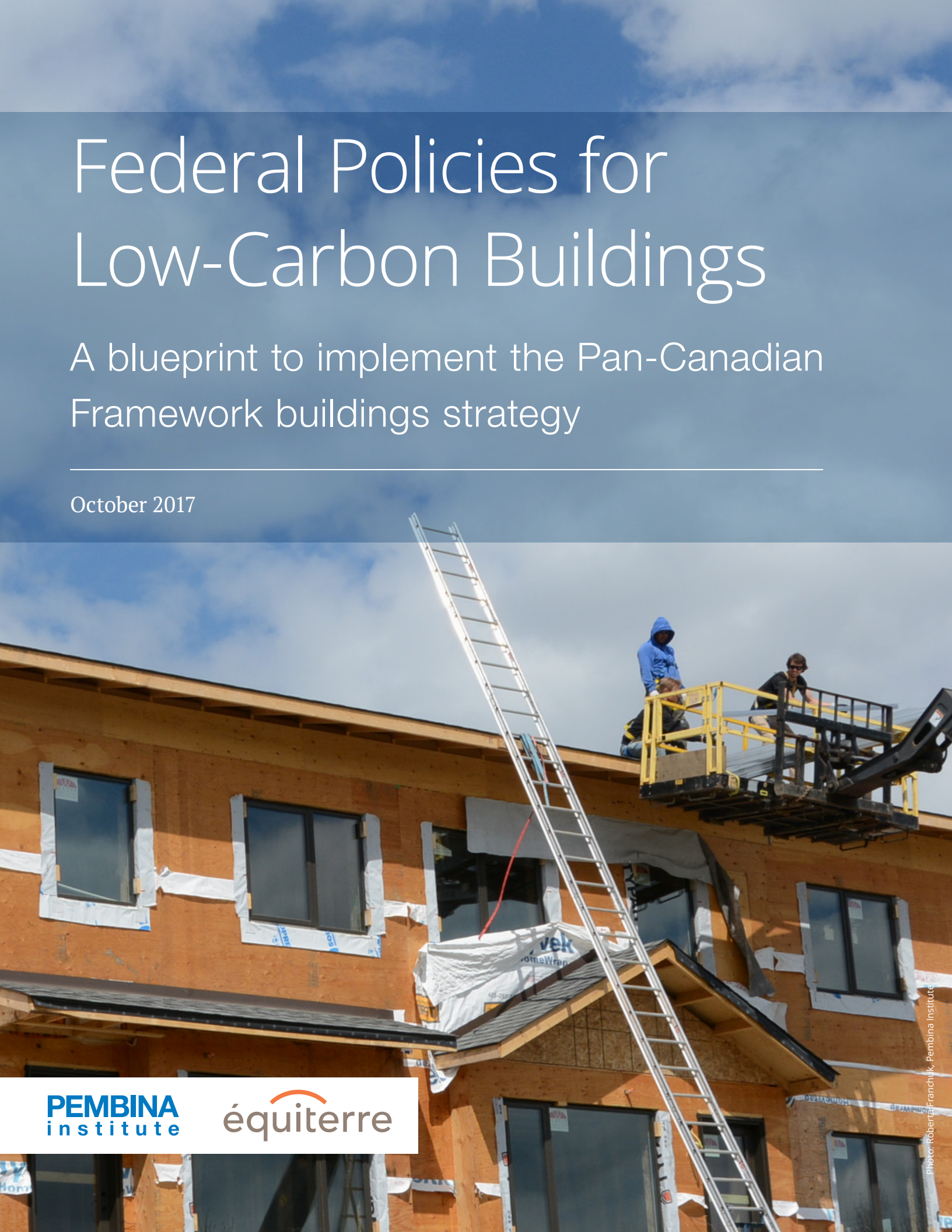
Federal Policies for Low-Carbon Buildings

A blueprint to implement the Pan-Canadian Framework buildings strategy

October 2017



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Contents

Executive summary

Low-carbon buildings are both a climate mitigation and a wealth creation opportunity — and Canada is ready to lead. In this blueprint, we offer a suite of ambitious and practical policies aimed at ensuring rapid implementation of the building commitments outlined in the Pan-Canadian Framework on Clean Growth and Climate Change.

A. National targets

A discussion on the need for explicit targets for the buildings sector, in a bid to signal the level of ambition required at all levels of government, and to align initiatives across levels of government.

B. Core policies

Energy codes and certification hub

The federal government can become an energy codes and certification hub by updating its model code adoption process in favour of incentives for compliance promotion and enforcement, by supporting net-zero contractor certification schemes, and by adjusting tax incentives.

Buildings data strategy

The federal government can develop a buildings data strategy, including a public, regular Canada-wide energy efficiency potential study, a suite of key public databases of projects, and a neutral scorecard of provincial and municipal action against key metrics. This data may be used to support efforts at all levels of government, as well as serve as a baseline to assess progress and allocate funding.

Buildings financing initiative

The federal government can launch a buildings financing initiative, including a loan guarantee pilot program, a seed capital program to support local financing initiatives, an aggregation function of financing products within the Canada Infrastructure Bank, and funding support for efforts to standardize energy efficiency project financing on a national scale.

Green buildings transfer funding

Through the deployment of its Low-Carbon Economy Fund and other transfer funding arrangements, the federal government can launch a green buildings transfer funding scheme with provinces, and attach "green strings" to its infrastructure funding commitments. The funding should be contingent on progress against Pan-Canadian Framework-related metrics and the national targets set out in Part A.

C. Supporting policies

In addition to the core policies, the federal government can foster progress through a suite of supporting policies, including fiscal measures, international cooperation via IRENA, and the development of a network of low-carbon demonstration buildings in major Canadian cities.

Combined with the commitments outlined in the Pan-Canadian Framework and Budgets 2016 and 2017, these policies and programs will place the building sector at the core of the federal government's clean growth, skills training and innovation agenda.

