



Building Canada's Energy Future Together



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WORKING TOGETHER TO BUILD CANADA'S ENERGY FUTURE

Federal, provincial and territorial governments are working together through the Energy Mines and Ministers' Conference and the Pan-Canadian Framework on Clean Growth and Climate Change, aligned with priorities under the Canadian Energy Strategy, to build Canada's energy future. This collaboration is based on a strong foundation of respect for jurisdictional responsibilities, regional diversity and transparency.

This report recognizes how governments are working closely together to protect Canada's energy security; encourage energy efficiency; promote clean energy and innovative technologies; and, expand market access of Canadian energy exports. This work includes actions and achievements featured in the following areas:

- 1. Innovation** - investing in clean technology and energy efficiency and supporting early stage research, development and demonstration.
- 2. Infrastructure** - improving our electricity systems by including interties, renewable and non-emitting energy sources, getting remote and Indigenous communities off diesel, implementing low-carbon transportation systems, and investing in energy efficiency.
- 3. Information and data** - improving accessibility to reliable and accurate energy data to inform decision-making and bolster public confidence in Canada's energy system.
- 4. Integrity and public confidence** - increasing transparency in energy decision-making and engaging Canadians on energy issues.
- 5. Indigenous peoples participation** - renewing the energy relationship with Indigenous peoples based on recognition of rights, respect, co-operation, and partnership.
- 6. Inclusive growth** - taking an inclusive approach in the transformation of Canada's energy sector, so that the benefits of a low-carbon economy are widely shared.
- 7. International markets** - establishing Canada as a leader in the global energy transition and expanding market access for Canadian energy products and services.

Transformative changes are underway in the energy sector, which are likely to accelerate in the decades ahead. It is an opportune time to leverage our shared interests to position Canada effectively for the long-term shift to a prosperous and low-carbon economy.

COLLABORATION IN ACTION

Important initiatives such as the Energy and Mines Ministers' Conference (EMMC), **Pan Canadian Framework on Clean Growth and Climate Change** and the **Canadian Energy Strategy** are in place to advance collaboration among federal, provincial and territorial governments, demonstrating significant common ground.

The Energy and Mines Ministers' Conference is an annual gathering of federal, provincial and territorial ministers responsible for energy and mining portfolios. At these meetings, ministers discuss shared priorities for collaborative action to advance energy and mining development across the country. In recent years, key energy priorities have included energy efficiency in buildings transportation and industry; energy security; clean energy and innovative technologies; the energy transition in northern and remote communities; expanding market access and strengthening public confidence.

In July 2015, Canada's Premiers released a provincial/territorial **Canadian Energy Strategy** (CES) through the Council of the Federation, which signalled their commitment to a common framework for shaping Canada's energy future, and articulated key areas in which they will collaborate. Through the 2016 *Vancouver Declaration*, First Ministers tasked federal, provincial and territorial Energy Ministers to collaborate on specific actions under the Canadian Energy Strategy — in the areas of energy efficiency, energy infrastructure, and energy technology and innovation — to contribute to the pan-Canadian framework. These actions acknowledge that, given energy production and use accounts for over 80% of Canada's greenhouse gas (GHG) emissions, energy ministers have a critical role to play in collectively shaping Canada's low-carbon energy future.

In December 2016, First Ministers endorsed the **Pan-Canadian Framework on Clean Growth and Climate Change (PCF)** — a plan to enable clean economic growth, reduce GHG emissions, and build resilience to a changing climate. The PCF sets Canada on a path to meet its target under the Paris Agreement of reducing emissions by 30% from 2005 levels by 2030. It is a flexible framework that allows each jurisdiction to design their own emission reduction policies and programs with the support of federal investments. The Framework includes more than fifty concrete policy actions spanning the country and all sectors of the economy. Federal, provincial, and territorial governments are collaborating on the delivery of the PCF, and are engaging and partnering with Indigenous Peoples as these actions are implemented. The first annual synthesis report released by First Ministers in December 2017 demonstrated that the PCF is on track to successfully achieve significant emissions reductions.

Generation Energy: The Conversation of a Generation

In April 2017, the Government of Canada launched Generation Energy, a national dialogue on Canada's path towards a low-carbon future. More than 380,000 Canadians participated. The dialogue engaged provinces and territories, Indigenous peoples and stakeholders, including industry, non-government organizations and academia. Through conversations across the country, Canadians imagined a prosperous energy future that balances environmental sustainability and economic interests.

Canadians understand that the energy landscape is changing dramatically with significant implications and potential opportunities. They envision a vibrant and competitive energy future that promotes growth and sustained prosperity, and positions Canada as a global leader in the low-carbon economy.

Canadians told us that a set of core values should guide us that is exemplified by collaboration, integrity, inclusiveness, fairness and transparency. Canada's energy future must fully leverage its diversity of energy resources, geography and its people.

ENERGY IN CANADA

From an energy perspective, Canada is very fortunate. We have a large land mass, small population and one of the largest and most diverse supplies of energy in the world. Our rivers discharge close to 7% of the world's renewable water – a tremendous source of hydroelectric power. We have the third-largest global supply of proven oil reserves, are the fourth largest producer and exporter of natural gas and have the third-largest reserves of uranium. Our energy resources are a source of strength that continues to shape our economy and society.

Renewables (e.g. wind, solar)

- 9th in wind power capacity
- 10-fold growth in solar capacity since 2010
- 8th in liquid biofuels



Hydro

- 2nd largest hydro producer
- 59% of Canadian electricity



Nuclear

- 2nd in uranium production
- Tier 1 Nuclear Nation
- Own nuclear reactor technology (CANDU)



Crude oil

- 4th largest producer
- 3rd largest proved reserves



Energy efficiency

- Saved Canadians \$38B in energy costs
- Avoided 95 Mt of GHG emissions



Natural gas

- 4th largest producer
- \$7B net exports

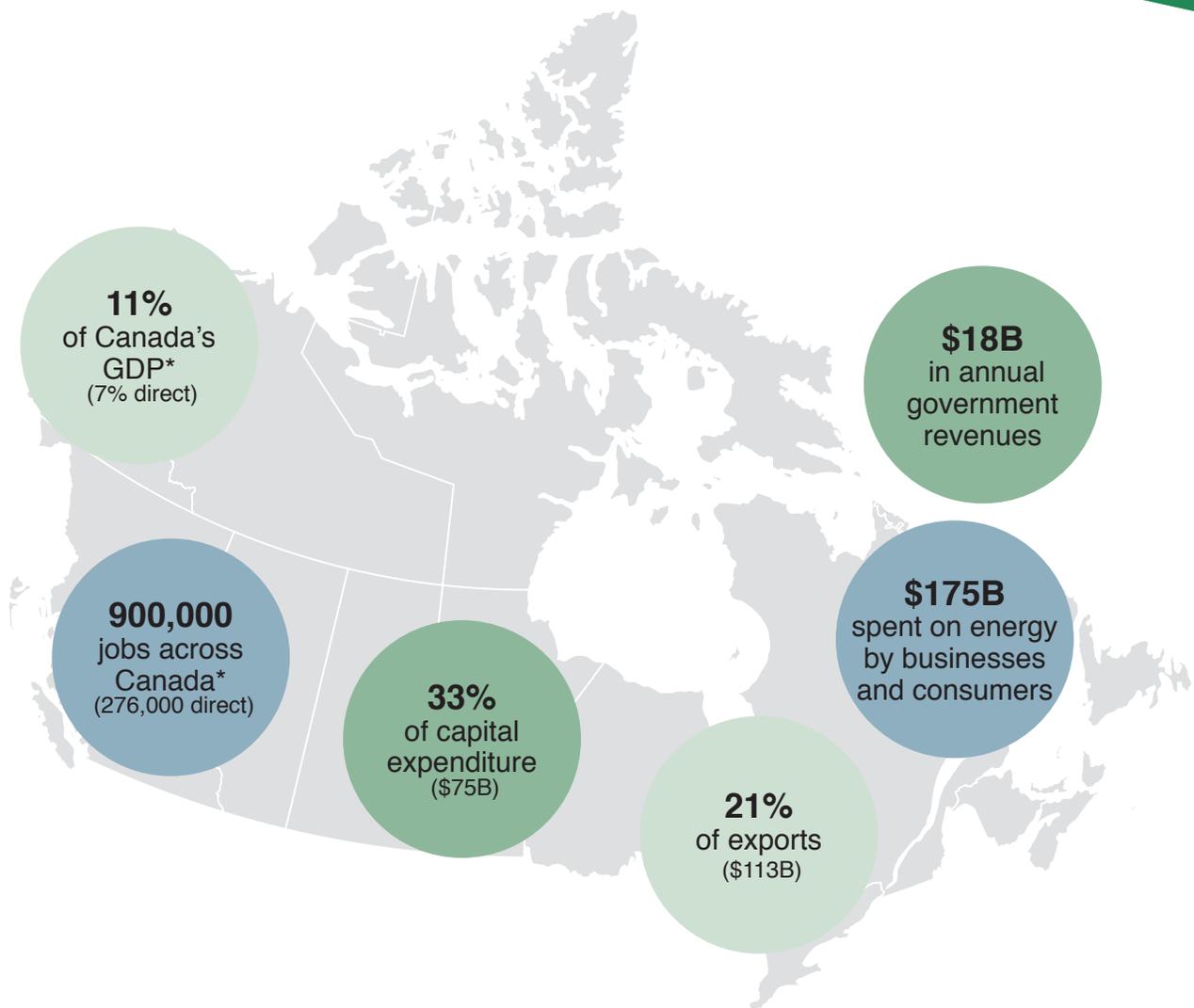


Energy innovation

- \$3B invested in energy RD&D
- 55,000 employed in clean technology sector



Canadian ingenuity has given rise to an industry that drives economic growth and can be considered a source of pride for Canadians. The energy sector catalyzes the creation of innovative energy technology, promotes trade and investment, and provides Canada with a competitive advantage on the world stage. The sector drives employment across the country, with a strong network of energy producers, service and technology providers from coast-to-coast-to-coast.



¹Statistics Canada, Natural Resources Satellite Account with NRCan estimates for indirect employment (2017).

The energy landscape is changing rapidly in Canada and across the world. Worldwide, countries are implementing the Paris agreement, making major investments to diversify to cleaner energy sources and fuels, focusing efforts on energy efficiency, and positioning themselves as low-carbon leaders. Major global economies recognise that the global shift to a low-carbon energy future will be complex; entailing fundamental changes in the way we produce, transport and use energy, alongside a re-thinking of supporting infrastructure, markets and institutions.

A few major trends are already evident. New technological platforms, intelligent systems and digitalization are creating change with the potential to transform how energy industries operate. The potential of clean energy technology has not been fully realised, necessitating deeper and broader public and private collaboration. The cost of renewable energy is decreasing rapidly, complementing traditional sources of energy with long-term implications for Canada's energy mix.

Positioning Canada as a low-carbon leader means taking responsibility to develop and use our vast energy resources wisely. Energy demand is expected to grow but, through innovation, we can drive energy efficiency across all economic sectors to manage future needs. Energy efficiency measures can reduce emissions, increase productivity and contribute to economic growth. Seizing opportunities to reduce energy demand through innovative design of goods and efficient delivery of services will allow consumers access to an array of products at an affordable price. From 1990 to 2015, energy efficiency improved by 26.5%. Final energy demand increased by 30% over this same period, but would have increased by 55% without energy efficiency improvements². Reducing our collective energy use can lead to cost savings, providing Canadians with more clean and affordable energy options as part of the transition to a low-carbon economy.

Governments recognise the need to understand and manage potential trade-offs that may result as the global energy transition takes shape. The transition will require leadership by all facets of society, including a willingness to take risks, and a strong culture of entrepreneurship. All sources of energy will be part of our energy future and our regional diversity will be a continued source of strength.

Indigenous peoples must be engaged as partners in the low-carbon transition. As the energy sector is central to the economic prosperity of many remote and rural regions, the involvement of Indigenous peoples as partners is crucial to solving pressing challenges and developing the solutions needed to support long-term success.

Governments must take an inclusive approach and maintain an ongoing dialogue with all Canadians, to collectively navigate the changes that lie ahead. In this way, we will continue to build the trust and confidence of all Canadians.



²Energy Efficiency Trends in Canada, 1990 to 2015 – Summary (2018)



1 INNOVATION: Growing the Economy through Clean Technology

Global demand for clean technologies and energy efficiency solutions is significant and increasing. Fostering investment in clean technology solutions will facilitate economic growth, long-term job creation, help Canada meet its climate change goals and expand global-market opportunities.

An effective strategy for clean energy technology development, commercialization, and adoption in Canada requires collaborative and focused action. With this approach, government investments in clean energy technology research, development and demonstration (RD&D) will create the largest benefit. Across the innovation spectrum, coordination among governments industry, stakeholders, academia, and Indigenous peoples will help to eliminate duplication of efforts, address gaps and identify opportunities for partnerships in support of clean energy innovation.

Given Canada's small domestic market, Canadian firms must look to highly competitive international markets to achieve scale. Succeeding in the clean technology marketplace requires globally competitive talent; access to the capital and resources needed to demonstrate the commercial viability of products; and strong international networks that facilitate the cross-border flow of clean technology goods and services.

The report, [Advancing Energy Technology and Innovation: Enhanced Strategic Collaboration between Federal, Provincial, and Territorial Governments](#) highlights lessons learned and best practices to advance innovative jurisdictional collaboration for clean energy technology development.

