MANDATE

The Task Force will examine the status of Clean Tech and Clean Technologies in Canada, and identify opportunities for North Grenville to pursue and potentially adopt strategies and opportunities to expand access to these technologies.

Any recommendations made to Council by the Taskforce should include:
- Proposed actions that may be taken by the Municipality to investigate and/or increase Clean Technologies, Green Technologies, create potential Clean Tech job opportunities and foster a thriving Clean Tech industry in North Grenville.

Recommendations will consider the needs of a broad range of residents and businesses, and could include the possibility of applying for grant opportunities as well as forging partnerships within the community to leverage existing assets to investigate approaches and practices that advance Clean Tech, Clean Technologies, and Nature-Based Solutions.

SCOPE OF WORK

- Identify and map current Clean Tech/Clean Technologies by sector already in use in North Grenville
- Explore potential partners and partnership strategies with the private, non-profit, and government sectors to assist in pursuing Clean Tech, Clean Technologies, and Nature-Based solutions
- Identify opportunities to create the conditions for conversion to clean technologies for residents and businesses in the municipality, including external government grants and other sources of funding
- Identify opportunities to pursue external funding for new initiatives related to Clean Tech, Clean Technologies, and Nature- Based Solutions
- Assess and analyze current and projected needs for Clean Tech and Clean Technologies within the Municipality
- Identify enablers and inhibitors in the current municipal by-laws, policies, procedures, and those at the provincial and federal levels related to increasing Clean Tech, Clean Technologies, and Nature-Based solutions
- Leverage preexisting forums to share best practices that promote Clean Tech, Clean Technologies, and Nature-Based solutions in other Municipalities.

DEFINITIONS

Clean Tech, also known as Clean Technology, refers to technologies and innovations developed with the primary aim of minimizing environmental impact or promoting sustainability. These technologies encompass a wide range of fields, including renewable energy, energy efficiency, sustainable transportation, waste management, and water conservation.

Examples of ***Green Tech*** include:
- Biofuels derived from renewable biomass sources like algae, corn, or sugarcane

as alternatives to fossil fuels.

- Advanced recycling technologies for processing and repurposing waste materials into new products or energy sources.
- Green building techniques and materials include eco-friendly insulation, passive solar design, and sustainable construction practices.
- Carbon capture and storage (CCS) technologies that capture carbon dioxide emissions from industrial processes and store them underground to prevent release into the atmosphere.
- Smart grid systems that optimize energy distribution and consumption, integrating renewable energy sources and improving overall grid efficiency. Nature-Based Solutions- Nature-based solutions (NBS) involve utilizing the inherent qualities of natural ecosystems to address environmental challenges and promote sustainability.

Examples of ***Nature-Based Solutions*** include:

- Reforestation and afforestation projects to restore degraded forests and sequester carbon dioxide from the atmosphere.
- Green infrastructure initiatives include constructed wetlands, vegetated swales, and permeable pavements to manage stormwater runoff and reduce urban flooding.
- Coastal restoration efforts like mangrove reforestation and oyster reef restoration to protect shorelines from erosion and storm damage while providing habitat for marine species.
- Sustainable agriculture practices such as agroforestry, cover cropping, and rotational grazing that enhance soil health, biodiversity, and carbon sequestration.
- Urban green spaces and biodiversity corridors that improve air quality, regulate temperatures and provide habitat for wildlife while enhancing community well-being.

(N.B. The terms are often used interchangeably: *Clean Tech/Green Tech* and *Clean Technology/Green Technology*. The above definitions are select examples. The Task Force Terms of Reference should clarify definitions when referring to the terminology.)