Context

Toward a low-carbon building stock

Low-carbon buildings represent both a climate mitigation and a wealth creation opportunity — and Canada is ready to lead. From small schools to the office towers dotting our urban landscape, buildings represent nearly 12% of the country's overall greenhouse gas (GHG) emissions,[1] and more than a quarter of energy-related GHG emissions.[2] A suite of policies can support a transition to a low-carbon building stock, with energy efficiency leading the way:

Energy efficiency is not only the first fuel, but also the first mitigation strategy.

According to the International Energy Agency (IEA), energy efficiency accounts for 49% of the measures required to limit the long-term rise in global temperatures to 2°C, well beyond renewable energy, the second largest contributor (17%).[3] Importantly, energy efficiency measures often have a negative abatement cost, meaning that they bring a clear return on investment. It is thus possible to fight climate change and create value in the process.

Energy efficiency acts as an economic stimulus and a productivity boost.

Similarly, energy efficiency acts as an economic stimulus, boosting productivity, creating jobs, and increasing global competitiveness. A study commissioned by Natural Resources Canada shows that sustained, mid-level investment in energy efficiency across the country could lead to the creation of 60,000 new jobs in 2019 alone and 120,000 jobs in 2033 alone (actual jobs, not job-years, not job-persons), in areas as diverse as manufacturing, construction, retail trade, and professional

[1] Environment and Climate Change Canada, "Canada's GHG Inventory," 2017. https://www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=83A34A7A-1

[2] NRCan, "National Energy Use Database," 2017. https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/home.cfm

[3] IEA, *World Energy Outlook 2016*. https://www.iea.org/newsroom/news/2016/november/world-energy-outlook-2016.html

services.[4] With efficiency, industries are more productive and consumers have more money left in their pockets to recycle back into the broader economy. It is thus possible to fight economic stagnation and create value in the process.

Energy efficiency must be paired with fuel switching to meet pan-Canadian targets.

Deeper energy efficiency is necessary, but not sufficient. Building policy will need to explicitly integrate carbon reduction objectives, and create metrics and regulations to encourage fuel switching. Building policy cannot afford to remain fuel neutral if we are to meet our climate objectives.

An ambitious energy efficiency agenda, supported by complementary policies promoting fuel switching and distributed renewable energy is thus key to spurring the transition to a low-carbon building stock.

Bolstering the Pan-Canadian Framework

The Government of Canada recognizes this opportunity. In late 2016, federal and provincial governments released the Pan-Canadian Framework on Clean Growth and Climate Change (PCF). The PCF — combined with measures outlined in Budget 2017 — represents a significant milestone: it sets forth a carbon pricing framework, identifies a suite of critical policies to steer Canada toward a low-carbon economy, and identifies the roles of various jurisdictions in achieving our GHG emission reduction target.

This blueprint offers a suite of practical policies, from energy codes development to efficiency financing, that will help the federal government implement the ambitious efforts outlined in the PCF.

Methodology

Research was conducted to identify policy recommendations that can help achieve and bolster the vision set forth in the PCF. Specifically, the highlighted policy pillars complement policies outlined in the Pan-Canadian Framework and Budgets 2016 and 2017, as well as other policy directions announced by the government.

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[4] Acadia Center, *Energy Efficiency: Engine of Economic Growth in Canada* (2014), 19. http://acadiacenter.org/document/energy-efficiency-engine-of-economic-growth-in-canada/

A two-pronged approach was taken in this work:

1. A literature review of existing and potential policies was conducted, with a focus on applicability in the Canadian context. The scan included policies from different regional, federal, state/provincial and local governments.
2. For selected sectors, we interviewed thought leaders to gather their latest policy proposals, beyond what is available in the literature.

Using this method, a short list of policy ideas was produced, and a select few were included in this document. A preliminary discussion accompanies each policy pillar, along with examples from other jurisdictions. A deeper analysis is recommended to develop these ideas into final policy proposals.

A. National targets

You can't manage what you don't measure. A set of ambitious national targets will set the tone for public and private investments in energy efficiency, distributed energy and other building technologies; help build transparency and accountability for national efforts; and serve as a framework to define and measure success toward a low-carbon building stock. Targets are an essential step to building the robust framework that Canada needs.

Why targets?

National targets for building retrofits support a number of core objectives:

Offering a clear vision

Not unlike provincial and federal GHG emissions reduction targets, national targets for building performance will outline a clear direction for the government and its stakeholders, by signalling the depth and pace of energy savings that are sought. Clear targets will help with planning efforts for programs and policies at all levels.

Promoting transparency

Targets promote public and stakeholder mobilization towards policy goals, and ensure government accountability. These national targets will serve as a benchmark for provincial and municipal jurisdictions, and encourage a broader discussion on the best ways to meet this challenge.

Framing an incentive structure

Performance against targets can be used as a key criterion for the granting of federal support to key stakeholders.

Above all, pan-Canadian targets are part and parcel of solid public administration. From health care to the environment, they inspire and hold our collective feet to the fire—and building performance should be no different.

What are other jurisdictions doing?

Targets come in different forms. In the United States and Canada, states and provinces typically express energy efficiency targets as a percentage of energy (electricity and/or gas) sales. Local public utilities commissions (e.g. the Ontario Energy Board, the Régie de l'Énergie in Québec) track progress in public hearings. Leading targets range from 1.5% to 2.5% of sales, per year. National targets are usually set as a percentage reduction under a baseline scenario, identified as business-as-usual or relative to a given year.

Nearly 90 countries, regions and unions have introduced specific policy goals or actions targeting energy efficiency and energy performance in the building and construction sectors.[5] Only a few, however, have set concrete targets and goals. Some notable examples include:

European Union

The Energy Efficiency Directive calls for a binding, EU-level energy efficiency target of –30% by 2030 under business as usual. This target is an update to the original target of –27%, in response to sustained pressure by advocacy and industry groups.

