



SARNIA-LAMBTON
ONTARIO • CANADA

SARNIA-LAMBTON
Economic Partnership
Powering a Sustainable World®

PETROCHEMICAL & REFINING COMPLEX

Sarnia-Lambton Hybrid Chemistry Cluster

HYBRID CHEMISTRY CLUSTER INDUSTRIAL PARKS

- 1 Bio-Industrial Park Sarnia
- 2 Bluewater Energy Park
- 3 St. Clair Industrial Park
- 4 Chippewas of Sarnia Industrial Park
- 5 Sarnia Research & Business Park

WESTERN SARNIA-LAMBTON RESEARCH PARK

- i Sarnia-Lambton Economic Partnership
- ii Bioindustrial Innovation Canada
- iii Bluewater Technology Access Centre
- iv Woodland Biofuels
- v Origin Materials
- vi Forward Water Technologies

LAMBTON COLLEGE

- i Centre of Excellence in Energy & Bio-Industrial Technologies
- ii Bio-Industrial Process Research Centre
- iii Centre for Industrial Material Development
- iv Industrial Research Chair for Colleges
- v Lambton Energy Research Centre
- vi Lambton Water Centre

PROPOSED INDUSTRIAL SITES

- Benefuel
- AChT (Advanced Chemical Technologies)
- Origin Materials
- Imtex Membrane Corp
- Forge Hydrocarbons

- Provincial Highway
- County Road
- Railway CSX
- - - Railway CN



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June 2019. For illustrative purposes only. Not to scale.



ABOUT THE PETROCHEMICAL & REFINING COMPLEX

The birthplace of Canada's Petrochemical Industry, Sarnia-Lambton is famous for being the site of North America's first commercial oil well after the discovery of oil in Oil Springs in 1857. A major expansion of the chemical industry took place beginning in the 1940's as a result of the 2nd World War. Since this time, the Sarnia-Lambton Petrochemical and Refining Complex has grown to include three refineries and more than thirty-five interrelated chemical facilities with processes ranging across the hydrocarbon value chain.

The Sarnia-Lambton area now represents Canada's second largest cluster of companies in the petrochemical and refining sector and represents the largest industrial sector locally. It is home to many well-known multinational companies, including Air Products, CF Industries, ARLANXEO, Cabot, Exxon Mobil (through its Canadian affiliate Imperial Oil), NOVA Chemicals, Plains Midstream, Praxair, Royal Dutch Shell, INEOS Styrolution, and Suncor.

The region's excellent location, access to raw materials and transportation routes to the markets of the world, and supply of experienced labour continue to ensure a vibrant future for the diversified oil and petrochemical complex which has developed. Additionally, the chemical complex also serves as an ideal platform for new biobased chemistry manufacturing in the form of the Sarnia-Lambton Hybrid Chemistry Cluster.

WHAT SARNIA-LAMBTON CAN OFFER YOU

- Strategic location on the Canada/USA border.
- Logistics infrastructure to move inputs and product by rail, road, water, or pipeline.
- Existing and shared infrastructure can save new projects twenty percent on capital costs.
- Savings of 35-40% on electricity pricing due to "behind-the-fence" energy pricings.
- Skilled workforce with specialized skills required for the petrochemical and refining industry.
- Integration of facilities across the hybrid chemistry value chain.
- Education, innovation and research & development emphasize the commercialization process.



LOCATION

Located on the Canada/USA border in the heart of the Great Lakes Basin, Sarnia-Lambton is a cost-effective choice for businesses looking for efficient access to important markets in Canada, the United States (US) and Mexico.

Through the United States - Mexico - Canada Agreement (USMCA), companies in Sarnia-Lambton have direct highway access to a market of nearly 400 million people.

TRANSPORTATION AND MARKET ACCESS

Sarnia-Lambton is uniquely located on major road, rail, water, air and pipeline corridors to ensure a smooth flow of inputs and end-products between the members of the value chain and your company's facility.

RAIL

The regional rail infrastructure is impressive with Canadian National (CN) and CSX Transportation operating mainlines Class I railroad service.

CN maintains five rail yards in the region including the Sarnia Rail Yard which is the largest flat switching yard in the Great Lakes District, with about 30 trains per day including through, terminating, and originating traffic. It has a car capacity of 1,600 cars and a normal daily working capacity of approximately 1,100 cars. The yard has a 1,100 car customer industrial spur capacity, with normal car totals on hand of approximately 1,000. Major customers include NOVA Chemicals, Pembina, CF Industries, Cabot Canada, ARLANXEO Canada Inc, and Suncor Energy Products.

CSX Transportation provides service to companies including Imperial Oil, Shell, Air Liquide, and ARLANXEO Canada Inc, while offering shunting services via spur lines conveniently located throughout the industrial complex.

The St. Clair Tunnel operated by CN connects Sarnia to Michigan allowing for the easy movement of goods to the US Midwest, US Gulf Coast, or eastern US ports. The tunnel allows for the carry of more freight than any other US - Canada border rail crossing.

Rail cars can be transported from Sarnia to the Port of Montreal (east) or Port of Vancouver (west) for transloading to ocean freighter.

Companies such as VIP Rail, Procor Limited, ARI Fleet Services of Canada Inc, and OWS Rail Car provide railcar switching, transloading, storage, and cleaning services.

CITY	KM	TIME (hrs driving)
Detroit, MI	105	1
Toronto, ON	240	2.5
Buffalo, NY	290	2.75
Cleveland, OH	375	3.75
Cincinnati, OH	525	5
Chicago, IL	550	5.25
Pittsburgh, PA	560	5.25
Indianapolis, IN	565	5.5
Ottawa, ON	675	6.25
Milwaukee, WI	710	6.75
Montreal, QC	765	7.5
New York, NY	920	9
Washington, DC	935	9
Nashville, TN	960	9
St. Louis, MO	980	8.75
Boston, MA	1015	9.5

ROAD

Sarnia-Lambton is served by a superb network of highways that connects the region to the Great Lakes industrial corridor, the southern United States, and Mexico.

