

Decarb Lunch Series

zebox

CLF Carbon
Leadership
Forum
British
Columbia

The Opportunities and Challenges of Deconstruction

cleanBC

Tue Oct 17, 2023,
from 12- 1pm PDT
Free Webinar | zebox.org

zeic

ZERO EMISSIONS INNOVATION CENTRE

zeb_x



B2E
Building to
Electrification
Coalition

CLF Carbon
Leadership
Forum
British
Columbia

+ Retrofit Program (In Development)



20 posts found

Categories

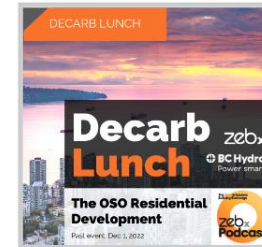
- Articles
- Reports
- Case Studies
- Videos & Slides
- Podcasts

Series

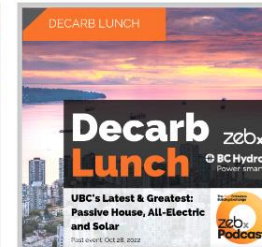
- Deep Emissions Retrofit Dialogues
- CleanBC Net Zero Energy-Ready Challenge Playbook
- CleanBC Net Zero Energy-Ready Challenge Winners
- Decarb Lunches
- Tech Demo Workshops
- Decarbonization Planning

Systems

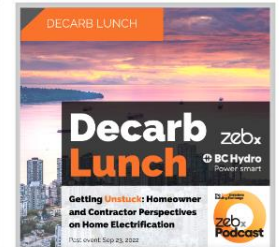
- Mechanical
- Building Enclosure
- Solar Energy
- Geothermal
- Domestic Hot Water Heat Pump



Decarb Lunch: Nov 2022, The OSO Residential Development



Decarb Lunch: Oct 2022, UBC's Latest & Greatest: Passive House, All-Electric and Solar



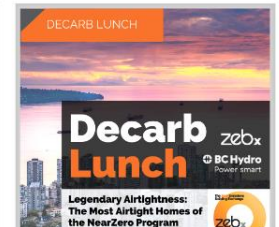
Decarb Lunch: Sep 2022, Getting Unstuck: Homeowner and Contractor perspectives on home electrification



Vancouver's New Green Building Regulations



Overheating: Will the need for cooling accelerate decarbonization?



Legendary Airtightness: The Most Airtight Homes of the NearZero Program





Tell us about yourself!

