FROM IDEAS TO ACTION:

ENHANCING INNOVATION TO HELP CANADIAN CITIES REDUCE GHGS

PREPARED BY:

Dunsky Energy Consulting
50 Ste-Catherine St. West, Suite 420
Montreal, QC H2X 3V4

T: 514 504 9030
E: info@dunsky.com
W: www.dunsky.com

INTRODUCTION: THE OPPORTUNITY BEFORE US

Canada is at a crossroads. We have signed on to the Paris Agreement of limiting the increase in global temperature to less than two degrees Celsius compared to pre-industrial times. The federal government, provinces and territories, and many municipal governments are committing to greenhouse gas reduction targets and looking to implement renewable energy, energy efficiency, land use policies, sustainable transportation and other mitigation measures. But despite historical efforts, existing programs and plans, we are still far from achieving the results and outcomes necessary to meet these goals.

Cities have a critical role to play in stepping up the pace and scale of Canadian carbon reduction. Urban communities account for 60 percent of Canadians' energy use and over half of our greenhouse gas emissions[1] so the importance of urban action in mitigating the effects of climate change cannot be overstated. We know what actions are needed -- solutions exist and innovation is ongoing – but the question at hand is how to help accelerate the development and adoption of innovative, locally-relevant low-carbon solutions in our urban regions.

To address this question, TAF is, among other research, undertaking two dialogues in the spring and summer of 2017 with thought leaders from across Canada. In particular, with increased federal and provincial focus on climate change solutions, could and should we be enhancing capacity for innovation, demonstration, de-risking and helping scale urban GHG reduction opportunities in cities? And if so, who should be involved and how?

The term "innovation" often focuses on discovery, on the development of something new. This is a vital part of the innovation process, but it is not the only one. For our purposes, when we refer to "innovation", we are not focusing exclusively on discovery or idea generation; rather, we are referring to all stages of the innovation process[2]:

- **Stage 1: Idea Generation and Mobilization:** This stage is the process by which new ideas, including refinements, redefinitions and new applications, are created and developed. The development of new technology, methodologies, and processes falls into this stage.
- **Stage 2: Advocacy and Screening:** In the second stage of innovation, innovative ideas are refined through a focus on identifying potential benefits and problems. In other words, they are refined and evaluated to assess their feasibility and application.
- **Stage 3: Experimentation:** During the experimentation stage, an innovation is actually developed or prototyped. This stage also includes testing and pilots.
- **Stage 4: Commercialization:** Commercialization refers to making the innovation accessible or viable for broader implementation. This may include refining it based on results of the pilot,

[1] Federation of Canadian Municipalities (2016). *Partners for Climate Protection National Measures Report 2015.*

[2] Desouza et al. (2009). Crafting organizational innovation processes. *Innovation: Management, Policy & Practice* 11. pp. 6-33.

understanding how it can be marketed or applied in a broader context, and demonstrating benefits.

- **Stage 5: Diffusion and Implementation:** The final stage of the innovation process is to generate buy-in and acceptance for the innovation and putting the structures, maintenance, and resources in place to have it developed and applied on a larger scale. In other words, it is the stage in which innovative ideas are scaled up for widespread implementation.

Often, when referring to innovation, individuals automatically focus on stage one. However, in the low-carbon arena, there are already a myriad of options for reducing GHG emissions. While developing new ones is important, it is not the only path to success (and, in fact, we would argue that focusing exclusively on new ideas will lead to failure). Thus, **when examining low-carbon innovation centres, we are working to understand which stages of innovation are being addressed by particular organizations**. In many cases, organizations address one or more of stages 1-4; however, for multiple reasons (including lack of funding, lack of mandate, or others) they do not focus on diffusion and implementation, or the scale-up, of innovations to have the broadest impact on GHG reductions possible.

What is a "Low-Carbon Innovation Centre"?

For ease of discussion, we are using the term "low-carbon innovation centre" to mean **an organization that helps accelerate multiple stages of the innovation cycle, whether those are technological, financial, policy, behaviour change or combinations thereof.** In other words, **a dedicated capacity to support cities to create, refine and/or develop, eliminate barriers to, and scale-up solutions that can achieve significant greenhouse gas (GHG) reductions** and, ideally, the multiple benefits associated with a low-carbon urban economy.

The Atmospheric Fund (TAF) has been a success story in this area since its 1991 inception. It has successfully developed, tested, de-risked, and scaled up low-carbon projects in a manner that allows them to be adopted by mainstream financing organizations and governments (see Attachment A for details on TAF's success). Now, with an increased federal focus on climate change, and with the release of the *Pan-Canadian Framework on Clean Growth and Climate Change* and the $2 billion Low Carbon Economy Fund, **there may be an opportunity to develop a network of low-carbon innovation centres across Canada.** We note that TAF is not looking to expand across the country – one of its successes is its local, on-the-ground presence. Rather, TAF is initiating a process of discovery on this topic, and seeking to work in collaboration with others across the country to assess innovation capacity, needs and options at national scale.

