



Toronto's Green Industries & How We Can Stimulate Their Growth

Clean Air Council – 25-apr-19

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Presentation Outline

- Economic drivers & the role of the Sector Development Office
- Defining the green sector and its size in Toronto
- How we get the numbers
- The global growth trends of the green sector
- Challenges for Canada's green industries
- Developing an industry growth roadmap
- Cluster development - an opportunity for local economic development
- Discussion and Roundtable (15 m)



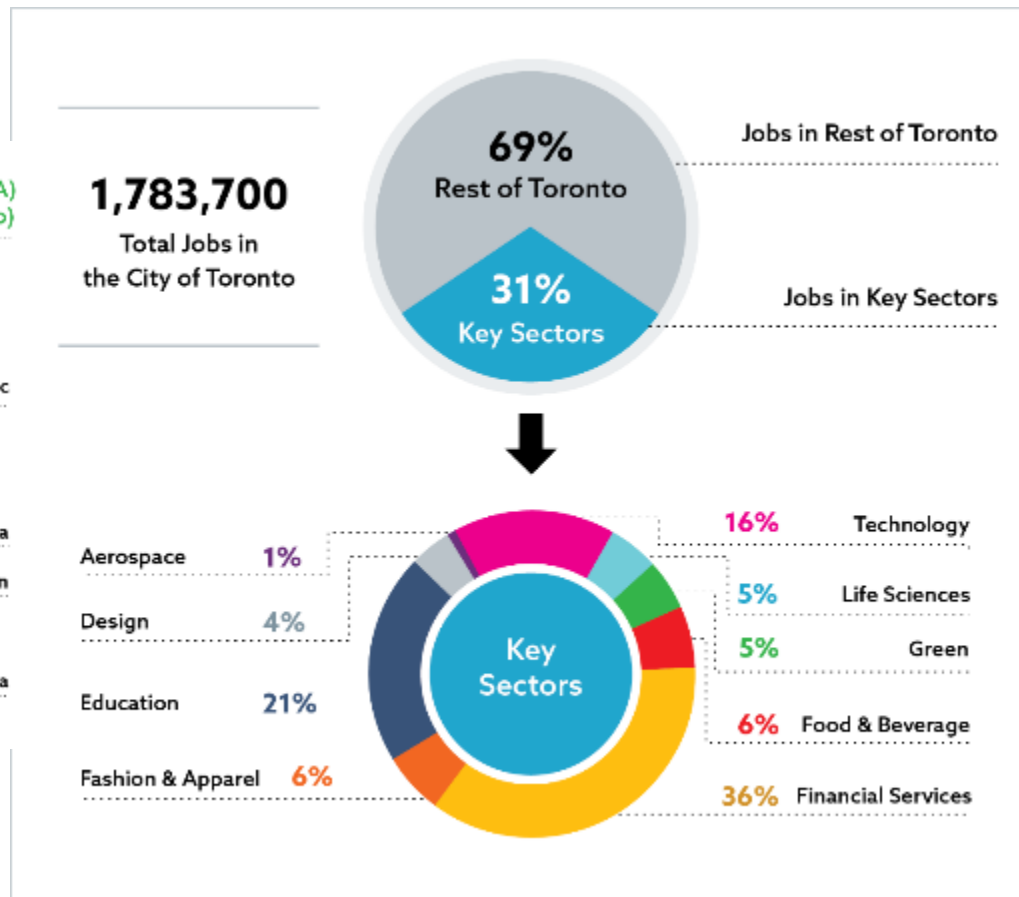
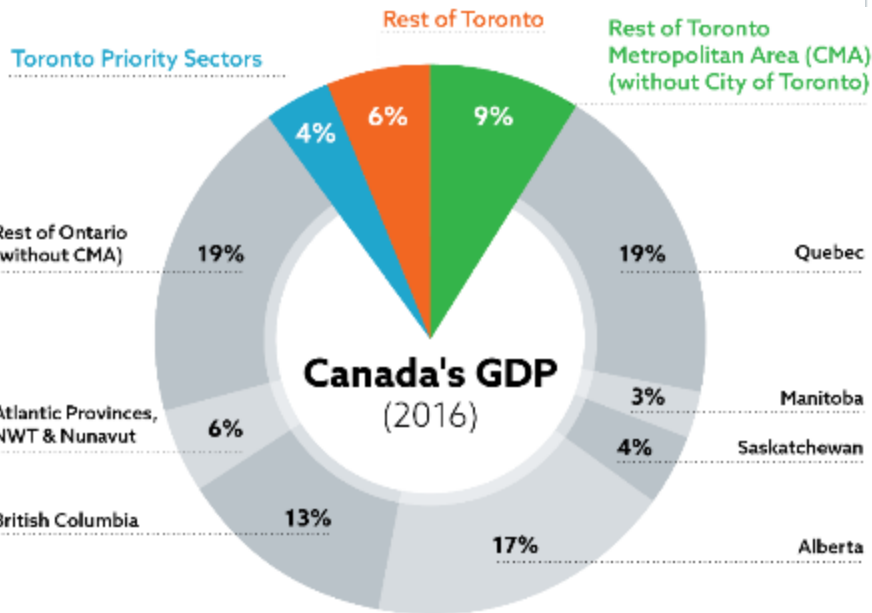
Economic Drivers and the role of the Sector Development Office





Toronto – the Driver of Canada’s Economy

- The GTA produces nearly 20% of Canada’s Wealth





The Role of the Sector Development Office

- We focus on key sectors of Toronto's Economy including:

Aerospace	Design	Education
Fashion	Food & Beverage	Green
Life Sciences	Smart Cities	Technology

- The Sector Development Office is built on the principles of cluster development to build and sustain robust networks of companies and partner organizations.
- We use both push and pull strategies and tactics to drive local economic growth.
- Our professional team of economic development specialists focus on the six key drivers to economic growth at a cluster level...



Key Drivers to Economic Growth (at a Cluster Level)



Defining the Green Sectors





Toronto's Diverse Green Sector

- Clean-tech, green-tech, the green economy – what is it?
- Understanding the economic impact of Canada's green sector is hampered by a lack of national statistics and definitions of what the green sector is composed of.
- The City of Toronto defines our green sector as follows:
 - Economic activities that reduces environmental impacts through: 1. Environmental protection and remediation activities; 2. The sustainable use of natural resources; 3. The supply chain of goods and services that are significantly less energy or resource intensive than industry standards.
- Toronto's green sector is composed of 5 key sections:

Bio-Economy	Urban sawmills, furniture made from urban wood, green chemistry (bio-plastics), bio-fuels.
Clean Energy	Solar, wind, batteries, district energy, smart thermostats, LED lights.
Green Buildings	Energy efficient windows, green roofs, builders.
Resource Management & Environmental Protection	Water supply and sanitation, recycling, solid waste, soil remediation, pollution controls, environmental monitoring.
Sustainable Transportation	Electric vehicles, bikes, scooters, buses, trains, and public transit.



