Policy & Regulatory Analysis Report

Decentralised Energy Canada

September 2022

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Chapter 1: Introduction

Who is DEC?

Decentralised Energy Canada (DEC) is a federally incorporated non-profit industry association. We are Canada's market access hub for the Decentralised Energy (DE) industry. Our programs are designed to gather and disseminate the latest market intelligence to technology providers and end-users. DEC members include many of Canada's earliest developers and adopters of DE solutions. Our extensive network is continuously engaged to create pathways for start-ups, entrepreneurs, communities and corporations, and to enable productive collaboration and industry growth.

Regulatory Definitions

Policy

A policy is a set of statements of principles, values and intent that outlines expectations and provides a basis for consistent decision-making and resource allocation in respect to a specific issue. Policies are one of the chief tools of governance. Policies are only documents and are not law, however, policies can lead to new laws. To become law, legislation must be approved by Parliament. Proposed legislation is introduced in Parliament in the form of a bill which provides the basis to amend or repeal existing laws or put new ones in place. (Source: Government of Canada)

Act

Legislation, also known as Acts, are forms of law that can provide the authority to make regulations. Generally, legislation begins as a bill (draft form), and can originate either in the House of Commons or in the Senate. (Source: Government of Canada)

Regulation

Regulations are the rules used to carry out the intent of Acts enacted by the Parliament of Canada. They are instruments of legislative power and have the force of law. Regulations contain more specific guidelines than Acts. (Source: Government of Canada)

Code

A code is a set of rules that serve as generally accepted guidelines recommended for the industry to follow. They exist for the purpose of safety, quality or other benefit. For example, electrical codes exist to ensure system reliability and that building occupants are safe from shock risks. On its own, a code is not a law that must be followed but can be adopted into a law or included in a business contract. Each code specifies the minimum acceptable requirements for an electrical process or for the performance of the final system itself. Codes may incorporate or refer to existing standards or specifications. (Source: nVent)

Standards

A code tells you what you need to do, and a standard tells you how to do it. A standard is a document that provides a set of agreed-upon rules, guidelines or characteristics for activities or their results. Standards establish accepted practices, technical requirements, and terminologies for diverse fields. Most standards aim to achieve an optimum degree of order in a given context. Because they are easy to recognize and reference, standards enable organisations to ensure that their products or services can be manufactured, implemented and sold around the world. (Source: Standards Council of Canada)

Common Regulatory Hierarchy

1. Act
2. Regulation
3. Code
4. Standards

1.1 Report Context

In September 2021, DEC started working with the Standards Council of Canada to develop a Standards and Policy Roadmap to identify strategic relationships with relevant Standards Development Organizations (SDOs), seed new work, mitigate duplication, collaborate, and influence the standardization landscape in the energy sector to meet Canadian DE industry priority objectives. The expected end date of this work is December 2022.

There are four main deliverables of this work:

1) Standards Landscape Review (Completed - January 2022)
2) **Regulatory Analysis Report (This report)**
3) Standards and Policy Roadmap (November 2022)
4) Publication of a National Technical Specification for terminology in collaboration with CSA Group (Ongoing - anticipated completion December 2022)

A unique component of this work considers the United Nations Sustainable Development Goals (UN SDGs) and the global movement towards net zero energy. This work summarises Canada's regulatory efforts and provides insight into the gaps that need to be addressed to align energy policy with society's shifting priorities.

The Purpose and Benefit of this Regulatory Analysis (RA)

The purpose of this Regulatory Analysis is to report on the current policy, regulations, and legislation surrounding DE in Canada and to identify any challenges and barriers to its implementation. The benefit of conducting this analysis is to inform the roadmap development work in deliverable 3. From this, we can identify the gaps in policy and create a greater emphasis on the role that DE plays in achieving sustainable development goals through the adoption or creation of standards that can feed into Canada's regulatory process.

1.2 The Scope of the Analysis

Energy policy and regulation is a far-ranging discussion that is driven by the cost of energy, a change in society, advancements in technology as well as industrial restructuring.

The scope of this regulatory analysis includes:

- national regulatory overview;
- national regulatory priorities;
- regional regulatory overview including which version of Canadian Electrical Code is being used in province/territory; and
- regional regulatory priorities.

Chapter 2: Frame the Analysis

2.1 Overview of Decentralised Energy (DE)

DE is defined as kinetic and/or potential energy (thermal, radiant, chemical, nuclear, and electrical) that is created/stored close to the point(s) of consumption. It encompasses onsite energy generation, energy storage, and energy efficiency measures. DE projects vary in size and there is no set maximum capacity because systems are designed to meet a specific local load(s).

Microgrids, mini-grids and nanogrids are localised clusters of DE systems. Microgrids can operate connected to the distribution grid but are often designed to disconnect (i.e., "island mode") when grid outages occur. Mini-grids and nanogrids are fully autonomous with no grid connection. Interoperability is critical for microgrids, mini-grids and nanogrids and they must be designed to be responsive, dynamic, and automated.

