GROWING GREEN INDUSTRY COLLABORATION IN THE CITY OF TORONTO

JANUARY 2023

Image: View of Toronto skyline from water

FORESIGHT CANADA

TORONTO

Table of Contents

Image: A tree-lined city street with a view of Toronto's CN Tower

Acknowledgements

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About Foresight

Foresight is enabling Canada to become the first G7 country to reach net zero. To accelerate the transition, we need to rapidly launch, commercialize, and scale climate solutions. With the support of our Helix 5 collaborators — innovators, industry, investors, government, and academia — Foresight is relentlessly driving cleantech innovation in Canada.

This report was done in partnership with the City of Toronto.

Common Language

Term	Description
Green industry	The City of Toronto's EDC Division defines the green industry as those organizations that conduct economic activities related to: • Environmental protection and remediation • The sustainable use of natural resources which includes the supply chain of goods and services of recycled materials and other processes that reduce the consumption of natural resources; • The supply chain of goods and services that have been modified or adopted to be significantly less energy or resource intensive than the industry standard [1]
Green sectors	The City of Toronto divides the green industry into five sectors: • Bio-Economy • Clean Energy • Green Building • Resource Management and Environmental Protection • Sustainable Transportation [1]
Clusters	Clusters are geographic concentrations of interconnected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition [2]

Image: View of downtown Toronto with greenspace in the foreground

1. Executive Summary

In 2021, Toronto City Council directed the City of Toronto's Economic Development and Culture Division (EDC) to, "consult with the local green industry on the opportunities to develop a green cluster management organization, identify the preferred form of the organization or organizations, and the necessary steps to achieve its creation, by 2023." [3] In accordance, EDC partnered with Foresight Canada to consult with industry and identify pathways to support increased collaboration across Toronto's green sectors. Ultimately, this is intended to support green industry growth and contribute to achieving the emissions reduction goals laid out in the TransformTO Net Zero Strategy. [4] The following report summarizes major observations from industry consultations and provides recommendations on subsequent actions.

Methodology

To capture insights from Toronto's green industry on how greater collaboration could support growth and provide the most value to members, Foresight led an industry consultation process. **94 participants** were engaged across eight consultation sessions focused on individual sectors of the green industry, and **134 participants** completed a green industry survey. Despite a tight timeline, we are confident these consultation numbers are sufficient to gain a good understanding of the industry and its associated needs as they represent more than 10 percent of known organizations (assuming n=895, Figure 1) and participants were largely at a Manager or High-Level Executive/Owner position. Common themes and key insights were extracted from both and were used to support the development of recommendations.

Major Observations

The following observations were gathered from the industry consultation process:

The Case for Collaboration

- Toronto has a large and growing green industry with notable strengths in areas including energy storage, electrification, mobility innovation, green buildings, municipal water and wastewater treatment, and artificial intelligence (AI)-related energy technologies.
    - Toronto is also a notable technology hub, particularly in AI applications, as well as a financial services hub.
    - Toronto's large, diverse, and educated talent pool, along with a large concentration of academic and training institutions, further reinforces the strength of the green industry.
- The nature, size, and complexity of the green industry in Toronto has led to a fragmentation among members.
- 89 percent of survey participants agreed that developing a collaboration structure of some form in Toronto's green industry would be of some benefit to its growth.

Image: Six young professionals stand in a circle talking professionally

Suggestions for Industry Collaboration

On a scale from 1 to 5, with 5 being the highest value, **87 percent** of survey participants said that greater green industry collaboration would create value for their organizations (rank 4 - somewhat important or 5 - highly important).

Participants noted the following when asked to discuss important characteristics of a potential model for increased collaboration.

A successful collaboration model would:

- Have a clear mandate
- Have a strong value proposition
- Act as a convenor
- Be intentional about structure
- Be problem-driven
- Promote diverse and widely representative membership
- Have strong, industry-focused yet neutral leadership
- Be funded from diverse sources
- Include the following activities and support services:
    - Act as a knowledge hub
    - Support market development
    - Provide advocacy support
    - Facilitate opportunities for implementation

Greater industry collaboration would create value for participants by:

- Providing connections for expansion, and in so doing, accelerating market growth and credibility
- Creating business connections between start-ups and large multinationals
- Enhancing the region's global competitiveness and drawing focus on Toronto's areas of strength
- Creating a place for sharing knowledge, lessons learned, and sectoral expertise
- Strengthening actions to reduce GHG emissions and support decarbonization of the economy

Green industry collaboration already exists in the Toronto region to the following extent:

- Existing organizations in the Toronto region are creating collaboration across green sectors, but it could be improved. Most organizations operate in silos and are not interconnected, or are only focused on targeted areas.
- There is no one central organization at present representing the entire green industry

Recommendations

Based on the feedback received from the industry consultation process, it is recommended that the City takes a phased approach to establishing greater collaboration within the green industry. The recommended approach is as follows:

Phase 1 - Immediate Actions

1. **Convene and engage with City divisions who have a vested interest in this initiative.** Identify the appropriate champion from each division with aligned interests. Convene the divisions and establish regular engagement.

2. **Determine a mandate for collaboration.** Identifying shared priorities and a compelling mandate that will be achieved by increasing green industry collaboration in Toronto is critical to act as a guiding principle. It is suggested that the mandate achieves both economic and climate-related goals.

3. **Conduct industry profiling/ecosystem mapping.** City staff and partners can undertake industry profiling/ecosystem mapping of Toronto's green industry. There is a need to develop a comprehensive picture of the organizations, companies, and other stakeholders involved in Toronto's green industry, and to identify diverse groups that should be included in future convening. Communicating this mapping will help to raise awareness of this initiative.

Phase 2 - Establish an Interim Public-Private Ecosystem Development Group (PPEDG)

It is recommended that the second phase of work involves establishing an interim green industry Public-Private Ecosystem Development Group (PPEDG) seeded by the City for up to three years. The City would allocate resources to sustain one full-time, additional, dedicated staff member at a senior level to co-lead the PPEDG with a volunteer board of private sector partners (PPEDG lead). Each of the engaged City divisions would also allocate 10 percent of a senior staff member's time per week (approximately four hours) to ensure a coordinated approach. In addition to resources for one dedicated staff member, a yearly project budget should be provided. It would be prudent for the City to enter into an agreement with an external organization to host the PPEDG lead so the terms of their employment remain independent from bureaucratic process. The goals of the PPEDG should include:

1. **Continuing the collaborative momentum built in this initiative.**

2. **Conducting a detailed green industry SWOT analysis.**

3. **Working towards establishing an Independent Ecosystem Development Organization (IEDO) that is self-sustaining.** Key goals should include exploring diverse funding sources, establishing benchmarks on which to base KPIs, and developing a structure for the IEDO.

A proposed budget is as follows:

Component	2024	2025	2026	Component Total
Staff 1	$160,000	$160,000	$160,000	$480,000
Project funding and operations	$45,000	$45,000	$45,000	$135,000
TOTAL	**$205,000**	**$205,000**	**$205,000**	**$615,000**

**Staff resource is in addition to current EDC Sector Development Officer. Salary is flexible, allowing for hybrid options (i.e., internal/external to the City).*

Image: Downtown Toronto buildings reflected in the windows of an all-glass office tower

Phase 3 - Transition to an Independent Ecosystem Development Organization

It is recommended that the PPEDG is transitioned to being an independent organization. The rationale for developing an independent organization is to create an overarching body with the intention of facilitating collaboration through the development of a consensus mandate that does not replicate work already being done in the green industry. The IEDO would contribute to, and highlight the importance of, the work that existing green organizations in the region are doing. The IEDO would have an obligation to the green industry as a whole, rather than an obligation to any individual contributor. Ideally, this organization does not have another mandate, has limited existing biases, and can bring in best practices from other successful industry collaboration models from outside the region and country. The IEDO should include the entire green ecosystem and diverse communities with an active stake in the industry, which will be identified during the ecosystem mapping process. Based on local industry feedback, the core focus of the IEDO's work should include:

- Enhancing and promoting Toronto as a major green economy hub
- Sharing knowledge and opportunities
- Supporting market development

Conclusion

Taking a phased approach will allow the future collaboration model to be inclusive and evidence-based, customized to the specific needs of the region, and create measurable impact on goals. Formal organization and increased collaboration in the green industry will accelerate its growth, create jobs, and attract investment while helping to achieve regional climate goals.

Image: Two high-rise buildings with lots of plants hanging down from the balconies

Image: View of Toronto's CN Tower from a street lined with brick buildings and trees

2. Introduction

The development and deployment of green technologies and services is increasing as regions strive to meet net zero greenhouse gas (GHG) emission targets. The City of Toronto's green industry has seen major growth in recent years, but stakeholders have noted a fragmentation among its members, which can impact future potential.

In 2021, Toronto adopted the TransformTO Net Zero Strategy and the goal of reaching net zero emissions by 2040. [4] This ambitious plan to reduce emissions across the City presents a multitude of opportunities for scale-up and implementation of green technologies in the region. To promote green industry growth, and in support of achieving TransformTO goals, Toronto City Council directed the City of Toronto's Economic Development and Culture Division (EDC) to:

> ***"Consult with the local green industry on the opportunities to develop a green cluster management organization, identify the preferred form of the organization or organizations, and the necessary steps to achieve its creation, by 2023."***
> *— Toronto City Council, 2021* [3]

In accordance with this Council Directive, the City of Toronto partnered with Foresight Canada to consult with industry and identify pathways to support increased collaboration within Toronto's green industry to further its growth. The following report summarizes major observations from industry consultations and provides recommendations on subsequent actions.