In addition to the EU-wide Energy Efficiency Directive, a number of European states have issued their own energy efficiency targets. Germany issued its own long-term target of 80% reduction in building sector energy use by 2050; Denmark aims for 75% reduction in new buildings by 2020; Norway aims for near net-zero carbon buildings by 2020; and many more.

Cities

Ambition is often found at the municipal level. The City of Vancouver, for instance, has a Zero Emissions Building Plan, with the goal of eliminating GHG emissions from new buildings by 2030.

In 2007, provincial and territorial premiers, through the Council of the Federation, outlined a goal of "increasing energy efficiency by 20% by 2020." This target was not formally adopted by the federal government, and has not often been referenced over the

[5] UNEP, *Towards Zero-Emission Efficient and Resilient Buildings: Global Status Report* (2016), 5. http://wedocs.unep.org/handle/20.500.11822/10618

years. This experience underscores the importance of formal federal buy-in, and of public, third-party evaluation to track progress.

Proposed target levels and timeline

Due to the long life and unique nature of the buildings sector, we propose a two-pronged approach:

Long-term targets for existing buildings

- Work with the provinces and territories to set interim GHG emissions reductions targets from existing buildings consistent with Canada's 2030 GHG emission target.
- Set a pan-Canadian target of 30% less energy consumption in the existing building stock below 2005 levels, by 2030, with recognition of the need to achieve complete decarbonization of the building sector.

Long-term targets for new construction

- Set a pan-Canadian target that all new constructions be net-zero energy ready by 2030. The Pan-Canadian Framework calls for a net-zero energy ready National Energy Code for Buildings (NECB) by 2030. This target still needs to be formalized across all new construction.

Longer-term targets, looking to a decarbonization scenario by 2050, should also be considered. In this context — and in line with Canada's Mid-Century Long-Term Low-GHG Development Strategy — the goal of achieving a zero-emission building stock by 2050 can serve as an aspiration.

Accountability and reporting

Tracking progress against targets is a critical part of the process. In line with broader reporting & oversight commitments outlined in the PCF, national buildings targets should be coupled with a rigorous evaluation framework that is:

> **Clear:** A clear evaluation framework should be developed, highlighting methodologies to be used in evaluation, as well as clearly stated key performance indicators (KPIs) to be reported.

External: Progress against targets should be evaluated by third-party experts, to ensure full independence, and to benefit from experience in other jurisdictions.

Public: Progress reports should be made public in a timely manner, to keep officials accountable.

Regular: Improvements in building stock performance can be felt relatively quickly. Progress reports should be published every three years at most, with the possibility of interim reports.

Integrated with provincial policy: An explicit partnership should be struck with the provinces to adopt and report on these goals. Access to federal funding for building renewal should be contingent, in part or in whole, on provincial governments implementing the necessary policies.

Clear pan-Canadian targets represent a solid step forward. In partnership with provinces and coupled with a rigorous evaluation framework and timeline, and an updated suite of programs and policies, the federal government can truly take a leading role in moving toward a low-carbon building stock.

B. Core policies

Energy codes and certification hub

Context

Building codes and their promotion

Stringent building codes, both for new and existing buildings, are critical to improving the performance of our built environment, reducing energy demand, and mitigating GHG emissions. The Pan-Canadian Framework signals a remarkable step forward on this front, with the commitment to gradually moving to a "net-zero energy ready" model building code for new construction by 2030, and to developing a model code for existing buildings by 2022. Budget 2017 also sends a clear signal forward, dedicating $182 million to building code development for retrofits and new construction—with limited details as to the content.

Building code stringency alone, however, does not guarantee success. As of April 2017, only one province had adopted the latest version of the National Energy Code for Buildings (NECB 2015), while five provinces and territories had adopted the previous version of the code (NECB 2011).[6] Key enabling activities surrounding the model code — notably compliance promotion and enforcement activities at the provincial level — are significantly underfunded, leading to delayed code adoption and high delinquency rates. An update to the model code development, adoption, and compliance ecosystem is integral to incentivize provincial adoption of the model code, and to the broader success of the PCF's ambitious goals.

An emerging retrofit economy… and a looming skills gap

Contractors are at the centre of an emerging retrofit market, spurred by expanded energy efficiency programs at the provincial and utility level — and now by the Pan-Canadian Framework's ambitious efforts. Best practice for retrofit program design calls for the use of qualified contractors, to ensure both energy performance and reliable

[6] NRC, "Model code adoption across Canada," 2017. http://www.nrc-cnrc.gc.ca/eng/solutions/advisory/codes_centre/code_adoption.html

financial returns. Some utilities in the U.S. manage contractor certification requirements, often in partnership with not-for-profit organizations such as the Building Performance Institute.

In Canada, select training institutions and trade associations report[7] that, under the current levels of funding and policy support, the industry is not in a position to offer net-zero ready training at the scale (and timing) required by the Pan-Canadian Framework's ambitions.

More broadly, provinces and utilities have been reluctant to certify contractors for their energy efficiency programs, leading to a gap in contractor certification and raising calls for a broader certification scheme. Through such a certification scheme, the federal government could ensure Canada's building industry is included in its Innovation and Skills Plan.

Policy objectives

By becoming an energy codes and certification hub, the federal government can:

1. Promote the reliable implementation of the Pan-Canadian Framework, by taking steps to ensure that stated policies are translated into actual energy performance and GHG mitigation on the ground.
2. Structure a blossoming energy retrofit industry, through certification and well-funded compliance promotion and enforcement for stringent energy codes.
3. Deliver Budget 2017 Innovation and Skills Plan through lifelong learning in the construction trades, allocating funding from the Labour Market Transfer Agreements to train and certify contractors, and allocating Budget 2017 clean technology investments to the building industry.

