



DISCUSSION PAPER:

PREPARING FOR NET-ZERO-ENERGY-READY CODES IN THE YUKON



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PREPARED FOR:

The Government of Yukon

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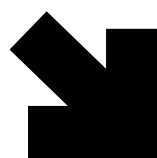
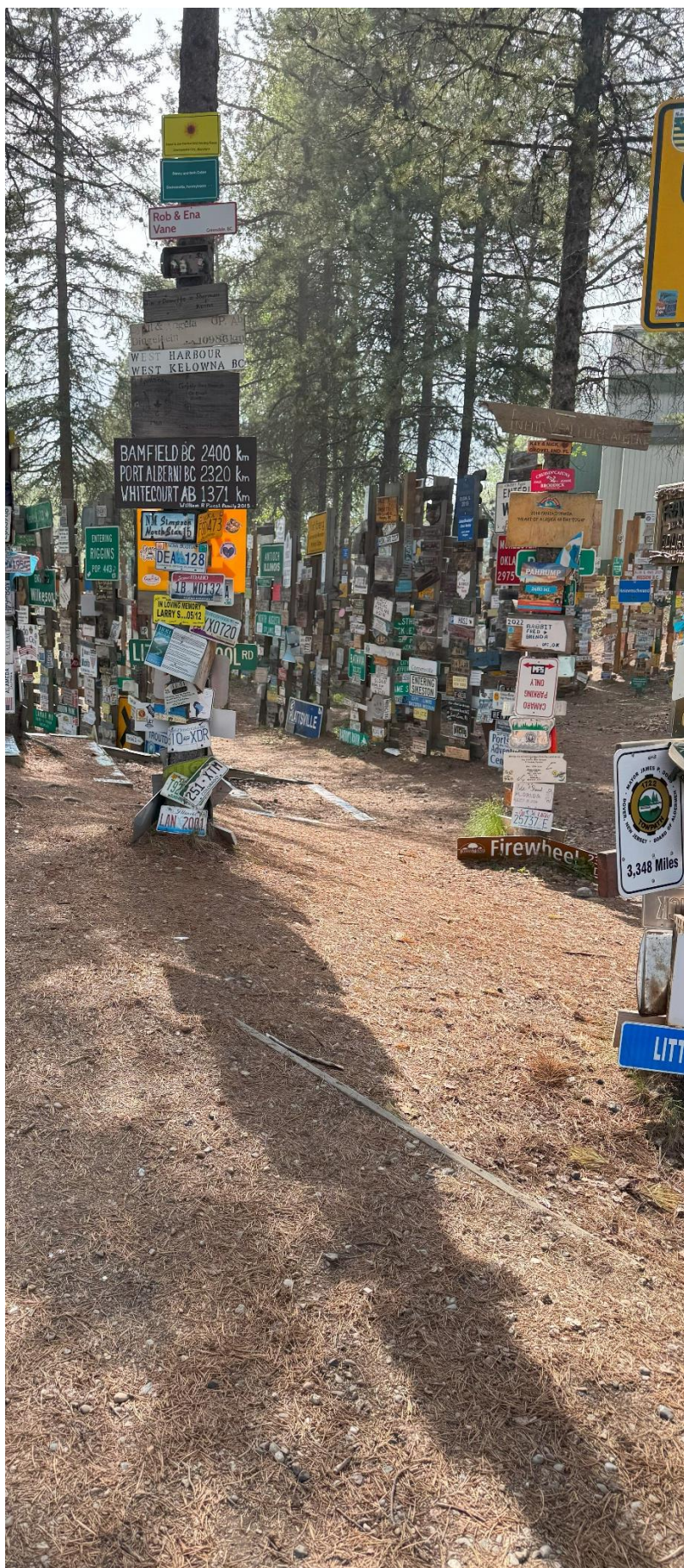


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1. EXECUTIVE SUMMARY

To support the progressive improvement of energy efficiency in new buildings and the transition toward net-zero-energy-ready (NZER) construction through building codes, the Government of Yukon engaged Andrew Pride Consulting to identify opportunities and challenges associated with achieving this objective.

The project involved several components, including a cross-country jurisdictional scan, technical engagements with industry stakeholders and partners, and developing a plan to accelerate to NZER.

The cross jurisdictional scan revealed that all provinces and territories are implementing a harmonized approach to the building codes, including the energy codes. The energy codes, the National Energy Code of Canada for Buildings (NECB)¹ and Section 9.36. of the National Building Code (NBC)², provide a tiered system for energy compliance with the lowest performance being Tier 1, elevating to Tier 4 (NECB) and Tier 5 (NBC) for the highest performance. Those top tiers are a proxy for NZER. Most provinces have selected their performance tier, or tiers, and many, like the Yukon, are considering how higher tiers may be adopted. It will take time for Canada-wide harmonization of energy efficiency in new buildings. The Yukon's approach is generally aligned with leading jurisdictions, such as British Columbia and most Atlantic provinces, and ahead of many provinces like those in the Prairies.

The technical engagements consisted of several early discussions with the industry followed by in-person workshops. The workshops were conducted in the Whitehorse area, where most new buildings are constructed; and to understand the rural and remote perspective, in Dawson City and in Watson Lake. Over 40 people from 25 organizations participated in the engagements.

The strong sentiment from the industry was that it is prepared to accelerate to NZER as long as certain barriers were addressed. Most participants believed that having

¹ NECB applies to all building types, however, residential buildings 3 storeys or less with a footprint of less than 600m² may use the NBC Section 9.36.

² NBC energy requirements in Section 9.36. are primarily applicable to residential buildings 3 storeys or less with footprint less than 600m².

progressive and predictable regulations, with adequate advance notice (i.e., 6-18 months), would greatly assist in ensuring that the path is set and achieved across the territory. The Whitehorse area has greater access to tools, technology, and personnel than those outside of the city, which creates a clearer, and quicker, path for energy efficiency in and around the city.

A SWOT analysis of accelerating to NZER in the Yukon was conducted based on the information gathered from research and engagements.

The strengths include:

- ✓ Currently achieving strong results
- ✓ Engaged builder community
- ✓ Relatively small number of homes per year
- ✓ Air tightness testing standard
- ✓ Government control of most new commercial/institutional building developments

Identified weaknesses were:

- ◆ Geographical separation of northern communities, and, generally, areas outside Whitehorse
- ◆ Limited supplier and trade networks
- ◆ Maintenance of high-tech systems
- ◆ Low understanding of non-energy benefits

Opportunities for consideration are:

- ❖ Incentive programs
- ❖ Government distribution of vacant land
- ❖ Leverage high cost of energy to drive high energy efficiency in buildings

Threats to achieving the goal are:

- ◆ Electricity supply shortage/ Connection challenges
- ◆ Diesel-fueled electricity
- ◆ Misunderstanding of “Ready” aspect of NZER

The starting point on the Yukon’s energy efficiency journey is advanced. About a decade ago, the City of Whitehorse enacted a by-law requiring all new buildings to implement several energy efficiency measures. Based on analysis of over 1,500 homes tested under the EnerGuide rating system, in the Yukon, new homes in the Whitehorse area are achieving Tier 3, with over 85% achieving tier 4 or 5. The balance of the

territory, based on those voluntarily tested using the EnerGuide rating system, is following closely with all but one home achieving Tier 3 or higher.

As the City of Whitehorse already has a by-law requiring performance equivalent to Tier 3 and the average new home is performing at Tier 4, it may be possible to have a more accelerated progression through the tiers for low-rise homes. This will give the industry outside of the city the ability to benefit from the leadership and insights gained in Whitehorse, as has been the trend over the past decade.

For most larger buildings, such as commercial buildings, multi-residential, and community centres, savings of 50% or higher are being achieved, which is at or above Tier 3 of the NECB. Thus, this analysis indicates a Tier 2 starting point for larger buildings could be achievable, given the already highly energy efficient building designs. This is equivalent to performance of the neighbouring capital City of Yellowknife in the Northwest Territories.

The plan is contingent on certain activities being conducted to help transition through the energy tiers. This discussion paper dives deeper into several activities to support the energy code progress. The key and urgent activities are:

- Develop training material specific to the design and construction of energy efficient buildings in the Yukon.
- Develop a program to encourage and retain more skilled trades available across the territory.
- Continued collaboration with the electricity supply chain, identifying and resolving capacity constraints.
- Review incentive structure to realign it with the highest energy efficiency tiers, with a refresh in advance of enforcing NBC Tier 5 across the territory.