2.1 Defining Toronto's Green Industry

Definition

The City of Toronto's EDC Division defines the green industry as those organizations that conduct economic activities related to:

- Environmental protection and remediation
- The sustainable use of natural resources, which includes the supply chain of goods and services of recycled materials and other processes that reduce the consumption of natural resources
- The supply chain of goods and services that have been specifically modified or adopted to be significantly less energy or resource intensive than the industry standard [1]

It should be noted that there is a lack of common language when referring to this industry. Terms such as "green", "clean", and "climate" may be used interchangeably. In this report the term "green" is used to define this industry, in accordance with the above definition.

Sectors

The City of Toronto further divides the green industry into five sectors:

- Bio-Economy
- Clean Energy
- Green Building
- Resource Management & Environmental Protection
- Sustainable Transportation [1]

Figure 1 shows the distribution of organizations by sector in Toronto's green industry as well as the representation by supply chain segment. [5]

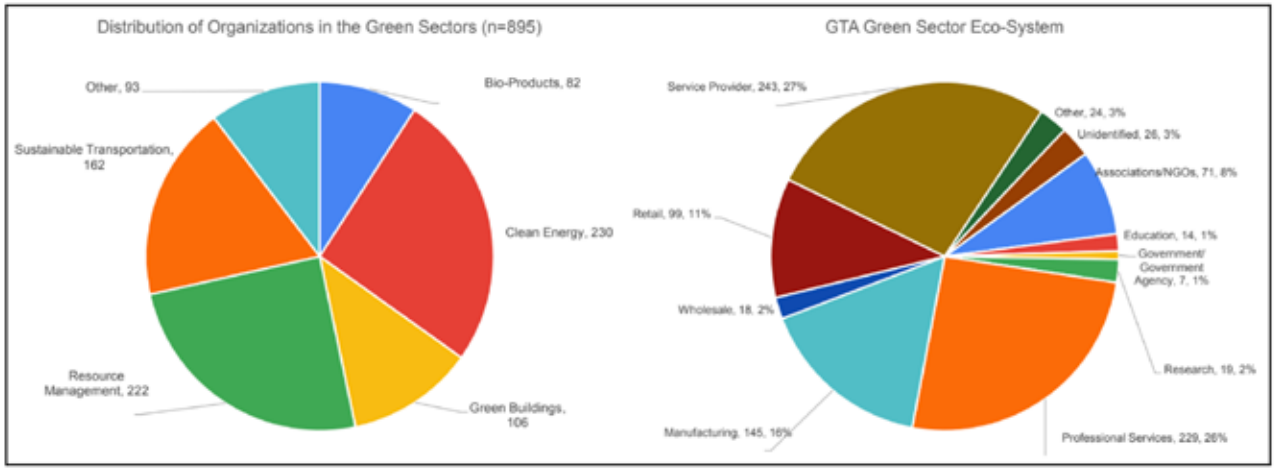


Figure 1: Distribution of organizations in Toronto's green industry by sector and supply chain segment [5]

Employment and GDP

Between 2014 and 2019 green sector employment grew twice as fast as the overall employment growth rate in Toronto (3.9% vs. 1.6% annually) and in 2019 it was estimated that over 60,000 people were employed in the city of Toronto. [6] Toronto's Sustainable Transportation sector employs the most people at approximately 23,000. [6]

The green industry contributed approximately $6.55 billion to Toronto's GDP in 2018, with Resource Management contributing the largest fraction of this among sectors ($2.03 billion). [6]

2.2 TransformTO Net Zero Strategy and Economic Opportunities

Deploying green solutions is critical for the City to achieve interim targets set out in the TransformTO Net Zero Strategy - A climate action pathway to 2030 and beyond report, including:

- 100% of new homes and buildings will be designed and built to be near zero greenhouse gas emissions
- Greenhouse gas emissions from existing buildings will be cut in half, from 2008 levels
- 50% of community-wide energy comes from renewable or low-carbon sources
- 25% of commercial and industrial floor area is connected to low carbon thermal energy sources
- 75% of school/work trips under 5 km are walked, biked or by transit
- 30% of registered vehicles in Toronto are electric
- 70% residential waste diversion from the City of Toronto's Integrated Waste Management System [4]

Better collaboration across Toronto's green sectors will support its growth, thus better enabling the City to achieve interim targets as well as reach net zero emissions by 2040. Discussing economic opportunities related to the TransformTO Net Zero Strategy was therefore a component of industry consultations.

Image: A tree-lined path cutting through a park in autumn

3. Global Collaboration Best Practices

Organized ecosystem-level collaboration has successfully grown various sectors in many global jurisdictions. Clusters are an example of successful industry collaboration models.

> ***"Clusters are geographic concentrations of interconnected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition."*** [2] *- Michael E. Porter*

Research has shown that clusters have led to stronger employment rates, higher average wages, increased patenting, and more innovation and entrepreneurship in their regions. [7] An analysis from the University of Toronto and University of Waterloo found that clustered economic activities in Canada had a positive impact on those industries overall, including generally higher incomes and growth rates. [8]

Image: Eight wind turbines on a hill above a river

Looking at best practices of successful green industry clusters can help draw learnings for the City of Toronto.

CLEAN Cluster Denmark

The CLEAN Cluster in Denmark promotes its collaboration model as a "triple helix", including public and private sectors, and research institutions. [9] CLEAN was officially operational in 2014. During the cluster's establishment from 2010-2014, they received €20 million ($27.8 million CAD) in public investment. [10] During these early stages, CLEAN created over 1,000 jobs and transitioned to a membership-based funding model once the value of their programming was well understood. [10] CLEAN is able to generate revenue for the economy, create jobs, sustain funding, and further the innovation ecosystem of Denmark.

GreenCape South Africa

GreenCape was established and seed funded as a not-for-profit organization in 2010 by South Africa's Western Cape provincial government to spur the growth of the regional green industry. [11] During development, GreenCape aligned its focus with national and regional economic strategies and areas of strength (e.g., renewable energy, waste, and resources) but was created as independent from the government. This has provided legal and political credibility and a level of dexterity to the organization, while they also maintain strong ties with, and support from, government. [12] They attribute, "stable and secure financial and non-financial support from provincial and national government," as a key factor in their success. [13] GreenCape has facilitated approximately R42 billion ($3.3 billion CAD) in investment in the renewable energy and manufacturing space and has led to the creation of over 19,000 jobs since its establishment in 2010. [13]

Cleantech ALPS

Cleantech ALPS is the cleantech cluster for Western Switzerland, founded in 2010. [14] They have taken the approach to focus programming on advancing technologies within the green industry that are advantageous to the economy of Western Switzerland. They have focused on areas such as photovoltaic energy, waste recovery, water, smart grids, and energy-efficient construction, which are critical to the Swiss economic transition, thereby ensuring strong markets for ventures to access. [15] In Switzerland, the cleantech sector is growing fast. They have seen a 25 percent increase in jobs from 2016-2021, and the sector comprises 5 percent of all workers in the country. [14] Cleantech ALPS has facilitated $200 million CHF ($292 million CAD) raised for cleantech startups, $10 million CHF ($14.6 million CAD) for pilot projects, and has supported 20 new cleantech startups created on an annual basis since its inception. [14]

CleanStart Sacramento

CleanStart was established in 2005 to accelerate clean technology ventures in Northern California. [16] Since its establishment, the cluster has been responsible for the creation of over 9,000 jobs and approximately $4.1 billion USD ($5.4 billion CAD) in revenue in the Sacramento region. [17] Of these totals, 4,850 jobs and almost $1 billion USD ($1.3 billion CAD) in revenue was facilitated by CleanStart from 2019-2022, indicating significant recent growth in the region. [17] Key goals of the organization when it was established were to be self-sustaining, retain skilled labor, receive investment, and raise sufficient venture capital. [17] The organization set clear targets for revenue and jobs and is close to hitting these milestones. [17] Establishing clear targets at the time of institution has helped CleanStart achieve its goals.

4. Methodology

To capture insights from Toronto's green industry on how greater collaboration could support growth and provide the most value to members, Foresight led an industry consultation process. A review of existing research and reports was undertaken to extract key metrics on Toronto's green industry, highlight economic opportunities related to the *TransformTO Net Zero Strategy*, and discover examples of global best practices in industry collaboration. This information was used to provide background information to consultation participants.

Industry Consultation Sessions

Facilitators hosted eight consultation sessions focused on individual sectors of the green industry, including five in-person sessions at the Ontario Investment and Trade Centre in Toronto, and three virtual sessions. To better align with industry, the Resource Management sector was split into three sessions: Water; Waste, Recycling, and Circular Economy; and Resource Management, broadly. A session for Ecosystem Partners was also hosted, intended for organizations that support the green industry and have a more holistic perspective. **94 participants** were engaged across the consultation sessions. A directory of individuals and organizations that participated can be found in the accompanying document entitled, Consultation Participants Record. A breakdown of participant numbers is as follows:

Session Topic	Sustainable transport	Water	Green Buildings	Bio-Economy	Clean Energy	Waste	Ecosystem Partners	Resource Management
Attendees	9	7	11	9	16	18	15	9
TOTAL								**94**

Detailed minutes from each session can be found in Appendix A. Session minutes were used to conduct a thematic analysis and extract common themes and insights across each sector. Key themes are discussed in the Major Observations section and were used to support the development of recommendations.