SECTORS

Agriculture & Food

- Plant-based foods, regenerative agriculture, biofertilizers, soil carbon measurement

Energy & Power

- Innovative renewables, long-duration energy storage, grid flexibility, green Hydrogen

Materials & Chemicals

- Biochemicals, advanced materials, carbon to fuels

Transport & Logistics

- Electric vehicles, sustainable aviation fuels, clean shipping

Resources & Environment

- Carbon capture and utilization, water efficiency, automated waste sorting, circular construction

Enabling Technologies

- Geospatial, quantum computing, and artificial intelligence applied to cleantech

DEPUTATIONS/DELEGATIONS RECEIVED BY THE TASK FORCE

July 15, 2024,
Supporting Municipalities: Green Municipal Fund
Carly Steben & Jill Sturdy, FMC

September 16, 2024,
Clean Air Partnership
Gaby Kalapos, Executive Director

October 21, 2024,
1. Federation of Canadian Municipalities (FCM) Opportunities
Susan Smith, Municipality of North Grenville - Funding and Grants Research Analyst

2. Community Futures Grenville Seeking the Task Force's advice on business needs in the Clean Technology sector.
Katie Nolan, Community Futures Grenville - Executive Director

3. Compostable Yard Waste Program Mike Finley, Municipality of North Grenville - Director of Public Works

November 25, 2024,
Town of Caledon, Resilient Caledon Community Climate Action Plan
Alexandra (Allie) Service https://www.caledon.ca/en/news/resources/Community-Climate-Change- Action-Plan_2021.pdf

December 16, 2024
1. Creating Resiliency, Lowering Emissions, etc.
Janice Ashworth

2. Climate Action Plan
Hillary Geneau, Director of Corporate Service

FORWARD PLANNING: Research, Analysis, Rationale, and Strategies

1. The Mayor's Task Force on Clean Tech should set out as a first task acceptance and publication of canonical definitions that reflect accepted government and industry standards and reference the baseline standards for each.

2. The canonical definitions should be drawn from Federal and Provincial Terminology for the purposes of funding applications and materials that help inform residents of the Municipality of North Grenville, with particular emphasis on international climate science, technology, and ecosystems terminology, for example, without limitations.

3. The Mayor's Task Force on Clean Tech has requested an Open Repository for resources, maps, explainer sheets, hyperlinks to relevant online documentation, etc., and any additional reports and presentations by Committee Members at Task Force meetings, public events, conferences, etc.

4. The Open Repository will provide residents, businesses, and prospective partners a barometer of North Grenville's readiness for new business ventures in Clean Tech, Green Tech, and Nature-Based Solutions. It will be a curated resource for residents considering renovation, retrofitting, remediation, and new technologies for their homes and businesses.

5. Collaborative Design: the Task Force with Municipal Staff shall prepare the parameters of: surveys, data analyses, analytical studies of community resources, and projected community economic development potential, not limited to the generality of the foregoing.

6. Vital to North Grenville's competitive profile and potential as a prospective partner, the ideal location for business and academia are the following factors: Remediation of issues that hamper North Grenville's progress and viability as a premium locale for commerce and academia.

7. North Grenville should adopt a strategic approach to foster academic research partnerships with regional institutions of higher learning based on the following rationale and strategies:

Rationale

1. Leverage Geographic Advantage: North Grenville's central location between Ottawa and Kingston provides unique access to multiple prestigious institutions.

2. Enhance Innovation Ecosystem: Partnerships can stimulate local innovation and attract clean tech companies.

3. Talent Attraction and Retention: Collaborations can create opportunities for skilled graduates and potentially retain talent in the region.

4. Economic Diversification: Research partnerships can support the growth of knowledge-based industries in North Grenville.

Strategies

1. Identify Niche Strengths

- Conduct a local asset inventory to identify unique resources or challenges that align with academic research interests.
- Focus on areas where North Grenville can offer distinctive research opportunities, such as rural sustainability or Agri-tech.

2. Establish a Research Liaison Office

- Create a dedicated office to coordinate with academic institutions and local stakeholders.
- Develop a database of local resources, facilities, and research opportunities to share with potential academic partners.

3. Create Collaborative Research Programs

- Develop joint research initiatives that address local challenges while aligning with academic interests.
- Offer funding or in-kind support for research projects that benefit the municipality.
- Apply for Federal and Provincial Funding

4. Provide Real-World Testing Grounds

- Offer North Grenville a "living lab" to test new technologies or social innovations.
- Facilitate access to local infrastructure, data, or communities for research.

