CANADIAN HOME BUILDERS' ASSOCIATION
netzero home
LEADERSHIPSUMMIT

SAFE HAVENS. Protecting our assets and our families.

Frank Lohmann
Senior Director, Building Science, CHBA

Qudsia Ahmed
AVP, Underwriting, Co-operators

Robert Lepage
Founding Principal, Climes Group Engineering Inc.

Dan Sandink
Director of Research, Institute for Catastrophic Loss Reduction

Sonja Winkelmann
Senior Director, Net Zero Energy Housing, CHBA

SESSION 4 - SAFE HAVENS

Builders/Renovators: What resilience measures are you already including in your homes?

40 responses

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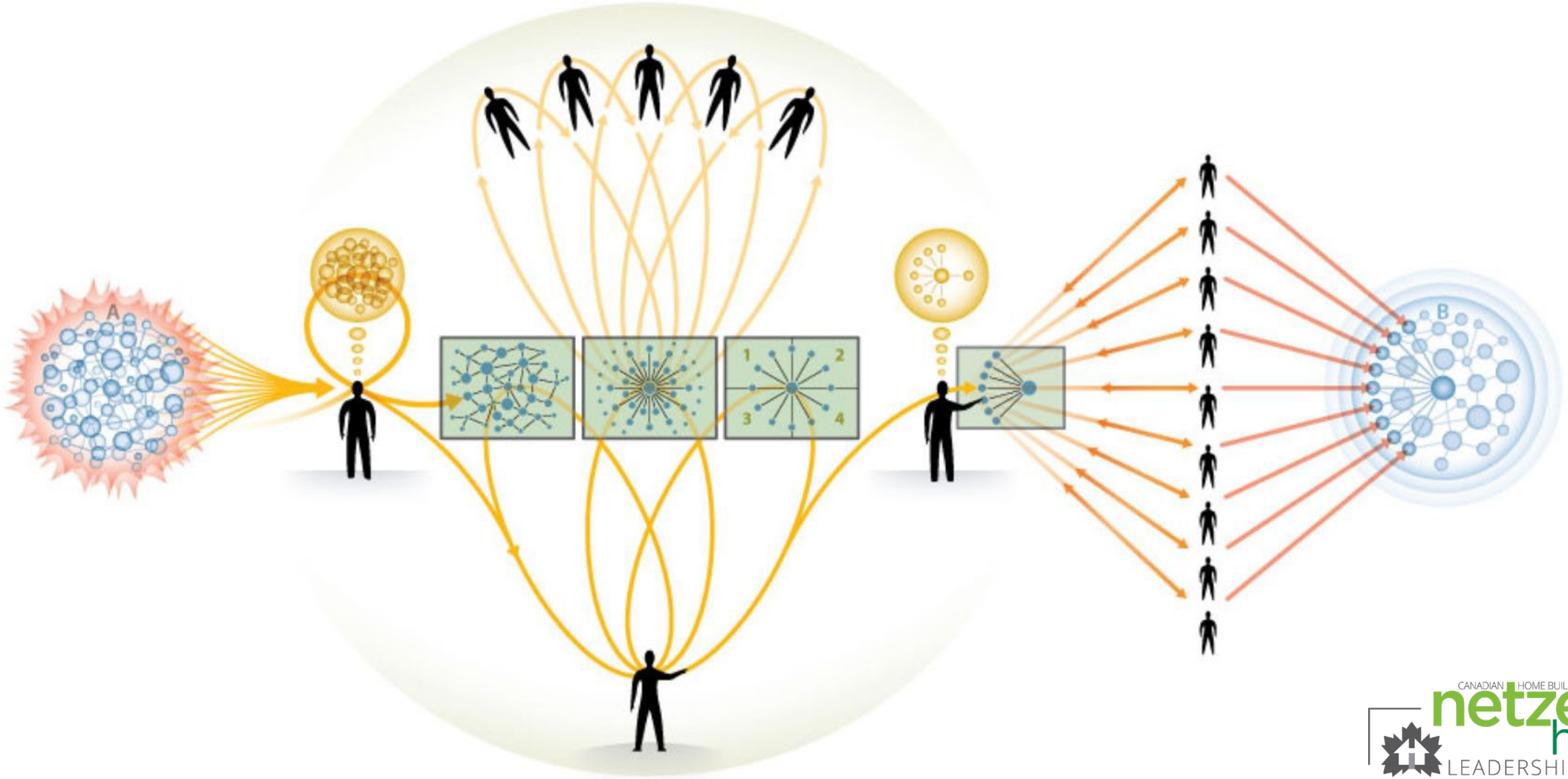
Frank Lohmann, Senior Director, Building Science, CHBA