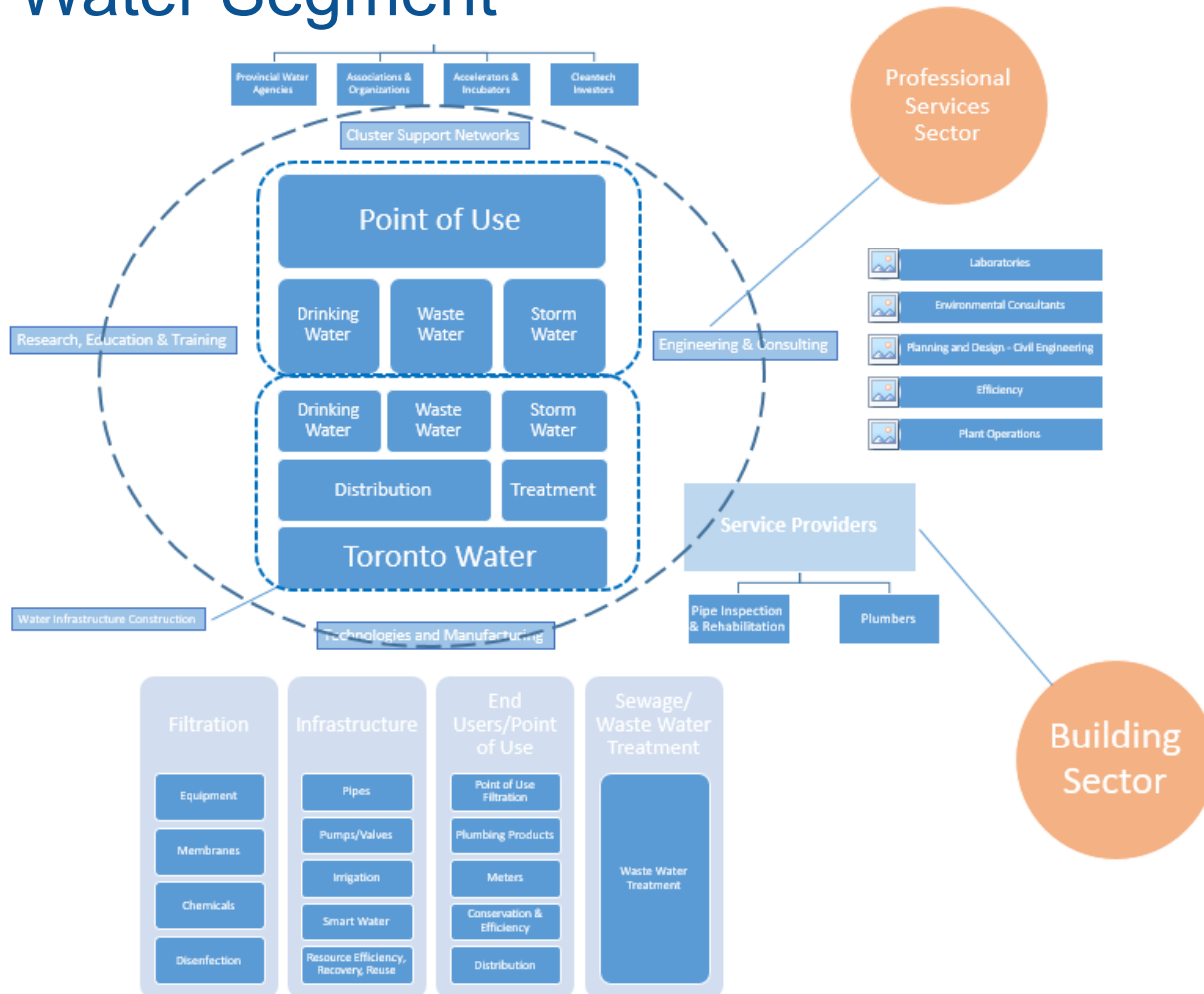
However it is Much More Diverse than Just 5 Parts!





And Each “Cluster” Has it’s Own Complexity

- Toronto’s Water Segment

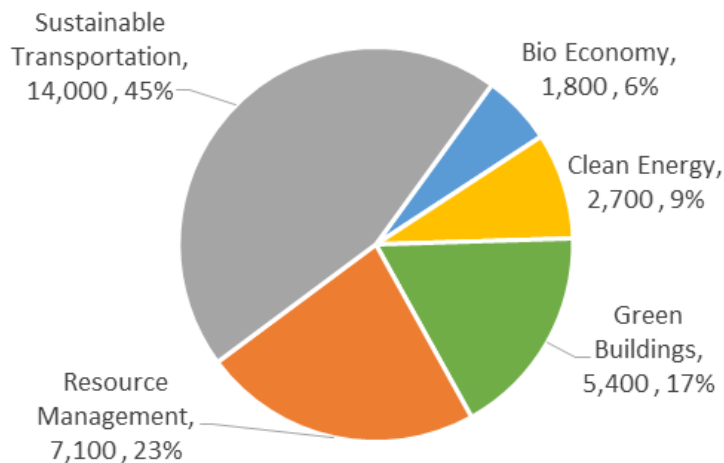




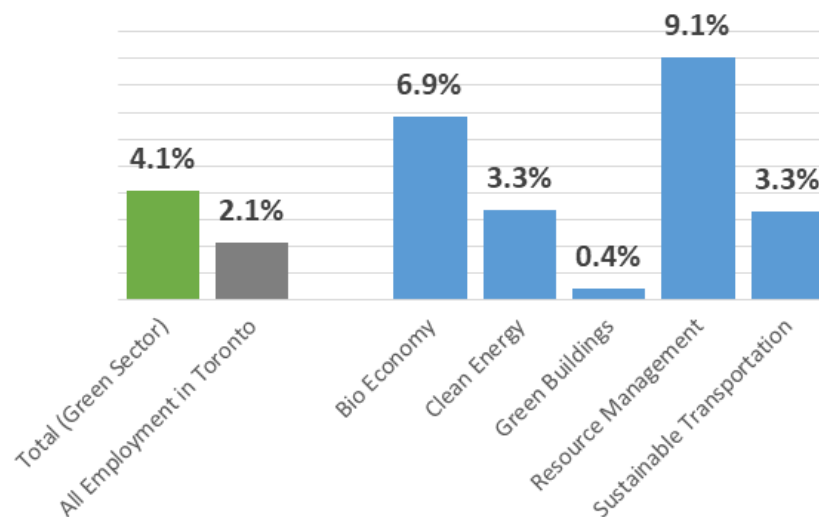
The State of Toronto's Green Industries

- Estimate of 31,000 jobs in the sector (just City #s in 2017)
- Significant growth in 2 of the sections
- Average annual job growth in the green sector is double that of Toronto's average

Distribution of Jobs in Toronto's Green Sector (2017)



Green Sector Employment Growth
(compounded average annual for 2012-2017)



How we get the numbers





Deriving our Numbers

- Industries are defined in North America by the North American Industries Classification System (NAICS)
 - Example NAICS #31183 - Tortilla manufacturing
 - The food sector has about 25 NAICS that define that sector
- Statistics Canada collects economic data on each NAICS
 - However there has been no new NAICS codes assigned to any green industry since the 1950s!
 - Green companies are found in various NAICS (such as electrical installers for PV firms)
- While we can track how well the tortilla manufacturers are doing in Toronto we have no idea about the solar industry
 - Tortilla manufacturers - 2 companies and 7 employees total



There are Some “Pure Green” NAICS Codes

- Scattered through the different sections so doesn't give us a good picture

NAICS	NAICS Category	Segments of the Sector
221111	Hydro-electric power generation	Clean Energy
221119	Other electric power generation	Clean Energy
221310	Water supply and irrigation systems	Resource Management
221320	Sewage treatment facilities	Resource Management
237110	Water and sewer line and related structures construction	Resource Management
336510	Railroad rolling stock manufacturing	Sustainable Transportation
418110	Recyclable metal merchant wholesalers	Resource Management
418120	Recyclable paper and paperboard merchant wholesalers	Resource Management
418190	Other recyclable material merchant wholesalers	Resource Management
451113	Cycling equipment and supplies specialty stores	Sustainable Transportation
482114	Passenger rail transportation	Sustainable Transportation
485110	Urban transit systems	Sustainable Transportation
485210	Interurban and rural bus transportation	Sustainable Transportation
485410	School and employee bus transportation	Sustainable Transportation
485510	Charter bus industry	Sustainable Transportation
488210	Support activities for rail transportation	Sustainable Transportation
541620	Environmental consulting services	Resource Management
562110	Waste collection	Resource Management
562210	Waste treatment and disposal	Resource Management
562910	Remediation services	Resource Management
562920	Material recovery facilities	Resource Management
562990	All other waste management services	Resource Management