There were also some edge cases that should be reviewed and potentially provided with an exception from the highest NBC tier until their unique cases can be appropriately addressed. These exceptions are expected to be minimal and include situations where wood-burning stoves are used to heat homes, and where electricity supply is constrained (i.e., on diesel-powered grids). Also needing specific attention are log homes and buildings with historical zoning restrictions (e.g., in Dawson City).

Overall, the Yukon is currently achieving relatively high levels of building energy performance compared to many Canadian jurisdictions. Enshrining progressive energy tiers in building code regulations is achievable if barriers are managed and stakeholders and partners remain engaged.



2. INTRODUCTION

The Government of Yukon is looking to assess and identify needs, concerns, opportunities and barriers associated with the application of the highest energy tiers within the building codes. The Department of Energy, Mines and Resources has contracted Andrew Pride Consulting. They designed and implemented targeted and technical engagements; a jurisdictional scan of legislation and regulation related to tiered-energy building codes and will provide three reports, including this discussion paper, from the collected information. These reports will be incorporated into a plan that will help inform government direction on implementing building codes. The technical engagement took place from April to June 2025. This report represents the findings from the research and technical engagements. Two subsequent reports were prepared with recommendations to the Government of Yukon on how to support adopting the highest energy performance level in the codes, equivalent to net-zero energy ready.

TARGETED AND TECHNICAL ENGAGEMENT

The technical engagements received input from groups that have been identified as partners and stakeholders related to the building industry. The information gathered during the engagement will help develop definitions of 'net-zero energy ready' for residential and commercial buildings in the Yukon context.



The information gathered was also used to identify or determine the following:

- The supports that industry and government will need to be able to meet each performance tier of the National Building Code of Canada (NBC) and National Energy Code of Canada for Buildings (NECB).
- Critical issues or barriers to adopting the performance tiers of the NBC or the NECB in the Yukon.



3. CROSS-CANADA JURISDICTIONAL SCAN

3.1. Energy Compliance Tiers

The 2020 editions of the NBC and NECB include the introduction of progressive performance tiers to provide a framework to achieve higher levels of efficiency. Authorities having jurisdiction can adopt and increase energy efficiency performance levels at their own pace and set a predictable roadmap for industry to move to higher performance. The five energy performance tiers for homes and small buildings (NBC, Section 9.36.) and four energy performance tiers for large buildings (NECB) are illustrated in *Figure 1: National Codes - Required Performance for Each Energy Tier*.

Energy codes are an important tool for governments to improve building energy performance and to deliver carbon emission reductions. Advancing to the higher tiers is seen as one way to achieve those policy goals, in addition to delivering valuable savings to homeowners, tenants, and building operators. In support of accelerated performance, Natural Resources Canada (NRCan) developed and launched the \$100 million Codes Acceleration Fund in January 2023 and an additional \$30 million in late 2024, to build code capacity and support for provinces, territories, cities, and other stakeholders. As a result of the federal funding several provinces and territories are developing roadmaps to support adoption of higher energy tiers.

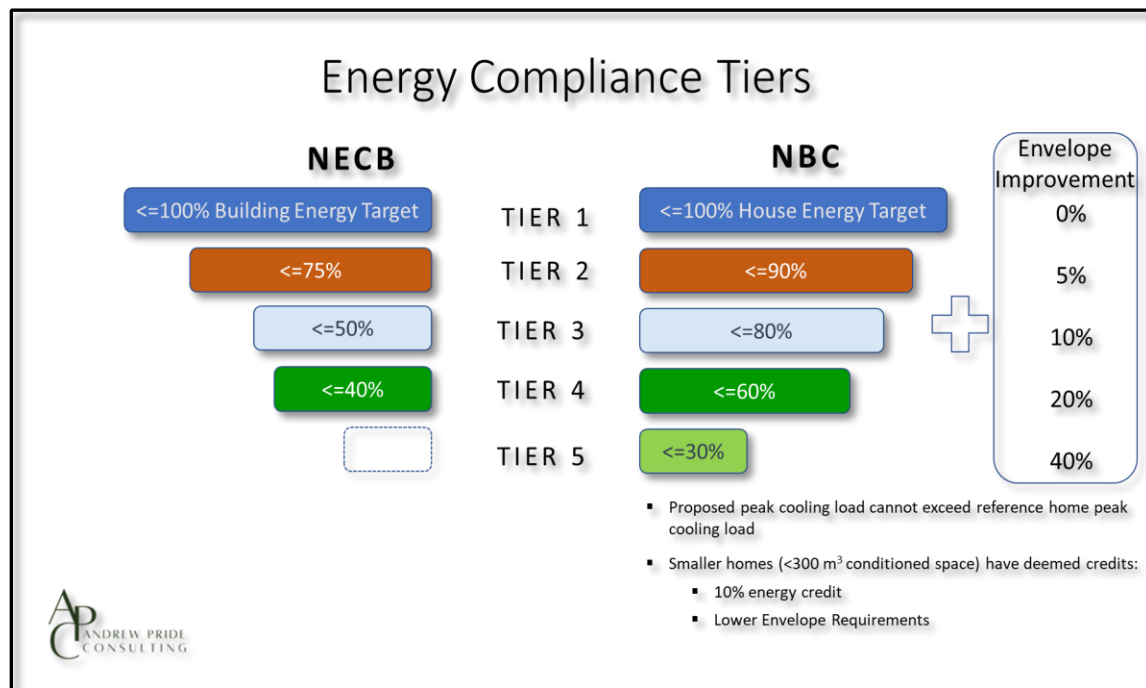


Figure 1: National Codes - Required Performance for Each Energy Tier

3.2. Cautions and Limitations

The cross-Canada jurisdictional scan was developed in 2025 using online resources, the author's experience with energy codes, and requested email confirmations from each province and territory. As noted earlier, there is a lot of activity at the provincial and territorial level to develop acceleration plans. Therefore, the findings which reflect today's reality may change over the coming year. The Yukon data includes some 2026 updates.

3.3. Findings

3.3.1. Energy Tier Adoption

As part of the 2019 Reconciliation Agreement on Construction Codes, each province and territory has committed to align with the national codes, including the energy codes. However, a province or territory may choose to vary with justification. As a result of the variance provision, some jurisdictions will not be adopting energy codes, some will only adopt one of NBC Section 9.36. or NECB, and some will limit the number of tiers available.