Examples of DE (not limited to)

- District Energy
- Cogeneration and Combined Heat and Power
- Solar Energy
- Earth Energy
- Bioenergy
- Modular Reactors
- Microgrids, Mini-Grids, and Nanogrids
- Energy Storage

Benefits achieved through the deployment of DE

- Deferred costs of new energy transmission capacity
- Resiliency and flexibility as they are structured by many small production units instead of a few large units
- Democratisation of energy as the decision-making, responsibility and ownership will be to regional or local level
- Increased resource efficiency as the short distances between production and consumption leads to efficiency gains
- Increased scalability and modular growth compared to centralised energy systems

The seven main drivers of DE adoption

1) **Global Commitments to Emissions Reductions:** 197 countries have adopted the *Paris Agreement* and, of those, 179 have solidified their climate proposals with formal approval.
2) **Traditional Electrical Grid Challenges:** Expensive, limited functionality, and time consuming. Today, less than 50% of a consumer's bill can be delivery charges.
3) **Rise of Prosumers:** When a consumer also produces energy, they are called prosumers. Most DE systems are developed by prosumers.
4) **Digitalisation of Utilities:** Digital information could unlock $1.3 trillion of value for the electricity sector. Four high-value themes are: asset life cycle management, grid optimisation and aggregation, integrated customer services and beyond the electron.
5) **Lower Cost Renewable Energy and Storage:** Solar PV modules prices are down ~90% since 2009 and wind turbine prices are down ~55-60% since 2010. Battery prices have also significantly decreased by ~87% since 2010.
6) **Extreme Weather and Natural Disasters:** Hurricanes, severe storms, wildfires, floods and other weather events since 2017 have resulted in a total combined economic loss of over $1 trillion dollars world-wide.
7) **Electrification of Society:** The global transition to net zero has begun and electricity for data centres, transportation and agriculture will be required. More than 90% of all passenger vehicles in the U.S., Canada, Europe and other rich countries could be electric and autonomous by 2040.

Complementary Industry Trends

1) **Rebuilding with Resiliency:** Rebuilding infrastructure with resilient design principles is key to ensuring that future natural disasters will not further hinder a community.
2) **A New Era of Insurance Coverage:** Given the wreckage that extreme weather events can cause, insurance coverage is, unsurprisingly, becoming more expensive. It is expected that insurance companies will begin to adapt their policies to accommodate resilient rebuilding strategies.
3) **Communities Going Net Zero:** Climate action is in the air. At COP26, Canada pledged to reduce methane emissions, cap all oil and gas emissions, reduce vehicle emissions and set a global price on carbon. This pledge will dictate how Canadian communities and municipalities will adopt Net Zero targets to support these commitments.
4) **Microgrids Abound:** Microgrids are used to increase energy efficiency, reduce power disruptions, and to mitigate the consequences of outages when they do occur. They also make economic sense, particularly when supported by the right policies and technology, and can deter capital costs for transmission infrastructure.
5) **Growth in Energy Storage:** During power outages, energy storage can greatly increase the welfare and resiliency of a community. Energy storage options that demonstrate the lowest ecological footprint and net zero emissions will be the main focus of investor interest.
6) **Harnessing Digitalisation:** Currently, energy efficiency holds a very heavy weight in the industry. Digital technologies can gather data and offer real-world solutions that help to optimise systems interoperability and increase energy efficiency. Digital transformation has immense potential to unlock $1.3 trillion of value for the electricity sector.
7) **From Linear to Circular:** We live in a linear take-make-waste system, where virgin materials are often cheaper than the cost of repair and reuse, which creates an inordinate amount of waste. An emergence of industry standards that support the circular economy are required in the DE sector.

Barriers to DE implementation

1) **Government Support for Market Research & Accessibility:** Very little government funding has been invested in the development of publicly available market research for DE and the accessibility of this information to be disseminated to the public.
2) **Traditional Economic Model:** The way electricity is produced, distributed, and traded via energy technologies is changing in response to the shift to DE. Therefore, the valuation of aggregation is required.
3) **Traditional Utility Models:** Traditional utilities are facing challenges. Anyone can own an energy generation system but 'beyond the electron' business models are required and could be provided by progressive utilities that pivot in response to market transformation.
4) **Navigating Standards:** Standards and best practices are spread out and the need for clear and accessible standards are required.

Notable synergistic Government of Canada commitments

1) Clean Electricity Standard (NZ2035)
2) Critical Minerals Strategy
3) Canada's New 2030 Emissions Reduction Plan
4) 2020 Model Codes (Net Zero Energy Ready Standards by 2030)
5) Just Transition-Workforce Retooling, Diversity and Inclusion, and Community Engagement

2.2 The Need for Action

Energy policy and regulations play a key role in aiding an equitable energy transition and intersect with many of the other areas. Policy can be complex - misinformation and a misalignment to social benefits are major barriers to progress. A substantial gap that must be addressed is the integration of sustainable development goals such as

affordable and clean energy, reduced inequalities and responsible consumption and production into energy policy. An important knowledge gap relates to the full life-cycle of energy in its various forms. Another knowledge gap includes the relationship between electrification and energy efficiency policies and housing justice issues.

