SUSTAINABLE PROPTECH CANADA

REPORT

MAPPING CANADA'S SUSTAINABLE PROPTECH LANDSCAPE 2023

Values vs. Value?

Climate Investment: Where Money and Morals Align

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Scotiabank has an important role to play in addressing climate change and supporting the transition to a low carbon economy along with partners in the public and private sector. As part of our commitment, we are pleased to sponsor this report on how technology, innovation and sustainability can help shape a new and greener Real Estate market in Canada and beyond.

Scotiabank

You are the Greenprint™

NATIONAL HOMES
You are the blueprint™

About the AUTHORS

DEENA PANTALONE

Founder and Managing Partner,
Venturon – Author

JOANNA CREED

Director of Operations and General
Counsel, Venturon – Author

NAOMI LAYNO

Research Intern – Venturon

JAMES MCKELLAR

Professor (former Associate Dean),
Brookfield Centre in Real Estate and Infrastructure,
Schulich School of Business – Author

01

> *We used to see 4 to 5 years ago the ESG department be part of marketing or PR. Now we have asset managers that are hiring sustainability experts with deep tech and real estate knowledge.*

- JULIA ARLT
AUSTRIAN PROPTECH INITIATIVE
(FORMER GLOBAL DIGITAL REAL-ESTATE LEADER AT PWC)

METHODOLOGY

To conduct this research, we used a number of company databases like Pitchbook, Crunchbase, and LinkedIn. We also conducted our own investigations by talking to dozens of experts in the industry to find companies that are not yet listed on public sources. Companies without a focus on the property industry or that were a subsidiary of a larger corporation were omitted. Dollar amounts referred to in this report are in Canadian dollars, except all company funding information which is in USD. The analysis was completed by Sustainable Proptech and Venturon. If there are any changes to be made, please reach out to hello@sustainableproptech.com.

VALUES VS VALUE

The push to decarbonize buildings continues. Governments around the world are enacting regulations to both incentivize buildings to become more efficient and penalize those that don't comply. Financial incentives propel change. It's the catalyst that is going to drive the world to Net-Zero. If renewable/sustainable solutions are not cheaper and better than their alternatives, they won't be adopted. While many of us like to think of sustainability as "the right thing to do," altruism is largely irrelevant when it comes to decarbonizing the world's largest industry.

proptech

[prop-tek], NOUN

Def: The application of information technology for the real estate industry.

sustainable proptech

[suh-stey-nuh-buhl prop-tek], NOUN

Def: The application of information technology to help make the real estate industry more sustainable.

Luckily, momentum is growing from investors, lending institutions, and the market at large to support these upgrades. Companies that lease commercial space have their own sustainability mandates and often have to report on their carbon footprint. Even renters and homeowners are seeking out more sustainable dwellings. For years, the climate challenge has been framed as a collective-action problem. Today, fixing the climate has significant economic benefits.

There are many ways to define sustainability. While the bulk of this report focuses on environmentally sustainable technologies, we also wanted to address social sustainability in the property industry. For that reason, we included a section about housing affordability since having unaffordable and inequitable housing is not sustainable, no matter how you define it.

Technology will play a vital role in making our buildings more sustainable, both socially and environmentally. A lot of incredible businesses are being created and will be created by entrepreneurs seeking the many opportunities in climate tech. Climate Tech is increasingly seen as a source of national prosperity, jobs, and geopolitical advantage. New materials are being developed and new construction methods are being tested. Software, sensors, AI, virtual and augmented reality are all being adapted to the built world to help make it more efficient, sustainable, and profitable. We have compiled a list of some of Canada's most exciting technologies and talked to industry leaders about which trends are driving sustainable innovation across the country. We hope you enjoy reading our report as much as we enjoyed researching and writing it.

LEARN MORE

If you'd like to learn more about what you read in this report, please reach out to our team. We are always looking to connect with real estate and related industry professionals who are working to make the industry and the world more sustainable and efficient.

Visit sustainableproptech.com

Contact:
deena@venturon.com or joanna@venturon.com

A LESSON *from the* PROFESSOR

PropTech should be viewed in the context of three significant challenges we face in how we build and adapt our environment to address current and future needs. The first two are related. New construction and associated demolition contribute 37% of our total global energy-related CO2 emissions. Construction involves massive amounts of steel and concrete, which are huge emitters of CO2. Embodied carbon, released during demolition, accounts for around 10% of annual global emissions. Related to this is the use of the most widely used man-made material in existence, cement, second only to water as the most consumed resource on the planet. Cement is the source of around 8% of the world's CO2 emissions. If the cement industry was a country, it would be the third largest emitter in the world, behind China and the U.S.

The third factor is the abysmal record of productivity in the construction industry, an incalcitrant problem that has prevailed for decades. Throughout the world construction has declining productivity, suffering from an aging and shrinking workforce, outdated production practices, an aversion to new technology, and an attitude that each project is a one-off prototype. McKinsey estimates that construction productivity growth averaged just 1%, compared to 2.8% for the total world economy, and 3.6% for manufacturing.

Where does PropTech fit into this discussion? Solutions to these challenges will occupy two ends of a spectrum: large-scale interventions that will radically reorder how we do things, as we are now seeing in energy production; and a myriad of small-scale interventions that collectively will move the dial into positive territory. PropTech can connect directly with users, offer quick results, and ease the transition from the current situation. PropTech should be emboldened by the automobile industry– cars today may look and drive similar to the past, but they have revolutionized an industry with two types of technology; battery storage and computer chips. The average modern car has between 1,400 and 1,500 semiconductor chips and some cars can have as many as 3,000 chips. This has radically altered production and introduced such user-friendly innovations as emission control, driver assistance, crash avoidance, autonomous driving, and power unit control. We need something comparable in the building industry, and PropTech might be our best bet. Much of the technology already exists or is being developed. The next decade will be a test of whether we can transform our built environment, using PropTech interventions in a manner not dissimilar to what we have achieved, in a very short time, with the automobile.

James McKellar
Professor of Real Estate and Infrastructure
Brookfield Centre in Real Estate and Infrastructure
Schulich School of Business

Community Wellness Integration in Copenhagen, Denmark

WHY CANADA, WHY NOW?

THE BUILT WORLD IS RESPONSIBLE FOR 40% OF THE WORLD'S CARBON EMISSION

Canada is on the forefront of the sustainable movement. The Canadian government has committed to reducing the country's greenhouse gas emissions by 40% to 45% below 2005 levels by 2030. The cost of the sustainable and energy efficient upgrades needed to meet the decarbonization goals of Canada alone is estimated to be between $25-$32 billion annually.

To help pay for these upgrades the Canadian government has a number of interest-free funding programs for sustainable homes and buildings. Canada's 2023 budget also has $26 billion of tax credits earmarked for sustainable investments. Canadian banks are also stepping in to lend to green building initiatives. Six of Canada's largest banks have joined the Net-Zero Banking Alliance which aligns their lending and investment with the goal of Net-Zero emissions by 2050.

DEMOGRAPHICS

Canada has around 40 million residents, most of which live within 240 kilometers of the U.S. border. The population of Canada is growing, albeit slowly, at 0.5%. Like many developed countries, Canada has an aging population with around 19% of Canadians 65 or older, a number that is expected to grow to 22.5% by 2030. Since the birth rate in Canada is only 1.4 children per couple, population growth is driven by immigration, which hit a record 1 million in 2022.

The influx of mostly educated immigrants is helping the country meet its labor needs, particularly in the tech sector. Immigration is also pushing home prices higher, making building more houses even more important. In April 2023, Canada had 261,600 housing starts, a record number in the country, and one that must increase to meet the needs of the growing Canadian population.

CANADA IS SUSTAINABLE...

2ND

highest number of LEED certified buildings

~19%

of energy comes from renewables

44%

are willing to pay a premium for sustainable products

...BUT THERE IS MORE WORK TO DO

11TH

highest CO2 emissions per capita

57TH

in the world for recycling

13TH

in electric vehicle readiness

EMISSIONS 2030 TARGET:

Canadian Sustainability

40-45%

below 2005 levels

82%

Electricity generated by non-emitting sources

Source: Natural Resources Canada

Source(s): Natural Resources Canada, Net-Zero Banking Alliance, Financial Post, Electric Energy Online, Moneris.Com, World Population Review, Yale University, Data Commons, CMHC

REAL ESTATE

The Canadian residential real estate market is worth approximately $6.1 trillion and the commercial real estate market is estimated to be worth approximately $1.2 trillion. Decarbonizing the country's homes and buildings has been a priority for the current government; so far $180 billion has been set aside over the next twelve years to upgrade infrastructure. This funding includes grants for property owners to help offset the cost of energy efficient upgrades. The government has also set up a source of funding for sustainable investment through the Canada Infrastructure Bank. Canada is home to a number of large and influential property companies, many of which are on the forefront of the sustainable movement. We are proud to highlight some of the most innovative, sustainable property firms in this report.

> *2023 is best characterized as the revenge of the CFO. There's a heightened focus on near-term returns.*

- SALIL MUNJAL, YALETOWN PARTNERS

CANADA'S LARGEST REITS

	MARKET CAP	IMPACT REPORT
Choice Properties REIT	$9.7B	✓
Canadian Apartment Properties REIT	$8.31B	✓
RioCan REIT	$6.15B	✓
Granite REIT	$5.2B	✓
SmartCentres REIT	$3.78B	✓
First Capital REIT	$3.25B	✓
Allied Properties REIT	$2.93B	✓
H&R REIT	$2.86B	✓
CT REIT	$1.69B	✓

Data current as of May 1, 2023

ESG SNAPSHOT OF CANADA'S LARGEST DEVELOPERS

- FULLY ESTABLISHED PLAN
- PLAN IN ACTION
- EARLY STAGE PLAN

- Concord Pacific
- Omni Group
- Minto Group
- Mattamy Homes
- Empire Communities
- The Daniels Corporation
- Tridel
- Pinnacle International
- Westdale Properties
- Broccolini
- Starlight Investments
- M.A.M Group
- Mancal Group
- ConDrain Group
- Amacon Developments
- Panattoni Development Company
- One Properties
- Menkes
- Great Gulf
- Muzzo Group
- Remington Group
- Triovest Capital

CANADA'S LARGEST REAL ESTATE INVESTORS:

✓ IMPACT REPORT

- ✓ Brookfield Investments
- ✓ Oxford Properties
- ✓ Dream
- ✓ QuadReal Property Group
- Westbank Corp
- ✓ Concert Properties
- ✓ Kingsett Capital
- ✓ Ivanhoe Cambridge
- Nicola Wealth
- ✓ Cadillac Fairview
- ✓ Hazelview Properties
- Crestpoint Real Estate

Source(s): CBRE

SUSTAINABLE LENDING

The property industry is built on debt. So too will be its sustainable transition. The upgrades and advancements needed to make the property industry more sustainable often require large capital expenses. These will need to be financed in order to make them happen. Luckily, a number of innovative and progressive lending institutions have stepped up to provide a growing array of financing products. Here is a highlight of some of them.

CANADIAN BANKS

Scotiabank

- Mobilized $96 billion in climate-related financing, target of $350 billion by 2030.
- In 2023, select ESG metrics related to Scotiabank's performance objectives in climate action, Net-Zero goals, and diversity, equity and inclusion will be weighted components within the Bank's strategic and operational scorecard, linking ESG performance to compensation.
- Net-Zero Research Fund has granted $2 million to 21 organizations exploring decarbonization and climate-related systems change.

NATIONAL BANK

- Created the Energy & Infrastructure Group to support transition to decarbonization.
- Capital available for renewable energy related loans.

TD Canada Trust

- Goal of Net-Zero GHG emissions from operations and financing by 2050.
- Target of $500 Billion in low-carbon lending, financing, asset management and internal corporate programs.
- Eco-Efficient Rebuild, allows customers to rebuild insured losses with environmentally friendly materials (limited to $50,000).

BMO

- Committed to mobilize $300 billion in capital through green, social and sustainable lending, underwriting, advisory services, and investment.
- BMO partnering with CIB to distribute $100 million towards building upgrades by owners who want to improve the environmental footprints.