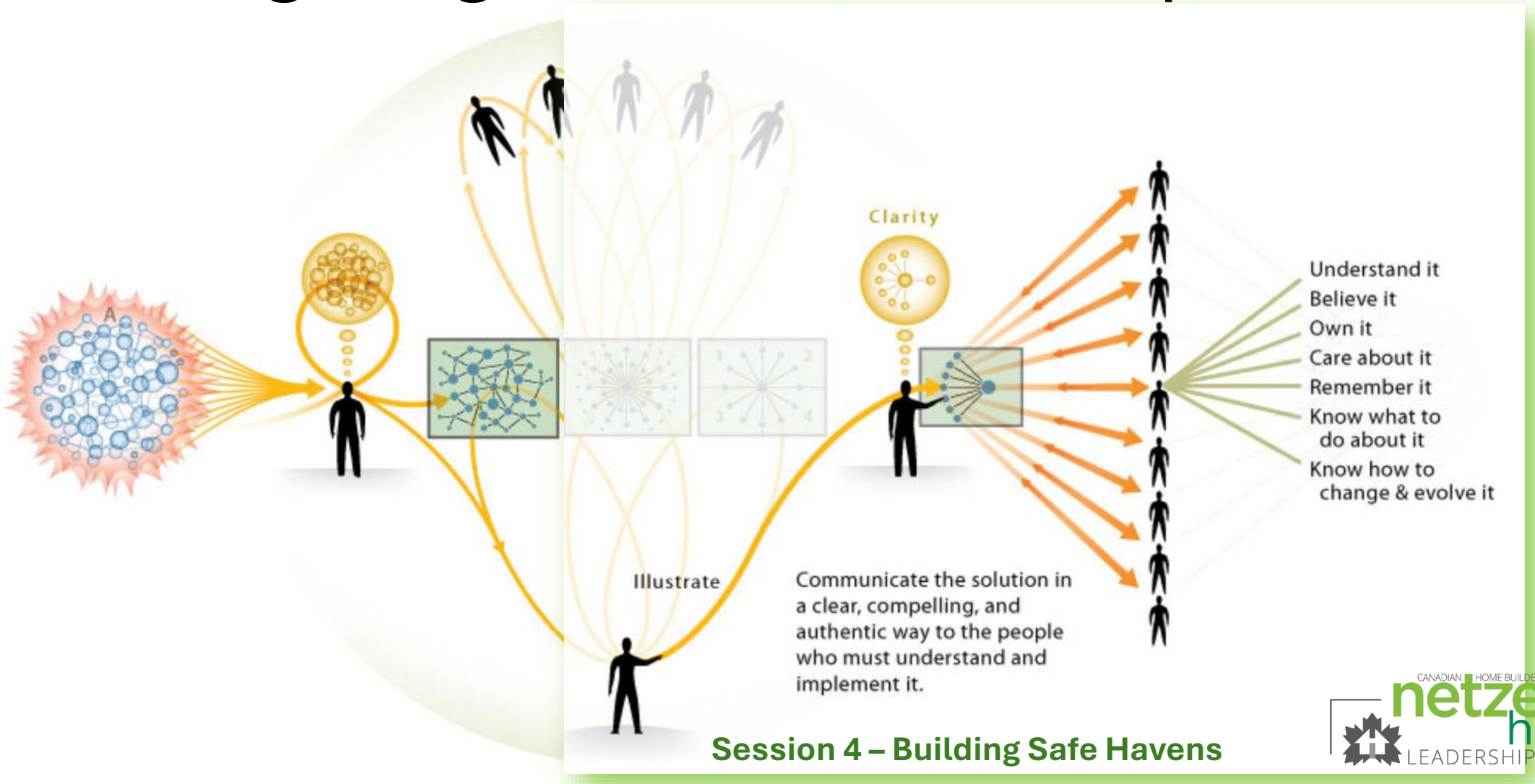
Session 4

Integrating Resilience and Adaptation



Session 4

Integrating Resilience and Adaptation



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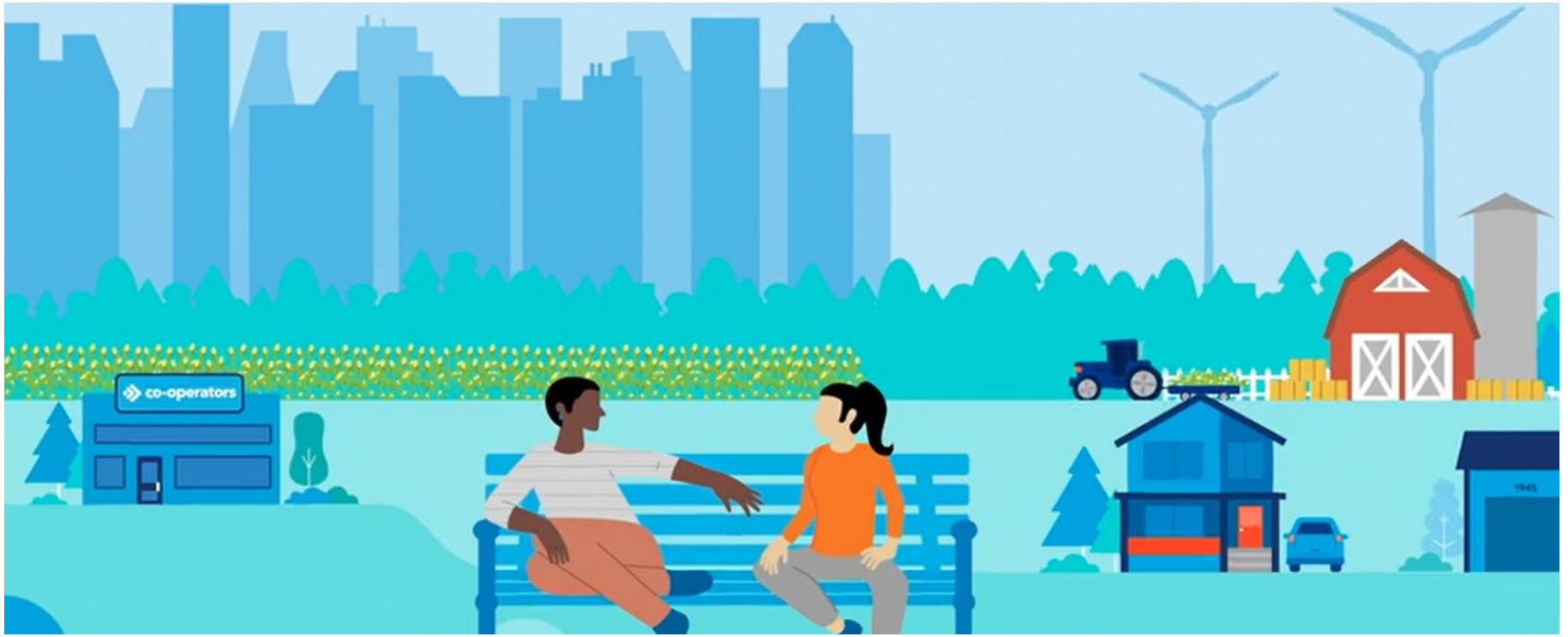
Qudsia Ahmed, AVP, Underwriting, The Cooperators

Reimagining Insurance

Integrating resiliency and sustainability principles to help insurance remain available and affordable.

Qudsia Ahmed, AVP Underwriting



co-operators

The World of Risk is Changing

Unsustainable Trends (Current State)

Increasing Risk Levels

↓

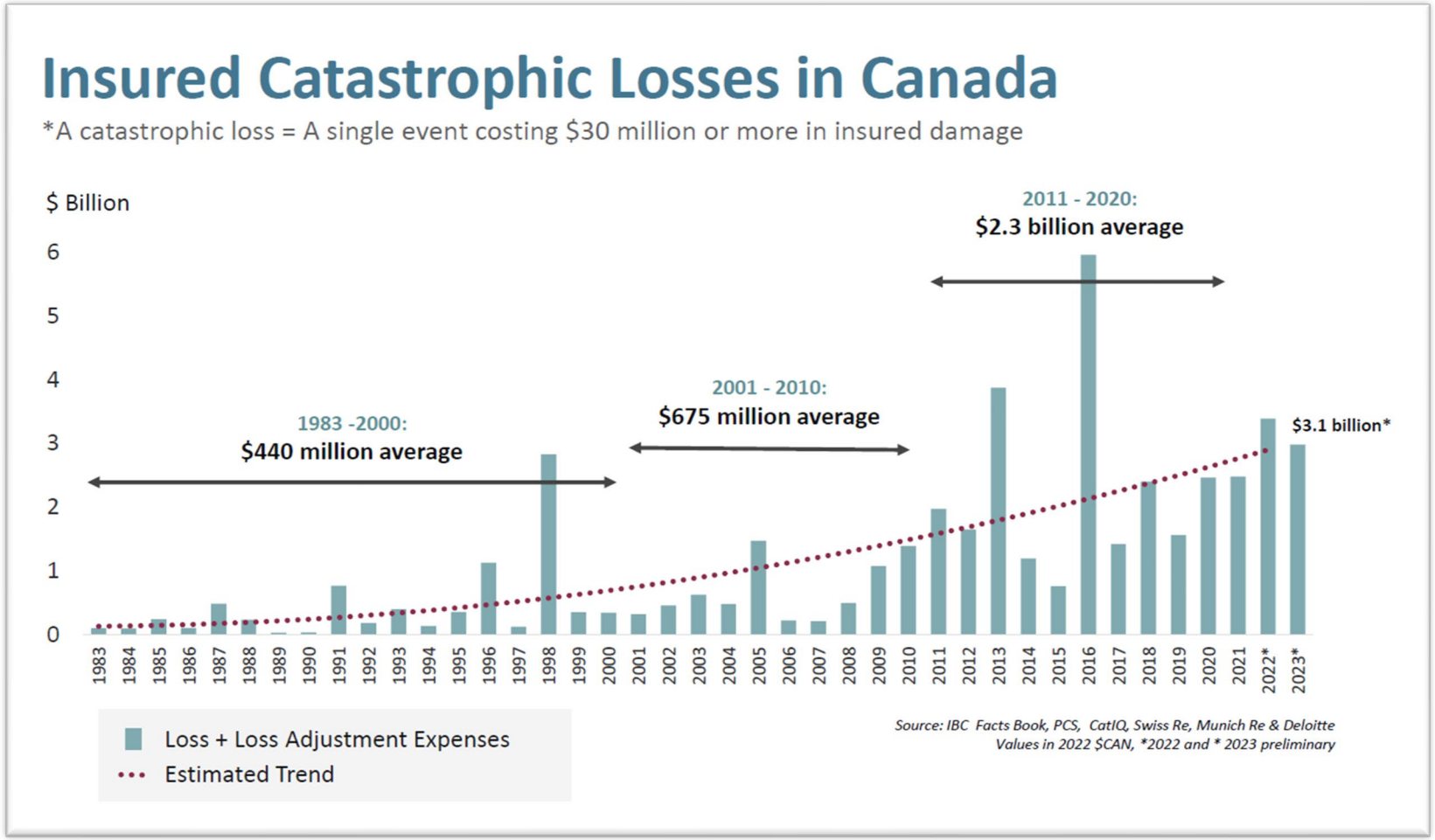
Increasing Claims Costs

↓

Rising Premiums

↓

Coverage Availability Gaps



co-operators®

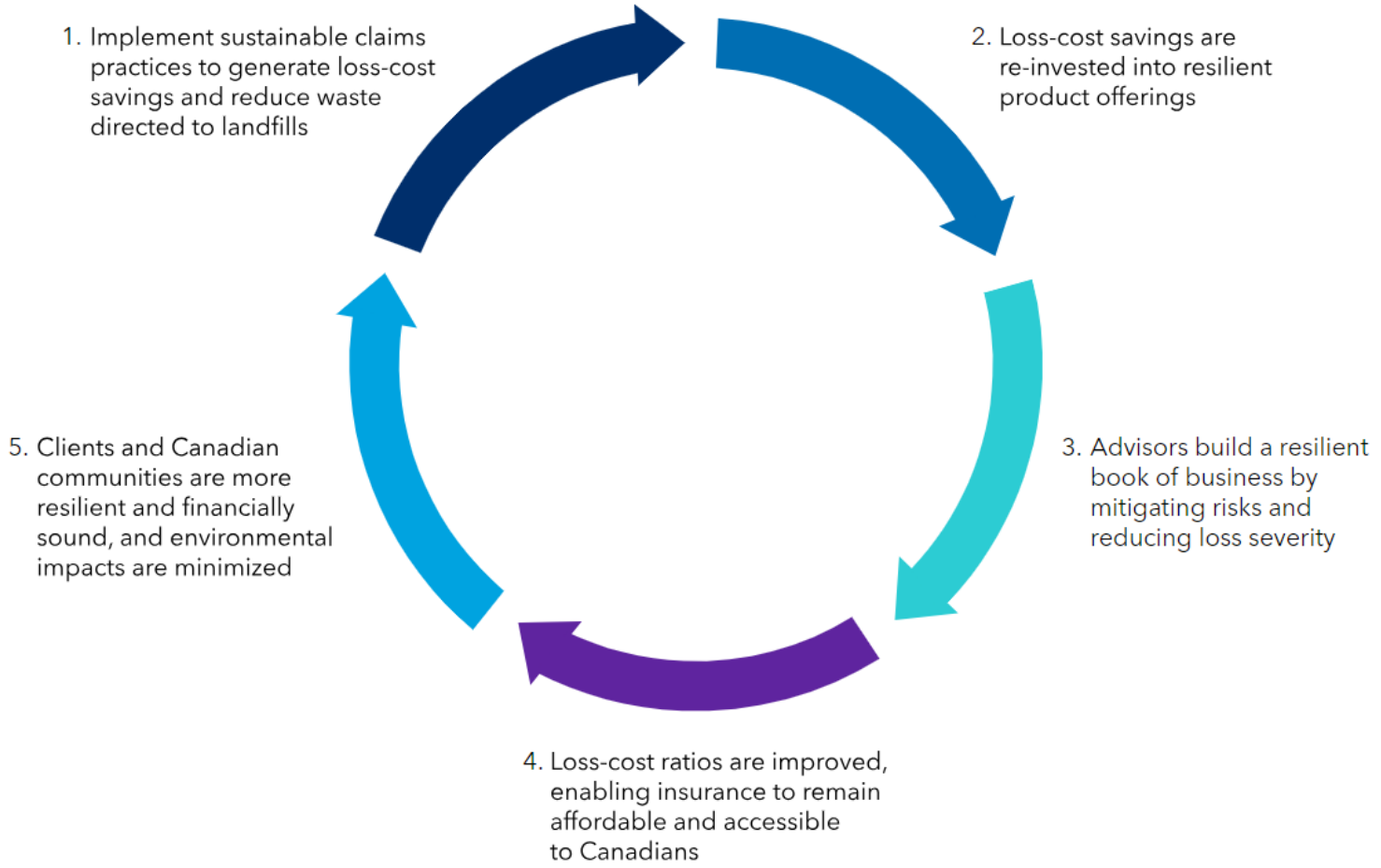
Adopting a Circular Operating Model

Insurance Industry (Current State)

Linear Operating Model
The insurance industry follows a Take, Make, Waste model.

