



New Housing Supply: How to Build it Right for the Future?



NATIONAL BUILDING
DECARBONIZATION
FORUM | APRIL 2024

Steven Pacifico, ED T2030D

TORONTO
2030
DISTRICT®

April 18, 2024

Agenda

1. Opening, Introductions, Context setting
2. Introductory remarks from panelists
3. Q&A, with Menti questions
4. Participant discussion
5. Replay



New Housing Supply: How to Build it Right for the Future?

Session Description

- In the face of housing shortages and net-zero targets, what does it mean to build right for the future?
- How do we ensure that any new homes built in this effort are fully compatible with our net-zero future?
- This session will characterize the residential new construction challenges and explore what the building community is doing to make sure we get it right for zero-emissions, climate resiliency, and affordability.

New Housing Supply: How to Build it Right for the Future?

Session Objectives

- Explore the opportunity for electrification in new housing supply, and the strategies at play to build right for a net-zero future;
- Discuss the challenges of meeting housing demand across the country; and,
- Create a space for participants to discuss and identify approaches that different levels of government and industry should take to meet housing supply and electrification.

New Housing Supply: How to Build it Right for the Future?

Panelists

- **Panel Moderator:** Steven Pacifico, Executive Director Zero Carbon Buildings Accelerator Program, Toronto 2030 District
- **Panel Presenter:** Mike Moffat, Founding Director, PLACE Centre, Smart Prosperity Institute / Assistant Professor, Business, Economics, and Public Policy, Ivey Business School
- **Panel Presenter:** Jeff Ranson, Director Responsible Development, Northcrest Developments
- **Panel Presenter:** Tim Webber, Partner and Co-Founder, Diverso Energy

STOP! COLLABORATE AND LISTEN.



The Housing Supply Challenge

- Canada needs to build 5.8 million homes by 2030 to address the affordability crisis (CMHC) and to meet supply demand
- Current rate projects 2.3 Million units, we need to build an additional 3.5 Million units by 2030
- Key challenges include:
 - Supply Chain Issues
 - Inefficient regulatory systems
 - Labour shortages, especially with skilled trades
 - Inflation and high interest rates

The Challenge

- Key Question: How do we build 5.8 Million homes by 2030 and reach our climate changes goals at the same time?
- Canada has committed to an ambitious emissions reduction plan to reach net zero emissions by 2050 and 40% lower than 2005 levels by 2030.

The Challenge

- If we build homes as we did from 2011 to 2021 we would (Helmer, 2023):
 - Lose 142,438 hectares of cropland
 - Lose 6,955 hectares of grassland
 - Lose 28,143 hectares of forest
- Difference between business as usual vs. infill GHG reducing scenario is more than 4.5 MT of CO₂e annually

Current Federal Government Actions

- **\$40 billion Apartment Construction Loan Program:** low-cost financing to build more than 101,000 new rental homes across Canada by 2031-32, will permit post-secondary institutions to access low-cost loans for student housing construction
- **\$15 billion in low-cost loans for the Apartment Construction Loan Program** and an additional \$1 billion in new funding for the Affordable Housing Fund
- **Affordable Housing and Groceries Act:** Removed the GST on new purpose-built rental housing
- **\$14 billion through the Affordable Housing Fund:** To build 60,000 new affordable homes and repair 240,000 homes
- **\$4 billion Housing Accelerator Fund:** Federal funding to encourage municipalities to remove prohibitive zoning barriers and incentivize building. Agreements signed to date have put the Housing Accelerator Fund on track to fast-track the construction of an estimated 500,000 homes over the next decade

Current Federal Government Actions

- **\$4 billion Rapid Housing Initiative:** Expected to help build more than 15,500 new affordable homes for people experiencing homelessness or in severe housing need
- **\$200 million Federal Lands Initiative:** To build 4,500 new homes by repurposing surplus federal lands and buildings to housing providers at low or no cost
- **Canadian Mortgage Charter Update:** Details the tailored mortgage relief that the government expects banks to provide borrowers who are facing financial difficulty with the mortgage on their principal residence
- **\$10.7 billion First Nations Housing:** On reserve, and Inuit, Métis, and First Nations Self-Governing and Modern Treaty communities. This also includes funding to implement the “for Indigenous, by Indigenous” Urban, Rural, and Northern Indigenous Housing Strategy
- **Housing Design Catalog:** Standardized pre-approved design catalogue, with the aim of helping speed up construction by being cost effective, labour efficient, and energy efficient

But will this help solve the housing crisis?