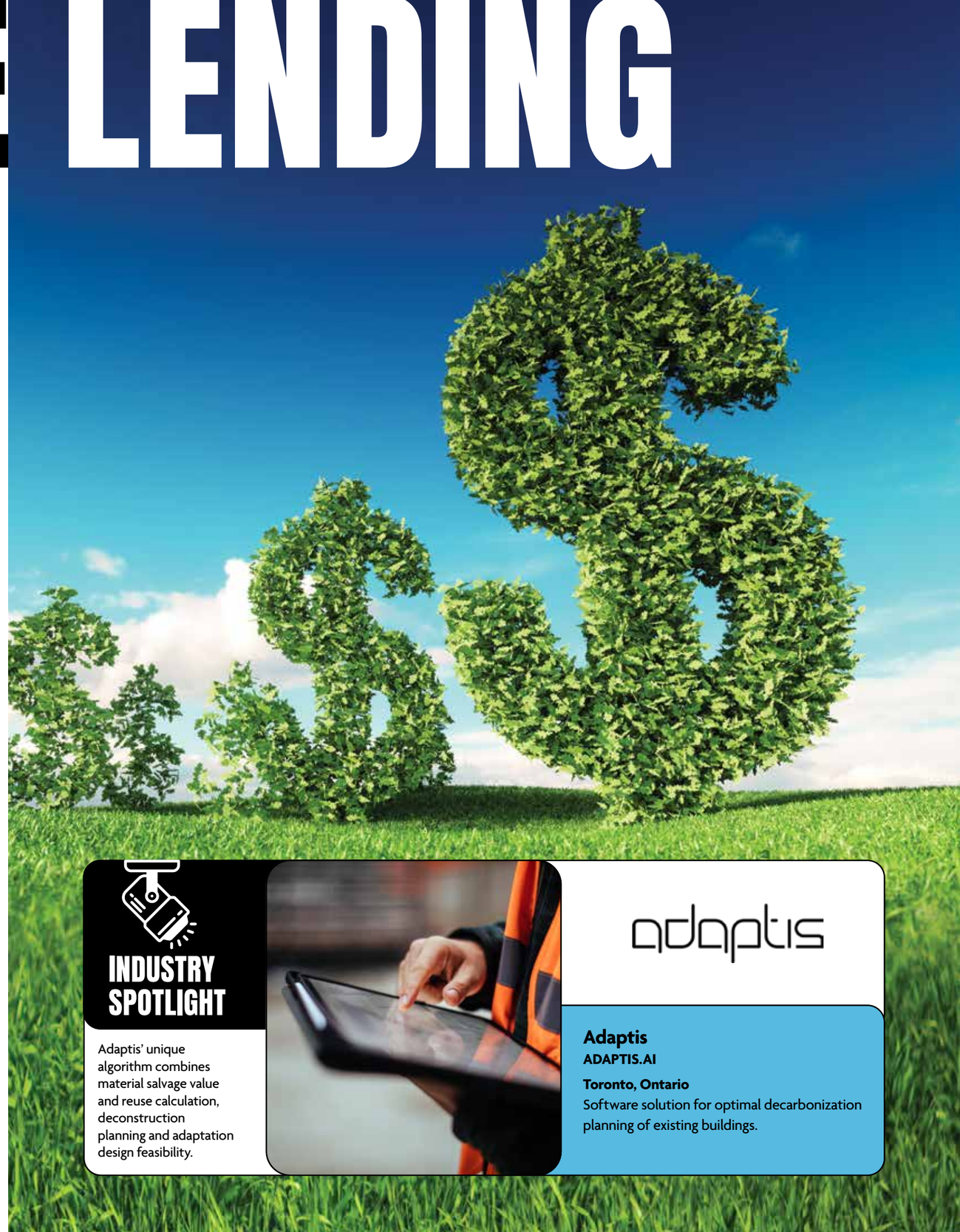
RBC Royal Bank

- $84.8 billion in sustainable finance in 2022, committed to provide $500 billion in sustainable finance by 2025.
- $12 million to more than 100 organizations that are working on solutions to pressing environmental challenges by leveraging technology and innovation.

CIBC

- CIBC set target to reduce its absolute operational GHG emissions by 30% by 2028.
- CIBC aims to mobilize $300 billion towards sustainable finance activities between 2018 and 2030.

Source(s): scotiabank.com, td.com, nbc.ca bmo.com, rbcroyalbank.com, cibc.com



INDUSTRY SPOTLIGHT

Adaptis' unique algorithm combines material salvage value and reuse calculation, deconstruction planning and adaptation design feasibility.

adaptis

Adaptis
ADAPTIS.AI
Toronto, Ontario
Software solution for optimal decarbonization planning of existing buildings.

THEMES

THEME 1 BETTER BUILDINGS

Since most of the buildings that exist today will follow us into the next 20 years, the real estate industry must commit real dollars to decarbonizing the built environment as we know it today. The challenge is twofold: reporting progress against carbon reduction goals and embracing new technologies and energy sources for a more sustainable future.

While at first glance these initiatives may just feel like the right thing to do in the name of sustainability, it's really a question of profitability, competitiveness and preferential financing.

Big name tenants, many of which have their own ESG standards to hit, are willing to pay a premium for buildings that align with their values and help them achieve their carbon reduction goals. Similarly, real estate investors and financing institutions are already prioritizing and rewarding companies with progressive and ambitious energy models.

This groundswell of investment and demand for change is paving the way for the next generation of PropTech companies that are building new solutions designed to make buildings more efficient. Scott Morrison, Partner, of ESG and Sustainability at PwC Canada, explains, "The real estate industry continues to invest more in sustainable technology as stakeholder pressure continues to build and costs keep increasing." He continues, "Investors are moving more swiftly to decarbonize their investment portfolios, tenants are demanding healthier and more sustainable spaces, and emission regulations are looming."

For real estate companies, the most impactful investments are those made to breathe new efficiency into existing assets. "When we invest in sustainability in our existing assets, we look at both the capital and operating budgets," said Mazyar Mortazavi, President and CEO at Toronto-based real estate company, TAS Developments. As more companies make progress on these capital projects, there are more examples of how quickly these investments pay for themselves, often in as little as five years.

INDUSTRY SPOTLIGHT

An RGC Energy solar installation at an industrial facility in Toronto, Ontario, to supply clean and sustainable electricity to businesses, homes, and communities.

RGC ENERGY

RGC Energy
RGCENERGY.COM
Toronto, Ontario
Solar utility company in Ontario.

CBRE

Based: Toronto, Ontario
Founded: 1983

JON RAMSCAR
PRESIDENT AND CEO,
CBRE CANADA

In Canada, CBRE Limited employs 2,200 people in 22 locations from coast to coast. CBRE's presence is deeply rooted in Canada's real estate industry. The company is leading the charge in bringing more sustainable solutions to the market.

CBRE has committed to becoming a Net-Zero carbon organization by 2040. To make that commitment a reality, CBRE Canada has invested in earning WELL certifications for buildings across its portfolio while also deploying the latest energy solutions and technology to usher in a brighter, more sustainable future.

"We're taking this opportunity to put a new foundation in place for the future and for ourselves in the real estate industry," explains Jon Ramscar, President and CEO of CBRE Canada. "For example, what technology can we put in place that can monitor the activities of a building? What's the water consumption? What power grid are you drawing from? How can we invest more in solar and other renewables? These areas create the biggest opportunity," he added.

The demand for these future-proofing technologies is being driven by both the investment community and CBRE's clients, many of which are seeing what's happening in other global markets and expecting similar results in Canada. "In the Canadian marketplace, investors and tenant occupiers have a shared interest in finding a higher purpose and making more meaningful business decisions. It's much more about a values-based approach today than ever before. Companies want to work with organizations that are aligned with their vision, their values and their purpose," highlighted Ramscar.

Citylink Logistics Centre located outside of Calgary will be one of the first CaGBC certified zero carbon industrial buildings in Canada.

Hopewell

Based: Calgary, Alberta
Founded: 1991

SANDERS LEE
FOUNDER & EXECUTIVE CHAIRMAN,
HOPEWELL GROUP OF COMPANIES

Hopewell's seven companies span real estate investment and development across residential, commercial and industrial properties. Based in Calgary, Hopewell's breadth of services and product types across the industry give Founder and Executive Chairman Sanders Lee a unique perspective about how investors and customers are approaching sustainability.

On the financing and investment side, Lee stresses that different types of backers will have varying viewpoints and appreciation for efficient buildings and Net-Zero initiatives. "Some investment vehicles are more progressive and some of them are more price driven, " explained Lee. "Pension plans – rightfully so – prioritize consistent, long-term returns while more institutions are placing a premium on projects that are futureproofed and arguably more progressive because they have a different constituency."

Hopewell is working on one of these first of its kind projects outside Calgary– an industrial development that will be one of the first CaGBC (Canada Green Building Council) certified zero carbon industrial buildings in Canada. For this project, investors were comfortable with the higher upfront costs of the project given its prominence, sustainable focus and impact in the community. Lee adds an important reminder that our current economic climate cannot stand in the way of projects like this one. "We cannot be dictated by the current financing environment. ESG is already completely underinvested and we need trillions of dollars to invest in the future," he concludes.

PARTNER SPOTLIGHT

Based: Toronto, Ontario
Founded: 1998

SCOTT MORRISON
PARTNER,
ESG AND SUSTAINABILITY,
PWC CANADA

SARAH MARSH
PARTNER,
NATIONAL ESG REPORT
AND ASSURANCE LEADER,
PWC CANADA

FRED CASSANO
PARTNER,
NATIONAL REAL ESTATE
TAX LEADER

As stakeholder pressure continues to build, along with rising building and operations costs, real estate investors are moving swiftly to decarbonize their investment strategy. In tandem, tenants are demanding healthier, more sustainable spaces. The commercial real estate industry is responding accordingly.

PwC Canada has been embedded in the sustainability space for more than 15 years, working with Canadian real estate companies to modernize their portfolios and create reporting systems for green initiatives that stakeholders can trust confidently. Fred Cassano, Partner, National Real Estate Tax Leader at PwC, states, "Investment in sustainable technology will continue to grow as ambition and policies around climate change evolve, with the federal government introducing new programs and support for emissions reductions. Further, geopolitical events have heightened concern around energy security, which adds to the impetus to embrace solutions, including technologies, that address emissions and sustainability matters."

"Real estate companies are increasingly making bold commitments whether it's around decarbonization or affordable housing. Our job is to assure that reporting is transparent and there's no risk of greenwashing," highlighted Sarah Marsh, a partner at PwC Canada and leads the firm's ESG Reporting and Assurance Practice.

Underscoring these commitments is an understanding that the industry has to evolve in order to secure revenue streams within their portfolios. Upfront costs to create more efficient buildings will have direct, downstream impacts on driving value at the building level and portfolio wide.

Scott Morrison, Partner, ESG and Sustainability at PwC Canada highlights the returns these investments can have for commercial real estate companies in a moment when attracting and retaining marquee tenants has never been harder. He explains, "As real estate companies have invested in retrofits, greener energy and other efficiency gains, we've seen the corresponding improvement in tenant satisfaction and leasing renewals, which is table stakes in today's environment within the real estate industry."

Morrison and Marsh both stress the importance of creating a data infrastructure that allows companies to track the impact of these investments in terms of emissions avoided, lower energy usage and costs plus the impact on top-line revenue.

The University of Toronto Scarborough Campus (UTSC), a 750-bed Passive House Student Residence, designed by Arcadis.

Based: Amsterdam, Netherlands
Office: Toronto, Ontario
Founded: 1974

MANSOOR KAZEROUNI
GLOBAL DIRECTOR,
ARCHITECTURE AND URBANISM,
ARCADIS

DEEPAK DARDA
GLOBAL DIRECTOR FOR GROWTH
AND DEVELOPMENT,
INTELLIGENCE GBA, ARCADIS

In 2022, IBI Group was acquired by Arcadis, a global leader in sustainable design and engineering for the built environment across 70 countries. The firm works with cities and real estate companies alike to design infrastructure and building projects that improve the resilience and health of our communities.

Mansoor Kazerouni, the Global Director for Arcadis' new Architecture and Urbanism division, emphasizes how important it is for these investments and actions to happen now. "In 2019, only 16% of the global GDP was committed to a carbon neutrality pledge," explained Kazerouni. "Today, that number has shot up to 90%. While most of these pledges may not be enforceable, ESG reporting is becoming less of a voluntary add on and more of a requirement. This added transparency will force organizations to put their money where their mouths are as consumers become more educated on the subject."

Deepak Darda sits in the company's Toronto office and is the Global Director for Growth and Development for the newly formed Intelligence GBA (Global Business Area) at Arcadis. He notes that greener materials, energy sources and technologies to manage and optimize assets are investments that end users are embracing even when there's a bigger upfront bill. "Telling your buyer that making the building future ready is most often met with appreciation especially in real estate transactions. Buying and leasing property is not a short term decision, so if marketing can help buyers understand the investment, these design, build choices, and smart technologies become your advantages in the market," he said.

One of these biggest shifts is in the transition to cleaner energy sources and investments in solar, hydro, nuclear and hydrogen technologies. Darda notes, "Right now, we are in a state of discovery for many alternative energy sources, especially fusion and hydrogen etc. Solar and wind are more in a commercialization stage, yet with so much potential market share to gain. Collectively, these sources represent the best paths for existing buildings to achieve Net-Zero status and drastically reduce emissions."

All of these investments showcase an eye for long-term gains. "We have to think about the future value of the assets that we're creating. There will be social pressure and economic pressure to equate the value of these assets to the level of sustainability that they incorporate. We must think about how we future proof these assets, and ignoring it today, is short sighted," concluded Kazerouni.

INVESTOR SPOTLIGHT

Based: Vancouver, British Columbia
Founded: 2001
Portfolio: Go Bolt, Cooledge, EdgeQ, ClimateAI

SALIL MUNJAL
MANAGING PARTNER,
YALETOWN PARTNERS

Yaletown Partners is a venture capital firm with offices in Vancouver, Calgary, Toronto and Montreal with a focus on modernizing traditional industries including real estate. The firm just closed on its second Innovation Growth Fund, doubling its active investment dollars to over $500 million.

While companies at the crossroads of PropTech and ClimateTech continue to solve long-term building efficiency challenges, Salil Munjal, Yaletown's Managing Partner, points out that the current economy will force short term ROI. He suggests that, "2023 is best characterized as the revenge of the CFO. There's a heightened focus on near-term returns. While the embrace of climate tech hasn't changed, the timeline has shifted. Customers are asking, 'do I really need to buy this piece of software or can I buy it six months from now?' These questions have always existed, but making buildings more energy efficient has never been a short-term play. But for now, quick wins may trump more expensive, long-tail solutions.

A condo project located in Toronto that will have geothermal heating and cooling provided by Subterra Renewables.