Statistics that Municipalities collect

- Through land use planning many Planning Offices will do an annual survey of employment lands to determine their use.
- Toronto Planning does the Toronto Employment Survey annually
- City staff have access to the raw data to undertake statistical analysis
- We can “plug” our known green companies into the survey to find what NAICS codes they are in
- We can then derive a “green intensity ratio” for each NAICS



This bulletin summarizes the findings of the 2018 Toronto Employment Survey. This information resource presents a picture of Toronto's economy based on a annual citywide survey of businesses. For more information, please visit us at: www.toronto.ca/your-name/locate-research-market-research-report/public-consultation



March 2019

Toronto Employment Survey 2018

Survey Highlights	
2018 employment	1,523,180
employment increase	26,940
employment growth	1.8%
business establishments	75,680
new business establishments	3,470
new manufacturing jobs	3,460
manufacturing job growth	2.6%
new office employment	18,990
office job growth	2.7%
service-based employment	78.1%
downtown job increase	21,820
downtown job growth	4.0%

A Dynamic City

Toronto continues to be one of the fastest growing cities in North America. Managing this growth while improving the city's livability and prosperity is a key objective of city building in Toronto.

With its competitive, diverse and connected economy, Toronto is well situated within the broader regional economy of southern Ontario. As economic conditions change over time, Toronto can build on these competitive advantages and create a vibrant city and region.

The Toronto area continues to prosper. From 2011 to 2018, Toronto GDP is estimated to have grown 3.2% per year, outpacing the average annual growth rates of both Ontario (2.1%) and Canada (1.8%).¹

The 2018 Toronto Employment Survey counted 1,523,180 jobs, an increase of 26,940 jobs or 1.8% from 2017.

In Toronto, growth is managed through the Provincial Growth Plan for the Greater Golden Horseshoe and Toronto's Official Plan. The Growth Plan (2017) directs municipalities to accommodate forecasted growth strategically by building compact and complete communities, making better use of land and infrastructure,

and providing opportunities for employment growth and business location.

The Growth Plan (2017) forecasts 3.4 million people and 1.72 million jobs in the City of Toronto by 2041.

Toronto's Official Plan, which came into force in June 2006, and which has subsequently undergone thematic policy updates, guides development in the city. Its policies promote economic prosperity by supporting growth and managing land use change.

Indirecting employment growth to certain areas, including Downtown, the Centres, Mixed Use Areas and Employment Areas, the plan helps create complete communities, focus transit and infrastructure investments and protect locations to support economic connectivity, citizens and business growth.

The 2018 Toronto Employment Survey offers a detailed picture of Toronto's economy, highlighting key citywide trends and emerging patterns in Downtown, the Centres, Secondary Plan Areas and Employment Areas.

In 2018, the Survey acquired employment data from 86% of identified businesses establishments. Excluding home-based employment, the Survey estimates it surveys over 99% of Toronto's business establishments.



Quantify: Example - Resource Management Segment

Resource Management		City (based on Toronto Employment Survey)				
NAICS	NAICS Category	Green Intensity Ratio	2012 Employment	2012 Net jobs counted in subsector	2017 Employment	2017 Net jobs counted in subsector
221310	Water supply and irrigation systems	100%	468	468	320	320
221320	Sewage treatment facilities	100%	75	75	341	341
237110	Water and sewer line and related structures construction	100%	181	181	269	269
237210	Land subdivision	0%	1,100	0	563	0
237990	Other heavy and civil engineering construction	0%	1,166	0	1,547	0
418110	Recyclable metal merchant wholesalers	100%	634	634	600	600
418120	Recyclable paper and paperboard merchant wholesalers	100%	0	0	12	12
484222	Dry bulk materials trucking, local	5%	0	0	3	0
541320	Landscape architectural services	0%			2,056	0
541330	Engineering services	4%	11,005	385	11,287	395
541360	Geophysical surveying and mapping services	5%	68	3	548	27
541370	Surveying and mapping (except geophysical) services	5%	101	5	147	7
541620	Environmental consulting services	100%	234	234	597	597
541690	Other scientific and technical consulting services	0%	4,190	0	4,462	0
541710	Research and development in the physical, engineering and life sciences	0%	1	0	3,603	0
562110	Waste collection	100%	988	988	1,223	1,223
562210	Waste treatment and disposal	100%	623	623	1,197	1,197
562910	Remediation services	100%	262	262	361	361
562920	Material recovery facilities	100%	54	54	120	120
562990	All other waste management services	100%	11	11	128	128
911910	Other federal government public administration	0%	11,871	0	7,573	0
912910	Other provincial and territorial public administration	0%	28,351	0	28,210	0
	Other local, municipal and regional public administration	5%	13,541	677	29,342	1,467
	subsector total			4,601	0	7,065

Global Trends in Green Sector Growth





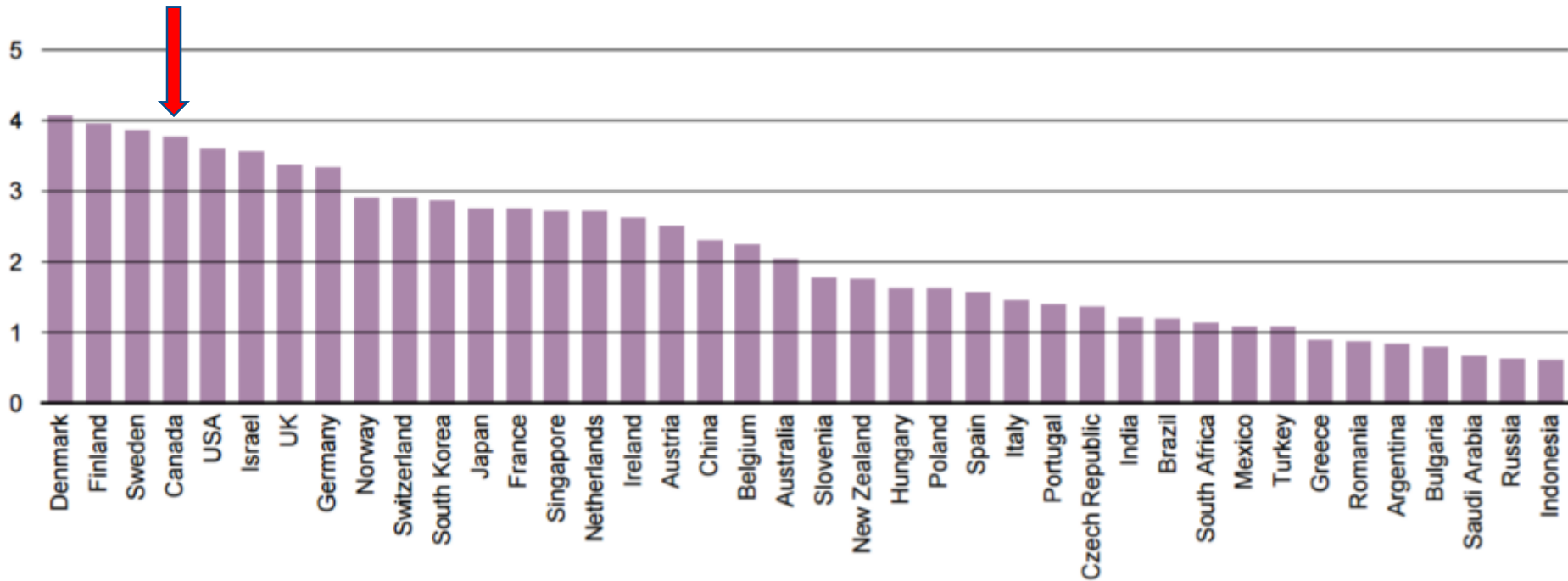
Green – A Rapidly Growing Sector Globally