Canadian Electrification Efforts

- 18% of Canada's GHG emissions are from the building sector and over 77% of building emissions are from combusting fossil fuels for space and water heating (Poirier, Cameron 2023)
- Electric based heat pumps are currently seen as the most viable and economical pathway for electrification in Canada
- 6% of homes have a heat pump in 2024 (Vérin, Poirier, 2024—BDA Pace of Progress).
- Canadian households are not on track to electrify their space heating by 2050 and likely not 2100 at our current pace (Haley, Torrie, 2021)

Canadian Electrification Efforts

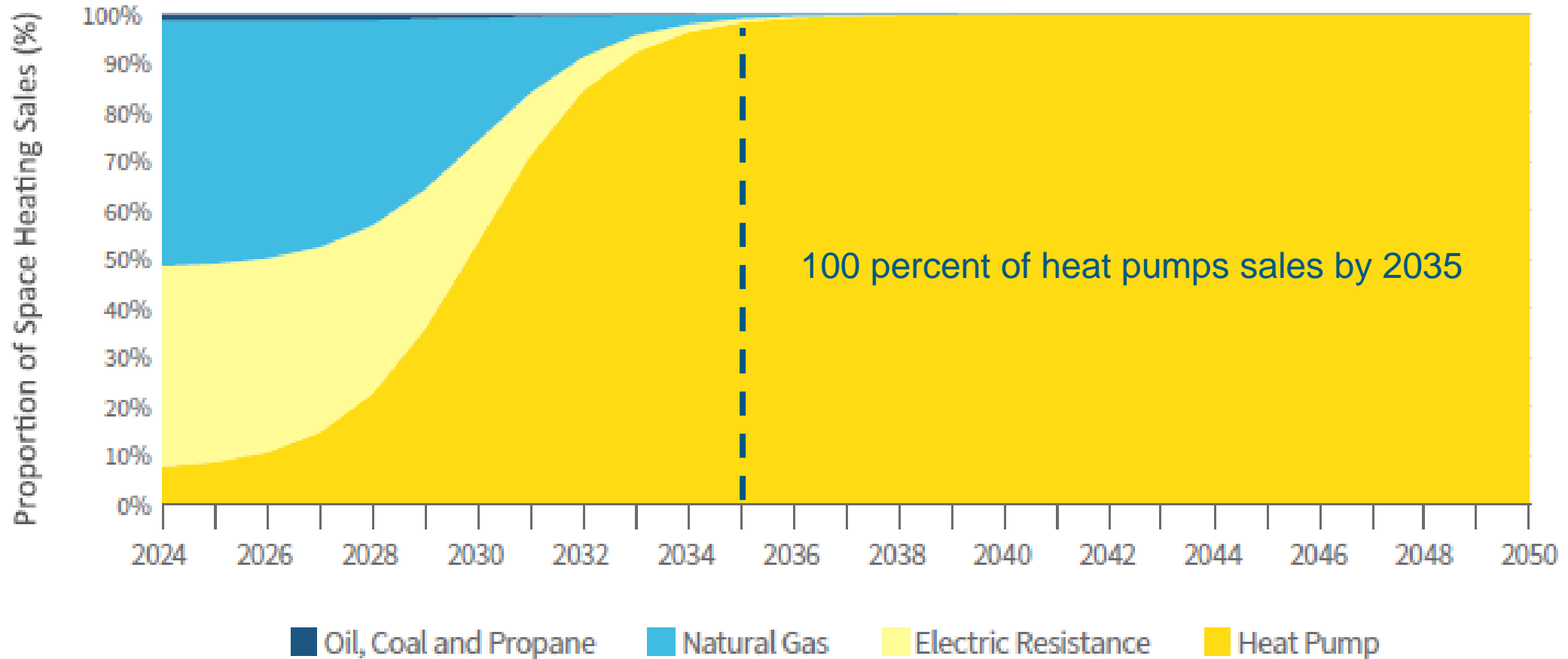


Figure 2: A significant market acceleration is necessary over the next decade to reach 100 percent of homes with heat pumps by 2050.

