



# The Green Market Acceleration Program

*Accelerating the Development of Made-in-Toronto Green Technologies  
Through Collaboration with the City  
19-sep-18*

**Rob McMonagle** Sector Development Office





# Presentation Outline

- Technology Development Challenges
- How City Governments can Help Private Sector Innovation
- How the Program Started
- The Green Market Acceleration Program – What it is
- The GMAP Intake Process and Selection Criteria
- Our Projects and Successes
- Challenges & Helping Support Innovation





# Technology Development Processes & Challenges

- New products and technologies often follow a standard path in converting an idea into a commercial product
  - The Technology Readiness Level (TRL) is an index to measure the maturity and usability of an evolving technology.

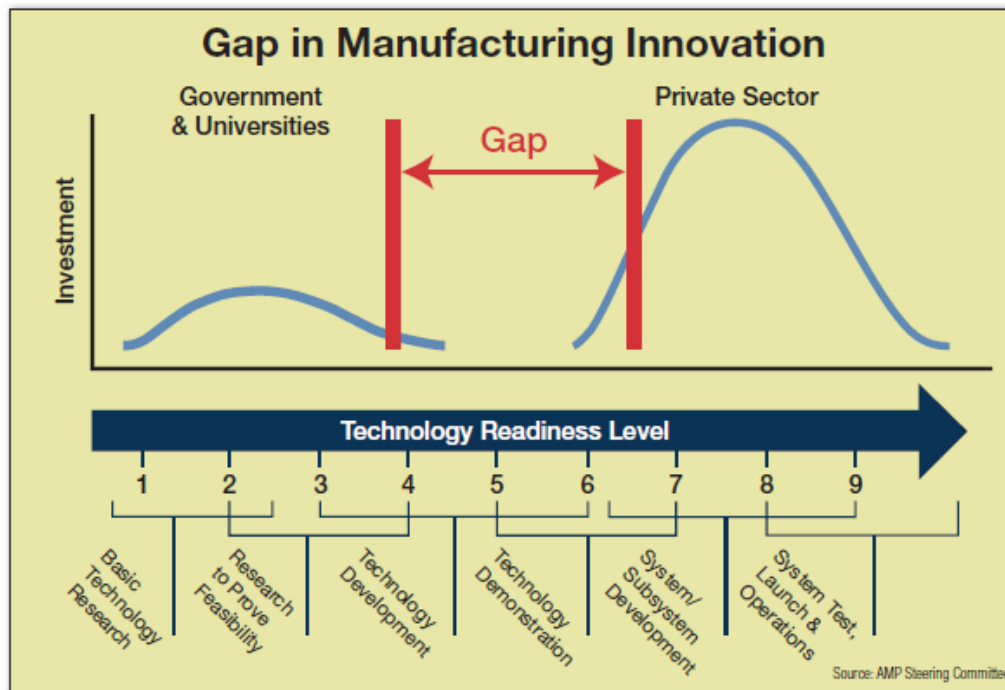
## Technology Readiness Levels

- TRL 0: Idea.** Unproven concept, no testing has been performed.
- TRL 1: Basic research.** Principles postulated and observed but no experimental proof available.
- TRL 2: Technology formulation.** Concept and application have been formulated.
- TRL 3: Applied research.** First laboratory tests completed; proof of concept.
- TRL 4: Small scale prototype** built in a laboratory environment ("ugly" prototype).
- TRL 5: Large scale prototype** tested in intended environment.
- TRL 6: Prototype system** tested in intended environment close to expected performance.
- TRL 7: Demonstration system** operating in operational environment at pre-commercial scale.
- TRL 8: First of a kind commercial system.** Manufacturing issues solved.
- TRL 9: Full commercial application,** technology available for consumers.