Based: Toronto, Ontario
Founded: 2017

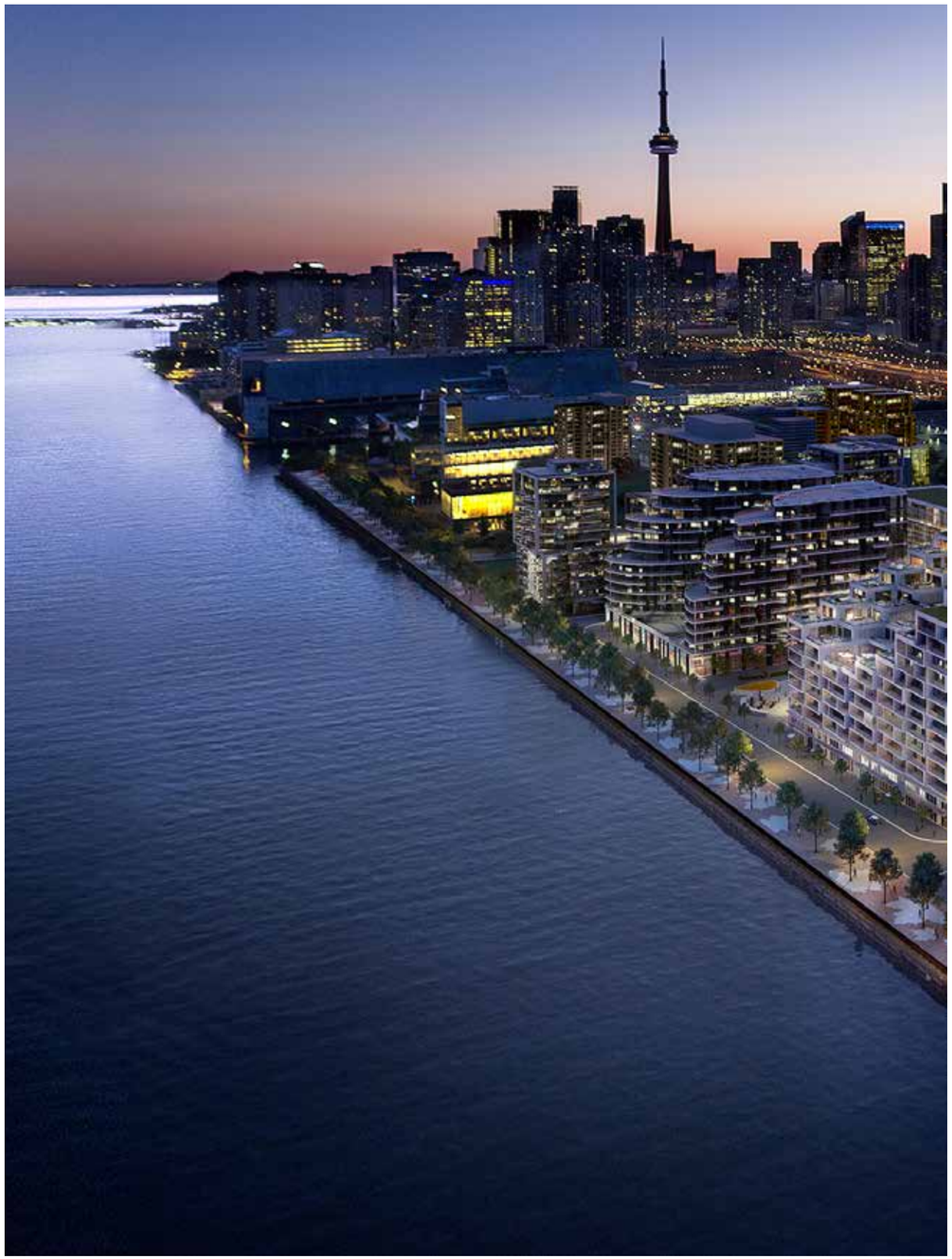
JOHN CASOLA
CHIEF INVESTMENT OFFICER,
CANADA INFRASTRUCTURE BANK

Canada Infrastructure Bank (CIB) is helping futureproof the country's infrastructure, including its buildings. CIB's Building Retrofits Initiative provides low-cost capital to retrofit plans that ultimately result in lower emissions from the building. The program requires a minimum 30% reduction in GHG emissions, but those who commit to higher reductions get preferential interest rates.

"We have designed a program that invests up to 80% of the actual capital costs of the retrofits, requiring either the building owner or the aggregator to put in the other 20%, so that there's some skin in the game," explained John Casola, Chief Investment Officer at CIB.

So far, CIB has invested over $913 million to support 11 retrofits projects and project aggregators. While these capital investments will inherently reduce the built environment's environmental harm, they will also help buildings become more attractive to potential tenants.

Casola highlights, "Buildings that are more sustainable can charge a premium and certain organizations will absolutely pay that premium. They have their own requirements for reporting, especially with upcoming carbon taxes and how that is factored into profitability. That's the ultimate business case for more investment in sustainable technology and greener buildings."



Bayside is a Hines Tridel community in Toronto

Based: Toronto, Ontario
Founded: 1934

BRUNO GIANCOLA
SENIOR VICE PRESIDENT, PROJECT MANAGEMENT, TRIDEL

GRAEME ARMSTER
DIRECTOR INNOVATION AND SUSTAINABILITY, TRIDEL

Toronto-based development company Tridel sets the standard for multifamily housing mid and high rises that sit at the intersection of sustainable and beautiful. The company lives up to its tagline "Built Green Built for Life," just winning its 14th consecutive award as home builder and green builder of the year at the 2023 BILD Awards.

As an 85-year-old family business, Tridel has shown its innovative spirit for decades, leading the charge to mean Toronto's ambitious initiative for Net-Zero buildings which requires that all new buildings subject to planning approvals are designed to be Net-Zero ready by 2028. "Tridel has an inherent entrepreneurial culture, leaning into new methods and new ideas to reduce emissions and hit Toronto's aggressive green standards," explained Bruno Giancola, Senior Vice President of Project Management at Tridel. "We are fortunate to work for a company that embraces this creative edge to take advantage of our position," he added.

For a ground up development firm, Toronto's 2028 deadline means this mandate is effective immediately. Graeme Armster, Director Innovation and Sustainability at Tridel, explains why the time to act is now, "We've got five years to figure this out, and we can't wait until 2028. By 2028, we expect to be a fine-tuned machine when it comes to addressing this policy change, so we're looking at technologies from heat pump solutions to electrifying domestic hot water, so that we're ahead of the curve."

Based: Vienna, Austria
Founded: 2017

JULIA ARLT
CO-FOUNDER
AUSTRIAN PROPTECH INITIATIVE (APTI)

Beyond her position as an advisory board of a handful PropTech startups, Julia Arlt is a serial entrepreneur specializing in PropTech and the real estate industry's transformation. For over five years, Julia was the Global Digital Real Estate Leader at PwC. The apti is a non-profit organization that connects the real estate industry with the PropTech startups and investors.

Her advice for buildings that are looking for quick wins as they become more efficient: the application of software automation in building operations yields a same-year ROI. Arlt explains, "Building automation and energy management platforms like aedifion, NANTUM and Switch Automation can save 20-40% of energy costs which far outweighs the annual costs of those tools. This is the easiest, fastest payback for the asset owner."

As the industry continues to move on the adoption curve for green initiatives, the investments are becoming more meaningful and measurable. Real estate companies are going beyond surface level data points just to check the boxes. Instead, they are looking at the lifecycle of their assets and purchase decisions from design and preconstruction through to operations.

Arlt is hopeful that this greater emphasis on the value chain of real estate will usher in a new era of innovation for our existing built environment. "Today, building retrofits cost 30% more than smashing a building and starting fresh. We have to change this and make retrofits make sense from an economic point of view," Arlt concludes.

The Shuffle, located in Dartmouth, Nova Scotia. This former hotel has been completely re-imagined by Sidewalk R.E.D, and designed into 79 micro housing units featuring art throughout and vibrant ground floor retail.

Based: Vancouver, British Columbia
Founded: 1975

ALEX LAU
VICE PRESIDENT,
GOLDEN PROPERTIES LTD.

Golden Properties is a second generation real estate company based in Vancouver and a leader in bringing sustainable, vibrant office buildings to life.

"Our work now revolves around creating healthy and productive work environments, bringing a bit more fun, community and productivity of the tenants. This includes the quality air that people are breathing, the quality of light, access to nature and views – things that actually people don't find necessarily at home. That's what we need to provide as landlords today," explained Alex Lau, Vice President at Golden Properties.

Another aspect of creating healthier buildings is investing in the decarbonisation of older buildings that dot Vancouver's skyline. Lau and the team at Golden Properties used its own headquarters as a case study to see what's possible. Their hypothesis: an 80% decarbonisation via a retrofit of the building with a five year payback period. This became the largest Net-Zero office retrofit in Canada outside Toronto.

"We created a decarbonisation roadmap and worked backwards to figure out how to get there. We realized all the solutions were not available right away, so we worked around equipment end of life and other constraints which culminated in a strategy that worked for us and the qualities of our building," added Lau. This retrofit provides proof points about the economics of decarbonising buildings that already exist today. However, Lau is quick to point out that the hard materials and embodied carbon associated with new construction ends up to be the real problem.

"We know we can get operational carbon down to almost zero. I believe that construction carbon is the more monumental challenge to solve. Can we make mass timber buildings cheaper than concrete and steel? Can we make the economics work and repeat it?"

A Subterra geothermal drilling project located in Toronto, Ontario.

Based: Toronto, Ontario
Founded: 2017

MATTHEW TOKARIK
PRESIDENT,
SUBTERRA RENEWABLES

Subterra Renewables (Subterra) is a Toronto-based geothermal utility company with the largest drilling fleet in North America that provides heating and cooling services to commercial and large-scale residential buildings across Canada, the United States and beyond, dramatically shrinking the fossil fuel consumption of those buildings.

Matthew Tokarik, President, Subterra Renewables, sums up the weight of this problem as a part of the decarbonization equation. "Approximately 70% of all the carbon that buildings produce is a direct result of heating and cooling with traditional fossil fuel combustion on site," said Tokarik. "This is the single biggest problem that we're trying to tackle since the majority of carbon emissions in major urban centers come from the building sector."

In addition to having 60 geothermal drills in its fleet, Subterra installs geothermal heating and cooling systems into customer buildings over a 30-year contract. This business model, better known as Energy as a Service (EaaS), reduces capital costs, operating costs and makes a significant impact on carbon savings in the building.

By 2030, the federal government is going to more than double the carbon tax, increasing it to $170 per ton. For the built environment, that means the cost of the natural gas will double. The benefit of geothermal energy is the elimination of natural gas combustion, reducing volatility and the future burden of the carbon tax. Historically, real estate has been hesitant to change its own status quo, especially when only viewing the move to make buildings more efficient through the lens of capital expenditures.

"Just looking at capex is being short sighted and myopic. Instead, looking at these investments over the course of the building's lifecycle yields a return. From the utility savings to the reduction in maintenance to the tax credits received when the project is complete, the long-term view creates an attractive opportunity and justifies the up-front capital cost," concluded Tokarik. "When Subterra is involved in a project, we can eliminate the up-front cost for developers all together."

INVESTOR SPOTLIGHT

Based: Montreal, Quebec
Founded: 2009
Portfolio: Encycle, Mysa, GreenMantra Technologies

SHIRLEY SPEAKMAN
SENIOR PARTNER,
CYCLE CAPITAL

Cycle Capital is a Montreal-based venture capital firm with $600 million in funds supporting growth stage climate tech companies. The firm's mission is rooted in helping scale companies that are developing innovations for the biggest ecological impacts facing our world.

Because Cycle Capital invests in more mature startups with proven science and technology, their focus is helping these companies expand their reach rapidly to grow as rapidly as possible. This strategy has helped the company with their mission "to empower entrepreneurs, investors and companies to find innovative solutions to the major ecological challenges facing humanity."

"We believe that you can't solve the climate problem without solving the building problem," said Shirley Speakman, Partner at Cycle Capital. "Real estate companies have no shortage of technology on the market to choose from, but they have to dig in and assess the maturity level of the solution and understand if it's a good fit for their building, capital investment and deployment. That may mean realizing that certain technologies just aren't right for older buildings or being selective about where in your portfolio you pilot new solutions."

INDUSTRY SPOTLIGHT

The Three Rivers community, by National Homes, located in Brampton, Ontario.

Panergy Wall Solutions
PANERGY.CA
Welland, Ontario
Founders: Martin Pena & Matthew Pantalone
Prefabricated wall solution resulting in superior air/weather tightness and thermal performance.

REAL ESTATE SPOTLIGHT

Based: Arnhem, Netherlands
Founded: 2020

MENNO LAMMERS
FOUNDER,
PROPTECH FOR GOOD

PropTech for Good was founded on Earth Day in 2020 to create a world leading ecosystem that empowers the real estate industry to take action and reshape the world's environments for Good.

"I believe that businesses can do well by doing good. By unlocking people's potential, we empower them to take actions that are better for the world, good for business, and life-changing for people. PropTech for Good is founded to accelerate this 'for Good' movement." said Founder Menno Lammers when describing his vision, "We create a global force for Good that innovates for a responsible, resilient, and regenerative world."

Lammers emphasizes the importance of addressing the inherent problems of our existing buildings and infrastructure rather than focusing on demolition and new construction. "Residential is under pressure, offices are under pressure, cities are under pressure. We really need to reinvent ourselves, the industry so that we don't just produce and consume, but instead, make the most positive impact with the things we already have with the aim to thrive for generations to come."

THEMES

THEME 2 DEMOLISH OR UPGRADE?

While operational carbon is often what dominates the conversation about shrinking the built environment's carbon footprint, the energy that buildings consume is only one part of the carbon associated with the real estate industry. Typically when a building achieves Net-Zero or carbon zero status, it only refers to the emissions, or lack thereof, that is produced to light, heat and cool the building.