(Vérin, Poirier, 2024—BDA Pace of Progress)

Canadian Electrification Efforts

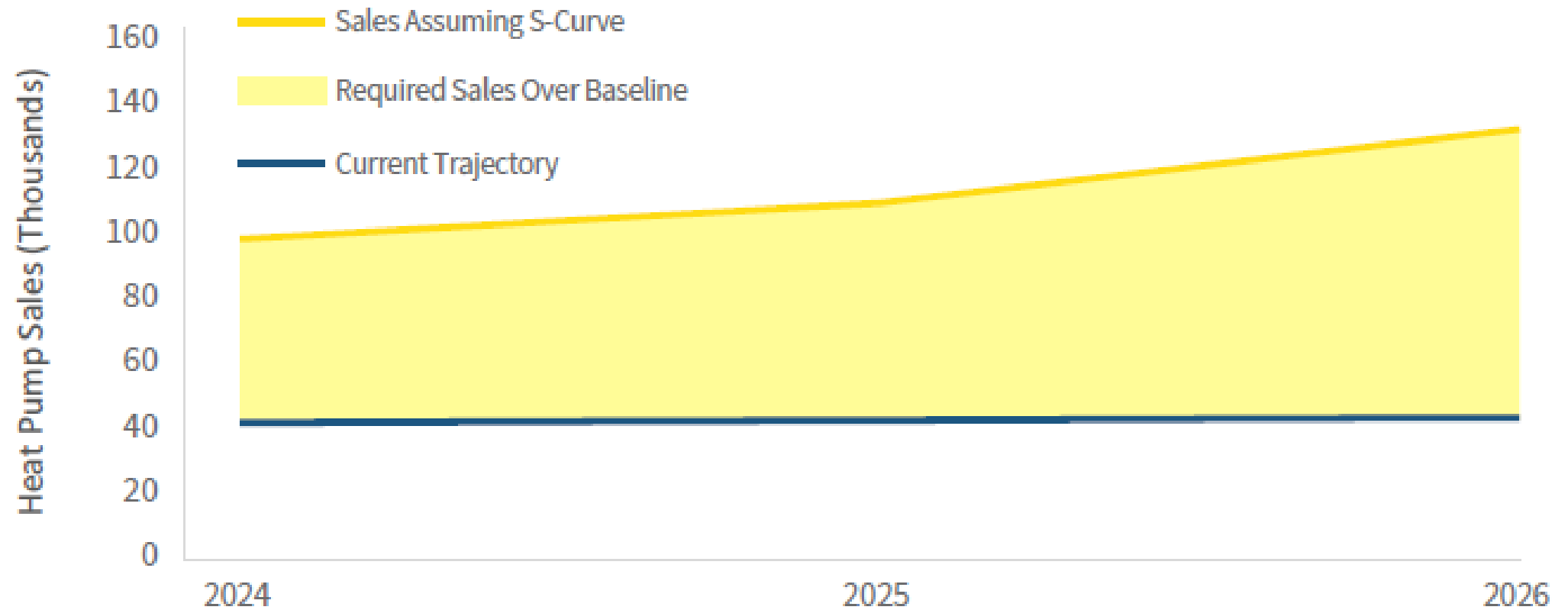


Figure 4: Cumulative heat pump sales will need to increase by 229,000 between 2024 and 2026 to stay on track to meet the 2050 emissions targets.

(Vérin, Poirier, 2024—BDA Pace of Progress)

The Building Decarbonization/Electrification Challenge

- Key challenges include:
 - Supply Chain Issues
 - Inefficient regulatory systems
 - Labour shortages, especially with skilled trades
 - Inflation and high interest rates
 - Lack of knowledge and awareness

Look familiar?

New Housing Supply: How to Build it Right for the Future?

Panelist Presentations

1. What are you working on?
2. What are your thoughts concerning the challenges of New Housing Supply and electrification in Canada?



Blueprint for More and Better Housing



NATIONAL BUILDING
DECARBONIZATION
FORUM | APRIL 2024

Mike Moffatt, Founding Director, PLACE Centre

Date April 18, 2024

Agenda

1. Who
2. What
3. Goals
4. Highlighted Recommendations

BLUEPRINT FOR MORE AND BETTER HOUSING

HOW FEDERAL, PROVINCIAL AND MUNICIPAL
GOVERNMENTS CAN ENSURE WE BUILD
5.8 MILLION HOMES THAT ARE AFFORDABLE,
LOW-CARBON AND RESILIENT



LISA RAITT
Co-chair



DON IVESON
Co-chair



MIKE MOFFATT
Coordinator



KIM BAIRD
Kwantlen Polytechnic



SHEILA BOUDREAU
SpruceLab Inc.



CHERISE BURDA
TMU



MARK CARNEY
Canada 2020



LEILA GHAFFARI
Concordia University



RICHARD JOY
Urban Land Institute



JENNIFER KEESMAAT
Markee Developments



ADAM MONGRAIN
Vivre en Ville



GREG MOORE
Icona Properties



CELYESTE POWER
Insurance Bureau
of Canada



REN THOMAS
Dalhousie University



TSERING YANGKI
Dream Unlimited Corp

Background

Timeline: September 2023 - February 2024

Mandate: Develop a national policy “blueprint” for how federal, provincial and municipal governments can ensure that 5.8M homes by 2030 are affordable, low-carbon and resilient

Process:

15 meetings over 6 months

8 new research products

Consulted with experts and practitioners (industry, Indigenous, non-profit) and reviewed extensive body of literature and recommendations

Four Goals of the Blueprint

GOAL 1 – MAKE IT LOW-CARBON: Reduce Canada’s housing-related emissions to meet Canada’s 2030 climate targets.