Federal, provincial and territorial governments are advancing energy technology research, development and demonstration activities in a number of areas, including:

1. Supporting earlier-stage RD&D

Governments have a shared interest in collaborating to advance energy technology research, development and demonstrations. Supporting new approaches to early-stage technology development, including breakthrough technologies, can reduce risks and accelerate the commercialization of new energy innovations, leading to reduced emissions of GHGs and other pollutants. Innovative partnerships with the private sector are an important contribution to this effort.

2. Accessing government programs

Federal, provincial and territorial funding programs can leverage expertise and resources through more effective interjurisdictional collaboration. A coordinated “no-wrong door” approach creates efficiencies for companies to access the suite of government programs and services available to support their commercial success in advancing energy technologies.

3. Working with Indigenous peoples and northern, remote, and isolated communities to adopt and adapt clean technologies
- Federal, provincial, and territorial governments support Indigenous peoples and northern and remote communities in adopting and adapting clean technologies. The report, *Natural Gas Opportunities in Remote and Northern Communities*, assesses the current and potential use of natural gas and Liquefied Natural Gas (LNG) for electricity generation, heating, and other purposes. Emphasis is being placed on business models that support community ownership and operation of clean technology solutions.

SUPPORTING EARLY STAGE RD&D

Working together since 2008, **Canada** and provincial governments are investing over \$2 billion towards carbon capture, use and storage (CCUS) initiatives, with up to \$4.5 billion in total public-private investment. Initiatives include RD&D in large-scale projects. According to the International Energy Agency, CCUS technology is part of a least-cost solution to addressing climate change, representing 15% of cumulative global emission reductions by 2050.

Emissions Reduction **Alberta** (ERA)'s \$50 million Oil Sands Innovation Challenge focuses on demonstration projects that involve prototype testing, field piloting, commercial demonstration, or first-of-kind technology deployments of innovative technologies that reduce GHG emissions and improve the cost competitiveness of bitumen production and processing.

CanmetENERGY, Canada's leading clean energy research and technology organization works with key stakeholders to drive the cleaner production and use of energy. CanmetENERGY collaborates on advanced combustion, gasification and CCS technologies to reduce emissions and improve performance. It is also helping develop Canada's oil sands and heavy oil resources in a sustainable way through advances in science and technology.

Transition énergétique **Québec** (TEQ) has partnered with the federal agency Sustainable Development Technology Canada, to support and fund clean-energy projects and guide companies to commercialize their GHG emission reducing technologies.

In February 2018, **Newfoundland and Labrador** announced Advance 2030, a plan for growth in the oil and gas industry based on principles including responsible development, collaboration, and innovation. Immediate actions being taken include developing a blueprint to support innovation in areas such as remote operations in harsh environments, subsea technology, and automation.

New Brunswick is investing \$10 million into developing a nuclear research cluster in the province, led by the New Brunswick Energy Solutions Corporation. Research will be focused on Small Modular Reactors (SMRs), which are smaller, more scalable, more cost efficient and safer than current designs. The province can build on its existing nuclear infrastructure, the Point Lepreau Nuclear Generating Station, and benefit from the current expertise in operating the station, while enhancing the facility. Research will be mostly on the non-radioactive side of reactor design, while research into the radioactive side is being conducted at the Chalk River Laboratories in Ontario.



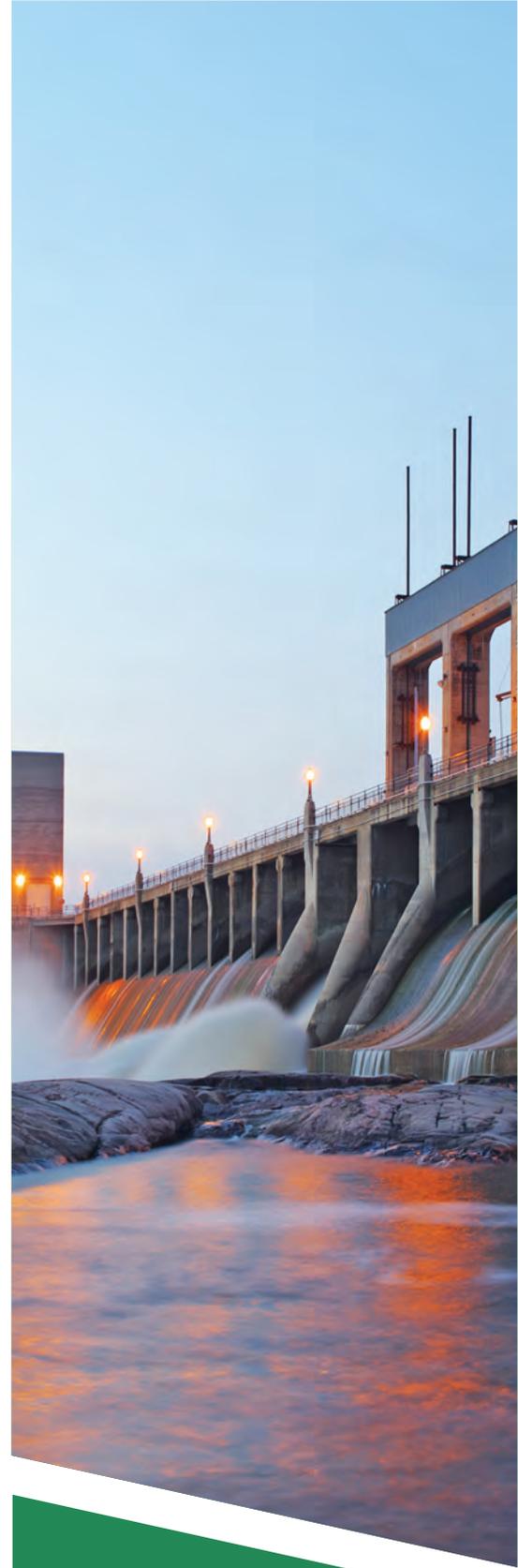
LEADERSHIP IN ACTION: INITIATIVES TO SUPPORT ENERGY INNOVATION IN CANADA

Clean Growth Program provides \$155M over 4 years for the co-funding of clean technology RD&D projects with provinces and territories, in Canada's energy, mining and forestry sectors. The leveraging of funds is being met through the establishment of trusted partnerships with key provincial/territorial partners and funding agencies. To date, NRCan has established seven partnerships.

Impact Canada accelerates breakthrough cleantech solutions to tough problems, such as reducing reliance on diesel in remote and northern communities. The initiative takes a challenge-based approach to engage innovators. NRCan engages provinces and territories when designing challenges for cleantech problem solvers to help improve outcomes for Canada.

The **Emerging Renewable Power Program** provides funding to expand the portfolio of commercially viable renewable energy sources available to provinces and territories as they work to reduce GHG emissions from their electricity sectors.

Alberta-Canada Collaboratory on Clean Energy Research and Technology enhances collaboration on more sustainable oil sands development, clean energy technology, and research addressing climate change and pollution. In the short term, this initiative supports collaborative project funding in Alberta's transition to a low-carbon economy. One example is Alberta's Climate Change and Innovation Technology Framework (CCITF), under its Climate Leadership Plan. The CCITF helps guide investments in innovation and technology to support environmental performance, economic diversification, energy transition and innovation system performance in priority sector areas. These sectors include cleaner oil and gas; methane emissions reduction; low-carbon electricity; waste to value-added; green buildings and energy efficiency.



CLEAN TECH IN NORTHERN, REMOTE AND ISOLATED COMMUNITIES

Canada's \$220 million Clean Energy for Rural and Remote Communities program supports knowledge and skills-building initiatives to help reduce reliance on diesel in rural and remote communities. The program also has a renewable energy stream that will support a suite of diverse projects across Canada to reduce diesel use for heat and power.

The **Northwest Territories**, as a primary strategic objective of its 2030 Energy Strategy, will work together with Indigenous, northern and remote communities in its jurisdiction to support the adoption of clean technologies through community engagement, participation and empowerment.

The **Northwest Territories** is investing in energy efficiency alterations, and as an early adopter of biomass heating systems in government facilities, has stimulated the development of supply chains to remote communities, allowing others to switch to renewable wood pellets.

Yukon is assessing the impact of adding significant amounts of solar- and wind-generated electricity to a micro-grid in Yukon. The work aims to assist First Nations, communities, and utilities in understanding how to integrate renewables into small diesel-powered micro-grids.

With *The Plan Nord toward 2035*, **Québec** is focused on the development of clean, innovative energy sources to supply isolated communities and on a broadening of energy supply to ensure the retention, development and economic diversification of enterprises in the North.

CANADA'S SMALL MODULAR REACTOR (SMR) ROADMAP

The federal government is collaborating with provinces, territories, and utilities from **Alberta, Saskatchewan, Ontario, New Brunswick, the Northwest Territories**, and **Nunavut** to co-create a vision for Small Modular Reactors (SMRs). The Roadmap will address possible applications for SMRs in Canada, including power generation, combined heat and power for heavy industry (e.g., mining and oil sands) and off-grid replacement for diesel in remote communities.

Across Canada, technical workshops with stakeholders, focused on possible development and deployment pathways for SMRs, are occurring. Constructive dialogues with national and regional Indigenous representatives were also held to discuss their energy priorities and the potential for SMRs to support those priorities.

SMRs hold significant potential to reduce reliance on fossil fuels such as coal and diesel, increase Canadian energy security, increase economic competitiveness, and support innovation.



2 INFRASTRUCTURE: Building the Energy System of Tomorrow

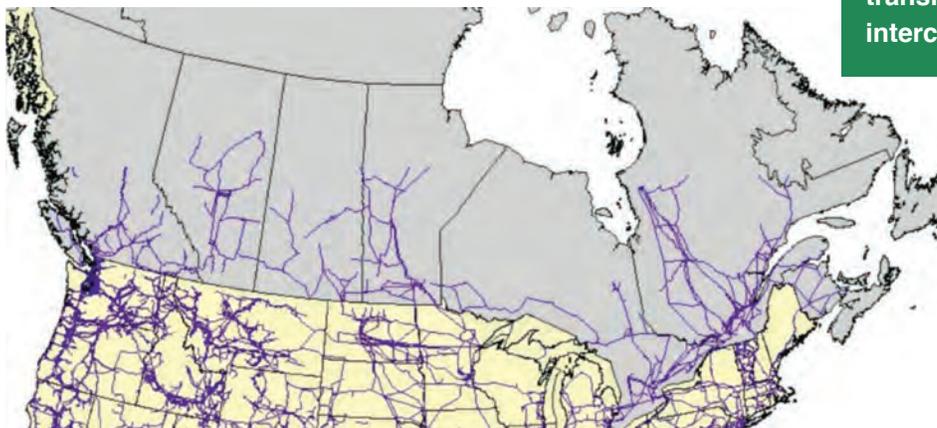
Investing in energy infrastructure is the foundation for the energy systems of tomorrow. This includes a vision for the electricity system that is reliable, resilient, affordable, efficient and non-emitting. Major shifts are anticipated in the next two decades that will necessitate investments in grid modernization, distributed systems, integration of new smart grid technologies, and energy storage. Next-generation transportation systems will be cleaner, smarter, and shared. Densely populated urban centres will feature integrated energy systems, increased energy efficiency in homes and buildings, and will enable Canadians to produce and sell energy, and use of low-carbon modes of transportation. Infrastructure that provides access to global markets will ensure that the best prices are received for Canada's energy assets.

Clean Electricity: Modernizing Systems and Connecting People

Canada has a significant advantage when it comes to low-carbon electricity, given our abundant renewable energy resources. We already have one of the cleanest electricity systems in the world. About 80% of Canada's electricity production comes from non-emitting sources.

To maximize this advantage, there are opportunities to broaden the portfolio of renewable and non-emitting energy sources and ensure that Canada's electricity grids can incorporate additional energy capacity, manage variability, ensure reliability, and deliver power to domestic and international markets. The federal, provincial, and territorial governments' report, [Integration of Variable Output Renewable Energy Sources – The Importance of Essential Reliability Services](#), highlights energy reliability challenges and opportunities as the integration of intermittent renewables into Canada's electricity mix increases and lays the groundwork for further work.

There are 34 major
Canada-U.S. power
transmission
interconnections



Federal, provincial and territorial governments are advancing actions in the following areas:

1. Modernizing electricity systems

Federal, provincial, and territorial governments have committed to work together to support the research, development, demonstration and deployment of smart grid technologies that help electric systems make better use of renewable energy, facilitate the integration of energy storage for renewables, and help expand renewable power capacity.

2. Connecting clean power with places that need it

Federal, provincial, and territorial governments have committed to work together to help build new and enhanced transmission lines between and within provinces and territories in compliance with market rules and by ensuring fair competition between electricity producers.

3. Reducing reliance on diesel with Indigenous peoples and northern/remote communities

In partnership with Indigenous peoples and businesses, Governments have committed to accelerating and intensifying efforts to improve the energy efficiency of diesel generating units, demonstrate and install hybrid or renewable energy systems, and connect communities to electricity grids. A successful workshop was held in Yellowknife in June 2018, where the unique energy challenges and opportunities of northern and remote communities were explored. A series of key messages and considerations were developed for policymakers.

In addition, the federal, provincial, and territorial governments' report, *Towards Renewable Energy Integration in Remote Communities – A Summary of Electric Reliability Considerations*, provides a summary that local utilities, and the off-grid communities that they serve, must consider to reduce diesel consumption. These actions will have significant benefits for communities, such as improving air quality and energy security and creating the potential for locally owned and sourced power generation.