Highway 402 provides access to the Ontario 400-series highway system providing transportation throughout the province towards Quebec to the east and Manitoba, Saskatchewan, Alberta, and British Columbia to the west. Highway 402 connects directly to Highway 401, the busiest highway in Canada.

The twin-span Blue Water Bridge border crossing is a key link between Canada and the United States. Strategically placed on the major trade and transportation corridors linking Ontario Highway 402 to U.S. Interstates, I-69 and I-94. The bridge is Canada's second-busiest crossing for commercial traffic, with over 1.5 million trucks and \$42.2 billion in road trade annually.

Dedicated car and truck lanes are available for cross border transportation via the Free and Secure Trade (FAST) and NEXUS programs allowing for pre-approved low risk importers, carriers, and drivers, to be cleared into either country with greater speed and certainty, and at a reduced cost of compliance.

Currently under development, Sarnia-Lambton area municipalities and industrial organizations are partnering on the Oversized Load Corridor, a dedicated transportation route that will provide companies located in the region with easier connection to global markets through the Port of Sarnia for the movement of large vessels, modules, and equipment.

Sarnia-Lambton is located within a one day drive to 65% of the US market, and major Ontario and Quebec markets.

WATER

Located on the banks of the St. Clair River, one of the busiest inland waterways in the world, the chemical industry has direct access to several 700+ foot liquid loading docks for incoming or outgoing bulk shipments. Through the St. Lawrence Seaway System, ships can navigate from Sarnia-Lambton to the Atlantic Ocean, March through December.

Sarnia Harbour accommodates many of the vessels that are part of the Great Lakes Fleet as well as international vessels moving product through the region. The harbour provides seasonal berthage, ship repair and maintenance, and a location for the movement of over-sized process modules in and out of the Sarnia-Lambton Petrochemical and Refining Complex.

AIR

Sarnia is well serviced by several regional and international airports, capable of delivering goods and people to any location in the world.

REGIONAL AIRPORTS

-Sarnia Chris Hadfield Airport (YZR)
Owned by the City of Sarnia and located on Highway 402, the Sarnia Chris Hadfield Airport offers air cargo and daily passenger service connections to Toronto Pearson International Airport. It is a designated port of entry with custom services provided.

INTERNATIONAL AIRPORTS

-London International Airport (YXU)
-Flint Bishop International Airport (FNT)
-Detroit Metropolitan Wayne County Airport (DTW)
-Toronto Pearson International Airport (YYZ)

AIRPORT	KM	TIME (hrs driving)
Sarnia (YZR)	n/a	n/a
London (YXU)	70	0.75
Flint (FNT)	120	1
Detroit (DTW)	130	1.25
Toronto (YYZ)	225	2.25



INDUSTRIAL INFRASTRUCTURE AND UTILITIES

Sarnia-Lambton has the infrastructure, utilities, and industrial base to support all forms of industrial activity, including the capital-intensive manufacturing of traditional oil-based fuels and chemicals, traditional and emerging energy technologies, and newly developing clean, green, and sustainable bio-based technologies.

ENERGY

Ontario Power Generation Inc. purchases over 2,000 MW of natural gas, solar, and wind generated power through various privately owned and operated facilities in Sarnia-Lambton. This locally generated power is used by area industries and transported through Ontario's electrical transmission system to other parts of the province and the U.S.

NATURAL GAS

- TransAlta Energy – Sarnia Regional Cogeneration Plant: **506 MW**
- Greenfield Energy Centre LP – Greenfield Energy Centre: **1,005 MW**
- Invenergy St. Clair Power LP - St. Clair Energy Centre: **584 MW**
- Greenfield South Power Corporation - Green Electron Power Plant: **300 MW**
- Imperial Oil – Sarnia Site: **90 MW**

SOLAR

- Enbridge/First Solar – Sarnia Solar Project: **80 MW**
- Cordelio Power -Moore Solar Energy Centre: **20 MW**
- Cordelio Power -Sombra Solar Energy Centre: **20 MW**

WIND

- Cordelio Power - Jericho Wind Energy Centre: **149 MW**
- Fiera Infrastructure/NextEra Energy - Cedar Point II Wind Energy Centre: **100 MW**
- Sky Generation - Ravenswood Wind Farm: **9.9 MW**
- Sky Generation - Proof Line Wind Farm: **6.6 MW**

Significant savings can exist for users of electricity at the Bluewater Energy Park and Bio-Industrial Park Sarnia, through access to “behind-the-fence” pricing. This special pricing arrangement can be accomplished by connecting directly to the neighbouring 506 MW TransAlta Cogeneration Plant, and avoiding costs associated with Ontario Power Grid system charges known as the “global adjustment”.