GOAL 2 – MAKE IT RESILIENT: Every home built from 2025 onward should stand up to worsening climate hazards, supporting National Adaptation Strategy goals.

GOAL 3 – MAKE IT AFFORDABLE: Cut the number of households spending more than 30% of their income on shelter costs to zero by 2031.

GOAL 4 – MAKE IT AT SCALE: Increase the scale and productivity of the homebuilding sector to build 5.8 million homes between 2022 and 2030.

Three Key Areas Related to Building Decarbonization

1. Building code
2. Financing tools
3. Innovation strategy

Building Code Recommendations (Examples)

Ensure the Codes supports integration with local building performance standards to reflect changing regional climate risks such as floods, fires, extreme heat, and permafrost melt, and add physical resilience as a building codes objective.

Invest in expanding the capacity of the Canadian Board for Harmonized Construction Codes (CBHCC) to develop new climate mitigation and adaptation provisions for the 2030 code cycle.

Financing Tools (Examples)

Examining the point system in the MLI Select program for new construction to increase the number of purpose-built rentals that are affordable, low carbon, and climate resilient over the building lifecycle.

Considering increasing the CCA to 12% for affordable, accessible, and climate-friendly purpose-built rental projects that have an MLI select score at, or above, 100 points or ACLP score above 19.

Innovation Strategy (Examples)

Provide a refundable tax credit, called the Housing Technology Investment Tax Credit, equal to 30% of the cost of investments in new machinery and equipment used to manufacture low carbon and climate-resilient housing.

Develop a robust innovation strategy for housing, including procurement policy and innovation centres for housing construction.

Ensure that the homes that become part of the CMHC pre-approved catalogue are designed to be low-carbon coupled with a procurement strategy for the innovative homes in the CMHC pre-approved catalogue, including guaranteed minimum orders.

Zero Carbon Downsview

Building a city-within-a-city
for zero emissions

The logo for Northcrest, featuring the word "Northcrest" in a dark blue, sans-serif font. A small yellow triangle is positioned above the letter "h".

Northcrest

The logo for the National Building Decarbonization Forum, consisting of three overlapping geometric shapes: a yellow triangle pointing up and to the right, a dark blue rectangle pointing left, and a light blue triangle pointing down and to the right.

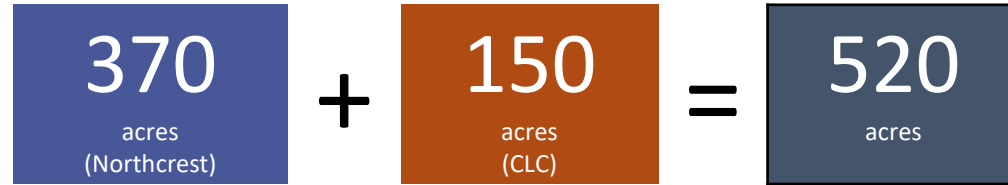
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Jeff Ranson

April 18, 2024

A New Plan is Taking Shape

- Northcrest is collaborating with the neighboring landowner Canada Lands Company (“CLC”) to comprehensively plan the site.



- The site is complemented by the 290-acre Downsview Park and Park Commons complex to the west, resulting in a total of 810-acres.
- Working with an international team of consultants and with deep collaboration with stakeholders, Northcrest and CLC developed a Framework Plan vision for the site in 2020-21.



Reclaiming a 2km Concrete Runway



Taxiway converted to
Pedestrian plaza





DOWNSVIEW WEST

RUNWAY NORTH A

RUNWAY NORTH B

ALLEN WEST

RUNWAY CENTRAL

RUNWAY SOUTH

TAXIWAY EAST

TAXIWAY WEST

WILSON



Climate Excellence

Build a community that is adapted to the future climate while leading the industry on community-wide emissions reductions



CLIMATE EXCELLENCE BUILDING BLOCKS

DECARBONIZATION:

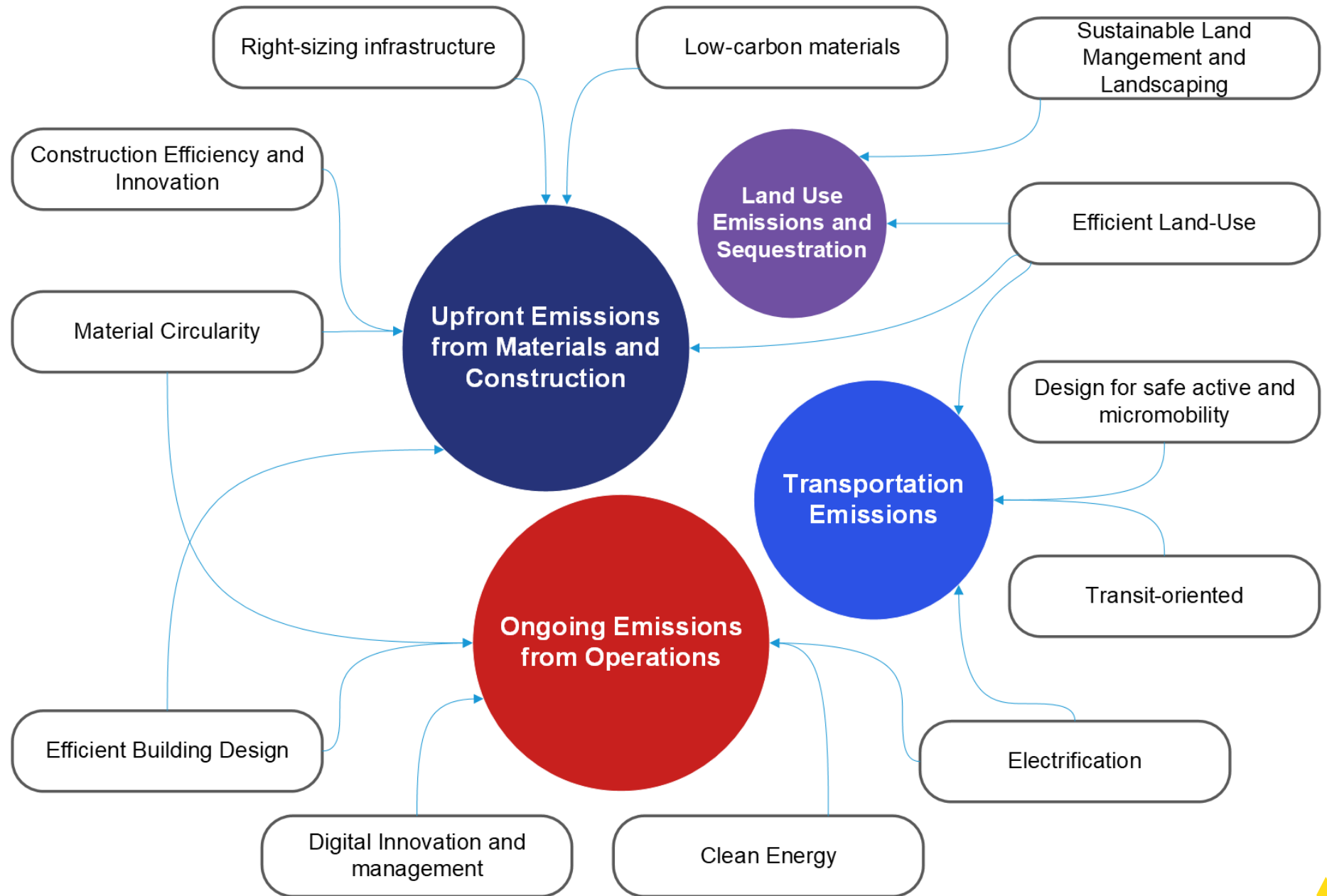
Minimize emissions wherever possible across the whole project and beyond

- Operational Emissions of buildings and infrastructure
- Embodied Carbon of buildings and infrastructure
- Transportation emissions
- Land-use emissions
- OTHER – External Scope 3

FUTURE CLIMATE READY:

Build a community prepared for future climate conditions and resilient to climate-related risks

- Building design for hotter temperatures
- Public space design for hotter temperatures
- Design for seasonal air quality issues (ie. Wildfire Smoke)
- Resilience toward extreme weather events
- Social infrastructure to support community resilience





No New Fossil Fuel Connections

Zero Carbon Building Design

Wood Construction

Shade for Outdoor Comfort

Cooling for Outdoor Play

Low-Car Mode Split

Low-Carbon Concrete

Low Carbon Thermal Network

25mm Stormwater Capture

Drivers



What Policy Tools Can We Expect?

