Bioindustrial Innovation Canada (BIC)

Response to:

Ontario Low-Carbon Hydrogen – Discussion Paper

For more information, contact:

A.J. (Sandy) Marshall
Executive Director
BIoindustrial Innovation Canada
sandym@bincanada.ca
(519) 402-3441

Bioindustrial Innovation Canada®
A Sustainable Chemistry Alliance

BioIndustrial Innovation Canada (BIC) is a nationally focused not-for-profit business accelerator based in Sarnia, Ontario. BIC's top priority is creating jobs and economic value while driving towards a sustainable, low carbon circular economy through reduced greenhouse gas (GHG) emissions and increased resource recovery and reuse.

BIC is focused on enabling Ontario and Canada to become globally recognized leaders in sustainability by:

- converting renewable resources, such as agricultural and forestry by-products and residues, into value-added energy, fuel, chemicals and materials including low carbon hydrogen
- efficiently using the world's limited resources (eg. water, energy) through innovative technologies
- recovering and reusing the world's limited resources within the circular economy

for use in a wide range of commercial applications along the chemistry value chain to advanced manufacturing including automotive.

As a business accelerator, BIC's long term strategy is to support the commercialization of clean, green and sustainable technologies. This can best be achieved through a strategy that directly supports the commercialization of early-stage companies while taking a longer term strategic approach that supports research and development of new emerging innovations that will be the next generation of start-up companies.

BIC strongly supports Ontario's efforts to create a hydrogen strategy and urges the Province to look further to important and achievable tactics that can be employed to ensure successful implementation and measurable results.

Leverage chemistry clusters in Ontario to build out low carbon hydrogen production capacity

A strong sustainable innovation ecosystem needs to have an emphasis on value chain creation, job training and skills development, a multi-nodal and geographically-diverse group of clusters that build on regional strengths facilitating significant opportunities for commercial enterprises at the regional level, ensuring that a competitive advantage is achieved.

For ecosystems to grow, governments and institutions need to understand and be prepared to address and financially support the skills needed by industry stakeholders. Innovative companies are reliant on access to a pool of professional trades, scientists, engineers, computer scientists and business professionals. Ecosystems flourish when they are surrounded and supported by institutions that can supply and support their needs.

Hybrid chemistry clusters are integrated ecosystems of new and evolving feedstocks and technologies with existing infrastructure and technologies which enable the acceleration and growth of the bio-based and sustainable chemistry-based industries. Simply put, they represent a convergence of existing traditional industry with a fresh injection of sustainable industry technologies. These clusters are built on existing technology, physical and market infrastructures to maximize utilization and revitalize the industrial and technology foundations.

Since 2008, the Sarnia-Lambton region has been actively developing a world-scale hybrid chemistry cluster. This cluster is a great example to showcase Ontario as a globally recognized leader in taking sustainable feedstock, such as agricultural and forestry by-products and wastes, and turning these renewable resources into energy, fuel and value-added chemicals such as low carbon hydrogen. We encourage the Government of Ontario to recognize the Sarnia-Lambton region as **Ontario's Hydrogen Hub**.

Economic development organizations in eastern Ontario are also working to establish a sustainable chemistry cluster in the St. Lawrence Corridor centred around Brockville.

Ontario can leverage these emerging sustainable chemistry clusters to build out hydrogen production capacity and leverage the existing distribution capabilities within these regions.

Support commercialization of innovative companies with emerging hydrogen technologies

It is very important to identify and assess emerging low-carbon hydrogen companies with innovative, sustainable technologies near commercialization, particularly focused in cluster locations. From our perspective, there are early-stage companies with the capabilities to produce low-carbon hydrogen through various technological routes such as:

- Production of hydrogen through conversion of biogas from anaerobic digestion
- Production of hydrogen directly through thermal conversion of biomass (pyrolysis, gasification)
- Production of hydrogen from mixed gas products from the thermal conversion of biomass (pyrolysis, gasification)

Each of these companies face a wide variety of barriers to commercialization ranging from supply security, engineering scale up, plant construction, market development and access to financing.

