

## Sarnia-Lambton Economic Partnership

Response to:

### Ontario Low-Carbon Hydrogen – Discussion Paper

**SARNIA-LAMBTON ECONOMIC PARTNERSHIP**

Western Sarnia-Lambton Research Park  
1086 Modeland Road, Building 1050, Suite 100  
Sarnia, Ontario, Canada, N7S 5E8  
519-332-1820



The Sarnia-Lambton Economic Partnership (SLEP) supports Ontario's efforts to create a low-carbon hydrogen strategy. Already Ontario's leading hub for hydrogen production, use, and innovation, the Sarnia-Lambton area boasts the province's largest cluster of hydrogen producing and off-taking facilities, Canada's #1 ranked college for applied research and Ontario's leading college for hydrogen research, a specialized workforce with the technical capabilities required for hydrogen production, and the infrastructure and distribution capabilities essential to the development of the low-carbon economy. With these prerequisites Sarnia-Lambton is the best place for the focused development of the low-carbon economy to create opportunity for all of Ontario, as **Ontario's Hydrogen Hub**.

As the primary economic development agency for the Sarnia-Lambton area, SLEP's mandate includes fostering economic stability, growth, and diversification across the Sarnia-Lambton area, to enhance quality of life and create a vibrant place to live and work. We believe there is opportunity to leverage the Sarnia-Lambton area's existing strengths to develop Ontario's hydrogen economy, creating local jobs and attracting investment while reducing greenhouse gas emissions.

In preparing this response to the *Ontario Low-Carbon Hydrogen Strategy – Discussion Paper* SLEP consulted with local experts across the value chain including private sector, academia and research groups, government organizations, and industrial support stakeholders. These consultations confirmed the Sarnia-Lambton area has unique competitive advantages that position the region to become Ontario's leading producer, user, and exporter of low-carbon hydrogen, as well as hydrogen technologies and services. More importantly, stakeholders suggest that the Government of Ontario recognize and support the Sarnia-Lambton area as **Ontario's Hydrogen Hub**.

### **Recognition of Sarnia-Lambton as Ontario's Hydrogen HUB**

The foundation for the hydrogen economy across Canada depends on the deployment of HUBs in mature applications. The Sarnia-Lambton area represents Ontario's most suitable opportunity to support a regional high profile hub development incorporating the full value chain at scale. As the leading hub in Ontario, the Sarnia-Lambton area has the capabilities to work closely with others, including emerging hubs and stakeholders – to drive hydrogen production, research, piloting and demonstration, training, and deployment across the province.

Our location on the Ontario-Michigan border within the transportation corridor between Montreal and Detroit would allow supply and demand through multiple sources, connecting demand for transportation, industrial and manufacturing centres, and providing access to the economies of scope and scale necessary for the development and transformation of the hydrogen sector. Bolstered by associated logistics and industrial infrastructure our location represents Ontario's best opportunity to capitalize on the export of low-carbon hydrogen.

It should be recognized that the Sarnia-Lambton area presents Ontario's most immediate opportunity to leverage existing grey hydrogen production (gaseous and liquid) with immediate, short-term, and long-term local opportunities associated with blue and green hydrogen production, fuels cells, hydrogen storage, and hydrogen blending.

### **Sarnia-Lambton: Ontario's Current Hydrogen Leader**

The Sarnia-Lambton area is Ontario's largest cluster of current and potential hydrogen producers and users. Industrial gas companies operate in Sarnia with hydrogen production and liquefaction assets, and hydrogen is produced as part of the chemical process associated with oil refining, and plastics and ammonia production. Pure hydrogen for oil refining and ammonia production are the most common end-uses, accounting for 33% and 27% of total demand. Local producers and users include, but are not limited to:

#### **Producers**

Air Products  
Praxair  
NOVA Chemicals  
CF Industries  
Imperial Oil

#### **Users**

Shell Refinery  
Suncor Refinery  
Imperial Oil Refinery  
ARLANXEO  
CF Industries

#### **Potential Producers**

Enbridge Gas Ltd.  
Air Liquide

Currently, hydrogen in the region is produced via steam methane reformation (SMR) of natural gas, resulting in grey hydrogen. SMR is the most widely used technology for hydrogen production and is expected to continue to be one of the primary pathways going forward. However, with the Sarnia-Lambton area's strong starting position, opportunities exist to achieve lower carbon intensities, and emissions reduction can be achieved from a transformative scenario capitalizing on the efficiency of scale presented by the region. Stakeholders believe that investment and growth in the low-carbon economy can be achieved by creating opportunities for local industry to do better with what they do today based on an incremental and well-defined shift (ex. Grey → Blue → Green).