1. Benchmarking > Disclosure > Carbon Caps
2. Retrofit Energy/Carbon Codes
3. Carbon Pricing + Fines
4. Incentives (\$, Tax Rebates & Density)

Things we put in our buildings re: Zero Carbon 2040

Curtain Wall:	30 Years
Commercial Boiler:	20 Years
Rooftop Unit:	20 Years
2040 Zero Carbon Req't:	15.5 Years
House Cat:	15 Years
LED Lamp:	10 Years

Doing it right in new development





Cut Waste:

- Land Use
- Massing
- Service Functions
- Parking
- Material Waste



Development Summary

Total Study Area (m2)
 Total Study Area GFA (m2)
 Total Study Area Estimated Units
 Total FSI

Area Distribution (m2)

Total Building Footprint Area
 Total Greenspace Area
 Total Pedestrian & Cycling Realm
 Total Road Area

Upfront Embodied Carbon (tCO2e)

EC From Buildings
 EC From Landscape & Infrastructure
 Total Study Area EC
 EC Per Unit

Additional Benefits

Avoided Infrastructure per Additional Unit (tCO2e)
 Additional Units Elsewhere*

	Existing Development Scenario	Reduced ROW Scenario	Key Outcomes
Total Study Area (m2)	129,921	129,921	
Total Study Area GFA (m2)	393,080	409,633	
Total Study Area Estimated Units	3,351	3,496	+145 Additional Units.
Total FSI	3.0	3.2	
Total Building Footprint Area	43,767	46,127	5% More Ground Floor Area.
Total Greenspace Area	35,002	38,491	10% More Greenspace.
Total Pedestrian & Cycling Realm	32,463	33,225	
Total Road Area	18,689	12,078	35% Less Road Area.
EC From Buildings	196,540	204,817	
EC From Landscape & Infrastructure	5,822	5,141	
Total Study Area EC	202,362	209,958	
EC Per Unit	60.4	60.1	Reduced Embodied Carbon per Unit.
Avoided Infrastructure per Additional Unit (tCO2e)		(1.74)	
Additional Units Elsewhere*		94	

Embodied Carbon:

- Concrete Innovation
- Structural Design
- Timber and Steel
- Bio-Materials

Mass Timber is our starting point



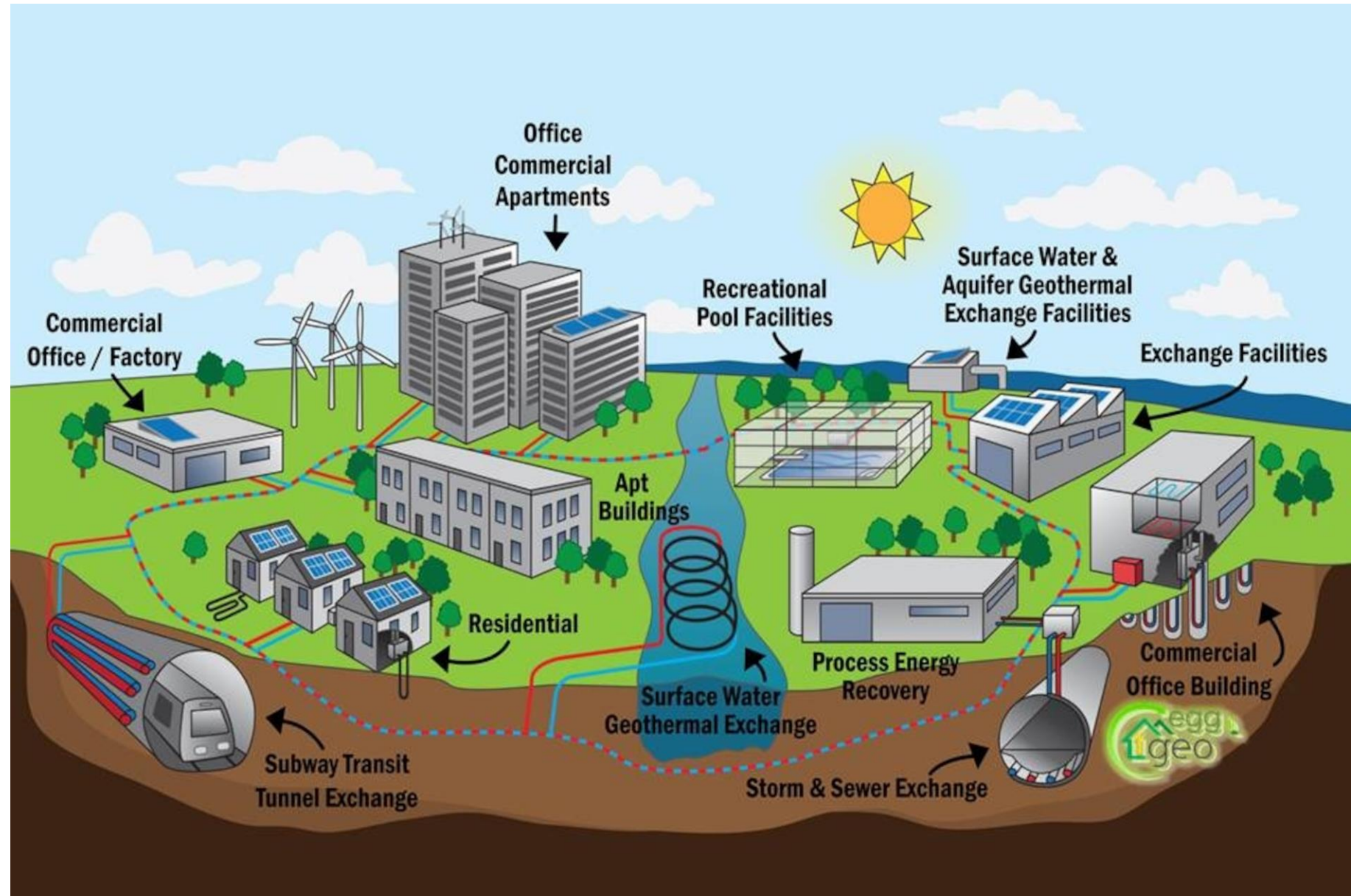
3

Focus on Thermal:

- Electrify
- Heat Recovery
- Commission
- Controls
- Peak Management
- Envelope

Abundant Solutions

Finding the right model is hard



4

Capture the Value:

- Measure Properly
- Price Risk
- Innovate Financially



Total Emission vs Total Cost



- ▶ Significant lifecycle emissions reductions before offsets during 30-year
 - 79% Operational
 - 44% Embodied
- ▶ Increased construction costs exceed 30-year recoverable operations savings
 - Total 30yr cost premium = 12%
- ▶ Cost per ton: ~\$953

Zero Carbon Valuation – what can we include?

Revenue

- Increased lease/sales value
- Lower Vacancy

OpEx

- Lower Utility Costs (w carbon taxes)
- Lower Insurance Rates (w resilience)
- Lower Maintenance Costs (w durability & predictive maintenance)
- Performance Incentives

CapEx

- Avoided Future Retrofits and Early Replacement of Equipment
- Rebates & Grants

Financing

- Access to Green Funding Mechanisms
- Extended Amortization
- Lower Debt-Service Ratio

Zero Carbon – Why don't we do it?

1 – Too Expensive

- More stuff, better stuff
- See 3

2 – Customer Won't Pay

- Can't, Don't care
- Insufficient mechanisms to recoup investment

3 – Don't know how

- Inertia, Status Quo
- Paralysis of Choice

Overcoming barriers to Zero Carbon

Focus on the grid

- Low-carbon supply is easier and cheaper than changing every building and reskilling the whole workforce.
- Price to incentivize efficiency

Systematize construction & approvals

- Provide low-carbon building plans with pre-approval
- Allow developers to "recycle" plans with pre-approval

Tax Policy

- Align development charges and property tax assessments to their public burden
- Ensure low-carbon performance doesn't increase assessed value

Housing Enabling Infrastructure

- Investment must match taxable property value created
- Finance energy infrastructure and energy efficiency
- Secure with LICs for new builds

Long Term Skin in the Game

- Secure building performance for a period of time
- Establish industry standards for low-carbon building valuation