MODERNIZING ELECTRICITY INFRASTRUCTURE

Facilitated by **Canada's Regional Electricity Cooperation and Strategic Infrastructure**, provincial and territorial governments and utilities are collaborating with the federal government to identify, assess and seek consensus on the best regional electricity infrastructure projects that may significantly reduce GHG emissions.

British Columbia is exploring opportunities to collaborate with the federal government on electrification of liquefied natural gas and upstream oil and gas activity. British Columbia submitted three projects under BC Hydro's electrification initiative: the Peace Region Electricity Supply, the North Montney Power Supply and the Prince George to Terrace capacitors project.



MODERNIZING ELECTRICITY INFRASTRUCTURE (contd.)

Prince Edward Island is conducting a study on the electricity grid that aims to maximize the benefits from renewable sources of electricity and the future electrification of the transportation system, while providing fair and cost-effective rates for Islanders.

Québec's 2030 Energy Policy (2030 EP), launched in April 2016, seeks to increase by 25% the overall renewable energy output and to increase by 50% the bioenergy production.

After extensive review by Manitoba's Public Utilities Board, **Manitoba** is building the Keeyask Generating Station, which will add 695 MW of additional renewable electricity capacity by 2021.

Manitoba generates 97% of its energy from hydroelectricity. There are 15 major hydroelectric generating stations, the largest of which is located along the Nelson River. The Wuskwatim Generation Station on the Burntwood River was completed in 2012 with a capacity of 200 MW.

Saskatchewan announced a target to double its share of renewable electricity, rising from the present 25% share to 50% by 2030.

Nova Scotia's Enhanced Net Metering Incentive Program allows Nova Scotians to install a source of renewable energy to help power their home or business. The utility installs bi-directional electricity meters for net metering customers, to monitor and record the flow of electricity from their home or business.

Alberta's Smart Grid Consortium, comprised of Alberta Innovates, Alberta Energy and Alberta electric distribution companies, work collaboratively to accelerate the development and deployment of smart grid initiatives. The Alberta Utilities Commission submitted a report that provides the province with a foundation to develop an electric distribution system policy. The policy would ensure the system stays robust, resilient and cost-efficient, as more distributed renewable energy comes online.

Newfoundland and Labrador's Labrador-Island Link (LIL) is a 1,100 km, 900 megawatt High Voltage direct current (HVdc) transmission line that connects the Island of Newfoundland to Labrador and will enter into service in 2018. It enables the significant hydroelectric resources in Labrador to displace carbon emitting thermal generation on the Island of Newfoundland as well as Nova Scotia.

ATLANTIC CLEAN ENERGY PARTNERSHIP

In April 2017, **Atlantic Premiers** announced the creation of the Atlantic Clean Energy Partnership. This new Partnership will focus on identifying potential enhancements to electricity generation and transmission infrastructure, the promotion of energy efficiency, and the demonstration, deployment, adoption, and export of clean energy technologies.

The Partnership will contribute to a more integrated and diverse energy distribution system that will support technological innovation, security and reliability of energy supply, and cost-effectiveness.

WHAT IS A KILOWATT?

- A **watt (W)** of electrical capacity is a measure of power. Megawatts (MW) and kilowatts (KW) are larger measures of electrical capacity.

$$1 \text{ MW} = 1,000 \text{ KW} = 1,000,000 \text{ W}$$

- A **W/KW/MW-hour** is the measure of how much electricity is produced or consumed from using this installed capacity continuously for one hour.
- **LEAVE A 100 WATT LIGHTBULB ON FOR 10 HOURS?** That's one Kilowatt-hour of electricity.

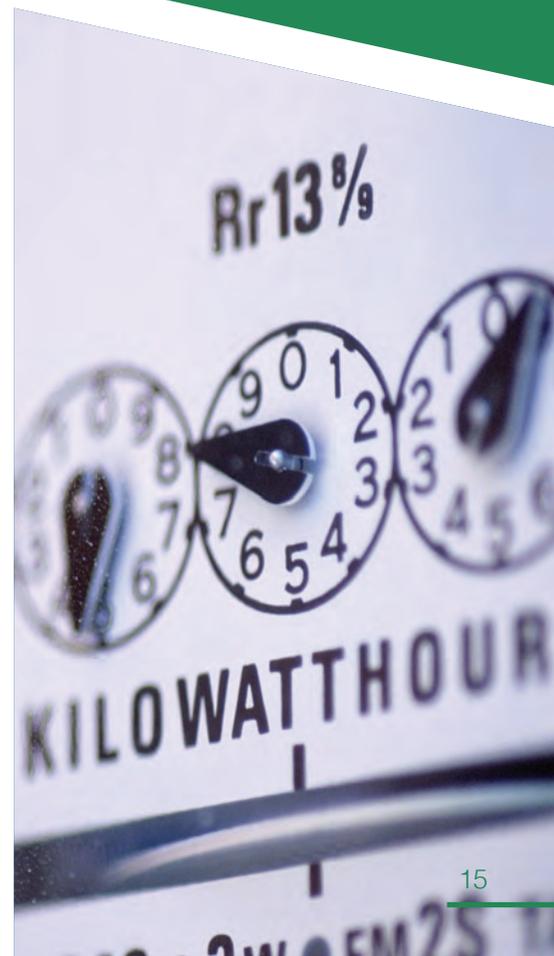


$$\text{X } 10 \text{ hours} = 1 \text{ KWh}$$

- **POWER YOUR HOUSE FOR A YEAR?** That's an average of 12 MWh (depending on location).



$$\text{X } 1 \text{ year} = 12 \text{ MWh}$$



CONNECTING CLEAN POWER TO CANADIANS

Atlantic Provinces are exploring the advancement of key infrastructure projects that will reduce greenhouse gas emissions in the region including the further exploration of transmission projects. Nova Scotia is currently interconnected with New Brunswick, but it will soon also be interconnected with the island portion of Newfoundland and Labrador through the 500 MW Maritime Link. A portion of the Maritime Link's firm capacity has already been assigned to carry energy from Muskrat Falls in Newfoundland and Labrador to Nova Scotia.

Through expanded interprovincial transmission, **Newfoundland and Labrador's** undeveloped renewable resources can support clean energy opportunities (e.g. hydro, wind). With the Muskrat Falls hydroelectric project being in service, Newfoundland and Labrador's electricity exports are expected to increase to more than 3 terawatt hours (TWh) per year (from 1.5 TWh), assisting other Canadian jurisdictions in meeting their renewable energy targets.

In **Québec**, more than 99% of electricity comes from renewable energy. Furthermore, in its 2030 Energy Policy, one of the Northern Plan priority initiatives in the energy sector is to support projects by off-grid communities and companies to convert electricity generation from fossil fuels to renewable energy sources.

The **Northwest Territories** is investing in high penetration wind power in the community of Inuvik. Inuvik is north of the Arctic Circle and is one of Canada's largest remote off-grid communities. The project includes up to 4 megawatts of wind paired with energy storage that will displace as much as 30% of the fossil fuels used to produce electricity in Inuvik.

Working together, **Yukon** Energy, ATCO Electric Yukon, NWT Power Corporation, Northland Utilities, QEC, AURORA College, and Nunavut Arctic College, are part of a study being conducted by Yukon College on the innovation of energy use in the north. The study analyzes the progress/ results of multiple renewable projects and technological innovations in Northern communities.

Alberta's Renewable Electricity Program, run by the Alberta Electric System Operator (AESO), encourages the development of large-scale renewable electricity generation projects through a competitive and transparent bidding process for companies. This program will add 5,000 megawatts (MW) of renewable energy capacity by 2030.

Manitoba Hydro will be constructing 44 km of 230 kV line from Birtle South (Manitoba) to the Manitoba-Saskatchewan border. An in-service date of June 2021 of the Manitoba-Saskatchewan Transmission Project is anticipated. The line will supply clean power from Manitoba Hydro to help manage the demand on Manitoba's power system and meet customer needs. Bringing in this renewable energy source will help the province reach its goal of reducing emissions by 40 per cent by 2030 from 2005 levels.

New Brunswick, Nova Scotia and Prince Edward Island are examining various non-GHG emitting energy options. This includes additional nuclear capacity at Point Lepreau, small hydro and wind in New Brunswick, distributed wind with storage in Nova Scotia, and additional wind in P.E.I.



CONNECTING CLEAN POWER TO CANADIANS (contd.)

Nova Scotia's Developmental Tidal Feed-In Tariff Program encourages the development of specific renewable energy projects by guaranteeing a rate per kilowatt-hour for the energy the project feeds into the province's electricity grid. It is designed to incentivize tidal energy developers to test and deploy their in-stream tidal energy projects in Nova Scotia.

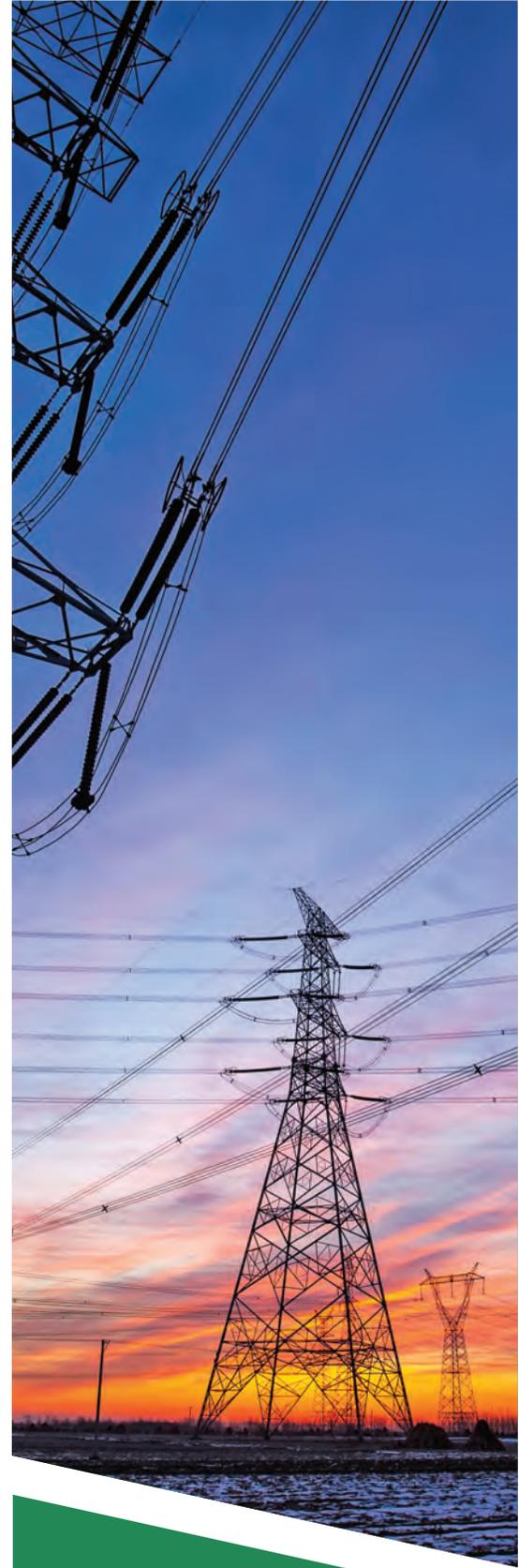
REDUCING RELIANCE ON DIESEL IN RURAL AND REMOTE COMMUNITIES

Canada is investing \$220 million through the Clean Energy for Rural and Remote Communities Program to fund projects that reduce reliance of rural and remote communities on diesel fuel, support the use of more sustainable, renewable energy solutions, encourage the adoption of energy efficiency measures, and build community skills and capacity. This program funding is part of a larger vision to provide \$21.9 billion over 11 years to support clean growth and combat climate change. Canada is also supporting the deployment of renewable energy projects in communities that rely on diesel for electricity and heating in the Yukon, Northwest Territories, Nunavut, Nunavik and Nunatsiavut.

Qulliq Energy Corporation's (QEC) Kugluktuk Power Plant project in **Nunavut** will allow the connection of alternative energy projects, enabling the territory to move away from diesel. The new power plant will be built with newer fuel efficient generator sets that will reduce carbon emissions and noise pollution. The project is anticipated to be completed by 2021.

Under the **Northwest Territories' 2030 Energy Strategy** the Government of the Northwest Territories (GNWT) has committed to reducing diesel use for electricity generation in remote off-grid communities by 25% by 2030. The GNWT is currently working with Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) under the Northern Responsible Energy Approach for Community Heat and Electricity (REACHE) Program to support the community of Tulia to install solar photovoltaic panels to displace diesel use. Also, the Territory's Petroleum Resources Strategy will seek opportunities to develop local natural gas resources to displace diesel use in remote and off-grid communities.

Manitoba hosted the pan-Canadian Summit on Reducing Diesel in Remote Communities in January 2017. Government officials, local and Indigenous representatives of remote communities, industry and other stakeholders from across Canada, consulted on energy needs, and solutions for renewable energy alternatives in remote communities.



Safety and Security of Energy Infrastructure – Pipelines

The federal government continues to make responsible decisions about its energy and how to move it safely. Pipelines are one of the safest methods to transport oil, petroleum products and natural gas. They have a long history in Canada due to their low risk of spills and reliability and thus remain critical to our energy infrastructure. The federal government, in collaboration with provinces and territories, is ensuring pipelines are regulated safely and effectively through the *Pipeline Safety Act* and making significant investments to protect our oceans and coastlines through the Oceans Protection Plan. The federal government is also building partnerships with Indigenous peoples, hearing their concerns, and ensuring the best possible projects are being built.

