

Building Energy Codes in SK: Current State and Future Changes

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Presenter

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Image: Airtight Engineering

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Image: Airtight Engineering

Land Acknowledgement

We gather today on the traditional lands of Treaty 4 Territory and the original lands of the Cree, Saulteaux, Dakota, Nakota, Lakota, and the homeland of the Métis. We are mindful of our role in reconciliation and partnering with indigenous people in our work.



Image: Airtight Engineering Inc.

Outline

- Energy Code Purpose and Scope
- Tiered Energy Codes
- Case Study
- Saskatchewan Implementation
- 2025 Code Changes
- Future Code Direction



Image: Airtight Engineering

Setting the Stage...

Prairie Housing Efficiency History

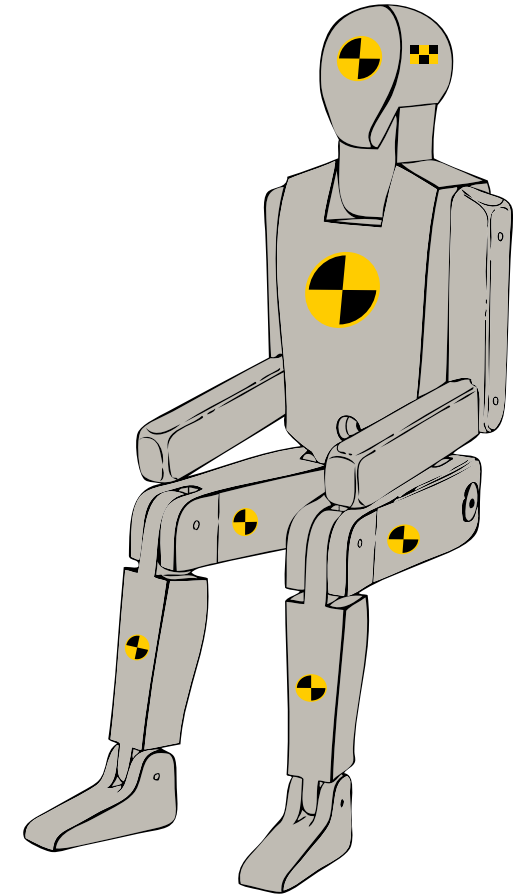
- 1977 - Saskatchewan Conservation House is developed in Regina by the Saskatchewan Research Council
- The project developed...
 - First heat recovery ventilator
 - First blower door air tightness test
 - Early drain water heat recovery unit



Image: [Ecohome](#); Source: Orr, 2015

Building Code Purpose

- Protect public health, safety and welfare
- Sets minimum standards of construction
- Sets minimum energy standards
- Similar standards exist for other products



Energy Code Purpose

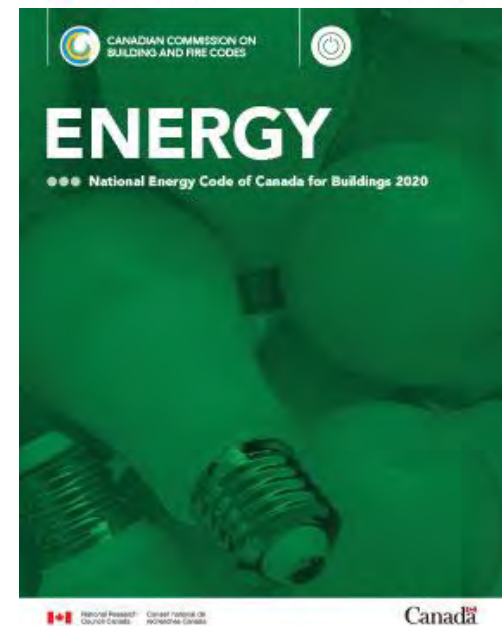
Impact:

- Saving energy, yes
- But also: better health, comfort, durability, and resilience

- F70** To provide potable water.
- F71** To provide facilities for personal hygiene.
- F72** To provide facilities for the sanitary disposal of human and domestic wastes.
- F73** To facilitate access to and circulation in the *building* and its facilities by persons with physical or sensory limitations (see Sentence 3.1.1.2.(3) for application limitation).
- F74** To facilitate the use of the *building's* facilities by persons with physical or sensory limitations (see Sentence 3.1.1.2.(3) for application limitation).
- F80** To resist deterioration resulting from expected service conditions.
- F81** To minimize the risk of malfunction, interference, damage, tampering, lack of use or misuse.
- F82** To minimize the risk of inadequate performance due to improper maintenance or lack of maintenance.
- F90** To limit the amount of uncontrolled air leakage through the *building envelope*.
- F91** To limit the amount of uncontrolled air leakage through system components.
- F92** To limit the amount of uncontrolled thermal transfer through the *building envelope*.
- F93** To limit the amount of uncontrolled thermal transfer through system components.
- F95** To limit the unnecessary demand and/or consumption of energy for heating and cooling.
- F96** To limit the unnecessary demand and/or consumption of energy for service water heating.
- F98** To limit the inefficiency of equipment.
- F99** To limit the inefficiency of systems.
- F100** To limit the unnecessary rejection of reusable waste energy.
- F101** To limit operational greenhouse gas emissions.