In short, current energy policy in Canada fails to recognise the role that DE plays in immediate societal demands for a just energy transition and there is an urgent need for action if we are to achieve Canada's current federal commitments.

Chapter 3: Assessing the Benefits of DE in Today's Society

In 2015, 193 United Nations Member States came together to commit to tackling 17 Sustainable Development Goals (SDGs) including a commitment to 169 targets by 2030.

DE can contribute to the United Nations Sustainable Development Goals (UN SDGs), in particular:

- SDG3: Good Health & Well-Being - e.g., reduced emissions
- SDG7: Affordable & Clean Energy - e.g., deferred, mitigated and eliminated infrastructure costs
- SDG8: Decent Work & Economic Growth - e.g., jobs and revenue from diversified energy integrated into urban, rural and Indigenous communities
- SDG9: Industry, Innovation & Infrastructure - e.g., resilient energy infrastructure, sustainable energy for industry
- SDG10: Reduced Inequalities - e.g., increased Indigenous participation in economic activity (economic reconciliation) and rural community development
- SDG11: Sustainable Cities & Communities - e.g., energy security, reduced land-use impacts
- SDG12: Responsible Consumption & Production - e.g., increased resource efficiency, reduced waste, and upcycling waste into valuable commodities
- SDG13: Climate Action - long-term community resilience and decarbonisation of energy

Two unique benefits of DE that are worthy of special mentions are locational benefits and energy security.

3.1 Valuing Locational Benefits

Effective energy policy must consider the economic valuation, planning, and regulatory considerations for assessing locational value primarily in their role in deferring, mitigating, or eliminating the need for infrastructure investments and strengthening community resilience. The strategic positioning of DE systems increases transfer efficiency, reduces emissions, and decreases energy costs. By shifting generation from centralised energy to decentralised energy, the energy sector opens a broad array of power source options and will accelerate the transition to a diversified, robust, and resilient energy system.

3.2 Valuing Energy Security

Energy security means ensuring adequate, reliable supplies of energy at reasonable prices and in ways that do not jeopardise society. While energy security has always been a pillar of energy policy, diversifying energy supply and emissions reduction have not been adequately addressed and will radically change the landscape of energy policy. Diversifying energy supply enables a society to mitigate the impacts of disruption in one energy input by increasing the use of other energy sources. Achieving energy security provides a breeding ground for entrepreneurship, innovation, and research and development. We are under increasing pressure to develop cost-effective policies that will both ensure the security of our energy system and support our sustainable development goals. A diversified supply mix of DE systems addresses this need.

Chapter 4: Analysis and Summary of Findings

DE technologies are undergoing rapid change and accelerated market uptake. Technology innovations combined with the global adoption of sustainable development goals is triggering a need to redesign energy policy and related regulations. Here we examine the elements of the national and regional policies and regulations that are impacting DE market growth.

It is important to note that while we consider changes in policy and regulations, there is a more basic need for an industry standard for terminology used when referring to decentralised energy. Well-defined terminology is needed to support effective communication, reduce ambiguity and increase clarity. This will inevitably lead to stronger DE market growth and greater strides towards sustainable development goals. As per section 1.1 of this report, the larger scope of work being undertaken by DEC, SCC, and the CSA Group includes the publication of a National Technical Specification for terminology which will be instrumental in developing effective policy and regulations.

In Canada, regulatory frameworks differ depending on the particular province or territory. As can be seen in table 4.1, provincial regulators have jurisdiction over their province's energy generation, intra-provincial transmission, distribution, retail pricing, and wholesale markets. The wholesale electricity markets in Alberta and Ontario have unbundled and separation of functions (as it relates to generation, distribution, transmission, and retail) and have quite strict requirements, whereas provinces in which Crown corporations dominate tend to have fewer requirements or regulatory frameworks in place. The heavy provincial (and territorial) ownership of Canadian electricity assets has a limiting effect on the role of the federal government, in particular, the federal regulation of inter-provincial electricity transmission and electricity exports. Provincial electricity regulators generally regulate on a public utility basis in relation to the non-competitive aspects of their markets which require "certificates of public convenience and necessity" or similar approvals for asset creation or facility expansions. This controls the terms and conditions of service between the regulated utilities and their customers.

Also, there is a heavy awareness of the importance of ensuring that the constitutionally-protected rights of Canada's Indigenous Peoples are respected throughout the decision-making processes of energy development. In particular, most energy regulation in Canada regularly assesses whether the Honour of the Crown in relation to Indigenous Peoples has been maintained, they have been adequately consulted with throughout decision-making processes, and that their interests have been accommodated.