Many local industrial stakeholders have made commitments through global corporate strategies to pursue a global low-carbon hydrogen and clean fuel economy.

### **Diversification and Integration with Core Industry**

The Sarnia-Lambton area's largest economic sectors are highlighted by the established Sarnia-Lambton Petrochemical & Refining Complex and the emerging Sarnia-Lambton Hybrid Chemistry cluster, which both operate across the same "hybrid chemistry" value-chain linking the petrochemical, bio-industrial, and clean energy industries. The hydrogen economy serves as a critical node operating within these industries, and represents an opportunity to diversify the industrial mix while shifting towards a low-carbon economy.

It is important for Ontario's low-carbon hydrogen strategy to recognize that the magnitude of energy feedstock needed highlights that a production strategy must be diverse, and that Canada will need to rely on fossil fuel pathways as well as a diverse range of low-carbon pathways to meet decarbonization objectives. Low-carbon hydrogen presents a major opportunity for the oil refining and ammonia production industries to lower the carbon intensities of their products and overall emissions. At the same time, there is an opportunity for Ontario to recognize synergies between hydrogen and other bio-based renewable fuels, such as liquid biofuels, synthetic fuels, biogas and renewable natural gas (RNG) which are applicable with the Sarnia-Lambton Hybrid Chemistry Cluster.

The Sarnia-Lambton Petrochemical & Refining Complex represents the most immediate opportunity for Ontario to strengthen and grow its existing hydrogen economy through the diversification of existing assets of both producers and users, and access to infrastructure and demand. While the continued development of the associated Sarnia-Lambton Hybrid Chemistry Cluster requires access to lower-carbon, green hydrogen inputs, to attract new development prospects associated with the clean, green, and sustainable chemistry economy.

We encourage Ontario to implement this transformative opportunity in a way that not only creates growth opportunities for new development, but also creates transformative opportunity for the existing industrial sectors.

Due to the forward-looking and collaborative nature of industrial stakeholders operating within the Sarnia-Lambton Petrochemical & Refining Complex and Sarnia-Lambton Hybrid Chemistry Cluster, there is strong community support for the diversification and integration of the low-carbon hydrogen economy and associated industrial developments. In the same way the community supported a shift to “hybrid chemistry” development opportunities, there is support for further diversification and growth through the hydrogen economy, with the goal of achieving the associated environmental and economic benefits for Ontario.

The diversification of these core economic sectors through the development and integration of the low-carbon hydrogen economy can ensure the stability of existing industrial operations and add economic value in the form of capital investment and job creation. We strongly encourage Ontario to implement the low-carbon hydrogen strategy so that it both creates opportunities for new industrial development and strengthens existing industry. To do so, SLEP asks that the Ontario Government build on our stakeholder engagement and conduct extensive consultation with those associated with the Hybrid Chemistry Value Chain in the Sarnia-Lambton area. SLEP is glad to facilitate discussions and/or introductions to all local stakeholders, including industry, research, academia, and First Nations representatives.

### **Infrastructure and Assets**

The development of infrastructure to support the low-carbon hydrogen economy requires significant coordinated investments. In most regions of Ontario this is challenged by uncertain demand creating high risk for investors. On the other hand, Sarnia-Lambton area provides Ontario the opportunity to leverage established energy and infrastructure assets to spur the development of targeted opportunities across the low-carbon hydrogen value chain, with impacts and results possible in the near-term. These infrastructure assets are highlighted by:

#### **1. Logistics and Distribution Infrastructure**

The Sarnia-Lambton area is well serviced by logistics infrastructure that has served the hydrogen industry for decades and that was established for the larger petrochemical and refining industry. The result is an integrated network of options for the movement of product highlighted by operating hydrogen and natural gas pipelines, road, rail and ship capabilities, and established distribution systems.