In November 2016, the federal government announced important decisions including those to approve the Trans Mountain Expansion (TMX) and Line 3 Replacement projects, directing the National Energy Board (NEB) to dismiss the Northern Gateway Project, and formalizing a tanker moratorium on British Columbia's north coast. In making these decisions, many issues were considered, including the reports from the National Energy Board (NEB) and the Ministerial Panel Report for the Trans Mountain Expansion Project; assessments of potential GHG emissions; the views of Canadians; and, what we heard during consultations with Indigenous peoples.

In relation to the TMX, the federal government is actively working with the provinces of Alberta and British Columbia to track the status of permits necessary for construction of TMX. Having declared that TMX is in the national interest, the federal government is also working with provinces to ensure full implementation of the Pan-Canadian Framework, confirming that the necessary measures are in place to protect our species at risk, addressing concerns with respect to oil spills and ensuring that world leading marine safety systems are in place.

In May 2018, Federal Finance Minister Bill Morneau announced that the federal government had reached an agreement with Kinder Morgan in order to secure the timely completion of TMX. The agreement will guarantee the resumption of construction work protecting thousands of jobs in Alberta and British Columbia. Federal loan guarantees will ensure that regulatory processes and construction continue through the 2018 construction season, eliminating the uncertainty for families whose financial security relies on this project moving ahead this year. The Government of Alberta will also support the project, providing an emergency fund for any unforeseen costs, if needed. In return, Alberta will receive value commensurate to their contribution.



Link to interactive map: <https://www.neb-one.gc.ca/sftnvrmmnt/sft/dshbrd/mp/index-eng.html>



CANADA'S OCEANS PROTECTION PLAN

The Oceans Protection Plan will help keep Canadian waters and coasts safe and clean, putting value on today's use as well as the use of future generations.

All Canadians, and especially coastal communities, need confidence that commercial shipping is taking place in a way that is safe for mariners and that protects and sustains the economic, environmental, social, and cultural health of our oceans and coasts.

- The federal government will invest \$1.5 billion over five years in coastal protections, with an action plan to deliver results for the coming decade.
- The federal government will partner with Indigenous and coastal communities to develop a world-leading marine safety system, specific to Canada's context that will increase our government's ability to prevent and improve response to spills.
- It will support science-based decisions through the funding of freshwater research.
- The plan will also place a high priority on protecting endangered and at-risk whale populations.

Engaging Indigenous groups on pipeline projects

In response to a request made of the federal government by Indigenous groups, the federal government worked in partnership with Indigenous communities and nations to co-develop and implement Indigenous Advisory and Monitoring Committees for the TMX and Line 3 Pipeline Replacement Program (Line 3). The Committees, the first initiatives of their kind for pipeline projects, provide for collaborative, inclusive and meaningful Indigenous involvement in the review and monitoring of the environmental, safety and socio-economic issues related to the Projects over their lifecycles. Indigenous and federal Committee members advance the shared objective to work together to enhance the safety of project activities and protect the environment and Indigenous interest in the lands and waters. In addition, the Economic Pathways Partnership pilot for the TMX and Line 3 projects is a whole-of-government approach to make it easier for Indigenous groups along the project routes to access existing federal economic development programs and services.

Outside of the committees, the federal government engages with Indigenous communities on West Coast energy infrastructure development, and on opportunities and mechanisms to enhance Indigenous participation in pipeline projects, while also supporting Indigenous priorities through project contributions and interdepartmental collaboration.

Provincial, territorial and federal governments prepared a [Pipeline Safety](#) web portal (last updated in 2016) to provide a comprehensive perspective on Canada's overall pipeline regulatory regime. The portal's intent was to enhance fact-based public understanding and dialog concerning transportation safety in Canada.

Offshore Oil and Gas Regime

The provincial governments of Nova Scotia (NS) and Newfoundland and Labrador (NL) have respective agreements with the federal government to jointly manage offshore administrative areas (the Accord Areas) in the Canada-NS and Canada-NL offshore areas. Federal and provincial departments are working on collaborative regulatory modernization initiatives to enhance the regulations enabled by the mirrored federal-provincial legislation that govern the Accord Areas.

The Frontier and Offshore Regulatory Renewal Initiative (FORRI) is an intergovernmental partnership between Natural Resources Canada, Crown-Indigenous Relations and Northern Affairs Canada, the Nova Scotia Department of Energy and the Newfoundland and Labrador Department of Natural Resources. FORRI's current work is focused on modernizing the operational requirements for frontier and offshore oil and gas activities.

Concurrent to FORRI's work, the Atlantic Occupational Health and Safety Initiative (OHS) is modernizing the occupational health and safety regulations for offshore oil and gas activities in Canada. OHS is an intergovernmental partnership between NRCan, the Nova Scotia Department of Labour and Advanced Education, and the Newfoundland and Labrador, Service NL. The Canada-Nova Scotia Offshore Petroleum Board (CNSOPB), the Canada-Newfoundland and Labrador Offshore Petroleum Board (CNLOPB), and the National Energy Board are regulator partners in these initiatives, providing subject matter expertise to governments. The CNSOPB and the CNLOPB are independent joint agencies of the federal and respective provincial governments.



Combined federal, provincial and territorial efforts are increasing the safety and security of Canada's onshore and offshore infrastructure. This will prove to Canadians that they can count on safe and reliable oil and gas development, both on land and offshore.

CYBER SECURITY

NRCan collaborates with provinces, territories and industry to address growing cyber threats to Canada's critical energy infrastructure (e.g., pipeline systems, electric grids, nuclear plants).

Cyber security of critical energy infrastructure requires close cooperation among jurisdictions because such infrastructure is largely provincially regulated, and in some cases owned by provincial Crown corporations. NRCan works with the provinces, security agencies, international partners, industry and academia to advance S&T focused on the specific cyber security needs of energy systems. This S&T includes targeted training for owners and operators on how to proactively identify, mitigate risks and respond to cyber attacks.

Given that 85% of critical energy infrastructure is owned by the private sector, NRCan also works closely with industry and academia through the Energy and Utilities Sector Network, and other government-led communication pathways. These fora provide the opportunity for sharing knowledge, intelligence and best practices to address cyber threats.

As part of the new National Cyber Security Strategy, released in June 2018, the federal government will continue to strengthen communication and collaboration with provincial and territorial partners to share best practices, lessons learned, technical training, and threat information, to proactively ensure the security and resilience of Canada's critical infrastructure systems.

Building More Efficient Energy Systems

Smart and Sustainable Buildings

In a clean growth economy, buildings and communities will be highly energy-efficient, rely on clean electricity, and be smart and sustainable. Making the built environment more energy efficient reduces carbon pollution; helps make homes and buildings more comfortable and more affordable by lowering energy bills; and promotes innovation and job opportunities.

New technologies and practices are continuing to revolutionize the way we use energy. Researching, commercializing, and adopting these technologies and applying new social and business practices can help incentivise more energy-efficient choices. Broad collaboration across governments, businesses, and societal leaders should encourage behavioural change across industrial, commercial, institutional, and residential sectors to apply energy efficiency practices. This includes developing regulations, standards, and codes. It also means leading investors towards the best available technology through information and financial support. Collecting data and providing up-to-date information on energy use can help individuals and companies measure their energy consumption and make more informed decisions to improve efficiency and reduce costs.



ENERGY EFFICIENCY MAKES SENSE

Energy efficiency drives Canada's transition to a low-carbon economy through measures such as equipment regulations, the Buildings Strategy, industrial energy management and the deployment of electric vehicle and alternative fuel infrastructure:

- \$1M in energy efficiency investments = \$7M GDP and 34 jobs
- Canadians saved \$38.2 billion in 2015 through energy efficiency improvements³

³Efficiency Canada Study, May 2018, Philippe Dunsky/ Dunsky Consulting, using a Centre for Spatial Economics model.

[Build Smart - Canada's Building Strategy](#), endorsed by federal, provincial and territorial governments, spells out a vision and highlights milestones for making homes and buildings more energy-efficient. Integrating the use of clean technologies can further reduce energy use and energy-related costs and make a significant contribution to reducing greenhouse gas emissions.

Federal, provincial and territorial governments are advancing actions in the following areas:

1. Making new buildings more energy-efficient

Federal, provincial, and territorial governments have committed to develop and adopt increasingly stringent model building codes, starting in 2020, with the goal to adopt a “net-zero energy ready” model building code by 2030. In this regard, provinces and territories will adopt codes taking into account their respective energy context. Continued federal investment in research and development, in cooperation with industry, will help to reduce technology costs over time.

2. Altering existing buildings

Federal, provincial, and territorial governments have committed to develop a model energy code for existing buildings by 2022, with the goal that provinces and territories adopt the code. This code will help guide energy efficiency improvements that can be made when altering buildings. Federal, provincial, and territorial governments have also committed to work together with the aim of requiring benchmarking, labelling and disclosure of building energy use by as early as 2019. Labelling and disclosure will provide consumers and businesses with transparent information on energy performance.

Furthermore, provincial and territorial governments have committed to work to sustain and, where possible, expand efforts to alter existing buildings by supporting tools, such as the [ENERGY STAR Portfolio Manager](#), ISO 50001 and recommissioning practices that will promote energy efficiency improvements as well as fuel switching, where appropriate. Governments have also committed to accelerate the adoption of high-efficiency equipment while tailoring their programs to regional circumstances.

3. Improving energy efficiency for appliances and equipment

Given that up to 80% of energy use in Canadian buildings is for heating, significant improvements in the efficiency of this equipment is critical to advance government commitments. The federal government has committed to set new standards for heating equipment and other key technologies to the highest level of efficiency that is economically and technically achievable. New and updated energy efficiency standards for technologies that are major contributors to residential and commercial energy have been set out in the framework [Encouraging Market Transformation Through Collaboration on Energy Efficiency Standards – Federal-Provincial-Territorial Action Plans](#). Accomplishments in implementing the 2017–2018 action plan, as well as an updated action plan for 2018–2019 have been developed.



LEADING THE WAY: ENERGY EFFICIENCY REGULATIONS

The most recent amendment to **Canada's Energy Efficiency Regulations** came into effect in June 2017, updating efficiency standards for 20 product categories. Proposed new and updated efficiency standards for 17 products will follow.

ENERGY EFFICIENCY STANDARDS: PRODUCTS

The Government of **Manitoba** and Manitoba Hydro have been consistent supporters of Natural Resources Canada's efforts to develop and enforce regulations concerning minimum energy performance levels for energy-using products. Manitoba is developing a strategy and framework to identify, develop and implement minimum energy performance standards (MEPS) for energy-using products, such as manufactured building components, appliances, and equipment.

In August 2017, federal, provincial and territorial energy ministers released [Market Transformation Strategies for Energy-Using Equipment in the Building Sector – Supporting the Transition to a Low-Carbon Economy](#) for energy-using equipment. It outlines governments' agreed upon aspirational goals for minimum energy performance in three areas – windows, space heating and water heating – from now to 2030 and beyond.

4. Supporting building codes and energy-efficient housing in Indigenous communities

Governments have committed to collaborate with Indigenous peoples to support efficient new building standards and building alterations. Governments are working to advance energy-efficient housing for Indigenous communities. This work includes increasing capacity to build and alter energy-efficient housing. The federal government is defining guidelines to support sustainable housing in Indigenous communities by developing a building and alteration guide that incorporates Indigenous knowledge and supports sustainable housing in Indigenous communities.

LOW-CARBON ECONOMY LEADERSHIP FUND

The fund will provide **\$1.4 billion in funding over five years** for projects that reduce greenhouse gas emissions, of which approximately 70% of projects involve energy-efficient measures. It will support such projects as building and industrial alterations for energy efficiency, process changes and fuel switching.

Primarily under **Québec's 2013-20 Climate Change Action Plan** measures, over \$261 million will support more projects to further reduce GHG emissions. These new investments, namely the industry and buildings components of the ÉcoPerformance programs, will allow more businesses to alter their buildings, and more industries to improve efficiency in innovative ways.

New Brunswick will invest approximately \$51 million, in partnership with NB Power, to help New Brunswickers improve the energy efficiency of their homes and businesses. Whether in support of small-business owners, low-income homeowners, or even larger manufacturing facilities, these investments will help manage energy costs throughout the province.

Alberta's Custom Energy Solutions program facilitates energy upgrades for industrial and commercial facilities. Applicants receive incentive funding with custom energy upgrades for equipment in manufacturing, oil and natural gas, wholesale trades, warehousing and waste management. Through the program, industrial facilities will save energy and money through these energy improvements.



LOW-CARBON ECONOMY LEADERSHIP FUND (contd.)

In **Prince Edward Island**, efficiencyPEI offers a suite of programs and services to help Islanders reduce energy consumption and save money. These programs have been recently expanded through partnership with the Government of Canada's Low-Carbon Economy Fund and include financial assistance for energy audits (commercial and residential), home upgrades (insulation, heating, equipment, windows, doors), as well as targeted programs and rebates for low-income clients.

CANADA'S ENERGY-EFFICIENT BUILDINGS

Federal, provincial and territorial energy ministers have endorsed a Buildings Strategy for Canada. The strategy provides an implementation plan to make new homes and buildings more efficient, to add alterations to existing homes and buildings and to improve the energy efficiency of the appliances and equipment they use.

A number of provinces have taken steps to increase energy efficiency requirements for new buildings:

- **British Columbia** introduced a voluntary step code in spring 2017 that establishes stepped energy performance requirements for new buildings. The step code is a key capacity building measure to support adoption of a net-zero energy-ready provincial building code by 2032.
- **Prince Edward Island** adopted the National Building Code (NBC) and the National Energy Code for buildings in early 2017. The NBC will be a requirement for all commercial buildings in 2018 and residential construction in 2020.
- **Manitoba** is working with its commercial building sector organizations to develop a strategy that includes recommissioning 80 per cent of buildings that do not currently meet high-performance energy standards, by 2030. Organizations include the Building Owners and Managers Association, Building Energy Management Manitoba and the Canada Green Building Council.
- Proposed coordination on codes and standards is taking place with **British Columbia**, California, Oregon and Washington.