Funding for this project has been provided by Natural Resources Canada, the Trottier Foundation and the Clean Economy Fund so that TAF can **assess the need for and feasibility of increasing urban low-carbon innovation capacity in urban centres across Canada.**

THE PROCESS

TAF has commissioned Simon Fraser University's Centre for Dialogue and Dunsky Energy Consulting to support this exploration. The first step is to understand **what is currently being done, what areas may be ready to become or host low-carbon innovation centres, what such centres might look like, and use experience (in Canada and elsewhere) to inform capacity development plans**. Some of our key questions are presented below.

Existing Capacity	New/Enhanced Potential	Building Capacity
Who is currently working across Canada (and elsewhere) in the area of low-carbon, urban innovation?	Which cities/provinces are interested in development/enhancement of low-carbon innovation capacity?	How could/should new/enhanced low-carbon innovation centres be structured, governed, mandated, etc.?
What are these organizations doing?	Do local champions exist in these cities who could help to drive capacity building?	How could/should new/enhanced capacity be capitalized?
What are these organizations' critical success factors?	What are the critical success factors for cities to implement these centres?	How could/should local centres work together to support and enhance their work and impact?

The first of two facilitated Dialogues was held in Vancouver on May 17th and focused on understanding what innovation is and how barriers can be addressed, how innovation can be scaled up at the city level, and what existing capacity we have to build on. Participants included municipal officials, not-for-profit groups and institutes, universities, private enterprises and philanthropic organizations.

A summary of the first Dialogue can be found in Attachment B. The key themes and insights, presented in more detail later in this paper, include:

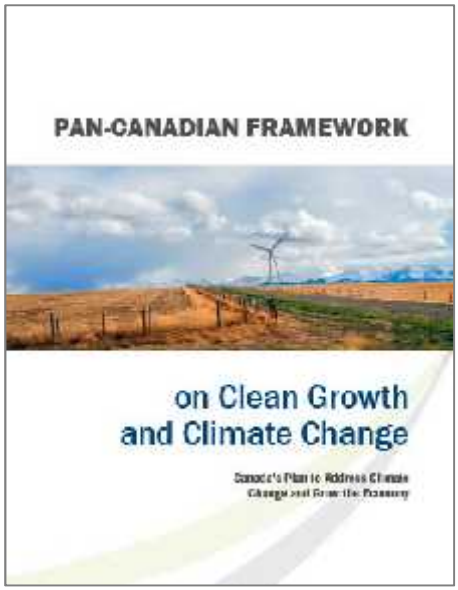
1. Cities need more effective strategies and support for adopting and scaling initiatives that have already proven to be impactful.
2. There are numerous organizations and activities that already exist in the low-carbon sphere, and some of them are finding innovative ways to scale up and de-risk activities.
3. While every organization is unique, there are some key features, functions, and activities that can have significant impact in supporting cities in scaling up low-carbon initiatives.
4. The prior points notwithstanding, numerous barriers remain to scaling up low-carbon activities to the level they need to be to achieve targets.
5. An enabling environment is required for cities to aggressively tackle GHG emissions reductions.

This second Dialogue, to be held in Toronto in July 6, will focus on "how" to build innovation capacity, leveraging the strengths, insights, capital and momentum that currently exist in Canada. This paper is intended to invoke thoughtful discussion at the July 6th Dialogue by providing background and context so all participants have some common understanding. It does not propose a solution, and it does not make recommendations. Rather, it captures what we heard at the first Dialogue and presents our research to date in terms of the framework, requirements, and success factors for enhancing urban low-carbon innovation across Canada for the purposes of achieving significant GHG emissions reductions. It also poses some questions and points to consider.

We look forward to building on these ideas and questions, which will help us develop a relevant action plan.