Three-part anonymous poll



Inspiring and spurring
collective action to
solve the embodied
carbon challenge

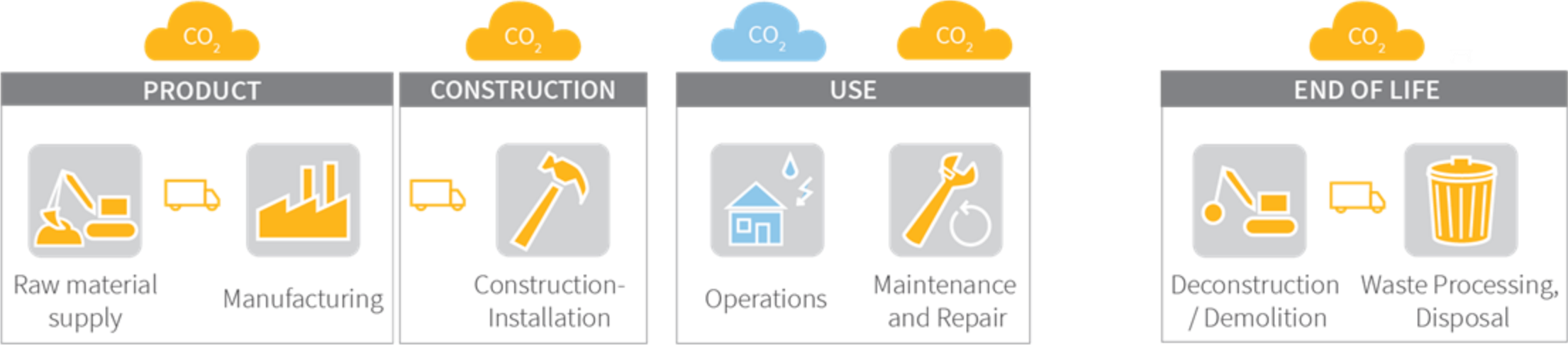
A program area of ZEIC

The Embodied Carbon of Buildings



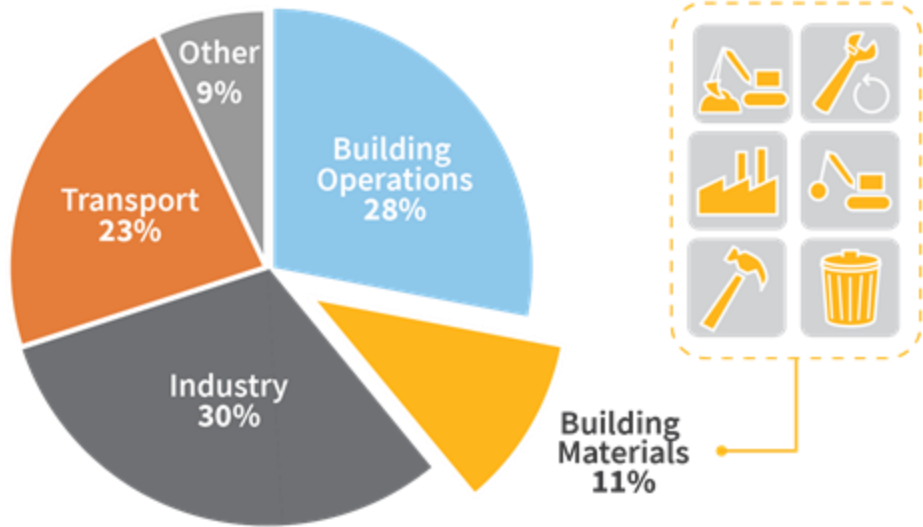
Image: S. Smedley Skanska

■ Embodied carbon
■ Operational carbon



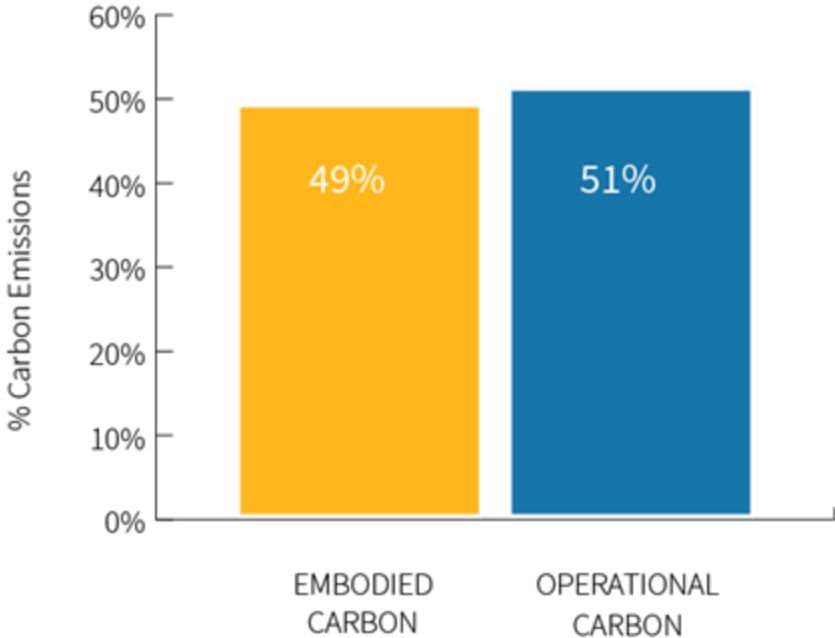
Embodied carbon is **significant**

Global energy-related carbon emissions



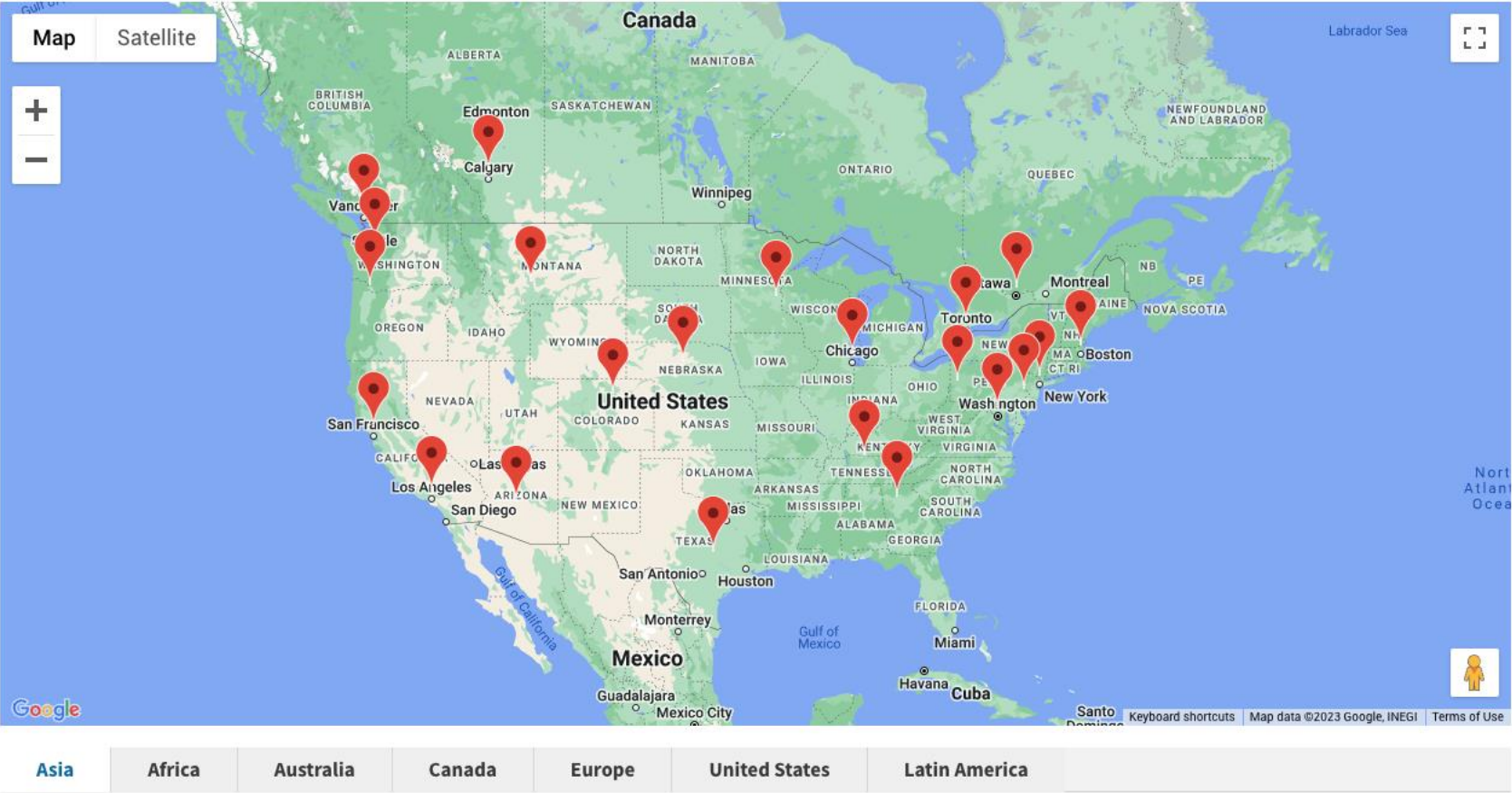
Data sources: UNEP Global Status Report 2017
[EIA International Energy Outlook 2017.](#)

Total Carbon Emissions of Global New Construction from 2020-2050 Business as Usual Projection



© 2018 2030, Inc. / Architecture 2030. All Rights Reserved. Data Sources: UN Environment Global Status Report 2017; EIA International Energy Outlook 2017

Carbon Leadership Forum Network



CLF BC Network Goals

- ❑ **Collective** Action
- ❑ Shared learning
- ❑ **Collective** problem solving
- ❑ Removing barriers to learning
- ❑ Going further, and faster
collectively

Embodied Carbon Exchange

The Embodied Carbon Exchange offers a place for open discussion relating to the daily challenges we face designing, developing and constructing low embodied carbon buildings.

[Get Involved](#)

Embodied Emissions Peer Network

The Embodied Emissions Peer Network is a place for local government staff and invited guests to get together with the common goals of knowledge and resource sharing.

[Learn More](#)

Embodied Emissions Research Network

The Embodied Emissions Research Network offers a place for those working in embodied carbon research to share knowledge, collaborate on initiatives and eliminate the duplication of research.

[Learn More](#)

Refine your Search

🔍 Enter your search

The Low-Carbon Material Sourcing Guide

[Read More](#)

Categories

- Past Events (7)
- Newsletters (0)
- Case Studies and Guides (3)
- Videos (5)
- External Resources (0)

Networks

- Socials, Awards & Other Highlights (0)

Subjects

- Certifications (0)
- Policy (0)
- Software Tools (0)
- Baseline Definition (0)



News: We're Hiring! Program Manager, CLF BC (Embodied Emissions)