Energy Code Scope

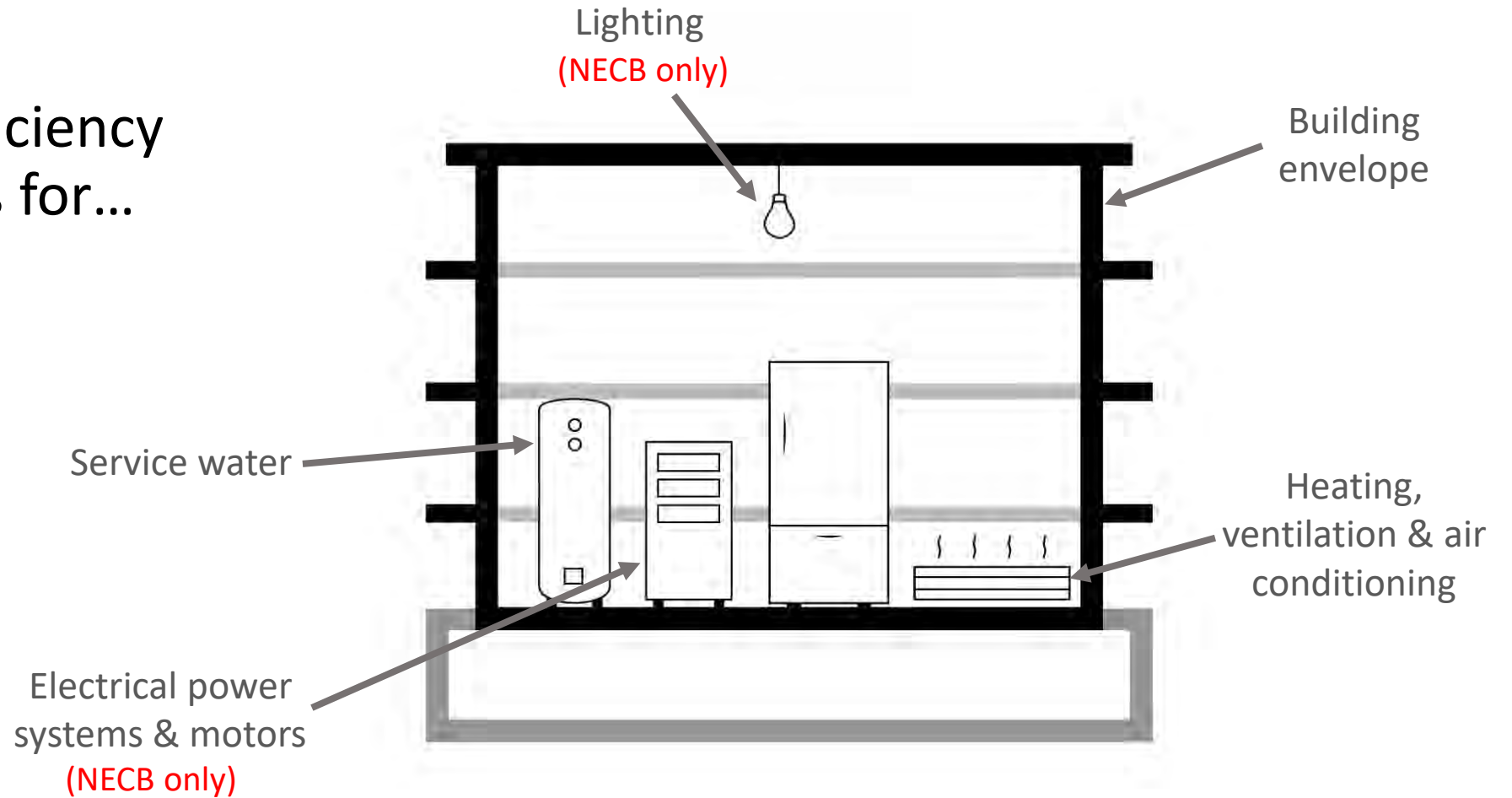
- Model building energy codes consist of:
 - Part 9.36 of the building code (NBC) – for houses and certain other small buildings
 - National Energy Code for Buildings (NECB) – for large buildings or higher-consequence small buildings
- Apply to new buildings and additions **More on this later...**
- Do not cover existing buildings or farm buildings



Images/source: [National Research Council](#);

Energy Code Scope

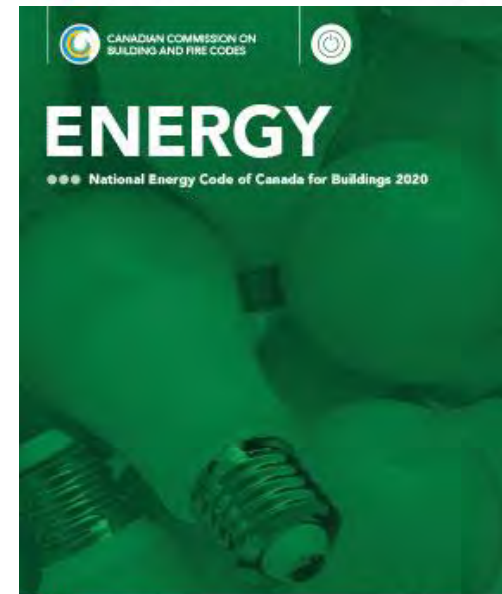
- Describes efficiency requirements for...



