RSI
RETHINK
SUSTAINABILITY

SUMMARY REPORT | 2024

The Future of Climate & Energy

EXPLORE. LEARN. RETHINK. ACT.

Rethink Sustainability Initiatives (RSI), the publisher of this report, is a trusted accelerator that employs foresight, collaboration, and systems thinking to shape a thriving future. The event upon which this report is based supports our mission to bring together leaders, experts, and communities to discover and implement scalable sustainability and resiliency solutions.

> **Every tonne that you prevent going in the atmosphere is a lottery ticket that decreases the probability of us tipping into a very unstable state because, at some point, the feedback loops are going to take over.**

— Tom Rand

Report Team

Chief Strategist:
Yasmin Glanville

Writers:
Leor Rothchild
David Gargaro

Designers:
Lisa Killin
Jennifer Yim

Contributors:
Sophie Meslin
Eliza Van Weerhuizen
Michelle Yip

Table of Contents

Part I
SETTING THE STAGE: A FUTURE FORWARD PATH..... 4
Part II
CONNECTING THE DOTS - BUILDINGS, CLIMATE, ENERGY..... 9
Part III
ACCELERATED PATHS TO NET-ZERO CARBON BUILDINGS & ENERGY..... 12
Part IV
KEYNOTE – CLIMATE ECONOMICS AND DECARBONIZATION..... 28
Part V
ENERGY TRANSITION FOR EQUITY PROTECTION..... 33
Part VI
BRINGING IT TOGETHER – KEY INSIGHTS FOR ACTION..... 35
Part VII
SPOTLIGHT SOLUTIONS..... 39
Part VIII
RSI FUTURES ACTION PARTNERS & SPONSORS.....57
Part IX
VISUAL HIGHLIGHTS.....58

Part I

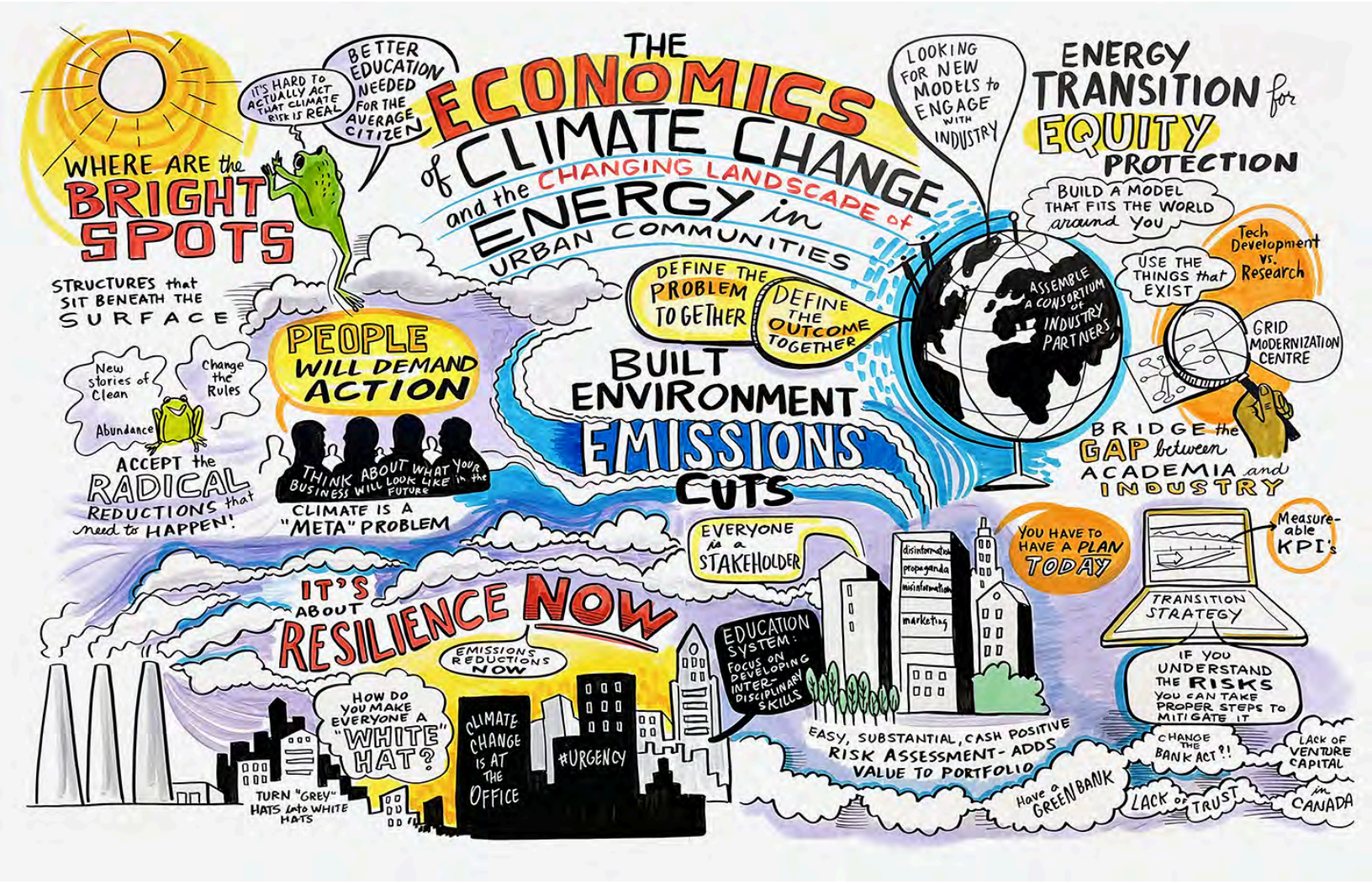
SETTING THE STAGE: A FUTURE FORWARD PATH

On March 20, 2024, RSI held its second event in the 2024 Futures Action series—The Future of Climate & Energy—hosted by TELUS at 25 York Street in Toronto.

More than 110 industry-recognized leaders and experts from across multiple sectors and disciplines participated in the discovery and rethinking of what is possible while sharing ways to act now. The participants included commercial-residential and institutional real estate developers, operators, and REITS; industry leaders and experts in energy generation and distribution, climate change, infrastructure risk mitigation, and district energy; and a diverse collection of Cleantech and Smarttech entrepreneurs and collaborators.

The Future of Climate & Energy event was made available online as a livestream and held in person at the TELUS Harbour, an impressive 30-storey office skyscraper, designed by Sweeny&Co. Architects in collaboration with Adamson Associates Architects.

Throughout the event, Lissa Sorsa, a graphical animation artist from Thinklink Graphics, captured the key concepts of the conversation in illustrations as they unfolded.


THE ECONOMICS of CLIMATE CHANGE and the CHANGING LANDSCAPE of ENERGY in URBAN COMMUNITIES
WHERE ARE the BRIGHT SPOTS
STRUCTURES that SIT BENEATH THE SURFACE
IT'S HARD TO ACTUALLY ACT THAT CLIMATE RISK IS REAL
BETTER EDUCATION NEEDED FOR THE AVERAGE CITIZEN
LOOKING FOR NEW MODELS to ENGAGE WITH INDUSTRY
ENERGY TRANSITION for EQUITY PROTECTION
BUILD A MODEL THAT FITS THE WORLD around YOU
DEFINE THE PROBLEM TOGETHER
DEFINE THE OUTCOME TOGETHER
ASSEMBLE A CONSORTIUM of INDUSTRY PARTNERS
USE THE THINGS that EXIST
Tech Development vs. Research
GRID MODERNIZATION CENTRE
BRIDGE the GAP between ACADEMIA and INDUSTRY
PEOPLE WILL DEMAND ACTION
New stories of Clean Abundance
Change the Rules
ACCEPT the RADICAL REDUCTIONS that need to HAPPEN!
THINK ABOUT WHAT YOUR BUSINESS WILL LOOK LIKE in the FUTURE
CLIMATE IS A "META" PROBLEM
BUILT ENVIRONMENT EMISSIONS CUTS
EVERYONE is a STAKEHOLDER
YOU HAVE TO HAVE A PLAN TODAY
Measure-able KPI's
TRANSITION STRATEGY
IF YOU UNDERSTAND THE RISKS YOU CAN TAKE PROPER STEPS TO MITIGATE IT
IT'S ABOUT RESILIENCE NOW
EMISSIONS REDUCTIONS NOW
EDUCATION SYSTEM: FOCUS ON DEVELOPING INTER-DISCIPLINARY SKILLS
disinformation
propaganda
misinformation
marketing
HOW DO YOU MAKE EVERYONE A "WHITE" HAT?
TURN "GREY" HATS into WHITE HATS
CLIMATE CHANGE IS AT THE OFFICE
#URGENCY
EASY, SUBSTANTIAL, CASH POSITIVE RISK ASSESSMENT- ADDS VALUE TO PORTFOLIO
CHANGE THE BANK ACT?!
LACK OF VENTURE CAPITAL in CANADA
Have a GREEN BANK
LACK of TRUST