Claims Waste
In North America, 98% of insurance waste goes to landfills.

Product Design
We rebuild with materials that are vulnerable to loss.



co-operators®

CLAIM CHANGERS
PRESENTED BY CO-OPERATORS

Sustainable Claims Practices

We're changing the game on insurance waste with sustainable claims initiatives that help keep our clients' belongings out of landfills.

2023

Sustainable Claims GHG reduction:
253 MTCO2e*

Drying-in-Place

Soft-Contents Cleaning

*Emissions from claims are currently outside of our operational greenhouse gas emissions scope. These reductions are estimations based on available data.

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Resiliency Focused Insurance Products

Resilient Roofing
Better protection against hail and high winds.

Hurricane Straps
Better protection against roof uplift during extreme wind events.

Prevention Following a Loss
Rebuild with loss prevention measures that protect against wildfire and flood.

TomorrowStrong™ Coverage	
Coverage Overview	**Driving Change**
Resilient Roofing: Up to $3,000 to rebuild with more resilient roofing.	✓ The TomorrowStrong Endorsement is the first of its kind in Canada. ✓ Provides additional funds to help clients build back better following a loss – at no additional premium. ✓ Automatically embedded within all qualifying home policies*. ✓ Provides stability by reducing our losses, especially in high-risk zones.
Hurricane Straps: Up to $1,500 to rebuild with hurricane straps.	
Prevention Following a Loss: Up to $1,000 to rebuild with a loss prevention measure focused on preventing that same loss from happening again.	

*Habitational and Farm Dwelling Policies (homeowner, residential, seasonal risks – excludes trailers)

co-operators®

Our future

Research & Design Sustainable Claims Practices

Partnering with international insurance providers, vendors, and the government to embed sustainability practices into our claims handling processes

Product Development focused on Risk Mitigation

Design insurance products to reduce risk and prevent losses to ensure Co-operators can offer affordable and assessable insurance solutions

Build Resilient Communities

Resilient products ensure our clients & communities are more resilient to face our growing climate risk

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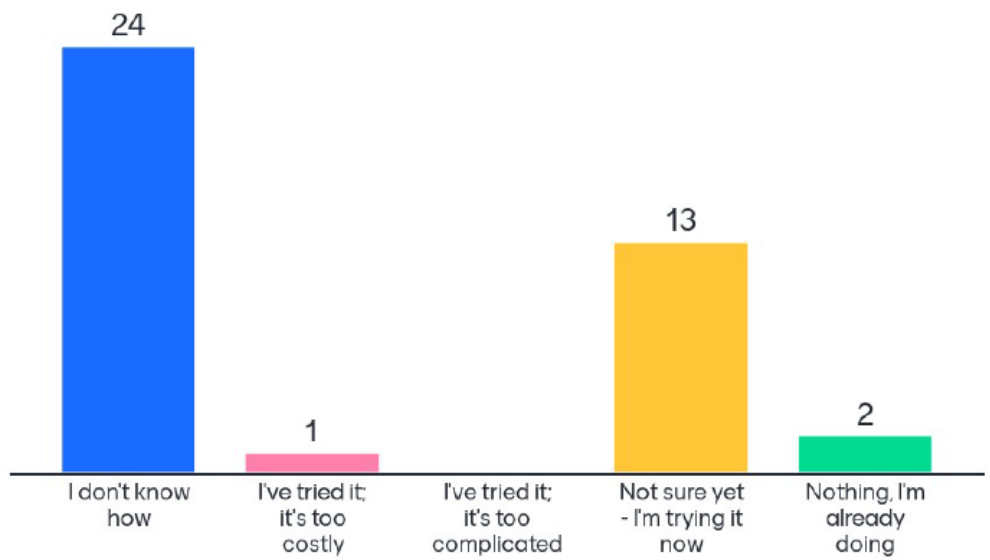
Robert Lepage, Founding Principal, Climes Group Engineering Inc.

SESSION 4 - SAFE HAVENS

What would stop you from using future climate data for design?



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Dan Sandink, Director of Research, Institute for Catastrophic Loss Reduction

Institute for Catastrophic Loss Reduction
Building resilient communities

Institut de Prévention des Sinistres Catastrophiques
Bâtir des communautés résilientes

Resilient Homes Task Force

Planned Activities and Outputs

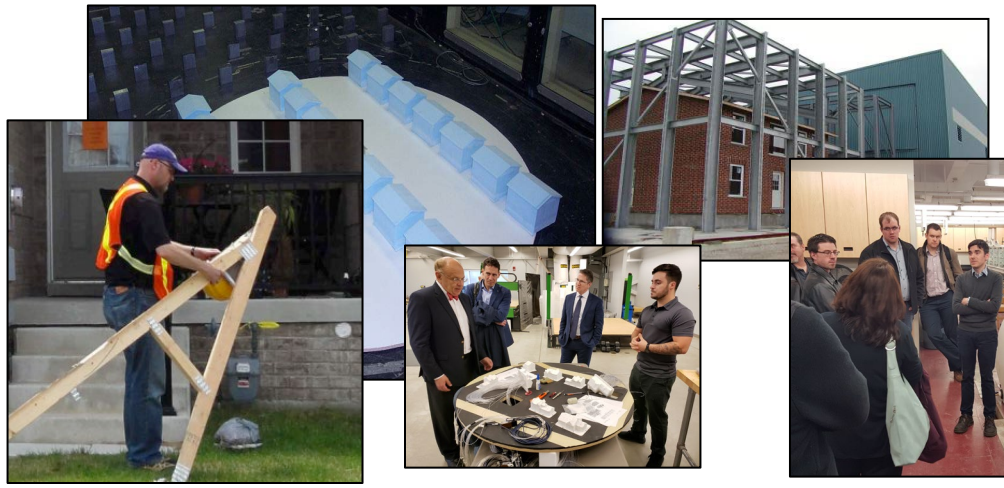
Dan Sandink, Director of Research – dsandink@iclr.org

CHBA Net Zero Leadership Summit – June 11, 2024 – Vancouver

Institute for Catastrophic Loss Reduction

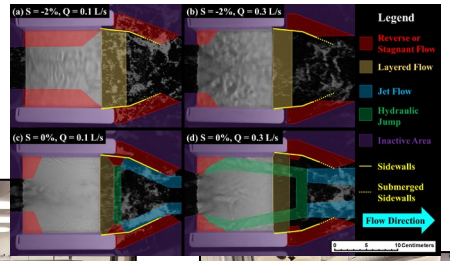
Western Institute for Catastrophic Loss Reduction (ICLR)

Understanding vulnerability, risk reduction options

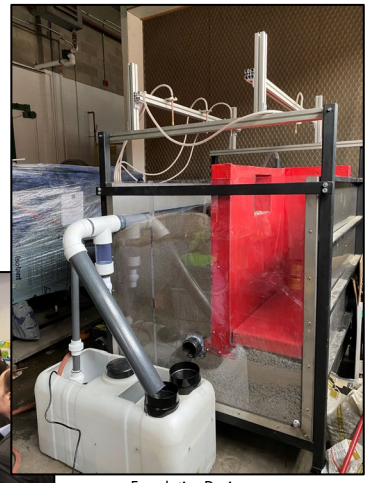


Boundary Layer Wind Tunnel, Three Little Pigs, damage inspection – UWO; WindEEE Dome Dunrobin Model

Backwater valve flow patters – D. Nguyen et al. 2023



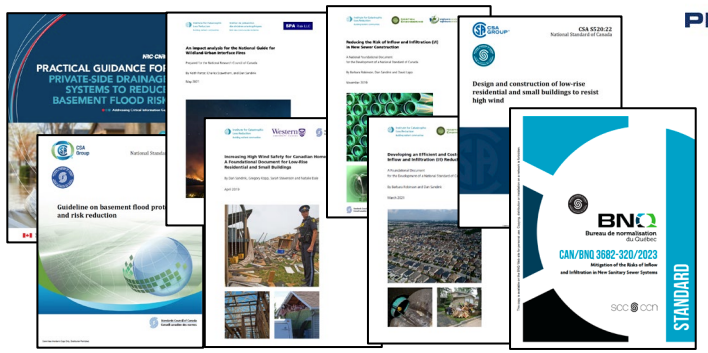
ICLR/U of G Basement Flood Protection Lab: https://basementfloodlab.com/



Foundation Drainage Model, U of G/ICLR

WUI fire inspections

Standards, guides, assessment methods



PIEVC CVIIP

www.pievc.ca

Basement flood protection; BCAs, foundational documents, I/I standards

Supporting implementation, pilots

Insurers Rebuild Stronger Homes

Basement Flood Protection Demonstration Event

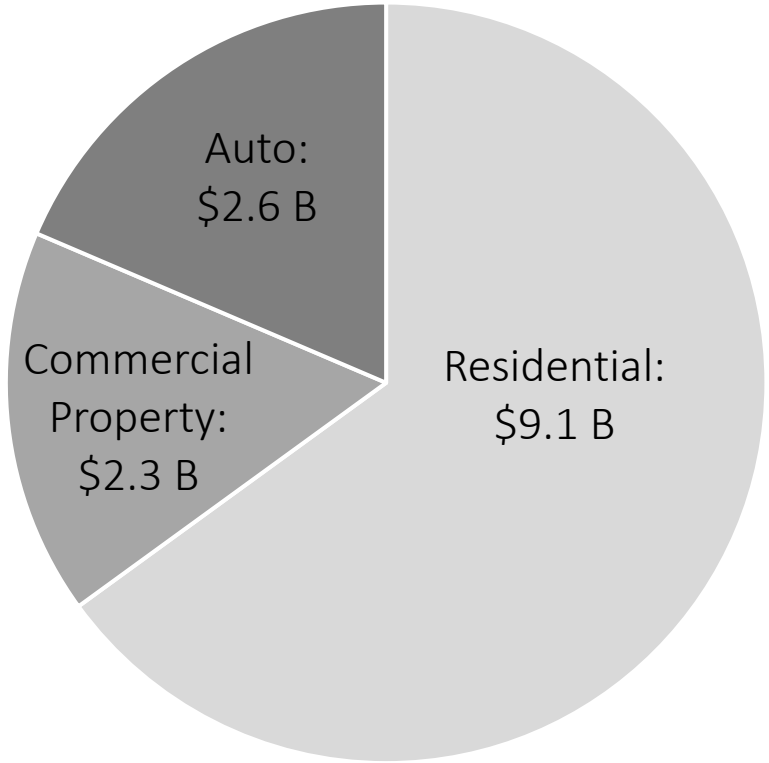
A special event in Edmonton, Alberta

Institute for Catastrophic Loss Reduction
Building resilient communities

TD Insurance

Catastrophe Loss in Canada

Cat losses, 2014 to 2023: ~$14 B (CI, CC)