- Globally the cleantech sector is expected to be worth \$2.5 trillion by 2022, a tripling of 2014 levels
- Prices are falling – green parity is or has been reached in many green techs
 - PV
 - **PV poised for global parity tipping point by 2030.** PV solar will become cheaper than gas and coal across most of the world's regions within a decade amid exponential growth all the way to 2050, according to McKinsey & Company.
 - Batteries
 - Research published recently in Nature Climate Change Letters shows battery pack costs may in some cases be as low as US\$300 per kilowatt-hour today, and **could reach US\$200 by 2020.**
 - Electric Vehicles
 - Report predicts 21m electric cars by 2030, **price parity by 2022**
 - LED Lights
 - The market value of LED lighting has continuously expanded in the past years with the progress of the technology. According to the latest report of LEDinside, LED lighting market scale will reach US\$ 33.3 billion in 2019 and **LED lighting market penetration will come to 63 percent in 2022** from 22 percent in 2017.



Canada's Green Sector in the Global Context

- Canada's Green Sector is consistently ranked in the top ranks of global indexes on innovation, research and supporting start ups





Storm Clouds?

- Canada's share of the global cleantech market has fallen from 1.6% to 1.4% since 2008 – a 12% decline
- Canada's international ranking fell from 14th to 19th place in cleantech merchandise exports from 2005 to 2014
- If Canada was to capture 1.6% of the global green market by 2025 then the sector would employ more people than the current automotive sector (130,000 direct jobs) in Canada

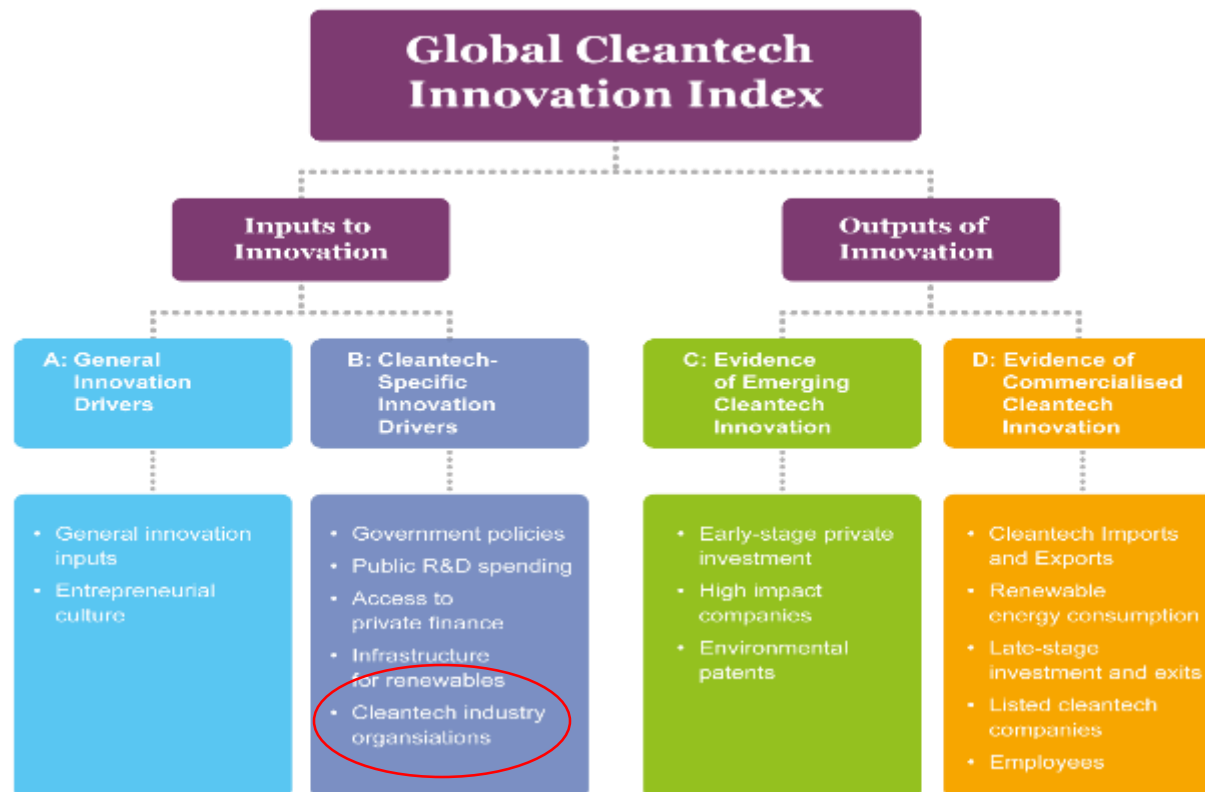
Challenges for our Green Industries





Tracking Green Industry Growth Drivers

- The Global Cleantech Innovation Index tracks industry growth drivers.
 - An important caveat to Canada's ranking: **“However, there are only a few cleantech organizations and clusters in Canada.”**

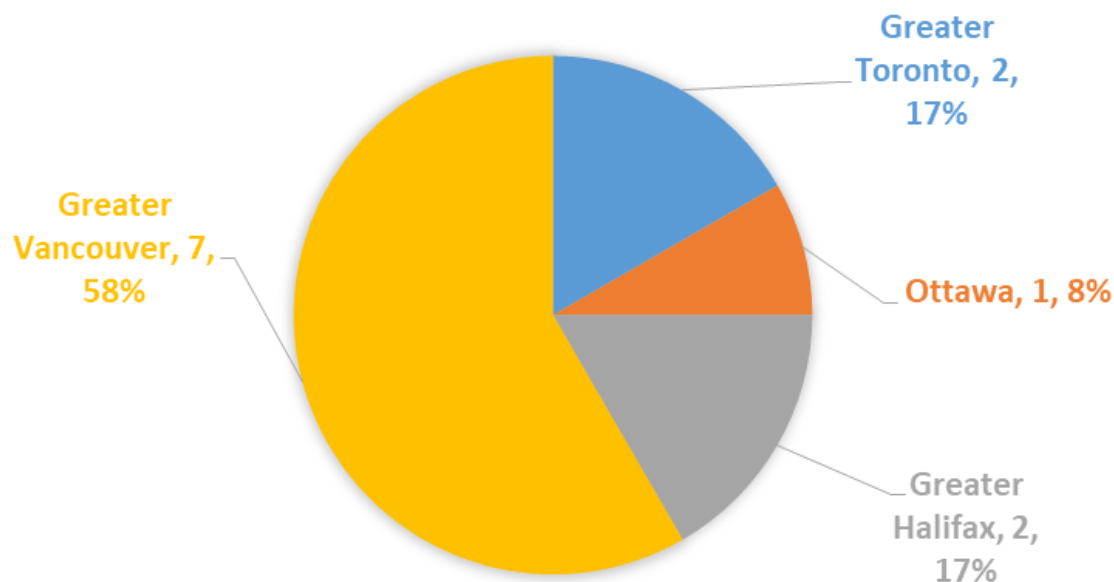




The Global Cleantech 100 – Toronto is under represented

- An annual selection (by a N.A. consulting/investment firm) of the top potential new “winners” in the sector
- 12 Canadian firms on the list – but only 2 are from Toronto