4.1 Jurisdictional Division of Responsibility

National (Federal Government)	Regional (Provincial/Territorial Governments)
● Resource management on frontier lands ● Nuclear safety ● Inter-provincial and international trade ● Trans-boundary environmental impacts ● Environmental impacts where federal lands, investments or powers applies ● Codes, standards and labeling relating to conservation and demand ● Other policies of national interest	● Resource management within provincial boundaries ● Intra-provincial trade and commerce ● Intra-provincial environmental impacts ● Generation and transmission of electrical energy ● Conservation and demand response policies

4.2 National Regulatory Overview

In Canada, energy is managed at the provincial and territorial levels. However, the Federal Government has jurisdiction over the following elements as it relates to energy resources in Canada:

- Resource management on frontier lands
- Nuclear safety
- Inter-provincial and international trade
- Trans-boundary environmental impacts
- Environmental impacts where federal lands, investments, or powers apply
- Codes, standards and labeling relating to conservation and demand
- Other policies of national interest

Federally, the Canada Energy Regulatory Act is the legislation that establishes responsibility of the Federal Government to ensure that pipeline, power line, and offshore renewable energy projects (within Parliament's jurisdiction) are constructed, operated, and abandoned in a safe and secure manner that protects people, property, and the environment. Additionally, it also defines the Government of Canada's commitment to achieving Reconciliation with Indigenous Peoples through renewed nation-to-nation, government-to-government, and Inuit-Crown relationships based on recognition of rights, respect, co-operation, and partnership along with its commitment to implementing the United Nations Declaration on the Rights of Indigenous Peoples.

4.3 National Policy Priorities

The Pan-Canadian Framework on Clean Growth and Climate Change is Canada's National Policy that dictates emission targets including carbon pollution pricing and provides measures to achieve reductions across all sectors. It aims to drive innovation and growth by increasing technology development and adoption and also includes actions to advance climate change adaptation and build resilience to climate impacts across Canada. This plan was developed in collaboration with provinces and territories and through engagement with Indigenous Peoples.

Priorities of the Pan-Canadian Framework on Clean Growth and Climate Change are:

- Reduction of GHG emissions
- Increase energy security
- Indigenous participation
- Coal phase-out
- Green infrastructure
- Renewable energy

The approach to electricity includes (1) increasing the amount of electricity generated from renewable and low-emitting sources; (2) connecting clean power with places that need it; (3) modernizing electricity systems; and (4) reducing reliance on diesel working with Indigenous Peoples and northern and remote communities.

4.4 Regional Regulatory Review

Useful Definitions

Net Metering

Net metering policies allow end users to offset retail electricity purchases using output from on-site distributed generation systems. Net metering policies also allow end-users to receive a credit or payment for the net excess electricity that is generated and exported to the grid. Net metering credits can be used to offset retail electricity purchased during other time periods. The value of net metering credits or payments is often pegged to the retail electricity rate. The value of the excess generation has been a topic of much debate and can have a significant influence on the payback period for distributed generation systems. (Source: Clean Energy Solutions Center)

Net Billing

Net billing is an alternative approach to net metering. Like net metering, end-users are able to offset retail electricity purchases under net billing. The primary difference between net billing and net metering is that there are differing rates used to value the excess energy fed into the grid and energy received from the grid under net billing. A wide variety of net metering, net billing and feed-in tariff policies is in place, as well as hybrid approaches that integrate various elements of these policies (Couture et al. 2015; Cox et al. 2015; Inskeep et al. 2015). (Source: Clean Energy Solutions Center)

Each province and territory in Canada have legislation that regulates DE generation.

Location	**Regulation Conditions**
Alberta	Under the provincial Micro-Generation Regulation, there are two types of micro-generators: small-scale (under 150 kilowatts) and large-scale (between 150 kilowatts and 5 megawatts). Most residential, farm, or small business micro-generators are small-scale micro-generators. Rates are dependent on retail electricity rate plans.
British Columbia	The net-metering program is designed for those who generate electricity for their own use. When more electricity is generated than needed, it is fed back to the grid and reimbursed as a credit towards future electricity use on the bill. When there is not enough generated to meet energy needs, it is purchased from the grid. If there are generation credits remaining as of the anniversary date (March 1), payment will be made for the excess electricity at the market price.
Manitoba	Distributed energy resources that are approved for electricity generation for homes or businesses are: ● Biomass; ● Fuel Oil; ● Small-Scale Hydro; ● Solar; ● Wind If there is more energy generation than use, the excess energy can be sold back at the excess energy price (for generators less than 100 kW). Until March 31, 2023, the excess energy price is $0.05079/kWh. This price is updated annually to reflect the current market value of excess energy and is not equal to our electricity rates as rates must recover the cost of additional services that Manitoba Hydro provides