Nova Scotia offers Deep Energy Retrofits for all low-income homes at no charge through the HomeWarming Program, supported by the Province of **Nova Scotia** and Nova Scotia Power. As well, rebates are being offered to consumers on the highest efficiency models available for heat pumps.

Industry: Improving Productivity through Energy Management

Canada's industrial sectors have significant potential to improve their energy efficiency and implement climate-friendly strategies for operating, particularly in energy intensive sectors. Through the adoption of energy management systems and investment in new technologies, the industrial sector will be able to better manage its energy use and reduce emissions. The end result will be a more productive, profitable, and sustainable industrial sector.

CANADA'S ENERGY-EFFICIENT BUILDINGS (contd.)

Yukon's Commercial Energy Incentive Program, Residential Energy Incentives Program and Good Energy Appliance Rebate Program have saved the equivalent of 4.6 per cent of Yukon's total annual electrical generation.

Ontario developed a regulation for energy and water reporting and benchmarking (EWRB); approximately 18,000 buildings will be required to report by 2020. Canada has been working with Ontario to support the development of EWRB using the federal government's ENERGY STAR Portfolio Manager[®] benchmarking tool.

The government of **Nunavut** and the Arctic Energy Alliance from **Northwest Territories** collaborated to provide residential and commercial energy assessments and community/stakeholder engagement services on energy issues of significance to northern communities:

- Ventilation, indoor air quality, and combustion air supply issues;
- Lighting upgrades to LED;
- Higher wall insulation levels;
- Direct vent, high efficiency oil heating equipment, rather than hot water tanks; and,
- Upgrading manual thermostats to programmable ones.



Federal, provincial and territorial governments are advancing actions in the following areas:

1. Improving industrial energy efficiency

Federal, provincial, and territorial governments are helping industries save energy and money by supporting them in adopting energy management systems. The federal government is making significant investments to support, the use of industrial energy management systems such as ISO 50001 and Superior Energy Performance. Using the [ENERGY STAR for Industry](#) programs will also help businesses track and analyze energy efficiency, thus leading to further improvements in energy use.

2. Investing in Technology

Federal, provincial, and territorial governments have committed to work with industry to continue to invest in RD&D and to promote deployment of new technologies that help reduce emissions. This has involved collaboration to identify demonstration projects for promising pre-commercial clean energy technologies required to reduce emissions from energy production and use in the Canadian economy. Investments are being made across Canada's natural resource sectors (e.g. energy, mining, oil and gas, and forestry), in projects that support the development, demonstration and adoption of clean technology, fostering industry uptake of innovative technologies that help reduce industrial emissions.

PROMOTING CLEAN ENERGY IN INDUSTRY

Newfoundland and Labrador's Management of Greenhouse Gas Act will set performance standards (GHG-to-output ratio), which will result in investments by companies to reduce energy input and GHGs per unit of output. Regulations are expected to be implemented by 2020.

The Northwest Territories, under its 2030 Energy Strategy, will implement an application based grant program to support energy efficiency and fuel substitution in industry. The program will provide nearly \$2 million a year over four years, and will provide up to 25% of the cost of projects that reduce GHG emissions.

The Government of **Nova Scotia** has partnered with Innovacorp, its early stage venture capital organization, to launch the Smart Energy Innovation program. Its objective is to help Nova Scotia researchers and early stage companies move their smart energy innovations closer to commercialization.

British Columbia launched a Technology Strategy, a \$100 million Tech Fund and a \$27 million Cement Low-Carbon Fuel Program. The Tech Strategy focuses on capital, markets, and talent.

Clean Growth Hub is a whole-of-government federal focal point for clean technology focused on supporting companies and projects, coordinating programs and tracking results. It provides an easy, single-point of contact for clean technology users and producers. This new service model provides access to expertise, knowledge, policies and programs within federal departments and agencies that support clean technology.



PROMOTING CLEAN ENERGY IN INDUSTRY (contd.)

In Budget 2016, Canada provided more than \$1 billion over four years to support future clean technology investments. In addition, over \$130 million is being provided over five years to support clean technology research, development and demonstration activities that reduce the environmental impacts of energy production, address climate change, and improve air quality.

Low-Carbon Transportation Systems

Canada will experience dramatic change in its transportation systems as new technologies and solutions become increasingly prevalent. Low-carbon transportation systems will use cleaner fuels, will have more zero emission vehicles on the road, will provide convenient and affordable public transit, and will transport people and goods more efficiently. A range of energy transportation sources – from biofuels to electricity, hydrogen, and propane – will grow based on regional advantages and system needs. Ongoing interjurisdictional collaboration will help ensure that Canada's transportation future will be more sustainable.

Federal, provincial and territorial governments are advancing actions in the following areas:

1. Setting emissions standards and improving efficiency

The federal government is continuing its work to implement increasingly more stringent standards for emissions from light-duty vehicles, including fuel-efficient tire standards, and to update emissions standards for heavy-duty vehicles. The federal government is working with provinces, territories, and industry to develop new requirements for heavy-duty trucks to install fuel-saving devices such as aerodynamic add-ons as well as encouraging best practices for freight fuel efficiency.

2. Putting more zero-emissions vehicles on the road: electric vehicles (EVs), plug-in hybrid EVs and hydrogen fuel cell vehicles

Governments are working together, including with private-sector partners and academia, to develop a made in Canada zero-emission vehicles (ZEV) strategy with the goal of accelerating demonstration and deployment of infrastructure for electrical charging, natural gas and hydrogen refueling stations. Early action is being taken to support the transition to low-carbon transportation fuels, and more effort is needed, as vehicle choices made today will determine the mix of technologies on the road in 2030.

3. Shifting from higher-to-lower-emitting modes and investing in infrastructure

Federal, provincial, and territorial governments have committed to work together to enhance investments in public transit upgrades and expansions. Governments across Canada have also committed to invest in building more efficient trade and transportation corridors, including investments in transportation hubs and ports. They have also committed to consider opportunities with the private sector to support refueling stations for alternative fuels for light- and heavy-duty vehicles, including natural gas, electricity, and hydrogen.



FACILITATING GREATER EV DEPLOYMENT AND FUEL SWITCHING

New Brunswick's Climate Change Action Plan includes the development of a provincial EV strategy. New Brunswick is the first fully connected province with a fast charging network for electric vehicles. NB Power installed 49 public charging stations in the province over two years, including 18 fast charging stations in partnership with the Government of Canada. In addition, NB Power and the Department of Tourism, Heritage and Culture will add 12 more chargers in provincial parks and historic sites in 2018.

Alberta committed \$1.53 billion to the Calgary Green Line LRT and set aside \$305 million for a Municipal Transit Initiative funding program to support municipal transit directly in July 2017.

In 2019, the Government of **Canada** will ensure 75% of new light-duty administrative fleet vehicle purchases will be zero-emission vehicles (ZEVs) or hybrid, with the objective that the government's administrative fleet comprises at least 80% ZEVs by 2030, as outlined in Greening Government Fleets: A helpful guide to understanding best practices.

Under its 2030 Energy Strategy, **Northwest Territories** will create a rebate program for zero-emissions vehicles and charging stations, as well as support a ZEV transportation corridor north from the 60th parallel to Yellowknife.

NRCan is negotiating collaborative agreements with PT trucking associations with a focus on low-carbon transportation and fuel management options including benchmarking, driver training, and fleet assessment programming. Activities are underway in **Atlantic Canada, BC, Yukon, Saskatchewan, Ontario** and **Manitoba**.

British Columbia is committed to the national effort to set targets to increase the share of light-duty ZEVs. British Columbia launched clean energy vehicles (CEV), charging infrastructure subsidy programs, and a public-sector procurement initiative for electric vehicle (EV) charging stations.

In December 2015, **British Columbia** joined 13 jurisdictions from around the world and signed the International Zero-Emission Vehicle (ZEV) Alliance. Members of the Alliance will work to increase the adoption of ZEVs, and strive to make all new passenger vehicles in their jurisdictions ZEVs by 2050.

Québec is aiming to have 100 000 electric vehicles on the roads in 2020. The zero emission vehicles (ZEV) standard adopted in October 2016 encourages car manufacturers to increase the supply of ZEV. In addition, Québec supports the installation of charging stations and the acquisition of ZEV. Québec is also investing to increase electric public transportation, to develop innovative solutions for freight transportation and to develop transportation electrification industry.

On June 15, 2018, Québec adopted a Bill to promote the establishment of a public rapid charging service for electric vehicles. Québec plans to add 1,600 fast charging stations to the existing network within the next ten years.



FACILITATING GREATER EV DEPLOYMENT AND FUEL SWITCHING (contd.)

Manitoba is at the hub of several major continental and global transportation routes. Transportation accounts for over 35% of the energy used in Manitoba and 39% of provincial GHG emissions. Manitoba was an early adopter of biofuels content requirements, and has the highest ethanol mandate in Canada, requiring fuel suppliers to replace at least 8.5% of their gasoline with ethanol. The biofuels program alone has reduced transportation GHG emissions by approximately 6%.

The Government of **Manitoba** and the Government of **Canada** will work together to make Winnipeg's public transit system fully electric and promote made-in-Manitoba battery-electric transit buses. Manitoba and Canada will also work together to reduce emissions from the commercial transportation sector, a principal economic generator for the province and source of emissions. Establishing new electric vehicle infrastructure will be a particular focus of efforts from both jurisdictions.

ZERO-EMISSION VEHICLE STRATEGY

Under the PCF, the federal government committed to work with PTs and the private sector on the development of a Zero Emission Vehicle strategy for Canada in 2018. This will get more EVs on Canada's roads in the following ways:

- The BC government and NRCan are partnering to co-deliver an EV fuels infrastructure deployment initiative.
- Working together, Pollution Probe and NRCan expanded work, which was initially conducted for Ontario regarding grid readiness for electric vehicles, into the prairie and Atlantic Provinces. The report was released in May 2018.
- Through the Transportation Working Group on Energy Efficiency, provinces, territories and NRCan have been working together to develop a best practice guide on how to deploy lower emitting options in government fleets (e.g. EVs, fuel switching, driver training).
- At the Clean Energy Ministerial (CEM) meetings in May 2018, the Global EV Pilot Cities Program was launched as part of the Electric Vehicle Initiative (EVI), which is co-chaired between Canada and China. The Program will bring together 100 EV friendly cities from across CEM countries, to share knowledge and experience on how to foster greater EV deployment. To date, seven Canadian cities are participating (Surrey, Richmond, Calgary, Winnipeg, Montreal, Halifax and Stratford, PEI).



3 INFORMATION AND DATA: Supporting Evidence Based Decision-Making



A strong knowledge base about Canada’s energy system provides the foundation to ensure that policy-makers, industry, investors, the financial community, academia, consumers and the public have the information they need to make informed decisions.

Having access to relevant, high quality data is necessary for governments to study the impact of energy legislative and regulatory changes on our economy. Policies, programs and legislation at all levels require data that is adaptable, easily available, and trusted.

In Canada, energy data is collected and used by several organizations on how we produce, transport, convert and use energy. There is a need to standardize this information and address gaps and inconsistencies. Technological advances and the leadership of many jurisdictions suggest that it is possible to have standardized data collection systems that deliver timely energy information that meets the needs of multiple stakeholders.

Federal, provincial and territorial governments are providing high quality energy information that:

- bolsters public confidence in Canada’s energy system and regulatory regime;
- supports environmental assessment and regulatory functions;
- supports business and investment decisions for the energy industry;
- helps Canadian consumers to make informed choices (e.g. energy costs, energy efficiency) and promotes energy literacy among Canadians; and
- provides credible trend analysis of the future energy system and low-carbon transition.

Information and Decision-Making

Canadians have told us that communities across Canada often lack knowledge about energy use or have deeply held perceptions about energy and its role in the economy. These opinions differ across regions. Governments need to be aware of these existing perceptions, be open and transparent, and support greater availability and use of energy data.

Making energy consumption data readily available and accessible would help educate end users about their energy behaviors, and help to create new solutions and business models that can optimize behaviors. Transparent public communication of the evidence that informs decision-making is also necessary. It can serve to reassure Canadians that sound facts are informing decision-making and counter sources of misinformation in the public domain that serve to polarize the debate.

Collaboration on a pan-Canadian energy information system would allow governments and other stakeholders to improve the quality, credibility and accessibility of energy data and better align information as follows:

- **Data:** provide accurate, timely, and accessible energy data covering all energy sources and uses
- **Analytics and Modelling:** conduct innovative energy analyses that explore future scenarios of low-carbon energy system pathways and make these publicly available.
- **Information Sharing:** develop a system-wide, coordinated approach across jurisdictions and with partners
- **Dissemination:** coordinate access to energy information to improve public trust and facilitate the dialogue on Canada's energy future

The long-term vision is to develop a modern, pan-Canadian energy information system that provides credible, impartial and comprehensive information that the public can trust, and which stakeholders can use to make decisions that support Canada's transition to a low-carbon energy system.