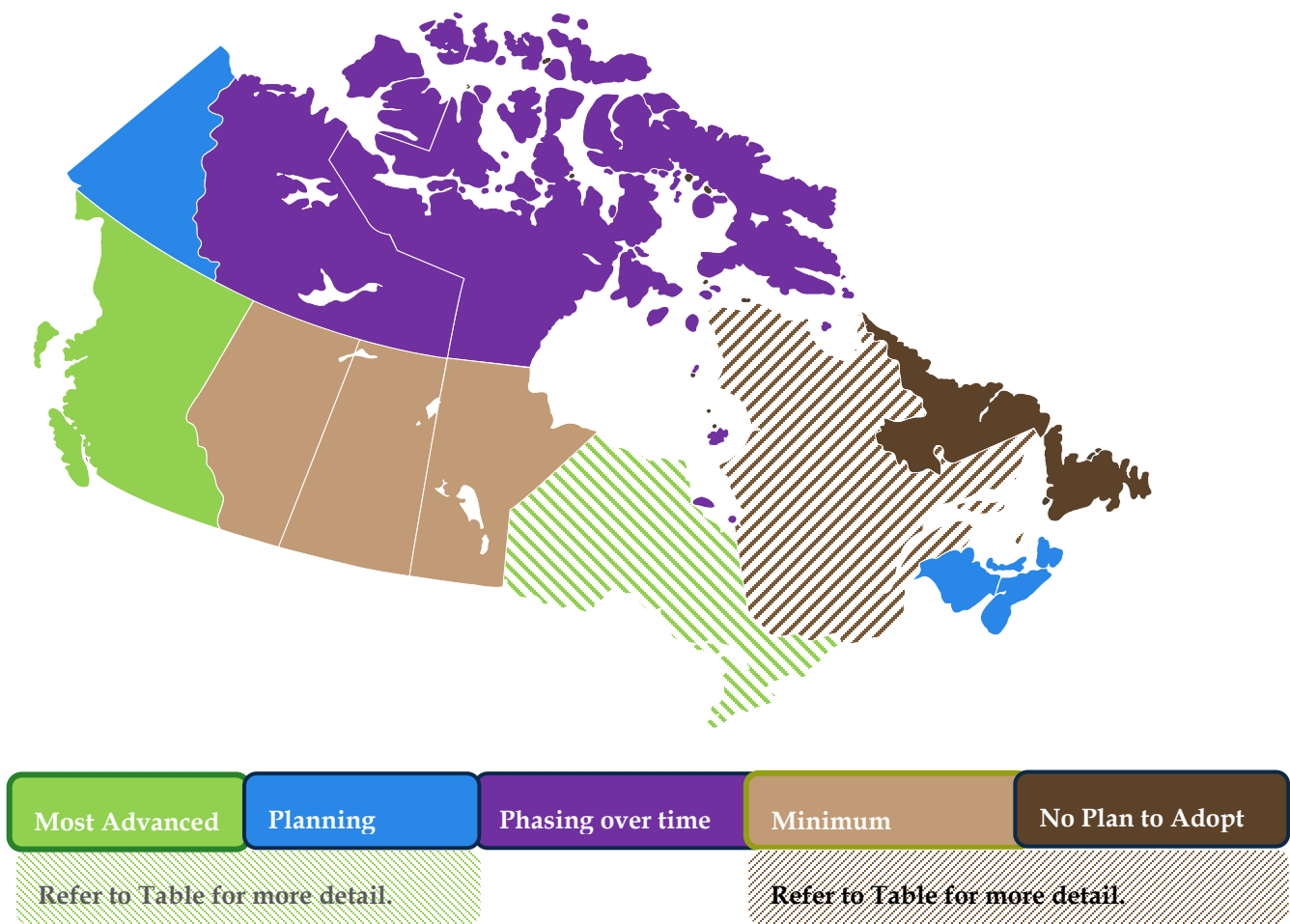


Figure 2: Illustration of Jurisdictional Energy Code Progress Across Canada

Figures 2, 3, and 4 summarize the adoption level anticipated for each province and territory.

NBC Section 9.36.

	Tier 1 ⁽⁵⁾	Tier 2	Tier 3	Tier 4	Tier 5
Newfoundland and Labrador	current	NO ADOPTION PLANNED			
Nova Scotia	current	2026	2027	TBD	
New Brunswick ⁽¹⁾	current	2025	2027 w/ Level B	2029 w/ Level A	2032 w/ Level A
Prince Edward Island	current	2027	FEASIBILITY STUDY IN 2025/2026		
Québec	current	NO ADOPTION PLANNED			
Ontario	-	-	OBC-SB12 ⁽²⁾	TBD	
Manitoba	current	ROADMAP UNDERWAY			TBD
Saskatchewan	current		TBD	Jan-27	TBD
Alberta	current				
British Columbia	-	-	current	TBD	2032
Yukon	current	-	CoW ⁽³⁾	TBD	
Northwest Territories ⁽⁴⁾	current	2025	CoY ⁽³⁾	2025	2025
Nunavut	TBD				
Table Notes: (1) New Brunswick is expected to also add progressive operational GHG Levels (2) OBC-SB12 is approximately equivalent to NBC-Tier 3 (3) City of Whitehorse(CoW) and City of Yellowknife(CoY) have by-laws approximately equivalent to Tier 3 (4) Norwest Territories adopted all tiers without a specific minimum criterion (5) Baseline energy performance level in the NBC was established in 2012 and has not significantly improved since that time.					

Figure 3: Planned Energy Tier Performance for Part 9 buildings By Province and Territory

NECB

	Tier 1 ⁽⁴⁾	Tier 2	Tier 3	Tier 4
Newfoundland and Labrador	NO ADOPTION PLANNED			
Nova Scotia	current	2027	2029	TBD
New Brunswick ⁽¹⁾	current	2027 w/ Level D	2029 w/ Level C	2032 w/ Level C
Prince Edward Island	current	2027	FEASIBILITY STUDY IN 2025/2026	
Quebec	current	NO ADOPTION PLANNED		
Ontario	OBC-SB10 ⁽²⁾	TBD		
Manitoba	current	ROADMAP UNDERWAY		2029
Saskatchewan	current			2029
Alberta	current			
British Columbia	-	current	TBD	2032
Yukon	N/A	TBD		
Northwest Territories ⁽³⁾	NO ADOPTION PLANNED			
Nunavut	TBD			
Table Notes:				
(1) New Brunswick is expected to also add progressive operational GHG Levels				
(2) OBC-SB10 is equivalent to NECB 2015/2017 editions – slightly lower performance than NECB 2020				
(3) City of Yellowknife enforces NECB Tier 2				
(4) NECB baseline has seen continuous improvement from 2011 to 2020 editions of the code				

Figure 4: Planned Energy Tier Performance for buildings, excluding Part 9, By Province and Territory

The Province of Newfoundland and Labrador does not plan, at this stage, on provincially adopting the national energy tiers. Instead, they allow their municipalities to establish energy performance requirements that work for their local communities. The City of St. John's is currently reviewing an accelerated adoption plan.

The other Atlantic provinces are mostly in stride with each other. New Brunswick had the most developed roadmap that includes accelerated energy and emission trajectories (Emission Levels will be introduced in the 2025 editions of the national codes³). Nova Scotia has established the next steps for energy efficiency in new construction enabling the industry to have a transparent view as to upcoming expectations. Prince Edward Island has a clear plan toward the highest tiers, however, they are currently engaged in a feasibility study to confirm those steps.

Québec has taken a different approach for their energy codes. They have adopted the 2020 editions of NBC and NECB, however, without a specific tier. Their 2030 green economy plan⁴ calls for the implementation of a system for reporting and rating environmental performance of buildings. This environmental disclosure program will address both new and existing buildings. For buildings outside of the environmental disclosure program, mostly residential buildings, the province has teamed up with Hydro-Québec to develop an information program geared towards informing homeowners of energy use. It is expected that this information will also be available when selling a home, apartment or building. Further, the plan calls for a sustainability code that will establish environmental performance standards for all buildings under renovation or new construction.

The Province of Ontario, one of the early leaders in energy efficiency for new construction, has yet to adopt the energy tiers. At this stage they remain at the performance levels set out in the Ontario Building Code Supplementary Standards SB-10 and SB-12. SB-10, for larger buildings (i.e., not-Part 9), references the 2015 edition of the NECB with a few enhancements, which results in higher energy consumption than Tier 1 building constructed under NECB 2020. SB-12 for Part 9 housing and small

³ For more detail on operational greenhouse gas emissions for the 2025 code please refer to the following link: <https://nrc-publications.canada.ca/>

⁴ Plan de mise en œuvre 2024-2029 du Plan pour une économie verte 2030, QC Plan pour une économie verte 2030

buildings, has a performance level approximately equivalent to Tier 3 of the 2020 NBC. It is anticipated that Ontario will adopt the tiered system in the next few years.

The Prairie Provinces remain at the lowest of energy performance levels in Canada. Manitoba, which used to be a leader in energy efficiency for new housing, reset both their energy performance levels in code to start at Tier 1. They are currently conducting a roadmap exercise to understand when they should advance to higher tiers.

Saskatchewan initially started out with a Tier 2 energy performance level; however, they decided to step back to Tier 1 to allow industry time to prepare for higher tiers. Alberta also adopted Tier 1 and will await industry signals prior to advancing their tiers.

British Columbia (BC) was the provincial trend setter with the 2017 launch of the Energy Step Code. Prior to 2017, each municipality could adopt their own energy performance requirements. This led to market confusion as there was inconsistency between jurisdictions within the province. The Energy Step Code introduced multiple tiers, called steps, from which each local jurisdiction could select. The municipalities were required to adopt the minimum established by the province or choose a higher step offered in the Energy Step Code. This provided clarity and predictability for the industry. The Energy Step Code was developed under the CleanBC strategy. The province's high performance code requirements and its advancement to net zero energy ready by 2032 were a result of CleanBC. At present, the province is reviewing CleanBC⁵. This could lead to further changes in their energy and carbon codes.

The territories are also reviewing their energy performance requirements in the building code. Nunavut is currently reviewing which performance level, if any, they will incorporate into code. The Northwest Territories has adopted all tiers allowing municipalities to select their own performance levels. The Government of Yukon is currently assessing their performance level through a planning exercise (to which this scan is a part). Interestingly, the two major territorial cities, City of Whitehorse (CoW) and City of Yellowknife (CoY), have both adopted energy provisions in their by-laws for new construction. Both by-laws require energy performance levels that approximate Tier 3 for low-rise buildings; and CoY also requires Tier 2 performance under the NECB.

⁵ [BC Gov News](#), *CleanBC review launched to strengthen climate action, results for people*

3.3.2. Definition of Net-Zero Energy Ready

Net-zero energy is a relatively vague term used to describe a building whose annual energy consumption is offset by renewable energy production. Net-zero energy *ready* describes a building whose annual energy consumption *could* be offset by renewable energy production, if, or when, a renewable energy system supplies power to the building. The term “net” implies that the renewable energy does not need to be coincident with the minute-by-minute energy used. Most commonly, net refers to the average energy used in a year being offset by the average energy produced in a year. The bigger question in the definition comes down to the technical requirements to meet “net-zero energy”. The national code system effectively side-steps the definition by not having it as a defined term. The top tiers are anticipated to be equal to the performance of a net-zero energy building.