Pipelines are the most economical way of transporting hydrogen in large quantities, and a backbone network of hydrogen pipelines could be a strategic infrastructure asset for Ontario. More than 30

kilometres of dedicated hydrogen pipelines are currently operating in Sarnia-Lambton connecting industrial users with hydrogen production facilities such as Air Products. More importantly, Sarnia-Lambton is well-serviced by hundreds of kilometres of natural gas pipelines providing direct connections to Canada's largest natural gas trading complex, also located in Sarnia-Lambton. These natural gas pipelines provide hydrogen blending opportunities to service industrial, building, and residential energy users.

Liquid hydrogen is effectively transported long distances by road, as demonstrated by Air Product's Sarnia LHY distribution depot currently shipping liquid hydrogen as far away as Alberta and into Kentucky in the United States. In Sarnia-Lambton Highway 402 provides access to the Ontario 400-series highway system and the Blue Water Bridge links the region to U.S. Interstates I-69 and I-94 in Michigan resulting in regional, national, and international opportunities. Additionally, the area is serviced by CN and CSX main-line rail capabilities including the CN Rail Tunnel connecting to US markets. Lastly, export market potential could exist via underutilized liquid loading dock port facilities.

Established energy companies operate extensive distribution networks utilizing feedstocks sourced from the Sarnia-Lambton area. For example, Suncor operates their PetroPass Fleet Stations nationwide utilizing diesel from the Suncor Sarnia Refinery. These stations could be expanded or converted to provide the trucking industry with hydrogen from the Sarnia-Lambton area.

## 2. Input Availability

The low-carbon hydrogen economy will require access to a diverse platform of feedstocks and energy sources. The Sarnia-Lambton area provides access to a variety of feedstocks each applicable to different production and conversion processes, including:

- **Natural Gas** – Canada's largest integrated natural gas complex, the Enbridge Gas Dawn Hub is located in the Sarnia-Lambton area. Natural gas is a key feedstock for Steam Methane Reforming (SMR), which is a key blue hydrogen production opportunity with the addition of Carbon Capture Use and Storage (CCUS) to achieve lower carbon intensities.
- **Electricity** – within Sarnia-Lambton is a large network of electricity production capabilities highlighted by solar and wind capabilities and cogeneration facilities operating on the same grid as Ontario's hydroelectric and nuclear resources. Hydrogen produced with electricity from a grid with mixed sources will have a low carbon-intensity due to Ontario's mix of sources. The Sarnia-Lambton area has existing low-carbon energy production capabilities, with 140 MW of solar production, including Ontario's third largest photovoltaic farm, and 100 MW's of wind capabilities highlighted by the 46 turbine Cedar Point II Wind Energy Centre.
- **Carbon Outputs** – Outputs from facilities associated with local petrochemical facilities provide input opportunities for CCUS applications.
- **Water** - Many hydrogen technologies require access to abundant water supply, which can be sourced via the St. Clair River.

## 3. Geological Storage Capabilities

The Sarnia-Lambton area is located on Canada's largest salt deposit resulting in large volumes of salt caverns utilized by the local chemical and energy industries. These salt caverns are actively used for storage of other products including hydrocarbon gases and have a long history of compliance with

environmental regulations. Storage assets such as salt caverns can be an important enabler for wide-spread hydrogen deployment by serving as permanent CO<sub>2</sub> storage, and potentially for storing hydrogen at scale. Research to support storage of hydrogen at scale is currently underway and can be accelerated by targeted investment by the Government of Ontario.

#### 4. Interconnected Development Sites

Fully serviced brownfield development sites with on-site interconnections to local industry provide opportunities for low-carbon hydrogen producers and users to benefit from the Sarnia-Lambton area's industrial mix. These sites provide logistics capabilities, access to inputs and hydrogen pipelines, and the utilizing of existing and shared infrastructure can result in a significant capital savings for capital intensive low-carbon technologies.