Energy Code Scope

- The 2020 model codes introduced energy efficiency tiers
- Two compliance paths:
 - Performance (energy modeling)
 - Prescriptive (points-based)

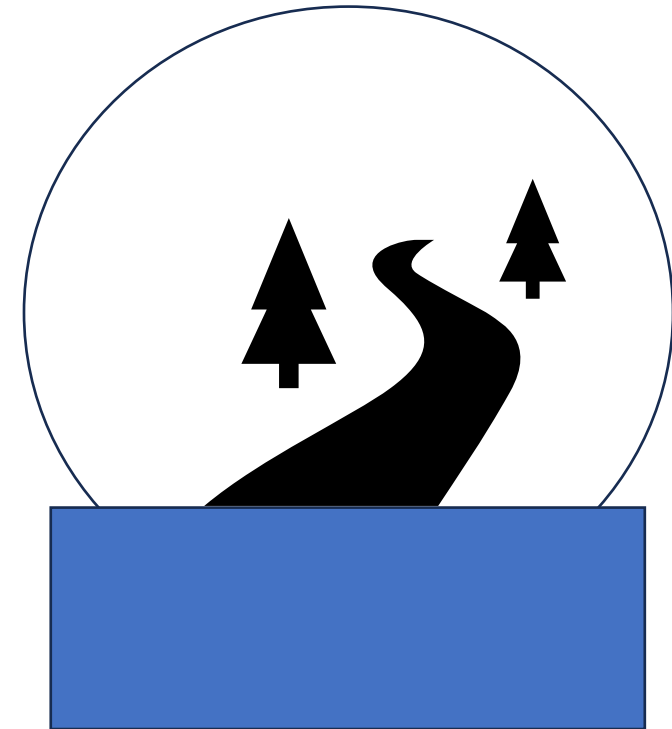
We will see more compliance paths in the 2025 code...



Images/source: [National Research Council](#);

Why Energy Tiers Exist

- Road map to Net Zero
- Provides a future state of code
- Predictability and consistency
- Efficiency tool for different levels of government, organizations



Tiers – Performance path

NBC 9.36		
Tier	% Improvement	% Heat loss reduction
1	0	0
2	10	5
3	20	10
4	40	20
5	70	40

NECB Section 10		
Tier	% Building energy target	% Improvement
1	100	0
2	75	25
3	50	50
4	40	60

- Improved vs what?
- Lower requirements for small buildings.

Tiers – Prescriptive (Points) Path

Table 9.36.8.2.
Energy Performance Tiers
Forming Part of Sentences 9.36.8.2.(3) and (4)

Minimum Sum	Energy Performance Tiers				
	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
Energy conservation points	⁽¹⁾	10	20	40	75
Energy conservation points from <i>building envelope measures</i> ⁽²⁾	-	-	5	10	15

Component	Maximum points achievable
Airtightness	17.8
Above grade walls	14
Building Volume	10
Doors and Windows	5.5
Water Heating Equipment	3
Ventilation Systems	2.7
Below grade walls	1.1

Source: [Government of Saskatchewan](#)

Case Study – Residential Project in Regina

- Residential home in Regina
- 4 bedrooms
- +- 2500 sq.ft footprint
- Basement for storage only
- Attached garage **Excluded from model**
- Client decided on Tier 4

Case Study – Tier 2

Energy Tier Upgrade Measures				
	Base Model		Tier 2	
Airtightness	2.5 ACH50		2.5 ACH50	
Roof	R60 blown insulation		R60 blown insulation	
Main Wall	2x6 @ 16" o.c. R17 effective		2x6 @ 16" o.c. R17 effective	
Crawlspace wall	2x6 @ 16" o.c. R17 effective		2x6 @ 16" o.c. R17 effective	
Crawlspace floor	2" EPSII		2" EPSII	
Basement wall	2x6 @ 16" o.c. R17 effective		2x6 @ 16" o.c. R17 effective	
Basement floor	Uninsulated		Uninsulated	
Windows	PVC frames, 2 panes, Argon, 1x lowE		PVC frames, 2 panes, Argon, 1x lowE	
Doors	PU foam filled steel or fibreglass		PU foam filled steel or fibreglass	
Ventilation	No heat recovery		HRV - 60% SRE. Normal operation: 55 CFM. Boost operation: 130 CFM.	
Heating System	95% AFUE gas furnace		95% AFUE gas furnace	
Cooling System	14.5 SEER A/C		14.5 SEER A/C	
Domestic Hot Water	0.59 UEF Gas Tank		0.59 UEF Gas Tank	
# 350W solar panels required	88		84	
Annual operating expense	\$	2,969.78	\$	2,902.67
Heat loss comfort assessment	12		11	

Case Study – Tier 3

Energy Tier Upgrade Measures		
	Base Model	Tier 3
Airtightness	2.5 ACH50	1.5 ACH50
Roof	R60 blown insulation	R60 blown insulation
Main Wall	2x6 @ 16" o.c. R17 effective	2x6 @ 16" o.c. R17 effective
Crawlspace wall	2x6 @ 16" o.c. R17 effective	2x6 @ 16" o.c. R17 effective
Crawlspace floor	2" EPSII	2" EPSII
Basement wall	2x6 @ 16" o.c. R17 effective	2x6 @ 16" o.c. R17 effective
Basement floor	Uninsulated	Uninsulated
Windows	PVC frames, 2 panes, Argon, 1x lowE	PVC frames, 2 panes, Argon, 1x lowE
Doors	PU foam filled steel or fibreglass	PU foam filled steel or fibreglass
Ventilation	No heat recovery	HRV - 60% SRE. Normal operation: 55 CFM. Boost operation: 130 CFM.
Heating System	95% AFUE gas furnace	95% AFUE gas furnace
Cooling System	14.5 SEER A/C	14.5 SEER A/C
Domestic Hot Water	0.59 UEF Gas Tank	0.59 UEF Gas Tank
# 350W solar panels required	88	79
Annual operating expense	\$ 2,969.78	\$ 2,855.34
Heat loss comfort assessment	12	10