THE CONTEXT: PAN-CANADIAN FRAMEWORK

This exploration of how to build capacity for accelerating innovative, urban climate solutions is firmly grounded in the context of the *Pan-Canadian Framework on Clean Growth and Climate Change* which was released in December 2016. Providing an overview of the necessity of reducing GHGs, and pointing out that 80 percent of Canada's emissions result from energy production and use,[3] the Framework opens up discussion on actions and strategies for meeting our targets. The federal and most provincial governments agree that "Taking strong action to address climate change is critical and urgent. The cost of inaction is greater than the cost of action."[4]



However, the federal and provincial governments taking action on their own will not be enough. As the *Framework* states, cities are vital to these efforts: "Municipalities are also essential partners. How cities develop and operate has an important impact on energy use and therefore GHG emissions."[5] The *Framework* highlights the federal government's commitment of "an additional $81 billion over 11 years for investments in **public transit, social infrastructure, transportation that supports trade, Canada's rural and northern communities, smart cities, and green infrastructure**"[6] (emphasis added). These are all areas in which cities have a critical role to play in decision-making, implementation, and success of our targets. Hence the

[3] Government of Canada. "Forward." *Pan-Canadian Framework on Clean Growth and Climate Change: Canada's Plan to Address Climate Change and Grow the Economy.* Cat. No. En4-294/2016E-PDF. 2016. n.p.
[4] Ibid. p. 1.
[5] Ibid. p. 23.
[6] Ibid. p. 48.

acknowledgement that "Canadian municipalities will also continue to be important partners in developing and implementing climate solutions locally, as well as through international collaboration with other municipalities around the world"[7] and that "Beyond direct federal, provincial, and territorial government operations, other bodies, such as municipalities and publicly regulated utilities, could become significant markets for and adopters of clean technology."[8]

All of these statements point to the enormous opportunity available for cities to have real and lasting impact on Canada's climate change strategies and GHG reductions. But to do so, they need the mechanisms and ability to make these changes happen, to respond to change and new opportunities, and to embrace new ways of working. This is the goal of the current project: to understand *how* low-carbon innovation centres can help cities, through one or more stages of the innovation process, embrace strategies and activities that can allow them to realize the full potential of GHG reductions.

STRATEGIES AND SUPPORT FOR REDUCING URBAN GHG EMISSIONS

New ideas to help cities implement activities to reduce GHGs are being identified on a regular basis in Canada by researchers, entrepreneurs, and government bodies. However, these ideas often face substantial barriers to adoption. **What is often needed for these ideas to become mainstream is for them to be "de-risked" through testing and refining prototypes in collaboration with key stakeholders, and documenting results.** Financing organizations such as banks can be hesitant to invest in new or untried initiatives because they require an appropriate business case with minimal risk. Yet to meet aggressive low-carbon targets, new applications and opportunities are needed.

As participants in the May 17th session identified, **demonstration of successful strategies and actions through testing and pilots** is required to gain knowledge and learning. It is by implementing strategies for delivering and scaling up low-carbon solutions that we can get closer to the necessary targets. **Learning and networking across regions and jurisdictions** is also key for developing best practices, enhancing credibility, and gathering lessons learned.

Organizations that apply innovation to scale up new and emerging technologies, methodologies, and activities also need to **document both successes and failures**. More importantly, funders need to be willing to accept failures as valuable – only by highlighting and learning from them can others hope to avoid the same mistakes. Ultimately, identification of what *doesn't* work helps to focus limited resources on the best possible solutions.

If cities are going to be leaders, or even contributors, to GHG reductions, they need support for doing so. **The federal and provincial governments have a key role to play in supporting cities to scale up effective low-carbon efforts.** Examples from the session include:

[7] Ibid. p. 2
[8] Ibid. p. 41

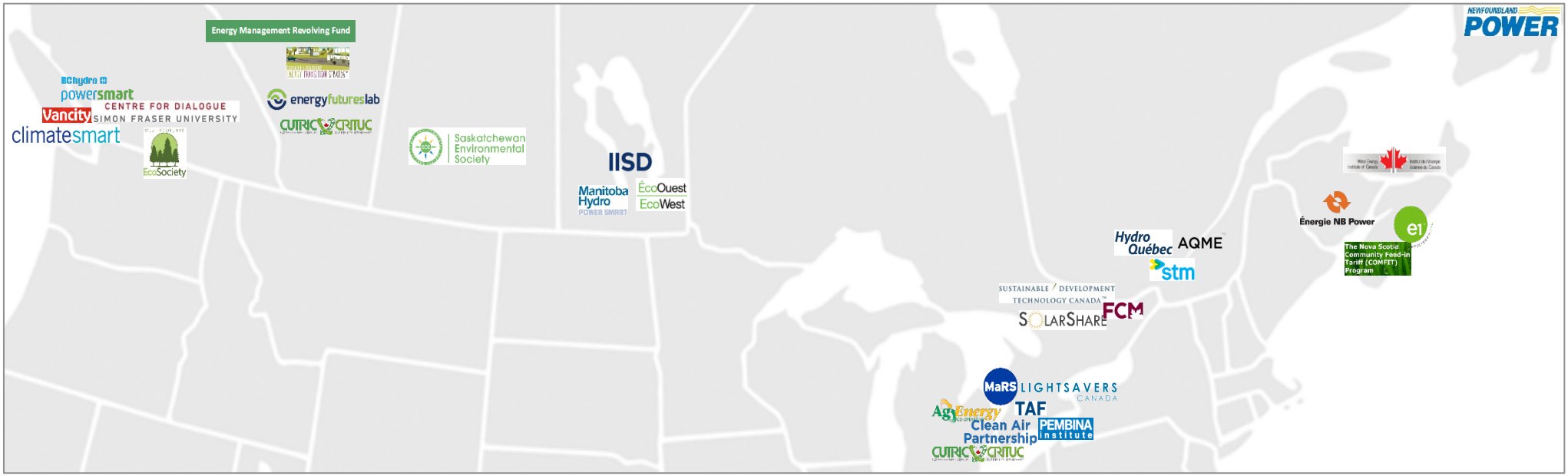
- **Regulation:** Cities do not always have control over low-carbon efforts when relevant legislation or regulation is set by the province or federal governments. Examples can include land-use planning and energy-related requirement. Consultation and liaison among different levels of government can help spur policy innovation.
- **Decision-Making Models:** Higher levels of government have a role to play in enabling and championing decision-making models that allow for innovative low-carbon efforts, for example by implementing life-cycle costing methods and procurement processes that value low-carbon considerations, among others.
- **Inter-divisional Coordination:** A valuable opportunity exists to have cross-functional decisions to pursue low-carbon options, but too often, individual departments make decisions in isolation that impact other levels of government or other departments. Examples include greater coordination between Energy, Environment, Community and Social Services, and other departments at all levels of government.
- **Partners:** One of the greatest impacts that governments can bring to decisions is to bring in new partners to inform thought-processes and perspectives. Having new partners at the table from the community or other relevant areas can lead to new ideas and opportunities. This specifically includes partners that do not always have the same goals or perspectives, allowing for challenges to conventional thinking.

What these initial ideas highlight is that even forward-thinking cities (such as those committed to 100% renewables or other ambitious targets) cannot achieve their goals unless they are given the framework and ability to pursue them. Flexibility, as well as leadership, is required by all levels of government to allow cities to go beyond minimum efforts for GHG reductions.

EXISTING CAPACITY: URBAN, LOW-CARBON AND/OR INNOVATION ORGANIZATIONS

Even forward-looking municipalities, financing institutions, and funders may not be able to invest in new low-carbon opportunities due to regulations, risk aversion, or other constraints. This is why a more independent structure or organization may be useful to help pilot and de-risk opportunities so they can be scaled-up with confidence. But where do these innovation organizations exist in Canada, and what is their relationship with their local city governments? Could capacity be built within cities or through external innovation partner organizations (existing or new) to speed up the innovation process in ways that accelerate local GHG reduction outcomes?

During the first dialogue session, participants identified over 50 existing initiatives that are considered low-carbon innovators, including academic partnerships, public-private partnerships, civil-society initiatives and municipal government initiatives. These organizations focus on or address low-carbon innovation in various ways and using various frameworks and methodologies. Canadian examples from this list are highlighted on the map on the following page, which is not meant to be all-inclusive. Rather, it is intended to highlight some of the extensive and exciting work currently being conducted.


Energy Management Revolving Fund
BCHydro
powersmart
Vancity
CENTRE FOR DIALOGUE
SIMON FRASER UNIVERSITY
climatesmart
EcoSociety
energyfutureslab
CUTRIC CRITUC
Saskatchewan Environmental Society
IISD
Manitoba Hydro
POWER SMART
ÉcoOuest
EcoWest
NEWFOUNDLAND POWER
Énergie NB Power
The Nova Scotia Community Feed-in Tariff (COMFIT) Program
Hydro Québec
AQME
stm
SUSTAINABLE DEVELOPMENT TECHNOLOGY CANADA
SOLARSHARE
FCM
MaRS
LIGHTSAVERS CANADA
AgEnergy
TAF
Clean Air Partnership
PEMBINA institute
CUTRIC CRITUC

The map, highlighting "top-of-mind" initiatives identified by participants, shows there is already low-carbon innovation throughout Canada, demonstrating that this work is considered important, and that a pan-Canadian framework already exists. Some organizations are focused on developing new technologies or researching innovations. Others are focused on disseminating information. Still others implement programs on a broad scale. Few, however, are focused demonstrating, de-risking and helping accelerate adoption of innovative opportunities to ensure that they can be implemented on a wider scale.

MODELS FOR FURTHER EXAMINATION

Building on the first Dialogue, and also noting that there are many organizations operating outside of the low-carbon arena that successfully apply and scale-up innovation to effect change, we have identified six organizations to serve as case studies because they **focus on accelerating or scaling up adoption of innovative solutions in urban centres** (see below). Each case study will include:

- Mandate and objectives
- Organizational structure and function(s)
- Financing approaches
- Performance, best practices and potential pitfalls
- Critical success factors and lessons to be learned from their experiences.