Darla Campbell, Associate, Sustainability and Asset Management at Dillon Consulting and an RSI Board Director, was the event facilitator. Peter Henderson, President and CXO at Ideovation, was the Master of Ceremonies for the event. He opened with an interesting exercise that helped to identify which industries were represented in the room through a show of hands. Henderson then informed the audience that, as they raise their hands, they are expending about one joule of energy to do so. He asked the crowd, "How many joules are there in a barrel of oil?" The answer was 6.3 billion.

Catalyzed by a stellar group of expert speakers, The Future of Climate & Energy event topics included the decentralization of energy, energy efficiency, the need to better incorporate sustainability into education, public awareness and communication, financing, public-private partnerships, and interdisciplinary collaborations. The discussions also touched on regulatory and policy hurdles to accelerate the progress toward net zero.

The Futures Action Initiative

RSI created The Futures Action Initiative to enhance leaders' ability to understand, prepare for, and mobilize actions to address the challenges of disruptions that impact the future sustainability and resilience of their organizations and communities. It began with an investigative article published in 2023, Reimagining the Future of Buildings and Work, which provides an overview of converging trends and issues reshaping the future of buildings, organizations, and the "new normal" for the modern workforce. It also explores how leaders and innovators harness the power of adaptability, mitigation, and innovation, and use the tools of futures thinking to design the buildings, communities, and workplaces of tomorrow.

Opening Remarks by Mary Verissimo, Director of Real Estate Services, TELUS

> **We enabled this energy program, including our real estate optimization program, with a mantra of better space but less of it.**
>
> — Mary Verissimo

Mary Verissimo spoke about TELUS' climate goals starting from 2010 and their progress. TELUS made significant strides in reducing emissions and energy usage. She stated the key strategies and technologies that enabled TELUS to surpass its 2011 goals. These emission reductions occurred during exponential growth.

In 2011, TELUS set the goals to reduce scope 1 emissions by 10% and scope 2 by 25%. TELUS surpassed this goal in 2019. TELUS has set the goal to become net carbon neutral by 2030 from a 2019 baseline.

In 2021, TELUS' climate goals were approved by the Science Based Targets initiative (SBTi). TELUS has been leading the Sustainability-Linked Bond Framework and has issued six such bonds to date.

Key strategies that enabled TELUS to surpass its goals

TELUS executed four Virtual Power Purchase Agreements (VPPAs) with three different developers/operators in Alberta, the most of any company in Canada. As a result of these agreements, a capacity of 167 GW of renewable electricity, sourced from both solar and wind, is being added to Alberta's electricity grid annually. TELUS owns the Renewable Energy Certificates associated with this renewable electricity generation and retires these certificates to offset its scope 2 emissions in the province, helping the company to achieve its current science-based climate goals.

Based on this experience, TELUS has also deployed on-site solar at several buildings and cell towers, helping in part to provide primary or backup power to its facilities. At TELUS Spark Calgary, the rooftop solar installation provides 25% of the building's electricity needs.

TELUS encourages its partners to identify and implement energy efficiency and optimization opportunities across its operations and in its value chain. These initiatives help reduce environmental impacts and often result in both financial and brand benefits. Additionally, organizations focused on these environmental issues often realize advantages in attracting and retaining top talent while also reducing climate-related and other risks.

Part II

CONNECTING THE DOTS - BUILDINGS, CLIMATE, ENERGY

Recap of The Future of Buildings & Built Environment and Connection with The Future of Climate & Energy

Dermot Sweeny and Yasmin Glanville provided a summary of the key takeaways from The Future of Buildings & Built Environment event on February 15 and how those points connect to The Future of Climate & Energy event on March 20 and a net-zero carbon future.

Speakers

Dermot Sweeny
Architect, Founder, President
Sweeny&Co Architects Inc.

Yasmin Glanville
CEO & Chief Strategist, CTR Inc.
RSI Founder, Board Director

Key Insights

Innovative building design and energy efficiency: The TELUS building, designed by Sweeny&Co, exemplifies a shift toward highly energy-efficient construction. The building uses nearly 50% less energy than would be consumed by a conventional office building, making it one of the most energy-efficient buildings in North America and a significant achievement toward sustainable building practices.

> **The overall philosophy of the TELUS building design points towards a future where buildings consume the least parcel of land and the most efficient energy and resources. The design supports sustainable living as well as ecological efficiency.**
>
> — Dermot Sweeny

Sustainable and integrated living ecosystems: Buildings and communities should be envisioned as integrated living ecosystems, sharing produced energy and advancing toward net-zero carbon through innovative construction materials and energy recapture technologies. Industry collaboration, knowledge sharing, and adoption of interdisciplinary approaches can help to fast-track sustainability efforts.

Urban planning and community development: The concept of "return to the village" focuses on creating denser, car-independent communities centred around public transit. This approach aims to reduce land use and encourage a community-focused lifestyle. The discussion advocated for

rethinking urban planning regulations to promote higher neighbourhood densities and eliminate car dependency, taking inspiration from successful laws like Toronto's "King's By-Laws."

Health, sustainability, and technology: The relationship between energy production, consumption, and human health is underscored, promoting sustainability as a path to health. More support is needed for smart technology in communities to enhance sustainability and occupant well-being, as well as identify solutions to the challenge of funding and the brain drain in Canada.

Lack of long-term strategies: The dominant short-term mindset evidenced by many CEOs' focus on quarterly return on investments does not yield long-term results. This emphasis overlooks the benefits of more integrated forward-thinking strategies and implementation.

Leadership communication and green initiatives: Green leadership and effective communication about sustainability achievements are essential to combat greenwashing and short-termism in corporate strategies.

The role of insurance: Insurance companies focus on long-term energy cost reduction and risk mitigation related to human health and safety.

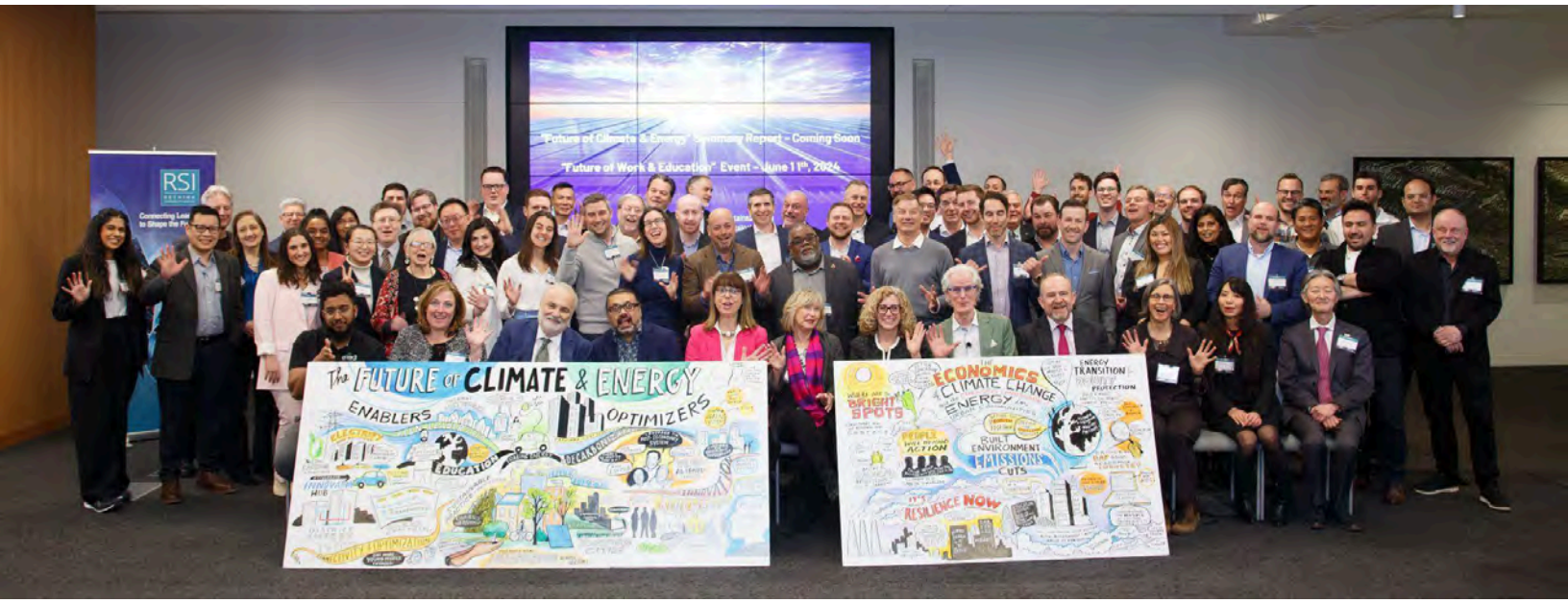
Affordable housing: Sweeny highlighted the need for increased volume and learning from international examples to tackle the housing crisis. Glanville added there is a need to rethink "housing" more holistically, as parts of integrated work-learn-live ecosystems that build on existing infrastructures, and to work with purpose-aligned partners and community stakeholders.

