions at the building and/or neighbourhood scale.[52] We include a metric to track programs and/or initiatives to facilitate municipal energy management and community energy planning. We offer further details on our methodologies for assessing these metrics below.

Certified Energy Managers

Certified Energy Managers (CEMs) can play important roles in energy efficiency program delivery, energy management, and evaluation, measurement, and verification of energy efficiency improvements. CEMs primarily work in commercial, institutional, and industrial buildings and facilities, and as such play a role in educating and motivating managers and employees to adopt conservation behaviours.

To benchmark the provinces on energy management capacity, we consulted the Association of Energy Engineers Certified Professionals Directory for data on certified professionals. We tracked managers with a business address located in a province. Some of these practitioners might provide services within their larger region, especially in smaller or geographically proximate jurisdictions (e.g., the Maritimes or Prairie Provinces). We feel it is appropriate to provide extra credit to a province if its energy experts are also providing services to its larger region. However, it is important to recognize that province-specific figures may not fully reflect energy consumers' access to energy professionals.

We award up to two points for Certified Energy Manager certifications per province, which could include CEM, CEM-International (I & II), and Energy Manager in Training (including International) certifications.[53] We divide the total certifications listed in a given province by the number of

[52] "Community Energy Planning," City of Toronto (City of Toronto, November 17, 2017), Toronto, Ontario, Canada, https://www.toronto.ca/services-payments/water-environment/environmentally-friendly-city-initiatives/community-energy-planning/.

[53] "AEE Certified Professionals Directory," Association of Energy Engineers, accessed July 5, 2022, https://portal.aeecenter.org/custom/cpdirectory/index.cfm.

businesses with more than 100 employees.[54] CEMs typically work in the commercial and institutional sectors, and in industrial facilities. To provide a consistent comparison that avoids biasing results against provinces with more small and medium sized businesses, we chose larger businesses likely to hire one or more CEMs. Of course, a CEM can be highly valuable to smaller companies or a consortium of small companies.[55] We used a per-business denominator because not all provinces had data to support a more relevant denominator based on the number of commercial-institutional buildings or total floor space in the sector.

Table 36. Energy management capacity

Certified energy managers per 100 large businesses (>= 100 employees)	Score
12	2
10.5	1.75
9	1.5
7.5	1.25
6	1
4.5	0.75
3	0.5
1.5	0.25

In 2021, the number of energy managers per 100 large businesses increased in all but one province. This included multiple provinces with double digit increases. In order to scale points in response to this growth we have increased scoring stringency. To do this, we increased the base-level point threshold by 25 percent (from 1.2 to 1.5 CEMs per 100 large buildings) and doubled this total every quarter point. See the point scale below:

[54] Statistics Canada, “Table 33-10-0493-01 Canadian Business Counts, with Employees,” Government of Canada, 2021, https://doi.org/10.25318/3310049301-eng.

[55] Seth Nowak, “Big Opportunities for Small Business: Successful Practices of Utility Small Commercial Energy Efficiency Programs” (Washington, DC: American Council for an Energy Efficiency Economy, 2016), aceee. org/researchreport/u1607.

Table 37. Certified Energy Managers & Energy Managers in Training certifications results				
Province/ territory	CEMs & EMITs (May 2022)		CEMs & EMITs per 100 large businesses (>= 100 employees) (December 2021)	Total (2 points)
	May 2022	Year-over-year change		
NS	77	20	12.7	2
BC	348	57	10.5	1.75
ON	1012	72	10.0	1.5
NB	46	4	9.3	1.5
AB	227	75	7.1	1
SK	35	4	5.4	0.75
YT	1	0	3.7	0.5
MB	29	-1	3.1	0.5
PE	3	0	2.8	0.25
QC	148	7	2.5	0.25
NL	2	1	0.7	0

Note: two individuals (AB, ON) hold both EMIT and CEM certificates. They have been counted only as CEMs.

Community energy planning

In our information request, we asked respondents to identify any support provided to facilitate local/community energy planning and/or management. We award up to one point to provinces that could identify clear and defined initiatives to build energy management and planning capacity in municipalities or Indigenous communities. These are typically community energy managers who develop and implement community energy plans. Provinces may receive partial points for initiatives that aid municipalities in energy management, but do not clearly lead to community energy planning more broadly. We describe provincial initiatives in this area in Table 38 below.

Table 38. Support for community energy management and planning		
Province/territory	Description	Score (1 point)
BC	With support from the federal government's Investing in Canada Infrastructure Program, the Province of British Columbia's Green Infrastructure - CleanBC Communities Fund provides support for increased capacity to manage renewable energy. The First Nations Clean Energy Business Fund capacity funding stream provides funding for community energy planning in Indigenous Communities. The New Relationship Trust also has a capacity funding stream that Indigenous communities can access for community energy planning purposes as well. The Local Government Climate Action Program provides local governments that are signatories of the BC Climate Action Charter or Modern Treaty Nations with funding to plan and implement emission reduction strategies and help communities prepare for future climate impacts. The CleanBC Remote Community Energy Strategy (RCES) is a multi-stakeholder initiative to reduce diesel consumption for electricity generation in remote communities. The RCES assists communities with developing community-led energy efficiency and clean energy projects, and provides programs to help improve energy performance and minimize emissions in new construction and retrofits. BC Hydro's Sustainable Communities program supports community energy planning and management. Program support includes co-funded Community Energy Manager positions in 16 local governments with specialties in sustainability, building, and transportation. BC Hydro supports a larger Community Energy Management network for all interested local government staff. BC Hydro also supports three topic specific Local Government Peer Networks focused on new construction efficiency via the BC Energy Step Code, electric vehicles, and low carbon retrofits. FortisBC supports Climate Action Partners through the Community Energy Specialist program. These funded positions lead policy development and implementation as communities develop or refresh their sustainability and energy plans, including BC Energy Step Code support where applicable, and raise awareness of and participation in conservation and energy management programs. There were nine participants in 2021. FortisBC	1

	also support Commercial Energy Analysts, Specialists and Thermal Energy Managers through the Commercial Energy Specialist program. The overall focus of these positions is to identify and implement energy conservation opportunities for facilities within their organization. Some of these organizations include non-profit housing, municipalities, government, and school districts. In 2021 there were 41 participants.	
MB	Efficiency Manitoba offers a Community Energy Efficiency Program. The program provides two years of funding to eligible municipalities to hire a Community Energy Efficiency Advocate, to create and implement a community energy efficiency plan. Efficiency Manitoba covers 80% of the advocate's salary up to a maximum of $40,000 each year. Efficiency Manitoba funded one community energy efficiency advocate in 2021. In addition, Efficiency Manitoba received 11 First Nation community applications, 4 municipal applications and a partnership proposal with the Winnipeg Chamber of Commerce which it is looking to fully support in 2022.	1
NB	New Brunswick Power has been sponsoring Certified Energy Procurement Professional development initiatives in partnership with QUEST-New Brunswick for over five years. The utility also works with the Francophone Municipalities Association and the Union of Municipalities of New Brunswick to identify mutually beneficial initiatives for NB Power and communities in NB — such as Project SauVÉ for municipal fleet EVs and EV ride sharing. The province’s Environmental Trust Fund also supports municipalities and other organizations in protecting, preserving, and enhancing the natural environment. Though community energy management is not explicitly mentioned as an eligible project, it awarded several projects along those lines in 2022-2023.	1
NS	The province’s Low Carbon Communities program funds community energy planning, feasibility studies, public engagement and awareness building, and demonstration projects. Efficiency Nova Scotia's Onsite Energy Managers program supports the development and implementation of long-term energy management plans for businesses, institutions, and municipalities including Halifax Regional Municipality, Cape Breton Regional Municipality, Town of Bridgewater and five small northern communities. The Sustainable Communities Challenge Fund, announced in 2022, will commit $15 million over three years to support communities’ adaptation to the impacts of climate change and reduce greenhouse gas emissions, and	1

	will be administered by the Nova Scotia Federation of Municipalities (though energy management is not explicitly mentioned as a component).	
ON	The province supports community energy planning through its Municipal Energy Plan program, which provides funding to municipalities to develop or enhance community energy plans. The plans are designed to align energy, the built environment, and land use planning to identify opportunities for community-wide energy efficiency savings. IESO's Grid Innovation Fund has supported a number of projects that facilitate local/community energy planning and/or management, including novel approaches that engage diverse stakeholders to develop road maps or frameworks for enhanced community energy planning in the past. Enbridge's Municipal Energy Solutions team assists municipalities in energy and climate change mitigation planning and execution.	1
AB	The Municipal Climate Change Action Centre (MCCAC) offers the Municipal Energy Manager Program, which funds local governments to hire energy managers who in turn develop energy management plans, identify cost and energy saving opportunities, and implement renewable energy and energy efficiency projects. The MCCAC offers the Municipal Energy Champions Program to support smaller communities with a low capacity for energy management, climate change planning, or emission reduction projects. Recognizing that these smaller local governments may only require short-term support, this program offers free person-to-person outreach and advisory services to enable participation in energy management initiatives.	0.5
QC	The Ministry of Energy and Natural Resources (MERN), through the Energy Management component of the EcoPerformance program, funds up to 75% of eligible costs (maximum of $310,000) to businesses, institutions, and municipalities, which includes support for hiring an energy manager.	0.5
SK	SaskPower is running a pilot program with five northern Indigenous communities. The pilot includes funding for community energy plans that would be developed for each participating community, to assist the communities with energy management planning and help the utility examine future programming opportunities to support	0.5

	them.	
YT	The Government of Yukon is completing an energy capacity development project to document and improve the ability of Yukon communities to implement energy projects with local benefits. The Community Institutional Energy Efficiency Program provides support for energy benchmarking and ongoing measurement of verification, and financial and technical support to assist First Nations and municipalities to complete major energy upgrades to community buildings.	0.5
PE	-	0
NL	-	0

Training and professionalization

The training and professionalization section addresses provincial policies and initiatives related to "building workforce readiness." The building workforce is multi-faceted, comprising building owners and developers, engineers, architects, and designers, contractors and trades, building officials, and building managers and occupants. The training and professionalization ecosystem for this workforce is even broader, encompassing government, training and educational providers, manufacturers, industry and unions. The policy regimes that govern this sector are also complex, vary from province to province, and thereby are difficult to identify best practices for, let alone clear benchmarking. Provinces also have varying workforce regulatory and licensing practices which shape the context of energy efficiency related certification and quality assurance.

Accordingly, we track three aspects of this policy area that are broadly applicable to all provinces, regardless of their specific building workforce regulatory and licensing practices: the existence of building workforce readiness plans and/or studies, energy-literacy initiatives, and professionalization strategies in energy efficiency programming.[56]

Recent studies by the Canada Green Building Council and Eco Canada, among others, have highlighted the urgent need to address workforce shortages, and the general low-level of "green literacy" and other energy efficiency-related skills gaps in Canada's building workforce.[57] Canada will need to address these challenges if it is to substantially reduce building-sector GHG emissions, and thus our ability to meet our climate goals for 2030 and beyond.

As this sector evolves and our internal capacity to track more fine-grained elements of building workforce training and professionalization policy develops, we expect that this section will become more comprehensive in future scorecards.

[56] Although previously discussed in this section, Energy Advisors can be found in the Buildings chapter and Certified Energy Managers can be found in the 'energy management capacity' section.

[57] Canada Green Building Council, "Canada's Green Building Engine: Market Impact and Opportunities in a Critical Decade" (Vancouver, B.C.: Canada Green Building Council, 2020).

Workforce readiness plans and studies

In its recent study of building workforce skill needs and gaps, ECO Canada offered seven broad recommendations for government action. Its lead recommendation urged governments to develop labour market information and an industry outlook of workforce demand. According to the organization, poor labour market information limits insight into employment and occupational opportunities associated with energy efficient buildings, which also restricts the ability of job seekers, providers, and the broader training and educational providing system to effectively plan for future demand.[58]

We asked information request respondents to describe any strategies, plans or studies provinces and territories have undertaken to address workforce requirements to achieve Canadian net zero energy ready building goals. We provide responses in Table 39 below. To score this metric, we assessed the extent to which responses demonstrated a concerted effort on the part of the province to a) study the issue, b) engage relevant stakeholders in consultation, and c) move toward a clear plan or strategy to address it. We award up to one point, based on this assessment.

[58] ECO Canada, "Assessment of Occupational and Skills Needs and Gaps for the Energy Efficiency Buildings Workforce" (Ottawa, ON: ECO Canada, February 2021).

Table 39. Building workforce readiness plans and studies		
Province/ territory	Description	Score (1 point)
NS	The province commissioned CaGBC to assess existing construction industry capacity and identify the specific skills necessary to deliver low-carbon buildings as well as current skills gaps in the industry. This project spurred a provincially funded NZER Workforce Coalition which aims to strengthen the low-carbon building workforce for deep retrofit and zero-carbon construction. It is comprised of representatives from government, NGOs, and industry leaders. The 2030 Low Carbon Economy Transition Training Strategy was completed in 2021. The purpose of this work was to engage industry, government, and educational institutions to develop a low carbon economy transition training strategy. The details outlined in the strategy included the current state of the low carbon training market, the identification of existing technical training resources, and a summary of a delivery matrix consideration for a mixture of face to face and online/distance learning.	1
BC	In 2018, the provincial government launched a Workforce Readiness initiative to identify the labour requirements created by its CleanBC plan. Following industry and intergovernmental consultations, the province extended the project's timeline to ten years and has broadened it to consider post-COVID economic and job recovery. As of writing, the CleanBC Workforce Readiness Plan has not been released. The project was funded through the Canada-BC Labour Market Development Agreement's Sector Labour Market Partnerships program as administered by the Ministry of Advanced Education, Skills and Training.	0.75
NB	The Canadian Home Builders Association (CHBA) has undertaken market research with funding provided by the Environmental Trust Fund to identify the obstacles to meet the province's climate change goals for residential construction. Knowledge gaps were identified, and courses were recommended and offered by CHBA-NB.	0.75
AB	The province contributed funding to a Canada Green Building Council (CaGBC)-led study of existing construction industry capacity and identify specific skills necessary to deliver on low-carbon buildings and homes, and to identify skills gaps in the building industry.	0.5

ON	The province contributed funding to a CaGBC-led assessment of existing construction industry capacity that identified the specific skills necessary to deliver low-carbon buildings as well as current skills gaps in the industry.	0.5
MB	Efficiency Manitoba is part of an expert working group assembled by the Manitoba Environmental Industries Association (MEIA) to collaborate and develop a plan for a made-in-Manitoba Energy Advisor (EA) training program offered through RRC Polytech. The program is designed to train individuals to become Energy Advisors to ready the market for changes to the anticipated provincial building code and Efficiency Manitoba program enhancements. Efficiency Manitoba is also providing bursaries and financial support for Indigenous students.	0.5
QC	Under its Master Plan, the provincial government has committed to attracting students to energy transition employment. The government has also supported the creation of the Québec Intelligent Energy Network (RQEI), which comprises researchers, academics, and colleges to promote collaboration on the creation and dissemination of knowledge to better meet energy challenges.	0.25
NL	-	0
PE	-	0
YT	-	0
SK	-	0

Though several provinces have provided support for studies into building workforce requirements, only British Columbia and Nova Scotia reported efforts extending beyond study toward the development of a strategy. We note that this effort was carried out through the federal-provincial Labour Market Development Agreement process, which all provinces also participate in. This suggests the federal government could encourage the development of similar initiatives in other provinces.

We awarded partial points to provinces that had supported a study, but that had not yet developed a plan or strategy. Québec's response indicated neither a study nor a strategy, but that the issue has been recognized as something that needs to be addressed.

Initiatives to improve buildings workforce energy literacy

Building or retrofitting for high-performance energy efficient buildings requires more than the technical skills associated with typical education and training programs for the building workforce. As the Canada Green Building Council has noted, there is also a need to increase overall levels of "green literacy" or better understanding of the broad implications of key building activities on the environment and the market infrastructure.[59] Green literacy entails wider acknowledgment of the reasons why we need to build more energy efficient buildings, develop the soft skills required to market these improvements, and pursue further technical training in advanced building and construction techniques. The need for greater literacy is relevant to the entire building workforce - from designers and architects, to construction trades, and to building officials and operators.

Building green and energy literacy is a major challenge faced by provinces and will require concerted planning and strategies to define requirements, develop curricula, credentialing, and certification programs, and to provide accessible opportunities for retraining the existing workforce. For this Scorecard, we asked provinces to identify any such initiatives, including support for training provided by program administrators or provincial governments. We award up to one point to provinces that demonstrated they had taken concrete action to develop curricula and programs to improve green/energy literacy in the building workforce, preferentially as part of a clear and well-defined strategy. We awarded partial points where we found support for training, but not as part of a broader effort to up-skill the building workforce.

[59] Canada Green Building Council, "Trading up: Equipping Ontario Trades with the Skills of the Future" (Canada Green Building Council, 2019).

Table 40. Initiatives to improve buildings workforce energy literacy		
Province/ territory	Description	Score (1 point)
NB	NB Power offers several virtual learning opportunities to architects, engineers, contractors, operators, and others in preparation for the new building code adoption. Sessions include but are not limited to Energy Management and Audit and Introduction to Net Zero High Performance Building Envelopes. While not mandatory, the Registered Energy Efficiency Builder (REEB) program, administered by the Canadian Home Builders' Association – New Brunswick and funded by the NB Environmental Trust Fund, requires builders to take energy efficiency training from NB Power (free of charge) to be listed on the registry. The province supported New Brunswick Community College's Net Zero Ready Smart Home Build education and demonstration project via the Environmental Trust Fund. The province's Climate Change Action Plan mandates that NB Power provide training for building contractors through partnerships with the Canadian Home Builders' Association — New Brunswick and other stakeholders. In 2021, the province supported several Skilled Trades Exploration Programs (STEP) in partnership with Mentor Apprentice Program Strategic Workforce Services. These programs provide women with skills trades training over a period of 12-16 weeks and matches them with an employer. In 2022-23, the province will be expanding this program to support other under-represented groups.	1
BC	A $5 million education and workforce training initiative enabled public post-secondary institutions to provide short-duration micro-credentials for re/upskilling. In fall 2020, the province supported the development of 23 micro-credential pilot offerings. Most relevant to energy efficiency are Camosun College's advanced skills for efficient building design, and Selkirk College's refrigeration skills courses. The province's Micro-credential Framework was released in September 2021 while Budget 2021 provided funding to support additional micro-credential development. Information on the micro-credentials being developed under this funding is expected to be available during Spring 2022. FortisBC supports a variety of capacity building and training initiatives through post-secondary institutions, Trade Ally	1

	Network, and Home Performance Stakeholder Council. In addition, FortisBC's Residential Energy Efficiency Works program provides training to help lift employment barriers with respect to the energy-efficiency construction industry and their New Home Program (residential new construction) provides funding to train facilitators on how to effectively run an Integrated Design Process with varied stakeholders.	
ON	The IESO's Save on Energy Training and Support program provides financial incentives for a range of training courses (e.g., Certified Energy Managers; Advanced Building Recommissioning). The IESO also supports a variety of custom building energy training initiatives such as BOMA's Restarting Smart Series for businesses and the Canadian Coalition for Green Health Care's Energy Lite Healthcare Operator Training and Support Program. Enbridge's new construction programs are designed to advance the industry understanding on how to achieve future advanced standards while maintaining fossil fuel heating systems. This is performed through sponsored workshops and consulting.	1
NS	The province provided funding to Clean Foundation to administer the Clean Leadership Summer Internship program for youth interested in a career in the low-carbon economy and the Black, Indigenous, People of Colour (BIPOC) and Mi'kmaq Energy Training Pilot which trains people from under-represented groups to become Energy Advisors and clean energy tradespeople. The province has provided funding to Efficiency Nova Scotia to develop additional low/no-cost training for the energy efficiency requirements in new buildings. The Mi'kmaw Home Energy Efficiency Project lists "community-preferred partners" who are qualified contractors that have worked within – or are from – the community, recommended by housing managers.	0.75
MB	Red River College Polytechnic includes courses on Manitoba energy codes, including provincial specific amendments, and offers a part-time Energy Advisory training course in collaboration with Efficiency Manitoba and the Manitoba Environmental Industries Association. Efficiency Manitoba has also collaborated with the Building Owners and Managers Association of Manitoba (BOMA Manitoba), Natural Resources Canada, and the Canadian Institute for Energy Training (CIET), Efficiency Manitoba provided a course subsidy for the Recommissioning for Existing Buildings (RCx) Course that took place on March 11 and 12, 2021	0.75

	In partnership with the Canadian Institute for Energy Training (CIET), Efficiency Manitoba provided a course subsidy for the Fundamentals of Compressed Air Systems Course that took place on May 20, 2021. The course is designed to teach facility engineers, operators, and maintenance staff how to achieve 15-25% cost savings through more effective production and use of compressed air. Efficiency Manitoba, as a Contributing Member to the Illuminating Engineering Society (IES) supported and provided training in the educational course “Fundamentals of Lighting”. The training is an in-depth study (25 hours) in Lighting Principles and Design. There were 12 local participants in the 10-lesson course running from Apr. 20 to May 20, 2021.	
YT	The Yukon government is providing up to $20,000 to Yukon Women in Trades and Technology, to develop training and post-training support as part of a "Women for Women Retrofit Program" to increase the number of retrofits undertaken by women.	0.5
SK	SaskPower partnered with NRCan to provide various forms of Energy Efficiency training for more than 100 customers through the Canadian Institute of Energy Training (CIET) in 2020 and 2021. The types of training provided ranged from Certified Energy Manager training to Energy Efficiency for Building Operators training. NRCan has also awarded SaskPower funding over the next three years to recruit and train 75 EnerGuide Energy Advisors to meet increased demand of individuals wanting to participate in the grant program - Canada Greener Homes Grant (CGHG). SaskEnergy facilitates training on gas heat pumps for contractors and engineers.	0.5
PE	Members of efficiencyPEI’s trade organization, the Network of Excellence (NoE), must participate in ongoing workshops and training to maintain membership. efficiencyPEI partners with various stakeholders to provide net zero emission buildings training. In January 2022 they collaborated with Canadian Home Builders Association to offer a R2000 Insulation builder training course.	0.5
QC	The provincial government reported that a study was conducted in 2021 to determine the availability of continuous energy efficiency training. The objective of the study was to assess what training is currently offered and to evaluate the needs of the building, industry and transport sectors. The results of this study have not been made public.	0
NL	-	0
AB	-	0

Professionalization of building workforce in energy efficiency programming

Identifying building workforce readiness and future requirements, developing plans and strategies to increase green/energy literacy in the building workforce, and providing training to existing workers are all important aspects of training and professionalization. These efforts involve a wide range of stakeholders, including provincial governments, education and training institutions, the construction industry, trade unions and more.

While training and capacity-building will be essential, so too will be creating demand for these skills and reinforcing professionalization across the building workforce. Energy efficiency programs can play an important role in this regard, as key points of entry for homeowners and building managers into the world of high efficiency building construction and retrofitting. One way in which efficiency programs can reinforce professionalization is to establish professional or trade networks consisting of companies that have the necessary technical and soft skills (and green/energy literacy) to ensure that efficiency improvements are implemented effectively. Alternatively, programs can require installation be performed by licensed professionals, or develop and put in place further credential/certification requirements that go above and beyond the minimum requirements associated with general trade licensing practices.

We award up to one point to provinces that demonstrated initiatives to improve or promote energy efficiency-related credentialing and professionalization within energy efficiency programming. We award additional points to clear, provincewide initiatives to identify, develop and implement credentialing or licensing requirements in energy efficiency programming that exceed existing standards, and/or are specific to energy efficient construction best practices. We awarded partial points where respondents provided evidence of work underway to develop such requirements that have yet to be implemented, or where professional requirements within energy programming were equivalent to provincially licensed tradespeople.