	(transmission, distribution, customer service, safety, emergency restoration). Net-billing is used (monetary credits on your Manitoba Hydro account) instead of net-metering (kilowatt-hour credits on the account).
New Brunswick	The NB Power Net Metering program provides customers with the option to connect their own environmentally sustainable generation unit to NB Power's distribution system. The program allows customers to generate their own electricity to offset their consumption while remaining connected to NB Power's distribution system – so they can meet their electricity demands when their generation unit cannot. In order to qualify for the program, the generation units must: ● Not exceed 100 kW in Nameplate Capacity. ● Come from renewable energy sources as prescribed in the provincial government's Electricity from Renewable Resources Regulation 2015-60. Sources like solar, wind, and hydro are acceptable ● Use equipment certified for use in the Province of New Brunswick ● Have an Electrical Wiring Permit from a licensed electrical contractor and be inspected and approved by the New Brunswick Department of Public Safety, Technical Inspection Services ● A special type of meter will be installed replacing your existing meter. This new meter provides readings for the electricity you use from NB Power, and the excess electricity back fed to NB Power's distribution system. The generator cannot be turned on before metering is in place, and written approval from NB power is provided It is also mandated by regulation that the owner of the home or place of business meets the ownership requirements as per the Electricity from Renewable Resources Regulation 2015-60.
Newfoundland	The Net-Metering Service Option provides interested customers with the option to generate electricity from small-scale renewable sources, up to 100 kilowatts (kW), to offset their own use, while maintaining a secure connection to the grid for times when they need to purchase electricity. A bi-directional meter is installed to measure the additional electricity a customer requires from the electricity grid, as well as any excess generation that may be supplied back to the grid. Provincially, the total installed customer-owned generation capacity cannot exceed 5 megawatts (MW), as set out in the Net Metering Exemption Order. Individual customer generation facilities shall be sized to not exceed the annual energy requirements of the buildings or facilities located on the customer's serviced premises up to a maximum of 100kW. The utilities will continue to monitor and evaluate the net metering program to ensure it provides a reasonable option for interested customers.
Northwest Territories	The NWT has adopted net-metering, which allows customers to install up to 15 kilowatts (kW) of renewable electricity generation on their property to offset their power use. This can help Northerners manage their electricity costs while reducing greenhouse gas (GHG) emissions. The credit for renewable energy delivered to the grid would reflect the variable generation costs of utilities (i.e., fuel cost, variable portion of operation and maintenance) in each rate zone. Electricity rates in the NWT are based on how electricity is primarily generated in a community.

Nova Scotia	Nova Scotia Power customers can install a variety of renewable energy sourced generators such as a wind turbine, solar panels, small hydro, or biomass generator to help power their home or business. If the renewable generating unit produces more energy than used, the unused electricity will flow onto the local grid for others to use. If there is more electricity generated than used, the surplus kilowatt-hours (kWh) are "banked" and applied to the next electricity bill to offset any electricity drawn from the grid. Renewable energy generators can be sized to meet, but not exceed the expected yearly electricity consumption up to a nameplate capacity of 100 kW.
Nunavut	Qulliq Energy Corporation's Net Metering Program allows residential customers and one municipal account per community to generate their own electricity from renewable energy sources and integrate it into the corporation's grids. Net metering customers can receive an energy credit for surplus power delivered from their renewable energy generation systems to our grid. This allows customers to reduce the amount of power they need from the grid. The program also helps decrease Nunavut's dependency on diesel fuel and cut carbon emissions. Each renewable energy installation must not exceed a generating capacity of 10 kilowatts.
Ontario	Through net metering, money can be saved by generating power with renewable energy, like wind or solar. To become a net-metered customer – and before a renewable energy system is bought or installed –an application is required to connect the energy source to the electricity grid. After the application is approved, and once the renewable energy system is installed and connected to the grid, the electricity distributor will read the bi-directional meter to calculate the electricity bill by: ● Measuring the amount of electricity, that is used from the grid and the amount of electricity that was sent to the grid; ● Calculating the value of the electricity sent to the grid, using the same rates that are charged for using electricity; ● Applying credits to the charges on the bill to reduce payment. If more electricity was supplied than what was used and credits are left over, the credits will carry over to the next bill. Credits can be carried over future bills for up to 12 months.
Prince Edward Island	Net metering allows customers to supply a portion or all of their annual electricity load from a small capacity renewable energy generator. Once there is a net metering agreement in place, a second electricity meter is installed. One-meter measures the electricity being delivered from Maritime Electric, while the second meter measures electricity being supplied to Maritime Electric's grid from the renewable energy generator. The monthly difference between the two meters determines if there will be an energy credit or a bill for the energy used. The maximum allowed size for a net metered renewable energy generator is 100 kW, and some installations 30 kW and larger may require three-phase power
Quebec	A customer-generator is a Hydro-Québec customer who produces electricity using equipment they own and operate to meet part or all of their energy needs. This allows a customer to inject their surplus power into the Hydro-Québec grid in exchange for credits in kilowatt-