Industry Survey

The green industry survey captured insights from **134 participants.** EDC's database of approximately 1,200 contacts in Toronto's green industry was used for direct outreach. The survey was also circulated to the Project Advisory Committee members, the Toronto Region Board of Trade, the City of Toronto's Indigenous Affairs Office, and the Industry Consultation Session participants with a request to share the survey with their networks. Additional social media marketing efforts were also conducted by individual contributors.

Key trends based on qualitative data as well as quantitative results from the survey are discussed in the Major Observations section. Findings were also used to support the development of recommendations. A summary of survey responses can be found in Appendix B. A breakdown of survey participants is discussed below.

Figure 2: Distribution of survey participants across the green sectors

In which green sector does your organization primarily operate?

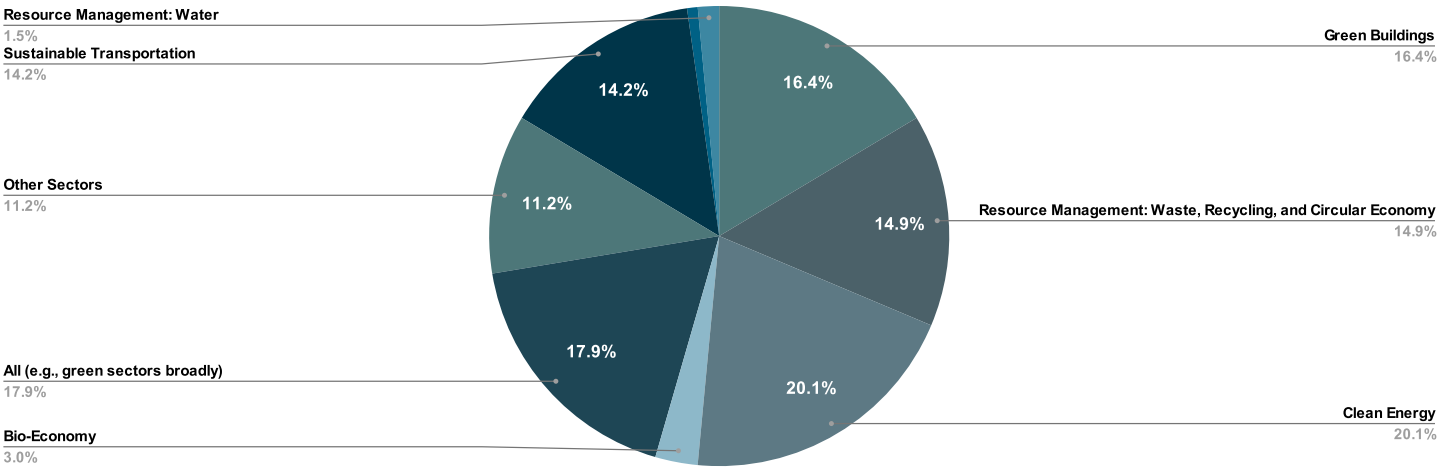


Figure 3: Distribution of survey participants according to size of organization

How many full employees do you have in the GTA at the present time at your organization?

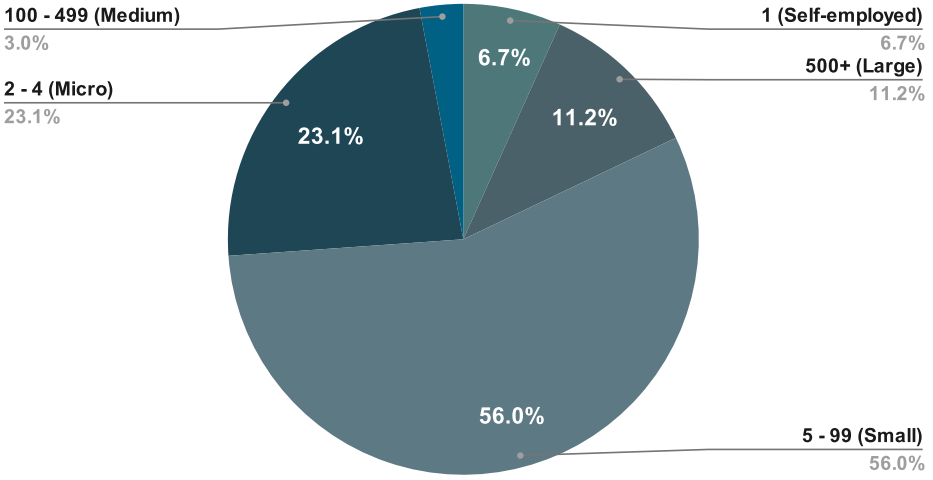
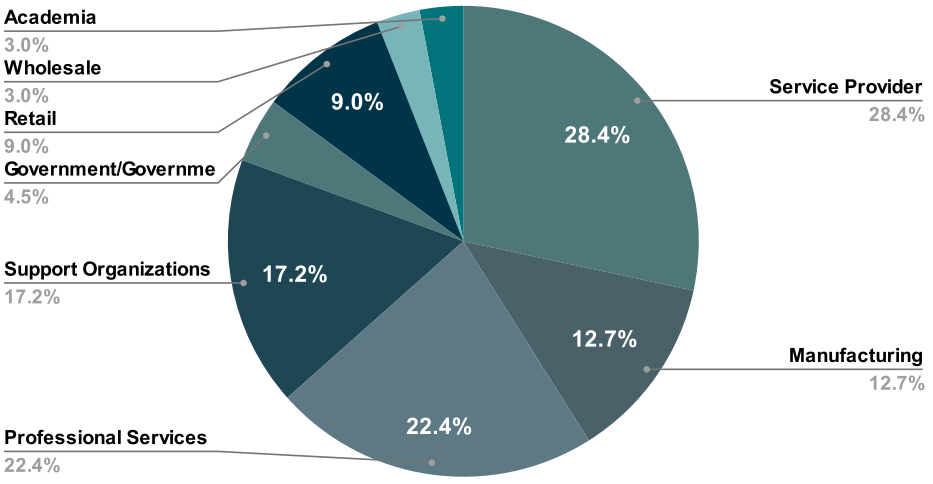


Figure 4: Distribution of survey participants according to organization type

What part of the supply chain/cluster chain does your organization fit into?



92 percent of survey participants indicated that they work in Toronto or the Toronto region with 8 percent from Ontario. As can be seen in Figure 2, participants came from a variety of green sectors. Figure 3 indicates that the majority of participants were from small (5-99 employees) or micro (2-4 employees) organizations. This is representative of the composition of the EDC green industry database and in most jurisdictions there is generally a larger number of small organizations than large organizations, despite larger organizations employing more people. Therefore, the distribution of organization size may be partially attributable to this fact. Figure 4 shows the majority of participants came from organizations in the Service Provider or Professional Services categories, which aligns with the distribution of organizations in the overall green industry ecosystem shown in Figure 1.

It is important to note that this industry consultation process was completed on a tight timeline due to the pace of development associated with the industry and its importance to achieving net zero goals. Despite the expeditious manner of the process, it gave an important opportunity to engage with, and lay the foundation for, continued collaboration in this critical industry. Assuming just under 900 organizations in Toronto's green industry (Figure 1, n=895), 134 survey participants and 94 consultation participants engaged in the process represent more than 10 percent of the known organizations. Additionally, 85 percent of survey participants were at a Manager or High-Level Executive/Owner position (Appendix B). We are confident these numbers are sufficient to gain a good understanding of the industry and its associated needs.

Image: People milling around various booths in a conference hall

5. Major Observations

The following sections summarize key observations gathered from the industry consultation sessions and the industry survey. Observations detail strengths, opportunities, and barriers facing the green industry in general and each of the green sectors (5.1), as well as key feedback on collaboration (5.2).

5.1 Sectors

5.1.1 Toronto's Green Industry - Common Themes

Strengths

- Toronto is a large city with a diverse population. There are copious amounts of resources and talent from around the world concentrated in one area. Culturally, Toronto's diversity is attractive for people and workers, creating opportunities for global partnerships. There is strong interest in innovation and the tech sector in Toronto and the surrounding region, including significant thought leadership and state-of-the-art research facilities from organizations like MaRS, University Health Network, and the University of Toronto.
- Toronto has a thriving venture capital ecosystem and is a finance hub in Canada. The availability and access to funding in Toronto is higher in comparison to other cities across Canada. Therefore, the associated scale of company, technology, know-how, innovation, and investment is higher.
- There is sufficient local political support toward meeting net zero emissions goals in Toronto. Toronto could set a strong precedent for other municipalities.
- Toronto has been known to be a technology hub, particularly in artificial intelligence (AI). Toronto is also strong in technology areas including energy storage, electrification, mobility innovation, green buildings, municipal water and wastewater treatment, and AI-related energy technologies.