Once companies have scaled up, they face different challenges making the leap to full production. Policies, programs and reasonable cost financing need to recognize the time, knowledge and resources that it takes to develop new markets and break into established value chains once a company reaches commercialization.

Government provides programs to support businesses to the point of becoming commercial, but business mentorship and executive talent is required beyond the point of scale-up if companies are to become anchor firms.

Organizations exist in Ontario who support companies at this early stage of development. BIC collaborates with like-minded organizations such as Green Centre Canada and the Centre for Research & Innovation in the Bio-Economy (CRIBE) and government agencies such as Industrial Research Assistance Program (IRAP), Sustainable Development Technology Canada (SDTC) and the Ontario Centres of Excellence (OCE).

Develop policy and programming to support the growth of firms

New policy and program measures are needed to promote market uptake of hydrogen and to create a level playing field with conventional (fossil-based) hydrogen.

Regulating new innovations demands scientific, technical and business expertise and the consideration that these innovations often fall between traditional regulatory categories or face a more complex regulatory environment than traditional products. An industry advisory group can play an important role as an interface between new technology and regulation. The group's mandate would be to work with Government to review regulations, offer technical guidance and associated policies that affect the development of the hydrogen-based economy and provide advice on reforms.

The most recent federal economic statement called for agile regulations to support innovation and economic development, the need for regulations to be more supportive of innovation and commercialization opportunities. The emerging hydrogen industry would benefit from more agile and streamlined processes that allow for faster commercialization and adoption with a predictable pathway to commercialization that would foster investor confidence.

Creating market pull for hydrogen value chain technologies and products

Large global corporations play a significant role in creating market pull. Market pull by these multinational companies is a critical need for early-stage companies to enable adoption by existing value chains. Significant resistance to change exists within the traditional value chains. Having strong supply chains and breakthrough technology is rarely sufficient to ensure commercial success for companies with new products and processes.

Public procurement presents a significant opportunity to strengthen market pull. Large government infrastructure projects could incorporate hydrogen fuel consumption and enable expansion of its distribution network.

Government procurement and mandates for the use of hydrogen by the public and private sectors are activities that lead to commercial adoption. Government support for the development and dissemination of standards, methodologies, benchmarks and evaluation criteria for hydrogen also supports the development of the industry.

Models that provide services to connect large multinational enterprises (MNEs) and small and medium enterprises (SMEs) for the purposes of collaboration should be reviewed and implemented.

Work with financial institutions to reduce risks to project financing

Understanding and mitigating risk is critical to financing projects. Financial risks include supply chain risk, technology risk and market risk. Financial institutions use benchmarks and criteria to assess the financial risk of a project or an investment. The Equator Principles are a financial industry benchmark for determining, assessing and managing environmental and social risk in

commercial projects.[1] The principles are widely used by banks and other financial institutions including Export Development Canada (EDC). The development of criteria and benchmarks to ensure the ability of capital markets to accurately quantify risk would be a key to assessing credit worthiness, providing financing and reducing debt costs.

Summary

Bioindustrial Innovation Canada (BIC) is a nationally focused not-for-profit business accelerator based in Sarnia, Ontario. BIC's top priority is creating jobs and economic value while driving towards a sustainable, low carbon circular economy through reduced greenhouse gas (GHG) emissions and increased resource recovery and reuse. As a business accelerator, BIC's long term strategy is to support the commercialization of clean, green and sustainable technologies.

BIC strongly supports Ontario's efforts to create a hydrogen strategy and urges the Government of Ontario to consider supporting the following important and achievable tactics that can be employed to ensure successful implementation and measurable results:

1. Leverage chemistry clusters in Ontario to build out low carbon hydrogen production capacity
2. Support commercialization of innovative companies with emerging hydrogen technologies
3. Develop policy and programming to support the growth of firms
4. Creating market pull for hydrogen value chain technologies and products
5. Work with financial institutions to reduce risks to project financing

BIC looks forward to working with the Government of Ontario to implement these tactics and create a strong and vibrant low carbon hydrogen economy in Ontario.

[1] https://equator-principles.com/