Table 41. Professionalization in energy efficiency programming		
Province /territory	Description	Score (1 point)
BC	The Home Performance Stakeholder Council – Registered Contractor List, enacted March 2020, resulted in a managed list of Registered Contractors that can be used by participants of the CleanBC Better Homes and joint-utility Home Renovation Rebate Program. The list includes contractors installing energy efficient, lower-carbon home performance solutions for heating ventilation and air conditioning (HVAC, i.e., furnaces and heat pumps), insulation and air sealing, and fenestration services for residential renovations in BC. General renovation contractors and Energy Advisors will be added to the list in the future. The HPSC included the development of accreditation and certification criteria and required training in consultation with industry, the development of systems and protocols needed to manage the Registered Contractor list effectively and efficiently, and the promotion of the Registered Contractor list through continued and expanded engagement with the residential renovation community. Those accessing the CleanBC Better Homes and joint-utility Home Renovation Rebate Programs insulation and air source heat pump incentives require the use of a Program-Registered Contractor while those accessing the CleanBC Income Qualified Program require Program-Registered Contractor for insulation, heat pump, and fenestration incentives. The CleanBC low-interest Financing Program requires the use of a Finance Registered Contractor. In addition, BC Housing requires all Part 9 residential builders to earn a minimum of 20 points in its Continuing Professional Development program each year to remain eligible to work, see https://www.bchousing.org/licensing-consumerservices/builder-licensing/CPD. FortisBC's Trade Ally Network provides directories for customers to find a licensed contractor. For certain residential upgrade measures, participants are required to use a program registered contractor in order to access rebates. These registered contractors are required to complete training, provide proof of company legitimacy, and pass quality assurance site visits on their installations as required. BC Hydro, FortisBC, and the province have developed training and certification of Program Registered Contractors for	0.75

	insulation, HVAC, and Energy Advisors. This is being transitioned to a third-party model managed by the Home Performance Stakeholder Council.	
QC	The Novoclimat program requires the participation of general contractors and ventilation contractors certified according to the specific parameters of this energy efficiency program for the residential sector. The Recommissioning component of the MERN EcoPerformance program requires the use of a recommissioning agent who has completed four days of training and passed an NRCan competency exam. Énergir's Recommissioning program has a similar requirement. A Régie du bâtiment du Québec licence is required for anyone who carries out construction work. To be qualified to perform specialized work such as the installation of a heat pump, a contractor must possess a licence with a combination of heating/ventilation and refrigeration subclasses.	0.5
NL	takeCHARGE requires Heat Recovery Ventilation installers to have successfully completed a Certified Residential Mechanical Ventilation certification. To qualify for on-bill heat pump financing, it must be installed by a Journeyperson Refrigeration and Air Conditioning Mechanic and a Registered Electrical Contractor working under permit. The takeCHARGE website maintains a list of technicians that meet a variety of requirements; however, there are no requirements related to energy efficiency-specific training or credentialing.	0.5
MB	Efficiency Manitoba maintains a "Registered Supplier" list of professionals in a variety of areas, including general contractors, insulation installers, heating system installers, electricians, and more. There are no requirements related to energy efficiency-specific training or credentialing to become part of this network. Efficiency Manitoba's New Homes Programs requires registered Energy Advisors complete an EnerGuide Rating of the modelled home. Efficiency Manitoba also uses pre-qualified compressed air contractors to perform baseline logging of compressed air systems. Pre-qualified contractors have met predetermined qualifications, including completion of courses, and have entered into agreements with EM to perform such services.	0.5

NB	Several NB Power programs require registered Energy Advisors through registered Energy Management Service Providers (EMSPs). Heat pump installations must be done by an accredited professional, and contractors must be pre-qualified through an application. The Small Business Lighting program requires a licensed commercial or industrial electrician to do the retrofit work.	0.25
NS	Efficiency Nova Scotia maintains a “Preferred Partners'' list of professionals in a variety of areas, including general contractors, insulation installers, heating system installers, electricians and more. There are no requirements related to energy efficiency-specific training or credentialing to become part of this network.	0.25
SK	SaskEnergy requires all plumbing, heating, electrical, air conditioning and ventilation work performed by or on behalf of SaskEnergy Network Members to be performed by licensed tradespeople or apprentices. Energy efficiency programs are only offered through Network Members	0.25
ON	The IESO’s Energy Manager program requires professional designation (Certified Measurement and Verification Professional; Certified Energy Manager, or Certified Energy Manager in Training), and direct-install programs (including Small Business Lighting and First Nations Conservation programs) require installers/technicians to complete work in accordance with provincial regulations and licensing.	0.25
AB	Under the Clean Energy Improvement Act, service organizations, energy auditors and subcontractors that install or otherwise provide a product or service for an energy efficiency or renewable energy upgrade must become a CEIP Qualified Contractor and be listed on the CEIP Qualified Contractor Directory. To become a Qualified Contractor certain insurance and code of conduct measures must be met. Once a Qualified Contractor has been selected by a property owner to perform work, they must enter into a Project Agreement with Alberta Municipalities and the property owner.	0.25
YT	In 2021, the territory launched a rebate for energy-related training. Professionals may register for a training program of their choice, and apply for a rebate after completion.	0.25
PE	efficiencyPEI requires that members of its trade organization, the Network of Excellence, that are involved in the heat pump and solar rebate programs meet additional credentialing requirements. For example, those participating in the solar rebate program must earn certification through the Canadian Solar Institute and be a member of the Canadian Renewable Energy Association.	0.25

Grid modernization

Electricity grids, and the institutional structures that manage and govern them, evolved in the 20th century to deliver vast amounts of electricity from centralized generation plants to consumers spread out across a wide service area. Several recent developments have challenged this model, particularly increased integration of variable renewable sources of electricity, such as wind and solar power, either at grid scale or on or near homes and businesses. Consumer preferences have changed as well, as some end users have sought more information and control over their electricity consumption. Natural gas networks are undergoing similar transformations, as utilities and regulators explore peak shaving and "non-pipe" solutions to avoid more costly natural gas infrastructure, and to strategically retire pipes that are aging, unsafe (e.g., Aldyl-A plastic pipes), or in neighbourhoods prioritized for electrification.[60]

As utilities and governments have come to appreciate the multiple benefits of demand-side management — including energy efficiency and demand response measures—they have adopted new practices and pursued new technologies to manage energy systems. Increasingly, they are recognizing the flexibility benefits of demand-side resources, that is, the ability to rapidly change energy demands at certain times, or in specific locations, to improve energy network efficiency. For example, demand-side flexibility might be a readily available, and cost-effective way to accommodate a higher share of renewable energy on a grid.[61]

Grid modernization broadly describes the introduction of new technologies and practices to enhance resiliency. System operators can implement multiple smart grid technologies and practices to modernize both electricity and natural gas grids. In this section, we focus on efforts taken in provinces to develop and strategically use advanced metering infrastructure to achieve energy savings. We also examine planning processes for and piloting of geo-targeted energy

[60] Justin Gerdes, "Can Non-Pipeline Alternatives Curb New York's Rising Natural Gas Demand?," October 17, 2018, https://www.greentechmedia.com/articles/read/can-non-pipeline-alternatives-curb-new-yorks-rising-natural-gas-demand.

[61] Jennifer Potter, Elizabeth Stuart, and Peter Cappers, "Barriers and Opportunities to Broader Adoption of Integrated Demand Side Management at Electric Utilities: A Scoping Study" (Berkeley, CA: Electricity Markets and Policy Group, Berkeley Lab, February 2018).

efficiency as a “non-wire” alternative in transmission or distribution grid planning, and the use of conservation voltage reduction (CVR) or volt-var optimization (VVO).

Advanced metering infrastructure

Utilities have traditionally measured electricity and natural gas consumption with simple meters at the customer’s location; these record only total consumption and thus require periodic, manual meter readings. A core component of grid modernization is the replacement of traditional meters with smart meters, which record consumption more frequently (often hourly) and communicate the information directly to the utility via a wired or wireless network. Smart meters are part of a broader advanced metering infrastructure, alongside the communications networks and data management systems that enable two-way communication between utilities and customers.

According to the U.S. Department of Energy, advanced metering infrastructure (AMI) provides several important functions associated with smart grids, including the ability to record consumption automatically and remotely. Yet one-way automated reading is, on its own, not equivalent to AMI. Other functions that can be provided include the ability to remotely connect and disconnect service, detect tampering, identify and isolate outages, and monitor voltage. When combined with more advanced two-way communicating meters and behind-the-meter technologies that provide information to the user and communicate with the meter, AMI also enables utilities to offer time-of-use-based rate programs and other incentives for customers to reduce or shift their energy consumption,[62] leading to both cost and energy savings.

For this Scorecard, we distinguish between two facets of provincial AMI infrastructure: AMI policies or initiatives and the extent of coverage; and activities to leverage AMI infrastructure to provide energy savings.

Policies and coverage

To score this component, we considered the extent to which provinces have taken action to implement advanced metering infrastructure and evaluated current coverage in different end use market segments (residential, commercial, industrial) in both electricity and natural gas

[62] Office of Electricity Delivery and Energy Reliability, “Advanced Metering Infrastructure and Customer Systems: Results from the Smart Grid Investment Grant Program” (U.S. Department of Energy, September 2016).

systems. We awarded up to one point to provinces that have achieved comprehensive coverage in one or more market segments, in either electricity or natural gas, with two-way communication functionality. We award partial points for initiatives underway but with as-of-yet low coverage, or responses that did not indicate the extent of coverage.

Table 42. Advanced metering infrastructure policies and coverage		
Province/ territory	Description	Score (1 point)
BC	Section 17 of the 2010 BC Clean Energy Act directed utilities to install advanced meters by the end of 2012. BC Hydro launched a program in July 2011, and FortisBC followed suit in 2014. A 2013 Direction to the British Columbia Utilities Commission (BCUC) set standards and conditions under which electricity consumers in the province can continue to use a legacy meter or choose to use a “radio-off” smart meter, rather than the standard smart meter model. Both BC Hydro and FortisBC (electricity) reported widespread coverage (>99%) of two-way advanced metering infrastructure (AMI) in both residential and non-residential rate classes. FortisBC Energy Inc. (natural gas) does not have advanced metering in place for any but its largest commercial/industrial customers. The utility applied to the BCUC to install AMI for all customers in May 2021. As of writing, no decision has been made by the BCUC.	1
SK	SaskPower has installed AMI meters at 98% of its commercial, industrial and farm sites. In 2021 SaskPower launched a residential AMI meter pilot program which aims to reach 100% of residential customers with AMI meters over the next 3 years. To date, 3% of residential customers have two-way meters. Nearly 100% of SaskEnergy's residential and non-residential customers have two-way meters.	1
NS	Regulatory actions related to Nova Scotia’s AMI initiative began in 2015, though installation of meters only started in 2019. Nova Scotia Power’s $133 million AMI initiative is currently underway. More than 90% of homes and businesses in the province have been upgraded to smart meters and work will continue throughout 2022 to upgrade those remaining.	1
ON	The province announced a Smart Metering Initiative in April 2004 with a target of complete coverage for all residential and small business ratepayers by 2010. Ontario has since completed a full deployment of one-way smart meters for residential and small business electricity customers with demand under 50kW. Interval meters have been mandated for electricity customers with demand over 50kW since Aug. 21, 2020. IESO reported that 93% of residential and 7% of non-residential customers now have two-way meters. Enbridge has piloted the use of one-way meters (automated meter reading, or AMR) and may be able to advance an AMI	0.75

	specific application and a viable rollout strategy to the Ontario Energy Board as soon as 2022/2023.	
AB	Installation of AMI in Alberta is the decision of the distribution utilities, though accelerated deployment may depend on the approval of a cost recovery request from the utility to the Alberta Utilities Commission (AUC). A recent report by the AUC into the distribution system notes AMI infrastructure coverage varies from utility to utility. The report notes that EPCOR is one of the few utilities with interval-capable meters installed across its service territories. ATCO Electric has one-way meters installed in its territory and plans to install 2,000 AMI meters in the Grande Prairie region. ENMAX is replacing existing meters only after end-of-life; approximately 16% of its meters are now AMI. Fortis residential and small commercial meters are not capable of interval readings; the company plans to replace all cumulative meters over the next 10 years. The City of Medicine Hat has replaced all electricity and natural gas meters with AMI meters. Additionally, the report notes that EQUS aimed for full AMI coverage by early 2021. This project has been completed.	0.5
QC	Hydro-Québec reported that it had installed more than four million communicating meters in the province, an increase from 3.9 million in 2019. Two-way meters account for 88% of residential meters, and 12% of non-residential meters. Natural gas utility Énergir did not provide information on AMI.	0.5
NB	In 2017 NB Power applied to the NB Energy and Utilities Board seeking approval to implement Advanced Metering Infrastructure; the board denied its request. NB Power reapplied in 2019 with a revised business case. The regulator approved this second application in September 2020. The project is underway with meter upgrades expected to begin in March 2022 and the project completing in 2024. Saint John Energy has a number of grid modernization and smart projects that aim to use data, storage dispatching, and load control to optimize the energy system.	0.5
MB	In April 2022, Manitoba Hydro released a request for proposal to seek consulting services related to Advanced Metering Infrastructure on an 'as and then requested' basis for a five-year term. The first objective under this consulting service agreement is for the development of a business case for AMI. EnerTrend, an energy profiling tool developed by Manitoba Hydro specifically for large industrial and commercial customers, utilizes advanced interval metering to collect near real-time data on the energy consumption of facilities.	0.25

NL	Utilities in the province have installed one-way meters for many residential and non-residential customers, though two-way meter coverage remains lower. Nine percent of Newfoundland and Labrador Hydro residential customers—and 5% of non-residential customers—have them installed.	0.25
PE	There have been smart meter pilot programs in Prince Edward Island, including 400 AMI meters installed by Summerside Electric in 2010/2011, though widespread coverage does not yet appear to be in place. Maritime Electric aims to have smart metering rolled out across the island by 2025.	0.25
YT	-	0

Leveraging AMI for energy savings

Advanced metering infrastructure (AMI) is an important component of grid management and modernization, but it can also be leveraged to facilitate energy savings and conservation. A recent ACEEE report emphasized that AMI needs complementary program strategies to leverage the technology to its full potential.[63] Such strategies can include:

- Feedback to customers and use of behavioural insights to help them reduce energy use
- Providing price signals such as time-of-use rates
- Data disaggregation to target energy savings initiatives, evaluate programs, and use innovation program designs such as "pay for performance," and
- Using grid connectivity to promote grid-interactive efficient buildings and use of conservation voltage reduction.

For this Scorecard, we asked information request respondents to identify activities in each of these four areas. To score this metric, we awarded a quarter point for clear evidence of activities by one or more utilities in each province for each area. We provide a summary of responses and scoring in Table 43.

[63] Rachel Gold and Dan York, "Leveraging Advanced Metering Infrastructure to Save Energy" (Washington D.C.: American Council for an Energy-Efficient Economy (ACEEE), January 9, 2020), https://www.aceee.org/research-report/u2001.

Table 43. Leveraging AMI to promote efficiency					
Province/ territory	Providing feedback (0.25 points)	Price signals (0.25 points)	Data disaggregation (0.25 points)	Grid-interactive buildings (0.25 points)	Score (1 point)
ON	Several local distribution companies have run temporary pilots using real-time feedback to residential customers. For example, The Nudge Report created by Alectra includes tailored suggestions for lowering peak consumption as well as specific benchmarking comments so that users may analyze their consumption behaviour month to month. In November 2021, the OEB issued guidance to the Ontario electricity and natural gas distributors to assist with their implementation of Green Button and facilitated the establishment of a Green Button Industry-led Working	AMI infrastructure supports time-of-use and tiered rates for residential and small general service <50kW customers in Ontario.	The IESO's Energy Performance Program, which currently has 300+ participating commercial and institutional facilities, uses hourly usage data to offer pay-for-performance incentives.	The IESO allows distribution connected customers to participate as Demand Response resources in its wholesale market, leveraging hourly usage data to verify performance after Demand Response activations.	1

	Group to enable ongoing collaboration during the implementation period. Green Button deployment, which provides customers access to usage data and advice on how to save energy, is closely linked to having electricity AMI infrastructure.				
NS	NS Power's AMI infrastructure offers customers bill alerts, and an energy management solution to provide energy use data, notifications, and end-use disaggregation.	NS Power piloted Critical Peak Pricing and a new Time of Use Rate in 2021 for Residential, Small General, and General customers. Subscription will be limited for the pilot phase, and rates are intended to be opt-in.	Efficiency NS's 2023-2025 DSM Resource Plan includes Pay for Performance, which is also intended to leverage AMI as part of program design. In addition, Efficiency NS continues to perform detailed planning for its 2023 Residential Behavioural relaunch, which may leverage AMI data.	The NS Power Smart Grid demonstration project is piloting the use of grid-interactive vehicle charging (two-way charging) and behind-the-meter batteries.	1
NB	NB Power has had a customer energy portal available through NBPower.com for the past six years. The utility is decommissioning the service and will replace it	NB Power’s AMI meters will be configured to enable time-of-day rate price signals, once approved for implementation through the New Brunswick Energy and Utilities Board. The utility is	Planning is underway to optimize the use of the data coming from AMI to enable better planning, targeted programming, and improved program evaluation, measurement, and	Saint John Energy’s smart grid will allow smart residential appliances to become part of the interconnected efficiency system.	1

	with an AMI enabled portal. It will go live in coordination with the overall AMI project, currently targeting 2022, and there are plans to implement a High Bill Alert feature.	also testing Time of Use Rates as part of the Smart Grid Atlantic research project.	verification.		
QC	Hydro-Québec's Hilo subsidiary provides real-time consumption for customers who have subscribed to a Hilo service (home automation network), transmits requests to customers to participate in periods of consumption reduction and offers a turnkey solution for energy management.	Hydro-Québec offers several dynamic pricing rate options.	In April 2022, Hydro-Québec launched its Energy Performance Indicator. This new tool, developed internally, aims to provide each customer with all its electricity use data at a glance. The advanced features allow them to better understand, track and analyze the elements that affect electricity bills. It also provides customers with personalized advice on how to save energy.	-	0.75
BC	BC Hydro operates a Behaviour Program for residential customers and optimization offers for business customers that make use of enhanced customer energy usage	BC Hydro's recently filed IRP has near term actions related to filing an application for a residential time-of-use rate and a home charging electric vehicle time-of-use rate.	BC Hydro uses advanced metering data for a wide range of uses for load analysis in system planning, customer service, and program and rate design.	-	0.5

	data. In addition, the utility allows customers to access their energy use data online, to analyze trends or compare against similar buildings. Although FortisBC's electric utility doesn't offer a program rebate, residential and small commercial customers can use technologies such as in-home displays, gateway modems, and software to see their near real-time usage. In 2020 and 2021, FortisBC Energy Inc (natural gas) and FortisBC (electricity), respectively, launched the MyEnergyUse online platform which ties into customers' online accounts and generates Home Energy Reports for customers to understand, measure and reduce their energy consumption.		FortisBC (electricity) has also used AMI data for measurement and verification purposes, to confirm participants' DSM project savings.		
MB	EnerTrend, an energy profiling tool developed by	-	Efficiency Manitoba uses interval meter data to pay	-	0.5

	Manitoba Hydro, uses advanced interval metering to collect near real-time data on the energy consumption of large industrial and commercial facilities.		load displacement performance incentives, specifically for electric energy generated during specific on-peak hours.		
SK	SaskPower's customer Portal supports data self-service for operational analysis to better understand power use through personalized reports of their billing, payment and consumption. There are ongoing projects to provide advanced customer analytics reports by fiscal year 2023. SaskEnergy has service agreements in place to provide AMI data for energy use monitoring.	SaskPower offers time-of-use rates to industrial customers.	-	-	0.5
AB	In its submission to the Alberta Utility Commission's distribution system inquiry, EPCOR noted that it was studying opportunities to	-	-	-	0.25

	leverage its AMI infrastructure to improve planning, optimize voltage, enhance demand response, and send price signals, to provide additional data analytics, and better understand load patterns.				
PE	-	-	-	AMI is used in the City of Summerside to support electric thermal storage to match wind generation.	0.25
NL	-	-	-	-	0
YT	-	-	-	-	0

Non-wires/pipes solutions

Energy efficiency and demand response can avoid the need to build transmission infrastructure, especially when targeting specific geographies and coupled with other strategies such as energy storage or distributed generation. There are regulatory and institutional barriers to incorporating these "non-wires" alternatives in grid planning processes, such as limited familiarity with the practice among utilities and regulators.[64]

Following our approach in the previous Scorecard, we asked information request respondents to describe planning processes in place to require or allow non-wires/pipes solutions in the evaluation of options to meet local or regional transmission or distribution requirements. We also asked them to identify any non-wires/pipes solutions that emerged from a planning process as a recommended solution, and any relevant pilot and demonstration projects.

We award up to one point for provinces that currently have planning processes for the requirement of non-wires/pipes solutions for local and regional infrastructure and have existing or completed pilot projects that incorporate non-wires/pipes alternatives. We award a partial point to provinces that are either in the process of establishing such planning processes, or have only completed pilot projects, but not both.

[64] IESO, "Barriers to Implementing Non-Wires Alternatives in Regional Planning," http://www.ieso.ca/-/media/Files/IESO/Document-Library/engage/rpr/rprag-20181101-barriers.pdf?la=en.

Table 44. Non-wires/pipes planning processes, projects, and pilots and demonstrations			
Province/ territory	Planning processes	Projects, pilots and demonstrations	Score (1 point)
ON	Both non-wires and wires options may be evaluated as part of the IESO's Regional Planning Process to meet regional electricity system needs. The IESO, transmitters, distributors, and other stakeholders participate in different stages of this process. Non-wires options are studied specifically during the Integrated Regional Resource Plan (IRRP) stage. As part of the 2021-2024 Conservation and Demand Management (CDM) Framework, local initiatives will be developed to deliver CDM savings in targeted areas of the province as identified through the IESO's regional planning process. In 2021, the IESO selected the first four target areas in Ontario for CDM initiatives to help address local system needs: Richview South area in Toronto, York Region, Ottawa, Belle River area in Windsor-Essex. On July 22, 2021, OEB issued a decision on Enbridge's IRP Proposal Application (EB-2020-0091). The decision provided a first-generation IRP Framework providing directions on OEB's requirements for Enbridge as they consider IRP (non-pipe alternatives including geotargeted energy efficiency in infrastructure planning) to meet its system needs. Enbridge Gas is expected to file an updated 10-year Asset Management Plan that includes consideration of non-pipe solutions to meet system needs, as per the IRP Framework, in its 2024 rebating application, expected in Q4 2022.	The OEB approved an additional $4.6 million in spending over the 2020-2024 period for a battery storage project that would defer distribution infrastructure as part of Toronto Hydro's Station Expansions Program. The IESO ran the local capacity auction for the York Region Non-Wires Alternatives demonstration in 2020 which procured 10 MW of local demand response and generation capacity for availability in summer 2021. In 2021-2022, the OEB partnered with the IESO in a joint targeted call to test the ability of Distributed Energy Resources to provide services to both the transmission and distribution systems. A number of projects have been supported through the Grid Innovation Fund, including: 5MW Clear Creek Non-Wires (NWA) Merchant Battery Project and the Benefit Stacking Transmission and Distribution System Non-Wires Alternatives Pilot Project. Enbridge Gas is expected to file an application	1

	On Dec. 20. 2021, the Regional Planning Process Advisory Group (RPPAG) submitted its Report to the OEB with recommendations to improve the regional planning process which the OEB accepted on April 28th. As a result of one of those RPPAG recommendations, the OEB will be amending two of its Codes to require all transmission asset owners -- transmitters and applicable distributors -- to provide end-of-life information on major transmission assets to the IESO, based on a longer-term outlook. This is intended to provide the IESO with the necessary amount of time to assess non-wire alternatives, including energy efficiency, as part of the IRRP process to determine if they are a viable option to a typical like-for-like wires replacement to meet the regional need. The Code amendments are expected to be finalized before March 31, 2023. In addition, with NWAs being implemented on the electricity side and Enbridge recently receiving OEB approval to invest in non-pipe alternatives (NPAs) on the gas side, another Regional Planning Process Advisory Group recommendation focused on increased planning coordination between the electricity and gas sectors.	for two non-pipe alternative IRP pilot projects with the OEB by the end of 2022.	
BC	FortisBC's electric utility considers non-wires alternatives on a project-by-project basis in its certificate of public convenience and necessity (CPCN) filings. It has also developed and utilizes a deferred capital expenditure factor to put an economic value on its demand side management (DSM) capacity savings. FortisBC's natural gas utility is exploring the potential of gas DSM programs to defer or avoid infrastructure through its integrated resource planning initiatives especially related to customers'	FortisBC (electricity) completed a commercial and industrial demand response pilot project in 2021 and has launched a second demand response pilot project, targeted at residential customers, which is expected to be completed in 2023. The utility is also currently undertaking a demand response pilot program in a region that is experiencing summer capacity constraints. It is planning on including a	1

	ability to manage peak demand. AMI may provide some opportunity, and this may be explored in future years. Other non-pipe solutions continue to be explored. BC Hydro's pilot work over the past few years has led to the development and inclusion of a Non-Wires Alternative (NWA) program which will be included in DSM Plans moving forward. This program will provide potential alternatives to traditional capital build solutions in substations to meet local or regional needs.	permanent residential and commercial demand response program as part of its upcoming 2023-2027 Demand Side Management Expenditures Plan. BC Hydro has identified a non-wires solution project to address capacity constraints at the Hope substation. Implementation is planned for 2022.	
NS	In 2016 the Nova Scotia Utility and Review Board (NSUARB) ordered Efficiency Nova Scotia and NS Power to begin investigating non-wires alternatives and locational DSM (geotargeting) techniques. Three reports on the topic have been provided under board proceeding number M07815, and provide conceptual design information and proposed preliminary techniques for economic comparison. In 2020 NS Power produced updated avoided costs of transmission and distribution reports, which are available publicly at the NSUARB. These avoided costs provide an enabling key piece of information for the development of further locational DSM activity in Nova Scotia.	A locational demand side management ("Klondike") pilot was completed in 2020 for customers in the Kentville area which provided enhanced incentives through five existing Efficiency Nova Scotia programs. This first geo-targeted effort provided learnings and identified opportunities to build on delivery approaches for future efforts. Opportunities for locational pilots as a demand-side resource for capacity-constrained assets continue to be explored.	0.75
QC	Hydro-Québec currently has a planning process that includes non-wire alternatives, but is working on updating it to integrate the most promising alternative solutions.	Hydro-Québec reported that some pilot projects at substations are currently underway, but did not offer further details. The Lac-Mégantic Microgrid and two distributed solar power plants were deployed in 2021.	0.75
NL	Newfoundland Power's capital planning process allows for the	A feasibility study was completed for a potential	0.75

	evaluation of non-wire alternatives (NWA) where they are applicable. Typically, NWAs are evaluated for potential feeder additions for load growth distribution projects.	battery storage solution in the Twillingate area of the province, but the study showed that it was not cost-effective.	
MB	Distribution and Transmission planning processes allow for but do not require non-wires/pipes solutions to be included in the evaluation of options to meet local/regional investment in infrastructure. This includes the consideration for the application of pipeline gas compressors and the use of stored propane or liquid natural gas to support system peak requirements. Manitoba Hydro has started initial work on developing a location specific DSM marginal value to be used to identify system constraints that could benefit from geotargeting.	Some “smart wire” solutions have been implemented on the transmission system, including upgrading technology and management of overloaded transmission lines. Manitoba Hydro is also exploring energy storage potential in the transmission system.	0.5
SK	SaskEnergy reported that it has shifted its strategy to target end-use energy efficiency prior to infrastructure investments in capacity expansions. SaskPower reported that its planning process for its transmission system considers the most cost-effective wires or non-wires solutions.	-	0.25
YT	-	The utility is investing in a grid-scale battery to provide peak demand management and is testing electric thermal storage units as a load-shifting tool.	0.25
PE	The 2016-2017 Energy Strategy notes that geo targeted energy efficiency can avoid the need to build transmission and distribution capacity. The plan calls for developing a set of guidelines for when geo targeted energy efficiency should be considered and developing geo targeted energy efficiency	-	0.25

	protocols. efficiencyPEI reported that its 2022-2024 DSM plan will identify geo-targeted demand response and energy efficiency initiatives		
AB	A 2021 study by the AUC into the distribution system identified a number of barriers to non-wires alternatives and distributed energy resources (particularly energy storage).[65] Bill 22: Modernizing Alberta's Electricity Grid was passed in spring 2022 which adds non-wire services to the function of electric distribution utilities, but its applicability outside of distribution-connected battery storage is unclear.	-	0.25
NB	-	-	0

[65] Richard Goldberger, "Looking to the Future: AUC Releases Final Report of Distribution System Inquiry into Modernization of Grid to Realize Benefits of Distributed Energy Resources," Alberta Utilities Commission, February 19, 2021, https://www.auc.ab.ca/looking-to-the-future-auc-releases-final-report-of-distribution-system-inquir/.