Call for a paradigm shift: Both Sweeny and Glanville called for a shift from short-term thinking to long-term solutions. This requires adopting interdisciplinary and multi-sectoral approaches to implement long-term systemic solutions.

Part III

ACCELERATED PATHS TO NET-ZERO CARBON BUILDINGS & ENERGY

A Path Forward to a Net-Zero Carbon Future in the Built Environment – Roundtable and Open Forum



The roundtable discussion focused on charting bold ideas that can help the buildings industry on its path to a net-zero carbon future. To deepen the applicability of the different solution perspectives, the roundtable was organized into two rounds: Enablers and Optimizers in the net-zero carbon buildings and energy transition movement. All the participants also came together in a dynamic open forum conversation.

Round 1: Enablers

Julia McNally
Director, Climate Action Toronto Hydro

Jonathan Westeinde
CEO, Windmill Developments

Michael Conte
Engineering Manager, FVB Energy

Mark Rabin
Founder and Board Director, Portable Electric

Peter Love
Moderator
President, Love Energy Consultants

> **We need to keep pace. Our system is in good shape now but as the energy transition moves forward, we're going to have to keep investing in our system – both modernizing it so we can optimize existing infrastructure but also growing it. So we've recently filed a rate case with the Ontario Energy Board and that's our ask: allow us to keep investing in the system.**
>
> — Julia McNally

Electrification and renewable energy: McNally introduced a bold vision to electrify all things possible, including buildings, heating, hot water, and vehicles both at work and at home. Through Toronto Hydro's new Climate Action Team, the organization is committed to aiding the city's electrification journey, and is ready for all the electrification projects that building owners and managers are contemplating. While Toronto Hydro does not currently have incentive funds, it is sharing information, linking Cleantech providers with customers, and helping developers and investors navigate Toronto Hydro's processes. McNally also emphasized the need for investment in the system's modernization and growth to support electrification and renewable energy integration.

Utility of the Future

Toronto Hydro's plan for evolving into the super-utility of tomorrow

Toronto is experiencing tremendous growth. As the city's population continues to increase and we work to grow green together, electrification will intensify. Toronto Hydro's future strategy is guided by questions such as: How will this increased electrification be delivered? And by whom?

Our grid is optimized to play a key role as the organization transitions into the utility of the future. Smart technologies are rolled out across the city, enabling an intelligent grid. Toronto Hydro is poised to further modernize service for its customers and support an increasingly interconnected future. While it continues to focus on its core utility work, Toronto Hydro is also excited to prepare for big changes to come in the electricity sector.

Strategic priorities

To become the super-utility of tomorrow, Toronto Hydro is evolving the way it serves its customers and keeps the lights on. This transformation will be anchored by the following six strategic priorities:

Intelligent grid: Grid automation and modernization investments are aiding the transition to an artificially intelligent system that detects and self-heals before problems occur. Market-enabling investments will help the utility to prepare for a range of possible futures.

Energy storage: Energy storage is rapidly becoming more affordable and can help Toronto Hydro and its customers manage an increasingly dynamic electricity supply/demand environment.

Transportation electrification: Vehicles are becoming increasingly electric. Toronto Hydro plays an important role as partner and enabler in supporting this shift.

Customer experience: Innovative communication tools like live chat allow customers to reach the utility directly. Enhanced services are planned to meet the unique needs of large commercial and industrial customers.

Process automation: By investing in and leveraging automation technologies, Toronto Hydro has the opportunity to realize economic benefits and improve the customer experience through greater reliability, productivity, and cost control.

Business growth: Toronto is growing and Toronto Hydro continues to find ways to effectively leverage this expansion to stimulate business growth in the form of new customers, buildings, and infrastructure.

Barriers to net zero and solutions: An event attendee, David Katz, Board Chair at Ontario Sustainable Energy Association, reinforced the challenge of making buildings net zero due to infrastructure limitations. Toronto Hydro is building out its electrical grid capacity, but localized capacity can still be challenging. This opened the panel discussion toward solutions such as enabling buildings to use or connect to renewable energy sources.

Policy, innovation, and bureaucracy: Concerns over bureaucratic hurdles in obtaining building permits and the broader need for policy and bureaucratic reform to facilitate innovation and pilot projects were cited as solvable barriers. This reinforced the call for rethinking the hurdles as parts of a broader systemic problem. There is also the need to translate the “systemic problem” into a fundable transformational opportunity, such as an Integrated Climate and Cleantech Innovation Hub or a Sustainable Solution Development Pilot, in partnership with key stakeholders who are motivated to invest in its success.

Gap between policy announcements and on-the-ground action: To meet Canada’s net-zero targets, municipalities need greater alignment or coordination across federal and provincial lines. There is also a need for intergovernmental alignment, collaborative consultations, and public-private partnerships with on-the-ground implementers of GHG emission reduction products and services. Working together—rather than in silos—is essential for translating "policy announcements into energy reduction actions at scale.”

In a study of municipal climate change plans in 63 of the most populous communities across Canada, it was found that plan implementation, as well as monitoring and evaluation, were the weakest aspects of most plans; many of the largest cities' plans shared this deficiency. Plans generally fail to articulate clear adaptation goals, contain only a reasonably strong fact base, and reflect poor stakeholder engagement. The qualitative analysis revealed three key findings that are important for policy and practice:

1. Canadian municipal climate change plans prioritize mitigation over adaptation.
2. Implementation, monitoring, and evaluation are aspects of municipal climate change plans that require improvement.
3. Despite the importance that scholars and practitioners ascribe to stakeholder engagement, Canadian municipalities appear to have given insufficient consideration to this element of the climate change plan-making process.

Source*: Guyadeen, D., Thistlethwaite, J. & Henstra, D.* ***Evaluating the quality of municipal climate change plans in Canada. Climatic Change 152****, 121–143 (2019).*

District energy: Conte discussed district energy as a critical solution for energy sharing. He emphasized the potential to unlock greater efficiencies by centralizing thermal energy to ease the load on the electrical grid and the importance of ensuring sufficient electrical capacity for district heating systems, particularly as industrial heat pumps replace the use of large natural gas boilers in these systems. Many Canadian district energy providers, such as Creative Energy in Vancouver and Enwave in Toronto, are making big investments to decarbonize the source of their district heating systems. The TELUS building's connection to Enwave's district energy system is one successful example of how district systems can facilitate reduced consumption through community-scale low carbon technologies.