THE ATMOSPHERIC FUND

TAF, through a $23 million endowment fund, performs most of the functions being examined through this project, such as policy reforms, running or initiating programs, piloting technology and disseminating knowledge outcomes, financing and grant making, and supporting capacity for innovation/de-risking.

BERLIN ENERGY AGENCY

The Berlin Energy Agency, a "modern energy service company" with total operating performance of almost $20 million (CAD), is a profit-making social enterprise mandated to reach GHG reduction targets and owned by four shareholders (the city of Berlin, a district heating company, a natural gas distributor, and a development bank). The organization focuses on developing and realizing "innovative projects that reduce high energy costs as well as CO_2 emissions." The agency:

- Offers energy services similar to an ESCO, but is willing to invest in innovative applications and new technologies.
- Conducts information and marketing campaigns focused on energy efficiency and climate policy.
- Provides technical consulting and analysis to business, communities and governments.

INSTITUTE FOR MARKET TRANSFORMATION

The Institute for Market Transformation is a non-profit organization promoting energy efficiency, green building and environmental protection. With annual revenue of under $10 million, it focuses on the following:

- Addresses market failures that inhibit investment in energy efficiency and sustainability in the building sector by creating conditions for higher investment in the sector.
- Works to 1) Bring innovation to market, 2) Scale up innovation and impact, 3) Drive savings, revenues, job creation, etc.
- Advances "scalable" innovations and policies

COOP CARBONE

Coop Carbone is a co-operative created to help its members and partners take advantage of the opportunities offered by the carbon market to reduce GHGs. It:

- Collaborates with technology providers to maximize GHG reductions and contribute to the growth of Quebec's "green economy" through innovative technologies and contributing to the growth of new markets.
- Offers solutions to reduce energy costs related to transportation and heating of buildings.
- Pursues “the values of innovation and excellence" in its services.

CENTER FOR CARE INNOVATIONS

We will include one example outside of the world of low-carbon efforts to help us understand options and best practices that cross specific applications. The Center for Care Innovations is an American non-profit organization dedicated to "accelerating innovations for healthy people and healthy communities", including promoting the scaling of innovation. The organization:

- Creates programs, advances health-care technological innovations, provides grants, convenes and mobilizes, and helps de-risk innovations.
- "Clinics come to us to get connected to critical funding, assistance in selecting and implementing the right practices and new ideas for programs that build the health of communities beyond the walls of the clinics themselves. Foundations rely on us as an impartial and trustworthy guide as we help them connect to programs worth investing in, strategically build off each other’s work and translate mountains of often conflicting data into coherent theories of what works and what’s most ready to scale."

FINANCING ORGANIZATIONS

Many financing, funding, or grant making organizations have similar structures and options for disseminating funds. For this reason, one function-based case study will be developed that addresses the critical success factors and pitfalls of 3-4 organizations that are the most highly innovative in this field. Some key examples include:

- Edmonton Energy Management Revolving Fund
- London Green Climate Fund
- Chicago Infrastructure Trust
- New York City Energy Efficiency Corporation

INSIGHTS: KEY FEATURES, FUNCTIONS, AND CONSIDERATIONS FOR SUCCESS

CRITICAL SUCCESS FACTORS

As outlined above, our research will identify critical factors of successful innovation-focused organizations. Below, we highlight some initial criteria for success that were identified through research for the first dialogue session and by participants in that session. Our in-depth research of the six organizations will help to confirm whether these are critical success factors as well as additional ones we may not have addressed. Several of these criteria were included in the original dialogue paper, but they are worth highlighting again.

- **Vision and Mandate:** A sense of the long-term impacts and opportunities associated with GHG reduction activity and a mandate to address climate issues.
- **Champions:** Engagement of political and committed senior bureaucratic stakeholders, committed to and supporting GHG reduction action.
- **Strategic Focus:** Low-carbon innovations and measures should address the largest sources of emissions and the most promising low-carbon opportunities developed using evidence-based tools and best available information.
- **Multiple Tools:** Ability to offer varied expertise and solution development of a policy, technical, social or financial nature, taking into account political, market or social circumstances in a responsive and opportunistic way.

- **Independence and Access:** Independence from political forces allows for the greater risk tolerance inherent to the innovation process. At the same time, access to the public sphere supports the eventual scale-up of successful new prototypes.

- **Stable Funding:** Secure and multi-year funding is critical for an organization dedicated to innovation, as it takes time to worth through the demonstration, de-risking and scaling process.