[7] Select training institutions were contacted for the purposes of this report, and clearly outlined that NZR training is relatively limited in Canada, and would take significant time to ramp up without government support.

Policy features

Carve out an incentive fund for code compliance promotion and enforcement

The federal government already coordinates the development of model building codes, in partnership with provinces and other stakeholders. In Budget 2017, the government earmarked $182 million to "develop and implement new building codes". A portion of the federal government's clean technology investments in Budget 2017 should be allocated out to offer substantial funding for code compliance promotion and enforcement activities in jurisdictions that adopt the model code in a timely manner — an area of code implementation too often overlooked and neglected. Provinces may apply for this funding in exchange for swift adoption of the federal model code (or a more stringent code) and energy data transparency policies (see next section).

Develop and release the net-zero energy ready energy code as early as 2020, to incent early adopters, and consider funding net-zero certification schemes

To facilitate training and use, the 'net-zero energy ready' building code for new buildings should be developed as soon as 2020, to ensure early adoption of net-zero ready building technologies and demonstration projects. This energy code should list carbon reductions as an explicit objective and integrate carbon-intensity metrics for performance-based compliance paths, as was done for the Vancouver Zero Emissions Building Plan.

Early development and release of a Canadian net-zero ready code is essential to promote learning-by-doing in the construction industry. Similarly to the Energy Step Code developed in B.C., this stretch code could include different performance-based 'tiers' providing intermediary steps between current code and zero carbon / net-zero energy ready objectives.

At the Energy and Mines Ministers meeting in August 2017, ministers released *Build Smart: Canada's Buildings Strategy*, which laid out a proposed path forward for the development of the net-zero energy ready building code in a tiered approach, starting in 2018 with final release in 2022.[8]

[8] Energy and Mines Minister' Conference, *Build Smart: Canada's Building Strategy* (2017). http://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/emmc/pdf/Building_Smart_en.pdf

Delaying the development and release of the net-zero energy ready building code would also delay actual implementation by the industry. Technologies are already available to transform Canada's new buildings now. A net-zero energy ready building code with an explicit carbon reduction objective is a necessary guideline that must be made available to the industry no later than 2020.

In addition, the federal government should work in partnership with private training institutes (e.g. CaGBC, CIET, ILFI) to ensure that net-zero contractor certification schemes can meet the demand brought by the upcoming net-zero energy ready model building code. This may include additional federal funding for these private training programs, and/or the development of a supporting federal training program — modelled on the successful Dollars to $ense approach — with a view to eventually transitioning the program to a private entity through tender.

Extend tax incentives to increasingly stringent performance-based requirements for buildings

Current federal tax incentives for renewable energy and energy efficient equipment do not promote investment in overall efficient building envelope and performance.[9] While green buildings are expected to lead to cost savings in the long run, builders and investors remain wary of investing in whole-building green design or in green building certification schemes. Additional tax incentives are thus required to encourage the construction (or retrofit) of leading edge buildings across Canada. These incentives can be based on energy performance or GHG intensity (net-zero carbon, net-zero energy), or use a proxy such as the presence of a green certification (e.g. LEED).

Examples in other jurisdictions

United States

The U.S. DOE Buildings Energy Code Program manages a state technical assistance program, which includes support for developing adoption plans, compliance plans, economic analysis, cost impacts analysis, and more.

[9] Equiterre, *Proposed Federal Tax Policy Adjustments: Reducing GHG Emissions and Generating Revenue* (2016), 5. https://equiterre.org/sites/fichiers/equiterre_bugdet_recommendations-en.pdf

Similarly, through a state and local solution center, the DOE provides resources to assist states, local governments and K-12 schools in implementing high-impact energy policies, programs and projects. Support is provided in-kind.

Europe

The European Union has also set up the BUILD UP Skills initiative as part of its Intelligent Energy Europe program, to support member states in building roadmaps for certification schemes in the building sector.

Private certification institutions

A number of private certification institutions are active in the buildings space. For example, the Building Performance Institute (BPI) offers contractor certification programs, and is a referenced energy efficiency program administrator across the U.S. and Europe. Utilities and energy efficiency organizations take advantage of these certification schemes in their own program design: Energy Trust of Oregon, for instance, requires that qualifying contractors be BPI certified in order to participate in certain programs.

Quebec

Quebec has developed a contractor certification program for its flagship Novoclimat program, the Novoclimat 2.0 Select Group. Certified contractors must maintain an average Novoclimat registration rate of at least 90% of their homes sold each year in Quebec, offer technical training to their staff, and submit their construction techniques for an assessment of their energy performance.

A key theme across these examples is the desire to support cash-strapped or highly-regulated delivery entities (utilities, provinces, member states) in implementing ambitious policies.

Buildings data strategy

Context

Fragmented data landscape in Canada

The availability of data on energy use, energy technologies, and efficiency opportunities is pivotal to ensure a successful transition in the buildings sector, for all stakeholders:

- **Program administrators** rely on data to design energy efficiency, fuel switching and GHG mitigation programs (How much potential is there, and where? How much of it is achievable and economic, and by when? What are others doing?)
- **Policymakers** require reliable data sources to develop effective energy efficiency strategies and policies (What are the barriers? How can they be overcome?)
- **Builders and investors** rely on it to make design and investment decisions (Are retrofit projects financially viable? What are others doing? What works well, what doesn't?)

Through NRCan's National Energy Use Database, ENERGY CANADA Portfolio Manager, and EnerGuide Rating System, Statistics Canada's energy data, and other products, the federal government has played a significant role in collecting, maintaining, facilitating, and distributing data on energy use at the federal and provincial/territorial levels.

However, data sources on energy efficiency technologies, potential and building performance remain scarce and mostly fragmented across government levels, utilities and other stakeholders. Key documents of the energy efficiency programming value chain — potential studies, technical reference manuals, benchmarking studies — are routinely updated by individual utilities or jurisdictions, via private consultants, with limited support or dissemination beyond their own service area.