Goal posts, piloting, and technology integration: Rabin stressed the need for stable goal posts and an innovative ecosystem framework to test, trial, and tweak solutions. He provided an anecdote with respect to his company Portable Electric, which conducted several pilot projects in the U.S. American investors asked why the company did not have any public procurement projects in Canada. They had to explain that it was rare for Cleantech manufacturers to secure such contracts in Canada. Rabin cited positive examples, such as Project Greenlight by the Vancouver Economic Commission and the Green Market Acceleration Program in Toronto. These programs provided vertical integration from federal and provincial funding through to accelerators, private enterprise, and innovators. Mark noted, "Innovators are comfortable to take on risk but we need to know that there's a supportive ecosystem behind us throughout all stages of development, piloting, and rollout."

More broadly, smart technology integration into homes was acknowledged as a proven and measurable enabler to reduce energy waste and increase profitability.

Climate equity: The domino effect of global geopolitical disruptions is negatively impacting vulnerable populations and supply chains, as well as our ability to achieve net-zero carbon targets.

What is climate equity?

"Climate equity is the principle that each individual—regardless of gender, race, ethnicity, income, and other characteristics—should benefit from a clean environment and have access to the resources and opportunities they need to protect themselves from the impacts of climate change."

Source: *Achieving climate equity in Canada | Deloitte Canada*

Round I: Key Insights

Electrification, renewable energy, and energy decentralization through district energy were addressed. Overcoming bureaucratic and regulatory barriers was also discussed as crucial for fostering innovation and piloting new sustainable development solutions.

Westeinde highlighted his company's work on a visionary project in Ottawa known as Zibi, an integrated community of nearly eight acres of riverfront green spaces. It aims to be home to more than 5,000 people, more than 6,000 jobs, and Canada's most sustainable neighbourhood. Thermal electricity is in development in partnership with Ottawa Hydro for the new community.

> **I don't think technology is the challenge. It is the connectivity, the policies, the frameworks that enable those technologies to actually come in. It's a complex system. They're all interconnected and so everything needs to be interconnected and be optimized.**
>
> — Roundtable participant commenting on his experience

Round 2: Optimizers

Herb Sinnock
Director Sustainability,
Sheridan College

Graeme Doyle
National Director,
Building Operations
First Capital REIT

Chun Liang
Founder, Tree House
Energy Services

Bala Gnanam
VP Sustainability,
Stakeholder Relations,
BOMA Canada

Peter Love
Moderator
President, Love Energy Consul

> **We're in the business of a transformation right now. We can no longer nibble at the edges of decarbonization when we look at the scale of what we've got to do, when we look at the time frame in which we have to do it. So this requires bold, transformational work on all our parts.**
>
> — Herb Sinnock

Decarbonization and energy efficiency: Doyle discussed the need for a simple, scalable solution for deploying decarbonized heating to smaller properties, acknowledging the current lack of trades for installing renewable infrastructure and the pilot phase limitations of certain solutions. Previous versions of heat pump technologies did not deliver on performance and longevity. Liang also identified the need to engage end-users of the buildings in the decarbonization journey.

Education and sustainability: Sinnock emphasized the need to accelerate sustainability engagement in post-secondary institutions, suggesting that curriculum changes are necessary to create leaders who embrace sustainability. Gnanam pointed out that retrofit research and development should be integrated into the education system from grade one to post-secondary curriculum.

A **three-part solution** is required to catalyze and accelerate transitions:

1. **Enlist our academic institutions as lived examples.** Academic institutions are community-like, but smaller than a community, with more concentrated decision-making authority.

2. **Leverage town relationships to define and shape the community decarbonization roadmap.** This involves all community stakeholders, not just the municipality. Academic institutions are trusted partners, and trust is critical to getting various stakeholders around the table.

3. **Broad-based education goes well beyond just educating on technology, but takes a comprehensive view of the transformation challenge.** Our challenge goes beyond "heat pumps 101." These transformational changes are complex and multi-faceted; our communities need to understand the financial, governance, and policy issues just as much as the technological ones.

The wide gap between industry and academia: The lack of substantive partnerships between industry and academia is perceived as detrimental to climate action. We require an actionable opportunity that would be mutually beneficial to all parties and their collective ecosystems.

Private sector partnership: McNally highlighted the importance of higher education partnering with the private sector and hiring students whose values align with sustainability initiatives, addressing the ethical dilemma of sustainability in business practices.

Utilization of electrons: Liang and others emphasized the importance of optimizing and making better use of *electrons*, suggesting a redesign of heating and cooling systems and engaging end-users more effectively in the sustainability conversation. Love noted that we cannot get to net-zero carbon using only energy efficiency. "We need to look beyond energy efficiency such as building design," Sinnock added.

Climate anxiety: Sinnock observed a rise in climate anxiety experienced by younger generations. He cited a recent study by Sheraton College that shows the current student population expresses a sense of betrayal that these issues have not been taken seriously, yet maintained a note of optimism. Despite being sad, angry, and feeling disenfranchised, our youth remain optimistic that we can get on a path to a better future. They wish to be fully informed with both the good and the bad of climate change, meaningfully engaged in developing solutions, and put to work. By doing so, we not only engage a highly motivated and highly impacted segment of our population, but we can also help alleviate their anxiety and contribute to their positive mental health.

Challenges with government funding: Liang shared the difficulties in obtaining government funding for carbon-neutral studies, suggesting that faster and more efficient funding mechanisms are needed to advance sustainability projects.

Innovation and optimization: The role of innovation and optimization is critical for achieving sustainability goals, with a call for a significant shift in how education from grade one through post-secondary incorporates sustainability into the curriculum.

Balancing green with resilience: Asset owners can balance green initiatives with building resilience, with insights into how green buildings enable resilience rather than being separate or opposing considerations. Gnanam underscored the need to integrate resilient risk assessment as a part of broader enterprise risk assessment.

Real-time energy monitoring: The effectiveness of real-time energy monitoring in reducing consumption was mentioned, highlighting success stories from Denmark and the potential for similar initiatives to make a significant impact.

The bureaucracy gap: Bureaucratic obstacles underline the gap between policy announcements and meaningful implementation. Policy headlines have not always resulted in "boots-on-the-ground" action.

Embracing change: Achieving a zero-risk situation is not the determining factor for solution implementation. Leaders and ambassadors with determination and climate solutions should be given space to lead us to our collective climate targets. This is the mindset we need to apply and nurture in the ecosystem.

Fuel switching and hybrid solutions: The timing and strategy behind fuel switching was discussed, with a consensus that hybrid solutions are transitional and that achieving net-zero goals requires moving beyond combustion-based energy sources.

Messaging and mainstream awareness: There is a need for clearer messaging on climate action and the benefits of programs like the carbon tax, with an emphasis on mainstreaming climate change literacy to overcome misinformation and apathy.

Round 2: Key Insights

Optimizers underscored the importance of education, communication, and technological barriers, as well as a multi-faceted and community-based approach toward green buildings.

Electrification: McNally stated that everyone should move toward electrifying their homes and offices, as well as investing in electric vehicles (EVs), as Toronto Hydro has the capacity to provide the required power to support the move to electrification.

Renewing building systems: Liang emphasized that building owners need to do more than upgrading the envelope, which has a very long time to pay out due to the high upfront cost. Other solutions will produce more significant results, such as redesigning the heating and cooling systems.

Solutions for smaller buildings: Doyle wanted to see more solutions for smaller buildings, as it's often challenging to convince these building owners to invest in major retrofits. Optimizing a group of smaller buildings can have significant results.

Climate anxiety: Sinnock said that students are angry about the current state of the climate and environment. However, they are optimistic that significant change can happen through collaborative innovation and effort.

Key Takeaways: Open Forum Enablers & Optimizers

Critical areas that require immediate action:

- **Integrate sustainability more deeply into education** while simplifying decarbonization solutions and fostering public-private partnerships to accelerate progress.
- **Overcome bureaucratic and technological barriers** to enhance green building resilience, communication, and policy implementation.
- **Amplify climate education, awareness building, and public messaging on climate policies.** This includes the need for more innovative/impactful education and public engagement on climate change, climate action tools, policies, collaborations, and on-the-ground benefits.
- **Study best practice guidelines** on effective climate education and communications, including the United Nations guidelines on "Communicating on Climate Change."
- **Break through the status quo and embrace change.** Adopt a change-averse mindset where determined individuals including young change agents are encouraged and given the space to lead.