Conservation voltage reduction/volt-var optimization

The provinces could undertake many other grid modernization efforts that would directly or indirectly lead to greater energy efficiency, though such efforts may not be universally applicable. In this section, we evaluate initiatives to deliver electricity at lower voltages (conservation voltage reduction, or CVR) and manage reactive power and voltage levels (volt-var optimization, or VVO).

We awarded up to a half point to provinces that have acted in one or more of these areas, depending on the extent of the initiative, its formalization, and the depth of experience gained through testing and/or piloting of relevant technologies and practices. In previous years, provinces were awarded up to one point in this metric, however, this year, we reduced available points by 0.5 due to reweighting across policy areas as well as to accommodate the addition of new metrics within the Scorecard. Results are provided in Table 45 below.

Table 45. Conservation voltage reduction/volt-var optimization		
Province/ territory	Description	Score (0.5 points)
BC	FortisBC (electricity) is currently conducting a pilot to evaluate the potential for conservation voltage reduction using existing AMI meters. It is expected to be completed in 2023. BC Hydro currently runs VVO in energy-conservation mode on 42 stations, optimizing voltages for almost half of distribution feeders and covering some of the largest distribution substations. In fiscal 2021, BC Hydro estimated it achieved approximately 202 GWh of energy savings through these activities, which are not considered in the utility's DSM plan.	0.5
ON	Several local distribution companies have implemented VVO/CVR initiatives with funding from the Ministry of Energy Smart Grid Fund, including Entegrus, Hydro One, London Hydro, and EnWin. Between 2018 to 2021 Entegrus implemented a voltage regulation system, enabling conservation voltage reduction in the town of Thamesville. Grid Edge Control Devices from Varentec Inc. will be installed to establish an integrated smart grid solution, facilitating high-level grid control and visualization, as well as energy conservation through voltage reduction. The OEB approved a proposal by PUC Distribution for a smart grid initiative that will transform the utility's entire distribution system through an integrated project implementing various technologies such as Voltage/VAR Optimization, Distribution Automation and Advanced Metering Infrastructure. The project is scheduled to be in-service by Dec. 31, 2022.	0.5
AB	The City of Lethbridge is piloting Conservation Voltage Reduction with the support of Alberta Innovates. The software adjusts the voltage provided to connected customers to optimal levels using data from the Advanced Metering Infrastructure installed at customer sites.	0.25

NB	New Brunswick Power completed a conservation voltage reduction study in November 2020 as part of a Grid Modernization Research and Development Pilot Project, with Siemens, Natural Resources Canada, and the National Research Council. Approximately 5,000 NB Power homes and businesses in specific areas of the province were part of this one-year research and demonstration pilot project. The company plans broader conservation voltage reduction implementation in 2022/2023.	0.25
NL	Newfoundland Power uses conservation voltage reduction to manage peak load in the winter and has a commercial curtailment program during time of peak load on the system. Newfoundland and Labrador Hydro does have conservation voltage reduction capability but has not used it for energy conservation purposes to date and there are no immediate plans to do so. The utility also has curtailment options built into contracts with two industrial customers.	0.25
QC	Hydro-Québec conducted the 'CATVAR' (1, 2) project between 2007 and 2016 to install and demonstrate equipment to manage distribution grid voltage and reactive power. The company cancelled the project in 2016 due to planned energy surpluses and less than expected energy savings (though the deployed equipment will be maintained on the network until end-of-life, and thus will continue to deliver some energy savings)	0.25
SK	SaskPower has planned a volt-var optimization pilot for 2022. This pilot will leverage volt-var information acquired through AMI meters and smart substation metering and reclosers used to establish a dynamic volt-var baseline. This baseline will be used to implement measures to compensate for volt-var to reduce system losses.	0.25
MB	-	0
NS	-	0
PE	-	0
YT	-	0

Buildings, appliances, and equipment

Canada's buildings sector is responsible for about 28% of end use energy demand and is the largest source of potential energy savings, according to the IEA/NRCan national level energy efficiency potential study.[66] Buildings are also where we spend a significant amount of our time in our cold-climate country. They are a significant and often neglected component of Canada's infrastructure, and high-performance buildings are increasingly important for our quality of life, physical and mental health, and economic productivity.

Building sector policies are complex. Many strategies can influence the energy efficiency of our built environment, and provinces have numerous opportunities to demonstrate leadership.

- **Building codes** (twelve points total)
    - Houses and small buildings (four points)
    - Commercial, institutional, and multi-unit residential buildings (four points)
    - Municipal flexibility (half a point)
    - Retrofit code development (half a point)
    - Building code compliance activities (three points)

- **Labelling, benchmarking and disclosure** (six points total)
    - Numbers of Energy Advisors (two points)
    - Voluntary rating and disclosure (one point)
    - Mandatory rating and disclosure (two points)
    - Building performance standards (one point)

- **Appliances and equipment standards (**one and a half points**)**

We list overall scores by province and by topic in Table 46.

[66] International Energy Agency and Natural Resources Canada, "Energy Efficiency Potential in Canada to 2050."

Table 46. Building scoring results

Province/ territory	Building codes (12 points)	Labelling, benchmarking and disclosure (6 points)	Appliances and equipment standards (1.5 points)	Total (19.5 points)
BC	6.25	1.75	1	9.5
QC	2.5	2.25	0.5	5.25
YT	2.25	2.25	0	4.5
ON	1.75	2.5	1.5	5.75
PE	2.5	2	0	4.5
NS	1.25	2.5	0.25	4
SK	2	0.5	0	2.5
NB	0.75	1.25	0.25	2.25
NL	1.25	0.5	0	1.75
MB	1.25	0.75	0	2
AB	1	1	0	2

Building codes

Building codes set minimum standards for new construction, including energy efficiency requirements. Those that require higher energy efficiency performance effectively "lock in" significant long-term energy savings and avoid the need for costlier, more difficult retrofits later.

The provinces and territories hold responsibility for adopting new building codes and can further delegate that responsibility to local governments. The Canadian Commission on Building and Fire Codes (CCBFC), an independent committee of volunteers established by the National Research Council of Canada, develops model codes that provinces can adopt and amend. Section 9.36 of the National Building Code (NBC) establishes energy efficiency performance

requirements for houses and small buildings.[67] The National Energy Code for Buildings (NECB) prescribes minimum performance levels for all types of buildings, and is the standard for commercial, institutional, and high-rise residential buildings (Part 3 of the National Building Code). Residential buildings are responsible for about three-fifths of total building energy use in Canada, with commercial and institutional buildings accounting for the balance.[68]

Codes Canada, a unit of the National Research Council Canada, has been working for several years to update both codes. The resulting 2020 national model codes were released in March 2022. The 2020 codes are tiered codes, consisting of a base code followed by progressive tiers moving toward a longer-term performance target consistent with a "net zero energy-ready" standard.[69] Tiered codes offer provinces, territories, and (potentially) local governments more flexibility in code adoption and implementation while also offering all building sector stakeholders regulatory certainty and an anchor by which to develop a long-term strategy to cut energy waste and decarbonize the buildings sector. Provinces can move through the tiers at an accelerated pace, and municipalities can adopt upper tiers above their provincial minimums, if enabled to do so by provinces.

In previous years, we evaluated current provincial building codes and building code update plans separately. With the release of the 2020 model codes, we are revising this approach for the 2022 Scorecard, combining information about present code equivalency, inclusion of tiers, adoption plans and/or timelines for moving up tiers, and net zero energy and net zero emission code commitments into a single metric.

As of writing, no province had yet adopted the 2020 model codes. In 2019, the Regulatory Reconciliation and Cooperation Table (RCT) endorsed the Construction Codes Reconciliation

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[67] Canadian Commission on Building and Fire Codes, "Long-Term Strategy for Developing and Implementing More Ambitious Energy Codes: A Position Paper" (National Research Council Canada, 2016).

[68] Natural Resources Canada, "Canada's Secondary Energy Use (Final Demand) by Sector, End Use and Subsector," in *National Energy Use Database* (Ottawa, ON: Government of Canada, 2019), http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/showTable.cfm?type=HB&sector=aaa&juris=ca&rn=2&page=0.

[69] Kevin Lockhart, "What You Need to Know about the New Building Codes," *Efficiency Canada* (blog), February 4, 2020, https://www.efficiencycanada.org/what-you-need-to-know-about-the-new-building-codes/.

Agreement, aiming to reduce or eliminate variations in provincial building codes and to establish a standardized period of adoption of new model codes as they are published. This Agreement was ratified by all provinces and territories in 2020, effectively binding provinces and territories to implement the 2020 National Codes within 24 months of publication, and to implement subsequent codes within 18 months of publication.

Several provinces referenced this agreement in our information request, though some provinces have taken initiatives to adopt the latest codes more rapidly. In the tables below, we award points under the "Adoption plans/timelines" column only to provinces that have provided dates for adoption sooner than 24 months or for moving up tiers (if applicable), or that are currently taking concrete action to update codes. Full points are awarded only for firm timelines leading up through tiers toward net zero energy ready codes.

Houses and small buildings (Part 9)

As noted above, section 9.36 of the National Building Code (NBC) establishes energy efficiency performance requirements for houses and small buildings. The 2012 and 2015 versions of the NBC, and Tier 1 of the 2020 model code are functionally equivalent in terms of energy efficiency requirements.[70] Adopting a higher tier leads to progressively higher energy efficiency requirements from the provincial base code and is thus awarded higher points.

We scale points for current building codes (or building code equivalency) accordingly to the schedule below.

Table 47. NBC code/tier equivalency scoring methodology

NBC version	Points
NBC 2012/2015	0.25
NBC 2020, Tier 1	0.25
NBC 2020, Tier 2	0.5
NBC 2020, Tier 3	1
NBC 2020, Tier 4	1.5
NBC 2020, Tier 5	2

[70] Based on discussions with experts at Natural Resources Canada

Results for this metric are provided in Table 48 below.

Table 48. Building codes — houses and small buildings

Province/ territory	Current NBC base code equivalency (2 points)	Code includes steps/tiers (0.5 points)	Adoption plans/timelines (0.5 points)	Net zero energy commitment (0.5 points)	Net zero emissions commitment (0.5 points)	Score (4 points)
BC	2015	●	○	2030	2030	2
ON*	2020, Tier 2/3	-	○	-	-	1
YT	2015	-	-	2032	-	0.75
PE	2015	-	-	2030	-	0.75
SK	2015	-	○	-	-	0.5
AB	2015	-	○	-	-	0.5
NL	2015	-	-	-	-	0.25
QC	2015	-	-	-	-	0.25
NS	2015	-	-	-	-	0.25
MB	2012	-	-	-	-	0.25
NB	2015	-	-	-	-	0.25

** Ontario's current building code and supplemental SB12, based on the prescriptive point system, is deemed equivalent to between tiers 2 and 3 of NBC 2020 and is thus awarded 0.75 points for current code equivalency*

At time of writing, no province has adopted the 2020 model codes, though some have given indication of adoption more quickly than suggested by the Construction Codes Reconciliation agreement. Ontario has begun consultations on Tier 3 as the base code. Given that Tier 3 of the 2020 model codes is equivalent or a minor improvement to Ontario's present building code, there may be little appreciable increase in energy efficiency requirements if the province adopts Tier 3. Alberta has passed legislation that requires the adoption of federal model codes within a

shorter time frame, by March 2023. Saskatchewan has proposed an adoption date a few months earlier than the 24-month Construction Codes Regulatory Agreement time frame. The province is aiming for January 2024 adoption. This date has been approved by the minister but still needs to go through the regulatory approval process.

British Columbia remains the only province with steps/tiers presently available in its building energy codes. Provincewide, the energy requirements in the base code are equivalent to NBC 2015, however the province reported in our information request plans to make its Step 3 (equivalent to Tier 3 of the federal model codes) the base requirements by December 2022. Many municipalities in the province already require Step 2 or higher.

Only British Columbia, Prince Edward Island, and Yukon have included commitments to have net zero energy ready building codes in place by a specific date. However, the most recent New Brunswick Climate Plan, released in September 2022 (and thus outside of the window of consideration for scoring here), sets a clear commitment for net zero energy ready codes by 2030, and for the province to adopt the 2020 codes in 2023. British Columbia is the only province to have announced plans for a net zero emissions code (in its Roadmap to 2030 plan).

Commercial, institutional, and large multi-unit residential buildings (Part 3)

Unlike the NBC, the three most recent versions of the National Energy Code for Buildings (NECB) have progressively higher energy efficiency requirements for commercial, institutional, and large multi-unit residential buildings. Given that the oldest version still in use is more than 10 years old, and that two subsequent versions have been released since (not including the 2020 model codes) we no longer award any points for NECB 2011. Tier 1 of the new 2020 NECB is expected to have a 3-5% performance improvement, in general, over the 2017 version, according to communication with Natural Resource Canada personnel.

Points for current building codes (or building code equivalency) are thus scaled according to the schedule below.

Table 49. NECB code/tier equivalency scoring methodology

NECB version	Points
NECB 2011	0
NECB 2015	0.25
NECB 2017	0.5
NECB 2020, Tier 1	0.75
NECB 2020, Tier 2	1
NECB 2020, Tier 3	1.5
NECB 2020, Tier 4	2

Table 50. Building codes - commercial, institutional, and multi-unit residential						
Province/ territory	Current NECB base code equivalency (2 points)	Code includes tiers (0.5 points)	Adoption plans/timelines (0.5 points)	Net zero energy commitment (0.5 points)	Net zero emissions commitment (0.5 points)	Score (4 points)
BC	2015	●	-	2030	2030	1.75
YT*	2017	-	-	2032	-	1.0
NS	2017	-	○	-	-	0.75
AB	2017	-	-	-	-	0.5
ON	2017	-	-	-	-	0.5
PE	2017	-	-	-	-	0.5
SK	2017	-	-	-	-	0.5
QC	2015	-	-	-	-	0.25
MB	2011	-	○	-	-	0.25
NB	2011	-	-	-	-	0
NL	-	-	-	-	-	0

** Yukon has not adopted any version of the NECB at the territory level, though the City of Whitehorse does require buildings to meet NECB 2017 requirements. Given that a large portion of the territory's population lives in this city, we award partial points.*

Nova Scotia's recent Environmental Goals and Climate Reduction Act commits the province to adopt Tier 1 of the 2020 codes by September 2023. Manitoba has announced plans to adopt NECB 2017, prior to the 2020 codes, and so is awarded partial points for plans to improve energy efficiency requirements (though not to the most recent available model code levels). Prince Edward Island's net zero energy ready building code commitments extend only to residential buildings, and there is no clear indication that British Columbia intends to move to Step 2 at the end of the year for large buildings. As noted above, New Brunswick's latest climate

change plan commits the province to adopting the 2020 codes in 2023 but was released after the window of consideration for this Scorecard.

Municipal flexibility

The 2020 national model codes are tiered codes, which are intended to give clearer direction on the pathway toward net zero energy ready homes and buildings. In adopting the tiered codes, provinces are (ideally) adopting recognition of all tiers into provincial regulation as well, even if initially targeting the lowest tier as enforceable. It therefore remains possible that local governments, often the 'authorities having jurisdiction' over building code enforcement, could choose to enforce a higher tier in their jurisdiction, if they are permitted to do so by the provincial/territorial government. This is how the BC Energy Step Code works, which gives municipalities the flexibility to enforce stricter energy efficiency requirements than the provincial base code.

This was a potential benefit of tiered codes recognized in the original strategy document produced by the Canadian Commission on Building and Fire Codes in 2016, which wrote:

> "At first glance it might seem that a tiered approach counteracts harmonization because it introduces a number of acceptable solutions at various performance levels. However, there would be harmony within each of the different tiers. Any province, territory or municipality deciding to adopt the same tier will use the same set of solutions."[71]

While no province other than British Columbia previously had a stepped or tiered code in place, the release of the 2020 national model codes means that this could (and should) change as provinces adopt the new codes. This metric tracks whether provinces have adopted steps or tiers into their regulations, and whether municipalities have the authority to enforce a higher tier than the provincial base code. We award a half point to provinces where municipalities have been permitted to enforce higher tiers if they choose.

[71] Canadian Commission on Building and Fire Codes, "Long-Term Strategy for Developing and Implementing More Ambitious Energy Codes: A Position Paper," 4.

Table 51. Municipal ability to adopt higher steps/tiers			
Province/ territory	Ability to adopt higher tiers	Description	Score (0.5 points)
BC	•	Municipalities can write bylaws or implement policies and programs that require new buildings in one of their municipalities to be constructed to one of the steps in the BC Energy Step Code. There are four steps for large buildings, and five steps for houses and small buildings. Every step is evaluated using the same tests and metrics	0.5
NL	•		0.5
QC	•	Municipalities can adopt higher requirements than provincial building codes through local regulations.	0.5
SK	•	The CC Act provides that a local authority may, by bylaw implement standards higher than those adopted by Saskatchewan.	0.5
YT	•		0.5
AB	-		0
MB	-		0
NB	-		0
NS	-		0
ON	-		0
PE	-		0

Retrofit code development

Although the National Building Code does state applicability to existing buildings, in practice most jurisdictions often apply it only to the design and construction of new buildings and major renovations (e.g., additions). Each existing building that is undergoing alterations or renovations presents an opportunity to improve energy efficiency at the same time. In recognition of this, the Pan-Canadian Framework on Clean Growth and Climate Change outlined a specific goal to

develop a model code for existing buildings that would help guide energy efficiency improvements during renovations.

In 2016, the CCBFC and the Provincial and Territorial Advisory Committee on Codes (PTPACC) convened a joint task group to explore the development of a new building code for alterations to existing buildings. This group issued its final report in 2020, recommending that the issue be addressed through a new Part in the NBC, National Plumbing Code (NPC), and NECB; that requirements should be partially or fully harmonized with any such existing practices in leading Canadian jurisdictions; and identifying a number of principles that should guide the development of this new Part.[72]

We asked respondents to indicate whether they have or are currently developing energy efficiency requirements for alterations to existing buildings and/or building retrofits. We award half a point to provinces that were either planning or actively developing an alteration/retrofit code or were able to provide an anticipated date for implementation of such a code. Participation in the federal joint task groups does not receive points.

[72] Joint CCBFC/PTPACC Task Group on Alterations to Existing Buildings, “Final Report - Alterations to Existing Buildings Joint CCBFC/PTPACC Task Group on Alterations to Existing Buildings” (Ottawa, ON: National Research Council Canada, April 2020).

Table 52. Provincial energy efficiency requirements for alterations to existing buildings		
Province/ territory	Description	Score (0.5 points)
BC	In British Columbia, the Building and Safety Standards branch (BSSB) of the Ministry of Municipal Affairs and Housing has been working to develop guidelines for an alteration to existing buildings code since 2019. The BSSB convened two consultation sessions with stakeholders and issued a summary report in 2019. The process moved into its second phase in 2021/2022, consisting of further stakeholder consultation to discuss policy options. Feedback received during these sessions will help inform an Existing Buildings Renewal Strategy, to be released in late 2022. The objective is to introduce a code for alterations to existing buildings by 2024.	0.5
QC	TEQ 2018-2023 Master plan specifies that the province will publish a voluntary standard, Québec's Energy Code for Buildings (Le Code Québécois de l'énergie pour les bâtiments), which will go beyond the minimum requirements of the energy codes and add provisions for design, construction, commissioning, recommissioning, and renovations. This standard will apply for residential, commercial, institutional, and industrial buildings. The voluntary standard has not yet been published.	0
ON	-	0
SK	-	0
PE	-	0
YT	-	0
NB	-	0
MB	-	0
NS	-	0
AB	-	0

Code compliance and enforcement

Building energy codes only save energy if builders comply with them and building officials enforce them. Creating a robust policy framework for code compliance can also help build

capacity for more stringent energy codes in the future. The energy efficiency provisions of building codes can be neglected, as compliance with fire and plumbing regulations tend to present more immediate safety concerns. But low compliance rates mean a jurisdiction will not achieve its energy saving and GHG reduction goals. Building owners would also face significant long-term costs and lower-performing buildings, reducing confidence in builders and policymakers' ability to support stringent energy codes.

Consistent with the methodology used by ACEEE, this Scorecard awarded a province one point if it had conducted a compliance study within the past five years. If a province conducted a study, we asked for the compliance rate (we recognize that scoring provinces on their compliance rates might not provide an accurate picture of performance, since more stringent building codes are likely to have lower compliance rates). We award one point if a province could clearly demonstrate that specific resources were dedicated to compliance with energy efficiency standards, either in terms of budgets or full-time equivalent personnel.

We award up to one extra point for evidence of ongoing relevant activities, including code training and technical assistance for building officials and/or the design and building community; involvement of utilities in promoting compliance; creation of tools such as energy models to promote compliance; and/or the presence of a stakeholder group or collaborative prioritizing code compliance. We award a quarter point for activities in each of these areas. We summarize these activities and scores in Table 53.

Table 53. Compliance activities scoring results

	Other activities (1 point total, 0.25 points each)

Province/ territory	Compliance study in last 5 years (1 point)	Dedicated resources (1 point)	*Code training & technical assistance*	*Utility involvement*	*Compliance tools*	*Stakeholder group or compliance collaborative*	Score (3 points)
BC	●	-	●	●	●	●	2
QC	-	●	●	-	●	-	1.5
PE	-	●	●	-	-	-	1.25
MB	-	-	●	●	●	-	0.75
NB	-	-	●	●	-	-	0.5
NL	-	-	-	-	●	●	0.5
SK	-	-	●	-	●	-	0.5
ON	-	-	-	-	●	-	0.25
NS	-	-	-	-	-	●	0.25
AB	-	-	-	-	-	-	0
YT	-	-	-	-	-	-	0

Labelling, benchmarking and disclosure

Evaluating the energy-use performance of an either new or existing building is a crucial first step toward building performance benchmarking. The practice of benchmarking involves enabling building owners or operators to understand how their energy use stacks up against similar buildings, to identify measures to undertake to improve performance, and to build a business case for undertaking the improvements. But this information is not only useful to the building owner. If disclosed publicly—in real estate listings, for example—it can help to integrate the value of energy efficiency into real estate financing and/or lending and insurance markets, helping alleviate owner concerns of realizing a return on their investments. Comprehensive energy-use performance databases could also spur innovation in information and communications technology, inform energy efficiency policy and program design, and streamline energy efficiency upgrades and retrofits for specific buildings.

The value of energy-use performance rating and disclosure has been widely recognized. In its discussion of existing building retrofits, the Pan-Canadian Framework on Clean Growth and Climate Change set a goal that federal, provincial, and territorial governments would require "labelling of building energy use by as early as 2019."[73] The final report of the Expert Panel on Sustainable Finance also identified energy rating and disclosure policies as an important driver for a private building retrofit market. The Panel recommended a mandatory labeling and public disclosure program for building performance, and disclosure requirements on residential homes at the point of sale, lease, or transfer.[74]

For this Scorecard, we evaluated building benchmarking, rating, and disclosure initiatives in four interrelated categories:

- Numbers of Energy Advisors
- Voluntary rating and disclosure
- Mandatory rating and disclosure
- Building performance standards

Energy Advisors

Energy Advisors can play important roles in conducting home energy efficiency inspections, delivering residential energy efficiency programs and homeowner education and awareness, and in facilitating deeper building retrofits.

In prior scorecards, we distinguished between Energy Advisors for existing houses and Energy Advisors for new construction, in reflection of the now-outdated EnerGuide 0-100 rating system. Given that provinces should have by now made the transition to the updated EnerGuide v15 system, we no longer distinguish between existing/new buildings, and count only certifications

[73] Environment and Climate Change Canada, "Pan-Canadian Framework on Clean Growth and Climate Change.": Canada's Plan to Address Climate Change and Grow the Economy." (Ottawa: Government of Canada, 2016), 17, http://www.deslibris.ca/ID/10065393.