High wind, hail, urban/basement flood, wildfire are major drivers of climate-related catastrophe losses


Fort McMurray, 2016 (CBC News)


Binbrook, 2012 (Luke Bell, Weather Network)


2022 Derecho. (Northern Tornadoes Project)


Hail Damage, Calgary

Data Sources: IBC, 2022; CatIQ, 2023

Resilient Homes Task Force

Home Building Industry (appointed by CHBA)

Alex Miller (Co-Chair)	CEO, Big Block Construction
Rick Weste	President & CEO, Triple M Housing
Cassidy deVeer	President, 3rd Generation Homes
Carl Pawlowski	Senior Manager, Sustainability, Minto Communities Canada
Bob Deeks	President, RDC Fine Homes
Peter Darlington	Solar Homes Inc.

Insurance Industry (appointed by ICLR)

Susan Penwarden (Co-Chair)	Managing Director, Personal Lines, Aviva Canada
Lisa Guglietti	Executive Vice President & Chief Operating Officer, P&C Insurance Solutions, Co-operators
Anna McCrindell	SVP, Chief Operations Officer-East, Wawanesa
Dipika Deol	Senior Client Manager for Public Sector Solutions, Swiss Re
Craig Stewart	Vice-President, Climate/Federal, IBC
Peter Braid	CEO, IBAC

February 8, 2024 Task Force Meeting - Toronto

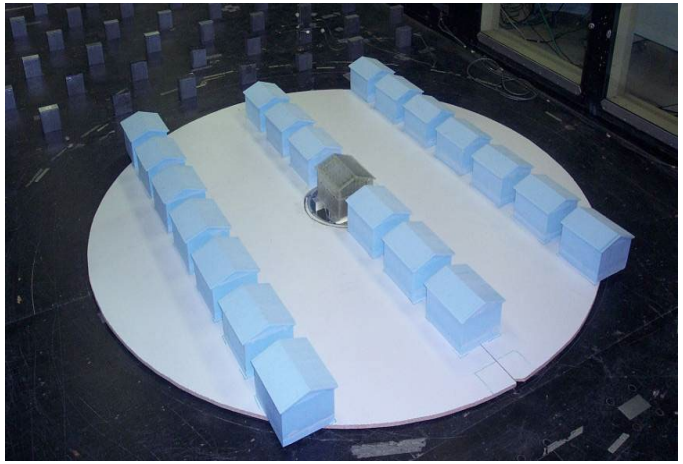
Good, Better, Best

We know what works for: Wind engineers, wildland fire specialists, drainage engineers, insurers – **we need to learn what works for builders.**

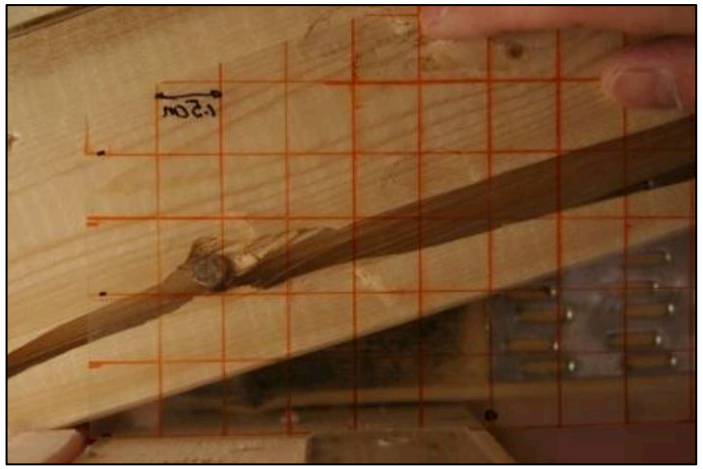
Good	**Better**	**Best**
• Address *recurring* vulnerabilities • Independent of municipal-side • Low-risk to builders • Applicable almost anywhere	• Builds on "good" • Based on research, lab assessments • Cost, practicality not fully assessed	• Application of more "experimental" options • Full application of guides, standards • Emphasis on building performance

Understanding Vulnerability

Boundary Layer Wind Tunnel



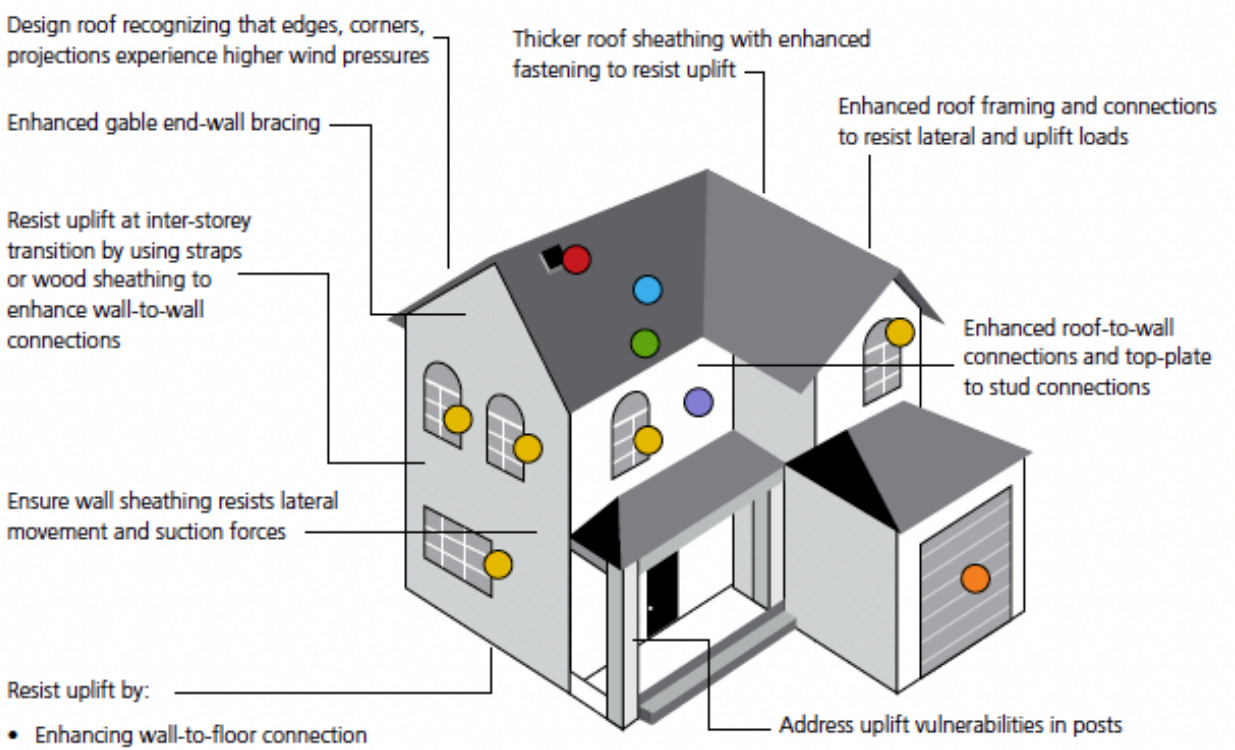
Full scale testing



Field inspections

Images: G. Kopp, UWO

High Wind Protection



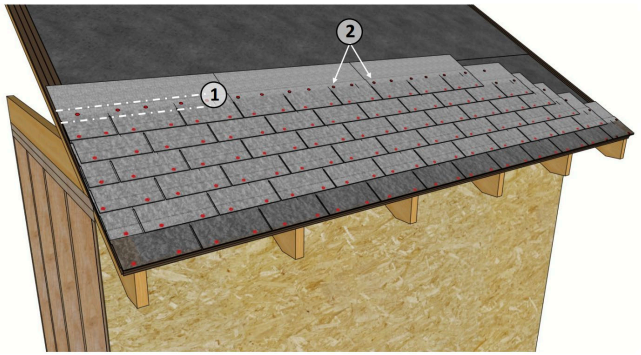
- Enhancing wall-to-floor connection using sheathing or straps
- Enhancing floor-to-sill plate connection by overlapping wall sheathing
- Anchor frame with bolts and larger washers

Non-structural options:

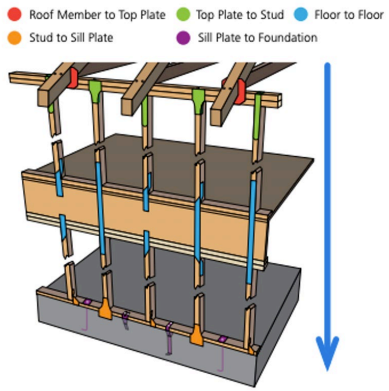
- High wind resistant roof cover, including use of additional fasteners for shingles
- Application of underlayment, secondary water barrier on entire roof deck
- Considerations for roof penetrations and roof vents
- Use of high-strength, wind resistant garage doors and attachments
- High wind, wind-borne debris resistant fenestration
- Use wall cladding products designed to perform under high wind loads

High Wind Protection

Good	Better	Best
• Roof cover (ASTM D7158 Class G), 6 fasteners • Tape sheathing joints	• Roof cover installation (ambient temperature) • Improved underlayment (re. S520) • Enhance vertical load path	Full application of CSA S520, inc.: • Thicker Roof Sheathing • Gable end wall bracing • Enhanced lateral load resistance • Cladding, PV, garage doors, etc.