> **We recently put out a survey. We had 150 respondents, people between 18 and 25, asking about their climate anxiety. As you can imagine, they're anxious, they're a bit angry. They feel betrayed. They feel as though really, collectively, we haven't done enough. But the interesting piece… was the optimism. I got them saying, there's stuff we can do. I think there are changes we can all make if we work together. We can get there. There is still in this generation coming up a sense that we've got time to turn this around if we really pull together. So I hope when they look at today, they say, yeah, this was the point where we did that.**
>
> — Herb Sinnock

Communicating on Climate Change (excerpts)

Communicating on climate change is about educating and mobilizing audiences to take action to confront the climate crisis. Everyone can play a part by raising their voice, sharing solutions, and advocating for change, as we are all shaped by different experiences, cultural contexts, and underlying values.

If you are creating a communications product—such as a video, podcast, written article or graphic on climate change—keep in mind the following tips to make it a valuable, effective, and reliable piece of content.

1.

Use authoritative scientific information

Misinformation and disinformation are widespread on the issue of climate change, and they are major obstacles toward progress in tackling the climate crisis. Deceptive or misleading content distorts the perception of climate science and solutions, creates confusion, and often leads to delays in action or even harmful action. "Rhetoric and misinformation on climate change and the deliberate undermining of science have contributed to misperceptions of the scientific consensus, uncertainty, disregarded risk and urgency, and dissent," according to the Intergovernmental Panel on Climate Change (IPCC).

- Check your sources.
- Stop misinformation. Beware of greenwashing.
- Use trusted messengers.

2.

Convey the problem and the solutions

Explaining the scale of the climate crisis is important, but it can seem overwhelming, leading people to lose interest and tune out. Climate change is one of the greatest challenges humankind has faced. It is daunting, but the fight against climate change is far from lost. The worst impacts can still be averted if we act now. A good

way around disillusionment and "crisis fatigue" is to convey a hopeful message focused on the solutions, helping people feel empowered and motivated to engage.

- Tell a story – make it real.
- Empower people.
- Link it to justice.
- Avoid stereotypes.

3.

Mobilize action

Cutting greenhouse gas emissions to net zero by 2050, and halving them by 2030, requires nothing less than a complete transformation of how we produce, consume, and move about. Surveys indicate that a majority of people around the world want their governments to take action and most citizens in advanced economies are willing to make changes in their own lives.

- Convey urgency. Make it about now.
- Focus on the opportunities. Get your audience excited about the prospects of a sustainable world.
- Make it relevant. Meet people where they are and avoid technical jargon.
- Engage youth. The global youth climate movement has played a powerful role in driving action and holding leaders accountable.

These guidelines were produced by the United Nations Department of Global Communications, in consultation with United Nations Climate Change (UNFCCC), the United Nations Environment Programme (UNEP), and the World Meteorological Organization (WMO), as well as ACT Climate Labs, Climate Action Against Disinformation (CAAD), the Conscious Advertising Network (CAN), TED Countdown, and the Yale Program on Climate Change Communication.

Source: Communicating on Climate Change | United Nations

Part IV

KEYNOTE – CLIMATE ECONOMICS AND DECARBONIZATION

Tom Rand, PhD
Co-Founder & Managing Partner, ArcTern Ventures

> **The left and right disagree about everything but they shouldn't disagree on climate change. Climate change is a meta problem.**
>
> — Tom Rand

In addition to being co-founder and managing partner of ArcTern Ventures, Tom Rand sits on the board of several clean energy companies and organizations, is a published author of three groundbreaking books, including *Climate Economics*, is an Action Canada fellow, and has been a member of several federal and provincial advisory boards.

His keynote focused on financial and market-driven climate solutions and called for the urgent tackling of the climate crisis on different scales.

Keynote Highlights

Balance optimism and pessimism: Rand emphasized the need to balance climate pessimism with market optimism, expressing a bullish stance on clean technology while maintaining a bearish view on climate change itself.

Invest in Cleantech: Highlighting ArcTern Ventures' commitment, Rand talked about the need to deploy $400 million in climate solutions, signaling strong market confidence in the sector.

Bright spots in the climate crisis: The built environment is identified as a significant opportunity for climate action, reflecting its potential for massive reductions in greenhouse gas emissions.

Rand's publications on climate change: Rand's publications, including *Kick the Fossil Fuel Habit* (2009) and *Waking the Frog* (2014), were cited to illustrate the challenges and psychological barriers in recognizing and acting upon climate change as an existential threat.

Fiduciary duties and fossil fuels: The entrenched interests of fossil fuel companies were discussed, highlighting their fiduciary duties to shareholders and resistance to change despite the existential threats posed by climate change.

The power of financial tools: Rand advocated for using financial tools and economic systems to drive radical action against climate change, suggesting that the business community must embrace these strategies for effective change.

Climate capitalism and economic radical intervention: The necessity for radical economic intervention is critical to combat climate risk and the potential for systemic change.

A**cknowledge climate risk:** Understand and acknowledge both the permanent and systemic changes that climate risk poses, as well as the urgent need for economic intervention at a radical scale.

> **Climate risk is a permanent and systemic change in the conditions we live in.**
>
> **We need economic radical intervention.**
>
> — Tom Rand

Projections and urgency: With projections suggesting a path toward 3°C of warming, the urgency of immediate emission reductions was underscored, pointing to the risks of climate feedback loops and societal breakdown.

Role of the built environment in climate action: Buildings, contributing to 40% of greenhouse gas emissions, were identified as critical leverage points, *the bright spots*, for climate action.

Case in Point: On the Ground Climate Action Solution – Decarbonization of Mid-range Commercial and Multi-residential Buildings

Sandrine Tremblay
Co-President and Chief of Technology and Innovation Officer, Kolostat & Krome

Sandrine Tremblay highlighted her company's expertise in HVAC design-build and specialization in decarbonization projects. With over 20 years of energy savings and seven years of decarbonization experience, Kolostat & Krome brings ESG, Finance, and Operations departments together for successful project implementation. Her practical approach to retrofitting heating and cooling systems showcases a tangible pathway to reducing emissions in the built environment.

Key Action Takeaways

by Tom Rand and Sandrine Tremblay

Financial and market-driven solutions: Leverage financial tools and market-driven solutions to address climate change, suggesting that investments in clean technology and systemic economic reforms are vital.

The critical role of the built environment: The built environment is a tangible focus for reducing emissions, advocating for immediate and practical actions to decarbonize buildings.

Urgency and action: The call for solutions to the climate crisis is now and it is urgent. The good news is that with both broad economic interventions and targeted actions within specific sectors like the built environment, radical positive change is possible.

Part V

ENERGY TRANSITION FOR EQUITY PROTECTION

A fireside chat conversation on the topic of energy transition for equity protection was held with Dr. Shatha Qaqish-Clavering and Dr. Alexander (Alec) Hay. They spoke about innovative financing and intellectual property, as well as the need for interdisciplinary collaboration, innovation-focused education, and public climate awareness.

Shatha Qaqish-Clavering, PhD
Executive Director,
Climate Positive Energy Initiative,
University of Toronto

Alec Hay, PhD
Founding Principal,
Southern Harbour Ltd.

> **There is a misconception that researchers do research for the sake of curiosity. In our case regarding climate, researchers do the research for humanity's sake.**
>
> — Shatha Qaqish-Clavering

Collaboration between academia and industry: Both Hay and Qaqish-Clavering underscored the failing partnership between industry and academia, which is crucial for decarbonization and grid modernization. Qaqish-Clavering emphasized the indispensable role of universities in the energy transition, advocating for research driven by humanity's needs rather than mere curiosity.

Challenges to grid modernization: The transition to decarbonization is hampered by grid limitations, necessitating more electricity and innovative solutions.

Proposed solutions: A grid modernization centre at Downsview Airport was proposed to simulate any grid worldwide, showcasing and testing technologies to attract investors and promote Canadian tech.

Resilience recommendations: Hay discussed resilience recommendations stemming from research, suggesting universities should invest in innovation success.

IP rules: Qaqish-Clavering mentioned new rules ensuring intellectual property (IP) developed in Canada benefits the Canadian economy, with government grants helping to form an industry consortium.

Litigation and corporate practices: Hay noted that class action lawsuits are increasingly favouring sustainability, pointing toward transparency as key to building trust and confidence in sustainable practices.