- **Ability to Mobilize Resources:** Seed funding from a stable source can and should be leveraged to draw in stakeholders and their resources – including matching funding, investment capital, professional support, and intellectual capacity.

- **Ability to Accept Risk:** Innovation, by definition, means pursuing untried or unproven paths. Sometimes these pursuits succeed, and sometimes they fail. A successful organization will recognize these and accept risk as a necessary part of achieving success with climate goals.

- **Innovation Tools and Expertise:** Understanding the innovation process and how to apply game-changing ideas to low-carbon solutions requires strategic thinking and a thorough knowledge of market transformation practices.

- **Partnership-Building Skills:** The recruitment, motivation, and cooperation of multi-sector partners helps to develop and de-risk innovations and speeds the diffusion of awareness and knowledge. This is also where networks and collaborative associations have key roles to play.

- **Flexibility and Hybridization:** Organizations that are nimble, can adapt to changes over time and that can work cross-sectorally and embody the positive elements from government, the financial sector, academia, and/or non-profits are important for achieving long-term success.

- **Project Pipeline:** Without a continuing flow of feasible and economic low-carbon projects, potential financing has nowhere to go. Innovative design and implementation of such projects are needed to attract private capital in sufficient amounts to make a difference for scaling such solutions.

These features and functions are ones that we have heard from session participants, thought-leaders in the field, and organizations across Canada as being critical to the success of low-carbon innovation. The same factors reappear, albeit anecdotally. Our research will delve further to determine which ones are critical in the scaling-up of low-carbon innovation to help inform a potential future network of organizations across Canada.

BARRIERS

Understanding the barriers to low-carbon innovation is just as critical as following best practices when considering how to build low-carbon urban innovation capacity. Barriers to low-carbon innovation, as identified by participants at the May 17th Dialogue, are not surprising – there are similar barriers in many fields – but they must be addressed if cities are to help Canada and the provinces achieve its international commitments.

Governance issues hinder the scale-up of low-carbon innovation. In particular, silos between departments, organizations, and jurisdictions means that positive and failing efforts can be duplicated or overlapped, and sometimes even work at cross-purposes. **Sustaining collective action in the long term is critical to achieve impact.**

Technical innovation is important. However, **if government and other funding only focuses on initiating new technologies or programs, then there is no opportunity to test, apply, and scale up ideas that showed initial promise**. Ongoing or long-term funding to allow technologies or methodologies to cycle through the full innovation cycle, *including scaled-up implementation*¸ is required to maintain long-term emissions reductions.

Evidence-based policies and decisions are important, and research into new innovations and opportunities is vital to achieving low-carbon targets. However, there is a growing sense of urgency as to the need for action**. Implementation *as well as* research is required** if cities are going to reduce their GHGs. As participants phrased it, there is currently a lot of talk, but not enough action to achieve meaningful GHG emissions reductions.

And cities, as has already been identified, are vital to that effort.

ENABLING FRAMEWORK

There are features and functions of organizations that lead to their success and ability to overcome barriers that hinder their work. However, for true impact and longer-term sustainability, a wider supportive framework is required. In particular, enabling strategies are ones that cannot be implemented by low-carbon innovation centres themselves; rather they need to be implemented by governments that if the centres are to have the greatest impact possible. Examples include:

- **Signalling regulatory change:** Mandating building energy labelling, carbon pricing, etc. all create an environment in which residents and businesses have the right information and market forces to include carbon impacts in their decision-making.
- **Tax incentives and disincentives:** For example, a significant carbon tax not only raises funds for low-carbon programs and strategies; it corrects the market to consider long-term impacts of decisions.

- **National convening without control:** While a network of low-carbon centres can play a convening role, government's involvement and awareness of initiatives and issues can lead to positive impact on policies.
- **Funding based on results:** Punishing failure is not the intent. However, planning projects and initiatives with an outcomes-based focus allows organizations to understand when something is working and when it isn't. Funding allocations based on planned outcomes, with continued funding based on course corrections and working to improve on sub-optimal outcomes focuses dollars on innovation geared towards impact while not stifling innovation.
- **Eliminating subsidies that increase carbon emissions:** Oftentimes government departments work at cross-purposes, with one set of policies counteracting another. Avoiding siloed decision-making and removing subsidies that work against the *Pan-Canadian Framework* would help to improve market signals.
- **Lead by example:** Procurement, infrastructure, and other areas are opportunities for the government to develop policies that mirror what needs to be done at the provincial and municipal level.
- **Accountability:** Leveraging investment, encouraging provinces to get involved and maintain a shared commitment for funding is critical for ongoing support and turning dollars into impact.
- **Provide data:** The best decisions, even innovative ones, are evidence-based. Cities and organizations need data to make choices that will help them to reduce emissions.
- **Allow for regional differences:** This project is not intended to create a "one-size-fits-all" solution to be spread across the country. Different cities will have different strengths and issues to address to reduce GHG emissions, and different existing or potential sources of innovation capacity. These should be leveraged, not ignored.