Embodied Emissions Case Study: Inlet View



Case Study: Passive House and Embodied Carbon



Concrete: A Pragmatic Approach to Lowering Embodied Carbon



Making the Case for Building Reuse



Carbon Storing Buildings: A Gateway to Justice and Belonging

2023 Embodied Carbon Awards



The Embodied Carbon of Buildings

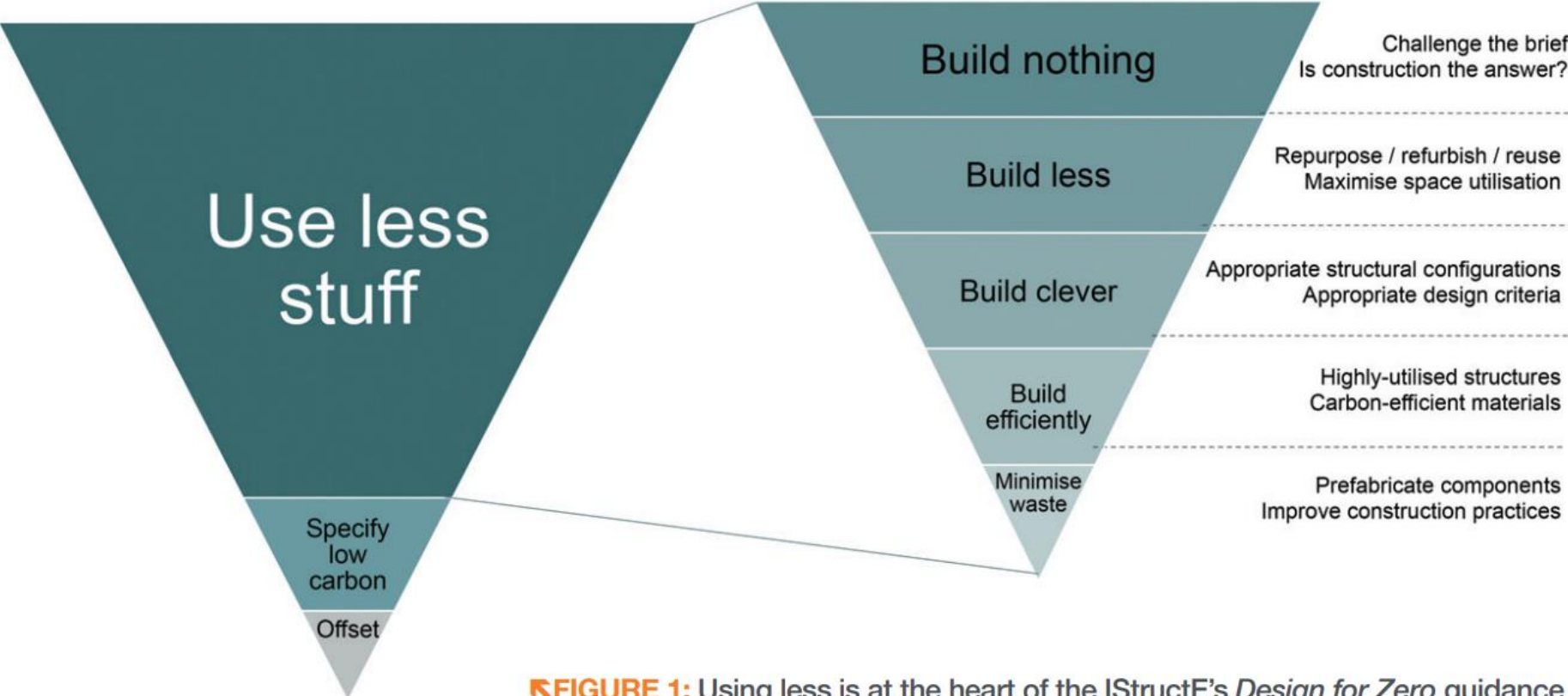


FIGURE 1: Using less is at the heart of the IStructE's *Design for Zero* guidance

Adapted by the IStructE from PAS 2080

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Survey Results

Three-part anonymous poll

A BLUEPRINT FOR CHANGE

Preventing demolition waste and retaining embodied carbon through home relocation and deconstruction

ZEBx/CLF BC Decarb Lunch

October 17, 2023





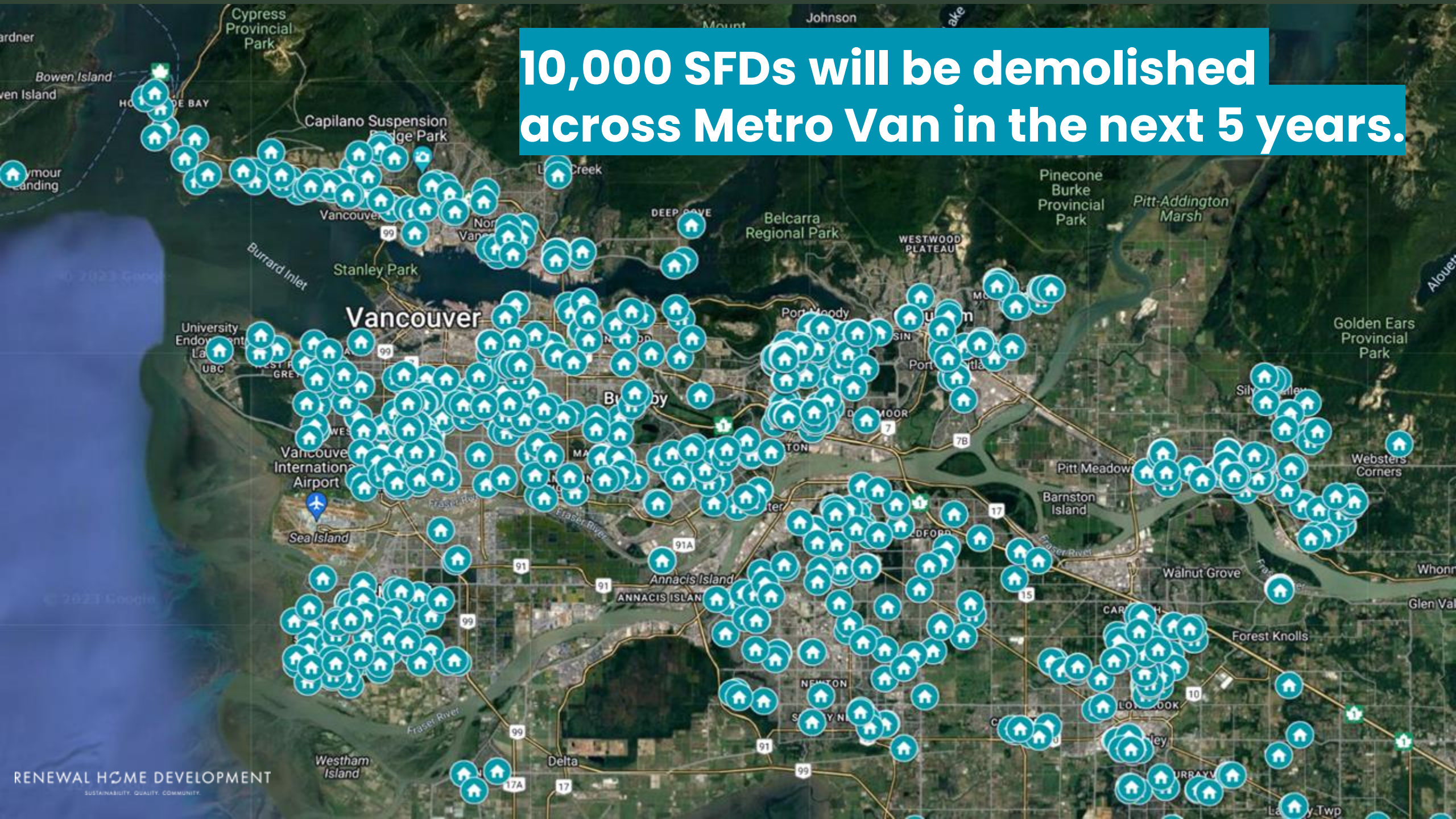
2,600 SFHs
demolished annually

100 tonnes
of material waste.