MAKING INVESTMENTS FOR BETTER DECISION-MAKING

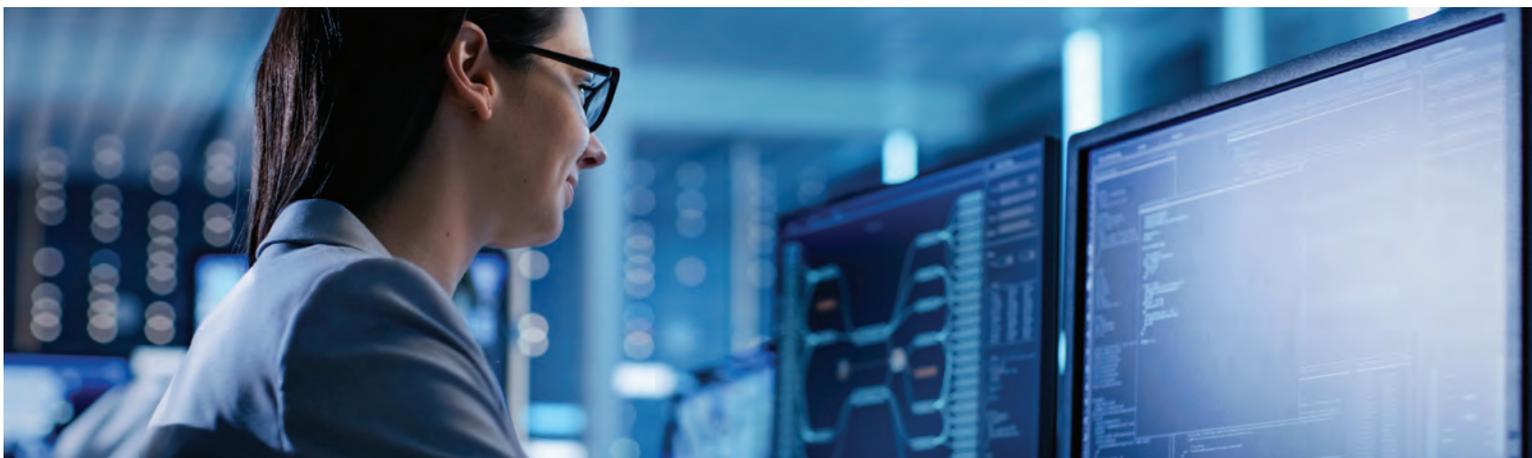
In 2018, the federal government invested \$14.5 million over four years to develop a **Clean Technology Data Strategy**. The strategy will ensure the alignment and integration of data collection and reporting activities on the clean technology economy, working with provincial and territorial governments, industry associations, business and other stakeholders. The strategy will provide the foundation for measuring the economic, environmental and social impacts of clean technology in Canada.

Since 2002, **Alberta** has been operating an energy data reporting system called Petrinex. Petrinex manages confidential information of the petroleum sector such as regulatory activities, volumes of oil produced and royalty billing. Current users of the system are the Alberta Energy Department, the Alberta Energy Regulator, industry, and Saskatchewan. British Columbia announced in January 2016 that it would join the system. With this standardized reporting across jurisdictions, Petrinex enhances the completeness, accuracy and transparency of energy data reporting.

In **British Columbia**, most municipalities have signed on to voluntary Climate Action Charters to help implement GHG reduction goals. The Charters commit municipalities to create Community Energy and Emissions Inventories and include GHG policies, targets, and actions in their official community plans. To support municipalities in this endeavour, provincial government departments established a system to collect sales data from the province's gas and electric utilities and organize it within municipal boundaries while protecting the confidentiality of personal energy data.

The **Energy Fact Book** is an annual publication from Natural Resources Canada that provides key information on energy in Canada in a format that is easy to read. It brings together data from various sources such as Statistics Canada, the National Energy Board, provincial and territorial governments to present factual information on Canada's diverse energy sources and their impact on our economy, environment, society and role in global trade (e.g. jobs, GDP, exports, production, consumption).

Under **Newfoundland and Labrador's Advance 2030** plan, by 2020, the province plans to develop a comprehensive digital portal to coordinate and provide a full range of oil and gas information and data – including prospectivity, supply and service capability, and fiscal regime – in one location.





4 INTEGRITY AND PUBLIC CONFIDENCE: Building Public Trust in Resource Development

Public confidence is achieved when the public trusts regulatory and government decision-making, and that decisions about resource development and management align with societal goals and the broader public interest. It is a key ingredient for growth, societal well-being and governance and a critical factor in successfully developing and managing Canada's natural resources. Investors have increased certainty, risks are mitigated to ensure the safety and security of citizens and the environment, and benefits in the short and long term are shared.

Trust in institutions is important for successfully implementing policies, programs and regulations. Governments recognise that transparency helps interested parties understand how decisions are being made and how their views and contributions are considered in the decision-making process. Sharing information and data can also help the public make decisions about energy choices. Publicly reporting the discussions that take place throughout engagement processes in a timely manner can reassure participants that they have been heard.

Governments, Indigenous peoples, regulators, civil society and industry are collectively responsible in building and maintaining public confidence. The challenge for governments is to balance protection of health and the environment with support for economic competitiveness, while ensuring that policies and decisions align with community interests and values.

Energy and mines ministers have committed to work together on building public confidence in energy and mineral development. Progress has been made in developing products to assist with capacity building and the sharing of best practices, as well as identifying areas where more targeted action could be taken. These actions will serve to support societal goals to restore public trust in regulatory and government decision-making, enhance investor trust, advance reconciliation with Indigenous peoples, and transition towards a low carbon economy.

Federal, provincial and territorial governments are making progress to build and maintain public confidence in resource development by undertaking actions in four broad areas:

1. Engaging to build relationships

Federal, provincial and territorial governments have developed principles and a checklist for engaging communities on resource development (see textbox).

2. Communicating transparently

Governments are increasing efforts to share information, knowledge and data with each other and with the public. Processes are being put into place to receive and respond to comments, questions, and concerns from communities or interested parties. These actions help to demonstrate that all views are welcome.

3. Advancing science and innovation

Sound science provides the evidence-base that informs decision-making. Canada's science and technology activities are performed in collaboration with all levels of governments, industry and academia, and with international counterparts. Efforts moving forward will also seek to increase respectful integration with Indigenous knowledge. S&T activities support cleaner energy development and inform the design of energy efficiency programs, regulations, codes, and standards.

S&T activities generate new knowledge, monitor and assess environmental impacts of resource development, and develop innovative clean technologies and processes - reflecting the needs and interests of Canadians and contributing to a prosperous and sustainable energy future.

4. Ensuring effective regulations

The federal government has undertaken a comprehensive review of environmental and regulatory processes to help restore credibility and ensure that decisions are based on science, facts, evidence and Indigenous knowledge.

Under these themes, government officials across jurisdictions have spearheaded initiatives and developed products to assist with building public confidence (see textbox).

COMMON PRINCIPLES FOR ENGAGEMENT AND PARTICIPATION IN ENERGY DEVELOPMENT

- Engagement must start early to build the foundation for a long-term relationship
- Engagement must occur often and be meaningful
- A common understanding of the purpose of engagement is required
- Informed engagement by working with communities to identify capacity-building needs and to reduce power imbalances
- Be inclusive and listen with intent
- Ensure transparency and trust



BUILDING PUBLIC CONFIDENCE

In June 2016, a **National Workshop on Public Confidence in Energy and Mining Development** brought together nearly 100 representatives from industry, Indigenous groups, non-governmental organizations, academia, and governments to discuss approaches to strengthen and maintain confidence. Workshops took place on Health, Safety and the Environment; Indigenous engagement; Community engagement; and, Resource Literacy and Communication. Participants identified leadership opportunities for governments and emphasized the need for further collaboration.

Government officials developed a brochure, **Building Trust in Canada's Natural Resource Development**. Informed by leading public confidence researchers, Indigenous peoples and stakeholders, the brochure highlights examples and areas for collaboration being undertaken by the provinces and territories.

A collection of 27 case studies was developed that demonstrates how governments, regulators and industry are supporting public confidence across the country, in both the energy and mines sectors. These best practices are featured in the report **Facilitating Responsible Mineral and Energy Development – Compendium of Case Studies on Building Public Confidence in the Mineral and Energy Resource Sectors**.

Infographics were developed as tools to help governments and regulators understand their roles in supporting public confidence at every stage of the **The Energy Development Cycle** and **The Mineral Development Cycle**.

British Columbia has established FracFocus, an on-line chemical disclosure registry of hydraulic fracturing fluid, joined by Alberta and the National Energy Board, to improve access to information on chemical use, oil and gas production and potential environmental impacts.

Alberta is improving pipeline safety regulations, including through the Alberta Energy Regulator, which is integrating the use of risk management activities to make informed decisions, selecting key performance measures and targets, and implementing a risk-based compliance process.

In **New Brunswick** NB Power undertook an extensive in person and on-line consultation exercise to determine the future of the Mactaquac Dam on the Saint John River.

Prince Edward Island has committed to tracking and reporting progress following the release of its Energy Strategy and Climate Change Action Plan in an effort to build public confidence.

In 2018, **Québec** marked the coming into force of the new Environment Quality Act and the implementation of a new, modern, clear and streamlined environmental assessment regime that sets higher environmental protection standards while allowing for greater public participation, notably by Indigenous communities.





5 INDIGENOUS PEOPLES' PARTICIPATION: Renewing the Relationship

Developing meaningful partnerships built on trust, respect, and shared understanding is essential to growing strong, mutually beneficial, and long-lasting relationships between Indigenous peoples, governments, communities, and businesses. As highlighted throughout this report, to ensure a strong and sustainable energy future for Indigenous peoples, it is critical that such relationships be deepened and strengthened. Collaboration amongst all parties allows for a better understanding of the opportunities and constraints to 1) better enable Indigenous participation in the energy economy; and (2) ensure that energy development is managed and regulated in a way that respects Indigenous rights and interests.

In addition to ongoing outreach by provinces and territories, the federal government is also actively engaging and consulting Indigenous peoples on a broad range of energy-related activities, such as the establishment of the offshore regulatory frameworks and the implementation of infrastructure projects among others. Investments are also being made in oceans protection, and in working with Indigenous and coastal communities through the Oceans Protection Plan.

Federal, provincial and territorial governments, Indigenous peoples and the energy sector are working to establish strong partnerships in a number of areas. Examples include: creating Indigenous Advisory and Monitoring Committees for new pipelines; engaging on pipeline safety; examining the use of Indigenous-led assessment processes; and, early engagement with Indigenous organizations and communities on energy planning that encourages participation, operation and ownership of energy and clean technology projects.

Internationally, Canada has been working with other countries (i.e., Mexico) on policies, processes and measures to enhance Indigenous participation and engagement in energy development. This has included efforts to establish principles and share best practices and experiences in Indigenous engagement and consultation, including to strengthen regulatory efficiency and effectiveness. These efforts can be expanded through Canada's bilateral relations with other countries.

As the transition to a low-carbon future is underway, Indigenous peoples, governments, industry and others are working together to turn ideas into practical solutions to help generate affordable and reliable energy for their communities that will maximize benefits over the long-term (see *Innovation and Infrastructure sections for examples*). Dialogue and collaboration allows all parties to learn and benefit from Indigenous knowledge and, work to create a sustainable and prosperous future for the generations to come.

COMMUNITY ENGAGEMENT

Northwest Territories' 2023 Energy Strategy places community engagement at the centre of its strategic objectives. They are to be achieved through better communications, engagement and capacity building; as well as more support for community energy planning and investments. Working with Indigenous communities to find solutions and gaining insights from their knowledge is a major priority.

ENGAGING INDIGENOUS PEOPLES IN ENERGY SOLUTIONS

The **Alberta** government helps Indigenous communities reduce energy costs, lower emissions and create job opportunities in renewable energy. The government is committed to working with communities and workers to support the transition towards the phase out of coal power emissions. Alberta is also currently reviewing Indigenous consultation policies.

Manitoba is engaging Indigenous peoples to become active participants in reducing their energy consumption. This is achieved through training local businesses on how to install and maintain geothermal heat pump systems while providing eligible homeowners financing through Pay-As-You-Save Financing.

In November 2016, the **Nunatsiavut Government** (NG) released the Nunatsiavut Energy Security Plan outlining a proactive approach to meeting the energy security needs of its five communities. The plan and implementation strategy place a high value on Inuit involvement in energy planning. The Government of **Newfoundland and Labrador** is a member of the Nunatsiavut Energy Security Working Group along with the NG, Newfoundland and Labrador Hydro (NL Hydro), Atlantic Canada Opportunities Agency, Natural Resources Canada (NRCan), and Crown-Indigenous Relations and Northern Affairs (CIRNAC).



6 INCLUSIVE GROWTH: Creating Opportunities for All



Inclusive growth is the idea that everyone should have a fair chance to both contribute to economic growth, and benefit from it. In the context of energy, that means Canadians from coast to coast to coast have secure, reliable, and affordable access to clean energy resources no matter where in Canada they live. It also means that the energy sector invests in both people and communities, affording opportunities for good, well-paying jobs, and building diverse and respectful workplaces.

Taking an inclusive approach during the transition to a low-carbon economy will involve greater participation by all facets of society. Providing consumers with choices for more affordable, clean energy and energy-efficient products and services, researching and collaborating on energy issues, providing technical expertise and making managerial and investment decisions as well as, getting directly involved in energy decision-making are all ways in which Canadians can make a contribution during the transition.