[74] Expert Panel on Sustainable Finance and Environment and Climate Change Canada, *Final Report of the Expert Panel on Sustainable Finance: Mobilizing Finance for Sustainable Growth.* (Ottawa, ON: Government of Canada, 2019), http://epe.lac-bac.gc.ca/100/201/301/weekly_acquisitions_list-ef/2019/19-24/publications.gc.ca/collections/collection_2019/eccc/En4-350-2-2019-eng.pdf.

under the new system.[75] To normalize across the provinces, we divided total certifications by the number of single-detached and single-attached households.[76]

This approach excludes apartments and mobile homes and other movable dwellings. Energy Advisors have been less active in these segments, and there is a need to train and certify advisors for multi-unit residential buildings. We excluded apartments, because an Energy Advisor could serve many apartment units, and thus an advisor-per-building metric would not present a useful benchmark for provinces with many multi-unit residential dwellings. We score provinces on Energy Advisors per 10,000 houses using the values in Table 54.

Table 54. Energy Advisor scoring methodology

Energy Advisors per 10,000 houses (single detached and attached) (>=)	Score
4	2
3.5	1.75
3	1.5
2.5	1.25
2	1
1.5	0.75
1	0.5
0.5	0.25

Table 55. Energy Advisor certification results

[75] Natural Resources Canada, “Number of Active Energy Advisors by Province - by Program” (Natural Resources Canada, June 1, 2021).

[76] Building counts are available in Natural Resource Canada’s comprehensive energy use database. The most recent data year available is 2019. Natural Resources Canada, “Residential Sector, Total Households by Building Type and Energy Source,” in *National Energy Use Database* (Ottawa, ON: Government of Canada, 2018), http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/data_e/databases.cfm.

Province/territory	ERS v15 (June 1, 2022)	*Year-over-year change*	Per 10,000 houses (single detached and attached)	*Year-over-year change*	Score (2 points)
YT	8	*(+5)*	7.2	*(+4.5)*	2
PE	21	*(+8)*	4.3	*(+1.6)*	2
NS	105	*(+25)*	3.4	*(+0.8)*	1.5
NB	54	*(+11)*	2.1	*(+0.4)*	1
BC	246	*(+94)*	2.0	*(+0.8)*	1
QC	311	*(+21)*	1.5	*(+0.1)*	0.75
ON	519	*(+144)*	1.3	*(+0.3)*	0.5
NL	22	*(+16)*	1.2	*(+0.9)*	0.5
AB	103	*(+43)*	0.8	*(+0.4)*	0.25
SK	27	*(+15)*	0.8	*(+0.4)*	0.25
MB	16	*(+10)*	0.4	*(+0.3)*	0

Voluntary rating and disclosure

We awarded up to one point to provinces with fully voluntary, provincewide rating and disclosure initiatives. We awarded partial points based on the scope of the initiative, i.e., if the initiative covers only Part 3 buildings, or if it is located only in one city, partial points will be awarded.

Table 56. Voluntary energy rating and disclosure initiatives

Province/territory	Building types	Scope	Score (1 point)
NS	Part 9/Part 3	Province-wide	1
AB	Part 9/Part 3	City of Edmonton; City of Calgary	0.75
QC	Part 3	Province-wide	0.5
MB	Part 3	Province-wide	0.5
BC	Part 9/Part 3	City of Vancouver; 12 municipalities	0.5
SK	Part 3	City of Regina; Municipal buildings;	0.25
YT			0
NB	-	-	0
NL	-	-	0
ON	-	-	0
PE	-	-	0

Table 57. Voluntary rating/disclosure initiatives - Descriptions	
Province/ territory	Description
AB	Alberta's Municipal Climate Change Action Centre, which is funded by the Government of Alberta, established a voluntary building-benchmarking program for municipal buildings. Both Calgary and Edmonton have building energy benchmarking programs for large commercial and residential buildings, using Energy Star Portfolio Manager. Edmonton's program launched in 2017, while Calgary's began in 2020. Neither program has mandatory disclosure requirements, though Edmonton requires property owners to receive access to rebates for building energy audits. Program details for Edmonton, as well as an annual report with aggregated results, are available here: https://www.edmonton.ca/programs_services/environmental/building-energy-benchmarking-program. More information on Calgary's initiative can be found here: https://www.calgary.ca/uep/esm/energy-savings/building-energy-benchmarking-program.html The Alberta Ecotrust is piloting a digitized and automatic energy scoring approach, integrated into the real estate process for residential buildings. The product will allow homeowners to compare different homes, publish a map that can updated by homeowners.
BC	As part of its Energy Retrofit Strategy for Existing Buildings, the City of Vancouver administers a building benchmarking program for municipal buildings (mandatory), with voluntary participation from large public sector, institutional, commercial, and residential buildings. In 2020, building performance software developer OPEN Technologies launched Building Benchmark BC, a voluntary benchmarking and disclosure program for both residential and commercial/industrial buildings. NRCan and the Province of British Columbia both provided partial funding support. Details are available at buildingbenchmarkbc.ca
NS	In April 2020, in collaboration with Efficiency Nova Scotia and the Canada Green Building Council, the Province of Nova Scotia launched a voluntary energy benchmarking program for large buildings. The program is running for three years.

	Residents can opt-in to having their EnerGuide labels and Homeowner Information Sheets uploaded to the ViewPoint real estate listing website. The NS Department of Public Works is using Energy Star Portfolio Manager to benchmark nearly 80 department owned buildings as part of the Energy Conservation Program. This benchmarking initiative is associated with a building recommissioning project. The 2022 provincial budget committed $2.3 million for energy audits of provincial buildings.
QC	The Building Energy Challenge (Défi-Énergie en immobilier) is a program for commercial and institutional buildings to voluntarily disclose energy-use data to competitors. The program is co-ordinated by BOMA Québec and supported by the City of Montreal, Ministère de l'Énergie et des ressources naturelles, Énergir and Hydro-Québec. Reported data is not made public, but the next iteration of the program plans to require public disclosure.
MB	The City of Winnipeg has established a voluntary Building Energy Disclosure Project (BEDP), which aims to help commercial and institutional building owners better understand the energy performance of their buildings and support overall greenhouse gas reductions. By committing to participate, building owners agree to disclose key energy performance metrics to the public. More details are available at https://winnipeg.ca/sustainability/building-energy-disclosure.stm. Manitoba Hydro also offers the subscription-based service EnerTrend, an energy-profiling tool developed specifically for large industrial and commercial operations. It allows them to be proactive in controlling their energy consumption and reduce costs. Energy profiles show how and when they are using energy; the important information needed to manage consumption, reduce peak demand, and lower costs. Advanced interval metering is installed at the site and collects data on the energy consumption of the operation Efficiency Manitoba offers free-of-charge Energy Efficiency Assessments of industrial, commercial and agricultural facilities.
ON	The Ontario Environment Plan, released in November 2018, states an intention to "work with the Ontario Real Estate Association to encourage the voluntary display of home energy efficiency information on real estate listings to better inform buyers and encourage energy-efficiency measures."
SK	The City of Regina participates in the Municipal Benchmarking Network of Canada, which collects data on the energy use of municipal headquarter buildings from participants.

NB	-
NL	-
PE	-
YT	-

Mandatory rating and disclosure

We awarded up to two points to provinces that have established mandatory, province-wide home or building energy rating and disclosure policies. Provinces may receive partial points for initiatives that are not province-wide, or in which both energy rating and disclosure are not mandatory (for example, if energy ratings are mandatory, but disclosure is not). We do not consider requirements for energy benchmarking or auditing in energy efficiency programming as mandatory unless all buildings of a certain type must participate in the program.

Table 58. Mandatory energy rating and disclosure initiatives

Province/ territory	Building types	New/Existing	Rating	Disclosure	Scope	Score (2 points)
ON	Part 3	New/Existing	Mandatory	Mandatory	Province-wide	2
QC	Part 3	New/Existing	Mandatory	Mandatory	Government buildings; large buildings (City of Montreal)	1
YT	Part 9	Existing	Mandatory	Voluntary	City of Whitehorse	0.25
BC	Part 9	New	Mandatory	Voluntary	Province-wide	0.25
MB	Part 3	Existing	Mandatory	-	City of Winnipeg; government buildings	0.25
NB	Part 3	Existing	Mandatory	-	Government buildings	0.25
AB	-	-	-	-	-	0
NL	-	-	-	-	-	0
NS	-	-	-	-	-	0
PE	-	-	-	-	-	0
SK	-	-	-	-	-	0

Table 59. Mandatory rating/disclosure initiatives - descriptions	
Province/ territory	Description
BC	In jurisdictions referencing the BC Energy Step Code in building bylaws, new buildings must undergo energy modelling and airtightness testing. For Part 9 buildings, this can result in an EnerGuide label. In his November 2020 mandate letter, the Premier directed the Minister of Finance to work with the Ministry of Energy, Mines, and Low Carbon Innovation to require inclusion of energy ratings in home real estate listings at the time of sale. BC is implementing this through a virtual home energy rating system, to be implemented in FY2022-23.
MB	In Manitoba's 2013 Green Buildings Program, regular energy and water use tracking for government buildings is mandated. In order to help government buildings reach this goal, the Government of Manitoba recommends participation with NRCan's ENERGY STAR Portfolio Manager benchmarking tool. In 2011, the Winnipeg City Council introduced measures mandating the energy and water performance benchmarking of city-owned buildings of over 3,000 m2. The City of Winnipeg also employs the ENERGY STAR Portfolio Manager Tool for benchmarking.
NB	New Brunswick's 2016 Climate Action Plan set an objective to require energy performance identification for all publicly funded new construction and major building renovations. Only aggregate GHG emissions are disclosed publicly, though departments can voluntarily disclose more if they choose.
ON	Ontario requires annual reporting on water and energy use for commercial, light industrial, and multi-residential buildings with more than 10 units and buildings that are 100,000 square feet or larger, with some exemptions. Public sector organizations are also required to report and make public their annual energy use and GHG emissions and develop five-year conservation and demand side management plans. The province discloses data via its Open Data website: https://data.ontario.ca/
QC	Government buildings must disclose energy use data to be included in an annual, governmentwide energy report. Aggregated data is available here: https://transitionenergetique.gouv.qc.ca/affaires/secteurs/secteur-institutionnel/portrait-de-levolution. In September 2021, the City of Montreal adopted regulation that requires the owners of large buildings to disclose their energy consumption

	data to the City annually. This includes commercial, institutional and residential buildings. The City plans to expand the number of buildings included in the regulation's scope.
YT	The City of Whitehorse Building and Plumbing Bylaw requires an EnerGuide rating system label on all new homes, as of April 1, 2014.
AB	-
NL	-
NS	-
PE	-
SK	-

Existing building performance standards

If Canada is to meet its climate change goals, governments will need to require widespread, comprehensive, and deep energy efficiency retrofits in existing buildings. The scale of this challenge is daunting and will require novel and innovative approaches to policy and program design.[77] Mandatory building performance standards could play an important role in increasing the speed and scope of building retrofitting.

A whole-building performance standard is, in short, a requirement for existing buildings (or buildings of a certain class or subtype, e.g., rental properties) to meet a specified energy efficiency and/or carbon emissions performance target. This target may be expressed as an established energy rating system level and/or benchmarking system level (e.g., EnerGuide; total energy demand intensity, thermal energy demand intensity, GHG intensity). A building owner would be required to pursue a retrofit if their building falls under a performance baseline, which contrasts with a permit for alterations triggering energy upgrades which was discussed in the previous section on "retrofit codes." A 2020 ACEEE study identified a number of such standards in place worldwide and outlined a number of key policy and design decisions.[78]

We award up to one point for the existence of mandatory, whole-building performance standards, depending on the scope of application (i.e., what types of buildings are included) and the stringency of the standard (i.e., the performance improvement it requires). We asked information request respondents to identify any existing performance standards in their province, with a further qualification that the standard must apply to the building itself, and not a business or industry (thereby excluding any GHG emissions reduction targets set in industrial output-based carbon pricing systems).

No province or territory identified existing mandatory, whole-building performance standards for existing buildings. However, some municipalities are starting to take the lead in this area. In May 2022, the City of Vancouver approved a plan to implement GHG intensity limits for commercial office and retail buildings greater than or equal to 9,290 square meters in area by

[77] Brendan Haley and Ralph Torrie, "Canada's Climate Retrofit Mission: Why the Climate Emergency Demands an Innovation-Oriented Policy for Building Retrofits" (Ottawa, ON: Efficiency Canada, 2021).

[78] Steven Nadel and Adam Hinge, "Mandatory Building Performance Standards: A Key Policy for Achieving Climate Goals," An ACEEE White Paper (Washington, D.C.: American Council for an Energy Efficiency Economy, June 2020).

2027, beginning with annual energy and carbon reporting requirements in 2024. The City of Montreal is also planning on building on its recently announced energy rating and disclosure initiative to launch performance standards at some point in the unspecified future.

Appliance and equipment standards

Appliance and equipment energy performance improvements, led either by regulation or industry, are critical energy efficiency drivers. The federal government regulates energy efficiency standards, testing standards and labelling requirements for energy-using products through Energy Efficiency Regulations, which were first introduced in 1995 under the Energy Efficiency Act. These regulations are amended regularly to add new products or update existing regulations. The most recent proposed amendment, which would harmonize Canadian regulations for central air conditioners and central heat pumps with those in the United States, are estimated to have net benefits of approximately $2.4 billion, to result in annual energy savings of 2.1 petajoules, and a total of 3.9 megatonnes of GHG reductions by 2050.[79]

Federal standards apply to products that are imported or shipped between provinces, while provinces have jurisdiction over products sold within their borders. In the United States, federal pre-emption overrides state standards for federally regulated products, but this is not the case in Canada. Historically, several provinces maintained their own appliance and equipment regulations – either for federally regulated products or for products not regulated by the federal government at the time (or both). The Vancouver Declaration, where First Ministers from provinces and territories agreed to develop the Pan-Canadian Framework on Clean Growth and Climate Change, included a commitment to harmonizing energy efficiency standards across Canada and with North American partners. This commitment was formalized in the "Encouraging Market Transformation Through Collaboration on Energy Efficiency Standards" framework, developed at the Energy and Mines Ministers' Conference in August 2016.[80]

[79] Government of Canada, "Canada Gazette, Part I, Volume 156, Number 14: Regulations Amending the Energy Efficiency Regulations, 2016 (Amendment 17)," April 2, 2022, https://gazette.gc.ca/rp-pr/p1/2022/2022-04-02/html/reg5-eng.html.

[80] Natural Resources Canada, "Encouraging Market Transformation Through Collaboration on Energy Efficiency Standards: A Federal-Provincial-Territorial Framework" (Winnipeg, MB: Government of Canada, August 2016), https://oaresource.library.carleton.ca/wcl/2016/20161021/M4-121-2016-eng.pdf.

In 2019, Regulatory Reconciliation and Cooperation Table (RCT) endorsed the Energy Efficiency Requirements for Household Appliances Reconciliation Agreement, which aims to harmonize standards across Canada for some products. Provinces that had maintained their own standards (British Columbia, Manitoba, New Brunswick, Nova Scotia, Ontario, and Quebec) have all ratified this agreement.[81] Nevertheless, all regulations across the country are not yet harmonized – provincial regulations remain in place that exceed federal rules or apply to products not yet regulated by the federal government.

Evaluating provincial efforts on appliance and equipment energy efficiency standards thus presents several challenges. Market size clearly pulls standards in a certain direction. Provinces with smaller markets, or without substantial manufacturing bases for such products, have historically chosen to follow federal standards (which has the benefit of creating a uniform market). Yet, there has historically been an opportunity for provinces to demonstrate leadership in regulating to higher standards or regulating products not covered by the federal government. Despite the ongoing efforts to harmonize regulations both within Canada and in North America, it is still possible for provinces to take leadership positions – many appliance and equipment product lines have a spectrum of energy use performance, while still all being compliant with base line regulations. Regulating above harmonized standards, or regulating products not yet covered, may reduce the number of products available for purchase in a given jurisdiction, but not require substantial customized practices to comply with local rules.

Efficiency Canada does not have the resources necessary to estimate energy savings impacts of appliance and equipment standards for different products in each province. Accordingly, our approach to scoring this metric in the 2022 Scorecard will consider only the number of regulated products above or outside federal standards across five main categories of products: space heating/cooling, water heating and refrigeration, lighting, fenestration, and miscellaneous. These categories are based on the energy intensity end-use or impacts and adapted from the ACEEE International Scorecard.[82] For both products above or outside federal

[81] Regulatory Reconciliation and Cooperation Table, “Reconciliation Agreement on Energy Efficiency Requirements for Household Appliances,” 2019, https://www.cfta-alec.ca/wp-content/uploads/2021/06/Energy-Efficiency-Requirements-RA-2019.pdf.

[82] S Subramanian et al., “2022 International Energy Efficiency Scorecard” (Washington, DC American Council for an Energy-Efficient Economy, 2022), www.aceee.org/research- report/i2201.

regulations, we award 0.25 points for standards across one category, 0.5 points for standards in two to three categories, and 0.75 points for standards in four to five categories.

Table 60. Provincial appliance and equipment standards – regulations above federal standards						
Province/ territory	Space heating/cooling	Water heating/Refrigeration	Lighting	Fenestration	Miscellaneous	Score
ON	Heat pump, internal water loop Heat pump, ground source, liquid-to-air Furnace, electric, single phase	Water heater, oil, tank-type Water heater, gas-fired, storage Water heater, electric, storage Water chiller	Incandescent lamp/general service lamps		Microwave (oven)	0.75
BC	Residential gas furnace Residential gas boiler Single-phase split-system heat pumps	Electric Household water heater				0.5
QC			Standard lamps/general service lamps			0.25

Table 61. Provincial appliances and equipment standards – Regulations outside federal standards

Province/ territory	Space heating/cooling	Water heating/refrigeration	Lighting	Fenestration	Miscellaneous	Score
ON	Floor furnace, gas-fired Furnace, gas-fired Furnace, oil-fired Wall furnace, gas-fired Heat pump, geothermal, direct expansion-to-air Heat pump, liquid-to-water, geothermal, excluding direct expansion Heat pump, water-source, variable refrigerant flow Room heater, gas-fired Boiler, gas-fired; Boiler, oil-fired	Water heater, electric Water heater, gas, tank-type Water heater, gas, instantaneous Swimming pool heater, oil-fired Pool heater, gas-fired Drinking water cooler, self-contained Vending machine, for other than refrigerated bottled or canned beverage	Lamp, incandescent, candelabra and intermediate screwbase Luminaire, dusk-to-dawn Luminaire, high mast Luminaire, used for roadway lighting	Window, low-rise, residential	Clothes dryer, residential, gas-fired Pumps, pool, dedicated purpose Transformer, liquid-filled Transformer, liquid-filled, power Uninterruptible power supply Air compressor Thermostat for room electric space heater	0.75

	Boiler, electric, steam Air conditioner, computer room Portable air conditioners			
BC		Door slabs Glazing products Non-metal, non-wood framed windows and sliding glass doors (for smaller buildings) Residential windows and sliding glass doors (for smaller buildings Skylights Metal framed windows, sliding glass doors, curtain walls, window walls and storefront windows (for smaller buildings),	Computers and monitors - desktop computers - laptop computers - notebooks - portable all-in-one computers - mobile gaming systems - thin clients - small-scale servers - workstations - high expandability computers - computer monitors	0.5

			Non-metal curtain walls, window walls and storefront windows (for smaller buildings) Hinged and bi-folding doors (for smaller buildings), Metal framed windows, sliding glass doors, curtain walls, window walls and storefront windows (for larger buildings) Non-metal windows, sliding glass doors, curtain walls, window walls and storefront windows (for larger buildings)		
QC				Thermostats	0.25
NB	Solid fuel burning heating appliances				0.25
NS		LED roadway lighting			0.25

Transportation

Transportation accounts for 23% of total energy consumption in Canada and stands to deliver 26% of the country's potential energy savings by 2050[83]. Achieving these savings would avert the release of 1.5 gigatons of GHG emissions through 2050, or one-third of the total potential emissions reductions.[84]

Light-duty passenger vehicles account for almost half of Canada's transport energy demand. While several current and possible future policies and initiatives could improve passenger vehicle energy efficiency, electrification of personal transport will play a particularly important role. According to the U.S. Department of Energy, electric vehicles convert 59% to 60% of electrical energy received from the grid to power at the wheels, while conventional vehicles convert only 17% to 21% of the energy in gasoline to power.[85]

Scores for the transportation category reflect provincial policies and performance in energy efficiency — primarily in personal transportation — thereby targeting the integration of private transportation with buildings and electricity grids, though we also consider active transportation strategies and funding, and public transit.

We collected information on the following policy areas or metrics:

- **Zero-emission vehicles** (six and a half points total)
    - Zero-emissions vehicle mandate (one point)
    - Electric vehicle incentives (two and a half points)
    - BEV/PHEV registrations per total vehicle registrations (three points)

[83] Canada Energy Regulator Government of Canada, "NEB – Provincial and Territorial Energy Profiles – Canada," July 28, 2022, https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/provincial-territorial-energy-profiles/provincial-territorial-energy-profiles-canada.html.

[84] International Energy Agency and Natural Resources Canada, "Energy Efficiency Potential in Canada to 2050."

[85] Office of Energy Efficiency & Renewable Energy, "All-Electric Vehicles," U.S Department of Energy, 2019, http://www.fueleconomy.gov/feg/evtech.shtml.

- **Transport electrification infrastructure** (six and a quarter points total)
    - Policies to support public charging stations (one and a half points)
    - Availability of public charging (including fast DC charging) stations (three and three-quarter points)
    - Support for battery electric (BEV) and plug-in hybrid electric vehicles (PHEV) in building codes and/or municipal bylaws (one point)

- **Active transportation** (two points total)
    - Active transportation plans or strategies (one point)
    - Dedicated funding for active transportation (one point)

- **Public transportation** (three points total)
    - Provincial funding (one point)
    - Ridership (one point)
    - Electrification (one point)

Total scores are presented in the table below:

Table 62. Transportation scoring summary

Province/territory	Zero emission vehicles (6.5 points)	Transportation electrification (6 points)	Active transportation (2 points)	Public transportation (3 points)	Total (17.5 points)
QC	5.5	6	2	1.5	15.00
BC	5.75	4.25	2	0.75	12.75
PE	2.5	3	2	0	7.50
NS	2.75	1.75	2	0.5	7.00
YT	3.5	3	0	0	6.50
ON	2	2	1	1	6.00
NB	2.5	2	1	0	5.50
AB	1.5	1.25	0	1	3.75
MB	1.25	1	0	1	3.25
NL	1.5	0.75	0	0.25	2.50
SK	0.5	1	1	0.25	2.75

Zero-emissions Vehicles

Zero-emission vehicle mandates

Governments can promote energy efficiency in personal vehicle transportation by adopting mandates requiring that zero-emission vehicles comprise a minimum share of all new vehicles sold in a given jurisdiction.

In June of 2021, the federal government stated an intention to develop zero-emission vehicle sales mandate for all new light-duty cars and passenger trucks. This announcement strengthened a former federal ZEV sales target by making sales goals mandatory and moving

up the 100% zero-emission sales deadline from 2040 to 2035.[86] The federal government states that it will use a combination of investments and legislation to assist Canadians and industry in transitioning to 100 percent zero-emission vehicle sales by 2035. It will also collaborate with partners to set interim targets for 2026 and 2030, as well as any other obligatory measures that may be required in addition to Canada's light-duty vehicle greenhouse gas emissions standards.[87]

If/when the federal government introduces a national ZEV mandate, we anticipate future scorecards will track provinces that introduce regulations that exceed federal regulations. However, it remains unclear exactly how the federal government expects to meet its 2035 goal. Provincial governments took the lead by introducing their own ZEV mandates, and to date only provincial rules are currently in force. For the 2022 Scorecard, we award one point to provinces with a legislated ZEV mandate. In Canada, British Columbia and Québec have ZEV mandates in place, the details of which are described in Table 63, below.

Table 63. Provincial ZEV mandates

Province/ territory	Description	Score (1 points)
QC	Quebec updated its Zero-Emission Vehicle Standard in 2020, first introduced in 2016. The standard established a credit/debit system that requires manufacturers to earn ZEV credits equivalent to 6% of light-duty vehicle sales and leases by 2020, 8% by 2021, 10% by 2022, 12% by 2023, 14% by 2024, and 16% by 2025. New tightened zero-emission vehicle standards for 2025-2035 are currently in review, targeting ZEVs as 100% of vehicle sales by 2035. Public consultation was scheduled for June and July 2022.	1

[86] Transport Canada, “Canada’s Zero-Emission Vehicle (ZEV) Sales Targets,” Government of Canada, n.d., https://tc.canada.ca/en/road-transportation/innovative-technologies/zero-emission-vehicles/canada-s-zero-emission-vehicle-zev-sales-targets.

[87] Government of Canada, “Building a Green Economy: Government of Canada to Require 100% of Car and Passenger Truck Sales Be Zero-Emission by 2035 in Canada,” June 29, 2021, https://www.canada.ca/en/transport-canada/news/2021/06/building-a-green-economy-government-of-canada-to-require-100-of-car-and-passenger-truck-sales-be-zero-emission-by-2035-in-canada.html.