43 tonnes
of CO₂e

\$112 million
for Vancouver Landfill closure
and post closure costs

10,000 SFDs will be demolished across Metro Van in the next 5 years.





Meanwhile...

17% of residents in First Nation communities are living in crowded dwellings. Additionally, 18% are in homes that are in need of major repairs.

Many Nations have 20+ year waitlists for housing.



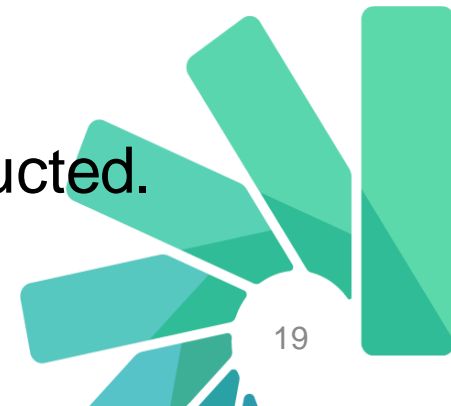
1 in 10 British Columbians lack 'core housing.'

The Opportunity



Estimate **20%** of homes could be relocated.

Significant portion of the remainder could be fully/partially deconstructed.



Renewal Home Development Case Study

Rancher slated for demolition by developers in Coquitlam.



Same home repurposed at 75 Veterans Road, Gibson.





Envisions a policy framework that **triages** options for home removal based on **circular economy principles** reflected in BC's Pollution Prevention Hierarchy and enshrined in BC's Recycling Regulation to achieve the **highest and best use of homes** slated for removal.



Municipal Action Plan – Key Recommendations

1. Mandatory house assessments prior to removal to determine if a home can and should be relocated, deconstructed, and as a last resort, demolished.
2. Create Early Green Removal Permits
3. Incentivize with a refundable deposit

West Vancouver and Coquitlam Councils have referred issue to staff to review and bring back policy recommendation.

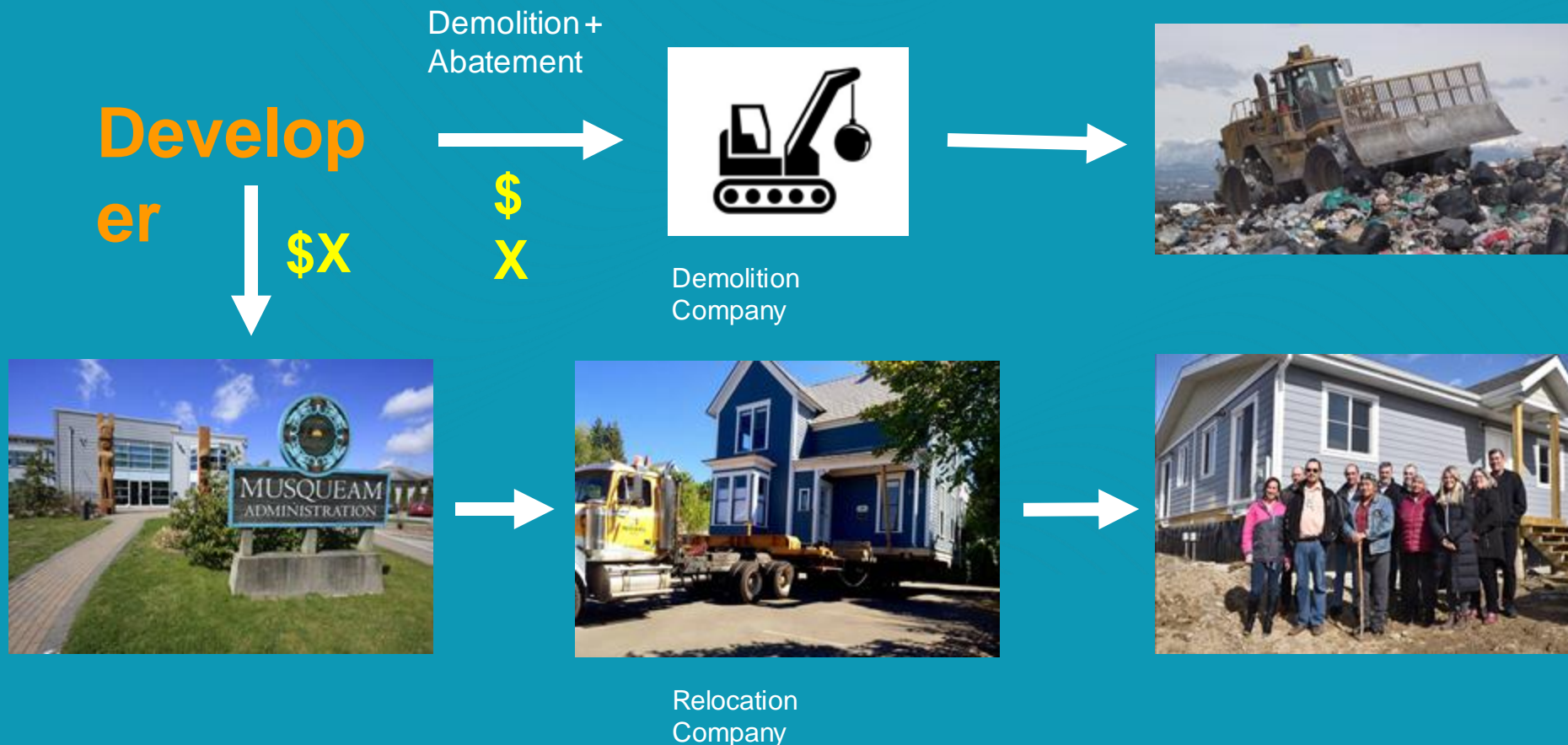


Home Relocation & Repurposing Program

- Initiative of Light House, Renewal Home Development and Nickel Bros.
- Relocating and repurposing homes slated for demolition to coastal indigenous communities and exurban non-profit housing associations.
- CMHC Housing Supply Challenge Finalist