The process of breaking ground and building a new development is carbon intensive. Dubbed embodied carbon, recognition of these emissions is spurring its own wave of investment and innovation with developers, architects, and engineers exploring ways to reduce the carbon created during the construction process. Halifax-based developer Sidewalk R.E.D. is one of these pioneers, heavily focused on adaptive reuse and breathing new life into underutilized buildings in urban cores. "The avoided embodied carbon of these buildings – if we were to tear them down versus to reposition and rethink the existing structure – allows us to deliver product faster to the market," explained Joe Nickerson, Vice President at Sidewalk R.E.D.

This new-school real estate philosophy mirrors a change in what potential tenants want in a building, particularly in the office market. "We have to prioritize the circular economy, and lean into the fact that the green and ESG credentials of a building are now what's most desired by the very customers that you're seeking to attract to the building," highlighted Juliette Morgan, ESG Consultancy Director at Gensler.

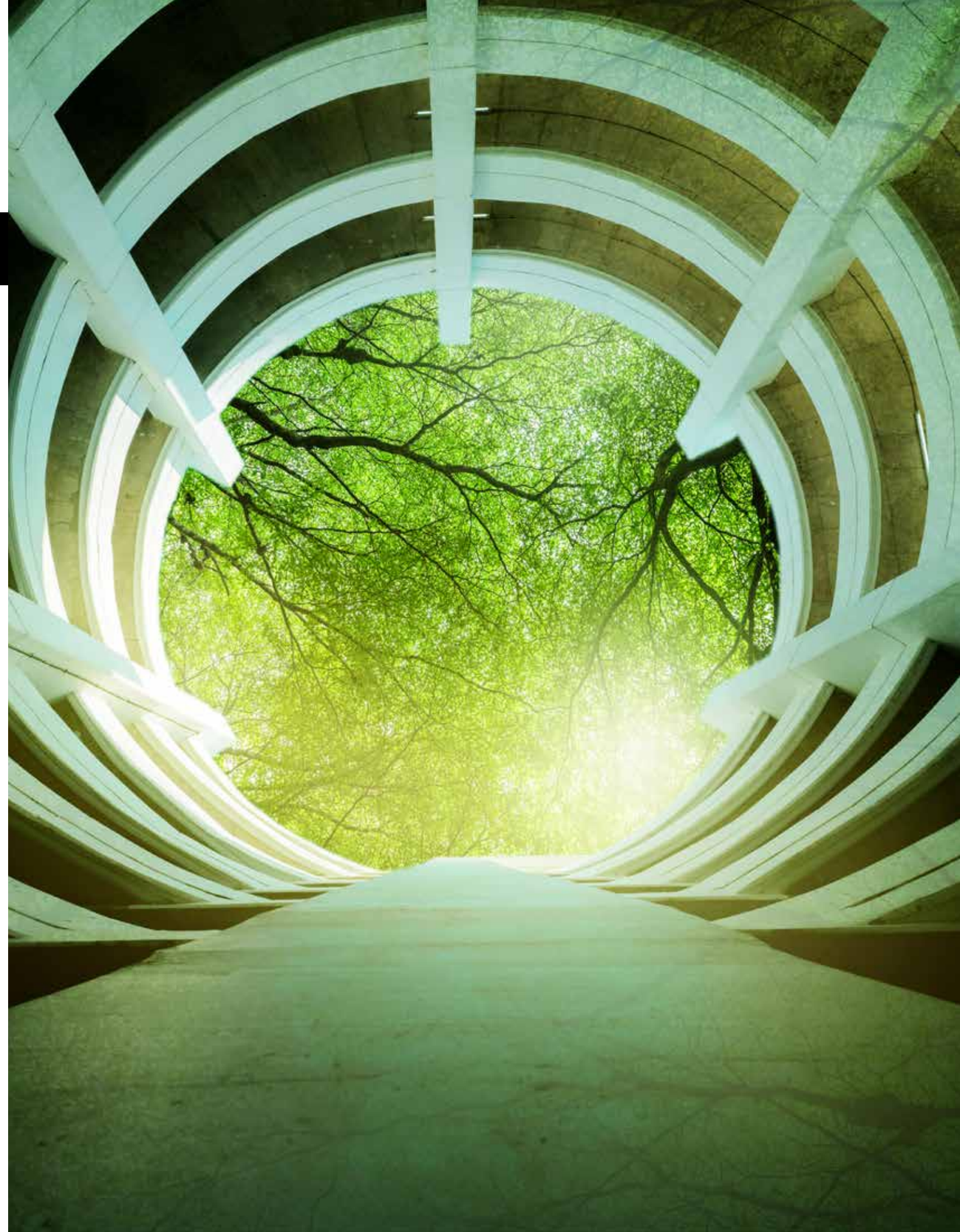
While this aspect of decarbonization is finally getting much needed attention, one of the difficulties in addressing embodied carbon is the limited understanding of how much of it is actually created. There's a growing number of companies that are focused on calculating and reporting embodied carbon to help close this knowledge and action gap.

THE THREE R'S OF DECARBONIZATION

1 REDUCTION
Increase efficiency and reduce waste.

2 REPLACEMENT
Zero emission alternative to fossil fuels.

3 REMOVAL
Physical removal of GHGs from the atmosphere.



Based: Toronto, Ontario
Founded: 2002
Assets: $17 billion in AUM

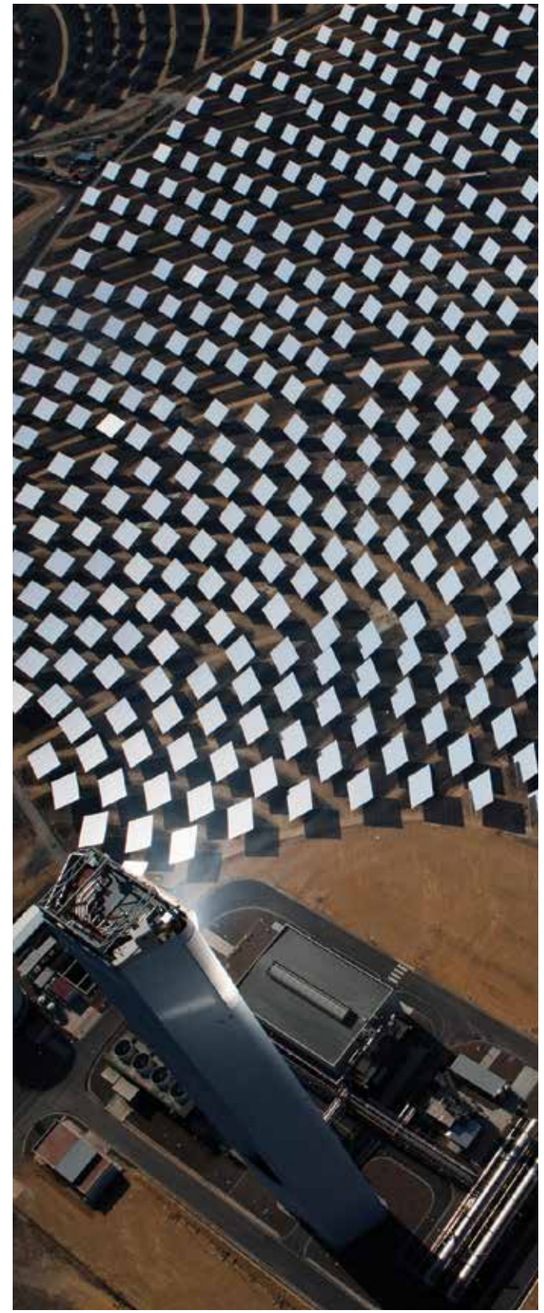
JON LOVE
CHIEF EXECUTIVE OFFICER,
KINGSETT CAPITAL

KingSett Capital is Canada's leading private equity real estate investment firm with $17 billion of assets under management. Founded in 2002, much of the firm's ethos revolves around sustainability, building both resilience and value in its portfolio. While many companies hold sustainability as a key value, it is truly ingrained in every aspect of KingSett Capital's contributions to the real estate industry.

"There's no way we could build a new building today that is not carbon zero. In the long run, it's just not good business sense. While you pay more today, we're satisfied that over time – between carbon taxes and customer preferences – being zero carbon is a winning strategy. In fact, it's our obligation to provide the market with carbon zero alternatives," stressed Jon Love, Chief Executive Officer at KingSett Capital.

Across all real estate product types, there are so few zero carbon options today that buyers seeking those solutions are often limited to a handful of places to tour. Love is hopeful that more real estate companies will seek out the premium that this category can yield in terms of sale and lease prices.

KingSett Capital is also very interested in the development of low-to-no embodied carbon materials. Love explains, "Concrete steel installations are the largest source of embodied carbon. While we haven't found nirvana yet in terms of alternatives, there is so much product development and scientific research being conducted with concrete and other core elements. We are optimistic that technology will take us to a place where you can dramatically reduce carbon in construction in a relatively short period of time."



The first commercial solar tower in the world built in Sanlucar la Mayor, Spain, by the Spanish company Solucar (Abengoa)

Gensler

Based: San Francisco, California
Founded: 1965

JULIETTE MORGAN
ESG CONSULTANCY DIRECTOR - CLIMATE ACTION & SUSTAINABILITY PRACTICE, GENSLER

While Gensler may be best known as an architecture titan, the global firm is also partnering with real estate companies to improve the efficiency of existing assets with capital improvements and the application of new technologies. The goal is clear: make these buildings more competitive and profitable in a crowded market.

Juliette Morgan, ESG Consultancy Director at Gensler provides this context, "The most desirable, most valued real estate are the buildings that are outperforming across environmental and social criteria. Those are projects doing a lifecycle assessment and proving that their embodied carbon is down. Buildings adopting renewable technologies and showing that it's operationally efficient. It's projects that are mindful of their materiality fit out and their biodiversity net gain."

In short, occupiers want well-refurbished buildings with high energy efficiency ratings proven by third-party accreditations like BREEAM and Fit Well.

TAS' demolition and sustainability consultants review what is salvageable from a site and the materials can be reused in the design.

Based: Toronto, Ontario
Founded: 1983

MAZYAR MORTAZAVI
CEO & PRESIDENT,
TAS IMPACT

At first glance, TAS is a Toronto-based Canadian real estate platform that spans development, asset management and private equity. But when you dig a little deeper, it's better to classify TAS as an impact company – and certified B Corporation® – focused on driving affordability, sustainability and social equity in the communities it serves.

While many real estate companies are just beginning to tackle operating carbon as Net-Zero mandates loom, TAS is equally focused on lowering the embodied carbon associated with the company's projects, particularly in redevelopment, an area that TAS has been focused on over the past 20 years.

Mazyar Mortazavi, President and CEO of TAS, explains the company's approach, "At every site we acquire and redevelop, our demolition and sustainability consultants document what is salvageable. That creates a materials list which goes to the architects and designers, so they can build those elements into the design criteria of our projects."

At their 2 Tecumseth Street project, TAS repurposed materials equivalent to hundreds of cubic tons of carbon by doing this exercise proactively. TAS undertakes a similar exercise to determine which construction materials will yield the lowest carbon footprint without sacrificing affordability, particularly on multifamily projects.

The company conducts an exhaustive process to study and compare timber, concrete, low carbon concrete, and concrete-timber hybrid, determining the correlated impacts of embedded carbon, operational carbon, and affordability. On a recent project, timber would have yielded optimal embedded carbon reduction, but it came at such a significant cost, that it would undermine the affordability of the project. TAS's approach looks at the project full life cycle carbon footprint to determine the best strategy between embedded and operational impact.

"Instead, we reached our net effective carbon targets by using a low carbon concrete. We also enhanced our building operational systems to keep the affordability at a level that allowed us to get to a carbon neutral building with carbon credits. It's important to note that we didn't just buy credits for the sake of it; it was a strategic purchase against an affordability objective that was balanced out by operations," explained Mortazavi.