Looking across the country, there are a limited number of provinces or territories that have defined net-zero energy ready. *Figure 5: Net Zero Energy Ready Definitions, Variations Across Canada* outlines a sampling of those territories, provinces, or cities that have offered a definition. Based on the scan, there are a few elements to the definition that one could consider, including:

- Is the top tier of the energy codes for buildings sufficient to qualify as net-zero energy ready?
- Does the future renewable energy need to be produced on-site? Could off-site renewables or community renewable energy satisfy the definition? If you have a clean grid (i.e., non-emitting sources used to provide electricity), is it important to have the on-site renewables?
- Should the building include designs and wiring to support the future installation of renewable energy?
- Building on the last point, does the infrastructure (such as the electricity grid) need to be ready to support the installation of renewable energy?

These questions were fed into the stakeholder engagement process to gain a perspective from the Yukon industry.

<i>Jurisdiction</i>	Definition of Net Zero Energy Ready	Defining terms
<i>British Columbia</i>	The energy required to operate a net-zero energy building is supplied by on-site renewables.	On-site renewables
<i>New Brunswick</i>	Net-zero energy ready construction: Buildings and homes that are built to the highest energy efficiency standards, and when combined with renewable energy generation, consume only as much energy as can be produced onsite through renewable resources.	Highest energy efficiency standards
<i>Yukon</i>	Net Zero Energy Ready (NZER) is defined as a building - that achieves the highest energy tier of the national model codes; and - that can offset its modeled annual energy use with renewable energy produced on-site or in the local community.	Highest level of national model energy codes
<i>Saskatoon, SK</i>	Net Zero Energy housing is defined by Natural Resources Canada as producing at least as much energy as it consumes on an annual basis. Net Zero Ready homes are designed and built to the same high energy efficiency standards as Net Zero Energy homes. The only difference is that Net Zero Ready homes are designed and wired so that solar panels can be easily installed in the future to become a Net Zero Energy home when the homeowner is able to add the solar panel system.	Designed and wired for future solar panels
<i>Halifax, NS</i>	Net-zero ready means reducing building energy consumption by 50% as compared to the 2017 National Energy Code for Buildings and maximizing on-site renewable generation, with the intention to purchase off-site renewables or carbon offsets as they become available to achieve net-zero.	50% reduction Off-site renewables
<i>St. John's, NL</i>	Net Zero Energy Ready (NZER) is a highly energy efficient building that minimizes energy use such that on-site or community renewables or energy from a clean grid can be used to reach NZE.	On-site or community renewables, or clean grid

Figure 5: Net Zero Energy Ready Definitions, Variations Across Canada

3.3.3. Governance of Energy Related Aspects of Building Codes

The provinces and territories, in general, are moving forward with plans to adopt the 2020 NECB and NBC, including energy performance requirements. Implementation dates and the scale of ambition vary greatly between provinces and territories, and some are reluctant or do not have the time, to adopt the energy efficiency requirements.

There are a variety of regulatory procedures followed by each jurisdiction. Most new houses and small buildings are regulated through a Municipalities Act, Building Code Act, or similar Act. Regulatory responsibility for building codes can also differ between jurisdictions. Further, there can be different departments responsible for NBC and NECB buildings. In addition, overarching climate policies may be administered by yet another department which could also impact or influence codes. *Figure 6: Overview of Energy Code Policy and Regulations by Province and Territory* provides a summary of each jurisdiction's Policy, Acts, and Regulations as it relates to energy codes.

With respect to building codes, provinces and territories do not share a common policy framework or direction for energy performance. Further, not all provinces and territories have adopted regulations for energy codes. Most provinces and territories often shuffle, rename, or completely revamp ministries, departments, and branches; as such it is challenging for industry to keep up with who is creating and enforcing the regulations.

When it comes to aligning energy codes, regulations, and climate policies, several jurisdictions have alignment between departments and ministries. British Columbia (BC) rallied under the CleanBC policy framework to have each ministry/department (municipal affairs and housing, and energy and climate solutions) participate in energy, and now carbon, codes.

Other jurisdictions have a dominant ministry with support from others. Nova Scotia's office of the fire marshal is responsible for all codes and often receives support from their department of growth and development and department of energy.

In New Brunswick, the Ministry of Justice and Public Safety handles all building and energy codes (formerly under the purview of the Ministry of Land, Community, and Housing, which no longer exists), whereas the climate change secretariat will manage the GHG action plan.

Energy and climate policies can differ from safety codes. Alberta takes a streamlined approach where all code and inspection groups are aligned under the Ministry of Municipal Affairs. Climate Change policies, however, fall within the Ministry of the Environment and Protected Areas.

In PEI, the Ministry of Environment, Energy, and Climate Action are looking to publicly advance to higher efficiency, however, codes are under the purview of the Ministry of Housing, Land, and Communities. Similarly, Manitoba's Department of Labour is responsible for codes and consults with the Ministry of Environment and Climate Change and Efficiency Manitoba (the agency responsible for Manitoba's energy efficiency programs) as part of their stakeholder outreach.

Although Newfoundland and Labrador's Climate Plan calls for the adoption of the NECB, the jurisdiction indicated that they do not intend to provincially regulate energy use in buildings in the near term. However, the province does enable their cities and municipalities to regulate energy use. St. John's, the largest city in the province by population, confirmed it will adopt Tier 1 of the 2020 Building Code and is reviewing Tiers for the NECB.

Québec is also not planning to adopt province-wide energy performance tiers. Under their governance structure, cities and municipalities can establish their own by-laws regulating buildings, including energy use.

Northwest Territories have also indicated that they will not be enforcing tiered energy codes. Nunavut is currently in the review process. While the Yukon and Northwest Territories have not adopted the NECB, their largest cities, Whitehorse and Yellowknife, adopted the most current version of the energy code - the 2020 NECB. In May 2025, the City of Whitehorse removed that explicit requirement to comply with NECB. The by-law does require minimum thermal insulation values; however, they may differ from those required in the NECB. Prior to the 2025 update, the by-law would have required the more stringent of the two insulation values.

Province/Territory	Policy	Act	Administration.^
Newfoundland and Labrador	The Way Forward on Climate Change in Newfoundland and Labrador (2018) <u>publications-the-way-forward-climate-change.pdf (gov.nl.ca)</u>	Municipalities Act <u>assembly.nl.ca</u>	Department of Justice and Public Safety
Nova Scotia	Our Climate, Our Future: Nova Scotia's Climate Change Plan for Clean Growth (2022) <u>ns-climate-change-plan.pdf (novascotia.ca)</u>	Building Code Act <u>nslegislature.ca</u> & <u>Nova Scotia</u>	Office of the Fire Marshal
New Brunswick	Our Pathway Towards Decarbonization and Climate Resilience: New Brunswick's Climate Change Action Plan 2022-2027 <u>climate-change-action-plan.pdf (gnb.ca)</u>	Building Code Administration Act, 2021 <u>legnb.ca</u> & <u>gnb.ca</u>	Department of Justice and Public Safety
Prince Edward Island	2040 Net Zero Framework: Accelerating Our Transition to a Clean, Sustainable Economy (2022) <u>2040_net_zero_framework_for_feb_23_2022.pdf (princeedwardisland.ca)</u>	Building Codes Act and Regulations <u>princeedwardisland.ca</u> & <u>Government of Prince Edward Island</u>	Ministry of Housing, Land, and Communities
Quebec*	2030 Plan for a Green Economy (2020) <u>Implementation Plan Gouvernement du Québec (quebec.ca)</u>	Buildings Act, <u>gouv.qc.ca</u>	Régie du bâtiment du Québec
Ontario	N/A	Building Code Act	Ministry of Municipal Affairs and Housing
Manitoba	Manitoba's Climate and Green Plan (2017) <u>A Made-in-Manitoba Climate and Green Plan : Hearing from Manitobans (gov.mb.ca)</u>	Buildings Act <u>gov.mb.ca</u>	Department of Labour and Immigration (Inspection and Technical Services)