### **Hydrogen Opportunities for Sarnia-Lambton**

The Sarnia-Lambton area is well positioned to be a top national producer of clean hydrogen, with a variety of potential production pathways serving a variety of end-use opportunities.

#### *Hydrogen Production Opportunities in Sarnia*

<b>Grey Hydrogen</b>	SMR without CCUS	Current
<b>Blue Hydrogen</b>	SMR with CCUS	Utilize existing industry and assets.
<b>Green Hydrogen</b>	Renewable Electricity	Carbon intensity a factor of energy grids source mix.
<b>Mix of Grey/Blue/Green</b>	Blend hydrogen pathways	Blending will lower carbon intensity of higher carbon output production methods
<b>Hydrogen – Natural Gas Blending</b>	Blend low-carbon hydrogen with natural gas	Utilize local natural gas pipeline infrastructure
<b>Hydrogen Storage</b>	Storage for future energy use	Utilize existing salt cavern geology

Currently, the region's hydrogen production consists primarily of SMR processes, with smaller volumes of production from petrochemical manufacturing, resulting in high volumes of grey hydrogen. The implementation of CCUS would result in a lower-carbon blue hydrogen stream that could be cost-competitive with potential electrolytic hydrogen production due to availability of abundant low-cost natural gas in the Sarnia-Lambton area and Ontario's high electricity prices.

Low-carbon green hydrogen can be produced through access to Ontario's electrical grid, with electricity produced mostly by hydroelectric and nuclear facilities. Future hydrogen producers in Sarnia-Lambton can produce green or blue-green hydrogen utilizing connections to Ontario's mixed source grid consisting hydroelectric, nuclear, wind, solar, and cogeneration capabilities. The carbon intensity of production is relative to the mix of sources feeding the grid.

As supply volumes of low-carbon hydrogen grow; access to existing pipeline networks or geological storage options becomes necessary due to footprint and cost considerations. As the region's natural gas pipelines can be used to both store and transport hydrogen, if the Province provides the necessary investment support, policy/regulatory incentives and support for innovation, the Sarnia-Lambton area can see development opportunities arise from natural gas injection and power-to-gas demonstrations.

Once blended into the natural gas pipelines associated with the Dawn Hub, the hydrogen-natural gas mixture can replace pure natural gas in many applications, including reconversion back into electricity or as a lower-carbon fuel for local cogeneration facilities.

Low-carbon hydrogen via CCUS is best suited for locations like the Sarnia-Lambton area where CO<sub>2</sub> storage or utilization opportunities are near clusters of high emitting facilities. CO<sub>2</sub> can potentially be stored in porous sedimentary formations and salt caverns found locally. Additionally, bulk hydrogen for non-mobile applications can possibly be stored as a compressed gas in these salt caverns, creating practical footprint considerations and cost efficiencies.

The potential for low-carbon hydrogen end-use in Ontario is diverse, and the Sarnia-Lambton area has the capabilities to serve these markets through the current and future production of gaseous, liquid, and blended hydrogen feedstocks and the development of hydrogen fuel cells. End-uses supported by the Sarnia-Lambton area could include:

- **Feedstock for Industry** – The local petrochemical and chemicals industry is the largest user of hydrogen with the potential to grow mid- and up-stream demand. Additionally, hydrogen is a critical feedstock for the local ammonia industry. Lastly, hydrogen produced locally could be transported from the Sarnia-Lambton hub to Ontario’s industrial areas producing steel and cement.
- **Heat for Buildings** – Locally produced low-carbon hydrogen could provide heating for residential, commercial, and industrial buildings either burned directly or as a hydrogen-natural gas mixture. Blending into the local natural gas network at low levels is feasible today.
- **Feedstock for Power Generation** – Low-carbon hydrogen can potentially be produced via electrolysis from local renewable power sources, such as the Sarnia-Lambton areas wind and solar farms, where power is not needed during off-peak periods. This hydrogen can then be stored in natural gas pipelines, salt caverns, or in fuel cells, and be used to produce energy when demand is high. The capability of using supplemental hydrogen to offset downturns in electricity supply inherent in solar and wind production is a solution tailor made for each other.
- **Transport** – Locally produced low-carbon hydrogen can be utilized to service the transportation sector through use in fuel cells for light-duty vehicles, trucks, buses, forklifts, and mining vehicles. Additionally, fuel cells may eventually become applicable to the aviation and marine transport industries. The Sarnia-Lambton area could benefit from the impact of the use of low-carbon hydrogen in trucking, given the large volume of shipments in and out of the region to support the chemical industry.
- **Fuel Cells** – Applicable across several end-uses as outlined above, low carbon fuel cell development and implementation is a priority to the Sarnia-Lambton area’s industrial and research stakeholders, with several opportunities such as forklifts and medium/heavy transport presenting immediate opportunities, and logistics and fulfillment centres within an hour proximity of the Sarnia-Lambton area representing potential target markets.