	hours (kWh) that are applied to their bill. Inversely, if the power generated is not enough to meet their needs, power can be drawn from the Hydro-Québec grid. The electricity bill will show the consumption in kilowatt-hours, detailing how much electricity was supplied by Hydro-Québec and how much was injected into the grid. If more electricity is generated than used, the surplus earned will bank credits to be deducted from the net consumption on future bills. Under Net Metering Option I, if more electricity is fed in than drawn out, the surplus is put into a bank in the form of credits. These credits cannot be exchanged for money or transferred to another electrical service contract. They will expire after a certain period of time. The surplus bank will be initially reset to zero at the start of the consumption period beginning on or after March 31 following initial sign-up. After that, it will be reset to zero every 24 months. In which there is a two-year period to use the credits, apart from those accumulated during the first months. If arrangements are made with Hydro-Québec for a later reset date, as long as it falls within the 24 months following the sign-up. The bank will then reset to zero at the start of the consumption period beginning after the selected date, and every 24 months thereafter. Residential customers, farmers billed at Rate D or DM and small-power business customers billed at Rate G (without billing demand) who are able to generate electricity from a renewable energy source. The eligible renewable energy sources are: ● Wind power ● Photovoltaic power ● Hydroelectric power ● Geothermal power (for electricity generation only) ● Bioenergy (forest biomass or biogas) The electricity must be generated at a facility that is located at the same delivery point as the Net Metering Option. The maximum generating capacity of the equipment must not exceed the lesser of the following: ● the estimated capacity required to meet all or part of your energy needs; or 50 kW.
Saskatchewan	SaskPower's Net Metering Program provides SaskPower participants with the opportunity to generate up to 100 kW (DC) of power, using an eligible resource, to offset their own power use. The program allows for projects up to 100kW DC nameplate generating capacity. Participants are eligible for a maximum of 500kW of projects per calendar year.
Yukon	Yukon's micro-generation program is offered to residential, general service, and industrial utility customers with small-scale electricity generators. Any surplus energy generated can be put back into the local grid for an annual reimbursement at the following rates: $0.21 per kWh for Yukon's Integrated (Hydro) System and $0.30 per kWh for communities powered by diesel.

Each province and territory have policies that address reductions in greenhouse gas (GHG) emissions, increasing renewable energy, and energy efficiency programs. Additionally, some policies also have an inclusion of Indigenous participation with regard to the development of DE, however, not all provinces or territories include all these metrics. The tables 6.1 and 6.2 in the Appendix section provide a detailed account of the regulations and policies for each region, including links to those documents.

4.5 Regional Policies Priorities

Region	Policy Priorities
Alberta	● Targets for Renewable Energy Generation ● Phasing out coal
British Columbia	● Targets to reach Net Zero by 2050 ● Elimination of Industrial Methane ● Requirements for zero-carbon in all new buildings by 2030 ● Increased clean fuel & energy efficiency requirements
Manitoba	● Plans for new hydropower facilities ● Growing renewable energy alternatives ● Energy efficiency strategies
New Brunswick	● Energy security ● Environmental responsibility ● Reduction of GHG emissions ● Increasing renewable energy ● Energy efficiency initiatives ● First Nations engagement
Newfoundland and Labrador	● Reduction of GHG emissions ● Increased electrification ● Increased support for renewable energy ● Indigenous participation
Northwest Territories	● Reduction of GHG emissions ● Increase share of renewable energy ● Increased energy efficiency
Nova Scotia	● Reduction of GHG emissions ● Increase share of renewable energy
Nunavut	● Increased energy efficiency ● Increase share of renewable energy
Ontario	● Reduction of GHG emissions ● Increased energy efficiency ● Support Indigenous capacity ● Supporting regional solutions
Prince Edward Island	● Reduce energy use ● Increase renewable energy generation
Québec	● Reduction of GHG emissions ● Optimally develop energy sources ● Capitalize on energy efficiency potential
Saskatchewan	● Increase renewable energy generation ● Reduction of GHG emissions
Yukon	● Increase renewable energy generation ● Indigenous participation

Chapter 5: Ideas for Roadmap Development

These recommendations have been drafted for discussion at a policymakers' engagement session hosted by DEC on September 8, 2022. They will be revised and further developed with industry feedback from the session and the Roadmap Planning Session that will be carried out in Autumn 2022.

Understanding the regulatory hierarchy and the fundamental role that standards can play in changing the regulatory landscape, these recommendations are intended for consideration by industry working groups and standards development organisations (SDOs). DEC is a national industry association that can support the efforts of SDOs by engaging its industry network and by hosting working sessions and forums to support effective communication between the diverse supply chain stakeholders. The first step is finding common priorities and agreement on best practices.

Chapter two and three provided an overview of DE and identified the potential for DE to support several societal benefits including several SDGs. Chapter four's policy and regulatory analysis identified some of the challenges associated with regional disparity between the rules that govern DE market uptake. It is reasonable to expect differences in regional regulations to some extent but focusing on the development of industry consensus on fundamental principles regarding the role that DE plays in a just energy transition and to achieving Canada's federal commitments.

Questions that we can present for industry consideration in the Policy Roadmap Strategy Session include:

1) Should we identify opportunities and strategies for greater standardisation across Canada?
2) Have any credible tools been developed for measuring the locational benefits of energy systems?
3) Who is developing standards & definitions for net zero energy that can be adopted in Canada?
4) Should we be including all of the main greenhouse gases beyond carbon dioxide (i.e., water vapor, carbon dioxide, methane, ozone, nitrous oxide, and chlorofluorocarbons) in the development of regulations?
5) Are there existing tools and mechanisms in other countries that provide a framework for measuring the performance of energy systems according to principles of a circular economy?
6) How can we integrate SDG valuation into energy security goals?
7) What techniques can we explore for integrating equity parameters into rates, revenue, and market design including equity implications of decoupling revenue from sales?