Image: Two men in hard hats and walking through industrial machinery, outside

Opportunities

- The vast amount of infrastructure in Toronto provides many opportunities to test and deploy new technologies. Toronto can position itself as a hub for piloting and testing new technologies. There is an opportunity to build physical space or innovation sandboxes to further this.
- There is an opportunity for the City of Toronto and large organizations in the region to become leaders in adoption of green technologies, particularly in entities such as the University of Toronto, the Greater Toronto Airports Authority (GTAA), and Waterfront Toronto, who have pledged to be proactive adopters. Toronto's large influence can motivate other adopters to do the same, and create trust and literacy between adopters and innovators. This would also involve approaching procurement with a more proactive lens, setting an example for surrounding municipalities.
- With its influence and pull, there is an opportunity for the City of Toronto to be a catalyst for climate action in the rest of the province if an area is lacking support.
- As a highly diverse city, Toronto has the opportunity to increase awareness of the opportunities for BIPOC-owned businesses in the green technology space, particularly through connecting with communities who haven't typically engaged. It was suggested to explore implementing targets on diversity of founders for procurement contracts and other RFPs, developing physical consumer green awareness sites across the region, and increasing awareness education (such as through a workshop series or online course) on net zero strategies and targets.

Image: Light rail transit train drives along track on sunny city street

Barriers

- Groups are very siloed between sectors and between groups working in each sector, such as solutions groups and community groups in Toronto.
- There is a culture of risk aversion in Canada, in particular among governments, that makes it difficult to implement new technologies. There is a need to encourage flexibility while balancing government liability, especially as industry is working through trial and error. Insurance needs in Canada are higher than other jurisdictions, or insurance may simply be unavailable for cutting-edge technology.
- Public procurement in Toronto is a difficult process to navigate, and has tended to default towards well-established solutions from large corporations over local, innovative solutions. There is also a culture of fear of violating trade rules by showing favouritism to local solutions.
- It is difficult to pilot and demonstrate proof of concept for many new technologies. Pilot and demonstration projects are not easily accessible.
- There is a large skills gap in the workforce relating to green technologies. Educational curricula lag behind technology development. There is also a large awareness gap in the workforce regarding opportunities for careers in the green industry. The lack of workforce availability is a big barrier to technology adoption.
- The current regulatory frameworks and permitting processes for many technologies are a big hindrance to adoption. This is especially true when multiple levels of government are involved in the permitting process. The lengthy time periods required do not align with the financial realities of the innovation process. Many ventures move out of the Toronto region to the United States (US) because of the time required for permitting.
- Funding is typically inconsistent and often too short-term. Where funding programs do exist, there is often a lack of understanding of what opportunities are available among entrepreneurs, or barriers to accessing existing funding (e.g., requiring a minimum number of employees, revenue, etc.). Investors in Canada are less flexible with their funds in comparison to other jurisdictions such as the US, and it is challenging to raise funds in the current economic climate, making it difficult to secure money that isn't just from grants. Sustainable long-term funding (7-10+ years) for green initiatives is needed.

5.1.2 Sustainable Transportation

Strengths

- A high percentage of Toronto's population (42.5%) uses low carbon and active transportation methods (walking, biking, transit). [18] With the city population and density the highest in Canada (20,000/km^2), it may be easier to adopt mobility solutions in Toronto than other parts of the country.
- Toronto also has some existing infrastructure, including increasing transit options and shared micro mobility, which reduce the climate impact of transportation, and the city's EV readiness regulations position it to continue advancing EV infrastructure.

Opportunities

- As multiple municipalities are focusing on sustainable transportation, it is worth exploring a regional planning/whole system approach, such as a regional transportation service or authority.
- Mobility in Toronto can often be frustrating, meaning that residents would have a desire and openness to trying new solutions.
- Improvements in sustainable transportation are a win-win for different sectors, making them potentially an easier sell than other sectors.

Image: Birds-eye view of traffic driving down 3-lane highway

Barriers

- Low-income communities are often left out of decisions or underrepresented in new technology adoption. These communities must be identified and included in any strategies, including those for EV charging and tax incentives.
- Currently there is also a lack of pilot/sandbox opportunities to prove new solutions work, and there is a need for freight and warehousing to support implementation.
- There is also a missing culture of trust among those working in sustainable transportation, with some sectors being pitted against each other, rather than creating opportunities for collaboration.
- Other barriers to a sustainable transportation sector in Toronto include: significantly congested highways, high costs of accessing transit in low-income communities, and poor regional-level transit. The right-of-way is restricted in Toronto compared to other jurisdictions (35m vs 60m in US cities), meaning there is limited space for bike parking or other mobility infrastructure. Those who want to use e-bikes or bikes risk having their transportation stolen as there are insufficient security options. EV adoption is limited by a lack of street-level and lot-level EV charging, and limited availability of used EVs for purchase.

5.1.3 Green Buildings

Strengths

- Toronto is home to strong academic institutions showing leadership in the green building space. For example, the University of Toronto is working to become fully electric by multiple initiatives, including removing boilers. If we can prove how these innovative technologies are being used, it could situate Toronto and Ontario as a global leader.
- There is a significant appetite in Toronto for green building solutions, including among big companies that are starting to explore innovative models and ideas. Currently there aren't enough opportunities for implementation, meaning there is a lot of room for growth. The sector can take advantage of the current missed opportunity and charge a premium.
- The presence of policy instruments such as voluntary building management standards will start to push building owners and developers towards environmental options. Anticipation of future mandatory standards such as emissions performance targets is also an incentive.

Opportunities

- There is a lot of interest in sustainability-related workforce education and training in the industry. There is an opportunity to include workshops on climate change and clean construction materials, etc. in workforce training and pre-apprenticeship programs.
- The green buildings sector has a lot of opportunities for integration with the sustainable transportation sector. For example, the installation of bidirectional EV chargers can help with electricity grid capacity required for electrification.
- Given Toronto is a financial hub, there is an opportunity to pilot innovative financial models to support financing retrofits and new green buildings.
- A green innovation marketplace showcasing green building innovations could be a useful tool to explore, as there currently isn't a clear place for developers to find innovation.
- The sector is interested in implementing more sustainable building strategies to minimize sprawl. They want to increase density and build in the "missing middle", as it's cheaper to renovate and intensify than it is to build new, and cheaper to act now than it is to wait.

Barriers

- The passing of Bill-23 is potentially a significant barrier to the green buildings sector in Toronto. Key questions remain around what the City is able to do moving forward, and if the city still has any ability to enforce green standards. Importantly, there is a clear impact on the green standard from Bill 23 but not on the performance of existing buildings.
- Current building codes and standards are focused on safety, not efficiency. Changing existing building codes and standards takes a long time (approximately 5-8 years on average). In the absence of building code requirements, there is no benefit to the developer for an increase in efficiency.
- There are currently barriers in the workforce, driven by both an insufficient supply of contractors and suppliers, and entrenched thinking and processes among the existing workforce. Building owners report wanting quotes for green building solutions, but in the absence of a robust enough network of contractors/suppliers, they are unable to get them done. Furthermore, there is resistance to change all across the value chain, including architects, designers, and engineers. There is a need for re-education of key stakeholders, including Professional Engineers of Ontario (PEOs).
- It's currently still cheaper to use gas than electricity, meaning many people do not feel motivated to make the change to more sustainable heating options.

5.1.4 Clean Energy

Strengths

- The existence of several, highly scalable renewable energy technologies, plus the untapped potential of solutions like Wastewater Energy Transfer (WET) puts the sector in a strong position.
- The Toronto region has many stakeholders in clean energy including startups & SMEs in the sector related to renewable energy, energy storage, and energy efficiency, as well as grid centers and universities.
- Ontario's energy grid is currently relatively clean at 94 percent emissions free and produces only three percent of the province's GHG emissions. [19]
- Political will and general buy-in for the industry supports its success. Federal policies, such as the Carbon Tax, support the adoption of clean energy technologies. Toronto's 2040 net zero goal is very motivating and leads to local incentives that drive adoption and implementation of new technologies.

Opportunities

- There are opportunities for cross-sector collaboration as clean energy technologies can be applied in building applications such as solar, efficiency technology, and low-carbon building materials.
- Energy storage technology and feasibility of technology implementation are improving.
- There is an opportunity to demonstrate an economic benefit for private owners to generate interest in clean energy technologies.

Image: View of the Toronto skyline from tree-lined suburb streets in autumn

Barriers

- There are long timelines for large energy infrastructure projects due to government and regulatory processes, working with local utilities, legal procedures, permit requirements, etc.
- Funding to scale up clean energy technology is unavailable. There is a lack of high risk patient capital. Where funding opportunities are available, the templates are often tilted towards incumbents, and the opportunities are focused on IP-centric software and hardware.
- Local utility infrastructure is hard to integrate with new technology, making adoption of new technologies difficult.
- Cost can be a significant barrier to switching to clean energy solutions if the price of fossil fuels remains low.
- There is a missing policy for clean energy in single-family homes.
- Property owners and asset managers are often left out of important conversations and policy decisions.
- Supply chain issues mean that there is currently a lack of material and parts availability.