BC	British Columbia announced its intention to pass a ZEV mandate by 2020 in its Fall 2018 CleanBC climate strategy. The Zero-Emission Vehicles Act, passed in May 2019, implemented a credit/debit system for auto manufacturers, requiring them to meet an escalating annual percentage of new light-duty ZEV sales and leases. In July 2020 the province introduced regulations for the Act, which included phased targets to be met each year, as well as compliance requirements. In October 2021, the province released its CleanBC Roadmap to 2030 plan, which raises targets to 26% by 2026, 90% by 2030, and 100% by 2035.	1

Electric vehicle incentives

Consumer incentives are another form of transportation electrification policy support. The upfront purchase cost of battery electric or plug-in electric hybrid vehicles (BEV/PHEVs) vehicles can be a barrier to consumer uptake, despite generally having much lower operating costs than conventional vehicles.[88] Governments can reduce these barriers by offering financial incentives to consumers, such as tax credits, rebates, and sales tax exemptions. As of May 1, 2019, the federal government offers purchase incentives of $5,000 for BEVs and long-range PHEVs, and $2,500 for shorter range PHEVs.[89]

The Scorecard tracks and awards points based on the presence of consumer incentives and incentives for commercial fleet incentives. For consumer incentives, we include consideration of incentives for used vehicles, and non-automotive or specialty vehicles (e.g., e-bikes). Incentives for used vehicles are important from both an equity and efficacy perspective. With more provinces introducing consumer incentives, we score this metric with consideration of the scale of the incentives. We award up to a half point for new vehicle incentives (a full half point for incentives matching or exceeding the federal incentives; partial points for incentives below the federal amount); a half point for incentives that include used vehicles (no consideration of the incentive amount); and a half point for incentives for non-automotive/specialty vehicles.

[88] Natural Resources Canada, “2019 Fuel Consumption Guide” (Ottawa, ON: Government of Canada, 2019).

[89] Transport Canada, “Incentives for Purchasing Zero-Emission Vehicles,” Government of Canada, 2021, https://tc.canada.ca/en/road-transportation/innovative-technologies/zero-emission-vehicles/incentives-purchasing-zero-emission-vehicles.

Table 64. Consumer incentives				
Province/ territory	New vehicles (0.5 points)	Used vehicles (0.5 points)	Non-automotive/specialty-use (0.5 points)	Score (1.5 points)
QC	Up to $8,000	Up to $4,000	Yes (up to $2,000 for electric motorcycles; $500 for electric scooters)	1.5
YT	$3,000 - $5,000	$1,500	Up to $1,500 (e-bikes)	1.5
PE	$2,500 - $5,000	$2,500 - $5,000	Up to $500 (e-bikes)	1.5
BC	$1,500 - $3,000 (CleanBC) Up to $3,000 (SCRAP-IT)	Up to $3,000 (SCRAP-IT) PST exemption	Yes (CleanBC Specialty Use Vehicle Incentive Program)	1.25
NS	$2,000 - $3,000	$1,000 - $2,000	$500 (e-bikes)	1.25
NB	$2,500 - $5,000	$1,000 - $2,500	-	1
NL	$2,500	$1,500 - $2,500	-	1
ON*	-	$2,000 (Plug'n Drive)	-	0.5
AB	-	-	-	0
MB	-	-	-	0
SK	-	-	-	0

**As of Aug. 26, 2022, Plug'N Drive incentive funds have been exhausted and the program has officially been concluded.*

We also consider commercial and/or non-light duty vehicle incentives and the broader fleet efficiency initiatives of which incentives may be a part. This metric therefore includes consideration of programs for medium or heavy-duty vehicles, in either commercial or municipal fleets, as well. We award up to one point based on the eligibility scope of the program — the types of organizations and types of eligible vehicles.

Table 65. Commercial fleet and non-light duty vehicle incentives		
Province/ territory	Description	Score (1 point)
BC	The province launched its CleanBC Go Electric Fleets Program in early 2021; it is intended to support public and private owners of light-duty fleets transition to ZEVs. The program takes a multi-pronged approach to address various barriers to ZEV adoption in fleets via financial and technical support. The province offers rebates to B.C.-registered companies, Indigenous and local governments, and public sector organizations with light-duty fleet vehicles. B.C. Ministries and Crown Corporations are ineligible. Indigenous communities and businesses are eligible for increased rebates for some of the program offers. The Specialty Use Vehicle Incentive Program (SUVI) offers rebates on the purchase of eligible ZEVs that do not fit into the light-duty vehicle/passenger vehicle rebate program. Each organization can claim up to 10 rebates.	1
QC	The Ministry of Transport's Écocamionnage program provides vehicle incentives and support for other aspects of commercial freight emissions reduction, including incentives for used vehicles. Rebate amounts can be up to $125,000 for medium-duty vehicles and $175,000 for heavy-duty vehicles, depending on the battery size and age of the vehicle.	1
NS	Fleet operators are eligible to receive incentives through Nova Scotia's EVAssist program. Eligibility requirements follow the federal iZEV program - businesses are limited to 10 vehicles per year, and light, medium and heavy-duty vehicles are eligible, provided they are fully electric, or fully powered by hydrogen. The program is not available to local governments.	0.5
NL	Consumer EV incentives are a provincial government initiative that is administered by NL Hydro. Launched Sept. 1, 2021 (retroactive to May 1, 2021), these incentives are available to businesses, non-profit organizations, and municipalities. The utilities' proposed 2021-2025 Electrification, Conservation and Demand Management plan includes incentives for commercial and municipal electric vehicles and charging stations.	0.5
YT	A pilot program was launched to offer purchase incentives for medium and heavy-duty electric vehicles, up to 80% of the total cost.	0.5

AB	The Municipal Climate Change Action Centre offers local governments funding to purchase or lease electric fleet vehicles. Passenger vehicles can be funded up to $14,000 and can be combined with the federal incentive. Funding for medium to heavy-duty vehicles, such as electric garbage trucks, will cover 30% of costs, up to $300,000. Non-road vehicles can receive 30% of costs up to $50,000. The program is for municipalities only, not commercial fleets.	0.5
NB	As of July 2021, New Brunswick's EV rebate program applies to commercial LDV fleets that meet the same EV criteria as the iZEV program. Commercial entities can access 10 vehicle incentives per calendar year.	0.5
MB	The province has an efficient trucking program intended to reduce freight transport emissions, but it does not include any incentives for EVs or specific reductions targets.	0.25
SK	-	0
ON	-	0
PE	-	0

Table 66. BEV/PHEV registrations scoring methodology

Percentage of all passenger vehicle registrations that are BEV/PHEVs (>=)	Points
20.0%	3
10.0%	2.5
5.0%	2
2.5%	1.5
1.25%	1
0.62%	0.5

Electric vehicle registrations

Battery electric and plug-in electric hybrid vehicles registrations provide a quantitative indicator of personal transportation electrification. As in previous years, this Scorecard scores on BEV/PHEV registrations as a share of all new motor vehicle registrations, using only the most recent year. This provides a dynamic annual accounting and is consistent with federal and provincial sales mandates.

Under the proposed federal ZEV mandate, there is an interim target of 20% of all vehicle sales to be

ZEVs by 2026.[90] For the 2022 Scorecard, we have revised this metric to use 20% as the top threshold (worth 3 points), declining by half points as the ratio of ZEV sales to all vehicles is divided in half. Scoring methodology is provided in Table 66 below, followed by results in Table 67.

Table 67. Percent of all passenger vehicle registrations that are BEV/PHEVs*

Province/territory	2020	2021	*% points change*	Score (3 points)
BC				2.5
QC	6.8%	8.9%	*2.1*	2
YT				1.5
ON	1.8%	3.1%	*1.3*	1.5
PE	0.8%	2.1%	*1.3*	1
AB				1
NS				1
MB	0.7%	1.4%	*0.7*	1
NB	0.5%	1.3%	*0.8*	1
SK	0.4%	1.1%	*0.7*	0.5
NL				0

** Available data is obtained from Statistics Canada.[91] However, due to data sharing limitations, BEV/PHEV registration data for select provinces and territories is not available. For missing provinces, readers can access ZEV registration data from IHS Market. See https://ihsmarkit.com/info/0521/automotive-insights-canada-evs.html.*

[90] "Helping More Canadians Drive Electric Vehicles," Office of the Prime Minister, April 11, 2022, https://pm.gc.ca/en/news/news-releases/2022/04/11/helping-more-canadians-drive-electric-vehicles.

[91] Statistics Canada Government of Canada, "New Zero-Emission Vehicle Registrations, Quarterly," October 11, 2022, https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2010002501; Statistics Canada Government of Canada, "New Motor Vehicle Registrations, Quarterly," October 11, 2022, https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2010002401.

Transport electrification infrastructure

Support for vehicle charging

Canadian governments and other actors can help reduce barriers to vehicle electrification by setting targets and/or providing support to increase the availability of public charging infrastructure for BEV/PHEVs. Range anxiety is a well-documented barrier for potential buyers, second only to cost concerns.[92] Policies and programs to support the installation of private and public charging infrastructure can reduce barriers to BEV/PHEV uptake. Level 3 (Fast DC) chargers are particularly important on highways to promote convenience and make BEV/PHEVs competitive with energy-dense petroleum fuels.[93]

The federal government established the Electric Vehicle and Alternative Fuel Infrastructure Deployment Initiative in its 2016 budget, with $96.4 million directed to support a coast-to-coast charging network for electric vehicles, natural gas stations along key freight corridors, and stations for hydrogen fuel cell vehicles in metropolitan centres. Budget 2019 included an extra $130 million over five years (April 2019 to March 2024) to help Canada meet its zero-emission vehicle (ZEV) target, and Budget 2021 committed $56.1 million over five years to develop codes and standards for retail charging and fuelling stations. As of May 2022, the program had approved funding for 1,096 EV fast chargers and had opened 622 of them.[94]

We award a half point to provinces that support private charging stations in homes or workplaces and a half point for efforts by governments or utilities to increase availability of public charging stations. We award initiatives that include or prioritize Level 3 charging stations 0.5 points; reduced from a full point in Scorecard 2021. We award partial points for policies or programs that were cancelled during the period under review, or to provinces that do not have

[92] Ona Egbue and Suzanna Long, "Barriers to Widespread Adoption of Electric Vehicles: An Analysis of Consumer Attitudes and Perceptions," *Energy Policy*, Special Section: Frontiers of Sustainability, 48 (September 1, 2012): 717–29, https://doi.org/10.1016/j.enpol.2012.06.009.

[93] Level 2 chargers have an output of 240 volts (AC) and can take up to five hours to charge enough for 200 km of range. Level 3 chargers deliver 400 volts (DC) and take ~30mins to reach 80% of 200km range.

[94] Government of Canada, "Electric Vehicle and Alternative Fuel Infrastructure Deployment Initiative," March 2021, https://www.nrcan.gc.ca/energy-efficiency/transportation-alternative-fuels/electric-and-alternative-fuel-infrastructure/electric-vehicle-alternative-fuels-infrastructure-deployment-initiative/18352.

their own standing programs, yet still partnered with the federal government. We did not award points for initiatives that sought only to remove regulatory barriers to private investment, with the expectation that the outcome-based metric on public charging availability should capture the impacts of all policy approaches.

Some provinces scored partial points for infrastructure funding that has been announced but not yet made available. Saskatchewan received a quarter point for their Electric Vehicle Infrastructure Program, which was launched in 2022 and will provide funding for direct current fast charging (DCFC) stations. Ontario also received a quarter point for their 2021 announcement of new EV chargers at 17 ONRoute locations by Summer 2022, and three more locations by the end of 2022. Funding for these installations was announced in March 2022. Manitoba also received partial points for their public charger rebate, administered by the Manitoba Motor Dealers Association, because it is not a government-funded initiative.

Table 68. Support for public/private electric vehicle charging infrastructure

Province/territory	Support for private charging (0.5 points)	Support for public charging (0.5 points)	Prioritize Level 3 charging (0.5 points)	Score (1.5 points)
BC	●	●	●	1.5
QC	●	●	●	1.5
NS	-	●	●	1
NB	●	●	-	1
YT	●	●	-	1
MB	-	◐	●	0.75
AB	-	●	-	0.5
NL	-	●	-	0.5
PE	-	●	-	0.5
SK	-	◐	-	0.25
ON	-	◐	-	0.25

Public charging availability

In previous scorecards, we scored provinces on the availability of public charging infrastructure by comparing the total number of EV charging stations with the extent of the provincial road network.[95] Measuring charging station availability against public road infrastructure is a useful metric, as it allows us to assess the extent of the charging network that exists to counter range anxiety. Scoring on numbers of stations, rather than individual ports, provides a fair comparison across rural and urban jurisdictions, as densely populated regions could in theory provide sufficient charging availability with fewer stations and more ports, while sparsely populated regions would require more stations but fewer ports. For our 2022 Scorecard, we complement this metric with one that benchmarks provinces on charging ports per capita, splitting the previously available three points into 1.5 points per metric, to address any remaining concerns about bias against provinces with proportionally larger road networks.

Benchmarking thresholds for the stations per road kilometres metric are set with consideration of the average range of EVs available in Canada and looked for international best practices and studies of the necessary charging availability to counter range anxiety. According to a study by the Canadian Energy Regulator, the average electric vehicle range in Canada nearly doubled between 2013 and 2019, from 219 kms to 386 kms.[96] An analysis of U.S. charging corridors found that stations spaced about 70 miles apart (112 kms) was sufficient to give drivers the confidence needed for long-range trips.[97]

One could therefore assume that one station per 100 kms would be sufficient, yet this doesn't account for population density, number of charging ports per station, factors that could reduce EV range, or the peculiarities of provincial road networks. In our 2021 Scorecard, we compared gasoline stations per road kilometres and found the Canadian average close to 4 stations per

[95] "Inventory of Publicly Owned Road Assets, Infrastructure Canada," Government of Canada, Statistics Canada, May 24, 2022, https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3410017601.

[96] Canada Energy Regulator, "NEB – Market Snapshot: Average Electric Vehicle Range Almost Doubled in the Last Six Years," Government of Canada, June 25, 2019, https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2019/market-snapshot-average-electric-vehicle-range-almost-doubled-in-last-six-years.html.

[97] Eric Wood et al., "National Plug-in Electric Vehicle Infrastructure Analysis." (US Department of Energy, September 2017), https://www.nrel.gov/docs/fy17osti/69031.pdf.

100 kms. Despite increases in EV range, it is a reasonable assumption that most gasoline vehicles exceed the average range of EVs in Canada. Accordingly, we set our top threshold for scoring this component at ~1.5x the average number of gasoline stations per 100 kms of road in Canada — or six EV charging stations per 100 kms of road network. Based on this maximum threshold, we score provinces using the methodology outlined in Table 69 below, or a quarter point per every station per 100 kms.

Table 69. Charging stations per road kilometre scoring

Stations per 100 kms	Points
6	1.5
5	1.25
4	1
3	0.75
2	0.5
1	0.25

Benchmarking for charging ports per capita is based on available charging ports per 10,000 residents. The International Council on Clean Transportation (ICCT) showed Norway and Sweden to be global leaders in charging points, with over 15 charging points per 10,000 residents in 2016. Other global leaders included Switzerland, Australia, and Denmark, with approximately 5 charging ports per 10,000 people.[98] As EV fleets expand, Canadian charging networks will need to expand to match these global leaders. Therefore, we award a quarter point per every port per 10,000 residents up to a maximum of 1.5 points for 6 ports per 10,000 residents (see Table 70).

Table 70. Charging ports per capita scoring

[98] Dale Hall and Nic Lutsey, "Emerging Best Practices for Electric Vehicle Charging Infrastructure," White Paper (International Council on Clean Transportation, October 2017), https://theicct.org/sites/default/files/publications/EV-charging-best-practices_ICCT-white-paper_04102017_vF.pdf.

Ports per 10,000 residents	Points
6	1.5
5	1.25
4	1
3	0.75
2	0.5
1	0.25

We obtained data on electric vehicle charging stations and ports from the NRCan Electric Charging and Alternative Fuelling Stations Locator. The online database reveals all publicly accessible and currently available public charging stations across Canada. Listings include both networked charging stations (those part of one of ten different charging networks), data for which is uploaded automatically through an API), and non-networked stations (data for which must be submitted manually to the database). Each station may have one or more Level 2, or Fast DC charging ports, or some combination thereof. Level 1 chargers were excluded from this data set.

An independent third-party verifies the NRCan database, but the resource might not include all charging stations in each province. Other charging station database services may have different numbers, though in some instances this may be due to their inclusion of unverified, self-reported, non-networked stations. We are nevertheless confident that the NRCan database provides a fair basis for comparison across the provinces.

We show scoring results in Table 71 and Table 72 below.

Table 71. Electric vehicle charging stations per 100 kms of public-owned roads

Province/territory	Charging stations (Level 2/3)		Kms of public-owned roads	Stations per 100 kms	Score (1.5 points)
	August 2022	*Year-over-year change*			
QC	3,127	*319*	47,886	6.5	1.5
PE	50	*6*	1,116	4.5	1
ON	1,871	*278*	83,757	2.2	0.5
BC	1,213	*120*	61,437	2.0	0.25
NB	130	*-3*	9,797	1.3	0.25
NS	126	*30*	9,946	1.3	0.25

NL	55	16	6,444	0.9	0
AB	274	49	86,501	0.3	0
YT	13	-	4,785	0.3	0
MB	67	15	29,946	0.2	0
SK	66	6	76,217	0.1	0

Table 72. Electric vehicle ports per 10,000 residents

Province/territory	EVSE ports	Population	Ports per 10,000 people	Score (1.5 points)
QC	6,506	8,639,642	7.5	1.5
BC	3,189	5,264,485	6.1	1.5
PE	83	166,331	5.0	1.25
YT	17	42,982	4.0	1
ON	5,284	14,951,825	3.5	0.75
NB	245	797,102	3.1	0.75
NS	228	1,002,586	2.3	0.5
NL	94	522,453	1.8	0.25
AB	626	4,480,486	1.4	0.25
SK	155	1,183,269	1.3	0.25
MB	151	1,390,249	1.1	0.25

In addition to charging stations, we also score provinces on the availability of DC fast-charging. The presence of DC fast chargers is also important, particularly on roadside charging stations,

because they can restore an 80% charge on a typical vehicle in about thirty minutes.[99] For this Scorecard, we award a quarter point for every 0.5 fast chargers per 100 kms of public road, up to a total of 0.5 points.

Table 73. Stations with DC fast charging

Province/territory	Stations with DC fast charging	*Year-over-year change*	Stations/100 kms	Score (0.5 points)
QC	459	*56*	1	0.5
PE	7	*1*	0.63	0.25
NB	41	*1*	0.47	0
ON	338	*33*	0.44	0
BC	244	*72*	0.4	0
YT	13	-	0.27	0
NL	15	*1*	0.24	0
NS	22	*1*	0.22	0
AB	71	*22*	0.14	0
SK	32	*11*	0.1	0
MB	23	*10*	0.09	0

The number of DC charging stations increased in all provinces since July 2021. Quebec was the only province to reach the top threshold for this metric, with one station with DC fast charging per 100 kms. British Columbia added the most stations (72).

Support for BEV/PHEVs in building codes and municipal bylaws

Governments can further remove barriers to BEV/PHEV adoption with building code regulations that require supporting infrastructure in new-home construction. They can also empower local

[99] Jeff Turner, “EV Fast-Charger Expansion: Making the Economics Work for Utilities.,” May 21, 2020, https://electricautonomy.ca/2020/05/21/ev-charging-economics-for-utilities/.

governments to create their own EV charging requirement rules (e.g., energized electrical outlets capable of Level 2 charging or higher) in new developments or renovations through zoning bylaws. Such provisions can help reduce barriers to potential BEV/PHEV buyers because the infrastructure to support home charging will already be in place. It is also an example of how transportation is becoming more closely integrated with buildings, which is of particular interest to energy efficiency policy.

It may be more practical to include EV charging infrastructure in municipal zoning bylaws, rather than provincial building codes. This is because zoning bylaws offer more flexibility as they relate to land use, not just buildings. As a result, these bylaws can encompass parking lots that would not be captured by building codes, as well as different types of use at these parking lots (short term at a restaurant, longer at an office building, etc.).[100] Local governments in every province technically have the ability to include EV charging infrastructure requirements in their bylaws, unless the province explicitly forbids it (though, to the best of our knowledge, this is not the case in any province). However, when provinces officially clarify this via legislation or official statements, they provide municipalities with the certainty and support they need to make changes.[101] Provinces can also provide capacity to municipalities through model bylaws, coaching, sharing of best practices etc.

We award one point to provinces that indicated support for BEV/PHEV infrastructure in their building codes or that have explicitly allowed municipalities to include requirements in their bylaws. We awarded partial points if a province reported that municipalities can write such bylaws, even if none have yet elected to do so.

[100] Charles Benoit, "EV Group Says Zoning Law, Not Building Code Is Best for EV Infrastructure.," Electrek, February 14, 2020, https://electrek.co/2020/02/14/ev-group-says-zoning-law-not-building-code-is-best-for-ev-infrastructure/.

[101] Brendan McEwen, "'EV Readiness' Requirements Framework," April 11, 2019, https://cleanairpartnership.org/cac/wp-content/uploads/2019/10/NRCan-EV-Readiness-Requirements-Framework-Final-Report-4-11-2019-McEwen-Climate-and-Energy.pdf.

Table 74. EV charging requirements in building codes or municipal bylaws		
Province/ territory	Description	Score (1 point)
BC	British Columbia is the only province that has explicitly defined EV chargers as “out of scope” for its Provincial Building Code Act. Out of scope is defined as “matters … local government can regulate … if they have authority to do so in other statutes.” This is important, and a valuable decision for other provinces to follow, as it gives municipalities the clear permission to implement EV charging in their bylaws. The City of Vancouver has its own building code but has also chosen to adopt EV charging requirements in its parking bylaws. The bylaw requires residential and commercial parking spaces to be equipped with a set number of EV ready parking spaces, in addition to requirements for new dwellings with garages, that must be equipped with EV charging capability. The bylaw offers developers two tiers to base their installation around, with varying levels of power required, under the assumption that drivers will charge their vehicles around the city. BC Hydro provided coaching for the implementation of EV-ready bylaws and supported the development of an updated best practice guide on EV-ready requirements for both residential and non-residential new buildings. It is also piloting the concept of E-Mobility Managers. These full-time staff will be responsible for advancing transportation electrification within local governments using available levers such as community plans, land use plans, policy and bylaws, zoning, permitting, and building code compliance	1
QC	Québec changed its electricity code in 2018 to include an obligation to install basic wiring for EV charging in single dwellings with garages, carports, or parking areas. Municipalities have the power to include EV/PHEVs in their bylaws, and two municipalities have done so for high-rise residential buildings — the City of Sainte-Rose and the City of Laval.	1
YT	Amendments were made to the Yukon Building Code in April 2021 to require EV charging rough-in and designated parking spaces for new residential buildings in Whitehorse.	1

AB	The City of Calgary has included BEV/PHEVs in its bylaws, but the province did not explicitly state that all municipalities had this power, or if any others had acted this way.	0.5
ON	In 2017 Ontario revised its building code to include provisions for EV charging (section 3.1.21) in Part 3 and Part 9 buildings. The provisions went into force on Jan. 1, 2018, but were subsequently revoked by an amending regulation passed on May 2, 2019. Amendments were introduced in May 2018 to exempt condominium owners or corporations from certain conditions under the Condo Act to facilitate EV charging infrastructure installation. Local governments have the power to include EV/PHEVs in their bylaws, but none have yet done so.	0.5
SK	Local governments can include EV/PHEVs in their bylaws, but none have yet done so. There are no EV Ready provisions in Saskatchewan building codes.	0.5
NS	In the 2021 mandate letters, the premier directed the Department of Energy and Mines to work with the Ministers of Infrastructure and Housing and Municipal Affairs to invest in electric vehicle charging infrastructure on provincial and municipal government buildings, and work toward electric vehicle fast chargers in all new commercial developments.	0
PE	The PEI 2016-2017 Energy Strategy states that the government will consider “mandating that new homes be pre-wired for electric charging and link this measure to the adoption of the National Building Code.” It does not appear that any progress has been made on this policy issue.	0
MB	-	0
NB	-	0
NL	-	0

Active transportation

Active transportation refers to forms of transportation where people physically power their own mobility through walking, biking, skateboarding, and similar modes. Such active transportation modes were one of several other forms of sustainable transportation we looked at in our previous Scorecard. Cycling is one of the most efficient forms of transportation,[102] and combining modes of sustainable transportation where there is a focus on reducing vehicular traffic will increase energy efficiency, while providing public health co-benefits.

A 2014 federal report on active transportation noted that local governments typically take the lead on active transportation initiatives, but provinces can assist the process through legislation, regulation, and policies.[103] This helps to establish consistent goals and regulations across the province and can establish funds for municipalities to improve and extend their active transportation infrastructure. Many provinces therefore have policies and legislation specifically designed to promote active transportation.

We award up to two points for provincial active transportation plans or strategies. We score provinces on active transportation plans or strategies (up to one point) and the existence of dedicated funding to support it (up to one point). We award partial points where we were able to find evidence of a plan but no dedicated funding, or where there was funding but not part of a plan, or a currently active and dedicated initiative to expand active transportation infrastructure. We provide results Table 75 below.

[102] David Dodge, "The Most Efficient Transportation on the Planet," *Huffington Post*, January 29, 2013, https://www.huffingtonpost.ca/david-dodge/bike-lanes-vancouver_b_2567888.html.

[103] Government of Canada, "Mobilizing Knowledge on Active Transportation," accessed July 14, 2021, https://www.canada.ca/en/public-health/services/health-promotion/healthy-living/physical-activity/mobilizing-knowledge-on-active-transportation.html.