Evidence-based policy making in the buildings sector

The Pan-Canadian Framework committed the federal government to work with sub-national governments "with the aim of requiring building energy use by early as 2019". The Pan-Canadian Framework also outlines a commitment to support the collection and regular publication of comprehensive data on "clean technology" — an area that can cover low-carbon buildings and their significant data needs. Budget 2017 provides funds for the Clean Technology Data Strategy and the Clean Growth Hub, both of which target overcoming barriers surrounding data availability and data-driven decision making. A

specific buildings data strategy is required to fill the gaps in the industry, and promote excellence.

Policy objectives

By developing a strong buildings data strategy, the federal government can:

1. Enable evidence-based policy making for policies and programs at all levels, as well as investments and building decisions.
2. Build the track record for efficiency potential and success, shedding light on the energy and non-energy benefits (GHG reductions, job creation, etc.) of efficiency.

Policy features

Develop, publish, and regularly update a national energy efficiency potential study

A potential study outlines the technical, economic, and achievable potential for energy efficiency in a given sector —in other words, it answers the question: "How much could we achieve in Canada?" The federal government can work with utilities and provinces to commission regular potential studies, jointly publish the results online in a streamlined format, and offer both analysis and assistance to stakeholders. This would go a long way to help support utility and provincial efforts, as well as federal initiatives in the buildings sector.

Launch the federal buildings data platform, a suite of databases, maps and other tools

The federal government is uniquely positioned to develop a suite of databases, maps and tools to support policymakers and investors across the country. This proposed buildings data platform may include:

1. a database of energy efficiency financing projects, inspired by the DEEP project in Europe, to help lenders better understand energy efficiency project risk profiles;
2. well-populated and supported ENERGY STAR Portfolio Manager and EnerGuide Rating System databases;

3. a database and navigating tool of buildings policies at the local, provincial/territorial, and federal levels.

This data may be complemented by analytics reports, published at a regular interval in a consistent format, in a bid to track an accurate portrait of the evolution of the Canadian building stock and support policy makers, assessors, and real estate professionals.

Fund the annual publication of a buildings policy scorecard

Friendly, data-heavy competition breeds performance. The federal government can fund the third-party publication of a scorecard that assesses the performance of Canadian provinces and large municipalities against key metrics (buildings policies and results).

Note that, in May 2017, the National Energy Board Modernization Expert Panel recommended the creation of the Canadian Energy Information Agency, not unlike the highly valuable U.S. EIA. We favour the centralization and wide dissemination of high-quality energy data, and favourably view this recommendation. Elements of the buildings data strategy may well fit in a centralized energy data agency.

Examples in other jurisdictions

European Union

The European Union manages the EU Building Stock Observatory, a database and data mapping tool that tracks the energy performance of buildings across Europe. The observatory tracks energy efficiency levels in buildings in EU member states, available financing programs and energy poverty levels, and offers key fact sheets.

Similarly, the Energy Efficiency Financial Institutions Group runs the De-Risking Energy Efficiency Platform (DEEP) that tracks and publishes the financial performance of energy efficiency investments in European buildings, in a bid to increase the transparency, risk profiling and standardization of energy efficiency investment projects.

United States

The U.S. DOE has launched the Better Buildings Financing Navigator, which helps project developers, building owners and occupants find available energy efficiency financing programs for their specific needs. The platform provides interested

parties information on the financing landscape for their project of choice, highlighting both traditional financing (loans and leases) as well as specialized energy efficiency financing options (on-bill financing, property assessed clean energy (PACE) financing, energy performance contracting, etc.).

Not-for-profit organizations

The American Council for an Energy Efficient Economy (ACEEE) releases an annual state-level scorecard ranking the policies and initiatives of all 50 states against key indicators. This scorecard is routinely referenced in the industry, and states are openly competing to outrank their neighbours.

These examples put in stark contrast the limited availability of buildings-related data in Canada — a key gap in the industry. The federal government is in a strong position to ensure that its broader data strategy includes a buildings data strategy.

Buildings financing initiative

Context

Financing: another tool in the toolkit

Financing programs have been recognized in recent years as an essential tool to help overcome some of the market barriers that prevent property owners from making required investments in energy efficiency, fuel switching, and other retrofit measures. Much like incentive programs, financing programs can take many forms:

- **Repayment mechanisms** that help facilitate lending (e.g. soft loans, on-bill financing/on-bill repayment (OBF/OBR), local improvement charges (LIC) or property assessed clean energy (PACE) financing);
- **Credit enhancements** that focus on reducing the risk exposure of lenders (e.g. loan guarantees, loan loss reserves, interest rate buy-down).

Financing programs are essential to attract needed private capital investments to fund large energy retrofits. Financial institutions, such as the newly created Canada Infrastructure Bank, could stack and leverage several financing products for multiple, deep and large energy retrofit projects.

Financing is only one tool in the toolkit, and is not meant to be effective in isolation. Strong demand for retrofits — driven by national targets, transparent data, and stringent codes and standards — remains at the root of successful financing efforts.

Emerging financing programs across North America

The United States has experienced a surge in financing programs in recent years, with varying forms including utility OBF/OBR programs, residential and commercial PACE loans, and large-scale federal credit enhancements. The magnitude also defies expectations: in the case of PACE, more than US$4 billion in residential and commercial loans were granted between 2009 and 2016 in the United States.[10] The emergence of public and quasi-public green finance institutions, such as the Connecticut Green Bank and the New York Green Bank, has also helped further spur this movement.

[10] PACE Nation, "PACE Market Data," 2017. http://pacenation.us/pace-market-data/

Several jurisdictions in Canada have also embraced financing, most notably at the utility (Efficiency Nova Scotia and Manitoba Hydro both offer on-bill financing), city (The Atmospheric Fund has managed an LIC program) and pilot level (Quebec has launched LIC/PACE-like pilots). More recently, some provinces have laid the foundation for green bank-like institutions, notably in Quebec (Transition Énergétique Québec, which will partner with Invest Québec), Alberta (Energy Efficiency Alberta was granted financing authority), and Ontario (the Green Ontario Fund). Some cities are also exploring the idea of creating city climate innovation centres to fund and finance low-carbon initiatives, including in the buildings sector.