Home Relocation & Repurposing Program

1. Re-allocate demo + abatement quote to Nation/NPHA



Home Relocation & Repurposing Program

2. Flow through of charitable tax benefit from Nation/NPHA as “qualified donee”

Appraisal =
\$200,000



Developer Marginal Tax Rate =
27%

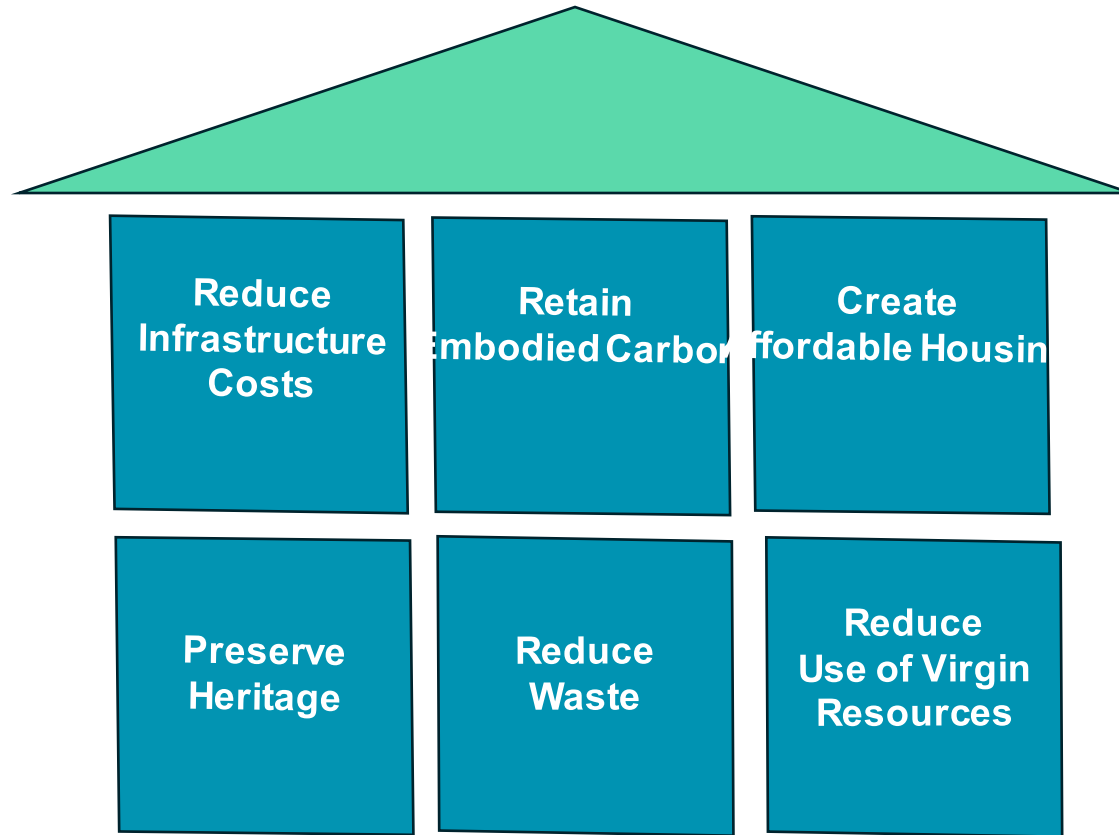


Tax Benefit =
\$54,000

*once received, after year-end



Bringing it all together under one roof





www.light-house.org

unbuilders



**HERITAGE
LUMBER**



Reclaiming the past, supplying the Future

Introduction

Adam Corneil - Founder & CEO

- 20+ years in sustainable construction in 3 provinces
- Passive House certified builder
- Reclaimed wood & deconstruction expert
- Policy change advisor to City of Vancouver & other regions
- Demolition Committee Member, National Zero Waste Council
- Teaches at BCIT – Deconstruction Project Management



Who We Are

Two complementary companies:

Unbuilders:

Canada's first dedicated deconstruction & salvage company.

Changing the end of life for buildings by tearing down the old demolition paradigm.

Heritage Lumber:

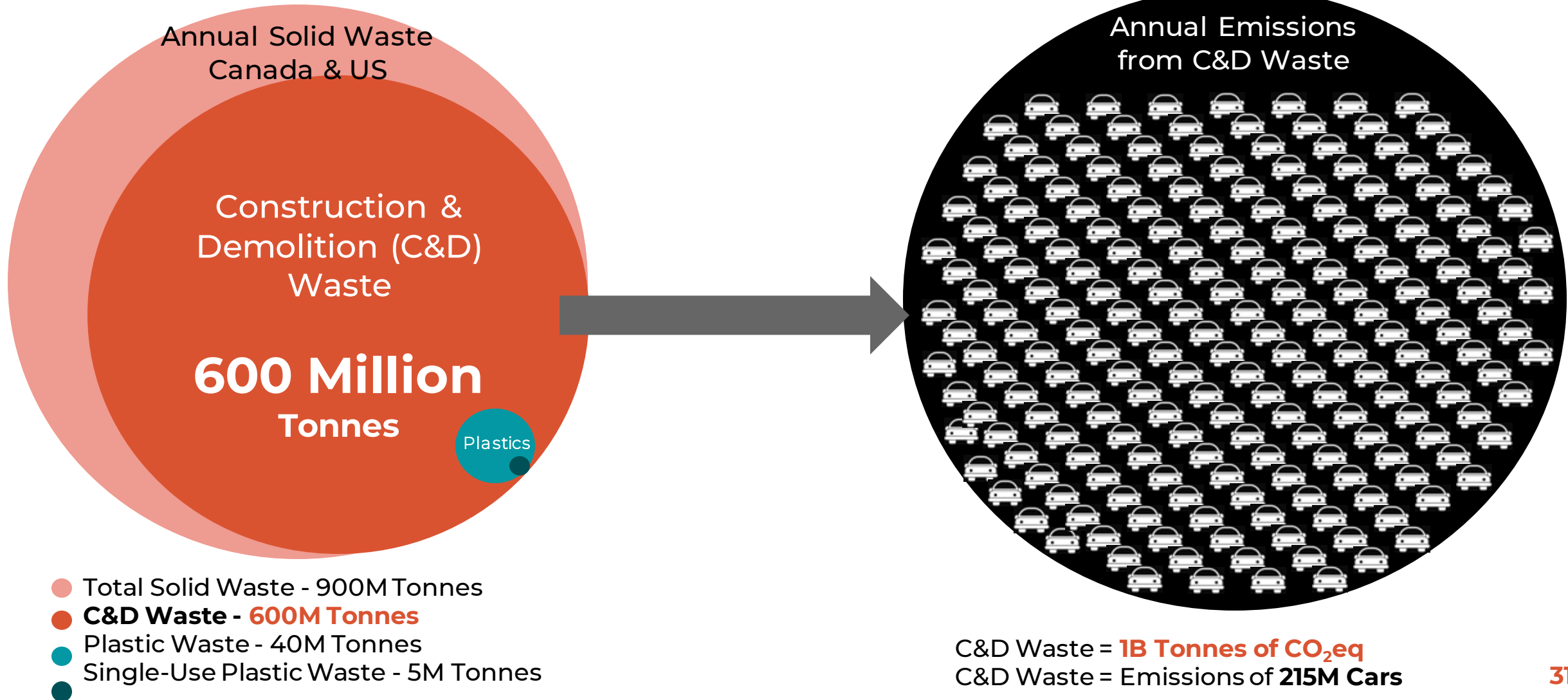
Reclaimed wood product manufacturer and broker.

Innovating new building products for a more sustainable construction industry.