Table 75. Active transportation strategies and funding		
Province/ territory	Description	Score (2 points)
BC	As part of its CleanBC plan, the province introduced its “Move. Commute. Connect” active transportation strategy. The strategy aims to double the percentage of trips taken by active transportation by 2030 through funding for community projects, education and awareness, policy and regulatory adjustments, and research. Additionally, the province offers the BC Active Transportation Infrastructure Grant Program, with two options for Indigenous and local governments. There are also e-bike rebates for individuals and businesses.	2
NS	The Environmental Goals and Climate Change Reduction Act (Sect 9) commits the government to establish a Provincial Active Transportation strategy by 2023 and to complete core active transportation networks that are accessible for all ages and all abilities in 65% of the Province’s communities by 2030. In 2013, Nova Scotia developed a “Choose How You Move” active transportation plan as part of its broader Sustainable Transportation Strategy, which is still in place. The province established the “Connect2” grant program under this strategy, which aims to make all trips under 2 kms possible using sustainable modes of transportation. Funding is available for projects that expand options for walking, biking, rolling, shared mobility, ZEVs and transit. $600,000 was allocated by the province for the 2020-21 fiscal year, with projects eligible for funding up to 75% of their total project costs. The province is also building out the Blue Route, a Nova Scotia-wide cycling route along provincial highways connecting communities. This has been underway since the early 2010s.	2
QC	Quebec has implemented the Action Plan for Active Transportation 2018-2023, which aims to increase active transportation, reduce cycling accidents by 25%, and add 858 kms to the Route Verte cycling infrastructure. There are dedicated funds toward active transportation as part of the Action Plan for Active Transportation 2018-2023.	2
PE	Prince Edward Island developed an Active Transportation Strategy in 2020 as part of its broader Sustainable Transportation Action Plan. The strategy	2

	establishes an Active Transportation Fund of $25 million to support investments in walking and biking paths, connecting existing trails, and other items.	
NB	New Brunswick released its 20-year “From Surfaces to Services” sustainable transportation plan in 2017, which includes active transportation as an important component. There is currently no dedicated fund toward active transportation.	1
SK	There is currently no active transportation strategy or plan in Saskatchewan. In May 2021, the province and the federal government announced over $50 million toward infrastructure projects, which will include expanding active transportation networks.	1
ON	While Ontario does not have an active transportation policy, items in #CycleON Action Plan 2.0 (2018) are still being implemented. The Ministry of Transportation is supporting the update of guidelines for planning, designing and operating municipal cycling infrastructure, for example, and regularly incorporates active transportation into the design of its own facilities by design, such as including bike lanes on provincial transportation projects. Finally, the province's recently published regional transportation plans for Northern and Southwestern Ontario commit to working with municipalities to support active transportation connections. The Ontario Municipal Commuter Cycling Program (OMCCP) ended its funding investments on Dec. 31, 2021. There is no other dedicated provincial funding for active transportation.	1
AB	Alberta does not currently have an active transportation plan or strategy, and there is no dedicated fund toward active transportation. Budget 2021 established the Strategic Transportation Infrastructure Program (STIP), which provides funding to municipalities to support local infrastructure projects, though active transportation does not appear to be a core objective.	0
MB	-	0
NL	There is a Community Transportation Program through the Department of Children, Seniors and Social Development. The program can fund up to $100,000 towards alternative transportation projects. Active transportation projects are not explicitly listed as eligible through this program.	0
YT	-	0

Public transportation

In our 2021 Scorecard, we introduced benchmarking and scoring on public transportation provincial policy and outcomes. While electrification of personal vehicle transportation represents an efficiency improvement over fossil fuel-powered vehicles, a far more energy efficient mode of transportation is public transit, which can move a far greater number of people for a given unit of energy than a personal automobile. Access to effective public transit is important from an equity standpoint as well, since not all Canadians can afford personal, electric automobiles.

Data for public transportation metrics is provided by the Canadian Urban Transportation Association (CUTA), whose members transit systems carry 95% of all public transit riders in Canada. These systems encompass bus, light rail, heavy rail, commuter rail, and ferry boat transportation. The data we receive from CUTA combines the territories, so Yukon is not included in these metrics.

We look at three key metrics of provincial public transit outcomes:

- Total funding for public transit
- Ridership levels per capita
- Electric transit vehicles

These metrics complement each other in pursuit of a comprehensive picture of public transit support and effectiveness in each province. Each metric is worth one point, for a total of three points available for this topic.

Total funding

Public transportation relies on several different sources of funding to operate and expand their networks. This includes federal, provincial, and municipal funding, and other forms of investment, such as from transportation firms (such as TransLink, in British Columbia). In the 2021 Scorecard, we compared provincial funding per capita to measure each provincial government's commitment to and support of public transit networks. The results showed high variance in per capita funding across the provinces, which could be due to different administrative structures. For the 2022 Scorecard, we combine funding from all levels of government. We have included the provincial share of total funding in Table 77 to show how

much provincial governments are supporting public transit but have not scored on this percentage.

We use the municipal population per province, sourced from the Canadian Urban Transit Association (CUTA), as the denominator. This includes the populations of the municipalities that CUTA member transit services have the right to operate in. Our scoring methodology is based upon the average amount of funding per capita and the amount of funding by the top performing provinces. The average amount of per capita funding across the country was $361 and the top performing province had $903 in per capita funding. Provinces that funded over $1,000 per capita on public transportation received the full point, those who funded between $650 and $1,000 received 0.75 points, those who funded between $350 and $650 received 0.5 points, and those who funded between $100 and $350 received 0.25 points.

Table 76. Total funding per capita scoring methodology

Funding per capita ($CAD)	Score
$1,000	1
$650	0.75
$350	0.5
$100	0.25

Table 77. Total spending per capita (municipal population)					
Province	Municipal population (millions)	Total funding ($CAD millions)	Provincial share of funding	Spending per capita ($CAD)	Score (1 point)
ON	12.79	$11,563.92	63.99%	$903.92	0.75
MB	0.82	$607.04	22.97%	$741.01	0.75
QC	3.74	$2,616.34	29.39%	$699.71	0.75
BC	4.29	$1,453.12	18.14%	$339.10	0.5
AB	3.17	$936.61	9.54%	$295.85	0.25
NS	0.44	$129.40	1.55%	$294.04	0.25
SK	0.58	$67.54	0.64%	$116.31	0.25
NL	0.15	$17.50	1.32%	$114.22	0.25
NB	0.31	$24.71	3.83%	$78.81	0
PE	0.05	$1.40	15.25%	$28.20	0
Total	**26.34**	**$17,417.57**	**49.75%**	**$661.27**	

Ridership

Ridership refers to the total number of "linked trips," or trips from origin to destination (i.e., trips using transfers are only counted once). This is a useful performance metric because it gives an indication of active usage of public transit in each province, which is not strictly tied to service levels (e.g., the number of buses on the road).

Table 78. Ridership per capita scoring methodology	
Ridership per capita (>=)	Score
100	1
75	0.75
50	0.5
25	0.25

To evaluate this metric we calculate ridership per capita, using the population estimates for provincial service areas. This number includes all permanent residents who live within a specific distance from a transit stop, as reported by CUTA. To establish a scoring methodology, we

reason that, in a highly effective transportation system, 25% of commuters would use the system twice per workday, approximately 75% of the time. This works out to a top threshold of approximately 100 trips per capita (service area population), per year.

Table 79. Provincial public transit ridership per capita (municipal service area population)

Province	Ridership (Millions)	Municipal service area population (Millions)	Ridership per capita	Score (1 point)
QC	272.57	3.74	72.89	0.75
BC	167.01	4.28	39.03	0.25
NS	13.28	0.34	38.84	0.25
ON	348.49	10.65	32.72	0.25
MB	22.13	0.77	28.73	0.25
AB	77.33	3.10	24.91	0
SK	11.93	0.59	20.09	0
NL	2.26	0.14	16.73	0
PE	0.56	0.05	11.29	0
NB	3.12	0.29	10.80	0

Electric bus transit vehicles

Although public transit reduces greenhouse gas emissions, diesel buses emit GHG and air pollution. The average diesel bus emits 0.64 pounds of CO2 per passenger mile at 25% occupancy.[104] However, electrification of public transit bus fleets can reduce CO2 emissions by

[104] Tina Hodges, “Public Transportation’s Role in Responding to Climate Change” (Federal Transit Administration, January 2010), https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/PublicTransportationsRoleInRespondingToClimateChange2010.pdf.

between 15% and 40% because they are more energy efficient and can be fuelled from zero-carbon sources.[105]

Table 80. Electric vehicles in provincial public bus transit fleets scoring methodology	
EV share of fleet	Score
10%	1
5%	0.75
2.50%	0.5
1.25%	0.25

To support this electrification effort, the federal government launched the Zero Emission Transit Fund, which offers $2.75 billion in support towards electrifying both public transit and school bus fleets. Provinces and territories can apply for the fund, as well as municipal governments, transit agencies, and privately owned accessible transit providers.[106]

To score this component, we used a slightly modified methodology as used in our benchmarking of electric passenger vehicle registrations. We use the same fleet percentages but awarded only up to one point.

Alberta continues to lead this metric with EVs making up 2.11% of their fleet. The province did not add additional EVs to their public bus transit fleet in 2021. Ontario showed the largest increase in both the number of EVs, and their share of the provincial public bus fleet adding 51 EVs in 2021 to increase EV share by 0.77% points to 1.19% overall. Québec showed similar growth to Ontario, increasing its share of EV in the fleet by 0.74% points. The province added 28 EVs in 2021.

[105] Tina Hodges.

[106] "Zero Emission Transit Fund," Government of Canada, Infrastructure Canada, May 30, 2022, https://www.infrastructure.gc.ca/zero-emissions-trans-zero-emissions/index-eng.html.

Table 81. Electric vehicles in provincial public bus transit fleets

Province	Fleet size	EVs	EVs Year-over-year change	EV share of fleet	Score (1 point)
AB	2,467	52	0	2.11%	0.25
ON	6,898	82	51	1.19%	0
QC	3,793	37	28	0.98%	0
BC	2,414	-	-	-	0
MB	663	-	-	-	0
NB	109	-	-	-	0
NL	54	-	-	-	0
NS	369	-	-	-	0
PE	20	-	-	-	0
SK	271	-	-	-	0

Industry

'Industry' comprises three broad types: energy-intensive heavy manufacturing industries, such as iron and steel, cement, and chemicals manufacturing; less energy-intensive light manufacturing, such as textiles, automobiles, and electronics; and non-manufacturing industries such as mining, forestry, and construction. Altogether, the industrial sector accounts for 39% of total energy end use in Canada - more than any other end-use sector - though it is the only end-use sector to have experienced lower overall energy-consumption growth compared with the end-use sector since 1990.[107] Data from NRCan shows overall industrial energy intensity has decreased by approximately 33% since 1995, though much of this progress is due to structural effects.[108]

While this sector offers less energy-saving potential than buildings and transportation, there is still considerable opportunity to reduce energy intensity. According to the International Energy Agency, by 2050 appropriate policies could decrease industrial energy intensity by a further 38%.[109] Less energy-intensive manufacturing industries promise the greatest savings, around two-thirds of cumulative savings by 2050, while the cement industry is at the other end of the scale at 2% of total savings.[110] Different industrial subsectors also tend to be concentrated in different provinces: nearly 80% of mining, oil and gas energy consumption is in Alberta, 82% of iron and steel energy consumption is in Ontario, and 80% of smelting and refining (i.e., aluminum production) energy consumption occurs in Québec.[111]

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[107] Natural Resources Canada, "Canada's Secondary Energy Use (Final Demand) by Sector, End Use and Subsector."

[108] Natural Resources Canada, "Energy Efficiency Trends in Canada: 1990-2015," Government of Canada, 2018, 1990–2015, http://oee.nrcan.gc.ca/publications/statistics/trends/2015/index.cfm.

[109] International Energy Agency and Natural Resources Canada, "Energy Efficiency Potential in Canada to 2050."

[110] International Energy Agency and Natural Resources Canada.

[111] Natural Resources Canada, "Comprehensive Energy Use Database," Government of Canada, 2022, https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/menus/trends/comprehensive_tables/list.cfm.

The consequence is that potential efficiency savings in the industrial sector vary significantly from province to province, as do the technologies and processes that might be adopted to achieve them. Accordingly, we have to date based our industrial scoring on energy management programs that are broadly applicable across industry subsectors and provinces. This practice does not change for the 2022 Scorecard. We have simplified the scoring approach, however, which is explained further in the section below.

Energy management for industry

Previous scorecards drew a clear distinction between programs offering support for various components of energy management (i.e., tracking, monitoring, and benchmarking; assessment; expert consultation; and capacity-building), and programs which offered a more 'comprehensive' approach (i.e., strategic energy management or energy management systems programs).[112] This distinction was reflected in two separate metrics, and was intended to emphasize the importance of comprehensive industrial energy management systems resulting in certification under internationally recognized standards (e.g., ISO 50001). In the 2022 Scorecard, we combine these separate metrics into one, though total available points remain the same.

'Energy management' is a broad term which denotes a spectrum of activities facilities may undertake to track, manage, and reduce energy use (or energy intensity). This spectrum runs from single, often shorter-term interventions, typically with a narrower scope (i.e., a particular system, not the facility or production process as a whole), to those that are intended to reshape organizational culture and management practices and build capacity to ensure continuous improvement in energy use. A related, though separate, distinction exists between technical or capital energy efficiency improvements and operational or behavioural change. Examples of the former include conducting an energy audit or a feasibility study; examples of the latter include supporting embedded energy managers, or 'strategic energy management' (SEM) approaches.

Recent research has found considerable energy saving and GHG reduction potential in strategic energy management approaches, but also that there is not much standardization in what

[112] For definitions of these components, and examples of the types of activities they include, please see our 2021 Scorecard.

constitutes SEM.[113] Research conducted by Efficiency Canada through the Scorecard and separately on other projects indicates that few programs put much emphasis on participants obtaining certification for their energy management systems (nor, perhaps, is there much interest on the part of the participants on achieving certification), and that even fewer provide direct incentives for certification (though program administrators often report a willingness to provide support for participants to pursue certification, if they demonstrate an interest in it).

In principle, certification indicates an organizational culture focused on continuous improvement in energy use. However, it does not require demonstration of concrete results. Energy savings associated with SEM programs are typically attributed to operational or maintenance changes. Savings associated with capital projects - pursued because of participation in SEM programs - are generally associated with other incentive programs. Energy management programs like SEM, or embedded energy manager programs, typically have two-year participation windows. Continued support or 'check-in's may be conducted after the program participation ends, but the extent to which energy management practices persist post-participation is not generally tracked.

In short, SEM-like programs are often considered more as enabling initiatives than as stand-alone efficiency programs, focused on developing the capacity in organizations to identify opportunities, and to develop and implement plans to manage energy consumption. Program support typically does not last longer than 2-3 years (or 5 years at the most). Accordingly, we see SEM-like programs as important components of a wider basket of energy management-related activities, each of which are integral to building capacity and realizing energy efficiency improvement over the longer term.

For these reasons, we have combined our former two metrics into one, with support for SEM or certification represented as two among other components of industrial energy efficiency program portfolios. The weighting of these components is equivalent to our approach in previous Scorecards – existence of a SEM or SEM cohort style program (with incentives or without) gains 1 point. On certification, the existence of clear financial incentives is worth one

[113] Andrew Whitlock, Ed Rightor, and Andrew Hoffmeister, "Canadian Strategic Energy Management Market Study" (Washington, D.C.: American Council for an Energy-Efficient Economy (ACEEE), November 2021); Ethan Rogers, Andrew Whitlock, and Kelly Rohrer, "Features and Performance of Energy Management Programs" (Washington, D.C.: American Council for an Energy Efficienct Economy (ACEEE), 2019).

point (informal ‘support’ for certification does not count). An explicit program requirement for certification is worth another full point. Results are provided below in Table 82.

Table 82. Industrial energy management programs

Province/ territory	Assessment		Tracking, monitoring, and benchmarking		Experts		Capacity building		Certification		Score (7 points)
	Energy audits (0.5 points)	Feasibility studies (0.5 points)	Bench-marking (0.5 points)	EMIS (1 point)	Consultation and technical support (0.5 points)	Embedded energy managers (0.5 points)	Workforce training & awareness (0.5 points)	SEM/ Cohorts (1 point)	ISO 50001/ 50001 Ready, or other (1 point)	Required (1 point)	
QC	•	•	•	•	•	•	•	•	•		6
NS	•	•	•	•	•	•	•	•			5
ON	•	•	•	•	•	•	•	•			5
AB	•	•		•	•	•	•	•			4.5
BC	•	•		•	•	•	•	•			4.5
MB	•	•	•		•	•	•	•			4
NB	•	•		•	•			•			3.5
PE	•	•	•	•	•	•					3.5
NL	•	•									1
SK					•						0.5
YT											0

Conclusion

Provincial/territorial highlights

In each Scorecard, we highlight key trends and observations for each province. Below you will find a discussion for each province and Yukon, which includes major events over the past year and context setting, as well as strengths and opportunities highlighted for each province. These highlights allow us to also discuss policy plans and more recent events that were outside of the timeline for scoring.

We base both strengths and opportunities for improvement on a combination of Scorecard findings and our understanding of provincial policy contexts. Opportunities for improvement are a combination of areas where a province might score relatively lower and/or where the province is poised to take advantage of existing strengths. We also try to avoid constantly repeating the same opportunities each year, for a given province. These are highlights and not exclusive recommendations; we encourage readers to drill down into specific topic areas as well as previous years' highlights to understand a given province's relative performance and policy mix and to find ideas for policy actions to improve energy efficiency in each jurisdiction.

Alberta

Alberta ranks 9th in this year's Scorecard earning 19 points out of 100. The province has fallen two places in the rankings.

Alberta remains one of the only jurisdictions in North America that does not allow its utilities to undertake "demand side management" activities to lower energy system costs and reduce customer bills. A report released in May showed that such a program would create $11 billion in net benefits over twenty years within the province.[114] These benefits are likely higher in Alberta than other jurisdictions due to the province's large industrial base and lack of previous energy efficiency programs (except a brief period when Energy Efficiency Alberta was in operation).

[114] Guidehouse Canada, "Demand Side Management Opportunities for Alberta," Alberta Energy Efficiency Alliance, May 15, 2022, https://www.aeea.ca/dsm.

Alberta is also the only province without energy efficiency initiatives directed towards low-income households, leaving energy consumers most in need particularly vulnerable to rising energy costs. Luckily, Alberta Ecotrust Foundation is developing an Energy Poverty Reduction and Home Upgrades Program that will focus on energy poor households in Edmonton and Calgary.[115]

Industrial energy efficiency is an area where Alberta is showing leadership and is saving the most energy. Programs that supported strategic energy management under Energy Efficiency Alberta continued under the provincial government in 2021, and the province reported 130 facilities or projects participating in these programs since 2018. There is also a program for "Industrial Energy Efficiency, Carbon Capture Utilization and Storage" funded via carbon pricing revenues through the Technology Innovation and Emission Reduction System (TIER) fund, and a significant amount of energy savings from the Energy Savings for Business Program operated by Emissions Reduction Alberta.

Municipalities also remain a site of innovative energy efficiency activities. In addition to the low-income energy efficiency programs noted above, Edmonton and Calgary are also piloting digital home energy labels, and digitized audits of the commercial building stock, led by Alberta Ecotrust's Climate Innovation Fund.[116] These new approaches to energy efficiency could be taken province wide with support from the provincial government, utilities, or the federal government.

Strengths

Building codes: Alberta automatically adopts national model codes 12 months after publication date, which means the province is scheduled to adopt the new "2020 codes" earlier than most provinces. To truly take advantage of the new national model codes, Alberta should set a date to move towards the top "net zero energy ready" performance tier in the new codes and allow municipalities to require building to higher performance than the provincial minimum code. The

[115] "Energy Poverty Reduction and Home Upgrades Program," Alberta Ecotrust Foundation, n.d., https://albertaecotrust.com//energy-poverty-reduction-and-home-upgrades-program.

[116] "Climate Innovation Fund," Alberta Ecotrust Foundation, n.d., https://albertaecotrust.com//climate-innovation-fund.

province can take advantage of the federal government's announced "Building Code Acceleration Fund" to create capacity within the industry.

Industrial energy efficiency: There is significant energy saving potential in Alberta's large industrial sector. Participation in industrial energy management programs has been strong, however it is unclear if these programs will continue. The Emissions Reduction Alberta Energy Savings for Business Program is also currently planned to end within the next year, which was responsible for 10.5% of Alberta's total energy savings in 2021.

Some current programs also group energy efficiency with carbon capture, utilization and storage (CCUS). The two can be complementary, however while CCUS might require pilot projects, industrial energy efficiency requires consistent resources to improve monitoring, management and adoption of new technologies on a continuous basis.

Area for Improvement

Low-income energy efficiency: Low-income consumers are the most vulnerable to rising energy costs given that there is no low-income energy efficiency program in the province. The Energy Poverty Reduction and Home Upgrades Program developed for Edmonton and Calgary could be taken province-wide.

Energy labeling: Residential energy labels give homeowners information on their properties and give potential buyers information on a home's performance. Alberta Ecotrust is piloting a way to make receiving an energy score easy through a digital process. This program could be taken province wide and backed up by requiring energy information at the point of property sale.

Utility demand side management: Every kilowatt hour generated in Alberta produces more greenhouse gas emissions compared to every other province, except Nova Scotia.[117] While Nova Scotia leads the country with electricity savings equal to 0.9% of sales, Alberta saved slightly more than half that in 2021. With a federal Clean Electricity Standard requiring net-zero emissions by 2035, Alberta can make hitting this target easier by increasing electricity savings.

[117] Environment and Climate Change Canada, "Emission Factors and Reference Values," June 8, 2022, https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/output-based-pricing-system/federal-greenhouse-gas-offset-system/emission-factors-reference-values.html.

Like most provinces, Alberta should use demand side management to reduce overall costs and customer bills in both electricity and natural gas systems.

British Columbia

BC leads in Scorecard rankings for the 4th year in a row, and the province continues to be the place to look for policy best practices.

In 2021, the government released an updated CleanBC Roadmap to 2030 that introduced several new energy efficiency best practice policies. These included making all new buildings zero carbon by 2030 and seeing all new space and water heating equipment to be at least 100% efficient by 2030; requiring all new home sale listings to include an energy efficiency label; an accelerated zero-emission vehicle mandate; and a cap on GHG emissions from natural gas utilities which will further encourage demand side management and electrification.

While BC scores high on buildings, transportation, and industry, it remains in the middle for energy efficiency programs. Both BC Hydro and FortisBC (electric) opted away from the most aggressive cost-effective energy savings scenarios in their latest long-term resource plans, emphasizing the risk of missing these targets due to lack of participation. However, higher savings targets are in line with BC Hydro's "accelerated electrification scenario" wherein the province meets its net-zero emission goals. Planned caps on natural gas utility GHG emissions should also call for a ramp-up in natural gas savings.

Thus, there is a risk that utilities are not fully aligned with the province's net-zero goals. The province's electricity and natural gas savings goals are not high by Canadian or North American standards. For example, BC's average annual electricity savings target in 2021 was 0.45% of sales while Nova Scotia led with a target of 1% of sales. American states frequently achieve 2% or higher. Similarly, natural gas savings from utility programs in 2021 were 0.4% of sales in BC, while California saved nearly 2%.

BC policymakers should be asking themselves how they can achieve more aggressive energy savings without creating undue uncertainty for utility system planners. A different approach can be found in the "mission-oriented" framework informing BC's economic plan.[118] Under a

[118] Mariana Mazzucato, "Inclusive and Sustainable British Columbia: A Mission-Oriented Approach to a Renewed Economy" (UCL Institute for Innovation and Public Purpose, 2022), https://www.ucl.ac.uk/bartlett/public-purpose/2022-01.

mission-oriented approach, risk and uncertainty associated with meeting aggressive goals are seen as assets because they encourage learning and exploration of new solutions. Such an approach could be taken to reach higher energy savings goals, building from existing initiatives such as FortisBC's Deep Retrofit Pilot, and the province's Innovative Clean Energy and Building Innovation Funds, and the Pembina Institute's Reframed Initiative.

BC is also recognizing the need for better energy efficiency as it deals with the impacts of climate change. This year the Chief Coroner released a review of heat related deaths in the Summer of 2021, calling for building codes to include passive and active cooling measures.[119] While adding energy efficient cooling technologies to new buildings and pre-planned retrofits will help, most buildings in need of these services would be better reached through a minimum performance standards for existing buildings related to energy efficiency, GHG targets that complement zero-carbon heating and cooling systems, and "right to be cool" related health and safety requirements.

Strengths

Strong climate plan: BC's updated climate plan includes several nation leading policies. Now the province needs to implement them. This includes building labels at point of sale, Property Assessed Clean Energy (PACE) financed upgrades through property tax bills, regulating 100% efficient space and hot water heating systems, and emissions cap for utilities.

Zero carbon building code: BC is moving beyond "net-zero energy-ready" standards towards a zero carbon building code by 2030 that will consider operational emissions within the building, complemented by a strategy to reduce emissions from building materials. The federal government is following BC's lead by developing a net-zero emissions national model code.