Case Study – Tier 4

Energy Tier Upgrade Measures		
	Base Model	Tier 4
Airtightness	2.5 ACH50	1.5 ACH50
Roof	R60 blown insulation	R80 blown insulation 12" truss heel
Main Wall	2x6 @ 16" o.c. R17 effective	2x6 @ 16" o.c. with 2" EPS exterior insulation
Crawlspace wall	2x6 @ 16" o.c. R17 effective	2x6 @ 16" o.c. R17 effective
Crawlspace floor	2" EPSII	2" EPS II
Basement wall	2x6 @ 16" o.c. R17 effective	Add 2" EPS Exterior insulation
Basement floor	Uninsulated	2" EPS II
Windows	PVC frames, 2 panes, Argon, 1x lowE	PVC frames, 3 panes, Argon, 2x lowE, Energy Star
Doors	PU foam filled steel or fibreglass	PU foam filled steel or fibreglass
Ventilation	No heat recovery	HRV - 60% SRE. Normal operation: 55 CFM. Boost operation: 130 CFM.
Heating System	95% AFUE gas furnace	95% AFUE gas furnace
Cooling System	14.5 SEER A/C	14.5 SEER A/C
Domestic Hot Water	0.59 UEF Gas Tank	0.59 UEF Gas Tank
# 350W solar panels required	88	62
Annual operating expense	\$ 2,969.78	\$ 2,812.43
Heat loss comfort assessment	12	8

Case Study – Tier 5

Energy Tier Upgrade Measures		
	Base Model	Tier 5
Airtightness	2.5 ACH50	1.0 ACH50
Roof	R60 blown insulation	R80 blown insulation 12" truss heel
Main Wall	2x6 @ 16" o.c. R17 effective	2x4 @ 16" o.c. with 6" EPS exterior insulation
Crawlspace wall	2x6 @ 16" o.c. R17 effective	4" EPS Exterior insulation with 2x6 interior wall
Crawlspace floor	2" EPSII	4" EPS II
Basement wall	2x6 @ 16" o.c. R17 effective	4" EPS Exterior insulation with 2x6 interior wall
Basement floor	Uninsulated	4" EPS II
Windows	PVC frames, 2 panes, Argon, 1x lowE	PVC frames, 3 panes, Argon, 2x lowE, Energy Star
Doors	PU foam filled steel or fibreglass	PU foam filled steel or fibreglass
Ventilation	No heat recovery	HRV - 84% SRE. Normal operation: 55 CFM. Boost operation: 130 CFM.
Heating System	95% AFUE gas furnace	7.65 HSPF Heatpump with 97% AFUE gas furnace backup
Cooling System	14.5 SEER A/C	21 SEER Heatpump
Domestic Hot Water	0.59 UEF Gas Tank	Heat pump water heater
# 350W solar panels required	88	37
Annual operating expense	\$ 2,969.78	\$ 3,048.45
Heat loss comfort assessment	12	7

Case Study – Selected Design

Energy Tier Upgrade Measures		
	Base Model	Tier 4
Airtightness	2.5 ACH50	1.5 ACH50
Roof	R60 blown insulation	R80 blown insulation 12" truss heel
Main Wall	2x6 @ 16" o.c. R17 effective	2x4 @ 16" o.c. with 4" Rockwool exterior insulation
Crawlspace wall	2x6 @ 16" o.c. R17 effective	Add 4" Rockwool Exterior insulation
Crawlspace floor	2" EPSII	2" Rockwool
Basement wall	2x6 @ 16" o.c. R17 effective	Add 4" Rockwool Exterior insulation
Basement floor	Uninsulated	2" EPS II
Windows	PVC frames, 2 panes, Argon, 1x lowE	PVC frames, 4 panes, Argon, 2x lowE, Energy Star
Doors	PU foam filled steel or fibreglass	PU foam filled steel or fibreglass
Ventilation	No heat recovery	ERV - 72% SRE. Normal operation: 100 CFM. Boost operation: 140 CFM.
Heating System	95% AFUE gas furnace	Heatpump 9 HSPF2 w/ 97% AFUE gas backup
Cooling System	14.5 SEER A/C	Heat pump 16.95 SEER2
Domestic Hot Water	0.59 UEF Gas Tank	2x 0.95 UEF Navien Tankless water heater + 42% Eff. Recovery
# 350W solar panels required	88	49
Annual operating expense	\$ 2,969.78	\$ 3,325.61

Case Study – Key Take Aways

- Tier 4 can be achieved mostly by envelope only measures
- This will be a more comfortable home!
- Need mechanical measure to hit Tier 5
- Integrated design process is important
- Industry still building experience and skills
- That is arguably the point of the Tiered energy codes



Saskatchewan Implementation

Does not apply to additions to pre-2019 buildings

- A policy decision
- The rest of the building code applies to additions...