5.1.5 Resource Management: Water

Strengths

- The City of Toronto Sewers By-law is a strong regulatory mechanism to keep strain off the sewer system as well as watercourses by prohibiting or limiting discharge of potentially harmful substances. [20]
- Toronto has a lot of water/wastewater infrastructure capacity. Additionally, Toronto is home to some of the largest water infrastructure projects in the country, including the Port Lands Flood Protection Project and the Don River and Central Waterfront Wet Weather Flow System. [21,22]
- The high number of utilities in the Toronto region has given rise to extensive expertise in the region in water technology applications related to municipal water and wastewater treatment.
- There is a strong desire in the region to steward water resources.
- Toronto is home to many organizations with copious knowledge and experience in the water sector such as the Ontario Clean Water Agency, Urban Water TMU, Ontario Environmental Industry Association, Toronto and Region Conservation Authority, etc.

Opportunities

- It would be advantageous to consider business models that facilitate more public-private partnerships, and focus on community-based public-private sector water management.
- With the extensive knowledge in the region, it would be prudent to revisit how current organizations work on water and build on what is existing.
- Communication and regular engagement between the water sector and the government can be improved for mutual benefit. Coordinating different parts of the sector (i.e., upstream, downstream, and end-user focused technology applications) which are typically differentiated can help simplify the sector's needs, which would help the city better understand barriers and opportunities.
- Innovation should focus on what needs to be built rather than exclusively on existing infrastructure.
- Implementing residential/community water management policies (such as the Downspout Disconnection Program) is an opportunity to increase resiliency in the City and alleviate stress on grey infrastructure.

Barriers

- Water/the water sector is often left out of climate conversations despite the fact that it is through water that the impacts of climate change are often felt (e.g., drought/flood/quality issues). This makes it difficult for water tech ventures to access resources and opportunities unless they position themselves through the lens of climate. Water is often not a priority for investment/funding as it is typically "out of sight, out of mind."
- The water sector is difficult to define and is complex as it feeds into other sectors.
- Many regulations and by-laws regarding water in the City of Toronto are out of date.
- There is a lack of openness to adopt innovative solutions and a general risk aversion at water utilities. Additionally, municipalities have control over most infrastructure, which makes it hard for private industry to get involved or for innovative water tech to scale/be adopted.
- Toronto does not have a community-based stormwater management system, therefore stormwater is not dealt with where it falls (i.e., captured or infiltrated), but rather in a centralized location (storm sewers/grey infrastructure). This leads to missed opportunities for technology and innovation regarding stormwater management, green infrastructure, and low-impact development technologies.

5.1.6 Resource Management: Waste, Recycling, and Circular Economy

Strengths

- Strong academic literature exists on the circular economy and can be leveraged effectively. A significant amount of new research does not have to be conducted. This saves time and provides expertise on the subject.
- There is immense knowledge and expertise on building and material reuse. This can be leveraged to repurpose existing infrastructure and address other issues related to the housing crisis.
- The circular economy crosses multiple sectors and requires flexible innovation to utilize many different material pathways. The agility of the innovators within this space is a strength.

Opportunities

- There is an opportunity to manage products launched in the marketplace for consumption. The product lifecycle can, in turn, be managed from the extraction stage.
- Construction, renovation, and demolition waste is minimally harvested in Toronto and presents an opportunity to be utilized.
- The benefits of a circular economy include job creation and a boost to the economy through applications such as new material pathways and processes, new waste streams and redeployment of existing materials. Opportunities will also increase around embodied carbon in materials and how a circular economy can reduce this.

Barriers

- Public awareness about the sector is generally low and even if so the public perceives it as challenging and is reluctant to change the status quo.
- There is no prescribed standard for site separation and transfer of waste. Waste often ends up in landfills as it is the most convenient and cost effective option.
- The approval process for reuse is dependent on engineers and experts. Given the level of liability for the tasks involved there is a need to establish training and set standards.

- Demolition of structures is often overlooked in terms of waste and impact. It is best to reuse existing structures and build new buildings that follow the green building standards.
- The need for physical space for this sector is high compared to other sectors. Dedicated special requirements and facilities are needed especially for testing proof of concept and pilots.
- Finding financial value for the waste, recycling, and circular economy sector is complex. Value may be better showcased in terms of carbon and material reuse applications.

5.1.7 Resource Management

Strengths

- The Toronto community has a strong interest in sustainability and the environment.
- The Greenbelt is a prime global example of protecting agricultural lands and green space in heavily urbanized areas.
- The Resource Management sector in Toronto has a large base of organizations and a diverse array of sub-sectors including carbon capture, utilization, and storage (CCUS), and remediation.

Opportunities

- There is a long history, and thus extensive, expertise in the sector. There is an opportunity to draw on lessons learned, share knowledge, and facilitate connections to build on this expertise.
- The large presence of brownfields presents immense opportunity to showcase local innovation in redevelopment.
- Public-private partnerships can be introduced for nature-based solutions.
- The agriculture sector is under severe stress given loss of income, loss of farms, and presents opportunities for transformation from major markets.
- As the largest city, Toronto could take the lead in Canada on protection and sustainable management of large forested and peatland areas.

Barriers

- New private urban land development has progressed without adequate support for maintaining and growing the urban canopy.
- "Red Tape-ism" (i.e., regulatory barriers) is an issue for brownfields redevelopment and has curbed the growth of the sector. An incentive for brownfields redevelopment is also lacking in the region.

5.1.8 Bio-Economy

Strengths

- Strengths of the Bio-Economy sector in the Toronto region include surplus feedstock, the presence of strong infrastructure, and resilient supply chains.
- Toronto has a relatively permissible regulatory environment for genetic engineering.
- The region is home to strong related sectors such as the Life Sciences.
- There is a significant overlap between the talent pool in human health sciences and bioproducts.

Opportunities

- There is a significant number of urban trees and woody biomass within city limits and so there is less need to rely on farms and forests located outside the city. This biomass can potentially be used for a number of sectors including new construction and households. The concentrated sources of organic waste due to the high population density in Toronto can also be leveraged as a feedstock. This presents an opportunity to create a strong supply chain with an anchor supplier and market.
- There is an opportunity for Toronto to become a Bioeconomy Development Opportunity (BDO) Zone. The BDO Zone initiative provides ratings to geographical areas based on feedstock risk. Once the city is recognised as a BDO Zone, it can then be leveraged to attract capital and de-risk investment. [23]
- Looking at other growing urban bio-economy sectors is an opportunity to learn best practices. For example, Trois-Rivières, QC has successfully prioritized providing piloting and testing infrastructure to further the development of the local bio-economy sector, which is based on the presence of a strong pulp and paper industry.

Barriers

- Presently, the City does not offer any wet lab testing space.
- There is no stipulated economic incentive provided to pursue net zero goals to the private sector. Providing a strong economic incentive may be preferred over stipulating restrictive regulations on recycling, composting, and biodegradation as this may force companies to move business outside Toronto.
- The US provides funding for companies to adopt clean technology in their line of business that Toronto is missing. Specific, early stage venture capital support for hybrid chemistry and circular economy-based SMEs is lacking.
- The government lacks subject knowledge on value chains, critical business paths, valuation, credit-worthiness, and risks associated with bioproducts and biomaterial projects.

5.2 Suggestions for Industry Collaboration

Participants in the industry consultation sessions discussed what the important characteristics of a potential future model or structure for industry collaboration would be.

As seen in Figure 5, **89 percent** of survey participants agreed that developing a collaboration structure of some form in Toronto's green industry would be of some benefit to its growth. Recurring or outstanding themes that were mentioned across the eight sessions are discussed in this section and are supported by data from the industry survey.

What would a successful collaboration model look like?

A successful self-organized model for green industry collaboration in Toronto would:

Have a clear mandate. A vision or mandate for collaboration would be defined from the start. There would be defined outcomes for success, which would create accountability and deliverables for members. The mandate would promote progressive action to achieve green targets, and would be defined considering the following:

- **Toronto's strengths.** A collaboration model would focus on Toronto's strengths within the green industry and consider how to elevate Toronto's position on the global stage.
- **TransformTO Net Zero Goals.** The model may also be a mechanism to collectively take action to help the region achieve GHG reduction targets in the TransformTO Net Zero Strategy.

Do you think the development of a collaboration structure (perhaps similar to Toronto Music Advisory Committee or CLEAN Copenhagen) of local businesses and other organizations in the green sector in the Toronto region would be of benefit to the growth of the sector?

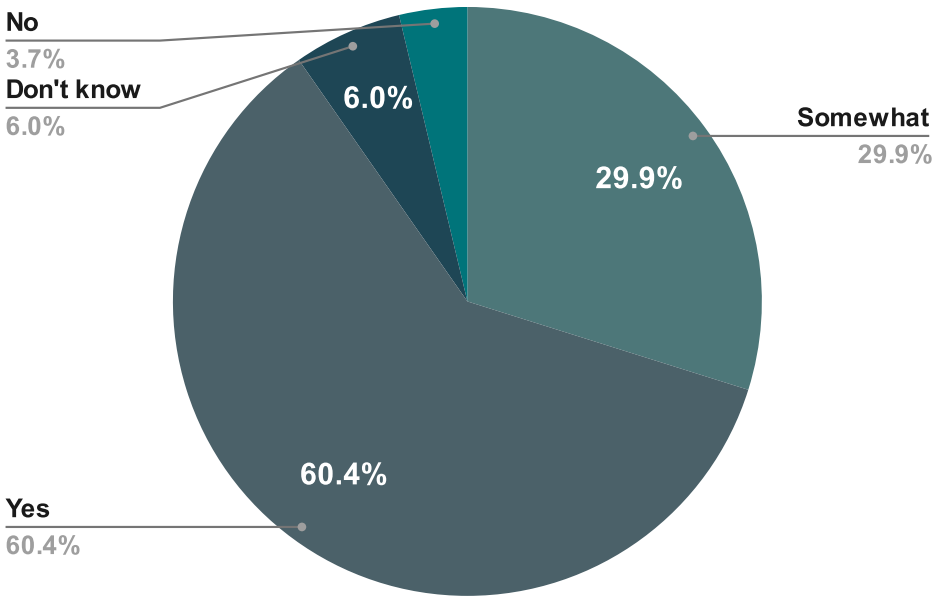


Figure 5: Percentage of participants agreeing that a collaboration structure would be beneficial.