Saskatchewan	Prairie Resilience: Saskatchewan's Climate Change Strategy (2017) <u>Saskatchewan's Climate Change Strategy Climate Resilience in Saskatchewan Government of Saskatchewan</u>	The Construction Codes Act <u>Government of Saskatchewan</u>	Ministry of Government Relations
Alberta	Alberta emissions reduction and energy development plan (2023) <u>Emissions Reduction and Energy Development Plan Alberta.ca</u>	Safety Codes Act <u>Alberta.ca</u>	Building Code Regulation administered by Municipal Affairs
British Columbia	CleanBC Plan - our nature. our power. our future. (2018) <u>cleanbc_roadmap_2030.pdf (gov.bc.ca)</u>	Building Act <u>gov.bc.ca</u>	Construction Standards and Digital Solutions Branch
Yukon	Currently under review	Buildings Standards Act <u>yukon.ca</u> & <u>Government of Yukon</u>	Community Services
Northwest Territories	2030 ENERGY STRATEGY A Path to More Affordable, Secure and Sustainable Energy in the Northwest Territories (2018) <u>gnwt_inf_7272_energy_strategy_web-eng.pdf (gov.nt.ca)</u>	NBC - Fire Prevention Act, or Good Building Practice for Northern Facilities <u>gov.nt.ca</u> <u>3789-gnwt_infrastructure-good_practises_manual_april07_web.pdf (gov.nt.ca)</u>	Department of Infrastructure (through proposals circulated to Minister for registered regulation)
Nunavut	IKUMMATIIT: The Government of Nunavut Energy Strategy (2007) <u>ikummatiit_energy_strategy_english.pdf (gov.nu.ca)</u>	Building Code Act <u>gov.nu.ca</u>	Department of Community Services

Table notes: ^Provinces and Territories may change departments responsible for building code regulations

* In Québec, housing falls under each municipality to regulate (this table only applies to Part 3 buildings in Québec).

Figure 6: Overview of Energy Code Policy and Regulations by Province and Territory

3.3.4. Role of the Municipality

While most provinces and territories establish a minimum energy performance in code, some also enable municipalities to establish their own set of requirements through by-laws. *Figure 7: Municipalities with Authority to Enact By-Laws Exceeding Provincial Building Code Minimums* summarizes the authority provided to municipalities. However, municipalities cannot set energy efficiency standards lower than those of the province or territory.

Charter Cities (Vancouver, Calgary, Edmonton, Winnipeg, Montreal, Saint John) have been granted certain additional powers and independence to enact their own by-laws. Only the City of Vancouver has used their charter city status to pilot new energy performance levels through the creation of the Energy Step Code, which was later adapted by the province. Other municipalities have used their zoning by-laws to encourage higher energy performance, such as the Toronto Green Standard and various other green development standards across the country.

Province/ Territory	Authority to increase stringency of code requirements	Must not deviate from minimum PT level	Notes
Newfoundland and Labrador	√		
Nova Scotia		√	May increase performance level with Minister's approval
New Brunswick		√	
Prince Edward Island	√		
Quebec	√		Energy tiers are being removed from code.
Ontario		√	

Manitoba		√	
Saskatchewan	√		
Alberta		√	
British Columbia	√		May only adopt national tiers (provincial steps)
Yukon	√		Territory does not include NECB in the code
Northwest Territories		√	Territory does not include NECB in the code
Nunavut	√		

Figure 7: Municipalities with Authority to Enact By-Laws Exceeding Provincial Building Code Minimums

3.3.5. Programs to Support Codes

Sporadic programs are available across the country to support the new construction industry. The eligibility and application for each varies greatly and can often be combined with other initiatives and programs (such as renewable energy and electrified transportation). *Figure 8: Sample of Programs to Support Energy Efficiency in New Construction* shows a sample of programs available in Canadian jurisdictions. The links have been provided for each program to provide additional detail and because they are frequently updated.

Generally, British Columbia has the broadest array of support tools (programs and outreach) for the new construction industry. This was an intentional effort that resulted from the creation and evolution of the Energy Step Code. Many of the jurisdictions have now modified their incentive programs to match the national energy codes, where previously they were a variety of approaches mostly based on a “%-better-than” code-built homes and buildings.

<i>Jurisdiction</i>	Support Programs	Potential Incentive	Notes
<i>Prince Edward Island</i>	<u>New Home Construction Incentives Government of Prince Edward Island</u>	\$2,000-\$16,000/home	Scaled to each NBC Energy Tier.
<i>Québec</i>	<u>Novoclimat program description Gouvernement du Québec</u>	\$3,500-\$6,500/home	Split between contractor and home buyer, scaled higher for 1st time home buyer. Plus, mortgage rebates.
<i>Ontario</i>	<u>Net Zero Energy Ready Homes Ontario Enbridge Gas</u>	\$1,650/home	Only available in certain municipalities and may include a design charrette. Additional incentive for one NZER home per builder.
<i>Saskatchewan</i>	<u>Homes Beyond Code - Home Builder Rebate SaskEnergy.</u>	\$3,000-\$9,000/home	Home buyer incentive scaled for each Tier 3, 4, or 5. Plus \$800 for the builder.
<i>British Columbia</i>	<u>Checklists and resources for energy and carbon step codes - Province of British Columbia</u>	-	Non-financial support for builders.
<i>Yukon</i>	2026 UPDATE – https://yukon.ca/en/good-energy-rebates <u>Apply for a rebate to reduce home electricity use Yukon.ca</u>	\$12,500 for tier 5 homes \$2,000 for tier 4 homes	Incentives now aligned to energy tiers. Also, incentives are available for heat pumps and other prescriptive measures including grid reliability measures.

Figure 8: Sample of Programs to Support Energy Efficiency in New Construction



4. WHAT WE HEARD

4.1. Methodology

Stakeholder and partner engagement is critical to accelerating energy performance in building codes. Advance interviews were conducted with seventeen industry representatives from the Yukon to provide information on the construction industry and the history of energy efficiency in the territory. Those conversations and the jurisdictional scan helped to inform broader industry workshops. Four in-person workshops were delivered: two workshops in Whitehorse, the hub of new construction; the other two took place in Dawson City and Watson Lake, capturing more rural and remote viewpoints.

This section summarizes the findings from the workshop and surveys and reflects suggestions made by participants.

4.1.1. Participating Organizations

Over 40 people from 25 organizations participated in the workshops and survey. Representative's stakeholder and partners organizations included in *Figure 9: Stakeholder and Partner Participants in Technical Engagements*.

Industry	Government	First Nations
ATCO Electric Yukon	City of Whitehorse	Champagne and Aishihik First Nations
Earthrise Building Services	The Government of Yukon (YG)	First Kaska
INRS	YG Building Safety	Liard First Nation
Kilrich Building Centres	YG Energy Solutions Centre	Little Salmon Carmacks First Nation
Kobayashi + Zedda Architects	YG Highways and Public Works	Selkirk First Nation
Northern Windows & Doors	YG Property Management	Tr'ondëk Hwëch'in
Olsen's Resource Consulting		
Sands construction Inc		
Self Employed		
Stantec Architecture Ltd		
Streamline Architects		
Vogt Homes		
Walker Home Construction		

Figure 9: Stakeholder and Partner Participants in Technical Engagements

4.2. Net Zero Energy Ready

Participants provided feedback on the definition of Net Zero Energy Ready (NZER). Almost all believe that NZER buildings need to achieve the energy performance of the highest Tier in Code. It was strongly believed that each building, or at least each community, must be able to provide renewable energy to offset the building's energy consumption.

There was a mix of opinions prioritizing the importance of:

- a) Providing sizing calculations for renewable sources to offset the modelled energy consumption.
- b) Providing specifications and drawings that include a rough-in for the future installation of renewable energy.

In addition, a few believe that for a building to be considered NZER, it should also:

- c) Have structural reinforcements needed to accommodate the weight of roof-top renewables (such as photovoltaic cells).
- d) Have an engineering or utility opinion that the electrical infrastructure supplying the home or building was capable and sufficient for on-site renewable energy.