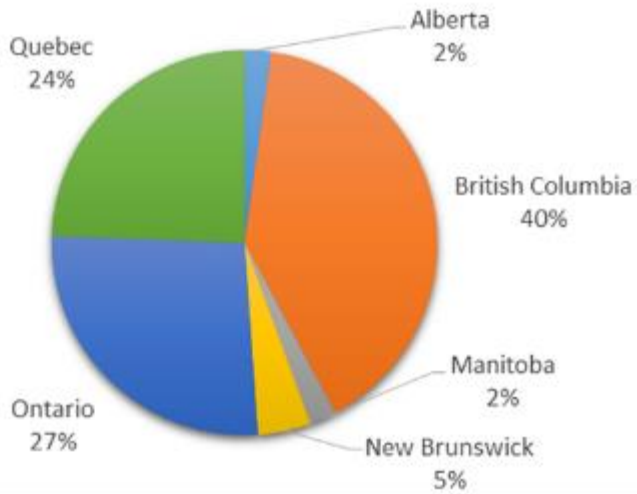
OF COMPANIES BY REGION



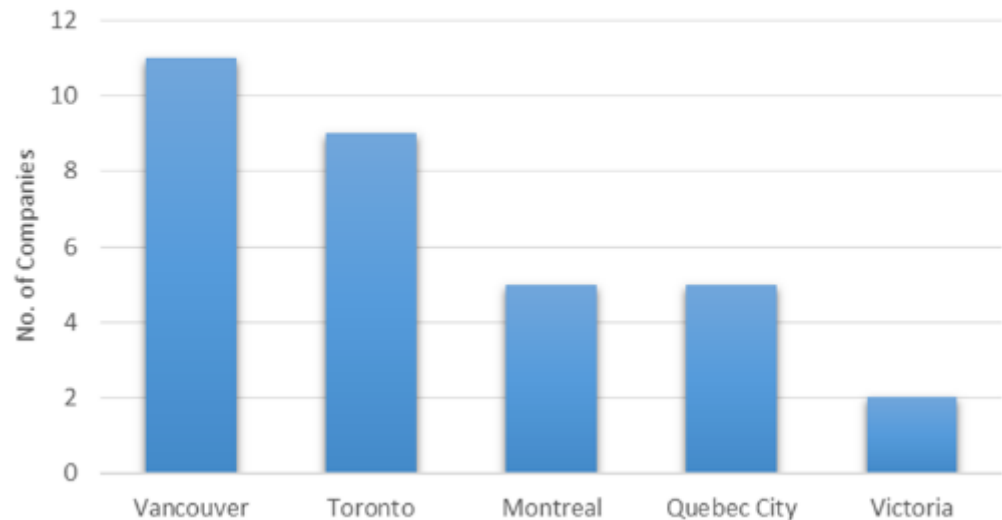


Bike Manufacturing is Lagging in Ontario

Bike Manufacturing in Canada
(Location of Companies)



Bike Manufacturing Centres in Canada





An Early Scan of Challenges

Challenges

- Unlike other sectors, in Canada the green sector does not have a single voice
 - There are over 40 green industry trade organizations
- Canada does not have a strong cluster eco-system. We have no local clean tech cluster organizations
- Numerous organizations are pointing to the lack of local green industry organizations in Canada as a barrier
 - Smart Prosperity Institute – Clean Innovation Discussion Paper
 - Global Cleantech Innovation Index (GCII)
- Articulating the economic impact and value of the green sector in Canada is difficult due to a lack of statistics
- Support for green is wrapped up in emotions and often is politically motivated. i.e. “job killing carbon tax”
- Canada’s clean tech sector’s growth may be lagging other leading countries – we’re losing ground. Toronto may be lagging even greater.

Developing our Green Industries Growth Roadmap





An Industry Growth Roadmap – What is it?

- Road mapping is a flexible planning technique to support strategic and long-range planning, by matching short-term and long-term goals with specific initiatives that can be undertaken by stakeholders.
- It allows the identification, by consensus, of key barriers to growth and focuses on early quick and do-able actions that help maximize growth and builds dialogue and strategic alignment between stakeholders.
- Unlike a Sector Strategy a Roadmap does not have to be complete in dealing with all the issues that may influence industry growth. A Roadmap selectively picks a few actions for early wins.
- The important thing is to put in place a plan that can be implemented that will have a positive impact on growth.





A Partnership to Help Maximize Growth

- Experience internationally shows that local government can be instrumental in supporting and initially steering local clusters growth.
- However ultimately it is the industry that needs to lead on initiatives.
- The Sector Development Office will need to work with partners in both the overall project and in each of the 5 sections of the Green sector in order to make this a successful long term initiative that will have impact.
- **Focusing on what is needed to grow the industry will speed up the adoption rate which is critical for government plans to battle climate collapse.**

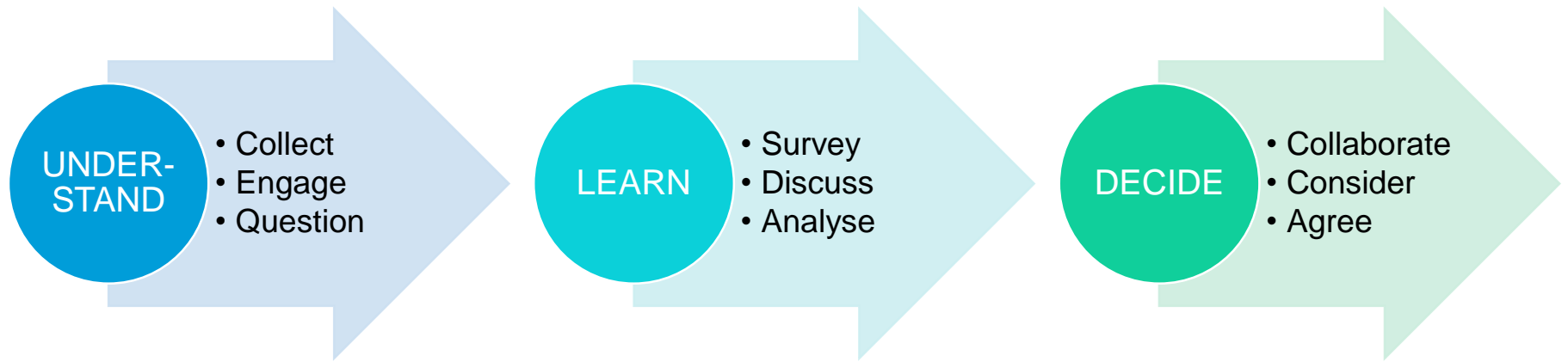


Regional Partnering – Toronto or the GTA?

- Economic clusters are local supply chains
 - They don't end at municipal boundaries
- The roadmaps are for the local supply chain not the sector that is located just in Toronto
- Resource constraints limit our analysis and cluster mapping to Toronto
 - However key stakeholders in each cluster that may be outside of Toronto are invited to participate in the surveys, consultations and road mapping
- Opportunity: Other GTA municipalities are encouraged to collaborate with us to support a greater impact on the green industries in their towns and cities.