Have a strong value proposition. The collaboration model would provide value to all stakeholders who participate. This would ensure that members are active and engaged in collaborating and are empowered to address problems. This value proposition must appeal to large companies, SMEs, and ecosystem partners, and across all sectors, who all typically have different motivations and constraints. Criteria for members may be set to ensure the right representative is put forward, finds value in collaboration, and is engaged and empowered.

> **"All contribute to a more attractive economic development landscape for domestic expansion and foreign investment."**
>
> *- Survey participant*

Act as a convenor. The collaboration model would bring together different parties working on related issues to grow the industry substantially. Self-organizing would remove the frictions on collaborating, providing a platform for better connectivity and awareness of who stakeholders are. A successful collaboration model would help break down the silos that exist between municipalities and industry, and between divisions within municipalities. The model would organize events and opportunities for serendipitous collaboration and would increase communication between stakeholders — especially from government to industry. It would maintain a regular frequency of engagement, and would include both virtual and in-person opportunities.

Be intentional about structure. An organization model would need to be designed in a way that emphasizes bottom-up collaboration. The model would leverage the existing convenor organizations in Toronto to avoid fragmenting the industry further. It would need to create opportunities for cross-sector engagement.

Be problem-driven. The collaboration model would work on targeted problems facing the green industry in Toronto. The model would have the knowledge of which stakeholders should be brought together to solve particular problems and could organize formal projects to work on them. Having an overarching convenor that knows who the players are and who is reliable would be valuable to solving problems.

Promote diverse and widely representative membership. A critical mass of partners that is highly inclusive would be needed for successful industry collaboration. This would include representation from all areas of the green industry, including those industry players that might not be typically engaged (e.g., the restaurant industry included in circular economy collaboration efforts), and the entire value chain of each individual sector (e.g., building owners, trades representatives, financiers, and insurance companies among others for green buildings collaboration efforts). Diverse communities should also be engaged, keeping in mind the ethics of stakeholder engagement with sensitive groups. The model would be based on a clearly defined ecosystem in order to identify and engage green industry value chains in the region.

Have strong, industry-focused yet neutral leadership. A collaboration model would have a strong leader that has the authority to pull the existing ecosystem together and the autonomy to make clear decisions that produce results. The leader would ideally be a neutral third party that can act on behalf of industry without a vested interest, and could connect with government without creating any conflict of interests. A good option for a leader would be an existing organization with experience as an ecosystem builder and strong connections to industry.

Be funded from diverse sources. Funding would likely be the biggest barrier to establishing a collaboration model, so a successful organization would have diverse funding sources. It would gain a significant amount of funding from the private sector; however, the model may need additional support during the establishment period.

Include the following activities and support services:

- **Act as a knowledge hub.** A collaboration model would act as a centralized location for existing materials, resources, and programs of interest to ecosystem members.
- **Support market development**. Self-organization of the green industry would work to create partnerships and increase visibility to expand customer bases, grow the overall share, and attract investment to the region.
- **Provide advocacy support.** Organizing the green industry would provide the foundation for collaborative advocacy for supportive policies both locally and provincially.
- **Facilitate opportunities for implementation.** The collaboration model offers implementation support and facilitates fast access to piloting, testing, demonstration, and scaling opportunities. It acts as a platform to showcase technologies and innovation.

> **"Addressing [the] effects of climate change is a big task, and no single organization can tackle it alone — it will take collaborative and concerted effort from public and private sectors, government, industry, and individuals. Providing a Toronto / City-led framework for this collaboration has great potential for [the] most positive impact."**
>
> *- Survey participant*

Image: Man with VR goggles interacts with a virtual screen while 3 coworkers look on

In what ways would greater green industry collaboration create value for your organization?

On a scale from 1 to 5, with 5 being the highest value, 87 percent of survey participants said that greater green industry collaboration would create value for their organizations (rank 4 or 5).

Figure 6 shows what would provide the most value to participants should there be a form of self-organization in Toronto's green industry. **Network Building** received the highest average ranking (4.24), with **Policy and Regulations** (4.11) and **Advocacy** (4.11) following close behind; however, all categories averaged in a similar range (Figure 6). This may indicate that participants see a variety of values to be derived from local industry collaboration and there is no singular outstanding value addition.

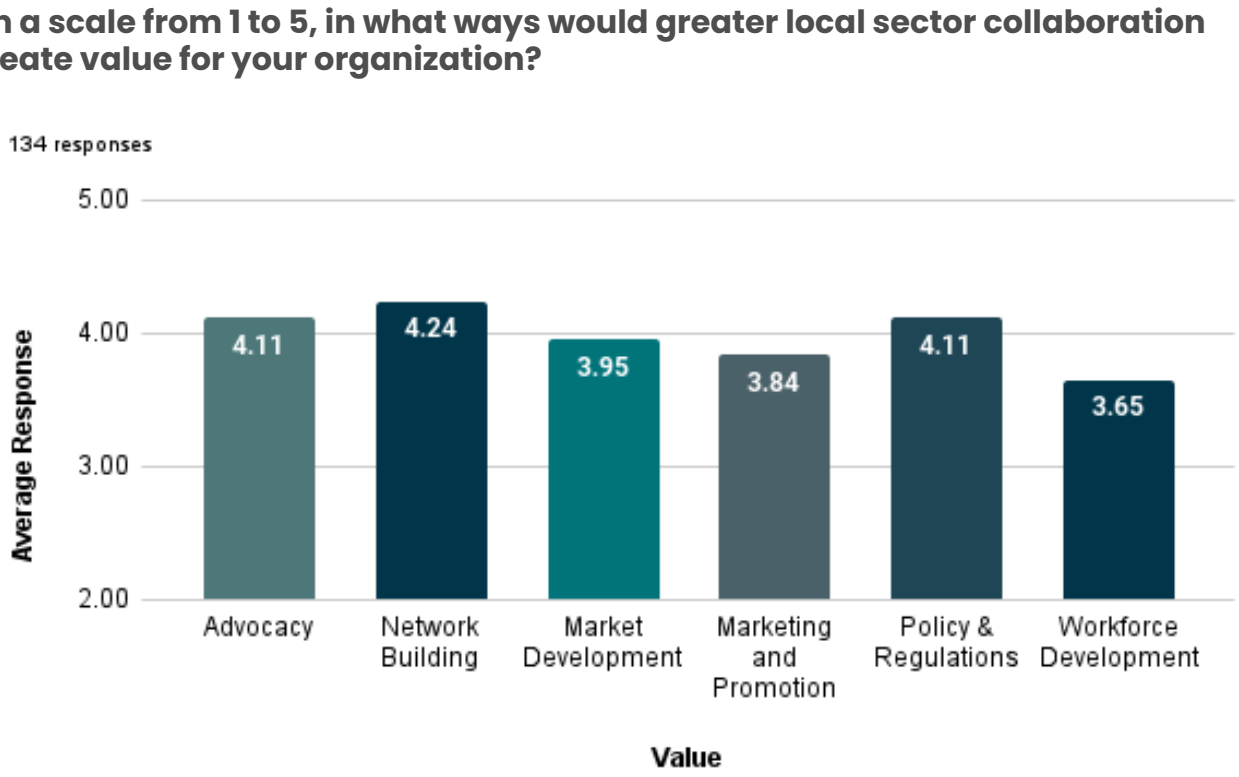
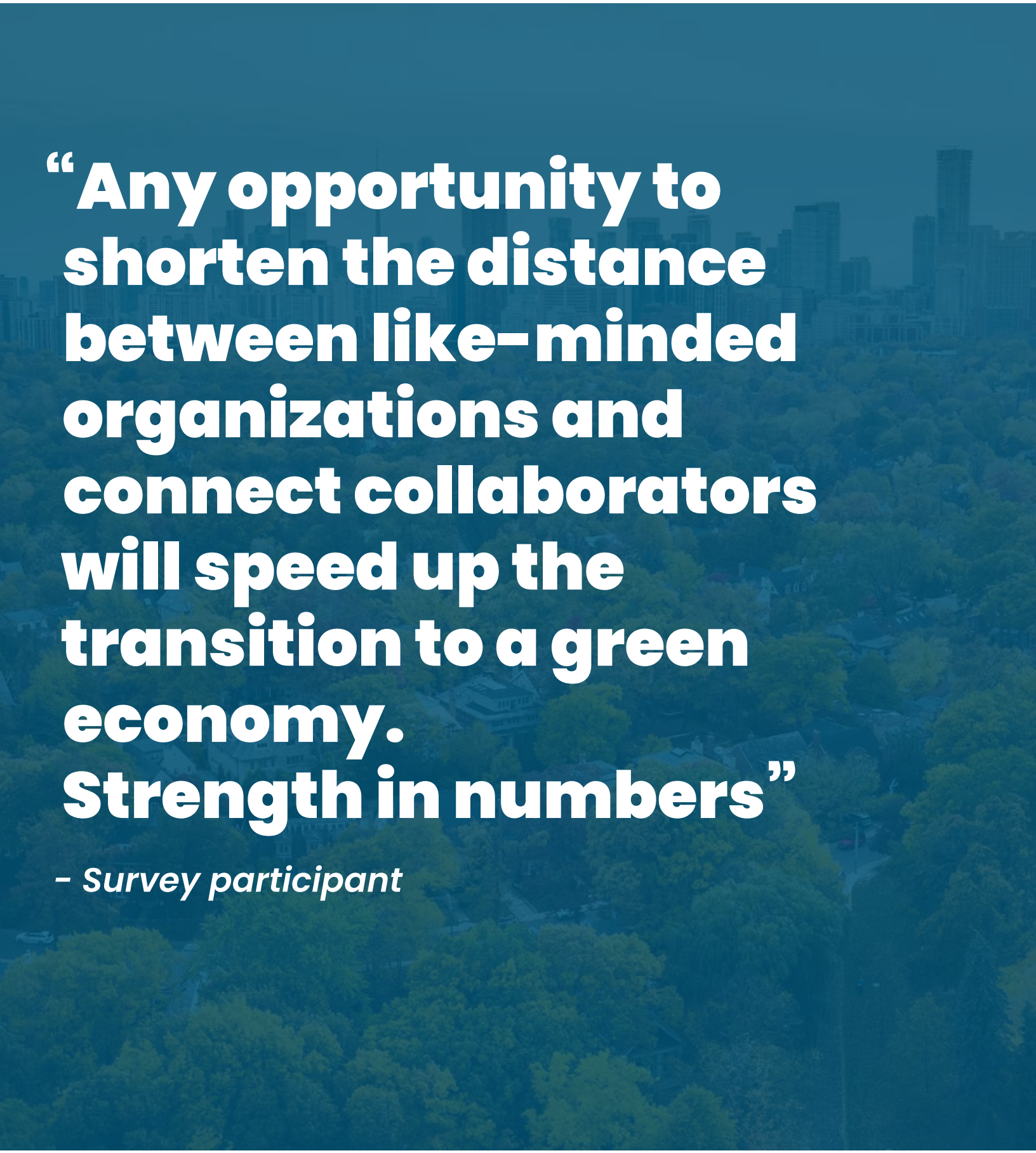