****Savings of 35-40% of electricity cost can be realized on several Sarnia-Lambton brownfield site locations.****

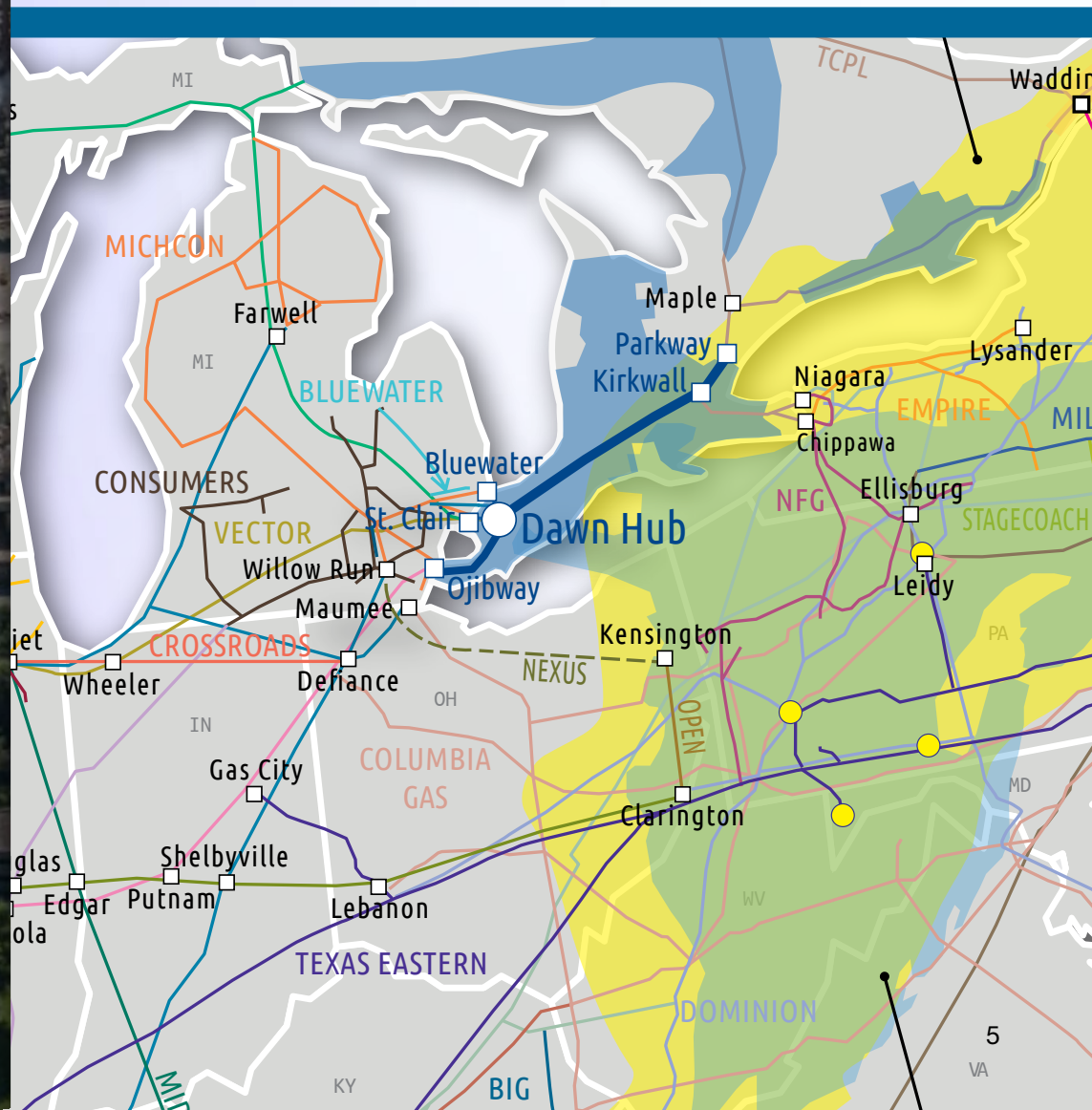
NATURAL GAS

Enbridge Gas Inc. owns and operates the natural gas storage, transmission and distribution systems in Sarnia-Lambton. Their Dawn Hub is one of North America's largest liquid natural gas trading hubs. Strategically located in southwestern Ontario, providing direct access to North America's major supply basins, including abundant and affordable natural gas supplies in the Utica and Marcellus producing regions.

With multiple supply routes – including direct interconnections to eight major supply pipelines – from western Canada, mid-continent, the Rockies, and the Gulf of Mexico, as well as the ability to serve markets in the mid-west, eastern Canada and the U.S. Northeast, the Dawn Hub is a reliable, secure, and liquid natural gas trading hub.

Companies operating in the Sarnia-Lambton Petrochemical and Refining Complex can access some of the lowest cost natural gas feedstocks in North America due to the proximity and interconnections to the Enbridge Gas Inc. infrastructure network.

****Dawn storage has a working capacity of 274 Bcf. ****



WATER, PROCESS WATER, WASTEWATER

The St. Clair River provides an abundant supply of cooling and process water for industrial users in the Sarnia-Lambton Petrochemical and Refining Complex. Several brownfield and greenfield industrial opportunities exist on land that is serviced by existing cooling and process water infrastructure and capacity. For many of these industrial lands a Permit to Take Water (PTTW) is already in place.

Many residences and businesses in Sarnia-Lambton are provided with potable water via the Lambton Area Water Supply System (LAWSS) which has a maximum rated capacity of 182,000 m3/day.

Many current chemical facilities operate their own wastewater treatment facilities. To accommodate new development, there are opportunities for process wastewater to be treated at the ARLANXEO biological wastewater treatment plant. The facility is a Ministry of the Environment, Conservation and Parks approved industrial wastewater facility, with a capacity of 24,000 m3/day.

STORAGE

Deep-well storage salt caverns are used to temporarily store hydrocarbons and liquefied petrochemicals and are a critical component of the petrochemical and refining industry. There are 73 active storage caverns in the Sarnia-Lambton area, utilizing 124 wells with a total storage capacity of 3.5 million cubic metres. This represents the equivalent to over 200 storage tanks.

Operating at a depth of over 600m below the earth's surface, these salt caverns store gaseous hydrocarbons including methane, butane, propane, ethylene, propylene, and butylene, which are often stored under pressure in liquid form.