# The Valley of Death in the Creation of Innovation

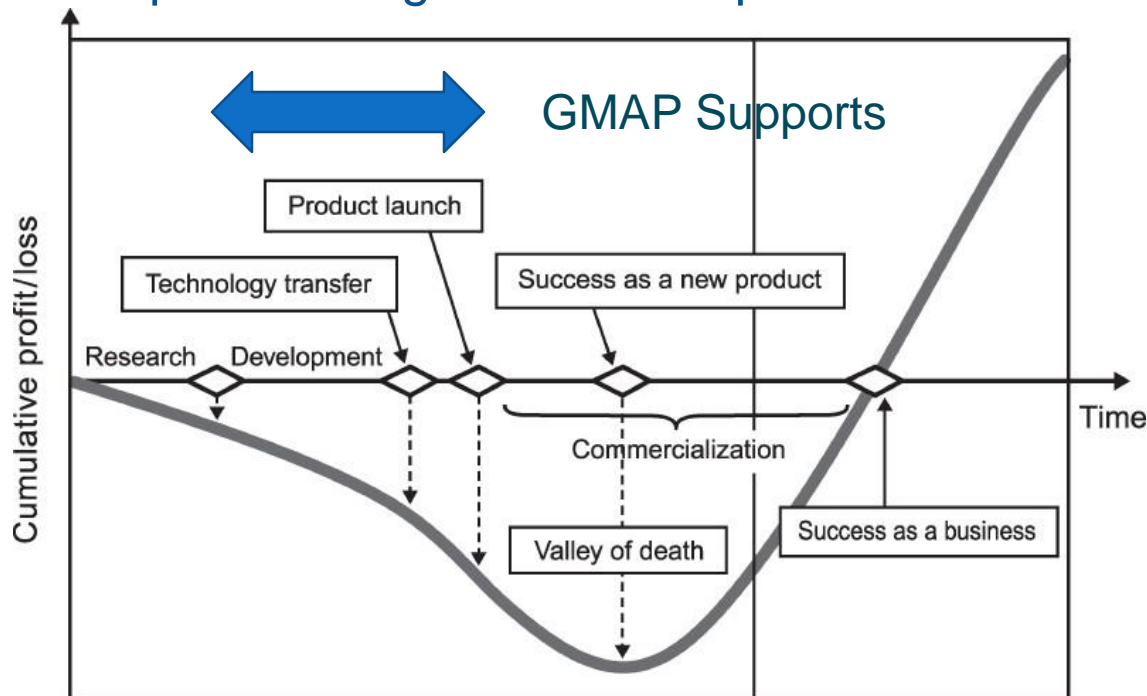
- Governments and universities support basic research (TR1-3)
- But once out of the lab the innovators are faced with few support programs until such time confidence is gained from the private sector to invest (TRL 8+) or government programs that support equipment purchasing and international marketing kick in





# The Valley of Death for New Products

- New companies are where innovation tends to accelerate as larger, established companies (just as governments) become cautious and conservative.
- However new companies face a funding crisis between the “idea” and the time the product begins to create profits or investors arrive





## Supporting the Development of Green Technologies at a Local Level

*“One of the most important potential types of customer for a typical cleantech company is the city.”* Cleantech Scandinavia report

- Toronto, like most municipalities, does not have the resources to provide financial support programs for companies to grow however we have two important resources:
  - We own the infrastructure and local buildings/property
  - We have a professional civil service with a large knowledge base operating the infrastructure.





# Early Pilots of the Concept

- Economic Development field and sector staff regularly work with local firms to overcome challenges
  - Includes finding locations they can demonstrate or pilot new technologies:
    - Morgan Solar – looking for a location to test their solar concentrator
    - HydroStor – needed a waterfront location to install their pilot plant
    - Sawmill Sid – does the City have enough high quality “waste wood” that they could produce lumber from?
  - Also we get requests to have the City evaluate or provide expert advice on potential technologies:
    - Waterless cleaning of automobiles
    - Samples of waste water to see if a biological process could provide a cleaning solution





# Overcoming the Silo Effect

- City divisions have specific files they are responsible for
  - Toronto Water (for example) looks after the supply of clean water and disposal of dirty water
    - From a purely divisional point of view - they have no interest (or resources) to see a local company succeeds
  - Economic Development has little leverage to encourage them to help a local company
- **SOLUTION:** Get Council mandate that divisions need to help local companies test their products





# The Green Market Acceleration Program (GMAP)

- Passed by Council in September 2015 as a pilot
- Passed by Council in May 2018 as a 4-year program (renewable every 4 years)
- Key elements:
  - Council direction for City Divisions to work with GMAP to assist local companies in their applied research, pilots and demonstrations needs
    - Important as Divisions are focused on their core activities and files
  - Allows City Divisions to sign agreements where there is no financial transaction



# What is GMAP?

- The GMAP team works with local companies who need:
  - Applied research - advice, data, or samples from City experts while they are developing their product
  - Proof of concept – testing site for the product
  - Pilot, demonstration and evaluation – full scale operation of a near market ready product
- GMAP acts as:
  - An advocate for the project to find an appropriate host Division
  - Review the proposal to ensure its viable and meets specific criteria
  - Act as the “project manager” for the proposal, facilitating the legal agreement, acting as the go-to person on issues, and overseeing any installation work
- Note – this is not a funding program – so the company needs to cover all costs. However we’ve partnered with the feds and province (past tense) to fund a number of our projects.



# What Do We Mean By Green?

- *There is often confusion on what is meant by green, clean-tech, sustainable, etc.*
- *EDC uses the following definition:*
  - ***The green sector is economic activity that produces products or services that directly or indirectly reduces the impact of human activities on the environment.***
  - *So GMAP can cover a significant variety of potential products and services....*





# What Types of Projects Do We Accept? – Using TRL

- GMAP operates in the:
  - TRL3 - TRL4 for knowledge transfer
  - TRL5 - TRL8 for pilots and demonstration

## Technology Readiness Levels

**TRL 0: Idea.** Unproven concept, no testing has been performed.

**TRL 1: Basic research.** Principles postulated and observed but no experimental proof available.

**TRL 2: Technology formulation.** Concept and application have been formulated.

**TRL 3: Applied research.** First laboratory tests completed; proof of concept.

**TRL 4: Small scale prototype** built in a laboratory environment ("ugly" prototype).

**TRL 5: Large scale prototype** tested in intended environment.

**TRL 6: Prototype system** tested in intended environment close to expected performance.

**TRL 7: Demonstration system** operating in operational environment at pre-commercial scale.

**TRL 8: First of a kind commercial system.** Manufacturing issues solved.

**TRL 9: Full commercial application,** technology available for consumers.



# Selection Criteria for Projects

1. Is this a green technology or service?
2. Is the project in TR3-4 (for knowledge) or TR5-8 (for pilots)?
3. Company's ability to implement the project and bring the product to market
4. Amount of effort required by the City – GMAP program team and the ask of the host Division
5. Compatibility with City assets
6. Potential local economic benefits (jobs, dollars brought into the region)
7. Potential environmental benefits – on both a local and global scale
8. Potential benefits to the City government (could this be of value for future adoption or through the regular procurement process?)