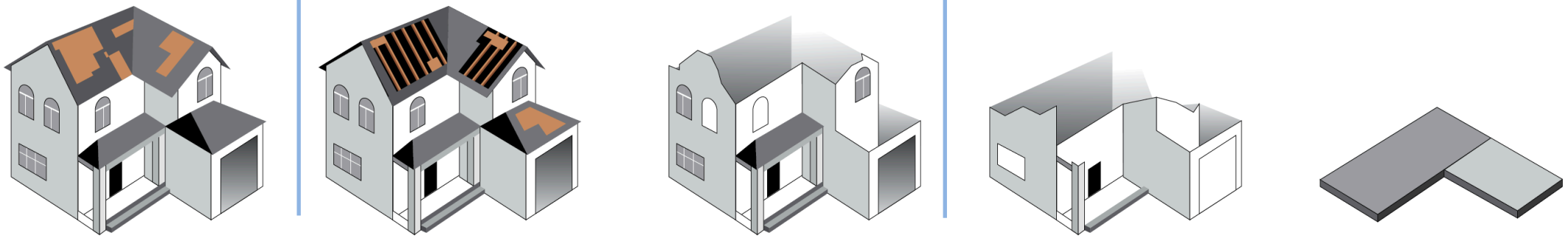
Housing & Urban Development, 2023



High Wind Protection

99.6%

52%



EF0

EF1

EF2

EF3

EF4

EF5

Binbrook, 2012 (Luke Bell, Weather Network)

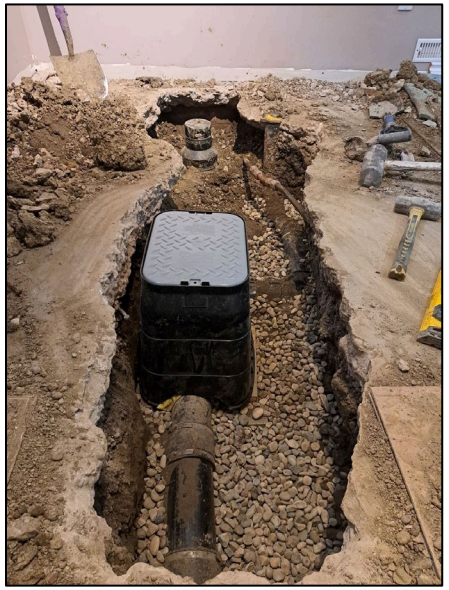
July 8, 2013 - GTA
126 mm in 6 hrs

1 in 100 year: 91 mm/6 hrs

Map: Sandink *et al.*, 2016; Image: *BlogTO*, 2013; IBC 2019 Facts Book

Basement Flood Protection (*provisional*)

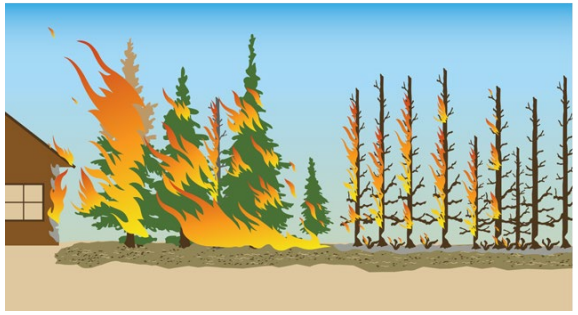
Good	Better	Best
• Sewer backflow protection • Backup power for sump pumps (where present) • Lot grading & drainage • Provision of maintenance information	• Enhance drainage (e.g., cap backfill) • Enhance downspout and sump pump discharge • Address gaps, openings in foundation • Backwater valves graded 3-8%	Full application of CSA Z800, including: • Enhanced protection of basement windows • Utility penetrations above grade • Enhanced foundation drainage practices, inc. maintenance access



Wildfire Protection

Convection/Transport of Embers

Radiant Heat



Conduction/Direct Flame Contact

Insurance Institute for Business and Home Safety (https://ibhs.org/newsroom/)

Images: University of Nevada Cooperative Extension, via Wildland Fire Risk Assessment and Mitigation Reference Manual, Province of Ontario, 2014.

Wildfire Protection (*provisional*)

Good	Better	Best
• Address home ignition zones (inc., decks, no mulch around buildings) • Class A roof cover • Multi-pane windows	• Separate wood fence from building • Cladding • Non-combustible attachments • Protect vents • Enclose eaves	Apply NRC WUI Fire Guide, including: • Gutters, selection of vegetation, addressing intermediate, extended zones

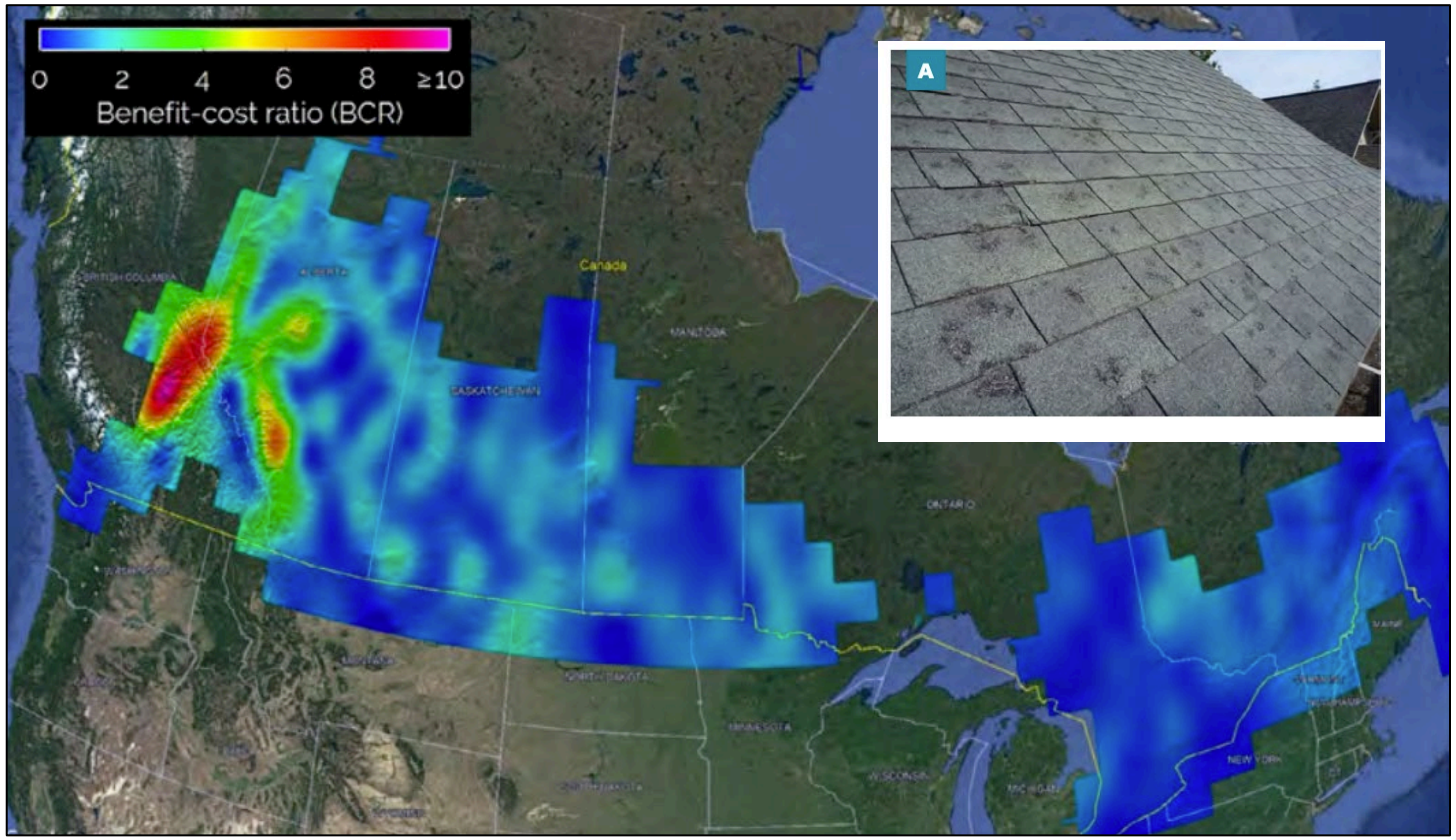
Hail Protection


Calgary

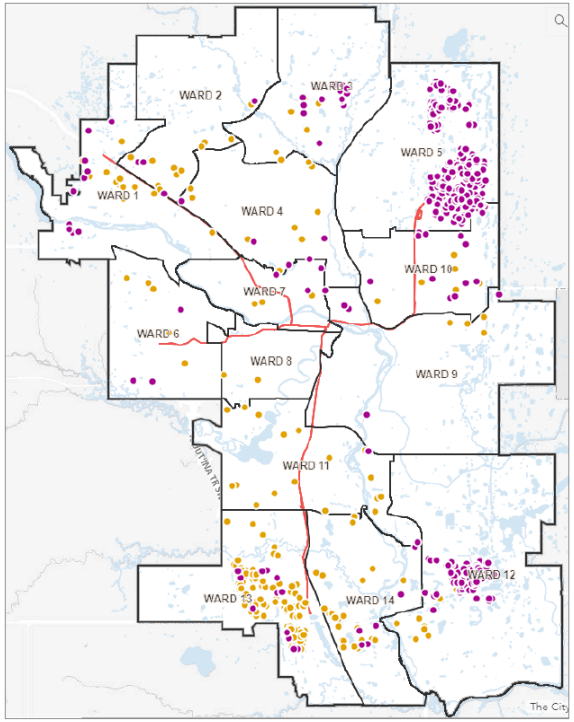
Hail in Calgary

June to September is hail season in Calgary. Hail is formed when drops of water freeze together in the upper regions of thunderstorm clouds. Hail can range in size from a small green pea to a tennis ball and can hit the ground at up to 100 km/hr. Severe storms can produce damaging hail, heavy rainfall and strong winds during these months. These storms can cause injury and damage to cars, homes, and businesses.