Three Steps to Action





Phase 1: Understand

- Establishment of a Sector Wide Advisory Committee
 - Multi-stakeholder and cross sectoral representation to provide advice to the project team
 - Example: the resource management segment has distinct separate clusters (water and recycling as an example) – what is the best way to identify each clusters growth opportunities?
- Asset Mapping of the 5 Segments of the Sector
 - Stakeholders, influencers and supporters
 - Charting out the supply chain of the green clusters
- Online Consultation – Opportunities for Growth
 - Short online scan/questionnaire to identify key areas
 - LIVE NOW - https://cotsurvey.chkmkt.com/green_industry_consultations
- Key Data Analysis
 - Updated modelling to refine estimates of size of the green sector – green buildings for example is using 2010 data



Initial Online Consultation (Live Now)

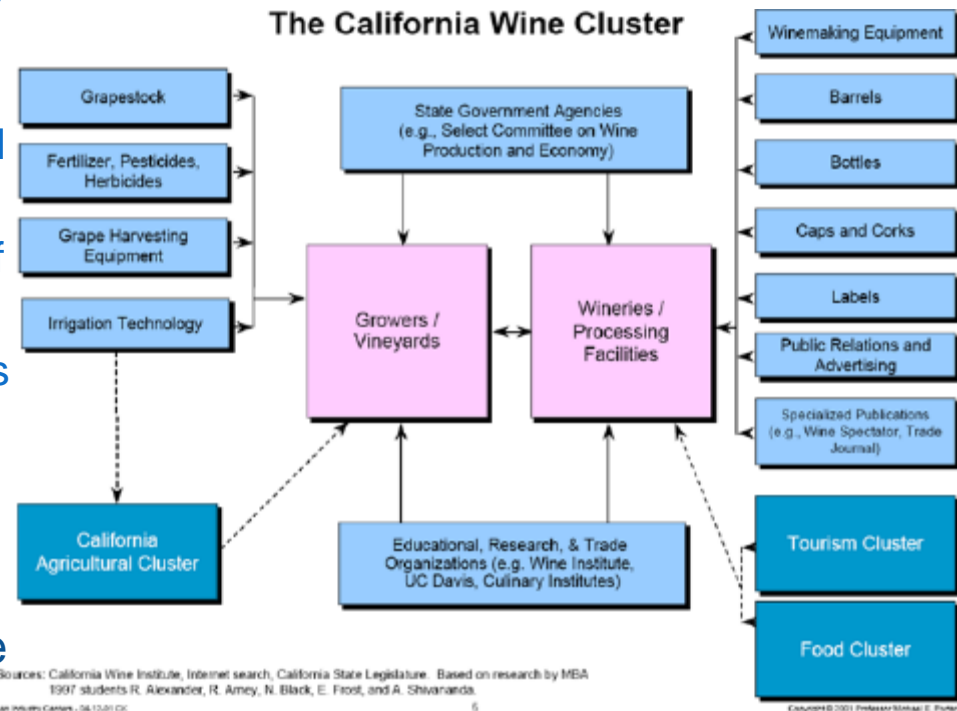
- Objective: to get a sense on what is perceived as the significant issues (non-quantitate) that can be drilled down in the consultation phase

- 1 What do you think is the greatest challenge facing Toronto's green sector?
- 2 What are the best ways to overcome these challenges?
- 3 What do you think are the best opportunities for Toronto green sector?
- 4 What are the main barriers to achieving these opportunities?
- 5 How might governments (please identify what level) support the growth of the green sector in Canada?
- 6 What can green industry organizations and stakeholders in Canada do to best support the growth of the green sector in Canada?
- 7 Do you have suggestions on what would help Toronto's green sector become more competitive?
- 8 Please provide any additional comments or suggestions on what you feel is needed to support the growth of Toronto's green sector.



Asset Mapping

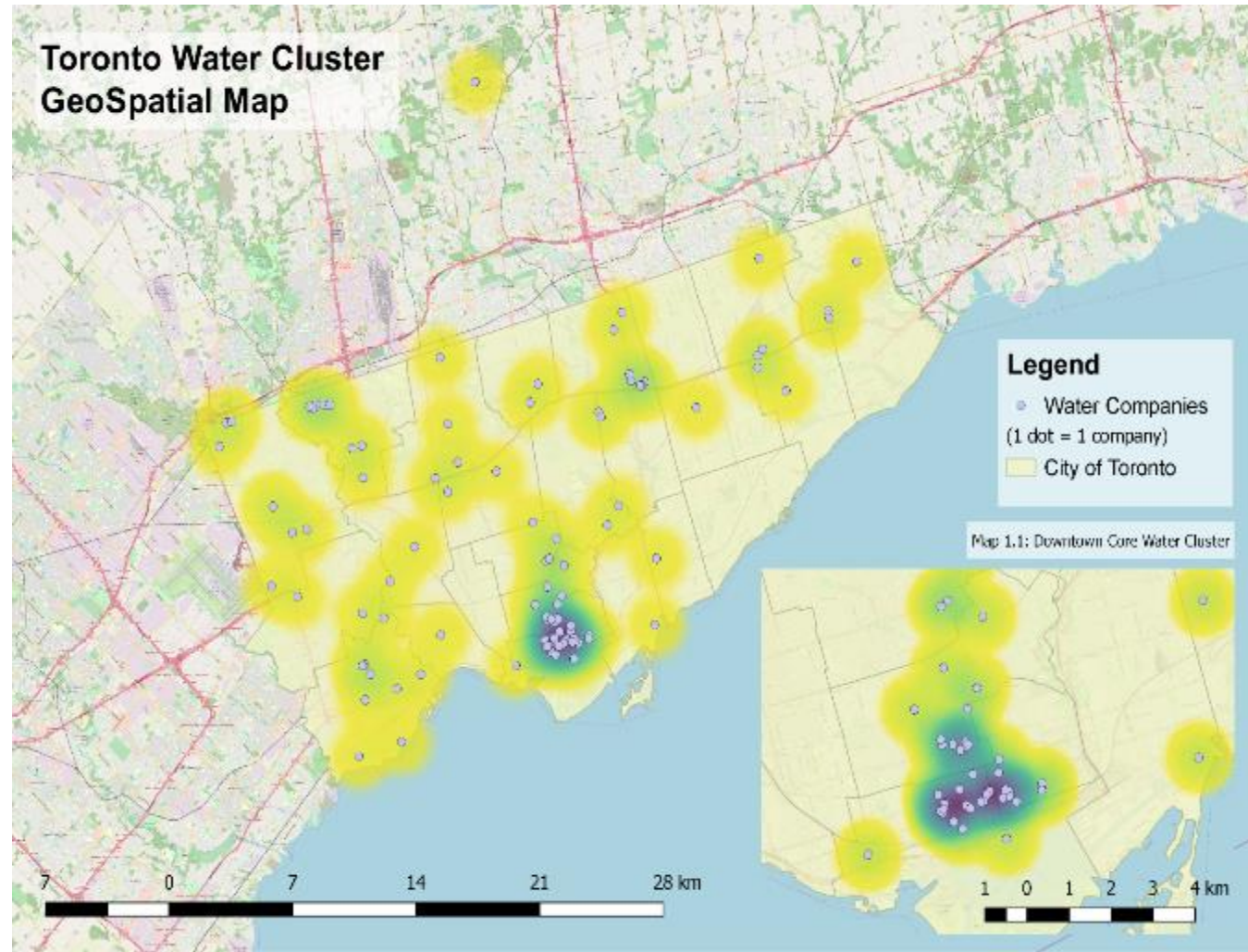
- What is it?
 - Cluster structure diagrams: showing the input-output linkages between different stakeholders of a cluster. This helps define the composition of the cluster and is the first step to any cluster analysis
 - Cluster geo-spatial mapping: mapping of stakeholders on a geographic map
 - Cluster Mapping: using various data sets to analysis the strengths and weaknesses of a cluster and provides opportunities to identify challenges and opportunities.
- Asset Mappings are often an extensive undertaking – for this project its an “asset map light”





Toronto's Water Cluster – Location of Firms

- Preliminary estimate of no. of firms in Toronto's water cluster: **120**





Phase 2: Listen

- Comprehensive on-line and in-person survey to understand the industries strengths, weaknesses, threats and opportunities and provide a perceptual analysis of the priority areas to maximize growth
- The report will be broken down to analyze the issues and specific needs of each of the 5 segments of the sector





Phase 3: Decide

- Roundtables for each of the 5 sections to identify key priorities for actions in each of the sectors
 - Issue: some sections are diverse and we will need to decide on a roadmap for a specific cluster of the section (i.e. the water or recycling section of Resource Management)
- Development of draft roadmap reports
- Workshop of Green Sector key stakeholders from all 5 sections:
 - Challenge statement: how can we get the sector working together?
- Follow up meetings on section roadmaps – next steps and establishment of action teams.