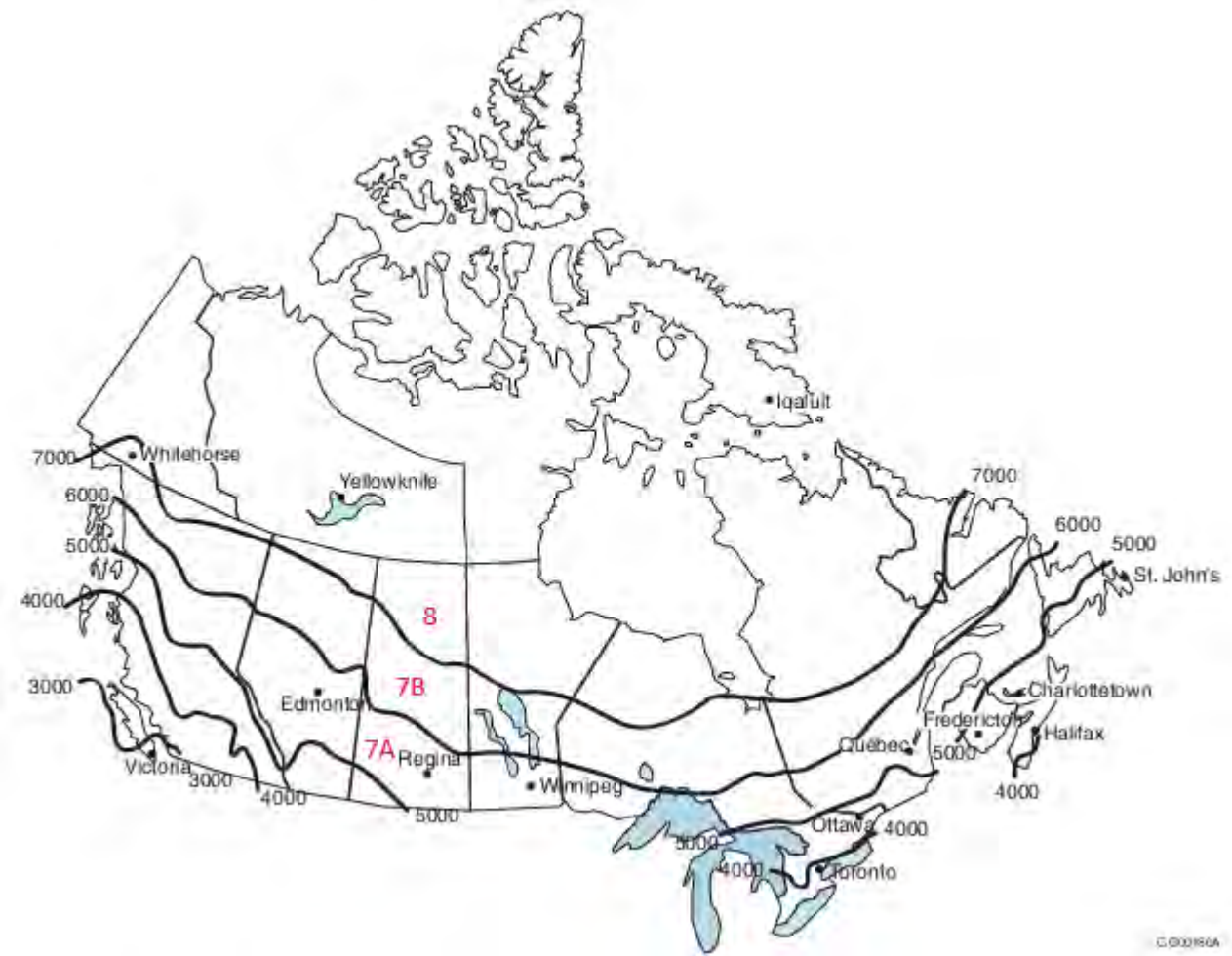


Image: Airtight Engineering

Saskatchewan Implementation

Whole province deemed Zone 7A

- Why?
- Implications



Source: [NECB 2025](#)

Saskatchewan Implementation

2019
Sask first implements national building energy codes

Sep 24, 2024
Sask delays adoption of 9.36 Tier 3 to Jan 1, 2026

"An additional year to implement the next tier in energy efficiency allows our industry partners to have the time and tools needed to ensure the best possible builds," Government Relations Minister Don McMorris said.

Jan 1, 2024
Sask adopts 9.36 Tier 2 and NECB Tier 1, with 9.36 Tier 3 in 2025.

Feb 19, 2025
Sask reverts to Tier 1, which builders "may adopt... immediately"

"All provinces are dealing with the challenges of growth, including affordable housing for all residents, and removing red tape allows us to harmonize our standards and support Canadian industries," Government Relations Minister Eric Schmalz said.

Source: [Government of Saskatchewan](#); City of Saskatoon, n.d.

Saskatchewan Implementation

City of Saskatoon:

- Currently at Tier 2
- Aiming at NBC Tier 3 and NECB Tier 2



Image: Airtight Engineering Inc.