PROPTECH SPOTLIGHT

Based: Toronto, Ontario
Founded: 2021

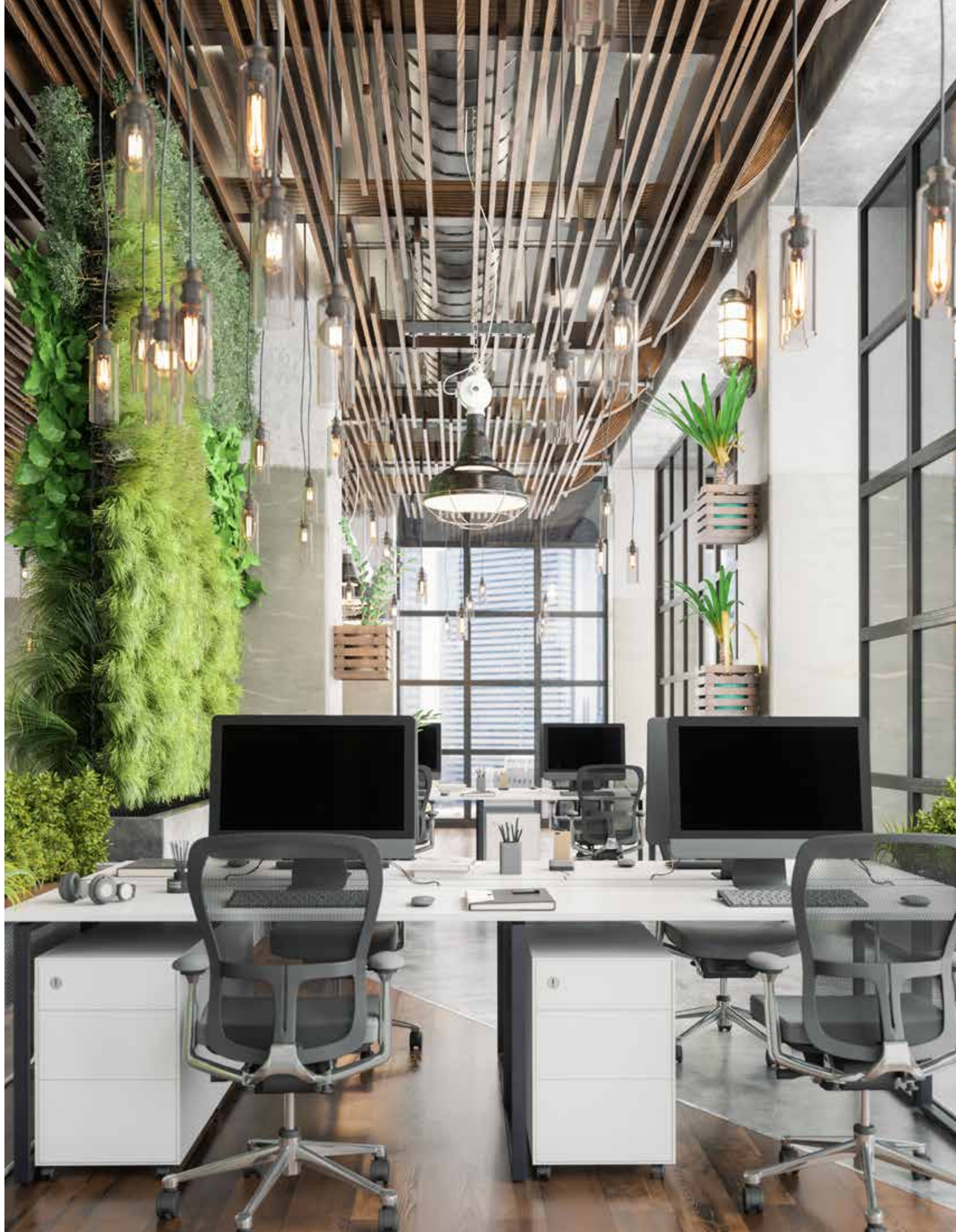
SANDERS LAZIER
CEO AND CO-FOUNDER,
CARBONHOUND

Carbonhound is a self-service software platform for companies trying to assess, manage and improve their own performance as a part of the bigger fight against climate change. Based in Toronto and co-founded in 2021 by Sanders Lazier and Kyri Vanguard, Carbonhound gives small and medium sized companies the ability to conduct carbon management on their own, saving its customers 70-80% compared to a consultant-driven approach.

"64% of the world's market capitalization is committed to Net-Zero and 92% of the world's GDP by country have Net-Zero commitments. The pressure on buildings is coming from potential tenants wanting green leases and a measurable commitment from their landlords to decarbonize their built operations," explained Lazier.

For new developments seeking to attract big-name tenants, embodied carbon is the top concern for potential leasers with their own carbon reporting requirements. Steel and concrete are the two biggest contributors to GHGs in terms of building materials, yet today, most solutions to make these materials less carbon intensive aren't fully commercialized and scaled. Lazier puts an emphasis on turning to more sustainable, natural materials today, "In the meantime, we have to start using more timber that acts as both a carbon store and sink. If we can start using more natural materials, like wood in new builds that would be massive. In terms of technologies for retrofitting existing buildings, that really just comes back to electrification and integrated reduction strategies."

Carbonhound is removing another key barrier to decarbonization: actually knowing the emissions a building is creating and how much efficiency investments are diverting. The company already has direct integrations with 98% of Canada's utility providers, automating often-manual data collection and management for reporting.



PROPTECH SPOTLIGHT

nidus3D printer creating a two story home in Ontario, Canada.

nidus3D

Based: Toronto, Ontario
Founded: 2021

IAN ARTHUR
PRESIDENT AND FOUNDER,
NIDUS3D

nidus3D is Canada's leader in 3D construction printing, bringing new solutions to dramatically reduce the embodied carbon footprint of new buildings to the market.

From the actual mix of the concrete nidus3D deploys to the way it's delivered and poured, the entire process is less emissions intensive than traditional construction materials, logistics and labor. Ian Arthur, President of nidus3D, highlights key aspects of this approach. "We only create as much as we're actually going to use on the building and what little waste we have is used for hardscape. In addition, the placement of that material is optimized. Those two factors combined for a 60% reduction in materials compared to legacy construction methods," highlighted Arthur.

In addition, the nidus3D method means less mileage and fuel burnt to get materials to the build site, reducing transportation by 45%. The 3DCP sector is also taking this methodology and applying it to the 3D printing of slabs, roof trusses, and bridge trusses. Early tests show that this can result in a 70% reduction in the concrete needed for an equivalent strength component.

The biggest obstacles in taking this approach mainstream lies in builder confidence and permitting. He explains, "Builders know even if they're pursuing legacy construction methods, if you add on a new technology on top of all the existing municipal obstacles, their lives become more difficult. We've had very varied experience on the permitting and engineering process. Some municipalities are extremely interested while other ones see it as something brand new that they don't really want to invest the time in. We believe though, that the industry, both builders and municipalities, will embrace the technology. There are too many challenges facing construction not to seek out new ways of building."

04

THEMES

THEME 3 THE OPPORTUNITY IN AFFORDABILITY

Housing in Canada has never been more expensive to build, buy or rent. At every monthly price point, there's a shortage of available units leading to a universal housing affordability challenge across the country. The problem is equal parts process and materials. Zoning codes, approval process and building requirements mean new build timelines are measured in years and decades, while rising material costs make middle housing and truly affordable units difficult to pencil.

"What's caused the lack of affordability? Public policy choices that have constrained supply by overtaxing new development and extending permit processes. They have to be updated to bring new sources of housing supply online more efficiently. With good public policy, we have an opportunity to address affordability in a meaningful way," explained Jon Love, Founder and CEO at KingSett Capital.

The federal and provincial governments are making individual contributions to produce new housing and address the inequities of the housing shortage, but public policy changes, repurposing and new building approaches are being led by the private sector. For example, in May 2023, the Toronto city council finally adopted an inclusionary zoning measure that cleared the way for four-unit multiplexes to be allowed in all city neighborhoods by right.

These public policy changes do address the timelines for project approval that often balloon budgets, but they don't address the hard cost of building housing. Often, people unassumingly think that middle market and subsidized housing is less expensive to build than market rate or "luxury" units; however, the costs are nearly identical. While tax incentives and other government programs are designed to entice real estate companies to build more of this housing, these initiatives alone aren't making a measurable difference in the affordability crisis.

Jenn Green, Director Affordable Housing and Corporate Social Responsibility at real estate developer and property management company Greenwin Corp., highlights, "It's almost as expensive to build affordable housing, and you can't charge as much for it – so therein lies the problem. We need more support to get mixed income housing developments across the finish line."

Much like decarbonizing the built environment, making our communities more affordable will require innovation and public-private partnerships.

INDUSTRY SPOTLIGHT

Urban beekeeping brings people together around an awe-inspiring experience through an interactive and sustainable solution which inspires people and organizations to do better and do more for the environment.

Alveole Buzz
ALVEOLE.BUZZ
Montreal, Quebec
Urban beekeeping, providing an innovative turnkey service.

REAL ESTATE SPOTLIGHT

Based: Toronto, Ontario
Founded: 1948

JENN GREEN
DIRECTOR,
AFFORDABLE HOUSING & CORPORATE SOCIAL RESPONSIBILITY, GREENWIN CORP.

Greenwin Corp. is a development and property management organization based in Toronto with a strong affordable housing mandate. The company has developed more than 4,000 affordable housing units so far with another 1,200 affordable housing units in the pipeline.

As an owner/operator, Greenwin approaches development and property acquisition with longevity in mind. However, mounting building costs and timelines often present the biggest challenge for bringing affordable housing at scale to market.

"Building faster and more efficiently means lower construction and financing costs over a shorter period of time," highlights Jenn Green, Greenwin's Director Affordable Housing and Corporate Social Responsibility.

"If we can crack that code thanks to sustainability, builders have a little bit more wiggle room for incorporating affordable units or even just lower rents on market units. Bringing in sustainable technologies helps to reduce those costs over time, and it just continues to make it more feasible to incorporate affordable housing."

Beyond creating energy efficient housing, Greenwin is also heavily focused on the social aspect of ESG commitments in the neighbourhoods they operate. This includes developing custom social programming initiatives that meet the unique needs of residents, such as after school programs, senior services, food access, mentorship opportunities and programs connecting graduating high school students with potential employers.

26 Grenville St. is located in Toronto, Ontario. This development is part of the Provincial Affordable Housing Lands Program and has Open Door Program benefits.

Based: Toronto, Ontario
Founded: 2002
Assets: $17 billion

JEFF THOMAS
GROUP HEAD OF DEVELOPMENT,
KINGSETT CAPITAL

KingSett Capital also partners with affordable housing providers like Greenwin to address the growing housing crisis across Canada. The firm's development group works in partnership to bring new housing to market while also breathing new life into existing buildings.

Jeff Thomas, Group Head of Development at KingSett Capital, notes that the stress of finding housing exists at nearly every price point today. He explains, "It's tough to find an apartment anywhere right now – wherever you live. This issue is particularly challenging for those seeking affordable housing options, where supply is particularly tight."

Part of the problem is that housing production has lagged growth considerably in major cities. "We deliver today to a population of 40M Canadians about the same number of housing units as we did in 1975, when Canada had a population of 24M." For affordable housing this gap is even wider.

"In the '70s, Canada delivered well over 30,000 units of social housing a year. That number has slowly dwindled to a couple of thousand units a year," notes Thomas.

KingSett Capital is set to break ground on a residential project later this year which includes 500 housing units, 200 of which will be earmarked as affordable. Aligned with KingSett's sustainability ethos, the new development will also achieve Net-Zero carbon status.

realstar group

Based: Toronto & London
Founded: 1974
AUM: $9B

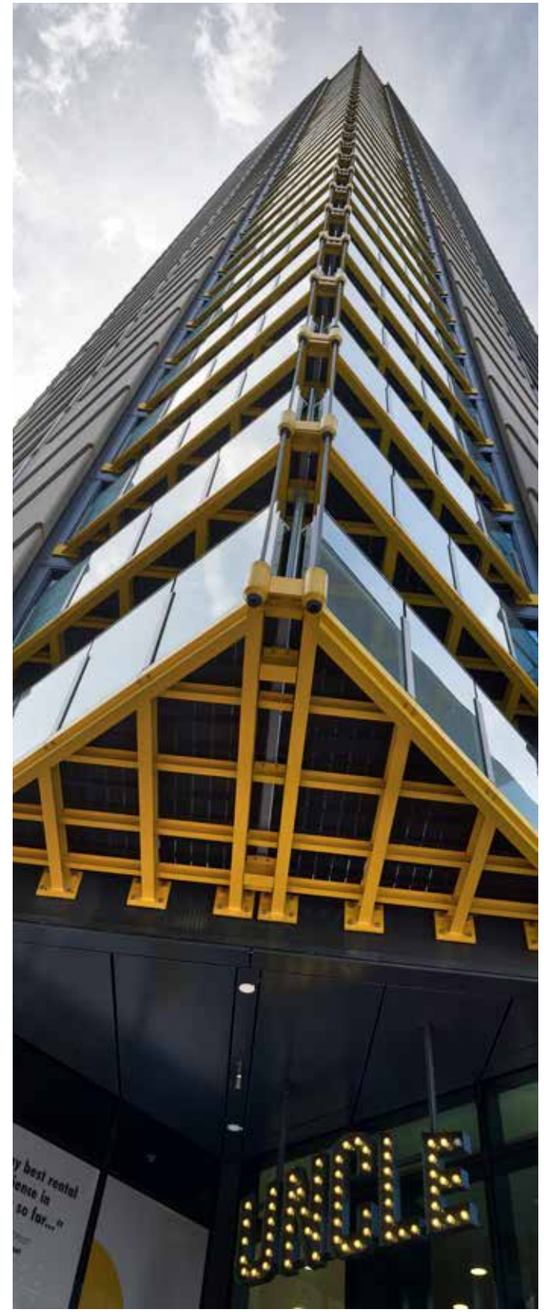
RYAN PRINCE
VICE CHAIRMAN, REALSTAR GROUP,
FOUNDER & CEO OF UNCLE

Realstar Group is privately-owned, vertically integrated real estate firm which specializes in rental housing and hospitality.

The company's residential arm owns and operates more than 25,000 rental units across Canada and the UK. It also owns the master licences for the Days Inn, Motel 6 and Studio 6 brands in Canada, with a total system of over 145 properties.

Ryan Prince, Vice Chairman of the group, identifies a mismatch between wage growth and construction cost as a key challenge for the industry. He explains, "The financial viability to build and generate multifamily housing with any degree of genuine affordability relative to people's earnings growth is extremely tough today. We're back to the '70s, where the government needs to step in and help drive the system forward to create high levels of high quality new supply."

Whereas in the past there were only two categories of rental accommodation - market or subsidized - new niche segments are starting to emerge. Prince compares this to the hotel sector, "The residential space is evolving in the same way hotel brands started to over 50 years ago where everything from a full-service luxury to a budget boutique-chic and everything in between lives under one family of brands. Multifamily companies, including ourselves with our UNCLE brand, have only just begun to crack the surface of this approach within the last ten years."



The UNCLE Elephant and Castle in London, England, is London's tallest apartment building (all 45 floors of it) with a gym, workspaces, and views for miles.