CAPITALIZATION

Finding resources for non-profit activity, in whatever sphere, is always a challenge, with intense competition for government and philanthropic dollars. Recognizing that innovation work is long-term, having stable funding over an extended timeframe really is a critical success factor. As our case studies already highlight, organizations need endowments, dedicated investment funds, working relationships with government, and/or deep support from philanthropic funders to capitalize their innovation work.

BUILDING CAPACITY: QUESTIONS FOR CONSIDERATION

This paper is intended to provide some context for the July 6th discussion, presenting ideas generated via the first Dialogue and our research to set the stage for an in-depth discussion about next steps. Specifically, we will be looking to answer the following question:

How should we frame, advance, and resource an action plan to increase innovation capacity to accelerate GHG reductions in cities?

This is a large question, and one that we hope to develop an answer to on July 6th. To get there, we ask that participants consider the following questions prior to the day:

- What are two or three concrete strategies and practices that will increase urban innovation capacity to accelerate GHG reductions in cities?
- What are some ideas for resourcing efforts to increase innovation capacity?
- Who needs to be buy into an action plan to increase capacity?
- What would success look like?

ATTACHMENT A: OVERVIEW OF THE ATMOSPHERIC FUND

THE ATMOSPHERIC FUND

In the early 1990s, a combination of events led to the establishment of an endowed municipal fund in Toronto dedicated to supporting climate action at the city level. The Toronto Atmospheric Fund – the first municipal climate agency in the world – was endowed by the City of Toronto with a $23 million fund and set up as an arms-length agency with an independent Board of Directors appointed by City Council. The impetus for the agency was a convergence of local political champions, an inspiring idea hatched at the first international climate conference hosted in Toronto in 1988, and the happenstance of a windfall asset generated by sale of a surplus land asset. But more than the creation of the agency itself has resulted in its success over the years. Additional unique factors include

- **Financial independence:** All of its operational costs are covered by returns earned on the investment of its endowment fund.
- **Apolitical governance:** Powers to invest its own fund and run its own operations were dedicated to its independent Board, which is comprised of a majority of citizen members and a minority of Council members.
- **Small, nimble and responsive nature:** TAF retains just 8 permanent staff.
- **Access to City of Toronto**: Access exists through formal and informal ties.

These factors have positioned the agency to undertake innovation activities that the City itself might find too risky to adopt, to interact with the broader community as a trusted, neutral convenor, to support and enhance community capacity, and to serve as a useful bridge to help pass proven innovations into the City for broader implementation. Some examples include:

The Green Condo Loan. TAF was approached by a leading condominium developer to help find a way to build a new condo with advanced energy performance while not increasing the overall cost in the marketplace. Working together, TAF and Tridel Condominium corporation created a specialized financing mechanism – the Green Condo Loan – to resolve the issue. As a result, Tridel built an advanced building and used it as a test case to support the idea that higher energy performance standards were viable for new construction in Toronto. Subsequently, the City of Toronto developed and passed a new building standard with increased expectations of energy performance, and resistance to the regulation by some in the development community were dissolved due to the Tridel experience. In essence, TAF worked with a development community leader to de-risk the new regulation, allowing it to become standard practice. Ultimately, the Province of Ontario building code also adopted the higher energy performance standard.

LIC Financing Pilot Program. Staff at the City of Toronto wanted to utilize a new ability to use a traditional municipal financing mechanism – local improvement charge (LIC) financing – to support private investment in energy efficiency retrofits. However, as the first municipality in Ontario to try the approach, there was concern that the costs to set up the fledgling program would outstrip revenues earned on loans provided to residents, or that interest charges to recoup the program setup costs would be so high that it would discourage program uptake. To overcome this, TAF provided a grant to the City to defray setup costs and to support a rigorous third-party evaluation of the pilot to generate useful lessons and inform best practices in future uses of the approach. The Home Energy Loan Program (HELP) pilot was adopted by Council and is now in a second iteration.

LED Signal Lights. Transportation Services wanted to adopt LED signal lights at intersections to generate electricity cost savings. However, at the time, there was little local experience with the technology. The department applied and received a TAF grant to set up several pilot test intersections to collect data and gain operational experience. The test results showed significant cost savings and allowed the division to make a well-documented case to City Council to fund broad-scale conversion.