5. Host Academic Events and Conferences

- Organize symposiums or workshops that bring together researchers, local businesses, and community stakeholders.
- Showcase local research opportunities and success stories to attract further academic interest.

6. Develop Student Engagement Programs

- Create internship or co-op opportunities for students to work on local projects.
- Establish a mentorship program connecting students with local professionals.

7. Facilitate Knowledge Transfer

- Create platforms for sharing research findings with the local community and businesses.
- Host regular "innovation showcases" to highlight ongoing research projects and their potential local applications.

8. Build Multi-Institutional Partnerships

- Foster collaborations that involve multiple academic institutions, leveraging the diverse expertise available in the region.
- Create a regional research network focused on rural innovation and sustainability.

By implementing these strategies, North Grenville can position itself as a hub for academic-community collaboration, fostering innovation and economic growth while addressing local challenges.

Forming research partnerships can offer several key benefits for North Grenville:

Access to Expertise and Resources

- Gain access to specialist expertise on policy issues from academic institutions [1].
- Leverage diverse expertise and resources to deliver important outcomes [4].
- Benefit from technical support and improved analytical capabilities [3].

Enhanced Innovation and Problem-Solving

- Create space to question existing thinking and take fresh perspectives on local challenges [1].
- Encourage experimentation and innovation in addressing community issues [5].
- Develop evidence-based solutions to complex problems like climate change and sustainability [6].

Economic Development

- Stimulate local innovation and attract clean tech companies to the area [4].
- Spur economic growth through the commercialization of research outcomes [4].
- Create opportunities for job creation and new startups in the region [4].

Improved Policy and Decision-Making

- Support moving from evidence to delivery, monitoring, and learning what works [1].
- Provide strong economic analysis and evidence for ongoing policy development [1].
- Help local leaders make policy and practice changes based on evidence rather than anecdote [3].

Talent Attraction and Retention

- Create opportunities for skilled graduates, potentially retaining talent in the region [4].

- Attract highly skilled professionals to the area through research collaborations [4].

Funding Opportunities

- Highlight funding opportunities that may not have been previously identified [1].

- Attract public and private investment to enhance local infrastructure [4].

Community Engagement

- Foster collaboration between local government, academic institutions, and community organizations [2].

- Improve public relations and community engagement through shared initiatives [2].

By leveraging these benefits, North Grenville can position itself as a hub for innovation, attract investment, and develop evidence-based solutions to local challenges, ultimately improving outcomes for its residents.

Citations:

[1] https://www.linkedin.com/pulse/fostering-successful-partnerships-between-

[2] https://gerinorai.lt/2022/12/18/the-benefits-of-collaboration-between-community-organisations-and-municipalities/

[3] https://dataqualitycampaign.org/wp-content/uploads/2020/03/DQC-Research-Partnerships-02212020.pdf

[4] https://uidp.org/economic-empowerment-perspectives-on-strategic-partnerships-beyond-research/

[5] https://www.nlc.org/article/2022/02/02/how-cities-can-benefit-from-cross-sector-collaboration/

[6] https://www.tandfonline.com/doi/full/10.1080/19463138.2024.2380052

[7] https://onlinelibrary.wiley.com/doi/10.1111/puar.13395

[8] https://pmc.ncbi.nlm.nih.gov/articles/PMC4500757/

[9] https://www.centreforcities.org/reader/delivering-change-city-partnerships-make-public-assets/benefits-challenges-collaboration/

[10] https://results4america.org/wp-content/uploads/2022/04/RFA_CCP-Power-in-Partnerships_03.04.22.pdf

Disclosure: Perplexity AI was used for seed research and compilation. The prompt engineering was narrowly focused and specific to North Grenville, based on open-source public information.

ADDITIONAL CONSIDERATIONS

The scope of the Mayor's Task Force and the breadth of the charge present many challenges notwithstanding, Artificial Intelligence can be used judiciously, and following appropriate prompt engineering methods, the Task Force can broaden its research and analytics.