Municipal empowerment: BC's consistent support for local capacity helps new policies and programs spread throughout the province. Policies to build local capacity include BC Hydro's Sustainable Communities program that connects local government staff through their Community Energy Manager network. FortisBC also supports community energy specialists and BC Hydro supports Local Government Peer Networks on new construction energy efficiency,

[119] British Columbia Coroners Service, "Report to the Chief Coroner of British Columbia, Extreme Heat and Human Mortality: A Review of Heat-Related Deaths in B.C. in Summer 2021," June 7, 2022, https://www2.gov.bc.ca/assets/gov/birth-adoption-death-marriage-and-divorce/deaths/coroners-service/death-review-panel/extreme_heat_death_review_panel_report.pdf.

electrification, and low carbon retrofits. BC utility programs stand out in their support for market transformation and capacity building that complements provincial policy.

Areas for improvement

Mission-oriented energy efficiency: The mission-oriented framework that informs BC's economic plan can be directed towards achieving the aggressive levels of energy savings that align with net-zero emissions. This would help the province escape the limitations of static benefit-cost frameworks used in utility planning to explore how to lead the country in large-scale building retrofits and energy saving innovations.

Delivering on a "right to be cool": BC's experience with extreme heat shows that access to cool indoor temperatures is a necessity. To avoid creating an underclass of underperforming and unsafe buildings, the province can complement new building codes and the "retrofit code" under development with mandatory building performance standards for existing large buildings, alongside tenant rights to ensure affordability, security, and maximum temperature thresholds.

Manitoba

Manitoba ranks 8th in this year's Scorecard. Improvements over last year include higher natural gas and electricity program savings achieved by Efficiency Manitoba, the crown corporation dedicated to energy efficiency.

The province is currently engaged in an update of its provincial energy framework, which presents an opportunity to adopt several energy efficiency best practices and to align energy efficiency with achieving net-zero emissions. This new framework can consider how efficiency programs, utility system planning, and government rules and regulations complement one another. For instance, programs can achieve more with supportive government policies like mandatory building labels at time of sale, and energy use reporting from large buildings.

The Efficiency Manitoba Act establishes annual average targets equal to 1.5% of electricity consumption and 0.75% of natural gas consumption, with any shortfalls or surpluses carried forward in future years to achieve 15-year energy saving targets. To recover from pandemic disruptions, Efficiency Manitoba will need to exceed these annual goals in future years.

Achieving higher savings in the future will require finding new energy efficiency opportunities. Traditional "low hanging fruit" measures like lighting cannot be relied upon to deliver ultra-low cost savings in the same way as before. Efficiency Manitoba's latest market potential research

is identifying new opportunities in heat pumps, residential home energy reports, and customized industrial initiatives. Maximizing future energy savings will likely require more investment per unit of energy saved to achieve deeper savings and GHG reductions, while reaching more people – including low-income and Indigenous communities.

An upcoming Manitoba Hydro Integrated Resource Plan presents an opportunity to show the role energy efficiency needs to play to achieve net-zero emissions. It should look to jurisdictions promoting electrification of transportation and heating while planning to avoid expensive electricity peaks (e.g., BC, Québec, Newfoundland and Labrador, Minnesota) and multi-fuel resource planning that helps break out of traditional fuel silos (e.g., Rhode Island, Massachusetts, New York).

A new energy framework can also consider how efficiency programs, utility system planning, and government rules and regulations complement one another. More energy savings can be achieved with supportive policies like mandatory building labels at time of sale, and energy use reporting from large buildings.

Manitoba's building energy code was one area in need of an update. The Scorecard analysis period tracks Manitoba using the 2011 version of the National Energy Code for Buildings. However, this score will improve in future years because Manitoba announced plans to adopt the new 2020 version of the codes in October 2022.

Strengths

Efficiency Manitoba Innovation Fund: In 2021, Efficiency Manitoba launched an Innovation and Research Fund. It will explore new energy saving opportunities through technology demonstration and market capacity building. Thus far the fund has supported projects related to indoor agriculture in cold climates, ground source heat pump innovation, drone-based air leakage assessments, and pre-engineered insulation systems.

New Indigenous Programs: A 2019 Efficiency Manitoba regulation directs at least 5% of demand side management budgets be directed towards low-income and hard-to-reach customers, including Indigenous populations. Pandemic safety requirement in remote communities have delayed energy efficiency initiatives, but this has not prevented Efficiency Manitoba from working with Indigenous communities to designed tailored energy saving strategies.

Efficiency Manitoba created an Indigenous Energy Efficiency Working Group to design, deliver, and implement programs and has a dedicated team which have developed specific programs for First Nation, Métis, and Indigenous small businesses. The Indigenous Community Energy Efficiency Program funds community advocates to identify energy savings opportunities and support local economic development by hiring local people to complete upgrades.

Opportunities for Improvement

High performance building codes: The new version of the national model building codes include progressive performance tiers that lead to net-zero energy-ready buildings. As Manitoba plans to adopt this new code, it should establish a schedule to move up these performance tiers. A federal Building Code Acceleration Fund is expected to be available to help provinces and municipalities develop the local capacity needed to build higher performance buildings.

Fuel switching policy: Programs that switch from fossil fuels to electricity (e.g., heat pumps) decrease Efficiency Manitoba's claimed electricity savings, under existing rules. This creates a disincentive to promote GHG reducing and economy-wide energy efficiency enhancing fuel switching because of the legislative target based on savings as percentage of sales in the previous years. Other jurisdictions with clear targets like Manitoba have coupled traditional electricity and natural gas targets with fuel neutral or GHG objectives and have provided clear definitions of beneficial electrification.

New Brunswick

New Brunswick ranks 7th in this year's Scorecard earning 30 points out of 100.

This year's ranking does not include new commitments under a new climate change action plan for 2022-2027, released in the fall of 2022. The new plan lists several best practices that encompass the metrics within the Scorecard, including commitments for:

- all new buildings constructed to be net-zero energy ready by 2030, with a plan to adopt more stringent tiers of the new national model building codes starting in 2023.
- Phasing out heating oil use in buildings by 2030
- Building labeling and disclosure programs, moving towards a time of sale disclosure requirement by 2030

- Requiring large industry to report GHG emissions and to submit GHG and energy management plans
- Setting clear electricity efficiency performance targets and dedicated annual funding to support low-income, Indigenous, and non-electric fuel programs
- Creating long-term financing and/or payment mechanisms by 2024
- Training 300 new and existing tradespeople by 2026 in skills related to residential and commercial high-performance buildings

In February 2022, the Auditor General released a report on residential energy efficiency programs that made extensive use of previous years' Scorecards. The report noted that non-electric programs did not have a sustainable funding source, the existence of barriers to low-to-moderate income customers, the need for the government to challenge lowered energy efficiency targets, and a lack of financing programs.[120] The new climate plan responds to these priorities.

Changes announced in June 2022 to the Electricity Act created a new "Energy Efficiency Fund" to support non-electric fuel efficiency programs and gave the government the ability to make regulations to establish minimum energy efficiency targets for electricity. A new efficiency potential study is currently being developed.

The government proposed draft regulations for public review in September 2022. The proposed minimum electricity savings targets would start at 0.5% of in-province electricity sales and rise to 0.75% by 2028-2029. These savings are higher than savings equal to 0.3% of sales achieved in 2021 and higher than previous years, such as savings of 0.6% of sales in 2018.

The regulations also proposed minimum budgets for non-electric, low-income, Indigenous and programs that do not meet the cost effectiveness tests of the utility, starting at $10 million and rising to $25 million by 2029. In 2020, approximately $5.4 million was spent on non-electric programs.

[120] Auditor General of New Brunswick, "Report of the Auditor General of New Brunswick 2021," February 2022, https://www.agnb-vgnb.ca/content/agnb-vgnb/en/publications/reports/year/2021.html#2021V1=Page1&2021V3=Page9&2021V2=Page6.

Strengths

Smart meters: New Brunswick started upgrading to advanced meters in March 2022, with expected project completion in 2024. This project is finally underway after several years before the Energy and Utilities Board. This infrastructure will enable better targeting of energy savings opportunities, evaluation, and real-time feedback to customers.

Research: New Brunswick has the highest energy research concentration on energy efficiency (based on National Science and Engineering Research Council grants). This is due to a single project at the University of New Brunswick on dispatchable control systems in local electricity distribution networks.

Areas for Improvement

Energy efficiency resource standard: With new changes to the Electricity Act enabling minimum energy efficiency targets, New Brunswick can create an energy efficiency resource standard. While the proposed regulatory changes establish *minimum* targets an energy efficiency resource standard works best as an aggressive target, informed by a clear planning rule. A proposed minimum electricity target of 0.75% in 2028-2029 is higher than New Brunswick has historically achieved, yet it is lower than the 1% of savings achieved in Nova Scotia in 2021 and much lower than American states consistently achieved annual savings of 2% or more. This level of savings by the end of the decade is unlikely to be adequate to achieve net-zero emission goals.

New Brunswick can establish both minimum levels and stretch goals by enshrining the principles that guide New Brunswick energy efficiency goals in the Electricity Act. Leading jurisdictions inform such standards with commitments to undertake “all cost effective” energy efficiency, which increasingly incorporate multi-fuel targets and electrification of transportation and heating systems consistent with net-zero emission futures. Achieving net-zero emissions also calls for maximizing energy saving opportunities per participant through deeper savings that prepare homes and businesses for net-zero emissions futures.

Low-income energy efficiency: The new Energy Efficiency Fund promises to provide stable long-term funding for low-income energy efficiency programs. There should also be an opportunity to match electricity ratepayer funds with non-electric funding to provide robust energy efficiency solutions to low-income customers, regardless of fuel used. The Auditor General compared funding levels for low-income programming with other Atlantic provinces

and called for NB Power to develop a plan and timeline to ensuring easy access for all applicants to the utility's Low Income Energy Savings program. Based on this year's benchmark, New Brunswick would need to increase low-income energy efficiency spending from $4 million to $32 million to match PEI and $12 million to match Nova Scotia.

Compensation for public interest utility interveners: New Brunswick's Energy and Utilities Board reviews demand side management program plans and significantly directs provincial policies in areas such as smart meters. These decisions have an important impact on the environment and low-income customers. New Brunswick is one of the few provinces with energy efficiency decision making under a regulatory board that does not encourage public interest organization participation by providing compensation for costs. This means all interests are not equally represented.

Newfoundland and Labrador

Newfoundland and Labrador increased its overall scores and pulled itself up from last year's last place finish. In 2021, the province started offering electric vehicle incentives, which should be the start of a larger push to take advantage of the province's clean electricity to offset local fossil fuels rather than needing to export it at a lower price than current retail rates. Sixteen new Energy Advisors also received certification within the province, which creates more capacity for people to participate in federal and provincial energy efficiency programs.

The province has constructed a strategic electrification strategy worthy of note. It includes a modified cost-effectiveness test that considers non-electric benefits from lower fuel and maintenance costs, thus helping break down the "fuel silos" seen in many other jurisdictions. The strategy is set to be frequently updated to account for changing market conditions and will couple electrification with demand control measures to manage system peak demand periods.

The province continues to lag behind others when it comes to electric vehicle charging infrastructure, which remains a large barrier to encourage transportation electrification and tourism within the province. This will be changing however, with the Board of Commissioners of Public Utilities approval of utility led EV charging infrastructure roll-out and St. John's council deploying 26 new charging stations.[121]

[121] "St. John's Council Approves Installation of Electric Vehicle Charging Stations," *VOCM* (blog), June 7, 2022, https://vocm.com/2022/06/07/st-johns-council-electric-vehicle-charging-stations/.

Newfoundland and Labrador could implement policies to support energy efficiency more broadly and efficient electrification. This includes adoption of the new 2020 model building code; financing electrification and energy upgrades through the property tax system (Property Assessed Clean Energy Finance) and requiring large buildings to disclose and benchmark energy performance.

Strengths

Electrification planning: Newfoundland and Labrador's unique context of experiencing an anticipated electricity surplus and rising energy costs calls for a strategy that strategically replaces fossil fuels with electricity, to break down fuel silos that prevent better economy-wide energy efficiency, and to continue electricity energy savings to reduce peak demands and help customers afford energy bills. The utility Electrification, Conservation, and Demand Management Plan contains strategic policies and programs that help manage costs and support provincial GHG reductions. Newfoundland Power has researched the peak demand impacts of cold climate heat pumps.

Low-income energy efficiency: A closer look at provincial low-income energy efficiency programs by an Efficiency Canada published study this year found that the Home Energy Savings Program administered by Newfoundland and Labrador Housing Corporation was capable of providing comprehensive energy savings per household. However, our benchmarking suggests the province as a whole is investing a low amount in low-income efficiency upgrades compared to other provinces. In 2021, Newfoundland and Labrador spent roughly $11 per person in low-income, compared to $233 in PEI and $92 in Nova Scotia.

Areas for Improvement

Data availability and evaluation of government programs: A number of energy efficiency initiatives within the province are supported by the provincial government, as well as federal funding sources such as the low-carbon economy fund. These initiatives are saving fossil fuels through efficiency and electrification, but the province did not report fossil fuel saving results. It is important that energy efficiency program results are frequently monitored and publicly reported to assess effectiveness, show results, and make mid-course corrections and improvements.

Certified Energy Managers: There are only 2 Certified Energy Managers in Newfoundland and Labrador. These are experts that primarily work in commercial, institutional, and industrial buildings. The low number of CEMs is coupled with a lack of industrial energy management programs or energy benchmarking and disclosure initiatives for large buildings. Energy management in large buildings can play an important role in helping the province strategically electrify and find flexible energy end uses that avoid expensive electricity peak demand periods.

Nova Scotia

This year Nova Scotia passed Quebec to place second overall, propelled by improvements in energy efficiency program results.

This new provincial government committed to achieving net-zero emissions by 2050 and 53% below 2005 levels by 2030 under the Environmental Goals and Climate Change Reduction Act. This legislation also committed to setting targets for energy efficiency programs in a way that prioritizes access to low income and marginalized populations, to implement a zero-emission vehicle mandate for 30% of new vehicles sales to be zero-emission by 2030, and to adopt the 2020 version of the National Energy Code for Buildings within 18 months of publication.

A Nova Scotia Power proposal to charge a system access fee for solar net metering was stopped by the government through legislative amendments introduced in April. This event triggered a wider discussion on misaligned incentives and performance expectations of the generation utility in a net-zero emission future. The government also introduced changes to the Public Utilities Act creating a "partnership and performance table" on performance standards and penalties, and to prescribe performance standards that relate to energy efficiency, reliability, as well as equity and energy poverty.[122]

The province is anticipated to release a new climate change action plan, which will hopefully boost the province into a leadership position on energy efficiency policy.

[122] "Public Utilities Act (Amended) - Bill 147," Text, Nova Scotia Legislature, 2022, https://nslegislature.ca/legislative-business/bills-statutes/bills/assembly-64-session-1/bill-147; "Amendments to Electricity Act, Public Utilities Act," Government of Nova Scotia, April 7, 2022, https://novascotia.ca/news/release/?id=20220407002.

Strengths

Low-income energy efficiency: Nova Scotia increased its low-income program spending in 2021 and spends the second most per low-income individual on low-income energy efficiency (behind PEI). Efficiency Nova Scotia's approved 2023-2025 demand side management plan will triple this level of investment, spending 20% of total budget on low-income, Mi'kmaw and diverse communities.

Peak electricity savings: Nova Scotia's traditional leadership in electricity savings also includes peak demand savings. Nova Scotia leads in shaving its peak electricity consumption through long-lasting energy efficiency measures that also provide customer bill and GHG reductions by saving energy throughout the year. Efficiency Nova Scotia is exploring more ways to reduce costs on the electricity system, manage new electric loads, and integrate renewable energy into the grid through a hot water demand response pilot and Nova Scotia Power is demonstrating grid-interactive electric vehicle charging and behind-the-meter battery systems.

Areas for Improvement

Energy efficiency resource standard: Nova Scotia is a traditional energy savings leader, yet it needs its energy savings targets to align with its economy-wide net-zero emissions goal and to provide long-term certainty to the energy efficiency sector to meet this goal. The province's ambition should be to not only be a Canadian leader, but to join leading American states consistently saving over 2% of electricity sales annually and over 1% of annual fossil fuel sales.

Net-zero building codes: The province has committed to adopting the 2020 national energy code for buildings sooner than most other provinces, however it should align its use of this code with its net-zero emission goal. The new codes enable the province to easily do this by defining multiple performance tiers moving toward a net-zero energy-ready. The province should set 2030 as the latest date to make this the requirement, and then allow municipalities with strong climate plans (e.g., Halifax) to require this standard sooner. New Brunswick's new climate plan commits to require a net-zero energy-ready standard for all new buildings by 2030, and PEI plans to do the same for residential buildings.

Performance-based utility regulation: The experience with Nova Scotia Power creating barriers to solar net metering highlighted similar misalignments that create generation utility resistance to energy efficiency. This misalignment could become a larger problem as the province seeks to move towards net-zero emissions. Several big energy saving jurisdictions with private utilities

like Nova Scotia decouple utility revenues from sales to remove energy efficiency disincentives, and then link utility revenue rewards to realized performance in areas like better reliability, lower bills, and lower GHG emissions. The government can make its legislative changes that create new performance standards have an impact by linking utility revenues to the type of performance required to achieve net-zero emissions in an affordable and equitable way.

Ontario

Ontario ranked fifth in this Scorecard; one position lower than last year. The province earned 39 points out of 100.

Ontario is facing an electricity capacity shortfall in future years, driven by increased demand associated with electrification of transportation and industries like steel, as well as the planned closure of the Pickering nuclear station and refurbishment of other nuclear facilities. But energy efficiency is coming to the rescue! In October 2022, the government expanded electricity Conservation and Demand Management (CDM) programs, largely reversing budget cuts made in 2019. Energy efficiency could play a larger role in meeting electricity energy system needs, with the new directive also encouraging local electricity distributors to propose ratepayer funded conservation and demand management applications to the Ontario Energy Board.

Natural gas conservation programs have operated under a series of interim plans for several years as the Ontario Energy Board considers a long-term plan from 2023 to 2027. The current proposal falls far short of targeting savings levels shown to be cost-effective and achievable in even the most pessimistic scenarios. The consequence could be prolonged continuation of the status quo in utility demand-side management as 2030 rapidly approaches.

Ontario currently has one of the most stringent building codes in the country and it was the first province to move to harmonize with the new national model codes, which include multiple performance tiers leading to net-zero energy-ready buildings. However, the province's proposed approach to adopt Tier 3 of the 2020 National Building Code (which is currently under consultation) suggests minimal near-term improvement in energy efficiency requirements for residential buildings, and no formal recognition of tiers within Ontario's building codes. If this proposed, status quo-oriented approach goes forward, other provinces could soon exceed Ontario building standards, and the province could miss out on the opportunity of municipal harmonization at higher tiers.

Strengths

Demand response: Ontario leads the country in available demand response and related resources to reduce electricity peaks, with the ability to save almost 8% peak power demands. These resources are acquired through a capacity auction that includes demand response from large customers and virtual demand response that aggregates flexible demand across several demand centers, as well as a specific energy efficiency capacity auction pilot.

Areas for Improvement

Expand energy efficiency programs: With a new recognition of the value of conservation and demand management programs on the electricity side, Ontario should consider how to further expand electricity programs and take a new look at natural gas demand side management to manage rising prices and reduce GHGs. The province has the long-standing program administration expertise necessary to ramp up energy savings to rejoin the ranks of top Canadian energy saving jurisdictions, or to go even further, and save energy on par with leading American states.

Net-zero building code: Ontario has moved toward adopting the new model national codes but has only proposed the middle tier, which largely corresponds with the existing provincial code. The principal benefit of the new national model codes is that they include performance tiers that establish a pathway towards net-zero energy-ready buildings. To maintain its building code leadership, Ontario should establish a date for making all new buildings net-zero energy-ready, as well as zero carbon ready, and allow advanced municipalities to use the new code to reach those standards sooner.

Fuel switching policy: Ontario policymakers have directed more coordination between natural gas and electricity programs for several years, without much progress. Enbridge, local electricity distributors, and the government have recently combined to explore how to smartly control dual fuel electric heat pump and natural gas heating systems.[123]

While the Ontario Energy Board's rules enable natural gas conservation programs to promote fuel switching, available and planned programs are currently restricted to customers who maintain a gas connection. In addition, the Ontario Energy Board decision on Integrated

[123] "Ontario Launches Clean Home Heating Initiative," Ontario News, September 27, 2022, https://news.ontario.ca/en/release/1002324/ontario-launches-clean-home-heating-initiative.

Resource Planning rules out Enbridge Gas funding and delivering fuel switching measures that could cost-effectively reduce pipeline costs.

Other jurisdictions are figuring this out, and even finding ways to incent natural gas utilities to promote beneficial electrification while strategically using fuel where and when it is most highly valued. For instance, BC plans will require gas utilities to meet a GHG reduction target, and Minnesota's Energy Conservation and Optimization Act enables gas utilities to promote efficient fuel-switching.

Prince Edward Island

Prince Edward Island placed fourth (just ahead of Ontario, for the first time), but fell short of Nova Scotia for the lead in Programs. The province achieved impressive low-income energy efficiency program spending in 2021 and is prioritizing fuel switching through their net zero framework.

Prince Edward Island has the most ambitious climate target in the country - to be net zero GHG emissions by 2040. However, its energy efficiency policies do not appear to be consistent with meeting that goal and the province has backtracked from previous energy saving commitments.

The 2022/23 to 2024/25 Electricity Efficiency and Conservation plan aims to save 0.7% of sales annually. However, the 2016/17 Energy Strategy called for saving 2% of sales for both electric and non-electric fuels by 2020, and a potential study showed this level of electricity savings to be cost-effective.[124]

The province's net zero framework aims to make all new residential construction net zero-ready by 2030, a "leading jurisdiction" in net zero ready for commercial operations, and to see 100% non-fossil fuel heating in new residential homes by 2025 and commercial buildings by 2030. Yet, the government has yet to implement these measures through regulation.

Strengths

Program savings: PEI was second in the country for electricity program savings and third for fossil fuel savings. Given this leadership and the success of efficiencyPEI it is surprising that

[124] Dunsky Energy Consulting, "Prince Edward Island Energy Efficiency Potential Study: A Comprehensive Assessment of Energy Efficiency and Demand Response Opportunities 2021-2030" (Montreal, QC: efficiencyPEI, 2020).

the 2022-2024 savings target is only 0.74% of electricity sales on average, which is lower than the 0.86% already achieved in 2021, and the province has no fossil fuel savings target.

Transportation: PEI scored third, behind BC and Quebec is transportation energy efficiency policy. This is the result of new incentive policies for new and used vehicles as well as e-bikes, and a large number of electric vehicle charging stations on both a per road kilometer and per capita basis.

Areas for improvement

Target higher savings: To reach net-zero PEI should not give up on previous goal to annual savings equal to 2% of sales for electric and non-electric fuels. Reaching this higher level of savings requires continued program leadership as well as government enabling policies, such as requiring energy performance labels when homes are sold and mandatory energy use reporting from large buildings.

Québec

Québec fell to third in this year's Scorecard, largely because of Nova Scotia's performance in energy efficiency programs. Québec leads in industry this year. It is the only province to actively incent ISO 50001 certification for energy management systems.

Québec also retained its lead in transportation, with plans to strengthen its zero-emission vehicle mandate to 100% of vehicle sales by 2035, and the highest per capita funding for public transportation and an extensive active transportation network through the Route Verte.

The dual energy (biénergie) program to heat buildings with clean and efficient electricity and use natural gas during peak periods was approved by the provincial energy regulations and launched in the summer of 2022. By 2024 it will also not be possible to replace a fuel oil residential heating system with fossil fuels in Québec.

The City of Montréal has taken further steps. The municipality will require all new buildings to be zero emissions by 2025 and will require owners of large buildings to disclose energy consumption, leading to a performance standard achieving carbon neutrality of all existing buildings by 2040.

As Québec plans to electrify transportation, heating and industry while also exporting to North America, the electricity system needs to prepare for new demands. Hydro-Québec's 2022-2026

strategic plan estimates a need for 100 TWh by 2050 (compared to 175 TWh currently) and calls for doubling electric energy efficiency targets. This higher target ramps annual incremental savings up to 0.5% of domestic sales. This is still lower than the targets of six other provinces and far behind American states that consistently achieve annual savings of 2% or higher.

Strengths

Fuel switching policy and programs: Québec dual energy program launched this year - smoothing the way for building electrification, and the province aims to phase out all fuel oil heating.

Public transit funding: Québec has the highest per capita public transit funding, with the provincial government funding 35% of the total, and also has the highest per capita public transit ridership.

Areas for improvement

Copy Montréal's building strategy: Montréal is moving toward mandatory energy efficiency and GHG performance standards for existing buildings. This starts with mandatory reporting requirements, leading towards carbon neutral buildings by 2040. The provincial government can take a similar approach for all buildings in the province. These performance standards can be coupled with objectives to improve health and safety of large buildings, such as resilience against extreme heat.

Regulate heating equipment: The dual energy program's ambition is to achieve the decarbonization of all buildings. This cannot be achieved solely through an incentive program, which is why the province should consider regulatory approaches such as BC requiring that all new heating systems be at least 100% efficient - a level of performance achieved by heat pumps or implementing similar requirements to ensure all heating systems are efficient and zero-carbon ready, using fully electric or dual fuel systems. As the province seeks more electricity savings, there is also a large energy savings opportunity in converting the large number of buildings with electric resistance heating to more efficient heat pumps.

Saskatchewan

Saskatchewan finishes in the last place rank in this year's Scorecard. The province has been last or second last for four years. Saskatchewan reported no electricity savings and modest (last place) savings from energy efficiency programs and spends the second lowest per capita

on energy efficiency. There is no active transportation strategy, and the province limits support for industrial energy efficiency to consultation and technical support.