Figure 6: Average ranking of the value of support activities from a collaboration model.



"Any opportunity to shorten the distance between like-minded organizations and connect collaborators will speed up the transition to a green economy. Strength in numbers"

- Survey participant

Participants noted that having self-organization across the green industry would also provide value by:

- Accelerating market growth and credibility by providing connections for expansion
- Creating business connections between start-ups and large multinationals
- Enhancing the region's global competitiveness and drawing focus on Toronto's areas of strength
- Creating lucrative, in-demand jobs
- Identifying opportunities for piloting, testing, and demonstration as well as opportunities for collaboration on pilots, which can lead to deal flow
- Creating the infrastructure for collaboration by breaking down silos
- Increasing literacy on the industry among stakeholders and the general public
- Creating a place for sharing knowledge, lessons learned, and industry expertise
- Increasing effective communication with policy makers and local government to ensure the regulatory environment is favourable to support the industry's growth
- Creating a stronger voice for the industry and leveraging this to other levels of government
- Reducing GHG emissions and supporting decarbonization of the economy
- Ensuring adequate representation among diverse groups
- Addressing risk aversion by having a third party leading collaboration efforts
- Identifying and contributing to overcoming skills gaps in the workforce

Image: Trees in front of an all-glass office building

To what extent do you feel green industry collaboration already exists in the Toronto region?

As can be seen in Figure 7, approximately **89 percent** of survey participants indicated that their organization collaborates with other companies in the green industry in some way. When asked to explain further, common answers included collaborating with customers or clients, working in coalitions to advance shared objectives, staying informed on current events or initiatives that may impact business, collaborating on research and process improvements, working with international clusters, and working with non-governmental organizations.

A number of existing organizations in Toronto have been able to successfully convene the green industry, foster collaboration, lobby the government, and host events. Some examples include the Ontario Clean Technology Industry Association (OCTIA), Ontario Environment Industry Association (ONEIA), MaRS, Toronto Region Board of Trade (TRBOT), Partners in Project Green, and Evergreen Canada. Live Green Toronto and Green Drinks Toronto were also referenced. Despite these organizations, it was heard that the existing levels of collaboration could be improved. Most organizations operate in silos and are not interconnected, or are only focused on targeted areas. Additionally, the networking that occurs may not necessarily lead to effective collaboration. There is no one authoritative organization at present convening the entire industry at a critical mass. Stakeholders noted a need for an evolution in collaboration through a more strategic, well rounded, and well-funded lead organization. Though it was noted that creation of a brand new organization may lead to further fragmentation of the ecosystem.

Do you feel your organization is already collaborating with other companies in your sector in some fashion?

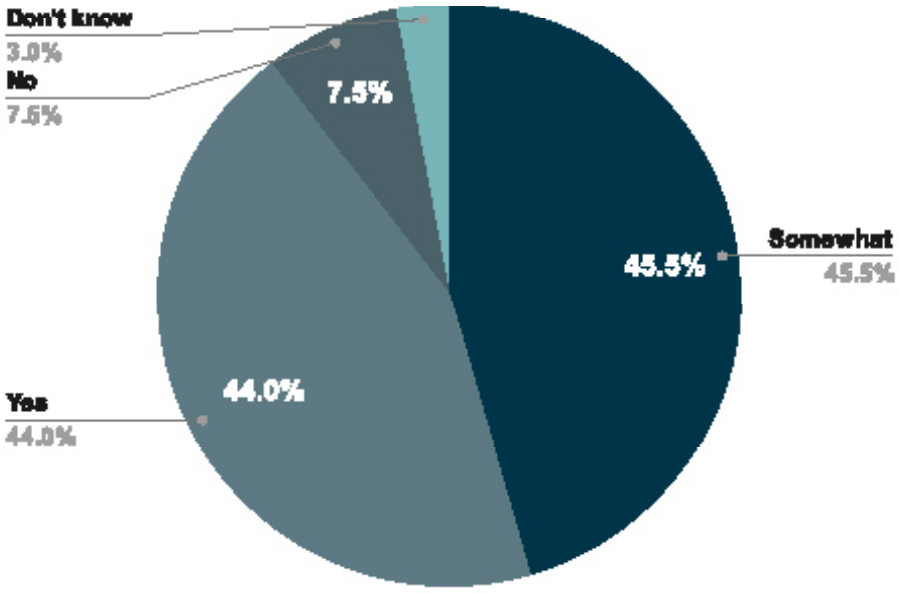


Figure 7: Proportion of participating organizations that collaborate with other companies in the green industry.

5.3. TransformTO Net Zero Strategy

During industry consultations, the TransformTO Net Zero Strategy was perceived as ambitious by some and reasonable by others. Many participants were not previously aware of the Strategy, which presents an opportunity for increased engagement with industry to better achieve targets relevant to the green industry.

A key takeaway was interest in how the City will now bring the goals and actions into fruition. When asked about key opportunities related to the Strategy that could be enhanced by green industry collaboration, participants remarked on the chance for organizations working on related areas to contribute in-kind support to achieve shared emission reduction goals. It was noted that economic development tools can be used to influence targeted growth of technology that can contribute to net zero goals. Participants made several comments regarding the need to better communicate the City's goals to potential suppliers of technologies, but also consider sustainable procurement mechanisms on the City's side. There is also a need to better educate businesses on related concepts such as GHGs and life cycle analysis.

Image: Sun shining through tall leafy trees in a park

6. Recommendations & Key Actions

Based on the feedback received from the industry consultation process, it is recommended that the City takes a phased approach to establishing greater collaboration within the green industry. The following recommendations build off of this report, which is also considered as part of Phase 1.

6.1 Phase 1 - Immediate Actions

1. **Convene and engage with City divisions who have a vested interest in this initiative.** To overcome silos and take a coordinated approach, identify the appropriate champion from each division with an interest in this initiative and aligned goals, and establish regular engagement. Suggested divisions include Environment & Climate, Transportation Services, Solid Waste Management Services, Toronto Water, Waterfront Secretariat, Indigenous Affairs, and Purchasing & Materials Management.

2. **Determine the mandate for collaboration.** Identifying shared priorities and a compelling mandate that will be achieved by increasing green industry collaboration in Toronto is critical to act as a guiding principle. The importance of achieving net zero goals and the divisional purpose of EDC as the lead equates to a mandate that achieves both economic and climate goals. The mandate should also capitalize on this opportunity to establish Toronto as a green technology hub globally.

Suggested example: Take advantage of the global clean economy shift to grow Toronto's economy, establish the region as a global green technology hub, and reach net zero goals by promoting green technologies through increased industry collaboration.