4.3. Barriers and Challenges

Summary of Barriers

- Cost/Affordability
- Electricity system limitations and reliability
- Logistics outside Whitehorse are more complex
- Trade and energy assessor availability and experience are more available in Whitehorse, less so outside the city
- New technology
 - maintenance requirements
 - consumer knowledge of energy mechanical systems
- Oil heating, which has limited efficiency alternatives, is often installed outside of Whitehorse
- People do not normally buy based on energy savings
- Trades learning curve
- Lack of understanding of how to build to higher tiers

- Lack of consistent measurement and reporting
- Performance of commercial buildings – actual may not reflect modelled

4.4. Opportunities

Summary of Opportunities

- Build on current performance
- Government leadership across territory by government funded buildings achieving highest tier
- Lots of solutions for commercial buildings to achieve top tier/NZER
- Supplier engagement
- Leverage land allocation methodology, increasing land allocations for builder commitment to highest tiers
- Support local communities in developing and delivering NZER buildings
- Government leadership (require all new gov't buildings to be NZER)
- Valuing and Marketing energy savings
- Articulate non-energy benefits (comfort, convenience, no oil tanks, air quality, etc.)
- Government funding (market the incentive programs)
- Provide data to support savings
- Use utility bills to communicate benefits of energy efficiency
- Defining Net Zero Energy Ready
- Predictable regulations

4.5. Solutions Proposed by Participants

Summary of Proposed Solutions

- Predictable and Timely Regulations
 - Mandate higher NBC tiers in stages (voluntary use of higher tiers to start)
 - Mandate NECB at highest tier
 - Mandate air leakage testing in all new homes and buildings
 - Builder and designer qualifications (responsibility and accountability)
 - Prioritize smaller homes (regulation and incentives)
 - Require publishing of building performance standards

- Mandatory home labeling on resale homes
- Illustrated guidelines for each tier
- Build value proposition for higher tiers
 - Banks and CMHC to provide preferential rates for higher tier performance
- Incentives:
 - Align with tiers
 - prioritize smaller buildings
 - aligned to reflect today's costs
 - paid to person/entity that pays the building cost (needs to translate to lower selling price), could be a split incentive between builder and purchaser/end-user
- Technical
 - Wall assemblies
 - "RDH-style" data sets that show cost/benefit
 - District-energy/energy-from-waste solutions (feasibility and implementation plans)
 - Biomass applications
 - Smart controls for commercial buildings (CO₂ and ventilation)
 - Staging installation to have work year-round (may require extended financing or solutions to keep building warm in winter)
- Commissioning agents and mechanical engineer involved in design (commercial/NECB)
- Marketing
 - education on energy savings (occupant and builders)
 - videos on "how to" operate systems (with link on equipment labels)
 - host information sessions for home occupants related to living in energy efficient houses (e.g., "house calls" program)
- Workforce planning
 - Work with youth in community
 - Trades mentoring program
- Incorporation of tiers in a roadmap and integrated energy planning



5. APPROACH TO NZER CODES

5.1. Introduction

This discussion paper explores the industry sentiment toward the energy efficiency aspects of the building code. There is a general belief that there are opportunities to accelerate energy efficiency in new construction, however, the approach needs to consider several key factors before moving to higher energy performance tiers. This section explores the factors that will help navigate to higher tiers.

5.2. Historical energy performance

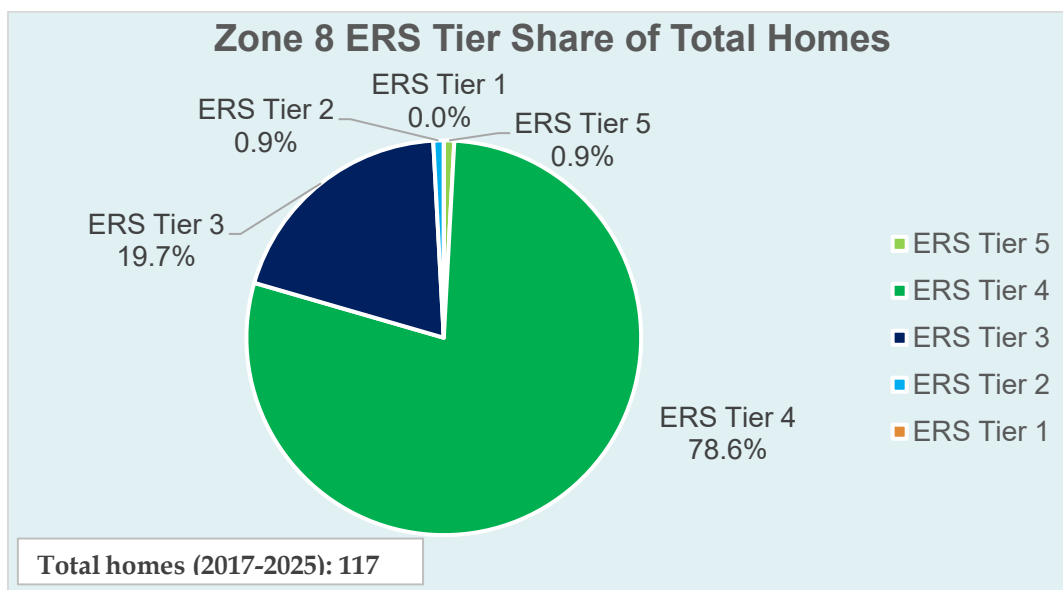
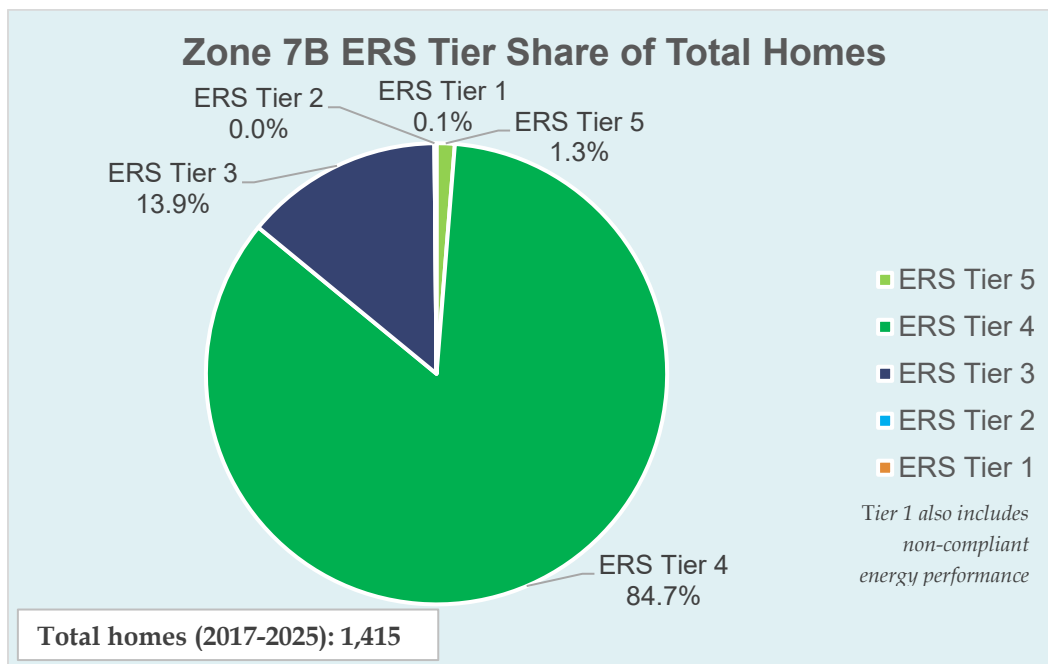
Based on over 1,500 home energy performance ratings over the past decade⁶ (2017-2025), the performance of all but three new homes in the Yukon meets or exceeds Tier 3 or higher. *Figure 10: Historical Energy Performance of New Homes in the Yukon, Presented as Tier-Equivalent by Climate Zone* illustrates the distribution of homes that achieved each tier over the decade. Nineteen homes have already achieved NZER by reaching Tier 5 using ERS⁷. This demonstrates that homes in the Yukon are already progressing towards NZER.

The data also shows that three of the homes tested failed to achieve Tier 3 and less than 15% failed to achieve Tier 4. One of the contributing factors to the positive trends is the City of Whitehorse's Building and Plumbing By-Law 99-50, established in 2016, requiring higher energy efficiency in all buildings constructed in the city. Interestingly, the performance outside the city also improved after the By-Law was enforced; implying that efforts in the major urban centre influenced the balance of the territory.

Anecdotal evidence suggests that most non-residential buildings meet NECB Tier 3 or 4 performance, with reported savings of 50% and higher.

⁶ Datasets provided by NRCan from the EnerGuide rating system database

⁷ ERS is NRCan's EnerGuide Rating System which compares the proposed home to an energy modeled reference home which is the standard methodology for the NBC 2020. In 2025, there is an optional energy use intensity (EUI) compliance path. Charts for EUI compliance will be provided in the subsequent Yukon NZER Report for Part 9 Homes.