INFRASTRUCTURE PARTNERSHIP OPPORTUNITIES

Opportunities exist for new investments to partner with existing industrial facilities to exploit under-utilized infrastructure and share costs for developments on select brownfield sites. Infrastructure that may be available for use includes:

- Buildings (office, change facilities, maintenance, and shop space)
- Logistics (marine terminals, rail spurs, and truck and rail loading)
- Pipelines (natural gas, compressed air, nitrogen, hydrogen, and crude oil)
- Services (Medical, security, and snow removal)
- Utilities (electrical and steam distribution, process/cooling water, wastewater, and firewater systems)
- Other (flare system access)

WORKFORCE

With a population of approximately 130,000, the Sarnia-Lambton area has a highly skilled workforce that specializes in the operation, building and maintenance of petrochemical and refining facilities and process units. Over 21,700 people are employed in manufacturing and service industries and businesses in Lambton County. The total labour force within a 100 km radius of Sarnia-Lambton is almost 550,000.

Due to the high quality of work, education, and safety, facilities in the area experience low employee turnover and absenteeism rates.

Companies within these local industries work to ensure their employees are well trained in the areas that most impact their ability to work effectively and safely. Together, the facilities have formed the Industrial Educational Cooperative to provide industrial training support through relevant construction, operation, maintenance and safety programs. Furthermore, Lambton College has supplied the Sarnia-Lambton Petrochemical and Refining Complex with employees for the last 50 years, specializing in meeting local industries demand for skilled employees.

Labour rates are competitive with the US Gulf Coast and other regions of a similar industrial clusters.

Sarnia-Lambton offers a dependable and abundant supply of skilled labour. The region's skill pool is exceptionally strong in the areas of science, engineering, process operations, instrumentation, metal fabrication and managerial ability. This strength is emphasized by 62 percent of the labour force having obtained a postsecondary certificate, diploma, or degree.

LABOUR FORCE STATISTICS	EMPLOYMENT BY INDUSTRY
• 64,500 – Labour Force • 60,300 – Employment • 58.1 – Participation Rate (%) • 6.52 – Unemployment Rate (%)	• 6,700 – Manufacturing • 5,600 – Construction • 3,100 – Professional, Scientific, and Technical • 3,600 – Mining, Oil, Gas, and Agriculture • 2,800 – Transportation and Warehousing

Utilization of existing and shared infrastructure can result in a capital cost savings of up to twenty percent.

INDUSTRIAL SUPPORT SERVICES



Sarnia-Lambton has the industrial support services infrastructure to support the petrochemical and refining industry from site selection to operation. This is accommodated by the 1,200 industrial related companies in the sectors of manufacturing, construction, utilities and communications, industrial services and warehousing and transportation, and is highlighted by **Sarnia-Lambton Industrial Alliance (SLIA)**.

SLIA is a coalition of over 35 Sarnia-Lambton companies that specialize in all aspects of metal fabrication, engineering, environmental, and support services geared to manufacturing industries.

While each company provides cutting-edge specialized services in its own discipline, the added benefit of dealing with these Industrial Alliance companies is their ability to come together to provide clients with seamless integrated services.

SLIA companies have the skills and manpower to take a concept from front end development through process design, engineering, environmental permitting, manufacturing of machinery and equipment modules, construction, installation, and plant commissioning.

Following plant commissioning, Sarnia-Lambton companies can also proficiently follow through with plant operation, environmental monitoring and compliance, maintenance, debottlenecking, and upgrading. Plant demolition, remediation, and recycling are also Sarnia-Lambton specialties – making the services of Industrial Alliance companies truly “cradle to cradle”.



Formed in 1952, the **Sarnia-Lambton Environmental Association (SLEA)** and its 20 member companies are committed to earning recognition by its members, regulatory agencies and the community for excellence in promoting and fostering a healthy environment consistent with sustainable development. This commitment includes the monitoring of environmental conditions to assess the impact of its members on the local environment – specifically; air, water and soil. Guided by scientific data and practical experience, member companies encourage each other to reduce the environmental footprints of their plant sites, and to share information with government agencies and the Sarnia-Lambton community.

Additionally, SLEA administers the **Chemical Valley Emergency Co-ordinating Organization (CVECO)** for mutual aid and its community information and education arm, the **Community Awareness and Emergency Response Committee (CAER)**. CVECO and CAER are key examples of local industries commitment to the Responsible Care® program administered by the Chemical Industry Association of Canada. Many initiatives in Responsible Care® are modeled on activities which originated in Sarnia-Lambton.



EDUCATION, INNOVATION, RESEARCH & DEVELOPMENT



The Sarnia-Lambton Petrochemical and Refining Complex is supported through a commercialization hub process that encourages the development of an idea from research, to incubation, to acceleration and commercialization. This allows technologies and products to be developed from concept to production all while supported by local organizations and infrastructure.



Western Sarnia-Lambton Research Park

The 80-acre Western Sarnia-Lambton Research Park, comprised of five interconnected buildings totaling 288,000 sq.ft., is a joint initiative of the County of Lambton, the City of Sarnia, and Western University. The Research Park's Commercialization Centre is Canada's largest clean-tech incubator, serving as a key contributor to the movement of an idea or a discovery from the lab bench to the marketplace. Focused on the biotech, energy, chemical, and industrial processing sectors, tenants range from large multi-national companies, to non-profit organizations, to small start-up companies, and commercialization projects.