# Program Process – Making It Simple

- The GMAP program is really a vetting and introduction service – there is no detailed process.
  1. Potential firms submit an application on line
  2. We vet the applications to insure that this is not a sales pitch to the City. That the intent is to help a company bring a product/service to market and that they would cover all costs for their "pilot."
  3. We work with the applicant to provide an "elevator pitch" which the GMAP team uses to approach potential host City agencies.
  4. If the host City agency is interested then we help coordinate introductions, meetings and an agreement between the applicant and the agency (we have some basic guidelines to this). In many cases this can be a simple 1-pager.





# Projects during the Pilot Stage (2015-2017)

Company	Project Description	City Host Division
<b>Screaming Power</b>	Development of a mobile app for monitoring building performance.	Environment and Energy Division
<b>Peak Power</b>	Use of City building energy data to model the impact of energy storage systems to reduce peak energy demand.	Environment and Energy Division
<b>Advance Property Solutions</b>	Demonstrating software that stores, digitizes and instantly delivers critical information to first responders via smart wireless technology	Toronto Fire Services
<b>Feedback Solutions</b>	Testing of an occupancy-based demand ventilation controller	Environment and Energy Division
<b>Alert Energy</b>	Testing of a building monitoring system that integrates the various utility billing and meter data into a single tool.	Environment and Energy Division
<b>eSight</b>	Staff volunteers to test the eSight device. The eSight device is designed to reduce the impact of certain vision conditions for staff with vision-related disabilities	Economic Development and Culture
<b>Club Coffee</b>	Testing of compostable coffee pods in the Solid Waste Green Bin composting system	Solid Waste



# Some Cool Projects We're Working on Now

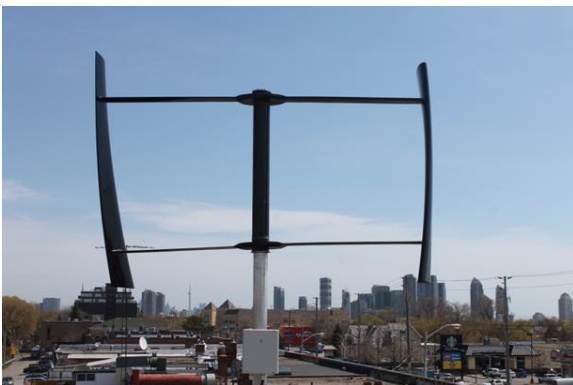
Currently 16 projects in various stages of development & implementation



Street Tree Surfacing (BIA)



Fold Away Bike Handles (Toronto Police)



Urban Wind Generator (Environment)



Bio Plastic from Food Waste (Solid Waste)



# Challenges

- Lack of resources
  - This is done off the side of the desk of two staff
  - Low priority by management to support it to be highly successful
- Projects take time
  - Firms are in most cases start ups – lots of hand holding
    - Poor pitching skills
    - They often hope to make a sale to the City and focus their pitches on “do you want to buy this?”
    - No firm understanding of project planning and the resources they’ll need to dedicate to make their projects successful
  - Finding the right contact in potential host divisions consumes a lot of time – then countless meetings to kind a champion inside the division
    - Still get “this is not part of our core mission” argument a lot – particularly from some divisions
  - Agreements between the company and the host division takes a lot of time





# Can't Keep a Good Idea Down

- There is a trend toward creation of municipal “Chief Innovation Officers” in many progressive municipalities
  - GMAP is helping encourage the creation of informal “chief innovation officers” at the Divisional level
    - Leading divisions such as Solid Waste – Innovation and Circular Economy Office – they are bringing projects to us
- This is an opportunity for City divisions to evaluate innovations they would not normally be exposed to
  - Key change in City procurement policies in 2017
  - As a result of the CETA trade agreement all governments had to put this in to procurement polities
    - A non-competitive procurement may be undertaken where both the proposed non-competitive procurement and the particular supplier can be justified in good faith, based on one or more of the following:
    - **N. Procurement of a prototype or a first good or service that is developed in the course of a contract for research, experiment, study or original development;**



**Contact Information**  
**Rob McMonagle**  
Senior Advisor, Green Sector  
Sector Development Office  
Economic Development & Culture  
City of Toronto

**[rmcmona@toronto.ca](mailto:rmcmona@toronto.ca)**

**[www.toronto.ca/gmap](http://www.toronto.ca/gmap)**