Chapter 6. Appendix

6.1 Regulatory & Legislative Landscape (Canada)

Province/territory	Electricity Legislation and Regulations

Alberta	• Electric Utilities Act (2003) Balancing Pool Regulation (2003) Billing Regulation (2003) Isolated Generating Units and Customer Choice Regulation (2003) Micro-Generation Regulation (2008) Municipal Own-Use Generation Regulation (2009) Small Scale Generation Regulation (2018) • Hydro and Electric Energy Act (RSA 2000) • Alberta Utilities Commission Act Fair, Efficient and Open Competition Regulation (AR 159/2009) • Act to Cap Regulated Electricity Rates (2017) • Renewable Electricity Act (2016) • Public Utilities Act (RSA 2000)
British Columbia	• Hydro and Power Authority Act (Current as of Feb. 16, 2022) • Safety Standards Act-Electrical Safety Regulation (Last amended Jan. 1, 2020) • Clean Energy Act (Current as of February 16, 2022) • Energy Efficiency Policy & Regulations • Energy Efficiency Act
Manitoba	• The Manitoba Hydro Act (Current as of Mar. 3, 2022) • The Energy Act (Current as of Mar. 1, 2022)
New Brunswick	• New Brunswick Electricity Act (Current as of December 17, 2021)
Newfoundland and Labrador	• Electrical Power Control Act (Last amendment 2018) • Public Utilities Act (Last amended 2019)
Northwest Territories	• Public Utilities Act (Last amended 2018)
Nova Scotia	• Electricity Act (2016) • Public Utilities Act (2019)
Nunavut	• Nunavut Power Utilities Act (2010)
Ontario	• Electricity Act (2021) • Ontario Energy Board Act (2021) • Energy Consumer Protection Act (2010)
Prince Edward Island	• Electric Power Act (2017) • Prince Edward Island Renewable Energy Act (2017)
Québec	• Hydro-Quebec Act (2021) • Act Respecting the Regie de L'Energie (2021)
Saskatchewan	• The Power Corporation Act (2019)
Yukon	• Yukon Energy Corporation Protection Act (2009) • Yukon Public Utilities Act (2002)
National	• Canada Energy Regulatory Act

6.2 Provincial & Territorial Policy Landscape (Canada)

Province/ Territory	Legislation & Policy	Highlights	Released Date
Alberta	● Renewable Electricity Act	Setting interim targets to track progress is required under the *Renewable Electricity Act*. In 2018, about 10% of Alberta's electricity was generated from renewable sources. In February 2019, the Minister of Energy established interim targets by Ministerial Order. ● 15% by 2022 ● 20% by 2025 ● 26% by 2028 These percentage targets were developed with consideration of the Alberta Electric System Operator's long-term outlook for the electricity system, the feasibility of when REP projects can come online and timing of market events such as the phasing out of coal, coal-to-gas conversions, new infrastructure, and advances in technology.	January 1, 2020
British Columbia	● Clean BC Roadmap to 2030	The CleanBC Roadmap to 2030 includes a series of actions across eight pathways. They include: ● A commitment to increase the price on carbon pollution to meet or exceed the federal benchmark, with supports for people and businesses; ● Requirements for new industry projects to have enforceable plans to reach B.C.'s legislated and sectoral targets and net zero by 2050; ● Stronger regulations that will nearly eliminate industrial methane emissions by 2035; ● A comprehensive review of the oil and gas royalty system to ensure it aligns with B.C.'s climate goals and provides a fair return for British Columbians, with outcomes released in February 2022; ● New requirements to make all new buildings zero-carbon by 2030; ● A nation-leading adoption of zero-emission vehicles	Fall 2021

		(ZEVs) by 2030 and 100% ZEVs by 2035; ● Developing new ZEV targets for medium- and heavy-duty vehicles; ● An accelerated shift toward active transportation and public transit (30% by 2030; 40% by 2040; 50% by 2050); ● Increased clean fuel and energy efficiency requirements; and ● Support for innovation in areas like clean hydrogen, the forest-based bioeconomy, and negative emissions technology.	
Manitoba	● Manitoba's Clean Energy Strategy	● Building new hydro; ● Leading Canada in Energy Efficiency; ● Growing Renewable Energy Alternatives; ● Freedom from Fossil Fuels.	2012
New Brunswick	● Integrated Resource Plan	New Brunswick's energy plan will help move New Brunswick to a cleaner energy future. This plan guides their decision-making by looking at current conditions, expectations, and forecasts for the next 20 years. The plan is updated every 3 years to reflect new technology, changes in customer demand, and accurate fuel pricing. The last Integrated Resource Plan was filed in 2020.	2020
Newfoundland and Labrador	● Renewable Energy Plan	The Renewable Energy Plan provides a sustainable long-term vision for Newfoundland and Labrador to maximize its renewable energy future. The five-year plan has four specific focus areas, all with short-term (within one year), medium-term (within two years) and long-term (two to five years) actions for each, which will support planning and delivery on a range of activities: ● Energy Uses and Markets; ● Regulatory Framework; ● Partnerships, Innovation and Industry Support; ● Training and Jobs.	December 2021