Now is the time to prepare, follow these steps to get ready:



Link: https://www.iclr.org/wp-content/uploads/2022/04/Benefit-cost-analysis-of-Impact-resistant-asphalt-shingle-roofing2.pdf



IR Roofing Rebate - Locations

Hail Protection

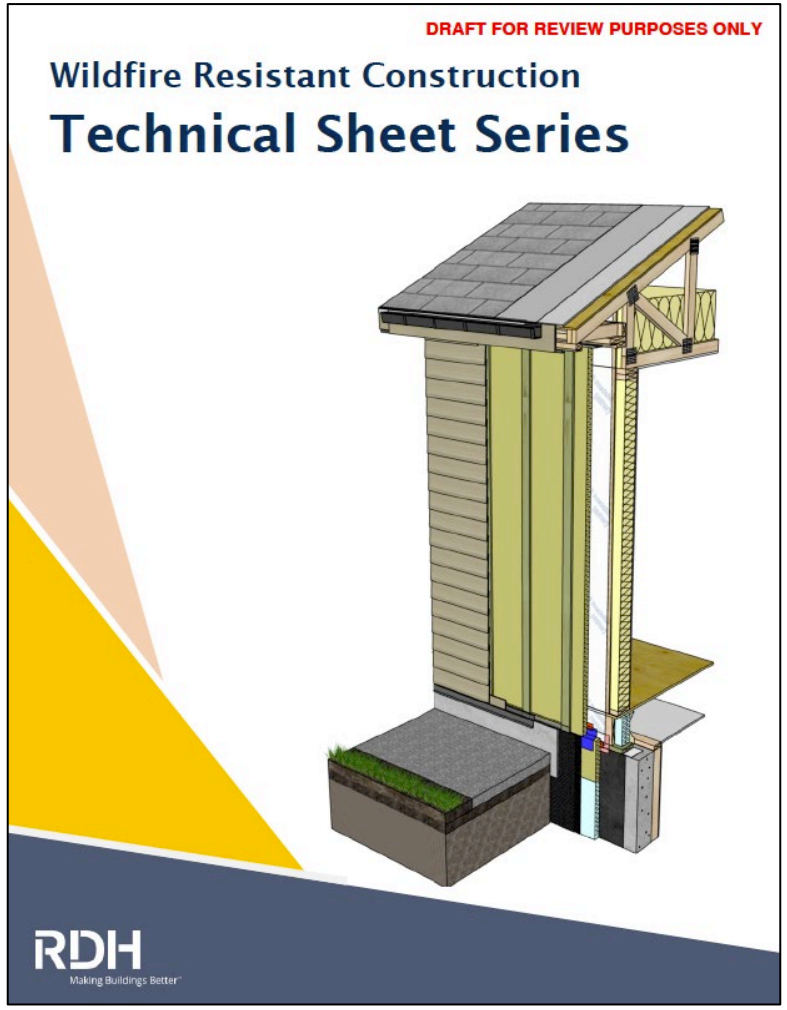
Good	Better	Best
• UL 2218, FM 4473 IR Roof Cover	• Roof cover • Secondary water barrier	• Roof cover • Secondary water barrier • Resilient siding

Class 4 IR Roof Cover – Calgary, 2022

After the June 2020 Calgary hail disaster – *James Hardie*

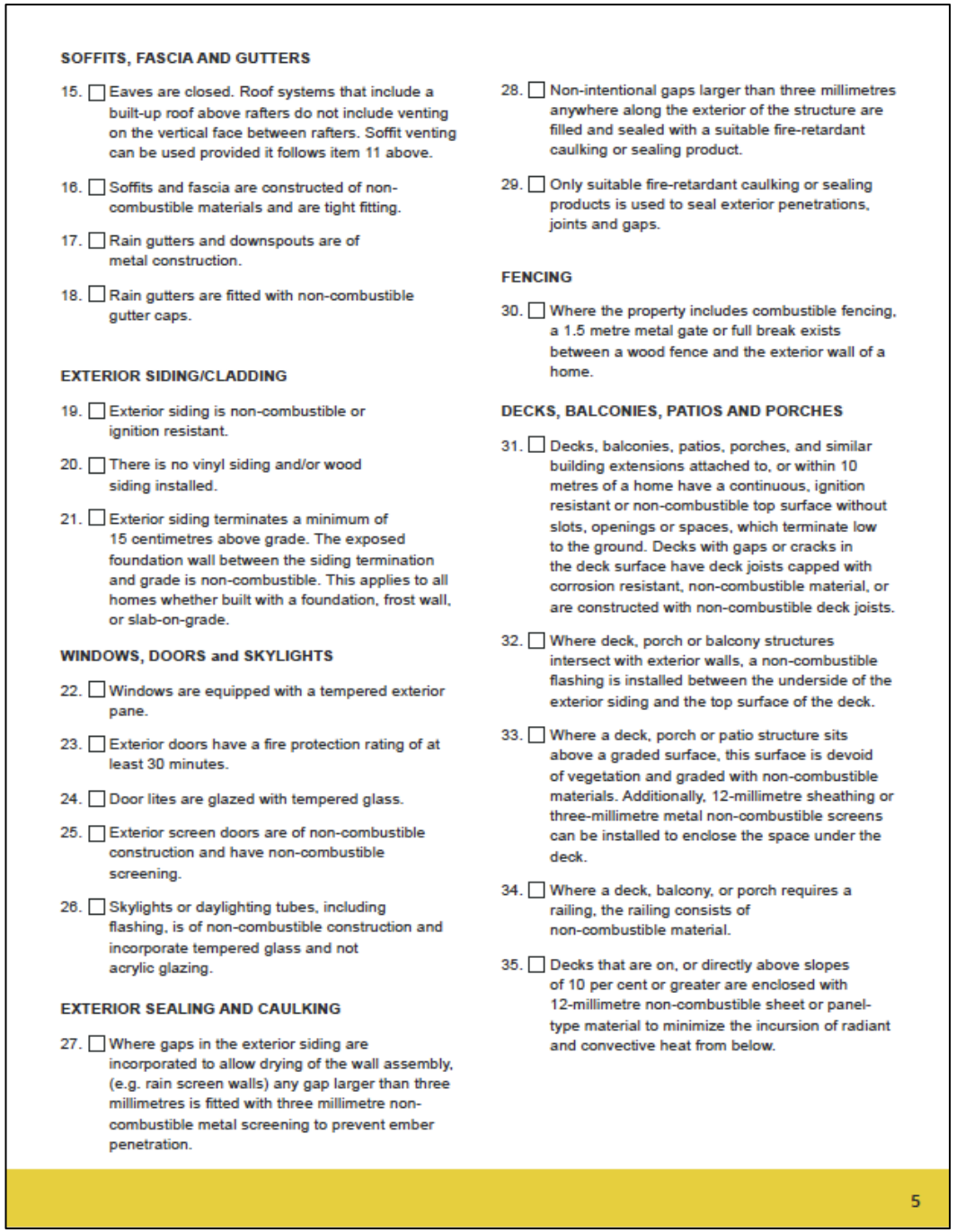
What works for you?

Technical drawings



What works for you?

Checklists



SOFFITS, FASCIA AND GUTTERS

15. ☐ Eaves are closed. Roof systems that include a built-up roof above rafters do not include venting on the vertical face between rafters. Soffit venting can be used provided it follows item 11 above.
16. ☐ Soffits and fascia are constructed of non-combustible materials and are tight fitting.
17. ☐ Rain gutters and downspouts are of metal construction.
18. ☐ Rain gutters are fitted with non-combustible gutter caps.

EXTERIOR SIDING/CLADDING

19. ☐ Exterior siding is non-combustible or ignition resistant.
20. ☐ There is no vinyl siding and/or wood siding installed.
21. ☐ Exterior siding terminates a minimum of 15 centimetres above grade. The exposed foundation wall between the siding termination and grade is non-combustible. This applies to all homes whether built with a foundation, frost wall, or slab-on-grade.

WINDOWS, DOORS and SKYLIGHTS

22. ☐ Windows are equipped with a tempered exterior pane.
23. ☐ Exterior doors have a fire protection rating of at least 30 minutes.
24. ☐ Door lites are glazed with tempered glass.
25. ☐ Exterior screen doors are of non-combustible construction and have non-combustible screening.
26. ☐ Skylights or daylighting tubes, including flashing, is of non-combustible construction and incorporate tempered glass and not acrylic glazing.

EXTERIOR SEALING AND CAULKING

27. ☐ Where gaps in the exterior siding are incorporated to allow drying of the wall assembly, (e.g. rain screen walls) any gap larger than three millimetres is fitted with three millimetre non-combustible metal screening to prevent ember penetration.
28. ☐ Non-intentional gaps larger than three millimetres anywhere along the exterior of the structure are filled and sealed with a suitable fire-retardant caulking or sealing product.
29. ☐ Only suitable fire-retardant caulking or sealing products is used to seal exterior penetrations, joints and gaps.

FENCING

30. ☐ Where the property includes combustible fencing, a 1.5 metre metal gate or full break exists between a wood fence and the exterior wall of a home.