Educational reform: The session touched on the need for multi-disciplinary programs within education to foster well-rounded individuals capable of addressing complex sustainability challenges.

Part VI

BRINGING IT TOGETHER – KEY INSIGHTS FOR ACTION

Tom Rand and Yasmin Glanville joined Shatha Qaqish-Clavering and Alec Hay on stage to answer participants' questions on climate economics and energy transition.

Economic models and capital: Questions about reconciling economic activity with emission reductions led to discussions on venture capital scarcity in Canada and the need for a fundamental change in the Bank Act to support Cleantech and sustainable projects.

Venture capital: The lack of venture capital in Canada forces many IPs abroad, highlighting the need for better financial support for Cleantech within the country.

Public awareness to foster action: The speakers underscored the need for enhancing public awareness and communication about the economic and environmental impacts of daily activities as it relates to the broader climate crisis. This was echoed by Rick Spence, an RSI delegate and

entrepreneur. He highlighted the general ignorance regarding the economics of everyday actions, such as water usage, and the need for better communication to foster informed action against climate change.

Interdisciplinary collaboration: It's time to harness the power of inter-sectoral collaboration between academia, industry, and the financial sector to accelerate the energy transition and innovation in sustainability.

Innovative financing and IP: Innovative financing models and intellectual property regulations were highlighted as crucial for fostering Canadian technology and sustainability solutions.

Education for innovation: There is a critical role of educational reform in creating a generation capable of leading in sustainability and innovation.

Closing Comments and Acknowledgements

> **I am an entrepreneur and engineer. I recently got into climate tech. I'm learning that no matter how much communication has happened, people are still not aware of what's going on.**
>
> **When I attend sessions like this, then I see it's really a lot more imminent than what it appears to be to an average citizen. I like to consider myself a little bit more aware but I can tell you, even for me, it has been very eye opening and it has been frankly shocking.**
>
> **I just hope that more people are aware of what's going on and we get to a point where the end consumer really demands businesses to take action and do the right thing to help their bottom line.**
>
> — Event participant

Henderson and Glanville thanked the event team, delegates, partners, and sponsors.

Glanville noted, “Together we can achieve so much more than on our own.” To build on insights gleaned, she invited everyone to continue the conversations for action where they work and live. Everyone should also consider joining like-minded experts and organizations who want to accelerate the development, piloting, and scaling of strategically aligned solution actions.

“Together we can achieve so much more than on our own.”

Part VII

SPOTLIGHT SOLUTIONS

Atlas-Apex Roofing and Amp Energy: Decarbonizing Clients' Operations by Maximizing the Value of Critical Roof Assets to Create a Climate-Resilient and Clean Energy Future

The Atlas-Apex Roofing and Amp Energy partnership uniquely and seamlessly combines the capability of two leading building infrastructure companies to provide a turnkey roofing and solar solution. This includes strategy development, analysis and design, implementation, and ongoing management and maintenance to ensure long-term success and profitability of the system. The highly scalable solar roof offering provides platform-wide decarbonization solutions at lower cost and lower risk.

With our combined solution capabilities, your company will benefit from:

- A cohesive and synergistic rooftop solution approach
- Using your existing roof assets to generate clean, sustainable energy to reduce your carbon footprint toward a net-zero goal
- Generating 30+ years of electricity savings (hedging market supply rates) from on-site solar power generation
- Reducing the urban heat island effect and extending roof life
- Leveraging rich, government-backed financial incentives to reduce project costs

A unique sustainable value for building owners

The Atlas-Apex Roofing/Amp Energy solar roof allows building owners to use existing roof assets to meet decarbonization and net-zero goals by deploying solar and battery energy solutions without risking or compromising the integrity of the facility's critical roof infrastructure.

The process:

- Engage the Atlas-Apex Roofing/Amp Energy team to create a decarbonization plan that meets sustainability and building envelope requirements.
- Upgrade roof infrastructure and generate solar electrical energy to significantly reduce carbon footprint.
- Decrease and stabilize the cost of electricity from solar power generation.
- Reduce urban heat island effect and extend roof life; the sun's radiant energy is converted to electricity rather than absorbed and emitted as heat.

Strategic partners

Atlas-Apex Roofing and Amp Energy leverage their unique strategic partnership in the rooftop solar space, combining their experience, expertise, and capability in roofing to ensure a strong, durable foundation and comprehensive solar power generation, energy storage, and grid-edge management to provide a full suite of turnkey solutions.

Atlas-Apex Roofing Inc.: Founded in 1928, Atlas-Apex Roofing Inc. is a Tier 1 national roofing contractor that provides customers with industry-leading experience, expertise, and capability in the Industrial Commercial Institutional (ICI) roofing space across Canada. We will ensure your roof provides a strong, durable, and lasting foundation that is especially critical for rooftop solar installations. From repairs and reinforcement to restoration or full replacement, Atlas-Apex Roofing will keep your roof assets performing to their maximum potential.

Amp Energy: Amp Energy is an Energy Transition leader, reimagining the future of energy through technology-enabled solutions at scale. Since 2009, we have built, have in construction or under contract 7+GW of solar, wind, and storage infrastructure. Our portfolio consists of renewable energy assets paired with battery storage, stand-alone battery storage, and a growing portfolio of green hydrogen developments. Alongside our proprietary and disruptive grid-edge digital technology platform, Amp X, which utilizes artificial intelligence and machine learning to drive scale globally, we are an emerging energy transition supermajor. Based in Canada, with operations in North America, Australia, Japan, Spain, the UK, and India, our international team brings deep expertise, innovation, and thought leadership to every aspect of the energy industry.

Atlas-Apex Roofing Inc.

Richard McLeod, National Business Development Manager

rmcleod@atlas-apex.com / 416-577-7663

www.atlas-apex.com

Amp Energy

Doug Jackson, Vice-President, Origination

djackson@amp.energy / 289-983-0508

www.amp.energy

Ener3: Revolutionizing Building Automation Systems for a Sustainable Future

Ener3 stands at the forefront of the battle against climate change, offering innovative Building Automation Systems (BAS) solutions for a wide range of buildings, including residential high-rise buildings, commercial structures, and industrial plants. Our mission is clear: to drastically reduce energy consumption, costs, and carbon emissions while ensuring optimal comfort for building occupants.

An integrated, automation approach to minimize energy usage and environmental impact

Buildings are significant contributors to greenhouse gas emissions, accounting for almost one-third of total emissions worldwide. At Ener3, we recognize the urgency of addressing this issue, which is why we take a holistic approach to building management, focusing on an integrated approach to the automation and control of all building systems to minimize energy usage and environmental impact.

What sets Ener3 apart? An integrated in-house approach to BAS solutions. From initial assessment to system design, installation, and ongoing maintenance, we handle every aspect of the process with expertise and dedication. This allows us to tailor solutions to the unique needs of each client while maximizing efficiency and effectiveness.

Central to our approach is the concept of energy conservation through BAS. We understand that many buildings are over-engineered, leading to unnecessary energy costs and consumption. By accurately measuring demand and intelligently controlling building systems such as heating, cooling, and lighting in response to that demand, we can achieve significant energy savings without compromising comfort or functionality.

What is the role of BAS in decarbonization?

A BAS is the control centre for building systems. Without it, heating and cooling—which are two major energy end users that could be managed—would not operate at peak efficiency and, in this scenario, may jeopardize your decarbonization target. Control and automation of these major systems that incorporate a clear understanding of building physics is paramount. Building physics is the interaction between indoor and outdoor environmental factors, with some examples being heat,

humidity, ventilation, and building fabric. We can design, install, and maintain BAS solutions that are "attuned" to these physical interactions by using our integrated approach; this tuning and integration is essential to the success of your decarbonization goals.

Decarbonization goals will likely involve electrification, which often necessitates a change in heating technology and may involve heat pumps. It's paramount that these electric heat pumps are integrated into the control centre, which is the building automation system, thus it's vital to design or redesign your BAS to incorporate this heating technology. We advocate for the implementation of BAS as a foundational step when pursuing electrification initiatives since it will lower your electricity costs regardless of the type of electric-fueled technology that may be implemented or retrofitted.