As the transition is already underway, Canadians are seeing new choices for products and services and for energy production and use as energy systems and electricity grids become smarter, more flexible and more secure. Canada's electricity systems are evolving, with the emergence of smaller scale and decentralized grids. The shift to digitalization is allowing energy companies to test and adopt new technologies and ways of doing business. Through the use of innovative and digital tools, Canadians are now beginning to have a direct stake when interacting with energy systems. *Prosumers* are able to generate some of their own electricity and sell it back to the grid or capture their own heat, through technologies such as rooftop solar panels or air-source heat pumps. Technological advances and modernized systems will drive social innovation and pave the way for a transformational shift in the energy sector.

As the energy sector becomes more technologically advanced, so too will its workforce. Building on Canada's highly educated workforce, transferable skills and retraining will be key to meeting changing labour needs. Successful institutions will be those with an adaptive workforce, and will ensure that Canadian workers are able to smoothly transition into or start a career in digitalized and automated energy sector.

Changing demographics will affect workforce transformation as well. As Canada's population continues to age rapidly, expanding the workforce and encouraging

EMPOWERING CITIZEN PARTICIPATION IN ENERGY

Qulliq Energy Corporation (QEC)'s new Net-Metering program will help decrease **Nunavut's** dependency on diesel fuel and cut carbon emissions. Residential customers will be able to produce some of their own electricity through small-scale renewable generators and send surplus energy they generate to the grid. In exchange, net metering customers will receive credits for future electricity use.

The **Northwest Territories** has released its Renewable Electricity Participation Model for Diesel Communities. The model allows communities to be part of the solution and includes rules for community ownership and participation for renewable electricity solutions in the regulated electricity system. The model supports community engagement, participation and empowerment.

the participation from a wider segment of society will be necessary. Drawing on the skills, expertise, talent and diverse perspectives from underrepresented groups will ensure Canadian businesses grow and compete in the global energy transition. Recruiting and retaining youth in energy sectors jobs continues to be an important part of transforming the energy sector workforce. This is particularly true of Indigenous youth who are the fastest growing segment of the Canadian population, but also one of the most relatively underemployed. Through the low-carbon transition, Canada's energy sector has the opportunity to hire and train the next generation of Indigenous workers.

With respect to gender equality, over the last 40 years, greater participation of women in the workforce has accounted for about one-third of Canada's economic growth. However, the energy sector remains one of the most gender imbalanced sectors, with women making up only a small fraction of the workforce. An opportunity exists for the energy sector, as it grows and diversifies its workforce in the decades ahead, to increase the participation of women through hiring and, by tackling barriers that limit the participation of women in the workplace. An increase in the participation of women would help boost the economic growth of the energy sector and the Canadian economy as a whole (see C3E textbox).

Creating opportunities for all in the energy sector will be essential to maintaining a successful industry. Taking an inclusive approach, a thriving Canadian energy sector is one that encourages participation, reflects diversity, and promotes equality and prosperity for all Canadians. It is one that upholds Canadian values and one that is stable, secure, and embraced by Canadians well into the future.

THE CLEAN ENERGY, EDUCATION AND EMPOWERMENT INITIATIVE (C3E)

Worldwide, the energy industry remains one of the most gender imbalanced sectors, with women making up just 20 percent of the workforce⁴. Women's representation in clean energy is only slightly higher at 35 percent internationally⁵, but in Canada, it is only 25 percent⁶. By taking steps to advance greater equality for women—such as employing more women in technology and boosting women's participation in the workforce—Canada could add \$150 billion to its economy by 2026⁷.

There is now consensus that the transition to a cleaner energy future will only succeed if women are fully engaged and that the economic, environmental, and social potential of this transition will only be realized if the benefits are inclusive, and shared. Gender equality doesn't just happen on its own. It takes clear policies and it takes action.

The [Clean Energy, Education and Empowerment Initiative](#) is a joint program under the Clean Energy Ministerial (CEM) and the International Energy Agency (IEA). This body of work includes a strong focus on data and benchmarking the participation of women in clean energy, awards and recognition, mentorship, and an international community of C3E Ambassadors.

The C3E is co-led by Canada, Sweden and Italy. In May 2018, it launched a new campaign called Equal by 30, a call-to-action that challenges companies and governments to endorse principles related to equal leadership, equal pay and equal opportunities, then take concrete action to achieve these goals.

This campaign will be a focal point when Canada hosts the CEM in 2019, and is open to companies and governments from across Canada's natural resources sector that are involved in the energy transition, ready to step up, and show their commitment to gender equality.

⁴ Women represent 20 - 25% of the workforce in the overall energy industry. (Stevens et al., 2009)

⁵ IRENA, Renewable Energy and Jobs Annual Review, 2016

⁶ Statistics Canada, 2017.

⁷ McKinsey Global Institute, *The power of parity: Advancing women's equality in Canada*, 2017.



7 INTERNATIONAL MARKETS: Establishing Canada as a Leader in the Global Energy Transition

Globally, developed and developing countries alike are placing a greater emphasis on the transition to a low-carbon economy; meanwhile, global primary energy demand is increasing rapidly. According to the International Energy Agency, global demand for energy is set to increase by 30 per cent by 2040⁸. Even under the most optimistic scenarios for renewable energy, fossil fuels will account for much of the increased demand. While fossil fuels will likely remain the dominant source of global energy for several decades, leading economies are implementing policies and making major investments to diversify to cleaner energy sources and fuels. These actions will help to grow global energy supply as well as ensure countries can meet international climate change commitments.

Canada's Leadership on the Global Stage

As a global energy leader, Canada has the opportunity to play a strong role internationally and seize opportunities during the low-carbon transition. This includes playing a critical role in fostering greater international energy trade and investment, as well as enhancing energy security. The transition will afford Canada important opportunities, grounded in its competitive advantages. For example, Canada has the potential to produce some of the cleanest fossil fuels globally and export these to world markets, making Canada well positioned to capitalize on the rapidly growing global demand for reliable fuels and energy supply.

This year, Canada holds the G7 presidency under the theme “*Working Together on Climate Change, Oceans and Clean Energy*”. Canada recently participated in the G20 Energy Ministerial, held in Argentina in June 2018, where energy leaders achieved consensus on priority areas of focus for energy security, energy access, and the transition to a low-carbon future. Canada will leverage this momentum at the upcoming G7 Energy Ministerial to continue the dialogue and advance collaboration to accelerate outcomes.

In 2019, Canada will also host the **Clean Energy Ministerial (CEM)** and **Mission Innovation (MI)** for the first time. By hosting this event, Canada will position itself as a leader on clean energy and innovation and highlight Canadian clean energy solutions. Canada will highlight provincial and territorial success stories and feature companies demonstrating breakthrough clean energy technologies. It will mark a major milestone in Canada's global leadership in international fora, as well as across the broader global clean energy landscape.

Launched in 2009, the CEM is a global forum of 25 countries to promote policies and programs that advance clean energy technology, to share lessons learned and best practices, and to encourage the transition to a global clean energy economy. Launched in 2015, MI is a global initiative of 23 countries and the European Commission that works to increase

⁸International Energy Agency - World Energy Outlook 2017

the availability of advanced technologies that will define a future global energy mix that is clean, affordable, and reliable. Participating governments are seeking to double their spending on clean energy technology, while engaging in international collaborations on clean energy research, development and demonstration that place an emphasis on innovative partnerships with the private sector.

Canada will harness the momentum set by our G7 leadership to welcome global partners to CEM/MI 2019 in Vancouver. Canada will use this opportunity to showcase its leadership in the transition and unveil a vision for a low-carbon energy future, building on Generation Energy. CEM/MI 2019 will have a dynamic, interactive format and a vision based on three themes:

- 1) Diversity and partnerships: Highlighting the role of industry, women, youth, Indigenous peoples and governments as stakeholders and co-leaders in a clean energy future.
- 2) Technology and innovation for a low-carbon future: Promoting Canada's success stories, including smart grids, renewables, electric vehicles, energy-efficient buildings and industry, biofuels, carbon capture, utilization, and storage, and nuclear energy.
- 3) Investment: Playing a leadership role in the global clean energy transition through its competitive economy, natural resource assets, commitment to environmental stewardship and highly trained workforce.

In addition, in May 2018, Canada announced its intention to join the **International Renewable Energy Agency (IRENA)**, the largest global intergovernmental organization promoting widespread deployment and use of sustainable renewable energy. As a member country, Canada will benefit from increased awareness of renewables' potential; international trade opportunities for Canadian clean tech companies; and international recognition of Canada's leadership role in renewable energy. As soon as Canada completes the accession process and becomes a full member, provinces and territories will be invited to participate in various activities, projects, studies and international events, as needed.

BREAKTHROUGH ENERGY COALITION

In parallel to the launch of Mission Innovation, a group of influential global private investors — led by Bill Gates — launched the Breakthrough Energy Coalition (BEC) with a commitment to provide more patient, risk-tolerant capital to emerging clean energy technology developers. Since its launch, BEC has now expanded to include 17 industrial partners (e.g., GE, Total, Virgin etc.) and has launched the Breakthrough Energy Ventures (BEV) fund, a US\$1B investment vehicle with a focus on accelerating the market readiness of technologies coming out of new, cutting-edge companies. In December 2017, BEC announced a pilot initiative with five MI governments, including Canada, to test and refine a new approach to public-private collaboration in order to support low-carbon energy investing. These investments are expected to catalyze broad business participation in the commercialization and deployment of clean, reliable, and affordable energy technologies worldwide.



Strengthening Competitiveness in Priority Markets

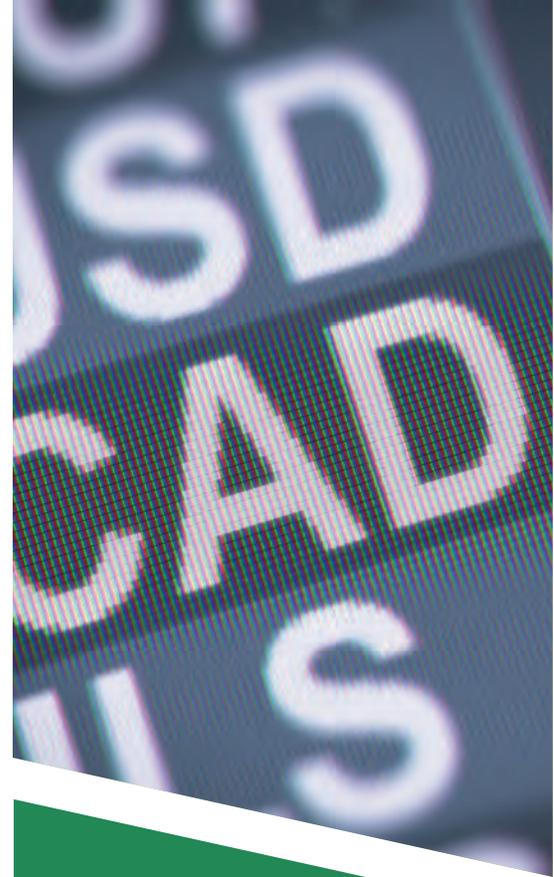
Maximizing Canada's potential as an affordable, reliable, secure and sustainable supplier of energy resources, and securing international markets for energy products, technologies, and services, requires a coordinated approach among federal, provincial, and territorial governments. With hundreds of major resource projects – worth over \$500 billion – planned across Canada over the next 10 years, an inclusive and sustainable approach to resource development will help to secure Canada's competitive advantage and ensure that good projects are implemented in a timely and transparent way.

Governments are working together on a number of initiatives to strengthen competitiveness. For example, the Governments of Canada, British Columbia, Alberta, Newfoundland, Saskatchewan, and Nova Scotia, as well as industry stakeholders, are working together to promote investment in Canadian oil and gas, highlight leadership on clean natural gas development, and continue trade advocacy.

A number of mechanisms are in place to support the competitiveness of the oil and gas sector. LNG facilities, for example, benefit from low corporate taxes, accelerated capital cost allowances of up to 30 % until 2025, as well as 40-year export licenses. Complementing federal actions, the Government of British Columbia also recently announced a natural gas competitiveness framework, including the elimination of the LNG tax, electricity rates compatible with other industrial sectors, and a Clean Growth Incentive Program. Together, these initiatives can ensure regulatory clarity and certainty for project proposals that support energy competitiveness and international market access.

Energy ministers are working together to further study barriers to investment in the oil and natural gas sectors in Canada. The objective is to ensure there is a common understanding of the competitiveness challenges in the sector. As well, governments have been working closely together, including with industry, to enable a competitive business environment while simultaneously supporting the transition to a low-carbon economy, such as through the promotion of technology and innovation.

More broadly, under the International Action Plan, federal, provincial and territorial ministers have committed to better align international priorities and, promote trade and investment in energy-related goods, services and infrastructure. This cooperation can help to expand the scope of Canada's international partnerships, promote Canada's energy products globally, and underscore that Canada is a preferred destination for global investment. In so doing, Canada is better positioned to open new markets and seize global opportunities in priority energy markets, particularly in North America, China and India.



WORKING TOGETHER TO STRENGTHEN CANADIAN COMPETITIVENESS

Canada is working closely with the Government of **British Columbia** in a review of the competitiveness of the Liquefied Natural Gas (LNG) sector on the West Coast, to better understand, and potentially address competitiveness challenges facing LNG development in Canada.

Saskatchewan is demonstrating global leadership through the transfer of Carbon Capture and Storage (CCS) knowledge and through collaboration with the International Standards Organization in the development of international standards for CCS to accurately measure, monitor and verify emission reductions by CCS projects.

North American Energy Integration

The federal government has actively engaged provinces and territories in the ongoing re-negotiation of NAFTA. Throughout the negotiations, the federal government has worked closely with provincial and territorial representatives to ensure interests of Canada's energy sector industry and workers, including regional, Indigenous and gender considerations were supported and advanced. Engagement with interlocutors across all orders of government has been critical to modernizing the Energy Chapter, which aims to strengthen North American energy integration and competitiveness with a view to creating jobs and opportunities in all three countries.