Sajecki→ Planning

Based: Toronto, Ontario
Founded: 2017

ED SAJECKI
PARTNER & CO-FOUNDER, SAJECKI PLANNING (FORMERLY, COMMISSIONER OF PLANNING AND BUILDING, CITY OF MISSISSAUGA, ASSISTANT DEPUTY MINISTER, ONTARIO MINISTRY OF MUNICIPAL AFFAIRS AND HOUSING)

DAVID SAJECKI
PARTNER & CO-FOUNDER, SAJECKI PLANNING

Sajecki Planning is an urban planning firm that's partnering with cities across the country to future proof their communities, making them places where people can live and thrive. A big part of this mission is helping cities manage where, when and how growth should happen, both in terms of people and buildings.

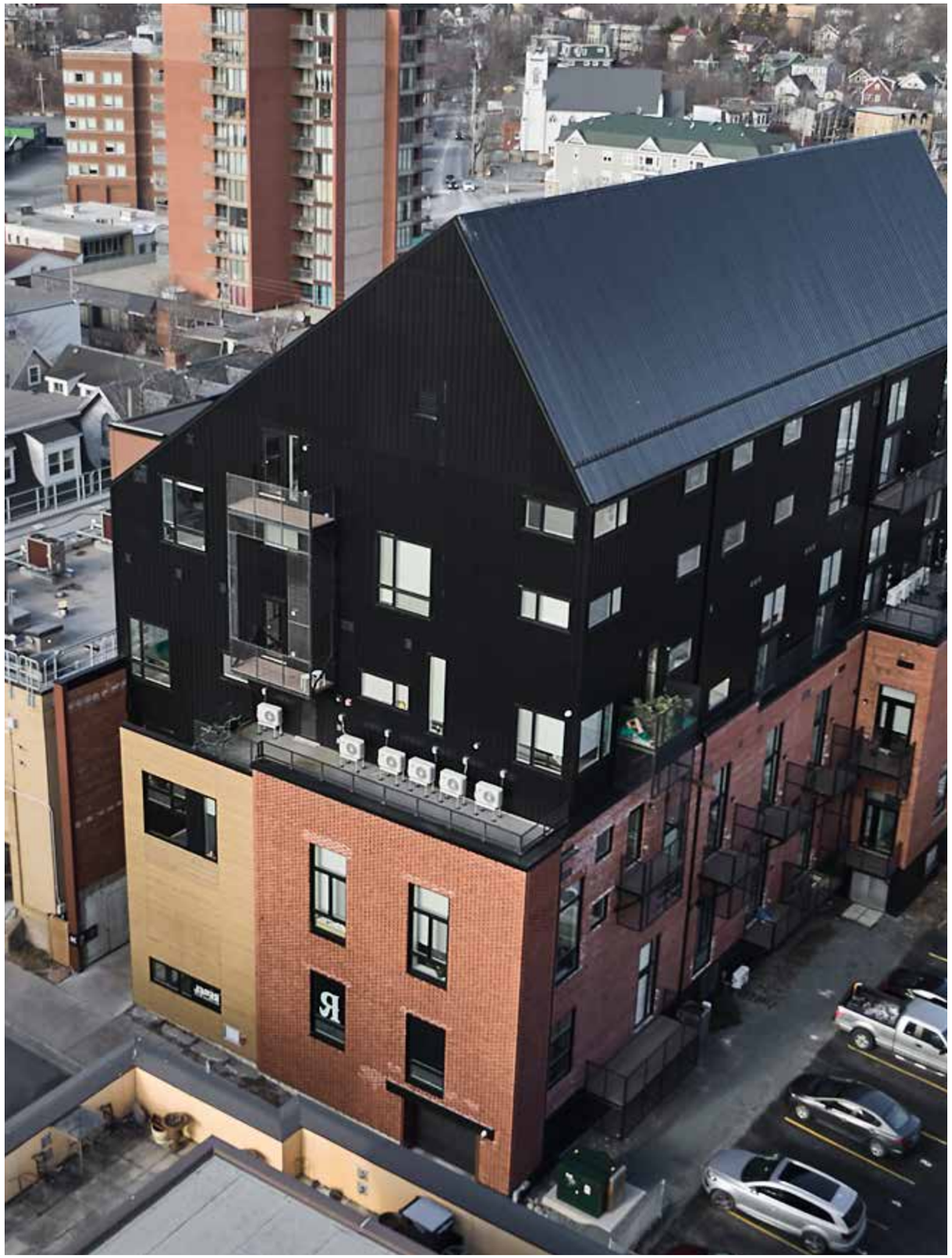
Their work spans master planning, public policy and real estate development giving the Sajecki team a unique perspective about how cities can become more sustainable and more affordable simultaneously.

Two ideas that live at this intersection are lower required parking ratios for new buildings and eliminating the red tape needed to develop smaller, low rise housing. Ed Sajecki, Partner and Cofounder, explains, "Every extra floor of underground parking adds exponential cost to the project and inherently encourages more cars in our cities. This is an example of a zoning requirement and process that slows down the process for getting housing approved, adding millions to a construction budget that gets passed onto future residents. At the end of the day, the federal and provincial governments need to come to the table and loosen zoning requirements."

This is particularly true for smaller, community-based developers that want to invest in duplexes, triplexes and fourplexes in single family areas. "I would love to take whoever is in opposition to gentle density to my neighborhood and show them around where I was raised. If we can start building a multiplex here or there, it's almost like urban acupuncture with small projects all over the place, each chipping away at our housing crisis," noted Sajecki.

Ed's cofounder David Sajecki also stresses the importance of experimentation and innovation in how housing and communities grow. "We're working with the town of Innisfil in Ontario to develop a community of 100,000 people over a very long horizon, within the town of Innisfil. The goal is to build within a very small footprint, while also being mindful about how to create communities," explained D. Sajecki. "We're working closely with the development community while also protecting farmland, integrating commercial with green spaces and great active transportation to broaden the definition of sustainability," he adds.

Too often, zoning codes, design reviews and approval processes stand in the way of housing creation – something that housing advocates highlight as requirements for improving housing affordability across the country.



36 Wentworth Street, Dartmouth, Nova Scotia: Once a forgotten telecom storage site, Tel Lofts is now home to 24 of downtown Dartmouth's most unique hard loft units.

SIDEWALK

Based: Halifax, Nova Scotia
Founded: 2012

JOE NICKERSON
VICE PRESIDENT,
SIDEWALK R.E.D.

Sidewalk R.E.D. is a real estate company based in Halifax focused on redeveloping neighborhoods, with a particular passion for adaptive reuse and delivering differentiated product in downtown cores. Most recently, the company has taken on its third office-to-residential conversion, painting a new picture of what nearly empty office buildings can become.

Sidewalk's most recent project, the Agency Art Lofts, is the conversion of one of Halifax's first high rise buildings, measuring 14 stories and nearly 200,000 square feet, the property is currently being converted into 141 hard-loft housing units with mixed office and retail throughout. "We've found our niche in repositioning underutilized Class-C office towers to deliver housing into the market faster than we otherwise could if we were building new," explained Joe Nickerson, Vice President at Sidewalk.

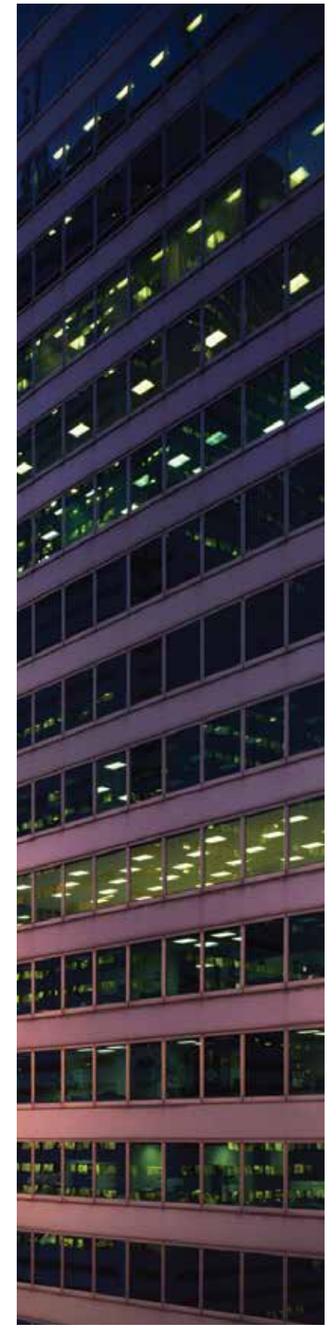
This approach has a major green benefit: dramatically eliminating embodied carbon as our cities evolve. The avoided embodied carbon of those buildings means less disruption to the neighborhood and less materials in the landfill. It can also present lower acquisition and development costs for real estate companies.

For example, Sidewalk recently acquired a Halifax building for $16.5 million that stood across the street from an empty gravel lot. Six months after Sidewalk's acquisition, that lot, which was once home to a federal, brutalist-style building, sold for over $40 million. Nickerson explains, "In most instances, you don't have a perfect development site next door to provide a comparative analysis of what it would cost to tear down a building or buy a cleared development site, but this illustrates the true costs of development from both a dollars and embodied carbon mindset."

Additionally, they are nearing completion on a previous conversion project, the Shuffle, which was formerly an 8-story hotel in downtown Dartmouth. The new building will deliver 81 boutique micro apartments units, the first of their kind in Halifax. Many of these new units will be smaller than traditional apartments but will provide all the luxuries people want. "They're smaller than your typical unit, but your all-in monthly rent is going to be substantially lower than what you would pay for a traditional market unit, bringing new affordability options into the market," Nickerson said.

PARTNER SPOTLIGHT

Scotia Plaza: The largest certified zero carbon building in Canada.



Scotiabank

Based: Toronto, Ontario
Assets: $1.3 Trillion

MEIGAN TERRY
SVP, CHIEF SUSTAINABILITY, SOCIAL IMPACT AND COMMUNICATIONS OFFICER, SCOTIABANK

FRANK OTTAVINO
SENIOR VICE PRESIDENT OF REAL ESTATE BANKING, SCOTIABANK

DAVID ROZIN
VICE PRESIDENT AND HEAD, TECHNOLOGY AND INNOVATION BANKING (GROWTH CAPITAL), SCOTIABANK/ROYNAT

Scotiabank is not only one of Canada's leading financial institutions, it's now at the forefront of making communities across the country more sustainable and affordable. Two years ago, Scotiabank announced a $10 billion commitment over ten years to back the Canada Mortgage and Housing Corporation's (CMHC) goal of ensuring every Canadian has access to an affordable home by 2030.

"Canada has the lowest number of housing units per capita of any G7 country. Housing construction in this country hasn't kept up with demand and population growth, and it's getting worse. According to CMHC, we would need to build 3.5 million units by 2030 to restore affordability, so that's nearly 500,000 homes a year which is almost double what we're already producing," explained Frank Ottavino, Senior Vice President of Real Estate Banking at Scotiabank.

While inflation and rising interest rates will always be a concern, Scotiabank is focused on balancing these realities with making community investment decisions that drive lasting value and social impact. A program that embodies this ethos is ScotiaRISE, which targets support to three main focus areas: high school and post-secondary graduation, newcomer support, and career advancement for disadvantaged groups.

"ScotiaRISE is a $500 million commitment for disadvantaged communities to improve their economic resilience. What's most significant is not just the $500 million, it is our focus alongside our community partners in creating long-term impacts and sustainable change," said Meigan Terry, SVP, Chief Sustainability, Social Impact and Communications Officer at Scotiabank. Through ScotiaRISE the bank is supporting greater pathways to trades employment and addressing the shortage of skilled labour required to build more affordable housing in the country.

Investments in making communities more sustainable and affordable will play a profound role in making Canada a more accessible place to work and live. However, adoption of innovations towards making these improvements to new and existing housing stock is still lagging, according to David Rozin, the Head of Scotiabank's Technology and Innovation banking division. He explains, "From a technology perspective, we see a number of solutions, including advanced materials, seeking to secure new clients and broader adoption in the market. Measurement, more efficient use of resources and materials are at various stages of adoption while affordability requires enhanced focus. There remains a clear mismatch between supply and demand in the market for housing and home ownership."