ERS Tier	Homes - Z7B	Share	ERS Tier	Homes - Z8	Share
ERS Tier 5	18	1.3%	ERS Tier 5	1	0.9%
ERS Tier 4	1,198	84.7%	ERS Tier 4	92	78.6%
ERS Tier 3	197	13.9%	ERS Tier 3	23	19.7%
ERS Tier 2	0	0.0%	ERS Tier 2	1	0.9%
ERS Tier 1	2	0.1%	ERS Tier 1	0	0.0%
TOTAL	1,415		TOTAL	117	

Figure 10: Historical Energy Performance of New Homes in the Yukon, Presented as Tier-Equivalent by Climate Zone using EnerGuide Rating System Methodology

5.3. Considerations

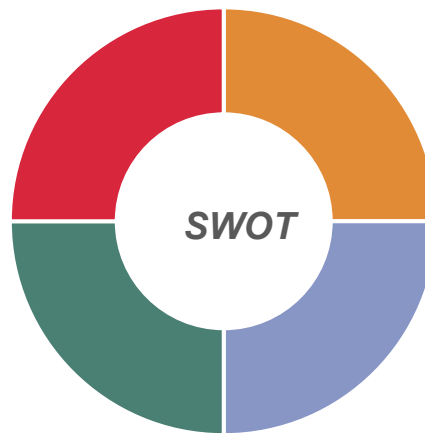
Figure 11: *SWOT Analysis of Industry Readiness for NZER Codes* provides a summary of the strengths, weaknesses, opportunities, and threats (SWOT) associated with the Yukon advancing to the highest tier of the energy codes, which is a proxy for net-zero-energy-ready (NZER).

STRENGTHS

- ◆ Currently achieving strong results
- ◆ Engaged builder community
- ◆ Relatively small number of homes per year
- ◆ Air tightness testing standard
- ◆ Government control of most new commercial/institutional building developments

OPPORTUNITIES

- Incentive programs
- Government distribution of vacant land
- Leverage high cost of energy to drive high energy efficiency in buildings



WEAKNESSES

- Geographical separation of northern communities, and, generally, areas outside Whitehorse
- Limited supplier and trade networks
- Maintenance of high-tech systems
- Low understanding of non-energy benefits

THREATS

- Electricity Supply Shortage/ Connection Challenges
- Diesel-fueled electricity
- Misunderstanding of "Ready" aspect of NZER

Figure 11: *SWOT Analysis of Industry Readiness for NZER Codes*

The SWOT analysis and additional details derived from feedback received during the technical engagements, lead to key activities to be considered for the path to NZER.

Figure 12: *Summary of Key Activities to Achieving NZER in Codes* summarizes those key activities, which are further expanded in this subsection. Most of the considerations apply to both housing and large buildings. Certain actions and audiences may change depending on the type of building being constructed, those will be detailed in the subsequent NZER reports for each of Part 9 housing and larger buildings.

KNOWLEDGE Do we know what and how?		CAPACITY BUILDING Can we build it?	
Clarity 	Technology & Tools 	Training 	Workforce 
Definitions	Systems and Solutions	Energy Advisors	Construction
Benefits	Modeling Resources	Engineers and Architects	Operations
Performance Trends	Illustrated Guides	Project Managers	Suppliers
	Regulations	Building Regulators and Enforcement	
ELECTRICITY SYSTEM			
FINANCIAL			
MARKETING			

Figure 12: Summary of Key Activities to Achieving NZER in Codes

5.3.1. Clarity

Having the industry in the same “headspace” (i.e., with similar level of baseline understanding) will help to alleviate misunderstandings and reduce confusion. Activities under this category include definitions; benefits; and performance trends. Additionally, the technical solutions for building to the highest energy efficiency tiers are numerous. It would be helpful to have information such as a library of technical solutions; energy modeling applications; and illustrated guides in addition to clear and predictable regulations.

DEFINITIONS

Understanding terms and having a common NZER vocabulary was highlighted by most of the workshop participants. The largest concern was the actual definition of NZER. Not that it was difficult to understand, in general, it is more the conditions that one would need to meet to ensure compliance. Additional insight on context for the definition and concerns can be found in 3.3.2 *Definition of Net-Zero Energy Ready* and 4.2 *Net Zero Energy Ready*. Defining additional terminology such as “effective” thermal transmittance (RSI value) and thermal conductivity (u-value) could also assist in keeping the industry aligned and help meet the expected performance requirements in code.

Action 1. Create a database of defined terms to be used in regulations, training, and communications.

BENEFITS

Communicating the benefits of building to higher tiers, or NZER, will assist the industry as well as future homeowners, tenants, and occupants understand why and how NZER is helping. These benefits include the more obvious energy savings, operational greenhouse gas emission reduction, and utility cost savings. However, the non-energy benefits should also be communicated. This would include aspects such as convenience, comfort, health, and reduced operating effort and its associated cost.

Action 2. Develop a list of benefits associated with NZER, including quantification, where applicable.

PERFORMANCE TRENDS

As noted earlier, the energy performance of the average new house in the Yukon is improving compared to the baseline house in NBC Section 9.36. Thanks to the NRCan data, this assertion can be reasonably articulated. For NECB buildings, there is little evidence, other than anecdotal. There is value in understanding how each proposed new building is performing to establish the level of compliance with minimum code and the voluntary take up for higher energy tiers. It would further benefit the industry to understand “how” the building achieved the proposed energy performance (i.e., what group of measures were proposed). As more data is provided and communicated (anonymized), the industry will learn and adapt. It is clear from the technical engagements that the industry in the Yukon is advanced and willing to progress further. Having a formula will greatly assist with accelerated energy efficiency in buildings. Understanding the incremental costs associated with the measure set would also be of benefit, however, there is substantial volatility in cost impacts, and as such cost data should be used cautiously.

Action 3. Develop a system to extract key data from building permits to allow for energy performance trending.

SYSTEMS AND SOLUTIONS

Builders in the Yukon are very familiar with energy efficient construction, particularly with wall assemblies. The City of Whitehorse has mandated air leakage testing in all buildings, which led to much higher performance and a well-trained industry. The same level of technology immersion is needed to advance to NZER - more so in homes than large buildings, however, it still applies to both. The technical engagements identified the following systems that could use additional technical support: Heat pump technology; higher airtightness performance; alternative wall assemblies (particularly for buildings); and smart controls (particularly for commercial buildings). Additional solutions that were discussed included how to manage wood-burning stoves in high-performance homes; and the application of oil or propane heating (for more remote areas).

Action 4. For common NZER solutions, provide illustrated guide or technical briefs for each system.

MODELING RESOURCES

Energy modeling is commonly used to demonstrate system, home, and building performance. Understanding what tools are available and who can run them will help broaden adoption of higher performance tiers for builders who tend to pursue more prescriptive/recipe-oriented construction. Solutions and providers that support remote locations would also be beneficial, as most of the current support personnel are in the Whitehorse area.

Action 5. Develop a list of modeling tools and advisors/consultants to support higher energy efficiency performance.

ILLUSTRATED GUIDES

Often builders and designers are keenly aware of what needs to be constructed to achieve higher tiers in the energy code. However, there can be a knowledge gap between theoretical and practical applications. Both the NECB and NBC have illustrated guides to support use and application of the codes. It may help to tailor a similar guide with a northern perspective to assist in unique details that apply to the colder climates (i.e., Zone 7B, 8, and higher).

Action 6. Consider developing illustrated energy efficiency applications for the Yukon

REGULATIONS

The technical engagement reinforced the message from participants that they see enshrining energy efficiency in territorial regulations as a way to support quicker adoption of higher tiers. Most industry proponents were supportive of this approach; however, they cautioned that the regulations need to be prospectively oriented and not effective immediately. Having a transparent roadmap to higher tiers was viewed as essential for the industry to adapt. Industry participants anecdotally provided a timeline of six to twelve months before a regulation becomes enforceable. Having a document that provides a basis or rationale for the accelerated energy efficiency would help the industry understand why the regulations are being updated.

Action 7. Publish clear timelines for enforcing higher energy tiers.

5.3.2. Capacity Building

The desire for the benefits of improved energy efficiency in homes and buildings is clear in the Yukon. To achieve the top tier requires capacity building. Without suitable industry training there is a concern that advancing too quickly may introduce implementation challenges and unnecessary costs. The capacity building considerations can be split into two categories: industry training and building the workforce.

TRAINING

The training initiatives can be further segmented into audiences taking the training.

Energy advisors or assessors are the team of consultants who assist the builders with calculations of energy efficiency savings and can support the selection of measures to improve overall performance. Many local energy advisors can also provide beneficial services related to product availability and applicability for the specific proposed building. These advisors require up-to-date information and need to be aware of new technologies and solutions. There are many resources already available through Natural Resources Canada and several industry associations.

Typically, energy advisors are focused on housing. There are similar needs to support design of energy efficiency in larger buildings. Most design teams have consultants that are familiar with high-performance buildings and are already designing to Tier 3 and Tier 4 of the NECB. Having training specifically focused on northern climates can be beneficial to ensure the products and solutions are applicable and available for builders in the Yukon.