		Together, with the ongoing support and participation of industry and stakeholders, this plan will support Newfoundland and Labrador's transition to a low-carbon economy, create employment opportunities for residents, and further position Newfoundland and Labrador as a Clean Energy Centre of Excellence.	
Northwest Territories	• 2030 Energy Strategy	The Strategy has six (6) Strategic Objectives to reach the overarching 2030 vision: 1) Work together to find solutions: community engagement, participation, and empowerment. 2) Reduce GHG emissions from electricity generation in diesel-powered communities by an average of 25 percent. 3) Reduce GHG emissions from road vehicles by 10 percent per capita. 4) Increase the share of renewable energy used for space heating to 40 percent. 5) Increase residential, commercial, and government building energy efficiency by 15 percent. 6) A longer-term vision: develop the NWT's energy potential, address industrial emissions, and do our part to meet national climate change objectives. The Strategy takes an adaptive approach to these Strategic Objectives, which will be re-evaluated after five years to ensure they represent what is achievable given new technology. The Strategic Objectives will be achieved through Actions and Initiatives to be undertaken by the GNWT and its partners.	April 2018
Nova Scotia	• Our Electricity Future: Nova Scotia's Electricity Plan 2015-2040Our Electricity Future: Nova Scotia's Electricity Plan, 2015-2040	Nova Scotia has a plan for its electricity future and includes: • Support for technology and innovation; • Our Electricity Future: Nova Scotia's Electricity Plan, 2015-2040 more predictable and stable power rates;	2015

		● More accountability and a regulatory system that is easier to understand; ● More competition for both large and small-scale generation	
Nunavut	● Ikummatiit-The Government of Nunavut Energy Strategy	Ikummatiit is the Government of Nunavut's overall energy strategy involving all Departments and Agencies. Ikummatiit seeks to establish a sustainable energy system that is secure, environmentally responsible and optimizes economic benefits for Nunavummiut, both today and tomorrow. A number of policy action items were developed, focusing on energy efficiency and conservation and the adoption of domestic renewable energy. This will reduce imported oil.	September 2007
Ontario	● Ontario's Long-Term Energy Plan	Ontario launched its first Long-Term Energy Plan in 2010. It was reviewed and updated in 2013. The 2017 Long-Term Energy Plan – Delivering Fairness and Choice – focuses on making energy more affordable and providing more options for use of energy. Through energy planning, Ontario has: ● Phased out coal-fired electricity generation, the largest single greenhouse gas emissions reduction action in North America; ● Built a clean system that is more than 90% free of greenhouse gas emissions; ● Ensured there is a robust supply of electricity to power homes and businesses across Ontario Key Elements of the 2017 Long-Term Energy Plan includes: ● Ensuring Affordable and Accessible Energy; ● Ensuring a Flexible Energy System; ● Innovating to Meet the Future; ● Improving Value and Performance for Consumers; ● Strengthening our Commitment to Energy Conservation and Efficiency;	2017

		• Responding to the Challenge of Climate Change; • Supporting First Nation and Metis Capacity and Leadership; • Supporting Regional Solutions and Infrastructure.	
Prince Edward Island	• PEI Provincial Energy Strategy	The Government of Prince Edward Island has developed a 10-year strategy to reduce energy use, establish cleaner and locally produced energy sources and moderate future energy price increases. The goal of the strategy is to develop a stronger, more sustainable, and energy-independent province.	March 2017
Québec	• The 2030 Energy Policy	The-2030-Energy-Policy is needed for Quebec to reach its target of reducing greenhouse gas (GHG) emissions to 37.5% below 1990 levels by 2030. Achieving the targets proposed in the 2030 Energy Policy would reduce GHG emissions by 18% of 1990 emissions, or 16 million tonnes of CO_2 equivalent, by 2030.	2016
Saskatchewan	• Plans for a Sustainable Power Future	In 2015, the Government of Saskatchewan committed to increasing its target for renewable energy generating capacity from 25 percent to 50 percent by 2030. 1 The goal will include increased reliance on wind, solar, geothermal, biomass, and other sources.	April 2019
Yukon	• 10-Year Renewable Electricity Plan	In November 2019, the Yukon government released a draft of its *Our Clean Future* strategy, with a vision for addressing climate change by building thriving, resilient communities powered by clean energy and supported by a sustainable green economy. In it, the government proposes an average of 93% of electricity generated on the grid be produced from renewable sources and includes specific actions to electrify the territory's transportation and heating sectors.	January 2020
National	• Pan-Canadian Framework on Clean Growth and Climate Change	The Pan-Canadian Framework on Clean Growth and Climate Change is our plan – developed with the provinces and territories and through	2016

		engagement with Indigenous peoples – to meet our emissions reduction targets, grow the economy, and build resilience to a changing climate. Our plan includes a pan-Canadian approach to pricing carbon pollution and measures to achieve reductions across all sectors of the economy. It aims to drive innovation and growth by increasing technology development and adoption to ensure Canadian businesses are competitive in the global low-carbon economy. It also includes actions to advance climate change adaptation and build resilience to climate impacts across the country.	