GEOHERMAL IN THE CITY



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Tim Weber



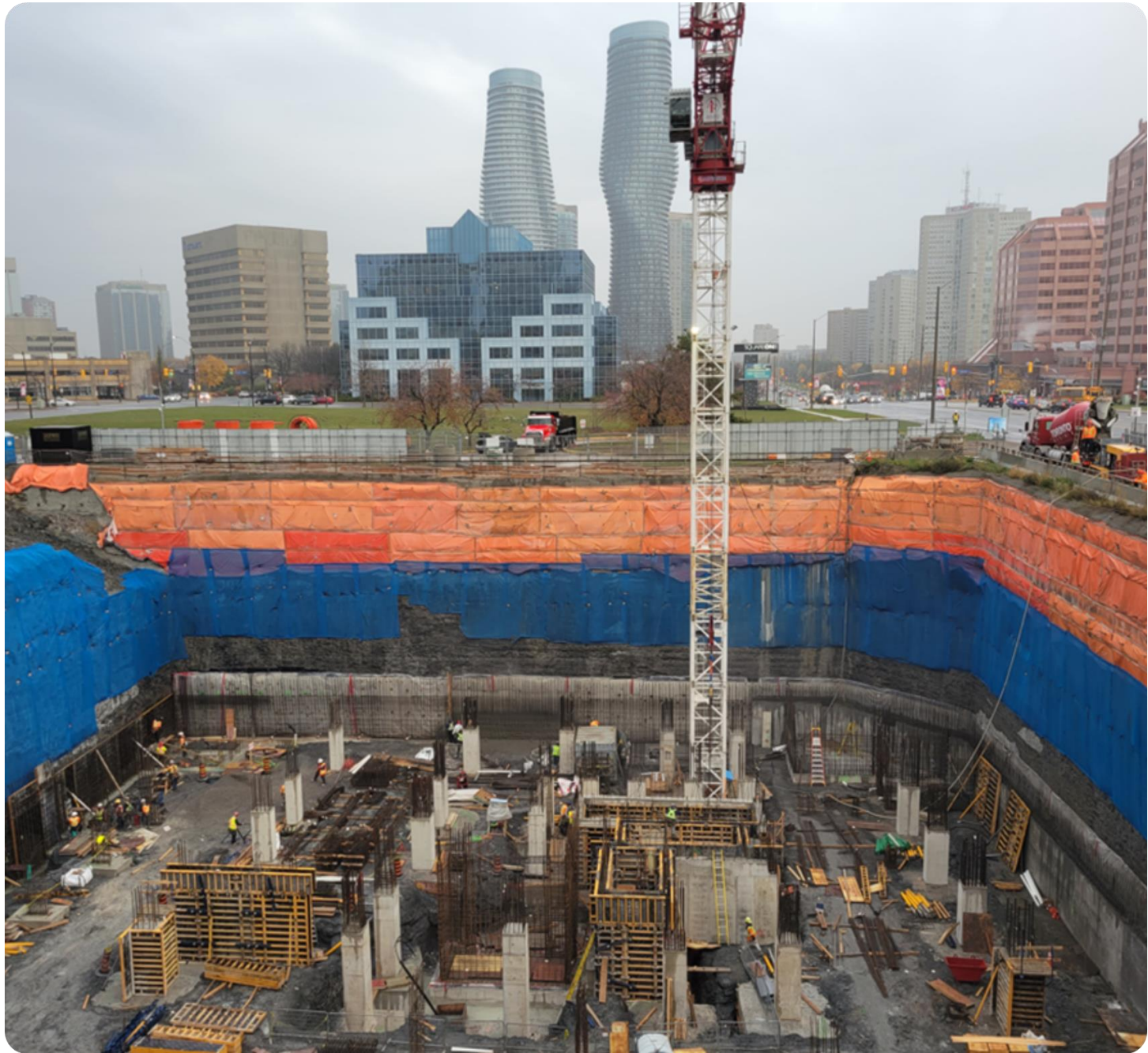
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Agenda

1. Geothermal misconceptions
2. Geothermal applications and technology
3. Polarizing objectives
4. Market ready solution
5. What will drive change?











Barriers to Entry

- Rising construction costs
- Interest rates
- Project proformas
- Increased equity requirements
- Sustainability vs. profitability



Status Quo Is No Longer An Option



Building Code
Changes



Localized
Low-carbon Initiatives




Shifting
Market Expectations

3rd Party Ownership

Business Model

- What if low carbon buildings were cheaper to build and more profitable to operate?
- Following a utility-like model, a third-party owner will design, build, pay for, own, and operate the geothermal borefield

 Reduce construction costs

 Reduce risk and complexity

 Meet carbon/energy targets



Market Ready Solution

- Simplified budgeting
- Cost certainty for 30 years
- 100% performance guarantee
- Future proofed building
- Tenant retention, tenant profile
- Capex and Opex (Flowthrough to tenants)



Market Ready Solution

- Sustainability vs. profitability
- No longer mutually exclusive



Change is Inevitable



01

Not all developers want to change.
Why do it?

02

What will drive change? One word:
Policy.

Sample Projects

The Exchange District

- Mississauga, ON
- 4 buildings
- 35-65 storeys
- 6 levels of underground



Sample Projects

101 Spadina

- Toronto, ON
- 45 storeys
- 17 units
- 300,000 sqft of mixed use



Sample Projects

30 Westwood Gardens

- Toronto, ON
- 16 storeys, 2 buildings
- 420 units
- 320,000 sqft
- Common parkade, main floor



Sample Projects

Alba Condos

- Mississauga, ON
- 32 storeys
- 414 units
- 300,000 sqft
- 8 levels of underground



STOP! COLLABORATE AND LISTEN.