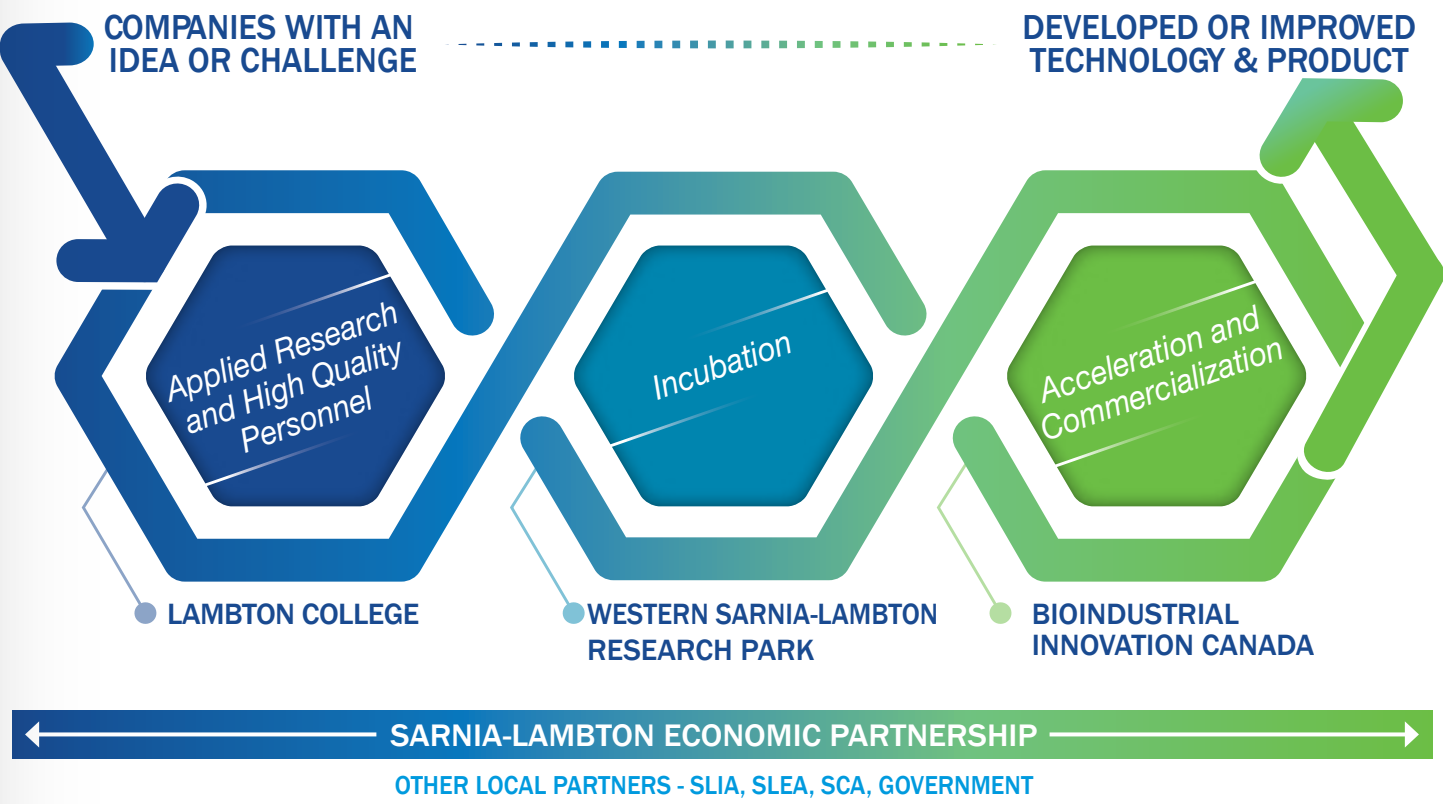
The Commercialization Centre provides client companies with access to over 50,000 sq.ft. of office, laboratories and pilot plant infrastructure for research, commercialization, and entrepreneurship.

Lab clients include the BioAnalytical Lab, Lambton Manufacturing Innovation Centre (LMIC), Centre for Industrial Material Development and the Lambton Water Centre (LWC).

Successful pilot projects have included: Origin Materials, Woodland Biofuels Inc, KMX, Forward Water Technologies, and many more.

- The Research Park has won the following awards:**
- 2016 – Outstanding Research Park Award – by the Association of University Research Parks
 - 2015 – 5th Top Research Park in North America – by UBI Global
 - 2014 – 7th Top Research Park in North America – by UBI Global

COMMERCIALIZATION HUB





Bioindustrial Innovation Canada

Since its inception in 2008, Bioindustrial Innovation Canada (BIC) has developed a successful foundation by working nationally and internationally with multiple and diverse stakeholders in both industry and government. These collaborations help the development and commercialization of bio-based and sustainable chemistry-based products – including the development of Canada's first hybrid chemistry cluster in the heart of Canada's largest petrochemical cluster and the Southwestern Ontario agricultural community.

Through these efforts, BIC is accelerating the growth of the Sarnia-Lambton Hybrid Chemistry Cluster, a natural community to link the existing petroleum industry with the future bioeconomy and show how the two sectors can evolve and grow. BIC continues to build out sustainable value chains as well as creating highly qualified jobs and economic value in Canada.



Lambton College of Applied Arts and Technology

Since 1967 Lambton College has worked cooperatively with the companies in the Sarnia-Lambton Petrochemical and Refining Complex to create a region of innovators, working together to strengthen our local economy, and meet industry demand for skilled employees. Built on a foundation of distinctive programs, applied research, evolving teaching methodologies, and experiential learning opportunities, Lambton College ensures the Sarnia-Lambton region will meet the skills and training required for the future of the growing petrochemical and refining industry.

Research and Innovation

Lambton College's Research & Innovation department is a global leader for collaborative applied research, development, innovation, education, entrepreneurship and commercialization.

Participating in project collaborations with regional, provincial and national small and medium-sized enterprises across the petrochemical industry.

Applied research at Lambton College has built a strong network of research partners and has grown to offer high quality labs, facilities and an exceptional research team that suit a multitude of research projects. Through collaboration, the applied research department works with partners to connect them with the appropriate resources, expertise and funding opportunities.