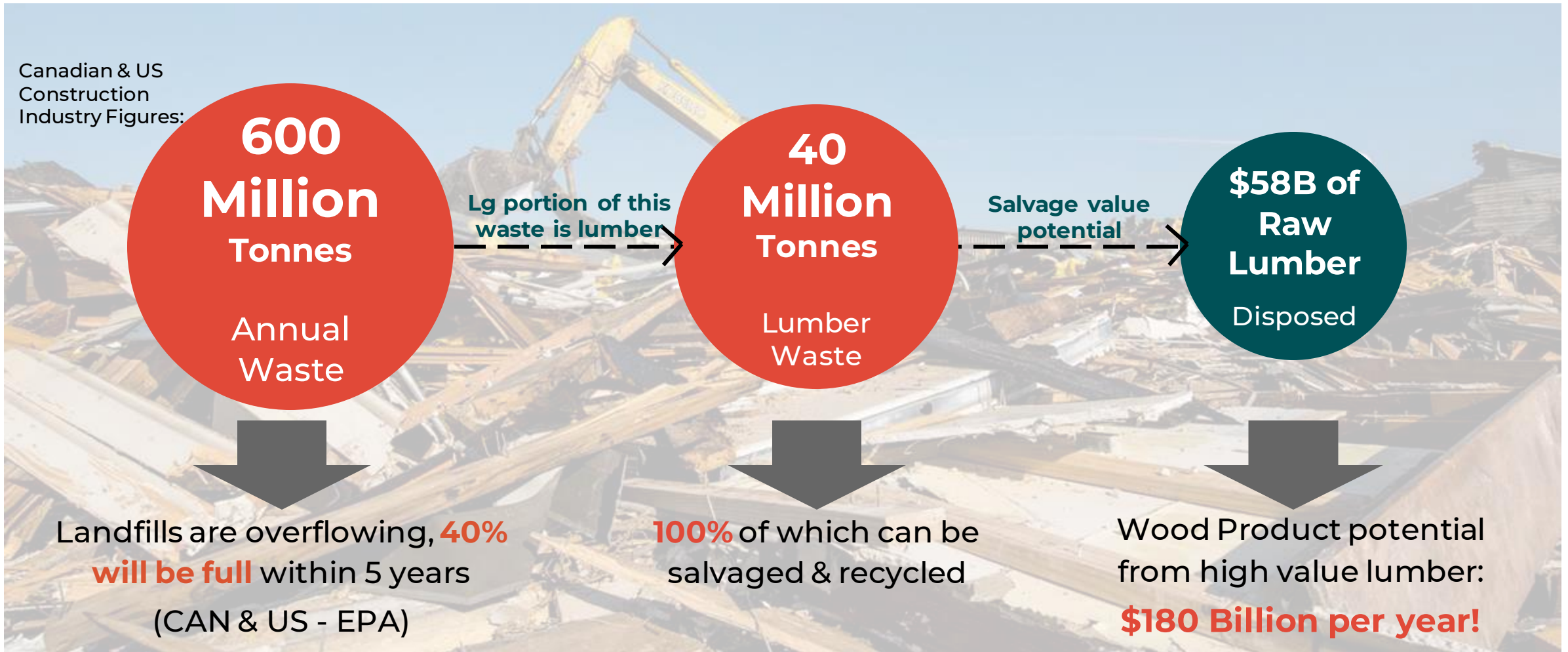
The Problem - Construction Waste

Construction is the **most wasteful** of all industries



Construction Waste is Wasted Value

Demolition & disposal leaves valuable resources landfilled in mass quantities



Massive Volumes of Waste

Equivalent of 6,000,000 homes landfilled annually in Canada & USA from C&D



Defining Removal Services

	Demolition	'Green' Demolition	Deconstruction
Initial Salvage	X	X	✓
Abatement	✓	✓	✓
Strip Out	✓	✓	✓
Structure	Waste	Recycling	Salvage & Recycling
Foundation	✓	✓	✓

Traditional Demolition



'Green' Demolition

Demolition where the majority of the materials are 'recycled'

Recycling Hierarchy

- Retention
- Value-added products
- Reuse - lateral

Redefining Recycling:

- Biofuels
 - Still massive polluter as GHG are released into the atmosphere
- Contouring material
 - Material ends up in landfill & has more energy/resource input



'Green' Demolition



The Solution – Salvage, Reuse & Remanufacture

Unbuilders deconstructs & salvages; Heritage Lumber resells & remanufactures

Unbuilders

- Average 90% waste diversion and 22,000 lbs of wood salvaged
- Record setting 99% salvage & recycle on single family home



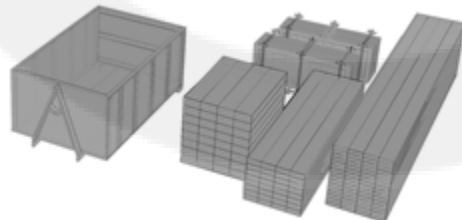
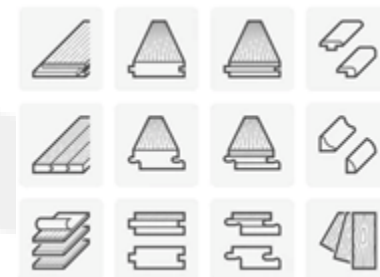
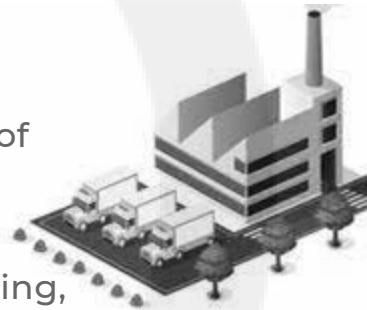
Charities

- Receive salvage goods for resale; use proceeds to build affordable housing
- Owner receives tax receipt for appraised value of goods



Heritage Lumber

- Mill in Maple Ridge, showroom in Vancouver
- Over 500,000 board feet of inventory and products
- Innovative reclaimed products - flooring, cladding, sheathing, tabletops, etc.



Deconstruction



The Impact

Unbuilding provides a triple bottom line - people, planet & profit

Environmental

- Potential diversion of **600 million tonnes** of waste C&D produces annually
- Landfills are overflowing
- Forests are low on wood fiber from fires, pine beetle and logging regulatory changes

Health

- Only deconstruction removes all hazardous materials from sites
- Avoids health risks to workers and communities
- Avoids contaminating soils, landfills and recycling facilities

Social Impact

- Better for **communities** and the preservation of history
- Contributes to the construction of **affordable housing** through partnership with **Habitat for Humanity**



Deconstruction Cost – Donation Model

Full deconstruction and renovation

FULL REMOVAL*	unbuilders	DEMOLITION
Strip Out	\$8500	\$8500
House Removal	\$32,000	\$17,000
Foundation Removal	\$6500	\$5500
Appraisal Cost	\$2000	N/A
Federal & Provincial Tax Credits	\$18,850 + \$9,750	N/A
Total Job Cost	\$20,400	\$31,000

* Based on average 2,400 ft² house with appraised value of \$65,000

RENOVATION*	unbuilders	DEMOLITION
Kitchen Removal	\$3,800	\$3,000
Appraisal Cost	\$500	N/A
Federal & Provincial Tax Credits	\$2,900 + \$1,500	N/A
Total Job Cost	\$0	\$3,000

* Based on average kitchen renovation with appraised value of \$10,000

Community & Partnerships

Deconstruction is: Collaborative, Locally-focused, rooted in the **Circular Economy**

Partnerships - It takes a village...to change an industry

- Demolition, Hauling & Facility Partners
- Charities - Habitat for Humanity, The ReUse People of Canada
- Industry network of builders, developers, woodworkers, architects & designers
- Banking - Vancity - Offering Deconstruction Loans
- Government - Policy change at the municipal and provincial levels in the works
- Academia - BCIT, UBC, Emily Carr, LaSalle College, UFV



Salvaged Goods

Items Salvaged:

- Cabinetry, appliances
- Windows & doors
- Fixtures – plumbing, electrical
- Flooring, mouldings
- Architectural features

Donated to charities & non-profits

Sold to for-profit used goods retailers (i.e. DemXx, Maple Ridge New & Used, etc.)