A role for the federal government… and the Canada Infrastructure Bank

In Canada, financing remains largely in its early days — but progress is swift. The federal government has recently outlined existing funding and fiscal incentives at the Energy and Mines Ministers' Conference. More remains to be done.

On a larger scale, in November 2016, the federal government announced its intention to create the Canada Infrastructure Bank (CIB). This crown corporation will be tasked with using limited public capital to leverage private investment in large-scale infrastructure projects, from water treatment plants to roadways. Few details are known about the design of the CIB or its programs at this stage. Akin to similar infrastructure banks in other jurisdictions — from Germany's KfW to the Rhode Island Infrastructure Bank — the CIB will be well positioned to support the retrofit and energy efficiency financing industries. Energy efficiency loans typically range from less than $1 million to $20 million — relatively small in the eyes of institutional investors. There is currently no financial institution in Canada that aggregates and securitizes these loans and sells them on secondary markets, an activity conducted in other jurisdictions and highly influential in the buildings retrofit space.

In this evolving ecosystem, calls for the federal government to play a larger role in green buildings-related financing — as a backstop via credit enhancements, as an aggregator, and as a seed funder of local financing initiatives — will only grow.

Policy objectives

By launching a financing initiative, the federal government can:

1. Support provincial and local financing efforts, to ensure they are in line with the Pan-Canadian Framework building commitments.

2. Foster the development of an innovative financing environment with strong private actors.

Policy features

Launch a loan guarantee program for high-performance retrofit projects

The federal government can launch and manage a large-scale loan guarantee program to backstop investments in key building retrofit initiatives. Modelled after the U.S. DOE's successful program, the program may focus on guaranteeing private loans to energy efficiency, renewable energy and other projects.

Offer seed capital for provincial, municipal, and utility financing initiatives

In the coming years, significant financing efforts will take place at the provincial, municipal, and utility levels. The federal government can support these efforts by setting up a seed capital initiative for provincial green-bank like institutions (to expand already established institutions and to spur new ones), city climate funds (provide seed capital for organizations following in TAF's footsteps), and other initiatives (e.g. support to set-up LIC/PACE financing programs in participating jurisdictions). This fund could be replenished on a regular basis through the issuance of green bonds by the Government of Canada.

Develop a green building finance centre at the Canada Infrastructure Bank, with a focus on aggregation

The federal government can build a green finance practice within the CIB, with the initial intent of aggregating energy efficiency loans (e.g. loans made by emerging financing programs across Canada), securitizing them and selling them on secondary markets (e.g. to institutional investors). As the market mature, this green building finance centre may expand its efforts to other areas, in line with green bank-like institutions around the world.

Support efforts to standardize technical underwriting practices for energy efficiency loans

In support of the burgeoning energy efficiency loan sector — and in support of the Canada Infrastructure Bank's efforts, discussed in the following section — the federal government can help modernize and standardize the technical portion of energy efficiency loan underwriting (the other portion being financial

underwriting, which is conducted by the lending institution). More specifically, the federal government can:

1. work to further integrate NRCan's technical tools (especially EnerGuide) with financial underwriting needs (e.g. adding room for quotes and other costs into the EnerGuide standardized reporting); and
2. support the development of the Investor Confidence Project (ICP Canada), which seeks to standardize commercial energy efficiency project finance, in support of underwriting activities.

Combined with the buildings data strategy, this initiative will help private investors assess retrofit projects in a standardized way, and help build a growing pipeline of bankable projects.

These efforts will help overcome market barriers and failures in the emerging retrofit economy, and attract private investment in low-carbon buildings.

Examples in other jurisdictions

United States

Since 2005, the U.S. DOE has managed a loan guarantee program, with nearly $4.5 billion in loan guarantee authority at its peak. The program authorizes the issuance of loan guarantees for energy projects that "avoid, reduce or sequester" air pollutants and greenhouse gases, and that employ significantly improved technologies. The program is intended for commercial technologies, and does not support research and development projects.

In 2014, the Connecticut Green Bank conducted the first securitization and sale of PACE loans on secondary markets. As the market developed, private financial institutions have begun directly investing in energy efficiency projects. In a similar vein, the Rhode Island Infrastructure Bank was expanded from the state's Water Financing Authority (a more classic infrastructure bank) to support energy efficiency loans across the state. It made use of first-loss position bonds to capitalize energy efficiency loans, and continues to leverage its standing as a well-rated agency to promote green financing tools.

Investor Confidence Project

The ICP protocols create a consistent and transparent framework that enables investors to underwrite and manage a project's energy performance risks. Initiated in the U.S. (and used in Connecticut Green Bank programs, among many others), ICP has expanded in recent years, and was recently adopted as best practice for energy efficiency project finance standardization in the European Union. In Canada, the MaRS Discovery District, in partnership with GCBI and CaGBC, is developing an ICP Canada initiative.

European Union

The European Investment Bank and the European Commission's Natural Capital Financial Facility provide loans and investments backed by an EU guarantee to support a range of projects including green infrastructure. The program was launched in pilot phase and offers financing to all members states of the EU in the form of direct and intermediated debt financing, and equity investment funds.

Germany's KfW Development Bank Energy Efficiency Renovation program

This is a public–private partnership where KfW provides publicly funded low-interest capital and grants, and where local retail banks interface with clients/owners. The program is available to new and existing buildings in public and private sectors, and the level of grants increase with the depth of the energy efficiency measures. This program was shown to return nearly four times more to the public coffers than it costs; more than five times if reduction in unemployment benefits were included.[11]

Financing remains a relatively new tool in the toolkit, especially for federal governments. Support of private and sub-national initiatives remains a key refrain across jurisdictions.