THE CANADIAN SUSTAINABLE PROPTECH WORLD

Facts and figures on the Canadian sustainability-focused PropTech scene

DATA

The data includes information up to May 1, 2023. Companies founded or financed after this date may not be included as part of the analysis. We will always try and support the growing Canadian Sustainable PropTech market. If we've missed a company that belongs on our map, **please contact us at hello@sustainableproptech.com. ****

2023 CANADIAN SUSTAINABLE PROPTECH MAP

SUSTAINABLE PROPTECH

	SMART CITIES	SUSTAINABLE CONSTRUCTION	ANALYTICS / RESEARCH	ASSET MANAGEMENT
LATE STAGE	amp, GoBolt	3ONE STRUCTURE, DIRTT Build better., morgansolar	Refined Data	ecobee, Eddy Solutions, KONTROL Technologies Corp.
GROWTH STAGE	Green Standards, HYDROSTOR, alvéole, MyHEAT, Diversso energy, PEAK POWER, CHARGELAB, UGO WORK, EnPowered, eLeapPower, SWTCH, subterra, ThoughtFireOS	Batitech, BONDI, CarbiCrete, CARBON CURE, ergosun, evo PAINT, FALK BUILT, GIATEC, GREENMANTRA, MITREX, NEXII, trusscore, 3E Nano	clir, MANIFEST CLIMATE, novisto	BRAINBOX AI, dcbel, ecopilot, ElectroMotion, ENCYCLE, KOBEN, LEGEND, levven, Lightspark, mysa, NO-WA, parity, sinopé, HARGY
EARLY STAGE	Asset Market, Carbon Neutral Club, CurbIQ, ecamion, envision², HYPERION, Kanin Energy, mintgreen, nectar, Portable Electric, RECYCLE SMART, kite, Unico	Built, CASCADIA WINDOWS & DOORS, carbon upcycling, cence, ELEMENTS, EVERCLOAK, Intelligent City, MIRU, NOMODIC, nidus3D, PANERGY, PLAEX, Promise Robotics, QUBE, RAINSTICK, RGC ENERGY, R-Hauz, rise, smarteralloys, upbrella, unitiwall, VERO, ZS2 technologies	adaptis, Audette, BUILTSPACE, carbonhound, climative, ECOSPEX, energyX, RATIO.CITY, riskthinking.AI, SAMETRICA, 15ROCK	CIRCUITMETER, sensorsuite, HAVEN, CarbinX, RYSE, enersion, BKR ENERGY, QEA, airsset, EAGLE, OXYGEN 8, POPPY, CONNECTED SENSORS

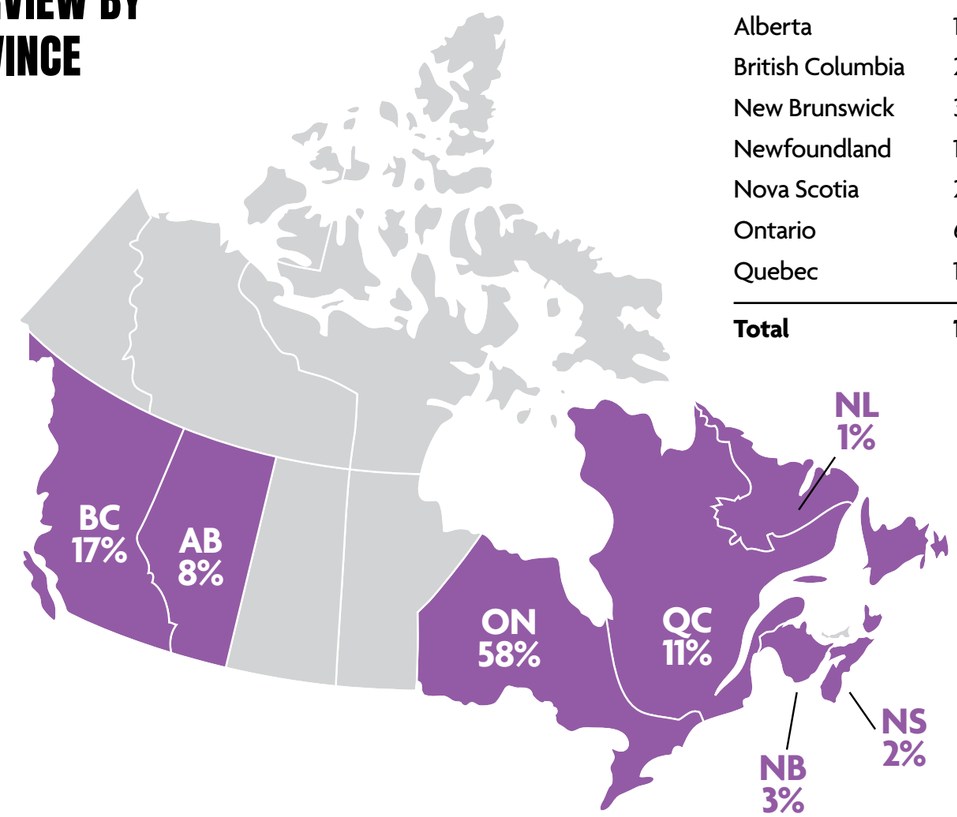
The full list of companies included on this Map can be found in Appendix A.

COMPANY GEOGRAPHIC LOCATIONS

Locations of Canada's sustainable PropTech companies by province

OVERVIEW BY PROVINCE

Province	Count
Alberta	10
British Columbia	20
New Brunswick	3
Newfoundland	1
Nova Scotia	2
Ontario	67
Quebec	13
Total	**116**



INDUSTRY SPOTLIGHT

ZS2 TechPanels integrate proprietary TechBoard™ which is a high-performance, zero-chloride board with significant benefits vs. conventional construction materials.

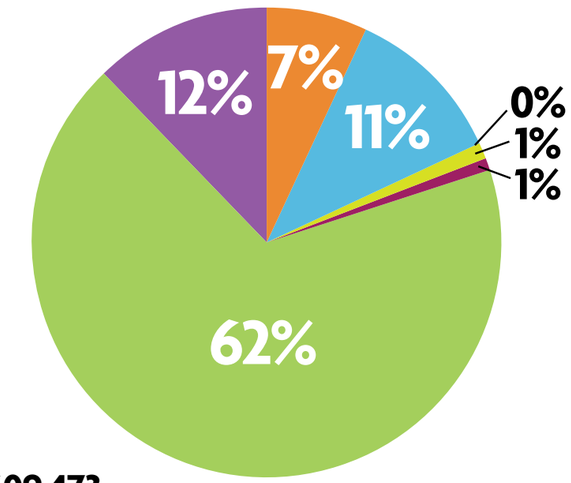
ZS2 technologies

Z2S Technologies
ZS2TECHNOLOGIES.COM
Calgary, Alberta
Developing advanced building technologies that are fire-rated, non-toxic, low-carbon and prefabricated panels.

06

FUNDING FLOWS TO CANADIAN PROVINCES

- **Ontario** $1,471,111,133
- **Quebec** $261,810,000
- **British Columbia** $244,188,340
- **Alberta** $163,250,000
- **Newfoundland** $31,400,000
- **Nova Scotia** $12,400,000
- **New Brunswick** $2,450,000



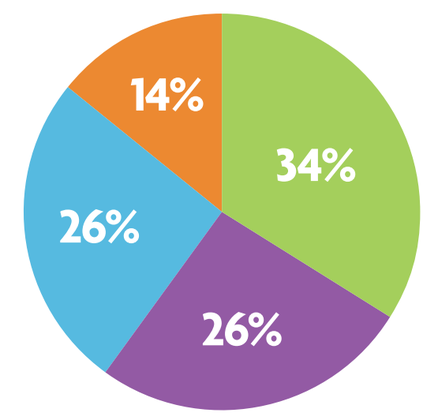
TOTAL
$2,186,609,473

BREAKDOWN OF CATEGORIES

In this report we have broken down sustainable PropTech companies into four categories: Analytics/Research, Asset Management, Smart Cities and Sustainable Construction

COMPANIES BY CATEGORY

- **Analytics / Research** 16
- **Asset Management** 31
- **Smart Cities** 29
- **Sustainable Construction** 40

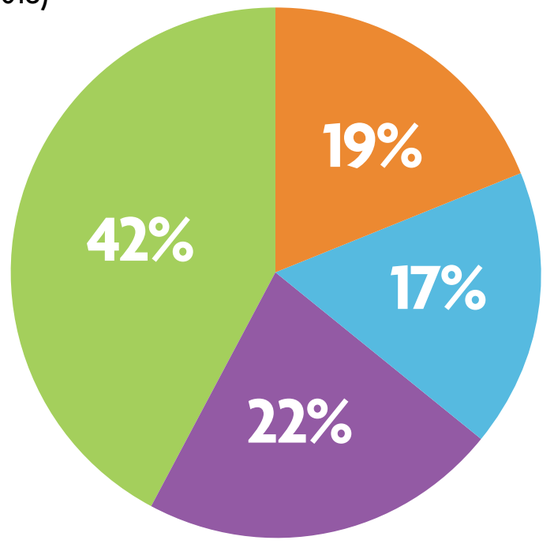


TOTAL
116

FASTEST GROWING CATEGORIES IN THE LAST 5 YEARS

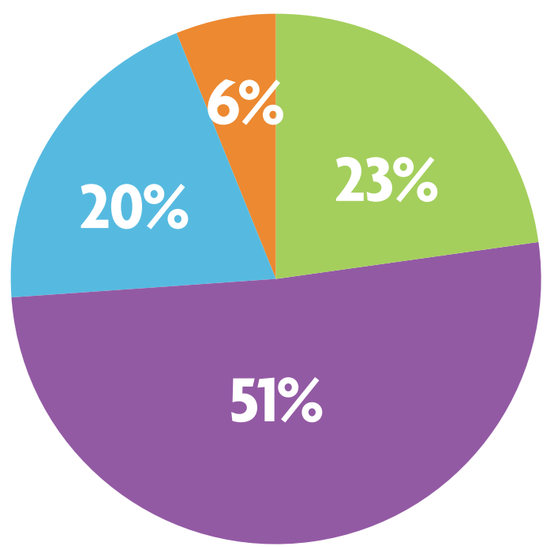
(SINCE 2018)

	Count
Analytics / Research	7
Asset Management	6
Smart Cities	7
Sustainable Construction	15
Total	35



FUNDING BY CATEGORY

- Analytics / Research **$126,511,133**
- Asset Management **$436,797,600**
- Smart Cities **$1,122,960,000**
- Sustainable Construction **$500,340,740**



TOTAL
$2,186,609,473

06

FUNDING

Information about the capital raises for Canada's sustainable PropTech companies

TOP 10 FUNDED COMPANIES

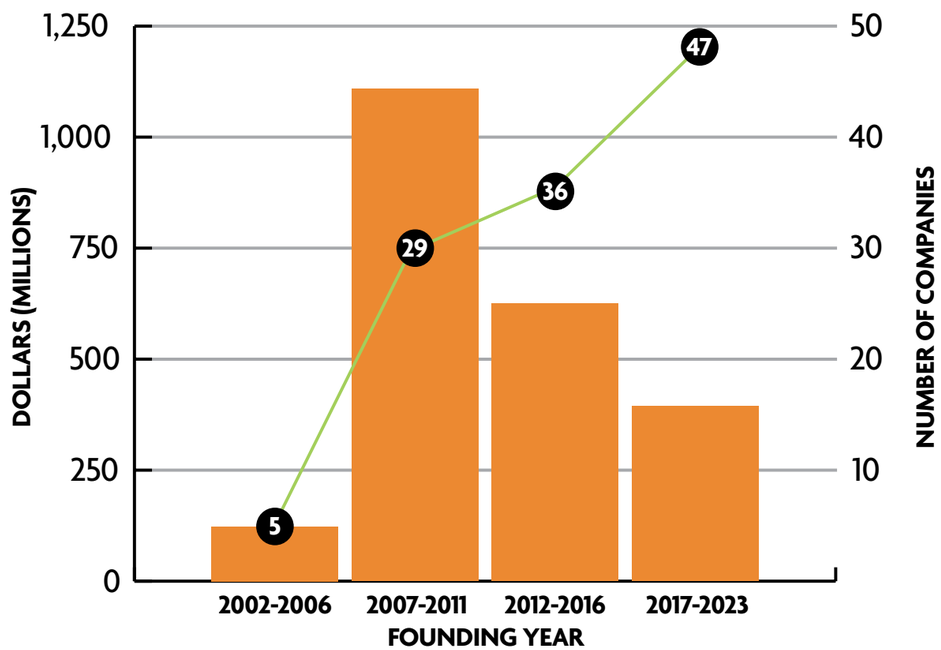
amp	$374,000,000
HYDROSTOR	$322,000,000
GoBolt	$178,300,000
ecobee	$146,000,000
NEXII	$119,000,000
DIRTT Build better.	$100,000,000
PEAK POWER	$65,100,000
XNRGY	$57,340,000
morgansolar	$53,100,000
FALK BUILT	$48,000,000

Source(s): Pitch Book, Crunchbase, Venturon internal data.

COMPANY AGE

Information about the founding dates of Canada's sustainable PropTech companies

BREAKDOWN BY AGE



Dollars Funded

Number of Companies

48%
of Canadian Sustainable PropTech startups were founded after 2016

Source(s): Pitch Book, Crunchbase, Venturon internal data.

CANADIAN PROPTECH INVESTORS

TOP CANADIAN GENERALIST VCS

Founded 2001

Founded 2002

Founded 1993

Founded 2011

Founded 2023

Founded 2011

TOP CLEANTECH SPECIALIST VCS

Founded 2012

Founded 2018

Founded 2009

Founded 2022

Founded 2020

Founded 2008

TOP CANADIAN PROPTECH SPECIALIST VCS

Founded 2019

Founded 2014

Founded 2016

Founded 2018

SIGNIFICANT INCUBATORS

06

RECAP

Staying Ahead of Disaster

Canada continues to rank as a world leader in decarbonizing the built environment, buoyed by public and private sector alignment and investment.

Green for Green ($$)

Canada's real estate companies are boosting profitability and competitiveness by making old and new buildings more sustainable.

Building a Way Around Carbon

Reducing the carbon associated with building construction is an emerging area for innovation discovery among PropTech companies and material manufacturers.

An Unsolved Housing Crisis

Housing affordability remains a major challenge in communities across the country with concerns about pricing people out of major metro areas.

Finding Carrots, Avoiding Sticks

With looming decarbonization deadlines and new reporting requirements for buildings, their investors and tenants, commitments have turned into action plans.

Red Carpet Treatment for Green Financing

Canadian banks and investors are rewarding real estate companies and PropTech startups alike with earmarked dollars and preferential financing.

Talent Reshuffling

As legacy industries like oil and gas start to phase out, it will be important to repurpose the people who will be affected into other, similar industries like clean energy.

No End in Sight

Both the political and cultural will of Canada is becoming more focused on sustainability and it doesn't look like it will slow down any time soon.