Part 9 Building Codes - Summary

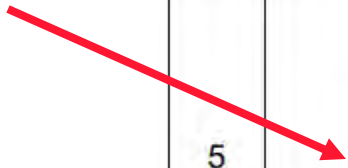
Province / territory	Base code	Tier equivalency	Tier adoption dates	Net zero energy ready	Net zero emissions	View policy
Alberta	NBC 2020	Tier 1	-	-	-	Link
British Columbia	BC ESC: Step 3	Tier 3	Step 4 - 2027	2032	2030	Link
Manitoba	NBC 2020	Tier 1	-	-	-	Link
New Brunswick	NBC 2020	Tier 2	-	2030	-	Link
Newfoundland and Labrador	NBC 2020	Tier 1	-	-	-	Link
Nova Scotia	NBC 2020	Tier 1	Tier 2 - 2026 Tier 3 - 2027	-	-	Link
Ontario	OBC 2024: SB12	Tier 2/3	-	-	-	Link
Prince Edward Island	NBC 2020	Tier 1	-	2030	-	Link
Québec	QCC: NBC 2015	Tier 1	-	-	-	Link
Saskatchewan	NBC 2020	Tier 1	-	-	-	Link
Yukon	NBC 2020	Tier 1	-	2032	-	Link
Nunavut	NBC 2015	Tier 1	-	-	-	Link
Northwest Territories	NBC 2020	Tier 1	-	-	-	Link

Source: [Efficiency Canada](#)

Costs

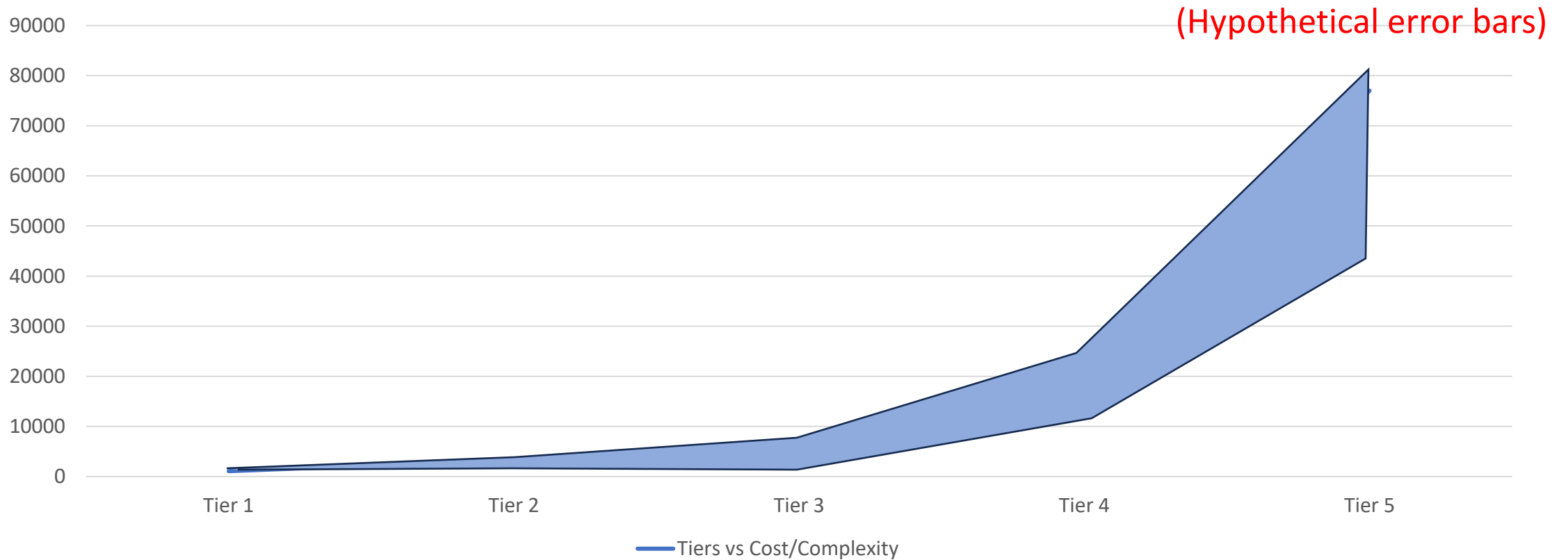
SUMMARY TABLE				
Tier	Increase to Construction Costs	* Cost Impact Per Home	Barriers Prior to Implementation	Timing
1	0% to 0.34%	\$0 - \$1,072	<ul style="list-style-type: none"> None 	Mid-2023
2	0.35% to 1.05%	\$1,100 - \$3,300	<ul style="list-style-type: none"> Energy Advisor/airtightness testing capacity. Multi-family airtightness testing requirements. Managing peak cooling loads. Education of builders, building officials and homeowners. 	Mid-2025
3	1.05% to 1.40%	\$3,300 - \$4,400	<ul style="list-style-type: none"> Clarify the prescriptive pathway. Energy Advisor/airtightness testing capacity. Building envelope training with trades. 	TBD
4	7.0%	\$20,000 - \$22,000	<ul style="list-style-type: none"> Housing affordability. Air source heat pump technology. Electric infrastructure to support electrified home heating. Envelope improvements. Clarify the prescriptive pathway. 	TBD
5	25%	\$70,000 - \$77,000	<ul style="list-style-type: none"> Revisions to Tier 5 requirements to reflect actual Net Zero construction. Impact on housing affordability. Diminishing returns on insulation. Designing for solar panels. Embodied carbons analysis. Electric infrastructure to support electrified home heating. Clarify the prescriptive pathway. 	TBD

This is a suspiciously round number...