Ideal Deconstruction Projects

Heritage Sensitive Buildings

- Façade retention
- Deconstruction of building core

Pre-1975 Buildings – Commercial & Residential

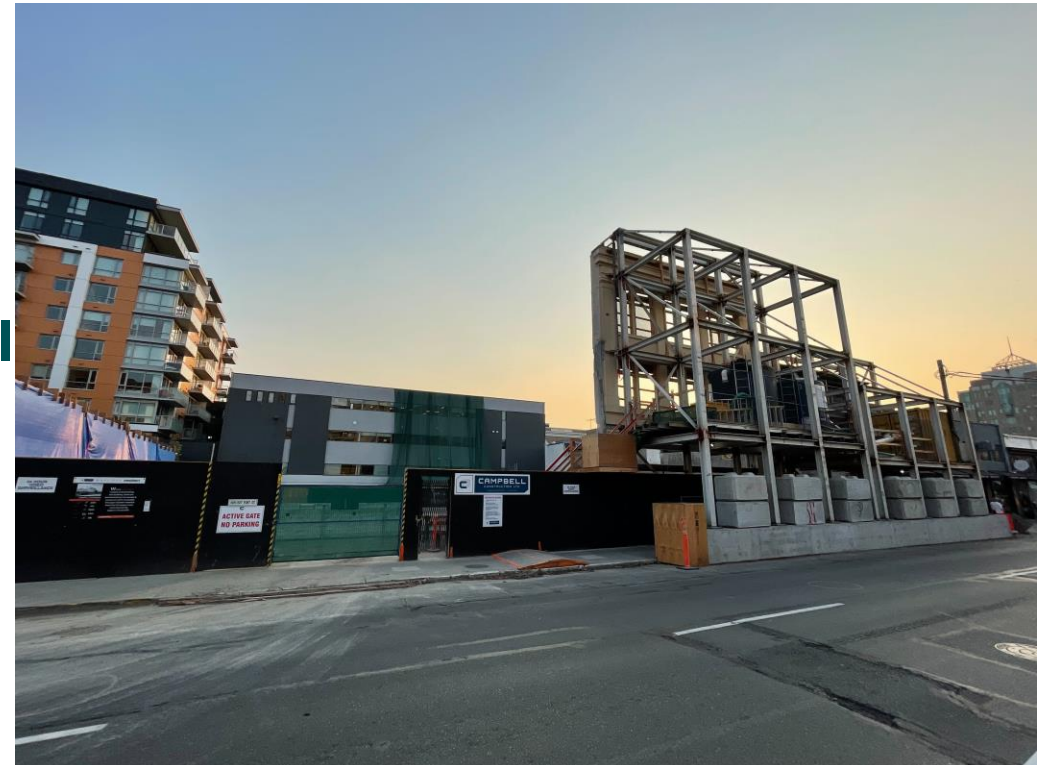
- Initial salvage – lower value typically
- High value old growth lumber

Post-1975 Buildings – Commercial & Residential

- Initial salvage – higher value typically
- Low value lumber typically

Renovations & TI's

- Initial salvage
- Source separation and recycling



Deconstruction Roadblocks

TIME

- Deconstruction takes more time
SOLUTIONS:
 - Machine-assisted deconstruction
 - Policy should incentivize deconstruction with early permits

COST

- Deconstruction costs more up front
SOLUTION:
 - Charitable model
 - Machine-assisted deconstruction
 - Policy should incentivize deconstruction with early permits

COMPLEXITY

- Deconstruction is more complex
SOLUTION:
 - Education



What's Next for Unbuilders

Move up the value chain from service to licensing then software

Deconstruction Management:

- Create inventory & lumber off-takes
- Manage donation, appraisal process & waste audit

Licensing & Training:

- **License & train** other contractors with Unbuilders tools, systems & techniques
- Drive **project leads** & provide decon management for licensees

Unbuild.It - Software Platform:

- **Contractors:** inventory, appraisal, donation & waste audits
- **Charities & Wood Outlets:** access upcoming inventories
- **Municipalities & Transfer Stations:** tipping receipts, seamless permit compliance
- **Marketplace:** pre-sell materials, donate remainder
- **Add AI** to automate inventory appraisals + cost estimates



Heritage Lumber - Reclaimed Wood & Products

Lumber & Timber

- Reclaimed timber & dimensional lumber
- Custom cut timbers



Products

- Wide Plank Flooring
- Wall & Ceiling Cladding
- Beam Wrap
- Tabletops & Counters
- Mantels



Regional Roots – Old Growth Lumber

Deconstruction harvests more than a raw material, we are salvaging **our history**

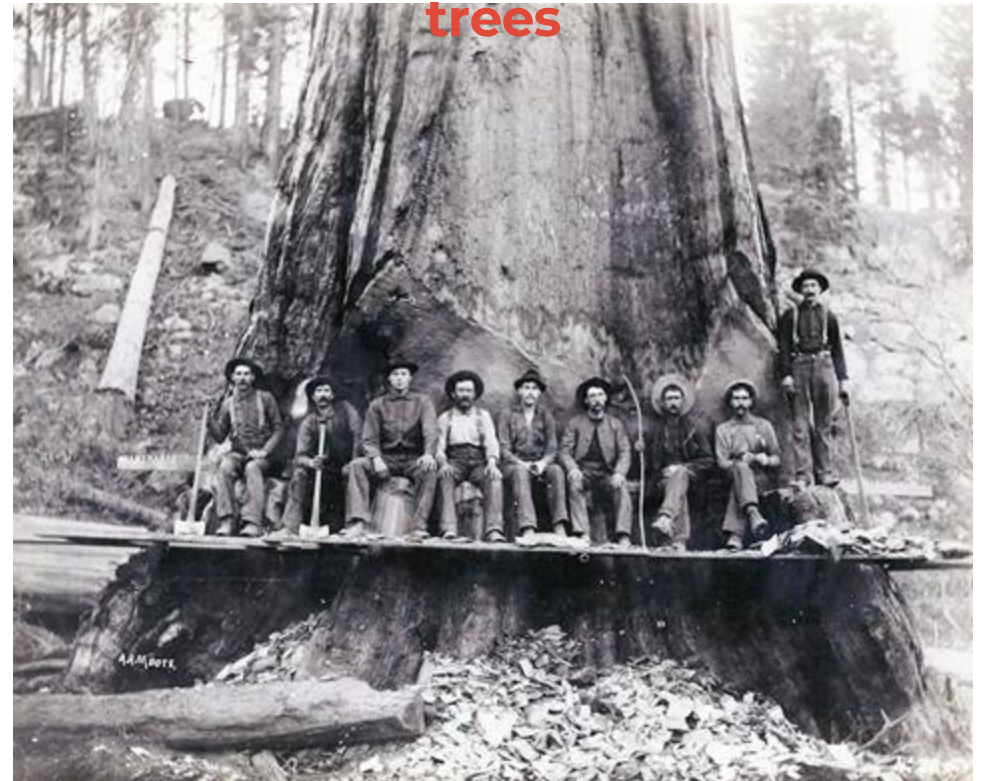
Old Growth Lumber

- Trees **1,500 years old** once covered our continent & built our cities
- **Scarce resource**, rarer w/ every demolition
- Pre-1975 buildings constructed w/ Old Growth

Benefits of Reclaimed Lumber

- **92% less embodied carbon**¹
- **3 times stronger** than new lumber¹
- **Most sustainable** building material on the market

Though our cities may be young,
they were built with **ancient**
trees



¹– “Using Reclaimed Lumber and Wood Flooring in Construction: Measuring Environmental Impact Using Life-Cycle Inventory Analysis.” Proceedings of the International Convention of Society of Wood Science and Technology and United Nations Economic Commission for Europe – Timber Committee October 11-14, 2010, Geneva, Switzerland.