NOW: Next Steps as of April

- The City will work with industry associations, cluster organizations, environmental groups, GTA municipalities and other stakeholders to develop the roadmap paths
- Partnerships on the work, communication, and long term vision
 - This will include the development of MOUs related to work, collaboration, communication vehicles
 - Small advisory committee composed of stakeholders from all subsectors
 - Data collection
 - “Toronto Green Industries” website? Partners
 - Advice on survey content – key questions to ask all green stakeholders
 - Organizing specific cluster roundtables
 - Review and sign on to the roadmaps

Cluster Development – an opportunity for local economic development





Defining Sectors, Clusters and Industries

- Economists have our own vocabulary 😊
 - Often the terms we use are interchangeable but may mean different things to specific stakeholders
- Sectors
 - Generally linked to industry classification codes of companies that do the same thing – for example NAICS 31183 is for Tortilla manufacturing which is a category of NAICS 311 – Food manufacturing.
- Clusters
 - Companies that are part of a supply chain - i.e. the corn mills that supply the tortilla makers and the food stores that sell the tortillas are part of the tortilla cluster.
- Industries
 - Often linked closely to sectors – i.e. industry sectors of the economy
 - However for the road mapping we're using it to identify all the various supply chains that are found linked to core green sector segments.



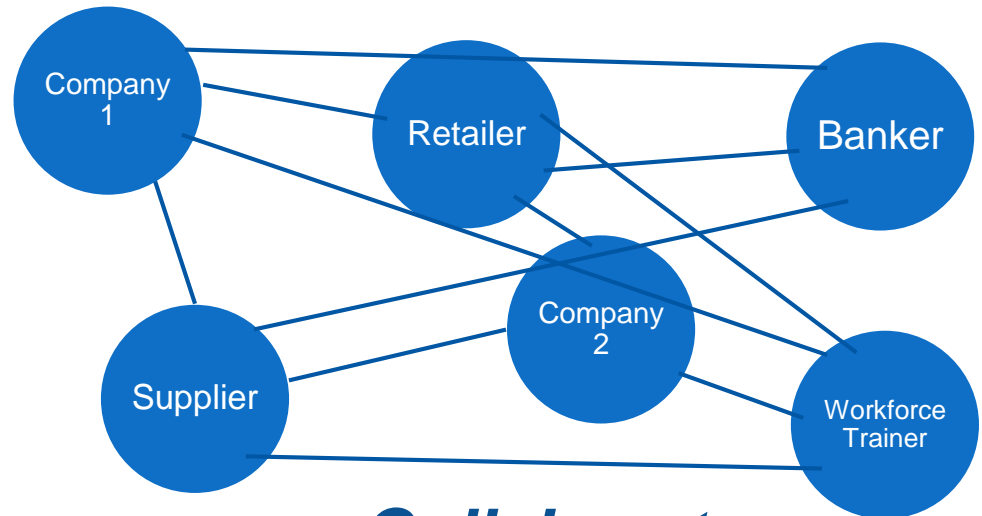
Sectors vs. Clusters

Sector



Competitors

Cluster



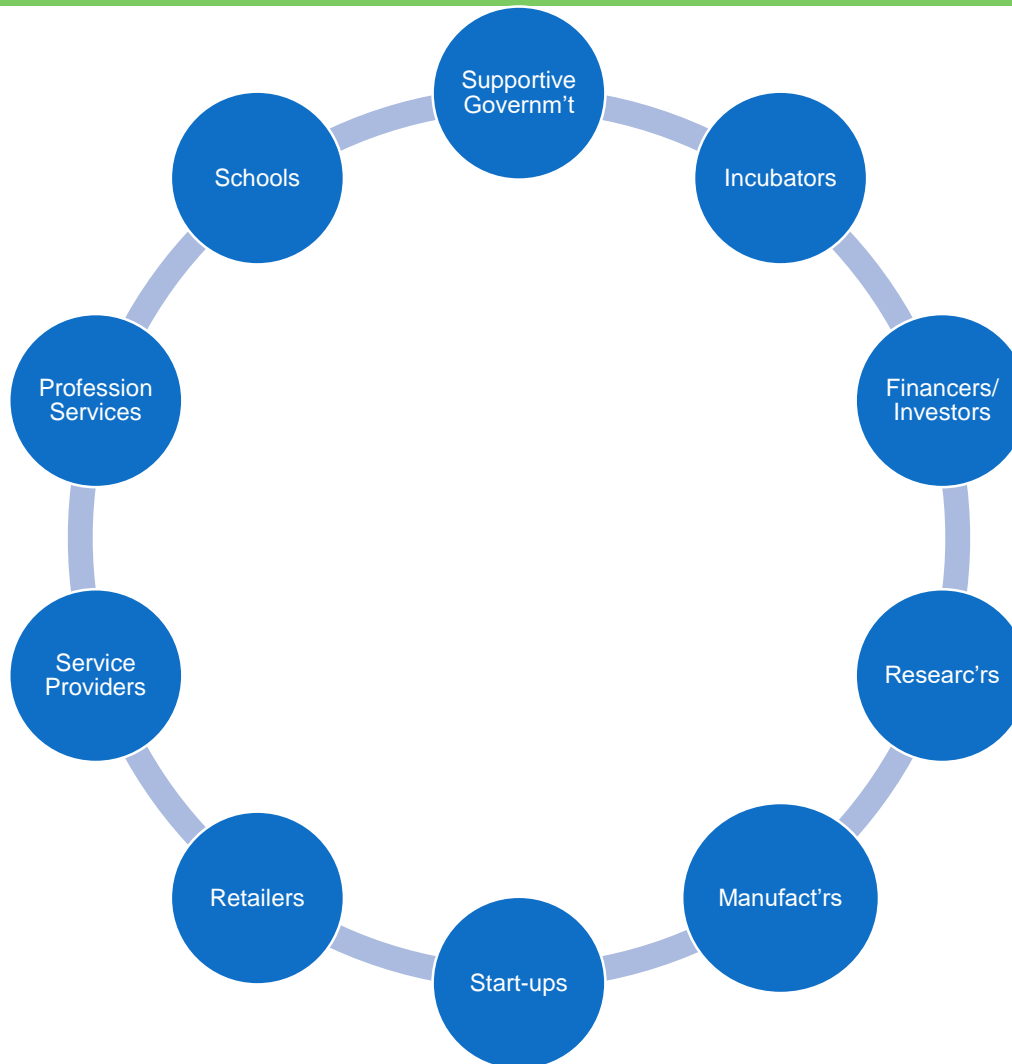
Collaborators

- Industry Organizations
 - Role: To find common ground that everyone agrees on

- Cluster Management Organizations
 - Role: To create actions that will stimulate growth of the cluster