A Test Example Prompt and Response

An anonymized summary and query were prepared to review the draft Terms of Reference and comment using OpenAI GPT 4.0 as an assistant to further the discussion on the Terms of Reference for the Task Force. Artificial Intelligence, specifically Large Language Models (LLMs), can advance the research and analytical work of the Task Force toward the delivery of initiatives that enhance both the environmental security and resilience of North Grenville, stimulate new economic development through green and clean technologies

PROMPT:

Act like a technology analyst with the goal of helping a Council understand the SUMMARY and consider the key takeaways and implications for their Task Force STRATEGY.

Specifically:
1. Reinforcement: Identify elements or insights from the SUMMARY that directly relate to or support the current STRATEGY as related to Clean Tech and Clean Technologies. How could these elements be used to further reinforce the STRATEGY?

2. Challenge: Identify ideas or perspectives in the SUMMARY that contradict or question aspects of the current STRATEGY. What implications do these insights have for the organization? How could your strategy adapt or respond to these challenges?

3. Innovation: Identify any novel concepts or approaches discussed in the SUMMARY that aren't currently incorporated in the STRATEGY. How might these new ideas influence or transform your STRATEGY? What would be the potential benefits and risks of incorporating these insights into your STRATEGY?

4. Technology: Identify which technologies have been incorporated into the STRATEGY and if they reflect current science and technology advances in Clean Tech and Clean Technologies, as well as Green Tech and Green Technologies.

OpenAI GPT 4.0 RESPONSE

Without a specific summary provided to directly analyze, I will proceed based on General knowledge and principles related to clean technology and strategies for municipal development in this area. This approach will allow us to discuss how reinforcement, challenge, innovation, and technology can play roles in enhancing the Mayor's Task Force on Clean Technology strategy as described.

1. Reinforcement:
The Task Force's emphasis on identifying short-term and long-term objectives, leveraging partnerships, and fostering a clean tech industry aligns well with the current trends and recommendations in clean technology. Elements such as the focus on equity, diversity, and inclusion can be highlighted to reinforce the strategy. These elements support the creation of a more resilient and innovative clean tech sector by ensuring a wide range of perspectives and ideas are considered. Emphasizing and expanding partnerships with academic institutions for research and development could reinforce the strategy by ensuring it remains at the forefront of clean tech advances.

2. Challenge:
A potential challenge to the current strategy might be the rapid pace of technological advancement in clean tech, which can render specific technologies or approaches obsolete quickly. Additionally, reliance on grant funding and external partnerships might pose sustainability and autonomy risks. To adapt, the strategy could incorporate a more agile framework that allows for rapidly adopting new technologies and methodologies. This might involve creating a dedicated team or process within the Task Force for regularly scanning and evaluating emerging technologies and industry trends.

3. Innovation:
The strategy could benefit from incorporating novel concepts, such as circular economy principles, which are not explicitly mentioned. Circular economy approaches focus on minimizing waste and maximizing resources, which can transform the strategy by embedding sustainability into the core of cleantech initiatives. This could involve developing programs encouraging product life extension, reuse, and recycling within the cleantech industry. Another innovative approach could be using smart city technologies to optimize resource use and reduce emissions. Incorporating these concepts could lead to enhanced environmental benefits and economic opportunities but would require careful planning to manage the complexities and investments needed.

4. Technology:
The Task Force strategy mentions clean and green technologies but does not specify which technologies are being considered.

- Reflecting current science and advances involves assessing and potentially incorporating technologies such as renewable energy (solar, wind, hydroelectric), energy storage solutions (battery technologies), smart grids, electric vehicles, and advanced recycling technologies.
- Assessing if these technologies align with the municipality's needs and capabilities is crucial. It's also important to stay updated on emerging technologies like carbon capture and utilization, advanced biofuels, and green hydrogen to ensure the strategy remains relevant and effective.

In conclusion, by addressing these four areas, the Council can ensure its strategy is robust, adaptive, and capable of positioning the municipality as a leader in clean technology. The balance between leveraging current strengths, adapting to challenges, incorporating innovative approaches, and staying abreast of technological advancements will be key to the success of the Mayor's Task Force on Clean Technology.

MEMBERS OF THE MAYOR'S TASK FORCE ON CLEAN TECH

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