### **Skilled Labour Force and Training**

To develop and implement the low-carbon hydrogen economy in Ontario a properly skilled workforce is required. The Sarnia-Lambton area currently has a well-trained and specialized workforce, with deep technical experience in the energy sector, that can pivot into a new low-carbon fuel industry. The region

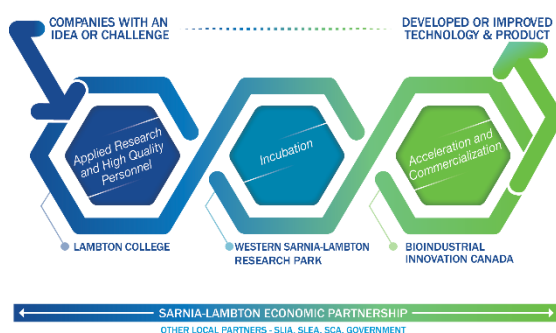
is one of Ontario's only locations actively employing skilled workers with direct experience and certifications working in the hydrogen industry.

As the hydrogen economy requires a workforce that is aligned with the petrochemical, bio-industrial and energy industries, there exists opportunities for the areas established workforce to shift towards servicing the anticipated needs of the developing sector.

Additionally, it is critical that Ontario recognizes the advantages of utilizing the expertise and programing available through Lambton College. Established programs such as the College's Chemical Production & Power Engineering Technology (CPET) program have gained national recognition for their ability to train advanced level operators for various industrial sectors, including hydrogen streams. Lambton College is one of a select number of colleges in Ontario that has committed to training the hydrogen workforce and is the most prepared to do so immediately.

### **Commercialization Hub Concept and Peripheral Stakeholders**

While SLEP believes that leveraging and incrementally shifting existing hydrogen capabilities is an important part of Ontario's successful implementation of the low-carbon hydrogen economy, innovation and technology advancements are critical to ensure Ontario establishes and maintains a leadership position in hydrogen and fuel cell technologies. Support for research and development and commercialization activities is needed to reduce costs, develop solutions in emerging applications and discover breakthrough technologies to benefit the sector.



The *Commercialization Hub* process that has successfully supported the development of the Sarnia-Lambton Hybrid Chemistry Cluster will be immediately applicable and impactful to Ontario's developing hydrogen economy. The Commercialization Hub encourages innovation and the development of an idea from research, to incubation, to acceleration and commercialization. Utilizing this structure, allows hydrogen technologies and products to be developed from concept to production while supported by local organizations and infrastructure, accelerating growth and increasing profitability.

Stakeholders associated with the Commercialization Hub include:

- ***Lambton College*** – Ontario's #1 ranked college for applied research, the College participates in project collaborations with regional, provincial, and national enterprises across the hydrogen industry. Their Hydrogen Lab provides a testbed for fuel cells, renewable energy generation and storage, and intelligent building systems applied research, with leadership from a NSREC Industrial Research Chair.
- ***Western Sarnia-Lambton Research Park*** – The commercialization centre is Canada's largest clean-tech incubator, serving as a key contributor to the movement of an idea or discovery from the lab bench to the marketplace.
- ***Bioindustrial Innovation Canada*** – A business accelerator of clean, green and sustainable technologies focused on creating jobs and economic value while driving towards a sustainable,



low carbon circular economy through reduced greenhouse gas emissions and increased resource recovery and reuse.