TOP 3 RANKED COLLEGE IN CANADA FOR APPLIED RESEARCH FOR 3 CONSECUTIVE YEARS

– Research Infosource Inc's annual list of Canada's Top 50 Research Colleges (2017, 2018, 2019)

Programs

Many of the technology and trades programs offered are three years in duration, with a co-op component which provides students with a combination of theory and application skills in current and emerging technologies.

Relevant programs offered by Lambton College include:

- Advanced Power Engineering Technology
- Advanced Project Management & Strategic Leadership
- Chemical Lab Technician
- Chemical Laboratory Analysis
- Chemical Production & Power Engineering Technology (CPET)
- Construction Project Management
- Electrical Power Distribution & Control Technician
- Environmental Management Practices
- Environmental Technician - Water & Wastewater Systems Operations
- Instrumentation & Control Engineering Technician & Apprenticeship
- Power Engineering Technician / Techniques / Technology (PETC)

Research Centres



Lambton Water Centre



LAMBTON MANUFACTURING INNOVATION CENTRE

Lambton College

Lambton Manufacturing Innovation Centre



Lambton Energy Research Centre



Bioindustrial Process Research Centre



Information Technology and Communication Research Centre



Centre for Industrial Material Development

Centre of Excellence in Energy and Bio-Industrial Technologies

Following a \$14.2 million upgrade of the 34,000 sq.ft. facility, which included the addition of 7,000 sq.ft. of training space, Lambton College's Centre of Excellence in Energy & Bio-Industrial Technologies opened in 2018.

The Centre focuses on two major streams: Education and Training, and Applied Research.

Students will have the opportunity to collaborate with industry in state-of-practice technology laboratories that support learning and research in next-generation technologies.



Sarnia-Lambton Industrial Education Cooperative

The Industrial Education Cooperative (IEC) facilitates a unique partnership of experts from Education, Labour, Contractors and Industry to improve safety performance in our community. Through the Sarnia-Lambton Safety Partnership Model, the organization enables an injury-free culture by identifying and implementing opportunities to improve safety performance and efficiencies and collaborating in the development of safety standards and programs.

Representing **250 companies** and providing over **40 safety training programs and services** for more than **10,000 workers**, the IEC has been recognized by Ontario Labour Ministers and senior officials of the Workplace Safety and Insurance Board (WSIB) as setting **a recognized benchmark** for other regions across the province through its vision of:

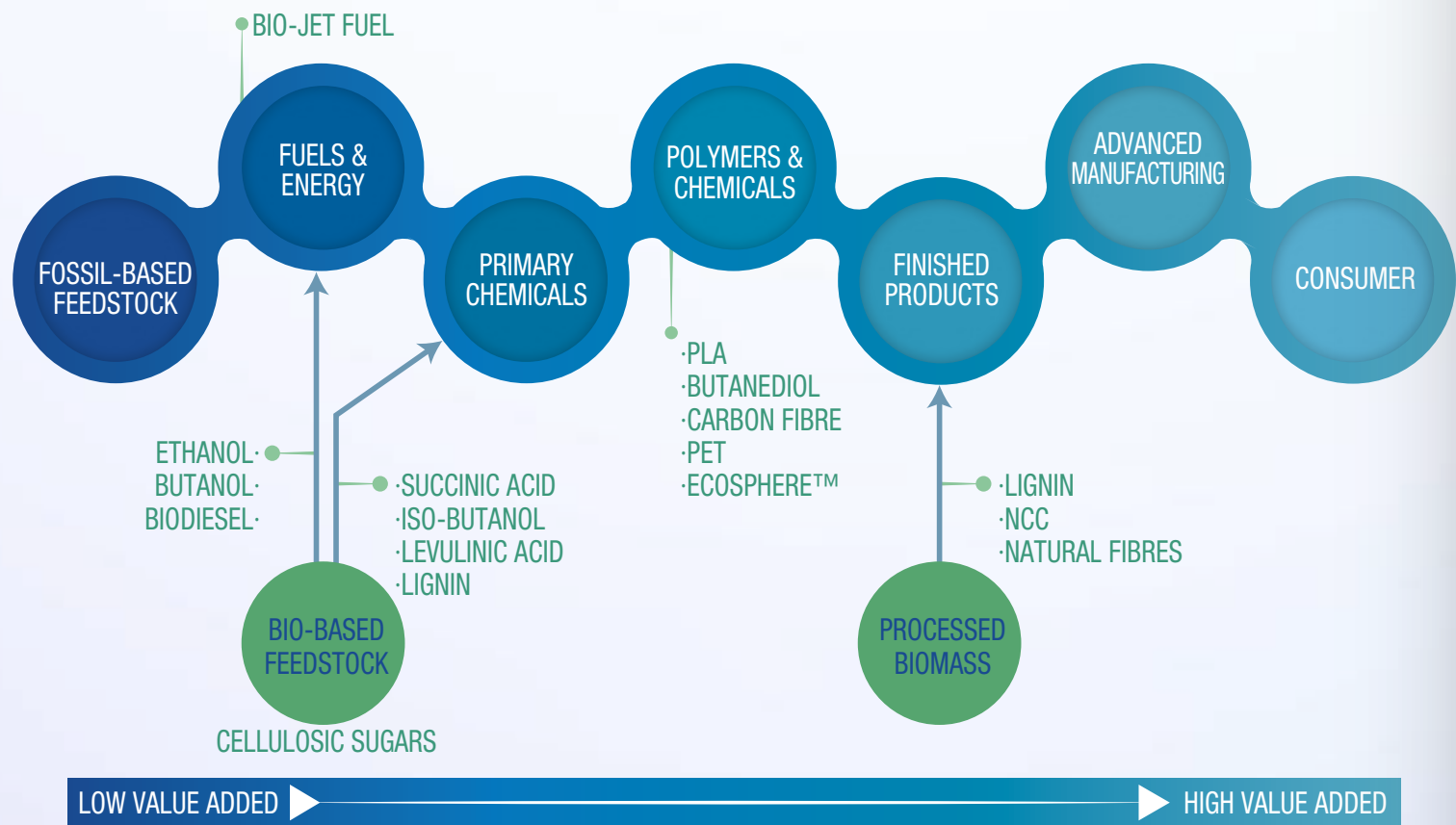
“Zero Incidents by Choice”