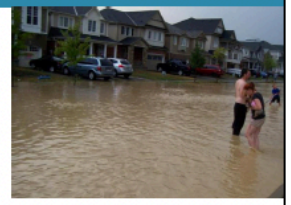
DECKS, BALCONIES, PATIOS AND PORCHES

31. ☐ Decks, balconies, patios, porches, and similar building extensions attached to, or within 10 metres of a home have a continuous, ignition resistant or non-combustible top surface without slots, openings or spaces, which terminate low to the ground. Decks with gaps or cracks in the deck surface have deck joists capped with corrosion resistant, non-combustible material, or are constructed with non-combustible deck joists.
32. ☐ Where deck, porch or balcony structures intersect with exterior walls, a non-combustible flashing is installed between the underside of the exterior siding and the top surface of the deck.
33. ☐ Where a deck, porch or patio structure sits above a graded surface, this surface is devoid of vegetation and graded with non-combustible materials. Additionally, 12-millimetre sheathing or three-millimetre metal non-combustible screens can be installed to enclose the space under the deck.
34. ☐ Where a deck, balcony, or porch requires a railing, the railing consists of non-combustible material.
35. ☐ Decks that are on, or directly above slopes of 10 per cent or greater are enclosed with 12-millimetre non-combustible sheet or panel-type material to minimize the incursion of radiant and convective heat from below.

What works for you?

Accessible homeowner/buyer information

Basement flood protection: New construction



Basement flooding can occur even where well-defined major drainage systems are present, due to excess water entering sanitary sewers. Regional basement flooding occurred during this storm in Binbrook, where ~250 mm of rain fell in 3 hrs. (Photo: Weather Network).

This document provides **basic**, **enhanced**, and **resilience** level measures appropriate for any Part 9 building in Ontario to reduce risk of basement flooding.

Extreme, short-duration rainfall events overwhelm stormwater system capacity, resulting in flooding of basements from a combination of stormwater/overland flow, sewer backup, and seepage. Every year, thousands of households in Canada are affected by basement flood events, resulting in $100s of millions in damages, most of which are uninsured.

Unlike river flood events in Ontario, urban/basement flooding can affect almost any home when rainfall intensities exceed stormwater management system design standards.

As this document is meant to support pilot implementation of flood resilience, it focuses on basic flood protection options. Guidance concerning basic, enhanced, and resilience level measures are provided in the table below. Detailed guidance on basic measures are provided in the appendix to this document. Enhanced and Resilience level measures are outlined in CSA Z800:18 – *Basement flood protection and risk reduction*.

Protection level	Recommendations
Basic	• **Provide sanitary sewer backflow protection.** • **Provide backup power system(s) for sump pumps (where pumps are present).** • **Provide backwater valve and backup power maintenance guidance to the owner.** • **Where provided, backwater valves and sump pumps systems should be accessible for ease of maintenance.** • **Ensure lot grading and drainage directs water away from the building (applies only where local lot-grading and drainage bylaws are not present)** *See appendix for additional detail on basic basement flood protection options.*
Enhanced	Basic measures plus: • Provide enhanced grade on mainline backwater valve (between 3% and 8%). • Provide a well-graded, impermeable cap on backfill area, which extends beyond the line of excavation and backfill. • Provide enhanced surface flood protection for exterior stairwells (where present). • Eavestroughs downspout and sump pump discharge points should be located beyond the backfill area, directed to appropriate receiving drainage systems. • Address foundation cracks and entry points for infiltration flooding. • Identify and seal all potential surface flood entry points (e.g., penetrations through foundations).
Resilience	Enhanced measures plus full application of remainder of CSA Z800:18, including: • Avoid installation of window wells. Where they are present, provide enhanced surface drainage protection. • Foundation drainage systems drain by gravity to receiving systems and are protected against backwater. Where this is not possible, drain to the surface via sump pump (avoid 3rd pipe systems). • Foundation drainage systems constructed in a manner that reduces risk of accumulation of debris over the life of the home. Access for foundation drain system maintenance is provided. • Enhanced provisions are made for possible sump pit overflow/sump pump failure. • Installation of sanitary sewer pipe complies with highest level of manufacturer guidance, with attention paid to grade, bedding, haunching, and backfill.

Institute for Catastrophic Loss Reduction
Building resilient communities

Contact: Info@iclr.org

What works for you?

Explanatory web videos

Mobile apps

How to Operate your ERV or HRV | Net Zero Ready Building Science

Ventilation with ERV or HRV | Net Zero Ready Building Science

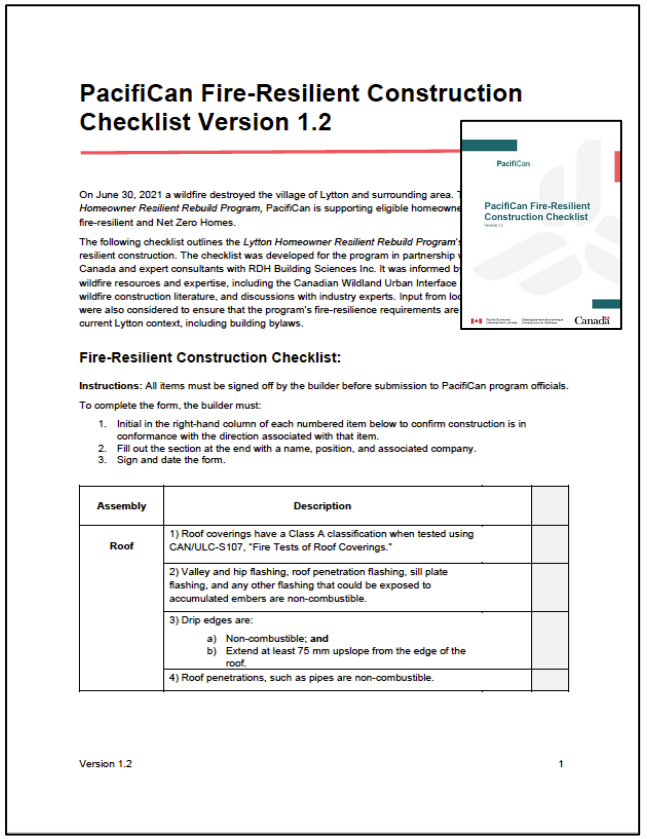
Wildfire Resistant Construction Builder Field Trial Offer

LEEP LOCAL ENERGY EFFICIENCY PARTNERSHIPS

12 projects will be selected to receive the following support:

- Co-operators and ICLR grant: $5,000
- James Hardie material rebate: $1,000 for standard siding package, $1,500 if using trim on corners, windows and battens
- Rockwool material donation: Up to 3 pallets of Comfortboard 80 depending on volume and thickness purchased
- *7* interested candidates to date

*Further details will be provided to interested candidates



PacifiCan Fire-Resilient Construction Checklist Version 1.2

PacifiCan

PacifiCan Fire-Resilient Construction Checklist

On June 30, 2021 a wildfire destroyed the village of Lytton and surrounding area. T
Homeowner Resilient Rebuild Program, PacifiCan is supporting eligible homeowne
fire-resilient and Net Zero Homes.

The following checklist outlines the *Lytton Homeowner Resilient Rebuild Program'*
resilient construction. The checklist was developed for the program in partnership
Canada and expert consultants with RDH Building Sciences Inc. It was informed b
wildfire resources and expertise, including the Canadian Wildland Urban Interface
wildfire construction literature, and discussions with industry experts. Input from lo
were also considered to ensure that the program's fire-resilience requirements are
current Lytton context, including building bylaws.

Canada

Fire-Resilient Construction Checklist:

Instructions: All items must be signed off by the builder before submission to PacifiCan program officials.

To complete the form, the builder must:

1. Initial in the right-hand column of each numbered item below to confirm construction is in conformance with the direction associated with that item.
2. Fill out the section at the end with a name, position, and associated company.
3. Sign and date the form.

Assembly	Description	
Roof	1) Roof coverings have a Class A classification when tested using CAN/ULC-S107, "Fire Tests of Roof Coverings."	
	2) Valley and hip flashing, roof penetration flashing, sill plate flashing, and any other flashing that could be exposed to accumulated embers are non-combustible.	
	3) Drip edges are: a) Non-combustible; **and** b) Extend at least 75 mm upslope from the edge of the roof.	
	4) Roof penetrations, such as pipes are non-combustible.	

Version 1.2 1

Please scan to sign up and learn more

Sponsors:

co-operators

Institute for Catastrophic Loss Reduction
Building resilient communities

Institut de prévention des sinistres catastrophiques
Bâtir des communautés résilientes

James Hardie

ROCKWOOL

ICLR & EnerQuality: Upcoming Workshop

Our Upcoming workshop: EQ & ICLR Resiliency Workshop
When: 18 October 2024
Where: Western U

Resilient Homes Task Force

We would like to hear from CHBA builders and renovators interested in conducting **field trials:**

High wind, urban flood, wildfire, hail

And we would like to
profile your resilience activities to date

Homeowners in Calgary and Edmonton discuss home resilience – ICLR, City of Calgary

CONTACTS:

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ICLR
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CANADIAN HOME BUILDERS' ASSOCIATION
netzero home
LEADERSHIPSUMMIT

Sonja Winkelmann, Senior Director, Net Zero Housing, CHBA

Barriers

Marketing and Promotion

- Poor branding, understanding, awareness, and demand
- Difficult to articulate value proposition (sales & marketing)

Competency & Capacity

- Limited education/accreditation and training/skills development

Technical Standards, QA & Tools

- Lack of standards and support tools

Cost Reduction

- High cost to build or retrofit (capital & labour)

Financing & Real Estate

- Lack of appropriate financing mechanisms and/or incentives

Policy

- Limited enabling policy (e.g. net metering, codes and regulations)

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What has been implemented for the NZHLP?