- *Bowman Centre for Sustainable Energy* - A sustainable energy think-tank committed to driving Canada's energy strategy to generate economically and environmentally sustainable growth.
- *Sarnia-Lambton Industrial Alliance* - A coalition of companies specializing in metal fabrication, engineering, environmental, and support services geared to manufacturing industries with capabilities associated with the hydrogen economy.

Ontario being at the forefront of innovation is critical to the hydrogen economy's growth in the Province. Sarnia-Lambton's supporting organizations provide immediate and relevant access to tools that will accelerate innovation, grow economic value, and attract foreign investment in the hydrogen economy and are crucial to Sarnia-Lambton being Ontario's Hydrogen Hub. With short- and long-term investment from the Province in the Sarnia-Lambton Commercialization Hub to support the growth of the hydrogen industry, Ontario would make considerable steps forward in its hydrogen strategy and greenhouse gas reduction commitments.

### **Reducing Barriers**

Stakeholder engagement has identified several barriers associated with the development and implementation of the low-carbon economy in Ontario, all of which are not unique to the Sarnia-Lambton area. It is imperative that the Province acknowledge and act on challenges associated with economic viability, policy and regulation, access to incentives, innovation, electricity pricing, industry standards, trade, and an overly linear focus on hydrogen as part of the low-carbon economy.

#### **High Economic Cost – Demand Creates Supply**

The most limiting factor associated with the low-carbon hydrogen economy in Ontario is the economic cost of development, both capital and operation. Low-carbon hydrogen is not currently cost competitive compared to conventional fuel options which results in low demand for the product. To ensure economic competitiveness, hydrogen projects must achieve scale, which is influenced most heavily by demand. In the short term, it may be best to grow the low-carbon hydrogen economy where demand is currently the highest. Currently, demand for hydrogen products is for industrial applications. Ontario's low-carbon hydrogen strategy needs to identify methods of creating predictable, long-term demand for low-carbon hydrogen and industrial products before industry can invest in these projects. This may be achieved through policy and regulation.

#### **Policies & Regulations – Clear, Stable, Long-Term**

Low-carbon hydrogen projects require supporting policies, regulations, and incremental greenhouse gas reduction targets. To ensure buy-in, policies and regulations need to be clear, stable, long-term, and in line with a common national framework. We support the Government of Ontario encouraging the use of low-carbon hydrogen technologies by both producers and end users through a combination of incentivizing low-carbon use, and penalizing stakeholders who do not meet defined targets. Additionally, policies and regulations must not take an adversarial approach to developing the industry, where the Government works with industry rather than imposes on industry.

### Incentives & Funding – Ease Large Up-Front Costs on Production & End-Use

Incentives and funding programs are an essential tool for Ontario to de-risk investment. As there are other challenges associated with the development of the low-carbon hydrogen industry, Ontario's strategy may want to consider ways to incentivize the movement to low-carbon production methods, or risk losing current and potential hydrogen producers and users to competing jurisdictions if costs escalate. For example, Alberta has seen significant development in the low-carbon hydrogen economy, and recently announced that hydrogen investments will be eligible for the Alberta Petrochemicals Incentive Program. Additionally, incentive programs need to exist to support innovation and development, one-time capital investments, and on-going production and use.

Some low-carbon hydrogen technologies and applications, such as CCUS and fuel cells for forklifts, have achieved commercial readiness and can be implemented more easily in the Sarnia-Lambton hub, potentially by those already in the sector such as Air Products or Praxair. However, technology implementation is very capital intensive, so long-term support and incentives for the research, development and commercialization of innovative technologies is necessary for less mature production methods and applications across the low-carbon hydrogen value-chain.

### Technical Concerns – Hydrogen Blending

Technical concerns related to the impact of hydrogen blending for use as a fuel require consideration in Ontario's strategy. The amount of hydrogen in fuel influences flame speed and temperature, which can impact existing fired equipment including industrial furnaces, boilers, heaters, and gas turbines. Hydrogen embrittlement risks for pipeline materials, and general safety and handling risks and requirements associated with hydrogen use are factors that could influence the amount of hydrogen fuel blending that can be safely managed in large-scale regional gas distribution systems. The expertise available in the Sarnia Lambton region is well-positioned to support a pilot project that would advance the understanding of these types of technical concerns and help provide options to resolve issues.