SARNIA-LAMBTON HYBRID CHEMISTRY CLUSTER

Complimenting the stable petrochemical and refining industry is the emerging Sarnia-Lambton Hybrid Chemistry Cluster, which integrates green and sustainable chemistry to create opportunities for further industrial growth. This is accomplished by expanding the traditional hydrocarbon value chain through inclusion of technologies and processes that utilize sustainable feedstocks, such as agricultural and forestry products and wastes, and turning these renewable resources into value-added product.

Sarnia-Lambton is becoming recognized around the world as North America’s leading centre for bioindustrial manufacturing and R&D, with companies at every development stage, from bench scale to pilot plant to full-scale commercialization. Successful bio-based facilities include the Suncor St. Clair Ethanol facility, LCY Biosciences, and Woodland Biofuels, to name a few.

HYBRID CHEMISTRY VALUE CHAIN



SITE OPPORTUNITIES

Bluewater Energy Park

Fully serviced 268-acre site located on the bank of the St. Clair River in Sarnia. The park has 170-acres of brownfield land available for the development of new manufacturing and is able to provide electrical power from TransAlta's 506 MW Sarnia Regional Cogeneration Plant exempt from fees to upload to the public grid known as “behind-the-fence” energy pricing.

- 110,000 sq.ft. of office and laboratory space at the Bluewater River Centre.
- 760-foot liquid transfer river docking facility.
- 2 controlled access vehicular entrances.
- CSX rail line crosses site with 4 rail spur lines into site.
- Service water, fire water and city water lines throughout the site
- Steam available at 470,185, 45 psig.
- Natural gas, hydrogen, nitrogen and compressed air available at fence line
- 15kV electrical distribution throughout site.
- Behind-the-fence energy pricing with potential savings of 35-40% on energy costs.

Bio-Industrial Park Sarnia

Fully serviced 408-acre site with 42-acres of brownfield development opportunity. Operated by ARLANXEO Canada Inc. and located along the St. Clair River, the site offers new developments new development opportunities with potential savings of up to twenty percent on capital costs through shared infrastructure opportunities.

- Support services, including medical services, security services, and employee locker facilities can be supplied by the Park.
- Access to petrochemical pipeline chemicals and industrial gases
- Serviced by CN and CSX rail
- Steam and electrical power available from neighbouring TransAlta Sarnia Regional Cogeneration Plant with availability of “behind-the-fence” energy pricing.
- Other utilities including compressed instrument air, nitrogen, natural gas and hydrogen are readily available via pipeline.
- 720-foot marine terminal for ocean and lake freighter service
- Parcels ideal for pilot, demonstration, or full-scale manufacturing facilities.

Other Business and Industrial Parks

Sarnia-Lambton has several options throughout the community including municipally and privately-owned industrial parks. Fully serviced industrial land - with water, sanitary sewers, electrical and natural gas services - is available at competitive rates; with excellent access to major highways, rail lines, and marine shipping channels, as well as dependable industrial infrastructure.

COMPANY PROFILES



AIR LIQUIDE CANADA INC.

Located in St. Clair Township, the plant process takes a carbon dioxide-rich waste stream from the nearby CF Industries plant and produces a liquefied food-grade product. The liquefied carbon dioxide is shipped by road and rail to customers in Southern Ontario and Michigan for use primarily in food freezing, beverage carbonation, greenhouse atmosphere enrichment, and welding applications.

Date Facility Commissioned: 1986

Workforce: 4



AIR PRODUCTS CANADA LTD.

The company operates two facilities in Sarnia-Lambton. The Sarnia facility was the first liquid hydrogen facility in Canada. Feedstock comes from a hydrogen waste stream from NOVA Chemicals' Corunna site, and from interconnections to the Air Products hydrogen production facility located in St. Clair Township. This second hydrogen production facility utilizing a natural gas-based steam methane reformer, the plant supplies 80 million standard-cubic-feet-per-day of hydrogen to the Shell refinery and the Suncor Energy Products complex in Sarnia. The hydrogen is utilized by the two refineries to produce ultra-low sulphur diesel and other petroleum products.

Date Facility Commissioned: 1981 (Sarnia), 2006 (Corunna)

Workforce: 34 (Sarnia), 10 (Corunna)



ARLANXEO CANADA INC.

ARLANXEO operates a major synthetic rubber production facility in Sarnia producing butyl rubber, including regular butyl, chlorobutyl, and bromobutyl. The site also manufactures Olefins from petrochemical feedstocks. Production is based around one rubber manufacturing unit, and two olefins units. ARLANXEO also operates the Bio-industrial Park Sarnia, supplying utilities and services to small to mid-sized green technology companies.

The facility is one of the first in the Sarnia-Lambton Petrochemical and Refining Cluster, with origins dating back to the Second World War. In 1942, Polymer Corporation Limited was formed to produce synthetic rubber and related products when the Western nations were cut off from all major sources of natural rubber. Built in 18 months, the facility was recognized in 1986 as one of Canada's ten outstanding engineering accomplishments of the last 100 years. Through several ownership changes the facility is now a wholly owned subsidiary of Saudi Aramco.