Technical Standards, QA & Tools

- Definition
- Technical requirements (homes incl. ERS
- Administrative requirements (participants)
- Legal language for sales/ purchase agreements
- Annual NZHLP Summary Reports
- Technical Committee: change requests & ongoing updates

Marketing and Promotion

- Brand/logos, consumer webpage with value proposition language and directory of builders/renovators
- Labels, plaques, brochures, shareable videos and blog posts, asset library with images, icons, and animated logos
- 4 social media accounts w. participant promo
- Awards and home opening/ribbon cutting promo package
- Project Profiles
- CHBA annual Home Buyer Preference Survey

Competency & Capacity

- Building Science, Builder, and EA training
- Sales and Renovator training
- Building Official, Trades, and 9.36 training coming soon
- Webinars
- Net Zero Leadership Summit
- Government funded RD&D projects
- Networking at NZC meetings
- CHBA Builders' and Renovators' Manuals
- LEEP

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What has been implemented for the NZHLP?

Cost Reduction

- **Still higher cost to build/retrofit** (capital & labour)
- **BUT** Net Zero has come down from ~$160,000 to ~$60,000 (some now at NZ TCO!)

Financing & Real Estate

- **Still need appropriate and reliable financing mechanisms and incentives**
- **BUT** new ones are being developed ie RBC Green Home Mortgage

Policy

- **Still need reliable enabling policy** (incl. opGHGs & emGHGs + resilience)
- **BUT** codes and regulations are now driving the timelines (However, they're not allowing renewable energy generation to offset the GHGs – which would be helpful in provinces with high emission factor grids!)

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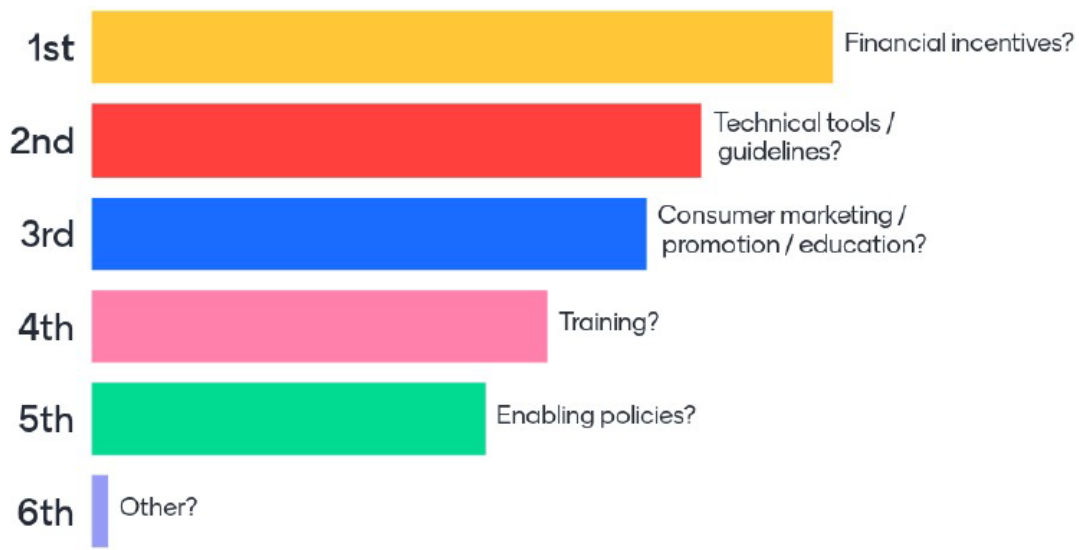
What do we need - to be able to implement RESILIENCE?

The Emissions and Resilience Working Group (ERWG) has been established to provide guidance to CHBA, to assess the feasibility and explore the potential integration of operational and embodied carbon emissions, and adaptation and resilience aspects due to extreme weather into the CHBA Net Zero Home Labelling Program (NZHLP).

SESSION 4 - SAFE HAVENS

Builders/Renovators: What should programs focus on that promote resilient homes?



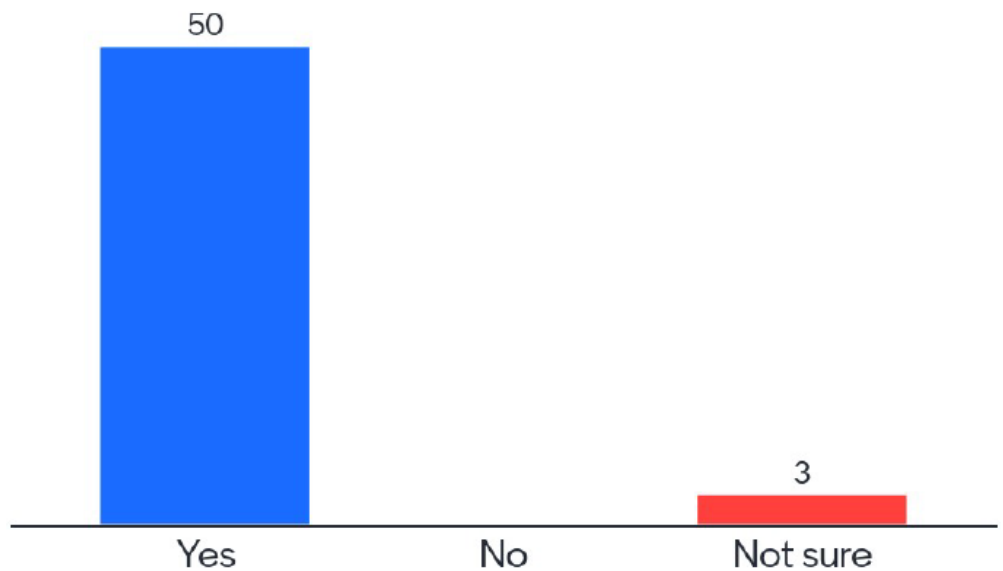
SESSION 4 - SAFE HAVENS

Builders/Renovators: What do you need to market/sell the resilient features and benefits of a home?

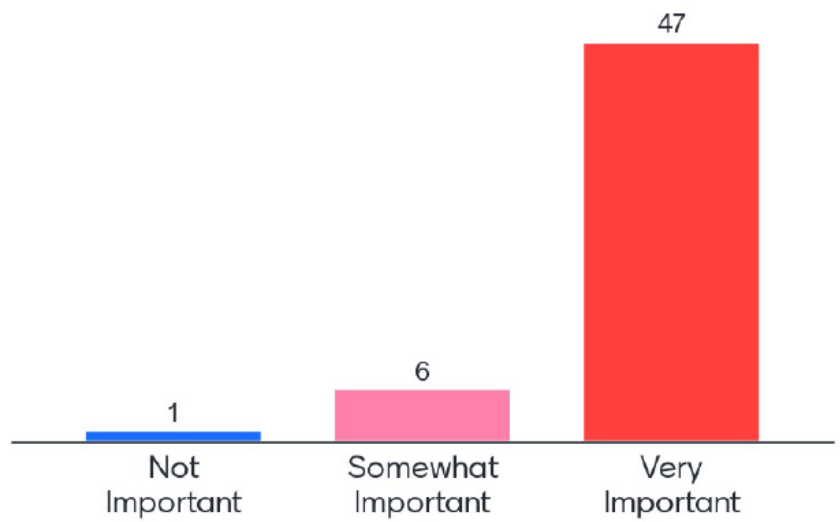
70 responses

SESSION 4 - SAFE HAVENS

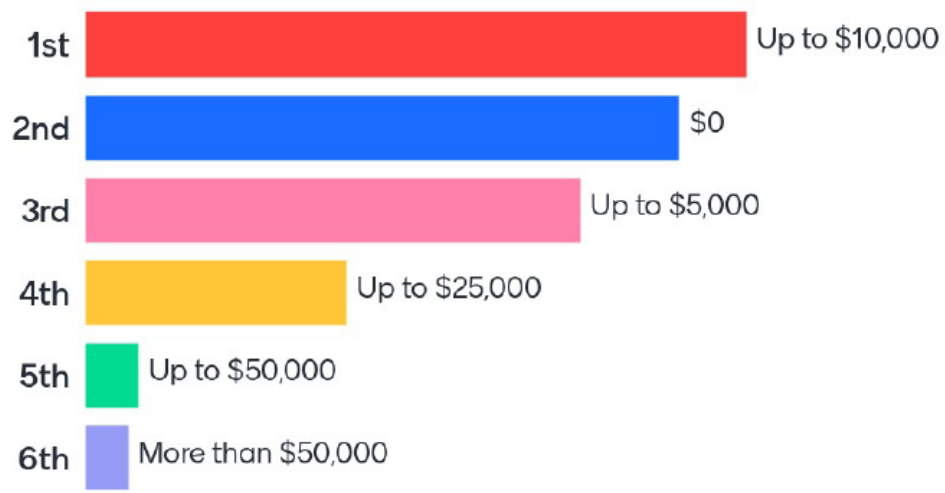
Builders/Renovators: Would insurance discounts help in selling these features?



Builders/Renovators: How important is affordability when it comes to resilient homes (financing costs per month)?



Builders/Renovators: In your experience how much are homebuyers willing to pay for resilience features?



What's on for tomorrow? Day 2 Agenda

7:30 AM	Networking breakfast buffet and in the theatre
8:30 AM	**LEADING THE WAY. Meet 5 Builder Teams achieving Net Zero/Ready in Multi-Family projects.**
10:15 AM	Break and networking in the DEMO HUB
10:45 AM	**HOW LOW CAN YOU GO. Electrification on 100 amps?**
12:00 PM	Lunch buffet and networking in the DEMO HUB
1:15 PM	**GOTTA KEEP 'EM SEPARATED. Compartmentalization for Multi-Family.**
2:30 PM	Break and networking in the DEMO HUB
3:00 PM	**ARE YOU READY FOR THIS? What's next for scaling a Net Zero future.**
4:15 PM	Summit wrap-up
THU	**Tours:** 7:30-8:00 AM breakfast to go, 8:00 buses depart, 1:00 PM buses return

MEET OUR DAY 2 CO-HOSTS!

Lynne Strickland,
Director, Initiatives, Net Zero Energy Housing, CHBA

Andy Oding,
Vice President, Director of Building Science, Building Knowledge Canada Inc.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