[11] KfW Bankengruppe, *Impact on Public Budgets of KfW Promotional Programmes in the Field of 'Energy-Efficient Building and Rehabilitation* (2011). https://www.kfw.de/migration/Weiterleitung-zur-Startseite/Homepage/KfW-Group/Research/PDF-Files/Energy-efficient-building-and-rehabilitation.pdf

Low-carbon buildings transfer funding

Context

Infrastructure investments: getting it right at the start

In a bid to stimulate the economy and take advantage of historically low interest rates, the federal government has embarked on a large-scale investment program in infrastructure. Most recently, the 2017 budget advanced such efforts by providing $33 billion in infrastructure initiatives, including supporting the implementation of efforts put forward under the Pan-Canadian Framework. These investments will have long-term repercussions: new infrastructure built today can be expected to be standing decades in the future.

The federal government is cautious to strike a balance between adding conditions to project recipients, and minimizing transaction costs and delays. However, few conditions pertaining to performance ("green strings attached") have been put on the potential recipients of funding.

Supporting program delivery at the ground level

The lion's share of green building programming is managed at the provincial and utility level. Yet, most Canadian jurisdictions fall well short of their U.S. neighbours: energy efficiency targets, if existing, are modest; associated program funding remains modest, with some exceptions; and longer-term funding sustainability is uncertain (e.g. BC Hydro's flagship demand-side management initiatives saw their budget reduced in recent years). The ACEEE Country Scorecard put Canada at number 10 in terms of energy efficiency policies.[12]

In short, most provinces and utilities are aiming low relative to their U.S. counterparts, and not spending remotely enough to the achieve significant energy savings and GHG reductions — though the tide is slowly turning. Many provincial governments are cash-strapped, while utilities, which are facing stable demand and infrastructure renewal

[12] ACEEE, *Country Fact Sheet: Canada* (2016). http://aceee.org/sites/default/files/pdf/country/2016/Canada.pdf

challenges, are reluctant to request further rate hikes from a wary ratepayer base. The federal government is in position to support —though not necessarily deliver — a significant increase in on-the-ground green building programming.

Getting transfer funding right

The Canadian federation is no stranger to funding arrangements between levels of government. From equalization to the Gas Tax Fund, provinces and cities rely on federal transfers for significant parts of their budgets. While the regular jockeying for health care funding is a staple of federal–provincial relations, a transparent, long-term agreement (or a suite of bilateral agreements) can reduce friction and be a steady source of funding for provincial and municipal government programming. Budget 2017 outlines that $9.2 billion of the government's proposed green infrastructure investments will be provided to provinces and territories over the next 11 years through bilateral agreements. In his letters to provinces, Minister Sohi already identifies GHG mitigation in the building sector (i.e. energy efficiency and fuel switching) as eligible for Green Infrastructure funding. A low carbon funding transfer scheme would ensure that this available funding is actually allocated to meeting the PCF building commitments.

Policy objectives

By enacting a low-carbon buildings transfer funding scheme, the federal government can:

1. Support the organizations that are delivering a sizable fraction of low-carbon building programming.
2. Incent the adoption and implementation of national targets, and regular progress reports.
3. Provide longer-term funding sustainability to key program delivery organizations.

Policy features

Expand the list of conditions for buildings-related federal infrastructure funding to include benchmarking, performance ("green strings attached")

The federal government can add requirements for private recipients of federal infrastructure funding, with an emphasis on simplicity. Two categories of requirements may be implemented, based on the type of funding:

- Basic: Require that recipients of funding set performance targets for their buildings, benchmark the buildings using the NRCan-managed ENERGY STAR Portfolio Manager, and report on performance for the first five years of operation. Applicable to building-related funding, including social housing.
- Advanced: require that infrastructure investments above a given threshold include stringent GHG life cycle assessment in its selection criteria.

This information should be disclosed publicly as part of the buildings data strategy (some exceptions might apply).

Develop a low-carbon buildings transfer funding scheme with other levels of government

In implementating the Infrastructure Plan bilateral agreements with the provinces, the federal government can create a transfer funding scheme aimed at low-carbon buildings programs (utility efficiency programs, fuel switching initiatives, capitalization for green banks (e.g. Ontario Green Fund), etc.). No other strings — whether the funding is used to fund financing or incentive programs, codes and standards development, or other programs and policies — should be attached, so that provinces are free to make the choices that they deem best given their unique circumstances.

Establish a robust reporting framework

As a condition to the funding, provinces should agree to report progress against key fundamentals (energy savings, GHG emission reductions, and so on). This information should be publicly reported and disseminated as part of the federal government's buildings data strategy.

The transfer funding should be contingent on the provinces' performance against the national targets outlined in Part A, as well as their participation in Pan-Canadian Framework activities.

Examples in other jurisdictions

United States

The U.S. DOE's State Energy Program provides funding to states through a competitive process.[13] Funds are awarded to accelerate the market transformation of energy efficiency and renewable energy technologies through the deployment of policies and strategies to create job opportunities, reduce energy costs and achieve energy and climate security. The amount of grants is determined using a frequently updated formula that ensures appropriate allocation of funds according to performance and national goals and objectives.

The U.S. DOE Weatherization Assistance Program provides federal grants to states to improve the energy efficiency of low-income families. In turn, these states manage their own programs and often contract out the delivery. The program has been operating since 1976.

United States

The American Recovery and Reinvestment Act (ARRA), signed into law by President Obama in 2009, offered stimulus funding in a host of areas, including infrastructure and buildings. ARRA was subject to the National Environmental Policy Act (NEPA), which required that projects meet a suite of environmental requirements to qualify for funding. ARRA contained significant transfers to state governments and organizations to run energy efficiency and fuel switching programs through the DOE's Energy Efficiency and Conservation Block Grant program.