Costs

Tiers vs Cost/Complexity (from BILD Alberta report)



Costs: Tier 2 - Performance Path

- Hot2000 model of a 1200 ft² bungalow with a basement
- Difference from baseline:
 - 6% FDWR (vs 12%)
 - Water heater UEF = 0.63 (vs 0.56)
- Incremental cost... \$500 (for ERS label)

National Building Code 2020		Proposed House	Reference House
Within Scope		Yes	
Annual Energy Consumption (GJ)		79.58	91.50
Gross Space Heat Loss (GJ)		88.73	101.47
Design Cooling Load (W)		2459	2787
Airtightness (ACH @ 50 Pa)		2.5	2.5
Overall Energy Performance Improvement (%)		13	
Envelope Performance Improvement (%)		13	
Peak Cooling Validation		Pass	
Energy Performance Tier			

Heated Volume	Target Metrics	Applicable Energy Performance Tier				
		1	2	3	4	5
> 300 m ³	Overall Improvement (%)	>=0%	>=10%	>=20%	>=40%	>=70%
	Heat Loss Reduction (%)	n/a	>=5%	>=10%	>=20%	>=40%
<= 300 m ³	Overall Improvement (%)	>=0%	>=0%	>=10%	>=30%	>=60%
	Heat Loss Reduction (%)	n/a	>=0%	>=5%	>=15%	>=25%

Other Metrics		
Thermal Energy Demand Intensity (kWh/(m ² .year))		67
Mechanical Energy Use Intensity (kWh/(m ² .year))		98
Greenhouse Gas Emissions Intensity (kg of CO ₂ /(m ² .year))		19.82

Assumptions: 32ft x 40ft bungalow with a basement in Regina

Source: Airtight Engineering

Saskatchewan Energy Code Incentives

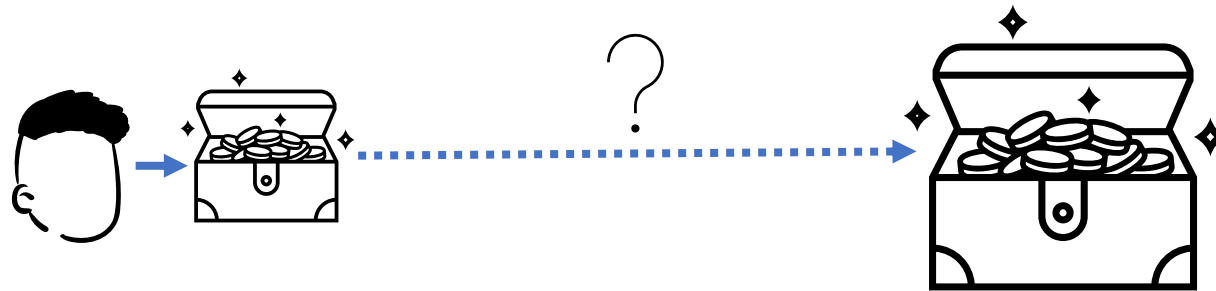
- SaskEnergy Homes Beyond Code
 - Tied to Energy Tier achieved
 - Must be installing natural gas for heating

	Tier 3	Tier 4	Tier 5
Homeowner	\$3000	\$5000	\$9000
Builder	\$800	\$800	\$800

Source: [Homes Beyond Code Program](#) | SaskEnergy

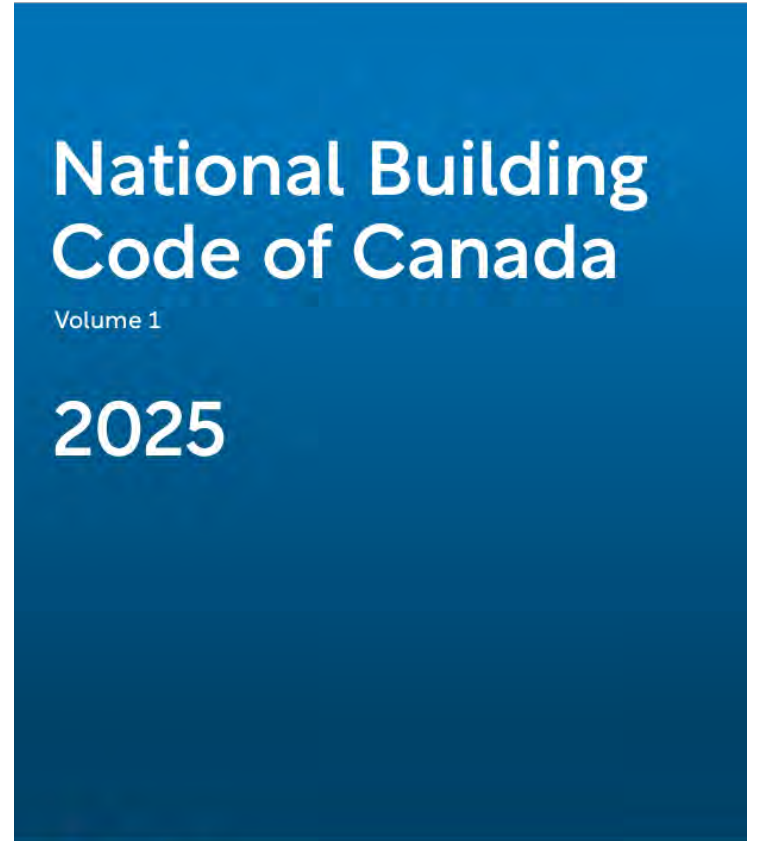
There are Two Ways to be Cost Effective

- Minimum effort: don't change anything
 - Short term
- Investment in change: education and getting better
 - Long term