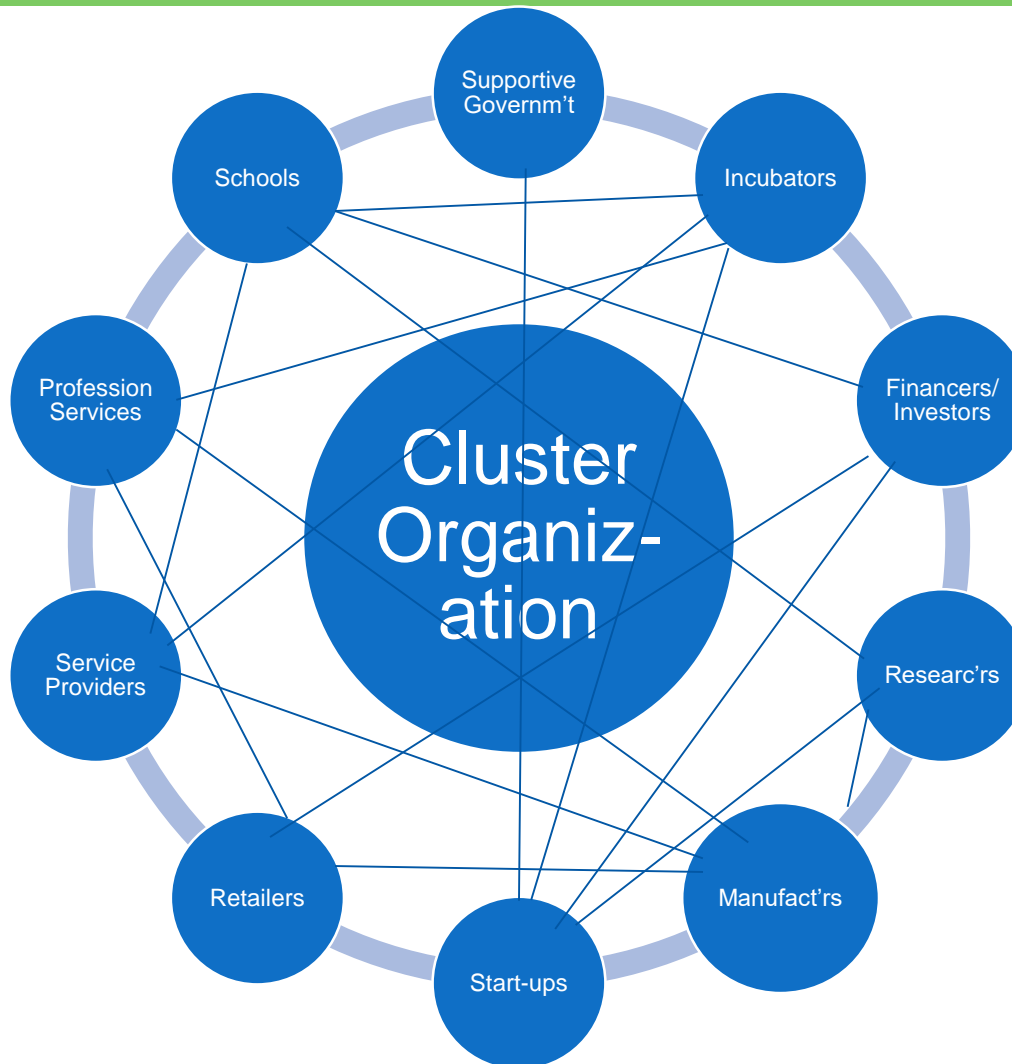


Components of a Industry Cluster





The Ties that Bind





We Lack Cluster Organizations in Canada

- In Toronto we have 2 cluster organizations
 - Toronto Finance International
 - TO Health
- Ontario has over 40 industry organizations that represent the local green sector
- In Canada there is only one green cluster organization
 - Ecotech Quebec
- In Greater Copenhagen (Denmark's population is 5.8m) there are 40 cluster organizations
- Good examples of Green Cluster organizations globally
 - CLEAN (Denmark)
 - Cleantech San Diego

Greater Copenhagen Cluster Catalogue

2017

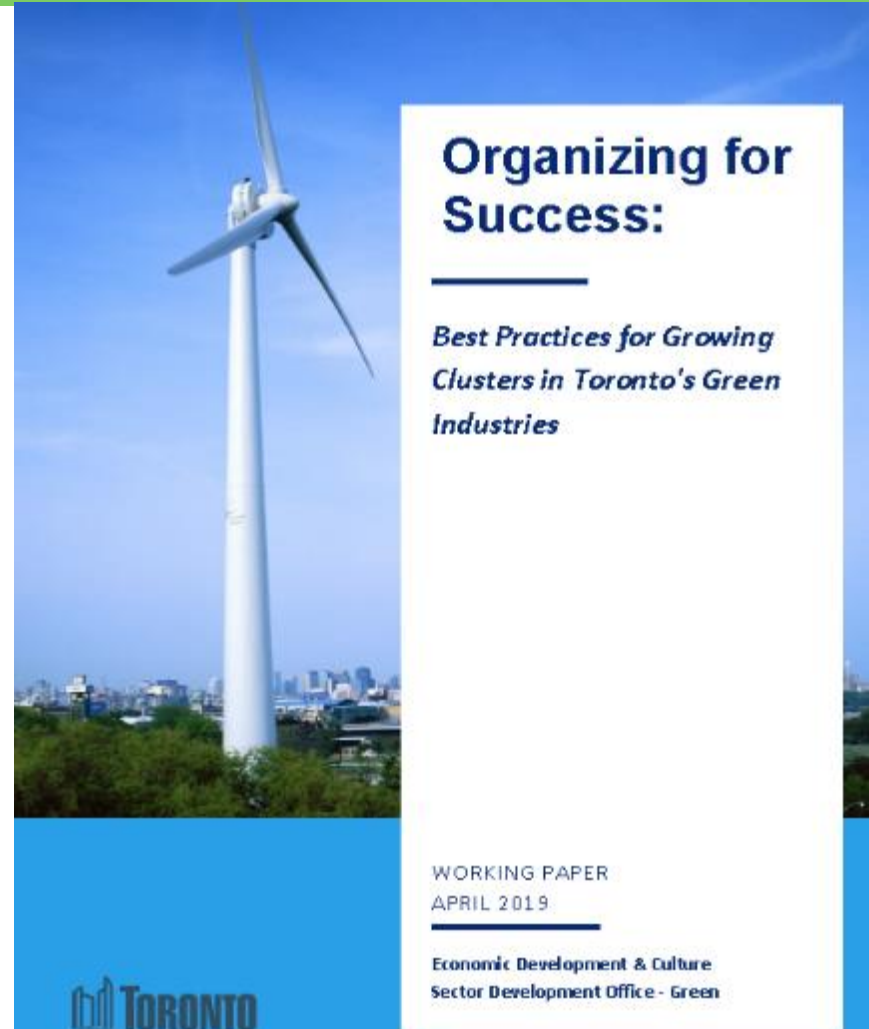


GREATER
COPENHAGEN



Starting the Discussion on Green Clusters in Toronto

- Toronto has just released a report
 - Best Practices for Growing Green Clusters in Toronto's Green Sector
- An excellent report also just released
 - The Canadian Cluster Handbook





Resources and Links

- Toronto's Green Industries Growth Roadmap – on line consultations
 - <https://s.cotsurvey.chkmkt.com/?e=152168&d=t&h=E67125ACC8312F1&l=en>
- Best Practices for Growing Green Clusters in Toronto's Green Sector
 - <http://www.cagbctoronto.org/images/Best-Practices-on-Growing-Green-Clusters.pdf>
- The Canadian Cluster Handbook
 - https://www.competeprosper.ca/uploads/WP_34_The_Canadian_Cluster_Handbook_Final.pdf
- Toronto Employment Survey
 - <https://www.toronto.ca/city-government/data-research-maps/research-reports/planning-development/toronto-employment-survey/>
- CLEAN Denmark
 - <https://www.cleancluster.dk/en/>
- Cleantech San Diego
 - <http://cleantechsandiego.org/>
- Toronto Finance International
 - <https://tfi.ca/>
- TO Health
 - <http://healthcluster.ca/to-health/>

**LETS DISCUSS – WHAT IS YOUR MUNICIPALITY DOING AND HOW
CAN THE GTA MUNICIPALITIES COLLABORATE TO MAXIMIZE THE
GROWTH OF OUR GREEN INDUSTRIES?**

Contact Information

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