### Electricity Costs – Too High to be Competitive with Other Jurisdictions

A consistent message shared by stakeholders is that Ontario's electricity costs do not allow for competitive low-carbon hydrogen production compared to other jurisdictions, both nationally and internationally. Industry has asked that actions be taken to lower the cost of electricity for use in low-carbon hydrogen technologies. One industrial stakeholder noted that electricity costs are forty percent higher in Ontario than their next least competitive location, placing Ontario near the bottom of consideration for future low-carbon projects.

### Codes and Standards – Harmonize Across Jurisdictions to Capture Export Potential

As the low-carbon economy presents significant opportunities for the trade and export of technologies and products, it is important that Ontario ensures provincial codes and standards are harmonized across jurisdictions. Not only does the Ontario low-carbon hydrogen economy need to be integrated with interprovincial and national codes and standards, but consideration should be given to aligning it with those found in key export markets such as the United States. This is required to exploit trade potential with both domestic and export markets. For many jurisdictions the import of low-carbon hydrogen is an important topic in the hydrogen economy, meaning the potential export market from Canada is equal or greater in size than the domestic market.

## Low-Carbon Economy vs. Low-Carbon Hydrogen

Stakeholders have been clear that a low-carbon intensity standardization across the hydrogen and related energy sectors is the best course of action, rather than concentrating on the more restrictive colour coded low-carbon production types – grey, green and blue. Industry support is for Ontario to be “colour-agnostic” in discussions on hydrogen technology.

Many stakeholders in the Sarnia-Lambton area associated with the related hydrogen, fuels, and energy sectors shared that hydrogen cannot be the only solution to the reduction of GHG emissions and that the low-carbon hydrogen economy harmonize with other complementary and alternative solutions such as low-carbon fuels, bio-based energy, and utilization of low-carbon ammonia. There is an expressed desire for Ontario to focus more broadly on the low-carbon economy rather than taking a linear approach focused singularly on low-carbon hydrogen, especially as other fuels can achieve lower-carbon intensities in some cases. These stakeholders advocate policy promoting low-carbon outcomes that are independent of pathway as the most effective method to decarbonize the province’s approach to the energy transition.

## Conclusions

The *Ontario Low-Carbon Hydrogen Strategy* is an important component to the development of a low-carbon economy and Ontario’s ability to achieve environmental and climate change goals. We look forward to being a key stakeholder in the development and implementation of the strategy, and to establishing and maintaining a relationship with all government ministries that are vital to the success of the strategy

We encourage the Government of Ontario to recognize the Sarnia-Lambton area as **Ontario’s Hydrogen Hub**. Investments in the Sarnia-Lambton area and its companies will allow Ontario to show real commitment to a low-carbon strategy and to show that Ontario is a player in the hydrogen economy. The continued and focused development of the low-carbon economy in the Sarnia-Lambton area creates environmental and economic opportunity for all of Ontario, including investment attraction, job creation and competitiveness.

## Contacts

STEPHEN THOMPSON  
CEO  
Sarnia-Lambton Economic Partnership  
519-332-1820 ext 232  
stephen@sarnialambton.on.ca

MATTHEW SLOTWINSKI  
Senior Economic Development Officer  
Sarnia-Lambton Economic Partnership  
519-332-1820 ext 236  
matthew@sarnialambton.on.ca

## **Stakeholder Consultations**

Stakeholder consultations were conducted as part of the development of this response. Consultations included the following Stakeholders from industry, academia, research, and industry support organizations:

- Bowman Centre for Sustainable Energy
- Transition Accelerator
- Suncor
- Shell
- Imperial Oil
- Plains Midstream
- CF Industries
- Air Products
- Air Liquide
- Praxair (Linde)
- Enbridge Gas Ltd
- NOVA Chemicals
- Bioindustrial Innovation Canada (*response review*)
- Lambton College (*response review*)
- Western Sarnia-Lambton Research Park (*response review*)
- Sarnia-Lambton Industrial Alliance (*response review*)