2025 Code changes – NBC 9.36

- SGHC characteristics of fenestration and doors
- New tiered compliance - energy use intensity path
- New prescriptive compliance for Tiers 1 and 5
- Points-based prescriptive trade-off path
- Tiered operational GHG emissions



Source: [NBC 2025](#)

2025 Code changes – NBC 9.36

Tier 5 Prescriptive performance (>300m ³ ; Zone 7A)	
Airtightness	0.6-1 ACH50
Roofs	~R70
Above ground walls	~R33
Windows	U-value < 0.94 W/m ² K and ER >42
Below grade walls	~R27
Unheated floors below grade	~R11
Heating system	Primary = heat pump. Sizing, efficiency, capacity relative to load mandated.
Water heating	Standard. HPWH UEF >= 2.95.
Drain water heater recovery	Required if there are above grade showers. Eff >= 42%.
Heat Recovery Ventilation	Required. SRE >= 75%

Source: [NBC 2025](#)

2025 Code changes - NECB

- Thermal bridging calculation updates
- Energy modeling software compliance
- Energy use intensity compliance path
- Operational GHG emissions

National Energy Code of Canada for Buildings 2025



Source: [NECB 2025](#)

2025 Code changes – 4 compliance paths

- Performance Path
 - Reference Building
 - Energy Use Intensity
- Prescriptive Measures **Part 9.36 only**
- Trade-off (points path) **Part 9.36 only**



2025 Code changes – Alterations

- Both codes have new parts/sections
- Clarifies requirements for existing buildings
- When does it apply?
- What is required?
- Exclusions



Image: Airtight Engineering Inc.

Future Code Direction Local

- Provincially
 - SK plans to adopt the 2025 codes on Jan 1, 2027
 - SK does not plan to implement the following sections:
 - Alterations to existing buildings
 - Operational greenhouse gas emissions
 - There are no plans to move to higher energy tiers at present
- Municipal tier adoption
 - City of Saskatoon – Currently 9.36 Tier 2
 - Saskatoon is Exploring Tier 3 and NECB Tier 2
 - City of Regina – Currently 9.36 Tier 1

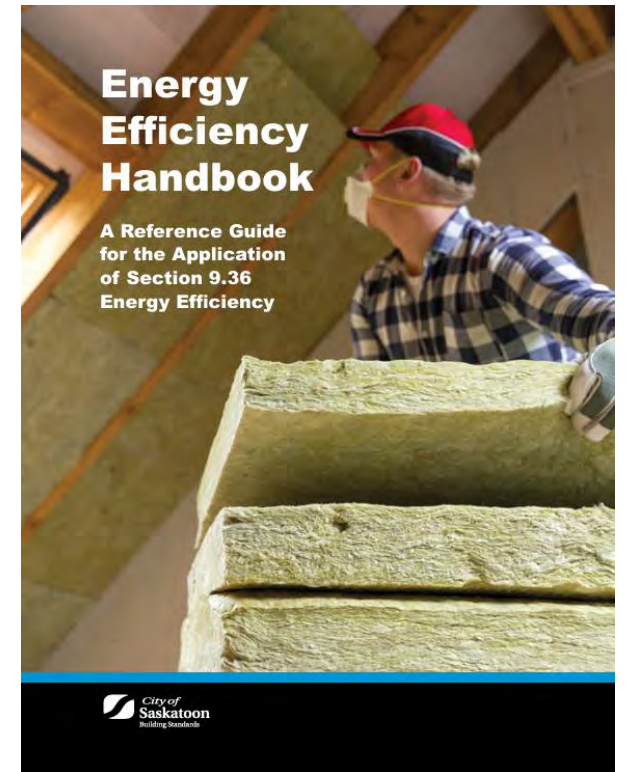


Image: [City of Saskatoon](#)

Future Code Direction National



- Pan-Canadian Framework on Clean Growth & Climate Change (2016)
 - Provinces to adopt “net zero energy ready” model codes by 2030
 - Development of “alterations to existing buildings” energy code (timeline: 2030)
- 2030 Emissions Reduction Plan (2022)
 - Develop standards & incentives for transitioning heating systems off fossil fuels
 - Building code reform to incorporate low-carbon building materials
 - Develop approach to require EnerGuide labeling of homes at the time of sale
 - Climate Adaptation Home Rating Program

Image: [Environment & Natural Resources](#); Source: Environment & Natural Resources, 2016; Environment & Natural Resources, 2022.

Where Are We Now...

Prairie Housing Efficiency History

- The fancy mechanical systems are gone, but insulation and airtightness are still saving energy!
- A conservation-first approach
- Results are used in:
 - R2000 standard (Canada)
 - CHBA Net Zero standard (Canada)
 - Passive House Standard (Germany)



Image: [Harold Orr](#)

How do we get back to being thought leaders?

How can we build better buildings for the people of Saskatchewan?



Image: Matthew Dipple



Thank You!

Further questions?

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