ACKNOWLEDGEMENTS

This report would not have been possible without the financial support and contributions of time and expertise from our founding sponsors. We are proud and grateful for their continuing support to allow us to create the most comprehensive report on the Sustainable PropTech market in Canada.

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worsley urban

Osgoode PROPERTIES

NATIONAL HOMES You are the blueprint

MNP

RGC

Venturon REAL ESTATE RETHINK

Thank you to the thought leaders, founders, real estate companies, banks, investors, consultants, and many others who have contributed to this report. A special thanks to Venturon and McOuat for their vision, insights and countless hours putting this report together.

We did our best to include all of the exciting Canadian startups innovating in the sustainable PropTech space. If we left any out, please feel free to contact us at **hello@sustainableproptech.com.**

APPENDIX A

Table of companies included on the 2023 Canadian Sustainable PropTech Map.

Logo	Company Name	Category	Description	Website	Year Founded
adaptis	Adaptis	Analytics/Research	Carbon accounting and reduction for existing buildings.	www.adaptis.ca	2018
Audette	Audette	Analytics/Research	Carbon planning for commercial real estate portfolios.	www.audette.io	2019
BUILTSPACE	BuiltSpace Technologies Corp.	Analytics/Research	Emissions reporting software.	www.builtspace.com	2011
carbonhound	Carbonhound	Analytics/Research	Carbon management tools.	www.carbonhound.com	2021
climative	Climative	Analytics/Research	Energy management platform.	www.climative.ai	2014
clir	Clir	Analytics/Research	Renewable energy analytics.	www.clir.eco	2017
ECOSPEX	EcoSpex Inc	Analytics/Research	An online SAAS platform connecting manufacturers to professionals looking for verified sustainable materials and clean tech.	www.ecospex.com	2014
energyX	EnergyX Solutions	Analytics/Research	Energy efficiency software for utilities and governments.	www.energyxsolutions.com	2016
∮	Fractalytic	Analytics/Research	Carbon metering software.	www.fractalytic.com	2022
MANIFEST CLIMATE	Manifest Climate	Analytics/Research	Climate change focused risk management software.	www.wanifestclimate.com	2015
novisto	Novisto	Analytics/Research	Corporate sustainability management platform.	www.novisto.com	2019
RATIO.CITY	Ratio.city	Analytics/Research	Land acquisition analytics.	www.ratio.city	2017
Refined Data	Refined Data	Analytics/Research	Investor reporting software.	www.refineddata.com	2007
riskthinking.AI	Risk Thinking	Analytics/Research	Climate change focused risks management software.	www.riskthinking.ai	2019
SAMETRICA	SAMETRICA	Analytics/Research	ESG reporting software.	www.sametrica.com	2011
15ROCK	15Rock	Analytics/Research	Climate risk analysis and reporting.	www.15rock.com	2020
airsset	Airsset	Asset Management	Indoor air quality monitoring, insights, and reporting.	www.airsset.com	2018
BKRENERGY	BKR Energy	Asset Management	Smart HVAC technology.	www.bkrenergy.ca	
BRAINBOX AI	BrainboxAI	Asset Management	HVAC and energy management technology.	www.brainboxai.com	2017

Logo	Company Name	Category	Description	Website	Year Founded
	Carbin X	Asset Management	Small-scale carbon capture device.	www.carbinx.com	2013
	Circuitmeter	Asset Management	Energy management and submetering.	www.circuitmeter.com	2009
	Cleanair.AI	Asset Management	Indoor air quality.	www.cleanair.ai	2017
	Connected Sensors	Asset Management	Water management solutions.	www.Connectedsensors.com	2019
	Dcbel	Asset Management	Solar energy solution.	www.dcbel.energy	2015
	EAIGLE	Asset Management	Computer vision analytics.	www.eaigle.com	2018
	Ecobee	Asset Management	Energy management hardware and software.	www.ecobee.com	2007
	Ecopilot	Asset Management	HVAC and energy management technology.	www.ecopilotai.com	2008
	Eddy Solutions	Asset Management	Smart water metering technology.	www.eddysolutions.com	2015
	ElectroMotion Energy	Asset Management	HVAC and energy management technology.	www.electromotionenergy.com	2009
	Encycle	Asset Management	Efficiency software for commercial HVAC systems.	*www.encycle.com*	2005
	Enersion	Asset Management	Air conditioning technology.	www.enersion.com	2016
	Haven IAQ	Asset Management	Indoor air quality technology.	www.haveniaq.com	2013
	Koben Systems (Genius)	Asset Management	Smart home technology.	www.kobensystems.com/genius/	2009
	Kontrol Technologies	Asset Management	Energy management and air quality technology.	www.kontrolcorp.com	2016
	Legend Power Systems	Asset Management	Energy management technology.	www.legendpower.com	2007
	Levven	Asset Management	Technology and products that make intelligent buildings available to everyone.	www.levven.com	2011
	LightSpark Software Inc.	Asset Management	Energy efficiency management software.	www.lightspark.energy	2017
	Mysa	Asset Management	Energy management hardware and software.	www.getmysa.com	2016

06

Logo	Company Name	Category	Description	Website	Year Founded
	Nowa 360	Asset Management	Sewage backup detection and prevention.	www.nowa360.com	2010
	Oxygen8	Asset Management	Low energy air filtration.	www.oxygen8.ca	2019
	Parity	Asset Management	Energy management soft-ware.	www.paritygo.com	2016
	Poppy	Asset Management	Indoor air quality technology.	www.poppy.com	2019
	QEA Tech	Asset Management	Energy auditing platform.	www.qeatech.com	2018
	RYSE	Asset Management	Smart window covering technology.	www.helloryse.com	2015
	SensorSuite	Asset Management	Building management and automation software.	www.sensorsuite.com	2013
	Sinope	Asset Management	Smart home technology.	www.sinopetech.com	2010
	XNRGY Climate Systems	Asset Management	Energy efficient air handlers.	www.xnrgy.com	2017
	Alveole	Smart Cities	Bee friendly services.	www.alveole.buzz	2014
	AMP Energy	Smart Cities	Smart gird and clean energy technology.	www.amp.energy	2009
	Asset Market	Smart Cities	A platform to accelerate the delivery of smart and connected services.	www.asset-market.com	2020
	Biocrude Technologies	Smart Cities	Waste management and renewable energy technology.	www.biocrudetech.com	2007
	Bolt Logistics	Smart Cities	Last mile e-commerce delivery platform.	www.gobolt.com	2016
	Carbon Neutral Club	Smart Cities	Meet climate targets by turning your workforce into a climate movement.	www.carbonneutralclub.com	2021
	ChargeLab	Smart Cities	Electric vehicle charging solutions.	www.chargelab.co	2015
	CurbIQ	Smart Cities	Curb intelligence to improve operations in cities.	www.curbiq.io	2020
	Diverso Energy	Smart Cities	Geothermal technology for buildings.	www.diversoenergy.com	2014
	eCAMION Inc	Smart Cities	Energy storage and management technology.	www.ecamion.com	2009
	eLeapPower	Smart Cities	Powertrain technology opti-mizes battery performance and charging time.	www.eleappower.com	2016

Logo	Company Name	Category	Description	Website	Year Founded
	Enpowered	Smart Cities	Energy management technology.	www.getenpowered.com	2015
	Envision SQ Inc.	Smart Cities	Indoor air quality technology.	www.envisionsq.com	2014
	Green Standards	Smart Cities	Redistributor of office surplus, including furniture, fixtures, supplies, and IT equipment.	www.greenstandardsltd.com	2009
	HydroStor	Smart Cities	Energy storage technology.	www.hydrostor.ca	2010
	Hyperion Global Energy	Smart Cities	Carbon capture technology.	www.hyperionenergy.ca	2018
	Kanin Energy	Smart Cities	Waste head recapture technology.	www.kaninenergy.com	2020
	Kite Mobility	Smart Cities	Mobility services for buildings.	www.kitemobility.io	2020
	Mint Green	Smart Cities	Cryptocurrency mining heat recovery technology.	www.mintgreen.co	2017
	MyHeat	Smart Cities	Heat loss mapping technology.	www.myheat.ca	2014
	Nectar	Smart Cities	Electric vehicle charging with no infrastructure costs.	www.getnectar.io	2022
	Peakpower	Smart Cities	Energy management and storage.	www.peakpowerenergy.com	2015
	Portable Electric	Smart Cities	Renewable energy semiconductor manufacturing.	www.portable-electric.com	2015
	Recycle Smart	Smart Cities	Waste and recycling program provider.	www.Recycle-smart.com	2008
	Subterra Renewables	Smart Cities	Geothermal and heat recovery technology.	www.subterrarenewables.com	2017
	Swtch	Smart Cities	Electric vehicle charging facilities provider.	www.swtchenergy.com	2016
	ThoughtWire	Smart Cities	Smart building IoT technology.	www.thoughtwire.com	2009
	UgoWork	Smart Cities	Lithium ion batteries for industrial forklifts.	www.ugowork.com	2015
	UnicoPower	Smart Cities	Electric vehicle charging solution.	www.unicopower.com	2017

06

Logo	Company Name	Category	Description	Website	Year Founded
	3ENano	Sustainable Construction	Solar glass coatings.	www.3enano.com	2015
	Batitech	Sustainable Construction	Prefabricated builders of houses and commercial buildings.	www.batitech.ca	2006
	Bondi Energy	Sustainable Construction	Heat pump retrofit services.	www.bondicorp.com	2019
	Built Prefab	Sustainable Construction	Prefabricated construction service.	www.builtprefab.com	2019
	BONE Structure	Sustainable Construction	Structural steel for Net-Zero building.	www.bonestructure.ca	2005
	Carbicrete	Sustainable Construction	Carbon negative concrete.	www.carbicrete.com	2016
	Carbon Upcycling	Sustainable Construction	Carbon capture technology.	www.carbonupcycling.com	2014
	CarbonCure Technologies	Sustainable Construction	Low-carbon concrete.	www.carboncure.com	2007
	Cascadia Windows	Sustainable Construction	Energy efficient sustainable windows.	www.cascadiawindows.com	2008
	Cense	Sustainable Construction	Smart building software.	www.cencepower.com	2015
	DIRTT	Sustainable Construction	Sustainable interior construction technology.	www.dirtt.com	2005
	Element5	Sustainable Construction	Mass timber building materials and services.	www.elementfive.co	2015
	ErgoSun	Sustainable Construction	Photovoltaic concrete roof tile.	www.solarmassenergy.com	2017
	Evercloak	Sustainable Construction	Smart nano-film technology.	www.evercloak.com	2018
	EVOpaint	Sustainable Construction	Advance paint manufacturer.	www.evopaints.com	2013
	Falkbuilt	Sustainable Construction	Efficient interior construction technology.	www.falkbuilt.com	2019
	Giatec	Sustainable Construction	Smart concrete testing technology.	www.giatecscientific.com	2010
	GreenMantra Recycling Technologies Ltd	Sustainable Construction	Asphalt alternative.	www.greenmantra.com	2010
	Intelligent City	Sustainable Construction	Mass timber building technology.	www.intelligent-city.com	2008
	Miru Technologies	Sustainable Construction	Smart window technology.	www.mirucorp.com	2012
	Mitrex	Sustainable Construction	Solar energy solution.	www.mitrex.com	2019

Logo	Company Name	Category	Description	Website	Year Founded
morgansolar	Morgan Solar	Sustainable Construction	Solar energy solution.	www.morgansolar.com	2007
	New Earth Solutions	Sustainable Construction	Living wall technology.	www.newearthsolutions.ca	2002
NEXII	Nexii Building Solutions	Sustainable Construction	Green construction technology.	www.nexii.com	2018
nidus3D	Nidus3D	Sustainable Construction	3D printing with concrete.	www.nidus3d.com	2021
NOMODIC	Nomodic	Sustainable Construction	Modular and prefabricated construction.	www.nomodic.com	2012
PANERGY	Panergy	Sustainable Construction	Prefabricated building tech-nology.	www.panergy.ca	2018
PLAEX	PLAEX Building Systems Inc.	Sustainable Construction	Recycled building material technology.	www.plaex.ca	2020
Promise Robotics	Promise Robotics Inc	Sustainable Construction	Construction automation technology.	www.promiserobotics.com	2020
QUBE	QUBE Building Systems	Sustainable Construction	Modular building material technology.	www.qubebuildings.com	2009
RAINSTICK	Rainstick	Sustainable Construction	Low flow shower products.	www.rainstickshower.com	2019
RGC ENERGY	RGC Energy Inc.	Sustainable Construction	Solar solutions provider.	www.rgcenergy.com	2021
R-Hauz	R-Hauz Solutions Inc.	Sustainable Construction	Prefabricated construction technology.	www.r-hauz.ca	2017
rise	Rise Home Design	Sustainable Construction	Sustainable home improvement store.	www.buildwithrise.com	2015
smarteralloys	Smarter Alloys	Sustainable Construction	Smart materials producer.	www.smarteralloys.com	2010
trusscore	Trusscore	Sustainable Construction	PVC-based wall and ceiling panels.	www.trusscore.com	2007
unitiwall	UnitiWall Corporation	Sustainable Construction	Panelized high rise construction.	www.unitiwall.com	2021
upbrella	Upbrella	Sustainable Construction	Sheltered high-rise construction.	www.upbrella.com	2010
VERO	VERO Solutions Inc.	Sustainable Construction	Modular construction tech-nology.	www.buildvero.com	2018
ZS2 technologies	ZS2 Technologies	Sustainable Construction	Advanced building technologies.	www.zs2technologies.com	2020

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