SaskEnergy is expanding its program portfolio, offering rebates for commercial boilers and space and water heating equipment, as well as energy saving hydronic additives for boiler systems, starting in 2022 and 2023. The utility also currently has a request for proposals to carry out a conservation potential review, and to provide portfolio energy efficiency services to support SaskEnergy's efficiency team.

An important policy event occurred this year with the release of the City of Regina's Energy & Sustainability Framework. It aims to achieve net zero carbon emissions and to source all energy from renewable sources by 2050 with a strategy that starts with reduced energy consumption and improved energy efficiency.[125] The plan recognizes the need to achieve 50% building energy savings and 10% electrical savings in 100% of pre-1981 constructed buildings by 2030, and to see all new residential buildings constructed to net-zero standards by 2030. Early action from the city includes matching the $5,000 grant from the federal Greener Homes Program.[126]

Strengths

Building Science Research: Saskatchewan was second in the Scorecard's metric for Natural Sciences and Engineering Research Council funding for energy efficiency research. 26% of research funds related to energy efficiency. This jump is principally due to the research of University of Saskatchewan professor Carey Simonson, who is studying how to improve the moisture transfer efficiency of HVAC systems, and how barriers membranes in air exchange systems can conserve energy and prevent the airborne transmission of COVID-19. Saskatchewan has a strong history in building science research. For instance, the blower door technology used to measure air leakage in buildings was invented in the province.

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[125] City of Regina and Sustainability Solutions Group, "Energy & Sustainability Framework Energy & Emissions Reduction Action Plan" (Regina, Saskatchewan, January 2022), https://www.regina.ca/export/sites/Regina.ca/about-regina/renewable-regina/.galleries/pdfs/Energy-Sustainability-Framework.pdf.

[126] "New City Program Matches Funds for Residential Home Retrofits Apply from June 20 to 30," City of Regina, June 6, 2022, https://www.regina.ca/news/New-City-Program-Matches-Funds-for-Residential-Home-Retrofits-Apply-from-June-20-to-30/.

Areas for Improvement

Net-zero building codes: Saskatchewan has adopted the more up to date 2017 National Energy Code for Buildings. With the release of the new 2020 codes, Saskatchewan should move to adopt the latest version of the codes and establish a timeline to make all new buildings net-zero energy-ready. Municipalities in Saskatchewan can write by-laws that implement higher standards than the province, which means cities like Regina with ambitious climate plans should be able to adopt higher performance tiers within the national model building codes.

Increase electricity saving programs: Saskatchewan has the third highest GHG intensity electricity system in Canada, which means it will be a challenge to meet the requirements of a federal government Clean Electricity Standard that will require net-zero emissions by 2035. The province is committed to reducing the carbon intensity of its electricity grid. Reducing electricity demand will make every renewable electricity kilowatt-hour generated have a bigger decarbonization impact and put money in customer pockets, but Saskatchewan achieved no electricity savings and has no energy efficiency targets. We can contrast this to Nova Scotia, the province leading the country in electricity savings which will help it move from having the highest emission electricity system in the country towards phasing out coal in 2030.

Yukon

This is the first year we integrated the Yukon into the full Scorecard. The territory ranked 6th earning 35 points out of 100 – four points behind Ontario.

In May 2021, the Yukon's climate change mitigation strategy, Our Clean Future, increased its greenhouse gas reduction target from 30% to 45% below 2010 levels by 2030. The strategy commits the Yukon government to creating a Clean Energy Act by 2023 that legislates greenhouse gas reduction targets and the territory's commitments to energy efficiency and demand-side management.

All energy efficiency programs are currently offered by the Yukon Government. In Scorecard 2021 we noted that after a utility regulatory board dispute, Yukon Energy and ATCO, were approved to offer rate-funded DSM programs as they had previously done through the InCharge brand. Since then, the utilities concluded a residential demand response pilot in 2021, but no new territory-wide programs have been launched by utilities since the decision.

In addition to a variety of retrofit rebates through the government-led Good Energy Program, the Yukon ran two deep retrofit pilots in 2021. The first pilot offered enhanced incentives and reporting requirements for homeowners wanting to reduce their energy consumption by 40% or more. The second, monitored the efficiency of heat pumps in a northern climate.

Strengths

Program savings and spending: There are substantial energy efficiency programs available for Yukoners. The territory ranked first in natural gas and non-regulated fuel savings. The 2021 savings equal to 3.5% of end-use demand is over 4 times the level of savings in the top province of Québec. The territory also has the highest program spending per capita at $126.

Indigenous energy efficiency: The Yukon leads in energy efficiency programs spending for Indigenous people, measured by spending per individual with Indigenous identity.

Net-zero building codes: The new 2020 national model building codes (released in early 2022) include progressive performance tiers leading to net zero energy ready buildings. Yukon is planning to adopt the 2020 model codes and are committing to requiring all new buildings to achieve net-zero energy performance by 2032.

Areas for improvement

Evaluation of program savings: Many provinces have third party evaluations for program savings, however the Yukon does not. This makes it difficult to accurately benchmark Yukon energy savings against other provinces. Third party evaluation can ensure savings are accurate, increase transparency, and help programs achieve their goals. A unique evaluation, measurement, and verification approach can be developed for the Yukon's smaller population which encourages flexibility and aligns programs with net-zero emission objectives and market transforming codes and standards.

Federal implications

In each year's Scorecard we consider the role of federal policy in supporting better provincial energy efficiency performance. Considering how federal policies can "crowd in" more provincial

action is an important consideration as the federal government develops a new Green Building Strategy.

Last year's Scorecard's federal recommendations concerned taking leadership on building codes, transforming building retrofits, expanding low-income energy efficiency, and promoting energy management systems in industry. Several recommendations from last year's Scorecard were implemented by the federal government.

New federal mandate letters gave a clear mandate to the Minister of Natural Resources and the Minister of Innovation, Science and Industry to develop model building codes that align with climate objectives. The federal mandate letters also called for the alterations to existing buildings code to be published by the end of 2024, rejecting a proposed timeline to wait until 2030. The 2030 Emission Reduction Plan, released in 2022, included Efficiency Canada's proposal to create a Building Code Acceleration Fund to build capacity for provincial adoption of net zero energy-ready codes.

The agenda to transform how we do building retrofits was supported in Budget 2022 by funding a Greener Neighbourhoods Pilot Project and a retrofit accelerator initiative to support upfront development of retrofits and aggregated building retrofit approaches.

This year's advances in low-income energy efficiency include an extra $458.5 million to support energy efficiency in affordable housing, and a $250 million from the low-carbon economy fund to support low-income households transitions away from fuel oil.

Finally, the federal government invested an additional $194 million to expand Industrial Energy Management programs to support ISO 50001, cohort-based training, energy managers, and retrofits, especially for small to medium sized businesses.

This means the federal government acted upon all of the recommendations in last year's Scorecard.

This year we identify five priority areas:

1) Expand scale and scope of low-income energy efficiency

Low-income Canadians are more likely to experience energy poverty, resulting in unaffordable energy bills and/or inadequate energy services, such as lack of air conditioning during extreme heat events.

Despite recent federal initiatives, national energy efficiency policy is still leaving most low-income Canadians behind. The federal Greener Homes Grant and Loan programs are not accessible to low-income households who cannot pay upfront costs or take on additional debt burdens. While the federal government has earmarked funds for affordable housing, there are 1.6 million low-income homeowners and 4 out of 5 low-income renters (2.2 million in total) do not live in subsidized housing. New funding announced in the fall of 2022 takes a major step forward in recognizing that a specific approach is needed to reach low-income households. However, this funding is restricted to fuel oil heated buildings, primarily in Atlantic Canada, while 90% of low-income energy expenditures are on electricity or natural gas.[127]

This year, Efficiency Canada published a detailed review of provincial and territorial low-income energy efficiency programs.[128] It identified gaps common to most provincial programs that the federal government could help fill by focusing on

1. Deep energy savings to cut bills
2. Fuel switching to zero-carbon ready sources to achieve net zero emissions
3. Removing non-energy barriers that prevent upgrades from happening
4. Targeting the most energy poor and hard to reach households

Many provincial programs cannot prioritize these objectives because their mandates are energy savings and fuel specific; not directly connected to net zero emission goals; and placed under restrictive cost-benefit screens that fail to consider societal and environmental benefits.

This year's Scorecard shows that total spending by the provinces on low-income energy efficiency decreased by approximately $10 million. Yet all provinces and territories (except Alberta) have some low-income specific programs, and Alberta Ecotrust Foundation is currently developing a program in Edmonton and Calgary.

[127] Kantamneni and Haley 2022, "New data shows need for low-income energy efficiency to target all fuels" Efficiency Canada blog.
[128] Kantamneni and Brendan Haley, "Efficiency for All: A Review of Provincial/Territorial Low-Income Energy Efficiency Programs with Lessons for Federal Policy in Canada."

This presents an opportunity for the federal government to get results quickly by leveraging provincial and utility delivery capabilities, while also directing these programs to help meet federal net zero emission and energy poverty reduction objectives.

We recommend the federal government immediately earmark at least $2 billion towards low-income energy efficiency in Canada, which provides a roughly equal investment already dedicated to middle and upper income residential and large building markets and provides a sizable enough investment to justify reforms in program design.

The Green Building Strategy should also prioritize equity and elimination of energy poverty as one of its objectives.

The lack of a national low-income energy efficiency strategy is an injustice that must be remedied so all Canadians can benefit from energy efficiency and because achieving net zero emissions requires decarbonizing low-income as well as middle and upper income homes.

2) Mandate efficient and zero-carbon heating

The provinces are already taking action on reducing or eliminating fossil fuels from space and hot water heating. BC plans to require all new heating systems to be at least 100% efficient, which will promote the use of efficient heat pumps; Québec will not install another heating oil system after 2024, while its utilities promote dual-fuel heating systems that will see clean electricity used for the vast majority of heating hours, and New Brunswick plans to eliminate oil heating by 2030.

Yet, the federal government has the regulatory tools through the Energy Efficiency Act or other mechanisms like the Canada Environmental Protection Act to require energy efficient and zero-carbon ready performance from all new heating systems in Canada. Federal incentives can also more easily be directed toward national scale manufacturers and distributors who can leverage air conditioning demand to also distribute heat pumps and make zero-carbon ready heating equipment the market norm. This will help build the scale and cross-country harmonization that leads to market transformation.

3) Define net zero building performance standards

Municipalities like Vancouver and Montreal are implementing mandatory building performance standards, yet few provinces have followed. To reach net zero emissions large buildings need to not only benchmark and disclose energy efficiency and greenhouse gas emission performance,

we also need to make a minimum level of performance mandatory so these buildings provide the right services to occupants and tenants in a net zero emissions future.

The development of a federal Green Building Strategy is an ideal time to clearly define net zero emission compatible performance for different building types, climate zones etc. The federal government can then direct its funding towards encouraging provinces to require this level of performance from their buildings and consider using federal powers to regulate the emissions performance from buildings in a way similar to power plants and vehicles.

4) Integrate with provincial programs to "crowd in" more funding

When the federal government launches a new energy efficiency program into the market it must consider its impact on existing provincial and utility programs. A program design that fails to consider existing programs and capabilities already in regional markets can lead to unintended consequences.

The worst case scenario is that a lack of program coordination results in crowding out provincial or utility funding or even cannibalizing existing programs in the market. This could occur because competing programs can make it difficult for utilities to claim savings that result from their investments, which makes them less cost-effective. A lack of coordination can also create market confusion which frustrates end users and adds greater administrative burden to program administrators.

Perhaps most important is that a lack of program coordination creates a missed opportunity for federal funds to encourage higher investments from utilities and other levels of government. Strategically designed federal funds could buy-down the cost of utilities achieving energy savings, which can encourage an expansion of existing programs. A customer could also stack federal incentives on top of provincial/utility incentives to achieve more energy savings overall.

These factors did not seem to be thoroughly considered in the design of the federal Greener Homes program. Provincial utilities and energy efficiency organizations have experienced customer confusion and uncertainties over the attribution of savings to their own programs.

Any federal energy efficiency initiative should be designed to crowd in more provincial funds and never create a situation that negatively impacts provincial energy efficiency efforts that complement shared net zero emission goals. This starts with federal policymakers understanding the inner workings of provincial policy systems, such as how rules for cost-

effectiveness testing and evaluation of savings can have a big impact on utility programs. The federal government can create specific rules for match funding; and publish clear guidance and expectations on how federal funds should expand provincial program efforts; and strategically co-ordinate where possible. Federal resources could also help provinces transition towards net zero emissions aligned energy efficiency strategies.

There is a clear role for federal energy efficiency programs because provincial and federal policy objectives are distinct, yet complementary. The federal government should be focused on achieving gross economywide savings and be willing to attribute savings to provincial utility programs if this results in an overall expansion of energy efficiency.

While many provincial utility programs must focus on static cost-effectiveness to justify the majority of funding, the federal government can focus on longer-term savings, market transformation, equity, and achieving net zero emissions.

Stable and effective energy efficiency services for Canadians will need to come from multiple funding sources and levels of government, each with distinct policy objectives. Canadian federalism should aim to make these objectives and programs complement one another, while creating streamlined program delivery for citizens, and increasing economywide energy efficiency performance.

5) Create targets and expectations for provinces

The federal Green Building Strategy and larger net zero emissions plan is highly dependent on provincial policy actions, given control over areas such as public utility regulation, building codes, skilled trades certification, and municipal bylaws.

While the federal government has provided funds to provinces through mechanisms like the Low-Carbon Economy Fund it has not clearly articulated the policies provinces need to implement for Canada to achieve net zero emissions. This presents a lack of direction to provincial climate plans and leaves citizens within provinces uncertain about what they should expect from their policymakers. It fails to direct federal funds towards policies that can spur structural market transformations instead of lowest cost GHG reductions that might not get us to a net zero end goal.

In the Green Building Strategy, Canada should consider presenting clear expectations for regulatory and policy changes, as is done under the European Union’s Energy Performance of

Buildings Directive and Energy Efficiency Directive. Federal funds and policy supports can then be more clearly directed toward specific policies and timelines.

A relevant example involves Canada's new national model building codes with progressive performance tiers leading to net zero energy-ready. The federal government has yet to publish a timeline for provinces to move up these tiers so the nation can achieve net zero emissions. A Green Building Strategy discussion paper suggests all new buildings must be net zero carbon ready as early as 2027, yet this year's Scorecard shows that no province is on that timeline.

The federal government can define provincial targets and policy supports related to:

- Net zero energy-ready and eventual net zero emission building code adoption and compliance
- Mandatory building performance standards for existing buildings
- Energy efficiency resource standards for electricity and natural gas utilities, and incorporation of net zero GHG goals into public utility regulation.
- Mandatory energy labels publicly displayed on commercial buildings and disclosure of energy performance and actual energy usage when buildings are sold or rented
- Green workforce strategies incorporated into workforce development agreements and labour market development agreements
- Provincial/Territorial Building Renovation Plans

The strategy must also not let action stall at the federal-provincial negotiating table. Municipalities are often the champions of green building policies and can move faster than provinces. The federal government should support municipalities seeking to implement more advanced standards for both new and existing buildings than their respective provinces, with the understanding that all jurisdictions must eventually "harmonize" towards net zero emissions.

Appendix A: Information request respondents

In April 2022, Efficiency Canada circulated an information request to government and utility/program administrator representatives in each province and territory. We contacted each representative beforehand to introduce the scorecard project and confirm their participation. We received a response to all information requests, though in some cases government and utility/program administrators worked together to return a combined response.

Table 83. Respondents to information request

Province/territory	Respondents
AB	Alberta Ministry of Environment and Parks
	Emissions Reduction Alberta
	Alberta Innovates
	Municipal Climate Change Action Centre *(A collaborative initiative of Alberta Municipalities, Rural Municipalities of Alberta and the Government of Alberta)*
BC	British Columbia Ministry of Energy, Mines and Low Carbon Innovation
	BC Hydro
	FortisBC
MB	Manitoba Conservation and Climate
	Efficiency Manitoba
NB	New Brunswick Ministry of Energy and Resource Development
	New Brunswick Power
NL	Newfoundland and Labrador Hydro
	Newfoundland Power
NS	Nova Scotia Department of Natural Resources and Renewables
	Efficiency Nova Scotia
ON	Ontario Ministry of Energy, Northern Development and Mines

	Ontario Ministry of Environment, Conservation and Parks
	Ministry of Municipal Affairs and Housing
	Ontario Energy Board
	Independent Electricity System Operator (IESO)
	Enbridge Gas
PE	efficiencyPEI
QC	Ministère de l'Énergie et des Ressources naturelles
	Hydro-Québec
	Énergir
SK	Saskatchewan Ministry of Environment
	SaskPower
	SaskEnergy
YT	Yukon Department of Energy, Mines and Resources

Appendix B: Net incremental electricity savings (GWh)

We show electricity savings at the meter level in gigawatt hours (GWh). Where necessary, we converted generation level savings to meter level using provided line-loss values, and gross savings to net using a net-to-gross ratio of 0.872. These are program savings only, excluding savings from codes and standards, rates, demand response, and distributed generation.

Table 84. Net incremental electricity savings (GWh)

Province/ territory	Program administrator	2017	2018	2019	2020	2021
AB	Energy Efficiency Alberta	404.0	172.0	21.1		
	Emissions Reduction Alberta					19.0
	Government of Alberta				50.9	219.6
	Municipal Climate Change Action Centre				2.1	6.9
	Total	*404.0*	*172.0*	*21.1*	*53.0*	*245.5*
BC	BC Hydro	170.0	315.0	230.1	255.4	251.4
	FortisBC	27.8	31.4	25.8	25.9	29.7
	Total	*197.8*	*346.4*	*255.9*	*281.3*	*281.1*
MB	Efficiency Manitoba				53.3	94.5
	Manitoba Hydro	187.4	154.6	103.2		
	Total	*187.4*	*154.6*	*103.2*	*53.3*	
NB	New Brunswick Power	55.0	75.5	70.8	54.0	38.5
	Total	*55.0*	*75.5*	*70.8*	*54.0*	*38.5*
NL	Newfoundland and Labrador Hydro	2.3	2.2	6.9	0.9	1.5

	Newfoundland Power	29.0	33.3	38.6	33.3	26.9
	Total	*31.3*	*35.5*	*45.5*	*34.2*	*28.4*
NS	Efficiency Nova Scotia	120.3	139.3	113.8	87.3	100.8
	Total	*120.3*	*139.3*	*113.8*	*87.3*	*100.8*
ON	Independent Electricity System Operator	2285.3	1824.7	446.1	343.4	972.8
	Total	*2,285.3*	*1,824.7*	*446.1*	*343.4*	*972.8*
PE	Efficiency PEI			14.0	10.9	12.8
	Total			*14.0*	*10.9*	*12.8*
QC	Hydro-Québec	524.0	454.7	478.2	442.7	732.5
	Government of Québec	83.7	51.4	101.2	383.7	76.8
	Total	*607.7*	*506.1*	*579.4*	*826.4*	*809.3*
SK	SaskPower	49.0	48.1	40.2		
	Total	*49.0*	*48.1*	*40.2*		
YT	Yukon Government	0.9	0.8	0.8	0.4	0.6
	Total	*0.9*	*0.8*	*0.8*	*0.4*	*0.6*
Canada total		**3,938.7**	**3,302.9**	**1,690.8**	**1,744.3**	**2,584.3**

Appendix C: Net incremental natural gas and non-regulated fuels savings (TJ)

We show natural gas and non-regulated fuels savings in terajoules (TJ). Savings reported as gross were converted to net using a net-to-gross ratio of 0.828 for natural gas, and 0.8 for non-regulated fuels. Savings reported in Mm^3 were converted to TJ using Canadian Energy Regulator conversion factors (1 Mm^3 = 37.30 TJ).

Table 85. Net incremental natural gas and non-regulated fuel savings (TJ)

Province/ territory	Program administrator	2017	2018	2019	2020	2021
AB	Energy Efficiency Alberta	607.0	625.6	413.2		
	Emissions Reduction Alberta					111.7
	Government of Alberta				186.3	715.2
	Municipal Climate Change Action Centre				0.7	
	Total	*607.0*	*625.6*	*413.2*	*187.0*	*826.9*
BC	Government of British Columbia				60.4	69.9
	FortisBC Energy	528.6	626.2	828.6	1016.7	1084.3
	Total	*528.6*	*626.2*	*828.6*	*1077.1*	*1154.2*
MB	Efficiency Manitoba				178.1	372.6
	Manitoba Hydro	100.7	208.9	161.8		
	Total	*100.7*	*208.9*	*161.8*	*178.1*	*372.6*
NB	New Brunswick Power		165.5	137.9	87.4	81.5
	Total		*165.5*	*137.9*	*87.4*	*81.5*
NS	Efficiency Nova Scotia	54.1	117.8	203.3	160.3	218.5

	Total	*54.1*	*117.8*	*203.3*	*160.3*	*218.5*
ON	Enbridge	1641.8	1575.1	1949.3	1480.3	3584.9
	Union Gas	2608.6	2468.1	2363.0	2230.7	
	Total	*4250.4*	*4043.1*	*4312.3*	*3711.0*	*3584.9*
PE	Efficiency PEI			43.4	45.2	47.3
	Total			*43.4*	*45.2*	*47.3*
QC	Énergir	1460.6	1497.5	1469.1	1618.5	1571.2
	Government of Québec	1580.1	2488.2	2535.1	913.6	1466.1
	Total	*3040.7*	*3985.7*	*4004.2*	*2532.0*	*3037.3*
SK	SaskEnergy	23.8	17.1	16.6	22.6	31.3
	Total	*23.8*	*17.1*	*16.6*	*22.6*	*31.3*
YT	Yukon Government	19.6	18.0	20.4	28.7	21.0
	Total	*19.6*	*18.0*	*20.4*	*28.7*	*21.0*
Grand total		**8625.0**	**9807.9**	**10141.8**	**8029.6**	**9375.7**

Appendix D: Energy efficiency program spending

This appendix lists spending on efficiency and enabling strategies, innovation or R&D, supporting initiatives, and codes and standards. Spending on related activities, such as rates, distributed generation, or demand response are excluded.

Table 86. Energy efficiency program and enabling/supporting spending ($CAD millions, nominal)

Province /territory	Program administrator	2017	2018	2019	2020	2021
AB	Energy Efficiency Alberta	$89.60	$79.95	$35.80		
	Emissions Reduction Alberta					$7.74
	Government of Alberta				$35.50	$0.76
	Municipal Climate Change Action Centre				$3.00	$6.78
	Total	*$89.60*	*$79.95*	*$35.80*	*$38.50*	*$15.28*
BC	Government of British Columbia	$0.64	$1.04	$3.60	$45.47	$67.49
	BC Hydro	$74.88	$100.31	$73.80	$72.95	$81.48
	FortisBC (electricity)	$7.71	$7.22	$10.00	$10.02	$12.37
	FortisBC Energy (natural gas)	$33.11	$34.42	$62.47	$73.68	$106.84
	Total	*$116.35*	*$142.99*	*$149.68*	*$202.13*	*$268.19*
MB	Efficiency Manitoba				$25.74	$39.27
	Manitoba Hydro	$66.68	$58.91	$35.06		
	Total	*$66.68*	*$58.91*	*$35.06*	*$25.74*	*$39.27*
NB	New Brunswick Power	$13.70	$17.50	$24.13	$20.87	$29.80

	Total	*$13.70*	*$17.50*	*$24.13*	*$20.87*	*$29.80*
NL	Government of Newfoundland	$3.30	$3.25	$3.10	$3.10	
	Newfoundland and Labrador Hydro	$1.56	$1.59	$1.74	$0.57	$1.76
	Newfoundland and Labrador Housing Corporation				$0.97	
	Newfoundland Power	$6.76	$6.04	$5.87	$5.82	$5.56
	Total	*$11.62*	*$10.89*	*$10.71*	*$10.46*	*$7.31*
NS	Efficiency Nova Scotia	$43.14	$50.48	$62.22	$53.92	$68.50
	Total	*$43.14*	*$50.48*	*$62.22*	*$53.92*	*$68.50*
NT	Arctic Energy Alliance					$4.01
	Total					*$4.01*
ON	Affordability Trust	$1.90	$10.56	$21.68	$32.08	$25.15
	Enbridge	$59.77	$64.78	$72.84	$64.55	$69.62
	Independent Electricity System Operator	$435.86	$464.33	$333.94	$219.76	$184.87
	Union Gas	$67.12	$68.99	$65.60	$54.49	$52.98
	Total	*$564.65*	*$608.66*	*$494.07*	*$370.88*	*$332.62*
PE	Efficiency PEI		$8.71	$12.99	$15.48	$14.15
	Total		*$8.71*	*$12.99*	*$15.48*	*$14.15*
QC	Énergir	$18.08	$18.40	$21.66	$22.34	$28.76
	Hydro-Québec	$56.30	$55.30	$49.60	$44.50	$96.60
	Government of Québec	$147.10	$155.00	$176.80	$309.38	$224.28
	Total	*$221.48*	*$228.70*	*$248.06*	*$376.22*	*$349.64*

SK	SaskEnergy	$0.84	$0.83	$2.34	$3.29	$4.95
	SaskPower	$10.00	$9.00	$5.30	$4.40	$0.52
	Total	*$10.84*	*$9.83*	*$7.64*	*$7.69*	*$5.47*
YT	Yukon Government			$1.76	$8.78	$5.54
	Total			*$1.76*	*$8.78*	*$5.54*
Grand Total		**$1,138.05**	**$1,216.61**	**$1,082.11**	**$1,130.68**	**$1,139.79**

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