Western Reclaimed Timber – Acquisition Sept '22

- Fully operational mill and product manufacturing including a kiln
- Buy and sell large volumes of reclaimed wood
- In-housed all production



WESTERN
RECLAIMED
— TIMBER —



What's Next for Heritage Lumber



Evolve from solid wood products to engineered products & prefab construction

Engineered Products (2024):

- **Wide Plank Engineered Flooring** - more than doubles our market potential
- **Sheet Goods** - fully reclaimed plywood - first to market
- Uses a large volume of current waste off the production line

Pre-Finished Products (2025):

- Select colors ready to ship & install
- Large **increase in online sales & B2C business**

Prefabricated Buildings (2025):

- Use lower value lumber for structural applications
- In talks w/ 2 companies currently for 2024 supply



Shor House Mayne Island BC

- Measured Architecture
- Architizer A+ Award Winner
 - "Best Sustainable Private House"
- Products used:
 - Yellow cedar ties
 - Decking and stairs
 - Reclaimed lumber
 - NLT floor system
 - Stairs
 - Millwork
 - Shiplap
 - Walls and ceiling



Shor House Mayne Island BC



Current Construction - Designed for Waste

Low Value Products

- TGI Joists, engineered products
- SPF – low quality wood

Glues & Screws

- Sub-floors, flooring and many products

Spray Foam, Caulking, Etc.

- Sub-floors, flooring and many products



Policy Changes Snapshot

Deconstruction and embodied carbon are being mandated; Logging restrictions creating need for old growth wood fiber

Deconstruction Policy

- Vancouver – ‘Green’ Demo Policy
- Victoria & District of North Van
- Elsewhere

Embodied Carbon

- Federal & Provincial building code looking at embodied carbon calculations

Old Growth Logging Deferrals

- Restrictions & bans on old growth logging



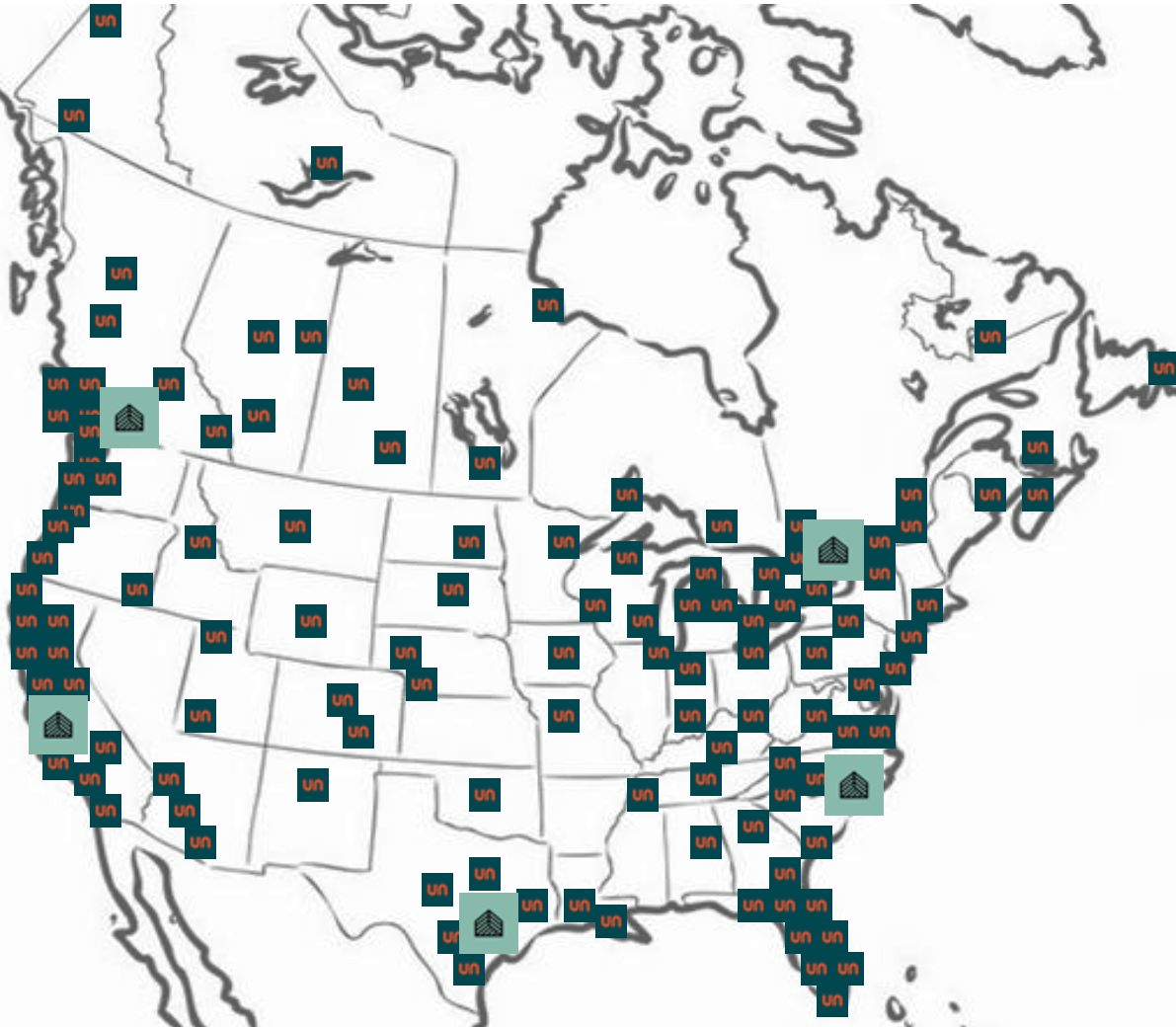
Our Vision:

A construction industry where deconstruction and remanufacturing replaces demolition and disposal.



Unbuilders:

Licensees
across North
America using
new Software
Platform



Heritage Lumber:

Centralized
Manufacturing
& Localized
Receiving

It's Not Waste,



It's Just Wasted.



@unbuildersdeconstruction



@heritagelumberca

info@unbuilders.com

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- Early access to building electrification news, updates and events;
- Recognition on B2E website and acknowledgement that your organization is fully engaged in the decarbonization of the building sector.

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Tuesday October 24

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Building to
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Decarb Lunch: Electrical Panel Management Strategies for Residential Applications

Friday November 24

12-1pm, 2023