3. **Conduct industry profiling/ecosystem mapping.** City staff and partners can undertake industry profiling/ecosystem mapping of Toronto's green industry. There is a need to develop a comprehensive picture of the organizations, companies, and other stakeholders involved in Toronto's green industry and identify diverse groups that should be included in future convening. Communicating this mapping will help to raise awareness of this initiative.

6.2 Phase 2 - Establish an Interim Public-Private Ecosystem Development Group

It is recommended that the second phase of work involves establishing an interim green industry Public-Private Ecosystem Development Group (PPEDG) seeded by the City for up to three years. Being independent from government will help the group with agility, allow for more of an industry-led approach, and will help avoid barriers created by government leadership changes.

The City would allocate resources to sustain one full-time, additional, dedicated staff member to co-lead the PPEDG with a volunteer board of private sector partners (PPEDG lead). It is recommended that the PPEDG lead is a reasonably senior person with the skills to manage the following scope of work. It would be prudent for the City to enter into an agreement with an external organization to host the PPEDG lead so the terms of their employment remain independent from bureaucratic process. Additionally, each of the identified divisions in section 6.1 would allocate 10 percent of their champion's time per week (approximately four hours) to ensure a coordinated approach. In addition to resources for one staff member, a small yearly project budget should be considered.

The guiding principle of the green PPEDG should align with the overarching mandate identified previously. Specific goals of the PPEDG should include:

1. **Continuing the collaborative momentum built in this initiative.** The PPEDG would function as a centralized hub for continued collaboration, bringing representatives together to problem solve, exchange ideas, and identify opportunities for collaboration. The PPEDG lead would spend a large amount of time on external engagement and developing opportunities such as workshops and roundtables to bring stakeholders together.

2. **Conducting a detailed green industry SWOT analysis.** There is a need to identify data-driven and specific areas of strength, weaknesses, opportunities, and threats facing Toronto's green industry and determine gaps before creating a formal collaboration model.

Image: Five co-workers smiling around a laptop in an office boardroom

3. **Working towards establishing an Independent Ecosystem Development Organization (IEDO).** The fully City-funded PPEDG would ideally last no longer than one to three years, after which it would transition to a self-sustaining organization with multiple funding sources. It is recommended that some of the key goals achieved by the PPEDG before it is transitioned include:

   A) Exploring **funding mechanisms** and developing a payment model to ensure the group is self-sustaining. The City may continue to be a funder in some capacity. In addition to industry funding (such as a fee-based membership model), looking to federal funding opportunities is also recommended at the IEDO stage. Creating a roadmap to ensure sufficient resourcing is recommended for longevity.

   B) Establishing **benchmarks** based on the overall mandate of the organization and determining key performance indicators (KPIs) to track success (i.e., economic and climate/emissions). An important factor of developing KPIs will involve determining how progress towards net zero emissions is tracked within the IEDO. It should be established if emissions reporting is a requirement of IEDO membership, and whether it is conducted by the IEDO itself or is a requirement of members to self-report.

   C) Developing a **structure** for the IEDO. A comprehensive and inclusive structure should be modelled based on the ecosystem mapping exercise. It is recommended to model the structure to be problem-focused. This would facilitate cross-sectoral collaboration and emphasize systems thinking.

A sample budget for Phase 2 is as follows. The City may wish to engage local or other governmental supporting funders to contribute to the establishment of the PPEDG.

Component	2024	2025	2026	Component Total
Staff (1 additional*)	$160,000	$160,000	$160,000	$480,000
Project funding and operations	$45,000	$45,000	$45,000	$135,000
TOTAL	**$205,000**	**$205,000**	**$205,000**	**$615,000**

**Staff resource is in addition to current EDC Sector Development Officer. Salary is flexible allowing for hybrid options (i.e., internal/external to the City).*

6.3 Phase 3 – Transition to an Independent Ecosystem Development Organization

It is recommended the PPEDG is transitioned to being an independent organization. This will allow the opportunity to have a neutral third party lead green industry collaboration efforts, which was a key comment made in the industry consultations. The rationale for developing an independent organization is to create an overarching body with the intention of facilitating collaboration through the development of a consensus mandate that does not replicate work already being done in the industry. The IEDO would have an obligation to the green industry as a whole, rather than an obligation to any individual contributor. Ideally, this organization does not have another mandate, has limited existing biases, and can bring in best practices from other successful industry collaboration models from outside the region and country. The IEDO would contribute to, and highlight the importance of, the work that existing green industry organizations in the region are doing.

The IEDO should include the entire green ecosystem and diverse communities with an active stake in the industry, which will be identified during the ecosystem mapping process. Based on local industry feedback, the core focus of the IEDO's work should be:

1. **Enhancing and promoting Toronto as a major green economy hub.** The group should focus on extensive marketing of 'Toronto's brand'. Toronto can be promoted as an international green economy hub, highlighting the work that has been done to date, and emphasizing regional strengths. This can help increase international collaboration, foreign investment, and elevate Toronto's position on the global stage, which will ultimately create opportunity for businesses. Engaging other groups working toward this goal is recommended to take a collaborative approach to promotion (e.g., Toronto Global, TRBOT, Destination Toronto).

2. **Sharing knowledge and opportunities.** Acting as a knowledge hub can be a core focus of the IEDO, consolidating available resources, funding programs, an industry directory, and relevant research for the green industry that will support businesses to overcome common challenges and identify new opportunities.

3. **Supporting market development.** The IEDO should implement programming that supports market development to provide a tangible value proposition from the collaboration model for both ventures and established companies. The IEDO can raise awareness among ventures of existing piloting, testing, and demonstration opportunities in the region. It can connect scaling green ventures with opportunities in Toronto such as the Villiers Island precinct and the Update Downsview project. Large asset holders such as the University of Toronto, GTAA, and WaterfrontTO who have made pledges to adopt green technologies should be actively connected with members to foster partnerships. Programming such as innovation challenges, marketplaces, matchmaking programs, events, and other opportunities for interaction between companies and potential investors or customers can be implemented to support deal flow.

Other programming for the IEDO that would provide value to members of the green industry include workforce development initiatives, conducting original research, and providing access to training and support for entrepreneurs. Programming should be focused on outcomes and should track KPIs based on the benchmarking initiative taken in Phase 2.

Case Study: Vancouver Economic Commission

The City of Toronto may look to the Vancouver Economic Commission (VEC) for an example on which to extrapolate when developing the IEDO. VEC is an external agency of the City of Vancouver that works on economic development for the region. [24] VEC programs such as Angels for Climate Solutions (training to facilitate investment flow into local ventures) and Project Greenlight (an innovation challenge platform to increase deployment of green technologies by regional asset holders) are structured to be problem-focused, are run in partnership with other local organizations (including Foresight Canada) and are funded from various sources (federal government, private sector, etc.). [25,26] VEC focuses on promoting the economic strengths of Vancouver as well as the region's competitive advantages. [24] Key areas of focus include conducting research to inform policy, supporting workforce development, entrepreneurship support, facilitating investment, and marketing the 'Vancouver brand'. As VEC is a City of Vancouver agency, this provides a well-established connection from government to industry. Though climate action is one of VEC's core pledges, it has a broader scope than the green industry alone. VEC is also not fully independent of municipal government. It is therefore recommended to view the structure of VEC as an example only.

Case Study: Quebec and Montreal - Prioritizing Clusters and Collaboration

The Government of Quebec has signalled an emphasis on prioritizing the development of collaborative ecosystems as a method of advancing Quebec's economy through programs like Strategic Clusters. This program supports cluster development in the province through funding of up to $250,000 (emerging clusters) or $500,000 (mature clusters) in priority areas of research and innovation. [27] Benefitting from strong government support, funding programs, and a focus on innovation, Montreal is home to 10 industrial clusters in a variety of "future-oriented" sectors including AI, aerospace, sustainable finance, and life sciences. [28,29] Industry collaboration — a key outcome of cluster development — is noted as a priority among organizations in Montreal working to grow the innovation ecosystem. An example of this is Startup Montreal's Ecosystem Map, which publicly communicates a clear picture of 'who's who' in the space — from events, to funding to cluster organizations — to better facilitate collaboration among ecosystem members. [30] Startup Montreal is a non-profit organization funded by the Government of Quebec, the City of Montreal, and the federal government. Though this example is geared towards support for innovation broadly across sectors, this shows precedence of varying levels of government in Canada allocating resources to independent organizations to better support collaboration among industry players.

7. Conclusion

Even in the absence of a formal collaboration model, Toronto's green industry is already making waves as one of the foremost green ecosystems worldwide. In early 2022, Startup Genome named the Toronto-Waterloo corridor as one of the top 35 regions for cleantech startups globally, ranking first among Canadian regions. [31] With formal organization and increased collaboration, Toronto has the potential to exponentially grow its green industry, which will positively impact both the city's overall economy and efforts to reduce emissions to net zero. Continuing to take a phased approach to advance collaboration within the green industry ecosystem will allow the future collaboration model to be highly inclusive and evidence-based, customized to the specific needs of the region, and to be creating measurable impact on climate and economic goals.

Foresight thanks the City of Toronto for the opportunity to conduct this industry consultation process and for their commitment to advancing the green economy in Canada.

Image: Ducks swim on a lake with the CN Tower and Toronto skyline in the background

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