Project managers and building owner design teams also need training. As much as the architects and engineers can design to meet Tier 4 (NECB) and Tier 5 (NBC), the owner representative needs to specify the higher performance. This leads to training the project managers and owners on the associated benefits, energy and non-energy, of an energy-efficient building.

Action 8. Develop training materials specific to designing and constructing energy efficient buildings in the Yukon.

WORKFORCE

One of the larger concerns raised in the technical engagements was the availability of trades who could build energy-efficient homes and buildings. This is more specific to construction activity outside of Whitehorse, as it was viewed that the city had the needed skilled trades. Often, larger-building construction activity outside of Whitehorse engages trades and suppliers from the city. Once a project is completed, or near completed, the trades tend to return to Whitehorse.

Highly energy efficient homes and buildings typically require a commissioning or final detailed review prior to handover to the owner and occupants. Having skilled trades available throughout the construction cycle was viewed as imperative.

Action 9. Develop a program to encourage and retain more skilled trades available across the territory.

The benefits of energy efficiency don't conclude once a building is constructed and turned over to the building operator, tenants, or homeowners. There is a need to have skilled operators for larger buildings and skilled service personnel for the homes and buildings. There were two schools of thought regarding developing capacity in building operations, one was to recruit and train talent to operate and service buildings, the other was to provide support systems and tools for self-service. Both are likely needed, again more so in areas outside of Whitehorse, than in the city itself.

Action 10. Review the technology being deployed and identify training needs or additional contractors for efficient operation of the building.

The final area of capacity building is within the supply chain. There were concerns raised that products used to improve efficiency are not readily available in the Yukon. An example was energy efficiency rated windows for commercial construction. There is a well-respected window supplier in the Yukon, however, they do not have the breadth of products that may be specified for Tier 4 commercial buildings. Similarly, available mechanical systems, such as cold climate heat pump technology, may not be readily available in the Yukon.

Action 11. Identify new technologies or systems that will facilitate the transition to NZER in the Yukon and develop appropriate supply chain for those products.

5.3.3. Additional Areas for Consideration

There were three overarching themes within the response to the technical engagements. The industry believes there needs to be effort extended to electricity system availability; financial support; and marketing.

ELECTRICITY SYSTEM AVAILABILITY AND RELIABILITY

The electricity generation, transmission, and distribution system in the Yukon varies significantly in availability, cost, and emissions. While much of the territory's buildings are powered by hydroelectric systems, there are still many communities fed from diesel generators. During the technical engagements, it was highlighted that NZER requires a shift towards electrification. This means that electricity needs to be available, reliable, and affordable compared to the alternatives. The Government of Yukon is encouraged to continue collaboration with electricity suppliers (i.e., Yukon Energy, ATCO Electric Yukon) to ensure newly constructed buildings can connect. Specific attention was drawn to the ability to connect renewable energy systems to the grid for those buildings that are looking to be net-zero (i.e., have sufficient renewable energy installed to offset the building's annual energy use).

Action 12. Collaborate with electricity suppliers, identify and resolve capacity constraints.

FINANCIAL SUPPORT

On average, new buildings in the Yukon are performing at Tier 3 and higher. Advancing to Tier 4 (NECB) and Tier 5 (NBC) will require additional capital cost. While most often the life expectancy of energy efficiency measures far exceeds the payback period, many people prioritize initial costs over long-term costs. The Government of Yukon provides incentives to help builders achieve higher performance. However, the programs may not be ideally suited to the needs of builders. The technical engagement noted that there could be better alignment of incentives to meet the requirements of the NZER performance levels.

Action 13. Review incentive structure to realign to the highest energy efficiency tiers.

MARKETING

Discussion in every workshop reinforced the need for clear and supportive marketing activities. The marketing effort can bridge together all the actions – capacity building, knowledge sharing, technology identification, workforce recruitment and retention. In addition, it was recommended that a program could be developed to help tenants and homeowners in managing energy use (and cost).

Action 14. Develop a marketing strategy for NZER and deploy strategic and beneficial marketing efforts.

5.4. Activities

The prior subsection identified several potential considerations for accelerating energy efficiency performance in new construction. *Figure 13: Energy Code Activities to Achieving NZER* summarizes the activities for accelerating regulated progressive tiers in each of the NBC and NECB. Each action is then rated for its level of urgency – from critical to achieving the tier improvement, to important actions, and then those which generally support the energy codes. The ranking was derived from the workshops and the post-workshop survey.

Of note, the NECB energy tiers can be on a quicker path, as the buildings are more likely to achieve Tier 4 with less support than the low-rise housing sector.

Action	Urgency
1. Create a database of defined terms to be used in regulations, training, and communications.	I
2. Develop a list of benefits associated with NZER, including quantification, where applicable.	I
3. Develop a system to extract key data from building permits to allow for energy performance trending.	D
4. For common NZER solutions, provide illustrated guide or technical briefs for each system.	I
5a. Develop a list of modeling tools and advisors/consultants to support higher energy efficiency performance.	D
5b. Maintain list of modeling tools and advisors/consultants.	D
6. Consider developing illustrated energy efficiency applications for the Yukon	D
7. Publish clear timelines for enforcing higher energy tiers.	I
8. Develop training materials specific to designing and constructing energy efficient buildings in the Yukon.	C
9. Develop a program to encourage and retain more skilled trades available across the territory.	C
10. Review the technology being deployed and identify training needs or additional contractors for efficient operation of the building.	D

11. Identify new technologies or systems that will facilitate the transition to NZER in the Yukon and develop appropriate supply chain for those products.	D
12. Collaborate with electricity suppliers, identify and resolve capacity constraints.	C
13a. Review incentive structure to realign to the highest energy efficiency tiers.	C
13b. Review incentive structure to realign to the highest energy efficiency tiers. (Refresh)	C
14. Develop a marketing strategy for NZER and deploy strategic and beneficial marketing efforts.	I
Table Notes: C= Critical I=Important D=Desired	

Figure 13: Energy Code Activities to Achieving NZER



6. BUILDING CODE ADAPTATIONS

This discussion paper identifies opportunities, challenges, and potential pathways for the Yukon towards achieving higher energy tiers in new construction. The energy efficiency tier establishes the minimum across the territory; however, it also enables local jurisdictions to enforce to a higher level. Further, the Government of Yukon could consider exemptions for specific situations. This section explores some adaptation exemptions, specifically for the City of Whitehorse and for certain technologies.

CITY OF WHITEHORSE

The City of Whitehorse implemented an energy efficiency by-law that has resulted in higher performance in newly constructed homes. All new homes achieve Tier 3 and most achieve Tier 4 compliance. Therefore, it may be possible to have a more accelerated progression through the tiers for low-rise homes.

EXEMPTIONS

There are some unique situations where additional work may be needed prior to enforcing the highest tier. It wouldn't be prudent to stall all buildings from the journey to NZER due to a very small number of unique situations; rather an exemption could be provided, until the issues can be resolved. Those situations include:

1. Homes where the primary heating source is a wood burning stove.
2. Homes and larger buildings with limited or restricted access to electricity.
3. Log homes.
4. Heritage buildings.

While it is not the intention of this discussion paper to resolve these cases, *Figure 14: Potential Highest-Tier Exemptions for Unique Situations* outlines the situation and the issue that would need to be validated and resolved prior to enforcing NBC Tier 5 or NECB Tier 4.

Building type	Concern Raised
---------------	----------------

Homes where the primary heating source is a wood burning stove.	Additional ventilation necessary for adequate operation of stove may increase energy use in home.
Homes and larger buildings with limited or restricted access to electricity.	Ability to install heat pumps, which is likely needed for highest tier, is limited.
Log homes.	Unique envelope construction could restrict overall building envelope energy performance.
Heritage buildings.	Specific zoning requirements for cladding and glazing may limit material selections and efficiency of the building envelope.

Figure 14: Potential Highest-Tier Exemptions for Unique Situations



7. CONCLUSION

The building industry in the Yukon is experienced and understands the benefits of high-performance building construction. Energy efficiency is already part of the culture in the Yukon. Currently achieving the performance required in higher energy tiers of the national codes, the industry is prepared to accelerate to the highest tiers and therefore net-zero-energy-ready (NZER).

However, there are a number of key initiatives that will be required to support the journey to NZER, as highlighted in this discussion paper. None of these present a significant barrier to achieving the higher tiers. **The most significant comment that was delivered throughout the technical engagements was the need for transparent, and reasonable, timelines that provide the industry with sufficient time to adapt to the higher performance, and they are prepared to adapt.**

The activities are prioritized. Some initiatives would be most effective if they started immediately, and many have a few years to complete.

As a compendium to this discussion paper there are two technical reports that delve further into defining net-zero-energy-ready with a Yukon context.