ATTACHMENT B: SUMMARY OF MAY 17TH DIALOGUE

On May 17, 2017, TAF brought together 24 stakeholders involved in urban low-carbon innovation, representing the government, philanthropic, academic, non-profit and private sectors. At the dialogue in Vancouver, BC, there was a good understanding of and enthusiasm for the objective and theme stated in the thought-starter paper provided to participants, namely "to assess the need for and feasibility of increasing urban low-carbon innovation capacity in urban centres across Canada … to explore if and how organizations dedicated to incubating demonstrating, de-risking and/or helping scale up innovative urban solutions can reduce barriers and risks to achieving significant GHG reduction."

The participants were very knowledgeable about the overall process and elements of innovation and how it could be applied to the challenge of achieving significant GHG reductions in cities. All agreed that **the focus cannot be just on "high-tech" innovation and that a framework for understanding types of innovation that will be useful for accelerating GHG reduction in cities**, such as infrastructure, policy, planning systems, information systems, and other (as-yet unknown) disruptions.

There was a sense of urgency and opportunity with municipal, provincial, federal, public and private alignment around climate change, cities, innovation, mobility, the green economy, and others, and a **strong impetus for action, not more talk**. The dialogue was not focused on addressing the many challenges of advancing GHG reduction in cities, including the barriers to innovation outlined in the thought-starter paper, except to recognize that **any initiative to build low-carbon innovation capacity must be designed to address the challenges faced by urban stakeholders**. Instead, the discussion emphasized what cities need in order to accelerate their GHG reduction efforts. Participants particularly stressed **the need for more effective strategies for adopting and scaling initiatives that have already proven to be impactful**.

There was also core recognition that **collaboration and constituency-building is key for having impact, avoiding duplication, and mitigating concerns**. For instance, the concept of "hybrid" organizations was re-visited quite often, referring to organizations that could act nimbly and across different sectors, embodying the positive elements from government, finance, academia, non-profits, etc. Vancity was cited as an example of a hybrid organization that is a bank but also has elements of a community organization.

Participants were asked to map and explore examples of existing innovation work relevant to urban GHG reduction in Canada. This exercise yielded over 20 initiatives including academic partnerships, public-private partnerships, civil-society initiatives and municipal government initiatives, many of them sharing traits of "hybrid" organizations. The particular innovation components of each were highlighted, such as independence; stable, long-term funding which allows work over extended periods; and ability to transcend multiple sectors. These will be examined more closely during the research phase of this project to identify key and common elements to help understand best practice.

A range of innovation features and activities that could help cities reduce GHGs were identified, including:

- demonstrations and actions rather than concepts;

- mechanisms to help capture national best practice – but not necessarily a pure networking approach – perhaps something more action-oriented as there seems to be some fatigue with pure knowledge transfer;
- regional and multi-jurisdictional work;
- using the full span of innovation process – from problem definition/systems thinking, to ideation, to demonstration, through to "pre-scale" actions – and ensuring that key skill sets and resources needed for each aspect is in place;
- emphasis on design thinking and co-creation to ensure approaches work well for the intended recipients;
- accountability, including measuring and evaluating the impacts associated with the work and how it moves the ultimate GHG reduction goals;
- clear theory of change to guide any work, backed up with developmental evaluation to test and revise and the capacity (time, money) to document both the successes and the failures;
- attention to the suburban landscapes/communities within cities;
- maximizing the opportunities for impact investing.

Based on these concepts and the discussion, Dialogue participants began to develop some models and initiatives that could support/advance innovation and accelerated GHG reductions in cities, including:

- An integrated low-carbon and land-use planning strategy, perhaps themed around housing affordability;
- A national prize for low-carbon innovation action/implementation including cash ($250K), national recognition, and support to second the team (lead or members) to replicate their idea in X other cities;
- A national peer-to-peer learning exchange for city staff, with placement in other cities or external organizations to proactively share knowledge on low-carbon best practices and expertise; and
- A virtual, district-energy model for buildings on a city scale.

Finally, participants provided some specific guidance on advancing more urban low-carbon innovation capacity, including:

- Have a clear and rigorous theory of change regarding the benefits of innovation in relation to improved (GHG reduction) outcomes. For example, understand the problems that we are trying to solve, ensure the value proposition is clear, provide a unique (non-duplicative) approach, etc.
- Keep it simple: find and duplicate successful models, including how TAF might serve as a starting point.
- Collaborate and engage diverse players.
- Define innovation broadly, including adoption and scaling of initiatives that have already proven to be effective; organizational cultural change; policy and program innovation; innovative financing tools and ways to access new revenue streams and have capacity to work on various aspects of innovation.
- Independence is key to the innovation process, as is good governance. For example, accountability to stakeholders/shareholders, transparency and measurement.