Aggressive protectionist United States (U.S.) trade actions (e.g. steel and aluminum tariffs), are creating uncertainty for international trade, investment, and business confidence, including affecting ongoing NAFTA negotiations. The federal government is collaborating with provinces and territories, as well as key natural resources sector stakeholders, to resolve these trade disputes, assess potential impacts and inform final decisions on countermeasures action.

Working together, federal and provincial governments, also continue to monitor and support regulatory approvals for Canadian market access projects in the U.S., including Keystone XL and Line 3 Replacement.

NORTH AMERICAN ENERGY INTEGRATION

A top international priority is strengthening North American energy integration and positioning our continent to be an energy leader. Energy trade between the U.S. and Canada is more than \$100 billion. Canada meets 30% of America's demand for uranium, 20% of its demand for oil, 10% for natural gas, and 2% for electricity. Some 34 transmission lines and 75 pipelines cross the Canada-U.S. border, and the North American bulk electricity system connects our three countries, ensuring reliable supply across the continent.

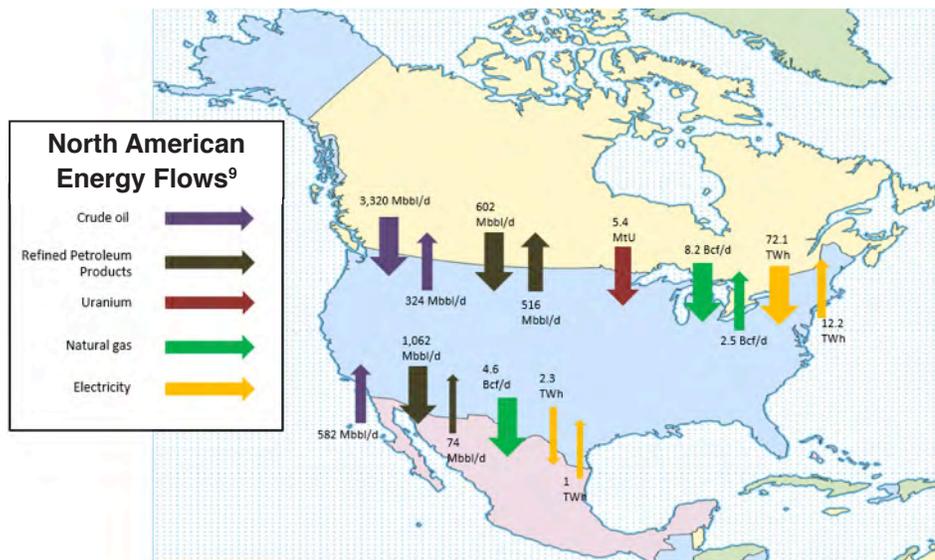
This level of energy integration has served both federal and provincial/territorial governments well – delivering affordable energy, producing impressive levels of trade, lowering costs, spurring private investment and driving innovation. The federal government is working together with provinces and territories to advance North America energy integration and cooperation.

Natural Resources Canada is a partner with the U.S. and Mexico on the **North American Renewable Energy Integration Study (NARIS)**, the largest geographic study of its kind. The study is analyzing the challenges and opportunities of transitioning to a modern electric power system in North America through to the year 2050. As the power system evolves, NARIS will illuminate long-term pathways for how the three countries can achieve their electricity system goals, and collaborate to ensure an affordable, reliable, and resilient transition.



NORTH AMERICAN ENERGY INTEGRATION (contd.)

To inform energy decisions, the **North American Cooperation on Energy Information (NACEI)** is a trilateral initiative established between Canada, the U.S., and Mexico to share and promote accurate energy-related information. A new website was unveiled in November 2017 (NACEI.org), which provides easy access to the data. The NACEI is expanding past the existing North American energy maps to include the resource potential of wind, tidal and geothermal, shale oil and gas formation data, and information on pipeline infrastructure beyond border crossing points.



Federal, provincial and territorial collaboration with Mexico has also been key in highlighting Canada's leadership on energy transition and clean growth. Through formal collaborative mechanisms with **Mexico, Canada and provincial partners** meet regularly to discuss priority issues and explore new opportunities for future bilateral and regional collaboration with Mexico.

Mexico's recent energy reforms have also provided opportunities for Canada to increase trade and investment. With Mexico awarding exploration and production contracts to the private sector, energy has become a key element of the bilateral trade relationship in recent years. Mexico has set targets for generating 35% of its electricity from non-fossil fuel sources by 2024, and 50% clean energy generation by 2050. These targets are creating opportunities for Canadian firms to participate in the development of Mexico's wind and solar resources, as well as potential expansion of its nuclear reactor fleet. Several Canadian clean technology companies are active in Mexico mainly in wind, solar, energy efficiency systems, smart grids, and electricity transmission and distribution.

⁹North American Cooperation on Energy Information (NACEI), Trade Data (2018)

COLLABORATION WITH MEXICO

Federal and provincial officials recently met to share highlights of ongoing collaboration, including progress achieved under the Memorandum of Understanding between **Alberta** and Mexico as well as agreements between Mexico and **Quebec**.

In addition, Ontario presented its plan to phase out coal-fired electricity generation in favor of renewable and natural gas sources, and shared best practices on Indigenous and remote community engagement, as well as women and youth. The federal government is working with Mexico under the Canada-Mexico Partnership (CMP). The aim of the partnership is to enhance Indigenous participation in energy development. Indigenous peoples from both countries are being brought together, with governments and industry, to discuss challenges and opportunities to enhance policy and practice in the areas of Indigenous engagement and regulatory efficiency and effectiveness.

A **series of principles** have been established on what constitutes **effective and meaningful Indigenous engagement** and participation, on both policy and practical levels. A commitment was made to follow up under specific streams of work (e.g., consultation, early engagement, conflict resolution, economic participation) and discussions are underway through the CMP to plan these activities in the next iteration.



Opportunities for China

For Canada, no market access opportunity holds more potential than the one that exists with China. China has nearly 70% foreign dependency on oil imports and continues to rely on coal for 63% of its energy demand. China's new energy policies are focused on balancing growth and the environment, resulting in clean energy demand that is expected to increase exponentially over the coming decades at a rate unseen in history. As an example, China has strong interest in Canadian LNG to help support its energy needs. Canada is working with China on opportunities to optimize the ability of LNG to offset higher emitting sources of energy, such as coal, helping to reduce net global GHG emissions and improve air quality.

Advancing strong Canada-China energy relations is a top priority for federal, provincial and territorial governments alike. Federal, provincial and territorial governments will continue to work together to strengthen the trade and investment relationship while promoting Canada's resource products and expertise.

Opportunities for India

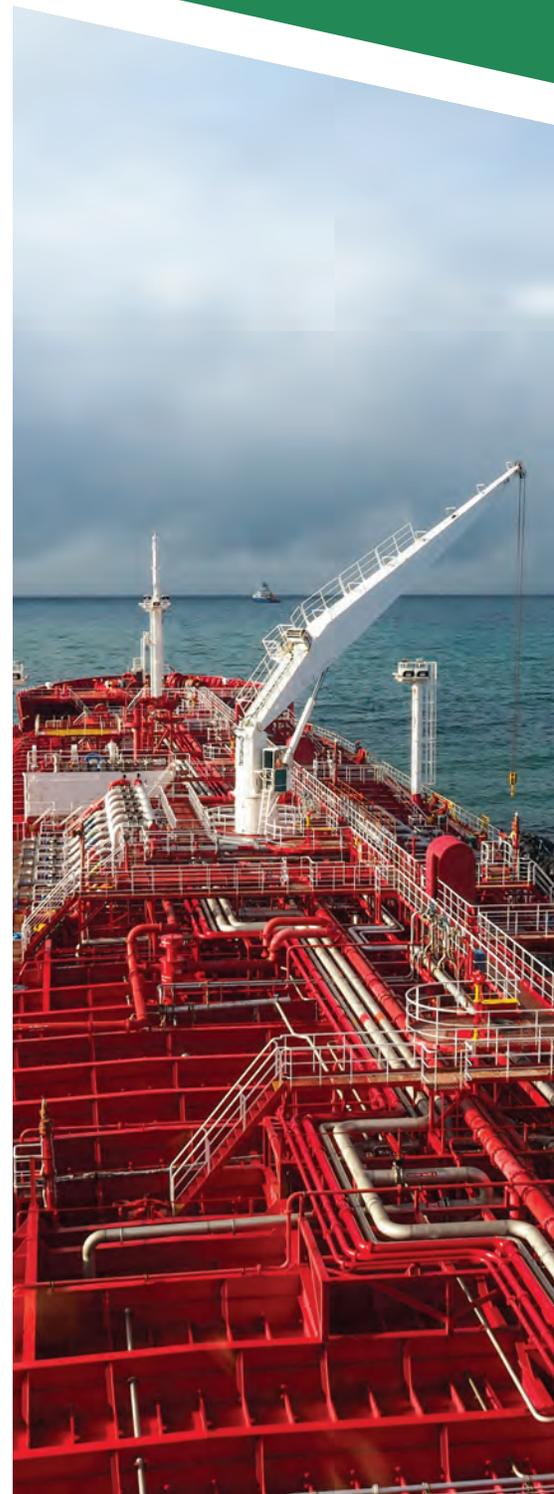
As part of its global policy agenda and trade diversification efforts, Canada is seeking to expand energy cooperation with India across all facets of energy. An energy consumer with growing demand, India is an important partner from a government-to-government perspective in decreasing carbon emissions, developing clean energy technology solutions, and on nuclear cooperation. Furthermore, India represents a key priority market for Canadian energy products, technology and services, as well as a country for investment attraction in Canadian energy projects (e.g., LNG).

Canada aims to deepen its relationship with India through the Canada-India Ministerial Energy Dialogue, established to support the transition to low-carbon economies and expand bilateral energy trade and investment opportunities. In April 2018, the Terms of Reference for the Energy Dialogue were expanded from a focus on oil and gas, to encourage additional collaboration projects on energy efficiency, and clean energy technology and innovation, including renewables and nuclear. As Canada prepares to host the next Ministerial meeting with India, the federal government will look to provincial and territorial partners to collaborate on advancing Canada's trade and investment objectives.

Throughout its work in various markets, governments are in an ideal position to promote Canada's energy products globally, advance market access priorities, and spread the message that Canada is a preferred destination for global investment. Likewise, the complementary nature of activities, as well as the many international partnerships maintained by federal, provincial and territorial governments with stakeholders, suggests there are many potential advantages to be gained from enhancing pan-Canadian cooperation on shared international objectives.

CANADA-CHINA ENERGY RELATIONS

Canada will look to provinces and territories to participate in the inaugural **Canada-China Ministerial Dialogue on Clean Energy**. This forum will facilitate energy solutions and expand trade and investment while strengthening Canada's position in the lead up to a potential free trade





LOOKING AHEAD: A collective vision supported by collaborative leadership

Through collaborative efforts, federal, provincial and territorial governments have made considerable progress in moving Canada toward a strong and diversified low-carbon energy future. Success has come from the open and productive conversations and consensus among governments.

Through the implementation of policies, programs and regulation in our seven areas of collective focus, **collaborative leadership** will revolutionize the energy sector in Canada, while growing our economy. Clean, resilient and affordable energy systems will be the cornerstone of our modern, clean growth economy. Buildings, transportation systems, and communities will be highly energy-efficient, rely on clean electricity and renewable energy, and be smart and sustainable. A low-carbon industrial sector will rely heavily on clean electricity and lower carbon fuels, will make more efficient use of energy, and will seize opportunities unlocked by innovative technologies.

Looking ahead, Canadians have every reason for optimism. Canada's wealth of natural resources endows it with an energy advantage and tasks it with a responsibility to use these resources wisely as a leader in the low-carbon energy transition. Canada has joined countries around the world in investing in cleaner fuels to diversify their energy mix and create low-carbon economies. Fostering and encouraging investment in clean technology solutions will facilitate economic growth, long-term job creation, and promote environmental responsibility and sustainability. Canada has a strong energy sector that provides jobs for Canadians from coast-to-coast-to-coast through various energy producers and technology providers. Innovative technologies, trade and investment in the different areas of the energy sector will position Canada to continue its competitive advantage on the world stage.

This optimism is reinforced when we look at Canada's expanding international engagement. Throughout its work in various markets, the federal government is in an ideal position to promote Canada's energy products globally, advance market access priorities, and spread the message that Canada is a preferred destination for global investment. Likewise, the complementary nature of activities, as well as the many international partnerships maintained by federal, provincial and territorial governments with stakeholders, suggests there are many potential advantages to be gained from enhancing pan-Canadian cooperation on shared international objectives.

Still, there are many challenges with the shift to a modernized and low-carbon economy, challenges that require collaboration and leadership from all facets of society. Governments will need to engage Canadians in an ongoing dialogue and foster a supportive culture of entrepreneurship for innovative clean technology solutions. The federal government will respect reconciliation goals, integrate Indigenous knowledge and support the well-being of communities. These steps for inclusion will prove essential in continuing progress in building the trust and confidence of Canadians.

Governments across Canada will continue to collaborate on actions that support this **collective vision**. They have demonstrated a common purpose to the benefit of all Canadians. In future years, energy ministers will report to Canadians on progress in delivering on actions as outlined in this report, and continue to forge a path forward together as we steer the major changes that lie ahead in the global transition to a low-carbon energy future.