Our track record and clients

One of the key benefits of partnering with Ener3 is the rapid return on investment our projects deliver. With an average payback period of just two to three years, our clients can quickly recoup their investment while enjoying ongoing savings on energy costs. Furthermore, the environmental benefits are equally impressive, with each project resulting in substantial reductions in CO2 emissions.

Despite the clear advantages of BAS solutions, we acknowledge there are challenges to widespread adoption. Many end-users are unfamiliar with the technology or skeptical of its potential benefits. Addressing this issue requires education and outreach efforts to raise awareness and demonstrate the tangible advantages of BAS implementation.

At Ener3, we are proud to count a diverse range of clients among our partners, including industry leaders CAPREIT, Burberry, and mechanical contractors Xtra Mechanical, Black and McDonald, and industrial giant Magna International. These partnerships reflect our commitment to excellence and our proven track record of delivering results.

Ener3 is leading the way toward a more sustainable future for the built environment. Through innovative BAS solutions, we can reduce energy costs and consumption, lower carbon emissions, and create healthier, more efficient buildings.

Ener3

JP Jonathan Persaud

jp@ener3.ca

www.ener3.ca

Halsa Housing Initiative: Sustainability and Wellness in Housing

The Halsa Housing Initiative isn't just about rental units; it's a paradigm shift in urban living. Halsa offers meticulously designed, highly replicable, prefabricated, low carbon, mid-rise rental buildings built with sustainability, community, and resident well-being at the core. This initiative represents a significant leap forward, not just in housing design, but also in addressing critical challenges facing our society.

A focus on sustainability and wellness

Halsa embraces prefabricated construction using CLT (cross-laminated timber), a revolutionary, renewable material with exceptional strength and thermal insulation properties. This innovative approach minimizes construction waste and streamlines the building process. AI design tools optimize space utilization and functionality within each unit, while robotic manufacturing ensures precision and efficiency. Large windows and open floor plans maximize natural light and foster a connection with nature, enhancing resident well-being.

Furthermore, Halsa prioritizes environmental responsibility throughout its design and construction. Geothermal heating and cooling systems leverage the Earth's natural heat exchange, minimizing reliance on conventional systems and reducing energy consumption. Solar panels installed on rooftops harness clean, renewable solar energy, further reducing dependence on fossil fuels. Smart building technology systems take energy efficiency a step further by automating features like lighting and temperature control based on occupancy and resident preferences.

Addressing modern challenges

The Halsa Housing Initiative tackles three critical issues facing modern society:

1. **The housing crisis:** Affordability and access to quality housing are major concerns across many regions. Halsa offers well-designed, sustainable rentals at competitive prices, aiming to alleviate the housing shortage and stabilize the market. By increasing the supply of readily available, desirable housing options, Halsa helps create a more balanced housing market, benefiting both residents and the overall economy.

2. **The climate crisis:** From low-carbon CLT construction to renewable energy generation and energy-efficient systems, Halsa minimizes its environmental impact. CLT boasts a significantly lower carbon footprint compared to traditional building materials like concrete or steel. Additionally, the efficient construction process minimizes waste and associated environmental burdens. By prioritizing sustainable practices throughout its lifecycle, Halsa contributes to a greener future for our planet.

3. **The productivity crisis:** Traditional construction methods can be slow and labour-intensive, contributing to housing supply shortages. Prefabricated CLT construction and AI design tools significantly reduce construction timelines. This increased productivity helps address

housing supply shortages within an economy, allowing more people to access quality housing options in a timely manner.

Building a connected community

Halsa's mid-rise format, typically ranging from six to eight storeys, fosters a sense of community while preserving natural light and open space at ground level. The design avoids the isolation sometimes associated with high-rise buildings while maintaining a higher density, making efficient use of urban space. Additionally, the integration of car and bike share programs encourages interaction amongst residents and reduces reliance on individual car ownership. This not only promotes a more sustainable lifestyle but also fosters a sense of community within the development.

The driving forces behind Halsa

This ambitious initiative is a collaborative effort by visionary entities:

- **Windmill Development Group:** The company champions happy, healthy communities while respecting the planet's finite resources. They prioritize sustainable practices across their projects, ensuring a thriving future for residents and the environment.
- **Leaderlane Developments:** This community-focused developer brings a wealth of experience in crafting dynamic urban spaces. Their commitment extends beyond housing, creating vibrant environments for residents to live, work, and enjoy their leisure time. Leaderlane understands the importance of fostering a sense of community within their developments, something that aligns perfectly with the goals of the Halsa Housing Initiative.
- **Intelligent City:** Pioneers in mass timber technology, Intelligent City pushes the boundaries of sustainable construction. They are setting new standards for affordable, carbon-neutral urban living. Their expertise in CLT construction is a crucial element in the success of the Halsa Housing Initiative.

A network of expertise

Beyond these core partners, Halsa benefits from the collaboration of a diverse network of experts:

- **Geothermal specialists:** Using their knowledge of the Earth's natural thermal properties, these experts ensure efficient and sustainable heating and cooling systems for Halsa residences.
- **Car and bike share providers:** These partners promote sustainable transportation options within the community, fostering a healthier and more environmentally conscious lifestyle for residents.
- **In-suite furniture suppliers:** By incorporating efficient and stylish in-suite automated moving furniture solutions, these partners maximize living space and functionality within each unit. This allows residents to move in with minimal additional furniture purchases, further contributing to the overall affordability of the Halsa housing option.
- **Cutting-edge building technology firms:** Integrating the latest smart home technologies creates a living environment that prioritizes resident comfort, security, and energy efficiency. These systems can include features like automated lighting, temperature control, and security monitoring, enhancing the overall living experience for residents.

windmill

Jonathan Westeinde
Chief Executive Officer
jonathan.westeinde@windmilldevelopments.com
www.windmilldevelopments.com

Sheridan College and Partners: Campuses as Living Laboratories for Community Decarbonization

As of August 2023, there were 649 climate emergency declarations in Canada and 186 in the U.S. Hundreds of these municipalities developed strategies to transition to lower carbon before 2050, but progress on the requisite transformations has lagged the urgency of the timeline. A significant reason appears to be difficulty understanding how to navigate technical changes alongside behaviour, policy, and finance pieces.

Despite the popular narrative, achieving net zero is a community effort involving the contributions of many stakeholders, robust policies, and multiple technological elements. Sheridan College has begun using its campuses as living laboratories to understand community-scale decarbonization. Because of their diversity of uses and distributed infrastructure, campuses turn out to be an excellent proxy for some of the dynamics of community decarbonization.

The existing and emerging challenges it addresses

There is a logical parallel between decarbonizing the smaller collection of physical assets on campus and those comprising a larger community. Many functions of cities are present on any larger campus. One finds offices, classrooms and academic spaces, laboratories, retail operations, food preparation and service, healthcare, recreation, and more. And, of course, campuses have full-time residents for much of the year. Each of these mini-villages is supported by infrastructure for parking, transportation, information technology, stormwater management, utilities, green space, and safety.

The primary difference between the municipal context and a campus is the mode of governance. The centralized administration of a campus streamlines and speeds decisions relative to the

constellation of stakeholders and complex bureaucracy of a municipality. Nevertheless, practices and findings from campuses are transferable to this more complex ecosystem.

How it works

Living laboratory efforts showcase the technical pathways to decarbonization and provide opportunities to explore and educate on other important aspects, including finance, policy development, governance, operation and maintenance, and community engagement. Many lessons and examples can then be shared with communities.

The power of collaboration with strategic partnerships

Sheridan College relies on a broad network of strategic partners to help develop and carry out its campus decarbonization activities. Many technical, construction, and engineering partners have been involved with Sheridan College's work for over a decade. These partners help disseminate the results and learnings from the campus living laboratory to a broader audience.

Since late 2022, Sheridan College has been convening Ontario colleges and universities to improve the quality and effectiveness of campus energy and carbon reduction planning at these institutions. These future living laboratories will be crucial to decarbonizing surrounding communities. Closer to home, Sheridan College used the work on its campus to initiate partnerships with the communities of Oakville and Brampton, Ontario to develop community energy and emissions reduction strategies. Both of these municipalities now have not-for-profit community-based organizations to help implement these plans, and Sheridan College continues to provide guidance. Sheridan College also played a key role in the development and early steps of community energy planning in the City of Windsor, Essex County, and the Town of Newmarket.