European Union

The European Commission provides grants for technical assistance for the implementation of energy efficiency, distributed renewable energy and urban transport projects and programs to regional and local governments. The grants finance feasibility and market studies, program structuring, business plan development, energy audits, preparation of tendering procedure, contractual arrangements and other implementation assistance. Since its initiation in 2009,

[13] U.S. DOE, "State Energy Program Competitive Financial Assistance Program," 2017. https://energy.gov/eere/wipo/state-energy-program-competitive-financial-assistance-program

EUR 95 million have been granted to support an estimated EUR 4.5 billion of investments.

Utilities

The idea of transferring funds from one public organization to another is not new, and also takes place between governments and utilities. For instance, the government of New Brunswick funds the Low-Income Energy Efficiency Program run by NB Power, the crown utility.

C. Supporting policies

In addition to the core policy and program proposals detailed in the previous sections, the federal government may also implement a suite of smaller yet important policies to further support the transition to a low-carbon building stock.

Fiscal measures

The federal tax code can be leveraged to encourage the deployment of green building technologies and strategies in Canada. Some key changes may include the following:

Expand class 43.1/43.2 provisions

The current federal government has expanded Class 43.1/43.2 capital cost allowance provisions to include a broader list of technologies, most recently geothermal projects, as outlined in the 2017 budget. There is room for integrating more technologies and increasing the rate of depreciation (currently set at 30-50%).

Case study: In the U.K., the capital cost allowance is set at 100% for selected products. Eligible measures include energy saving equipment, water saving equipment, and a host of low-carbon products beyond the green building space, such as cars with low CO_2 emissions, biogas and hydrogen refuelling equipment, and new zero-emission goods vehicles.

Expand the list of GST/HST exemptions for green building-related products & services

Additional sales tax exemptions should be applied on select products and services and updated on a regular basis; notably:

- Materials and equipment: thermal insulation, smart thermostats, LED lights, “Most Efficient” ENERGY STAR furnaces, boilers, and heat pumps
- Specific energy services: most notably energy audits in the residential and commercial sectors

Case study: Some provinces (B.C., P.E.I., Saskatchewan) offer sales tax exemptions for energy efficiency and renewable energy (RE) equipment. At the state level in the U.S., sales tax exemptions for RE/EE equipment are also a common incentive. Additionally, some states have property tax exemptions that apply to homeowner who install specific

RE/EE technologies (e.g. rooftop solar PV). In Europe, similar tax breaks are also commonplace, notably the U.K.'s Landlord Energy Savings Allowance.

Offer federal tax credit for investments in energy efficiency and renewable energy projects

Tax credits offer another possible approach for incenting the adoption of energy efficiency and renewable energy projects in the residential and commercial sectors. Tax credits can be designed to encourage the adoption of specific technologies (e.g. solar PV, heat pumps, etc.) or within certain market segments (e.g. new construction, existing buildings, etc.) to meet policy goals.

Case study: In the U.S., tax credits are a commonly used tool: the federal Business Energy Investment Tax Credit (ITC) (up to 30%), Residential Renewable Energy ITC (up to 30%), Energy Efficient New Homes Tax Credit, and various personal and corporate tax deductions an the federal and state levels form the backbone of a suite of incentives for EE/RE technologies. Additionally, tax credits for renewable energy are often structured as investment incentives (covering a portion of capital costs), while others are structured as production incentives (offering a variable $/kWh rate for a fixed number of years).

International cooperation

Learning from and cooperating with other experienced nations is of critical importance. Most notably, Canada should apply for membership with the International Renewable Energy Agency (IRENA) (Figure 1). Canada would be the 181st country to do so—the last of the G7.

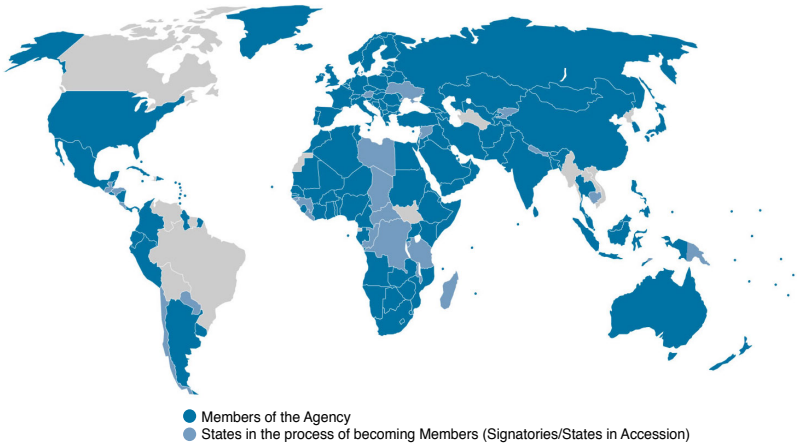

Figure 1: Membership in IRENA

Source: IRENA[14]

Network of low-carbon demonstration buildings

The federal government can support the creation of a network of carbon-neutral demonstration buildings across Canada. Modelled on the LEED-certified Maison du développement durable in Montreal, each project would serve as a showcase for green buildings, as a meeting space for organizations of all types, and as office space for innovative, sustainability-focused organizations. Specifically, we recommend that a portion of the Low Carbon Economy Challenge Fund be allocated for not-for-profit organizations to build low-carbon demonstration buildings across the country, to be delivered via the new Infrastructure Partnership Bilateral Agreements. Further, we recommend that surplus federal lands be made available for not-for-profit organizations to develop low-carbon commercial buildings.[15]

[14] IRENA, "IRENA Members." http://www.irena.org/Menu/Index.aspx?mnu=Cat&PriMenuID=46&CatID=67

[15] For more details on this recommendation, see Equiterre, *Deploying Low-Carbon Buildings: The Power of Not-for-Profit Organizations* (2017).