Sheridan mission zero Office for Sustainability

Sheridan College
Herbert Sinnock, Director, Sustainability
missionzero.sheridancollege.ca

FVB Energy Inc.: District Energy – The Way Forward for Sustainability

Why district energy is so important

District energy (DE) is experiencing a significant rise in popularity as an innovative and sustainable solution to meet the world's pressing need for low carbon energy. Due in part to the overarching goal of Net Zero 2050, DE is not just for campuses anymore.

For centuries, DE networks have been successfully deployed around the world, and these systems are an efficient, eco-friendly, and proven way to provide thermal energy to entire communities. By leveraging waste heat, using renewable sources, and optimizing energy distribution, DE systems have the potential to revolutionize how we heat and cool our neighbourhoods.

As noted in a United Nations (UN) publication on "District Energy in Cities,"

> **DE is one of the least-cost and most-efficient solutions for reducing GHG emissions and primary energy demand.**

A district energy success story: Markham District Energy (MDE)

At FVB Energy, we prioritize innovative solutions that are rooted in sound technical principles with a focus on resilience, flexibility, and adaptability that we believe are the tenets of achieving large scale decarbonization in an unpredictable future.

This is demonstrated by Markham District Energy (MDE), the fastest growing DE system in the GTA, and a leading example for new DE system development. Currently at 14 million sq. ft., Markham Centre is set to grow beyond 30 million sq. ft by 2040. FVB Energy was retained by the City of Markham 26 years ago to complete a DE feasibility study. The city identified several long-term strategic goals including developing a strong, business-friendly downtown core, and ensuring their energy system was sustainable and reliable. North America had recently experienced a horrific ice storm that caused the shutdown of several large cities. This led to an unprecedented effort in reconstruction of the power grid and was a catalyst for Markham to commit to a resilient DE system.

District energy: How we fight climate change

Since the monumental signing of the Paris Agreement in 2015, FVB Energy has seen a shift in the priorities of DE system providers and their clients. Not only are DE systems resilient and flexible, but they are also now a catalyst for large scale decarbonization to help fight climate change. FVB Energy has been at the forefront of this shift and has worked in some of the DE industries' most innovative and transformative projects.

While DE is part of a bigger holistic solution, the main message is that, while there must be a strong focus on energy savings, there must also be a stronger emphasis on smarter, renewable energy generation. That's where DE systems will play a major role.

The next generation of DE systems uses smart heating networks to ensure the development of sustainable energy systems and involves the integration of all available heat sources into a single network to supply heating and cooling energy to low-energy buildings, with low losses and high energy efficiency. Forward-thinking cities are connecting DE with energy-efficient buildings, waste heat, and renewables to create integrated urban systems and achieve resilience and circularity.

Who is FVB Energy?

FVB Energy Inc. is a full-scope engineering consultancy widely regarded as an innovator and pioneer of DE in North America. District energy is our only business, and for over 50 years we have focused on DE and decarbonization. The FVB group of companies is a global firm with operations in Sweden, Canada, the United States, and the United Kingdom and has been providing DE consulting services since 1970. Founded in 1992, FVB Canada has proudly been involved with over 80% of DE systems operating in Canada today.

We have a firm belief that if a community does not have thermal energy infrastructure, it has not met the sustainability test. There can be no "Net Zero 2050" without thermal district energy incorporated into the infrastructure. If a community, builder, neighbourhood or province does not have a thermal energy infrastructure strategy, it is missing 50% of the energy equation.

"Sustainability and innovation are a top priority for FVB," says Richard Damecour, President & CEO of FVB. "Our focus is to advocate for and develop sustainable district energy solutions, renewable energy sources, and infrastructure transformations to help our clients build sustainable communities. We have a vision to change the way sustainability and decarbonization is viewed, and district energy is critical to building a sustainable, low-carbon future."

FVB Energy Inc.
Richard Damecour, P.Eng., MBA, President & CEO
416-885-2651
rdamecour@fvbenergy.com
www.fvbenergy.com

Tree House Energy Services: An Accelerated Approach to Building Decarbonization

Canada has declared net-zero GHG emissions by 2050. How will the buildings sector reduce their emissions to net zero by 2050 and is there a plan to accelerate implementation to hit this target in one generation? Tree House Energy Services believes the built environment and natural ecosystems can work in unison to bend the arc of creation toward outcomes that provide sustainable futures for all. This new kind of creation uses an iterative process that weaves renewable and efficient energy systems together to naturally produce net-zero pathways. The pathways developed by this iterative process provide stakeholders with comprehensive solutions and options so they can choose what best suits their buildings.

Weighing outcomes through iteration

In addition to net zero, outcomes generated through iteration could also provide value beyond net zero. Some examples could be financial benefits created from a net positive energy building; another might be smaller heating and cooling equipment, leading to more leasable floor space. A third could be enhanced occupant comfort and collaboration for hybrid workers. Without iteration, it is unlikely that enough outcomes could be created that would lead to a significant weighing exercise that gives stakeholders more value-adds.

These value-adds may also provide a better base of outcomes to choose from and perhaps facilitate consensus on an implementation pathway.

How does iteration accelerate the process?

There is a misconception that iteration has the opposite effect of acceleration because by nature it is the repetition of a process that may only yield the same results. This would be true if process outcomes and stakeholder feedback were identical. This is an unlikely scenario even for similar building typologies due to the number of factors that need to be integrated into the implementation pathway with decarbonization at its core.

If stakeholders view the process as being comprehensive in the number of implementation pathways that have been studied, as well as in all steps of the process, which have undergone project specific iteration, there will be less probability of sudden change in action due to doubt.

Iteration goes beyond solving technical challenges and provides space for stakeholders to become comfortable and embrace the solutions to these challenges.

12-step process for decarbonization

These 12 steps can be grouped into five major waypoints:

- Decarbonization target (1-3)
- Modelled solutions (4-6)
- Consensus (4-6)
- Approval (6-7)
- Achievement (8-12)

Note the step groupings may vary from case to case. After a target setting, a key feature of this process is the synergy between modelled solutions and consensus building among stakeholders. Major modelling actions include: whole building energy modelling that calibrates the energy use of the computer model to the actual energy use of the existing building systems; modelling of GHG reduction measures; accounting for system interactions; and incremental life cycle cost analysis of measures. Bundling these measures into options that are evaluated in the consensus waypoint is a key output from the modelling steps.

A recent example of Tree House Energy Services' successful implementation of this process is South Fletcher's Sportsplex in Brampton. An investment in the zero carbon retrofit of the Sportsplex is expected to further the City of Brampton's role as a leader in creating sustainable facilities, and a champion of energy conservation and GHG emission reductions. It is also possible the Sportsplex may be recognized as the country's and city's first zero carbon recreational facility retrofit, under the CaGBC's zero carbon performance standard.

This would bring wider recognition to the city as a whole, confirming Brampton's commitment to reducing the effects of climate change.

Source: Zero Carbon Retrofit of South Fletcher's Sportsplex – Budget Amendment and Request to Begin Procurement (escribemeetings.com)

Tree House Energy Services
647-928-9140
info@tree-house.ca

Part VIII

RSI FUTURES ACTION PARTNERS & SPONSORS

Part IX

VISUAL HIGHLIGHTS

"EXTRAORDINARY EXPERTISE IN RENEWABLE ENERGY"

RSI
Introducing Tom Rand
KEYNOTE
March 20th, 2024

ENERGY TRANSITION
EQUITY
PROTECTION
CLIMATE CHANGE
BRIDGE the GAP between ACADEMIA and INDUSTRY

"Future of Climate & Energy" Summary Report - Coming S
of Work & Education" Event - June 11th, 2024

PILOTING
TEST TRIAL TWEAK REPEAT
We need an Innovation
FRAMEWORK
DISTRICT

FUTURE OF CLIMATE & ENERG
ENABLERS

For more information

If you are interested in discussing this report, learning more about future proofing challenges, solutions, and opportunities for collaboration, sharing your own action-focused insights or other action partnership opportunities, send us a note at: **Communications@rethinksustainability.ca**

For more information about RSI: **www.rethinksustainability.ca**

Thank you.