Date Facility Commissioned: 1943

Workforce: 350



CABOT CANADA LTD.

Three production units in Sarnia produce carbon blacks for elastomer reinforcement for North American customers utilizing a heavy hydrocarbon fuel oil feedstock. In the production process, the heavy oil is 'cracked' to form carbon black and hydrogen. After further processing, the carbon black is sold as a reinforcing agent used in rubber applications including tires, as well as a colorant and filler for plastics, paints, and inks. Committed to sustainability, Cabot recycles the hydrogen by-product internally for fuel.

Date Facility Commissioned: 1953

Workforce: 110



CF INDUSTRIES

The Courtright Nitrogen Complex is Eastern Canada's only major fertilizer producer and is the lowest greenhouse gas emitting nitrogen fertilizer facility in Canada. An integrated system of plants based on a world-scale ammonia unit. The facility converts air and natural gas into a variety of nitrogen-based chemicals for both agricultural, industrial, and transportation applications. At current capacity, 350 million cubic metres per year of natural gas are consumed in order to produce up to 1.2 million tonnes of products. The facilities core products are ammonia, urea ammonium nitrate, and diesel exhaust fluid.

Date Facility Commissioned: 1966

Workforce: 204



CLEAN HARBORS

The Lambton Facility is Canada's largest, and Ontario's only full-service integrated hazardous waste management complex. Incorporating modern high-temperature liquid incineration, secure landfill, thermal desorber unit, analytical laboratory and specialized transportation services, the facility can efficiently handle virtually any waste stream onsite. It serves heavy and light industry, commercial businesses, households and governments, and provides local access to a complete array of cost-effective environmental management solutions.

Date Facility Commissioned: 1960's

Workforce: 140



DOW CANADA

Occupying 42 acres, the Dow St. Clair River site manufactures a range of custom formulated polymers, resins and high-performance plastics for customers around the world. Many industries such as food and beverage packaging, automotive, wire and cable, and construction depends on these specialty polymers for their high-performance characteristics in a variety of applications.

Date Facility commissioned: 1959

Workforce: 75



ENBRIDGE GAS INC.

Enbridge Gas Inc. formed in 2019 from the amalgamation of Union Gas Limited and Enbridge Gas Distribution, is Canada's largest natural gas storage, transmission and distribution company based in Ontario. The distribution business serves about 3.7 million customers, heating over 75 per cent of Ontario homes. The storage and transmission business offers a variety of storage and transportation services at the Dawn Hub, the largest integrated underground storage facility in Canada and one of the largest in North America, with connections to most of North America's major supply basins. Enbridge Gas Inc. is owned by Enbridge Inc., a Canadian-based leader in energy transportation and distribution.

Dawn Hub activity:

- Dawn is one of the most physically traded hubs in North America.
- Top North American marketers are active at Dawn Hub.
- More than 100 active counterparties.
- Dawn is the largest integrated underground natural gas storage facility in Canada.
- Connected to most of North America's major supply basins.

Date Facility Commissioned: 1942

Workforce: 300



ENBRIDGE PIPELINES INC.

Enbridge's vision is to be the leading energy delivery company in North America. We deliver the energy people need and want—to heat their homes, to keep their lights on, to keep them mobile and connected.

We operate across North America, fueling the economy and people's quality of life. We move nearly two-thirds of Canada's crude oil exports to the U.S., we transport about 20 percent of the natural gas consumed in the U.S., and we operate North America's third-largest natural gas utility by consumer count.

Enbridge's Sarnia Terminal is part of the Enbridge Mainline System, connecting the region to the North American pipeline system. There are two pipelines (Lines 5 and 78) that flow crude and natural gas liquids (NGLs) into the Sarnia Terminal and three pipelines (Lines 7, 8 and 9) that flow crude eastward out of Sarnia towards markets in Toronto, Niagara and Montreal.

Date Commissioned: 1953

Workforce: 56

IMPERIAL OIL LIMITED

Present in Sarnia since the 19th century, Imperial's Sarnia operation is now the most integrated fuels, chemicals manufacturing and petroleum research facility in Canada, consisting of a refinery, chemical plant, and research centre. With a capacity of 121,000 barrels per day, the refinery processes mainly Canadian crude oil to produce a range of petroleum products including gasoline, aviation fuel, diesel, home heating fuel and marine fuel. The Sarnia chemical plant utilizes feedstocks ranging from light gases to heavy liquids, including ethane, to produce a wide variety of products, including polyethylene, solvents, higher olefins, and aromatics. The world-class research facility, the largest and oldest petroleum research centre in Canada, is focused on supporting customers, developing and improving petroleum products and providing new technologies to improve environmental performance.

Date Facility commissioned: 1897

Workforce: 800

DIAMOND PETROCHEMICALS

Diamond Petrochemicals Canada Corporation ("DPCC") operates Canada's only 1,3-Butadiene production facility in Sarnia, utilizing hydrocarbon feedstock. 1,3-Butadiene is a raw material for synthetic rubber, and it is found in production of tires as well as in many essential industrial and consumer goods. DPCC formed in 2020 and is a wholly owned subsidiary of Mitsubishi Corporation, one of the largest Japanese trading companies. The facility includes sphere storage, underground cavern storage, rail and connectivity to pipelines. DPCC is a member of the Bio-Industrial Park Sarnia operated by ARLANXEO.

Date Facility commissioned: 1943

Workforce: 45

H.C. STARCK CANADA

Serving mainly Americas-based customers with tungsten metal powders, tungsten carbide, and cast tungsten carbide, the facility's high-performance engineered powders are used in the hard metal, tool making, automotive, energy, oil and gas, medical aviation, and chemical industries.

H.C. Starck is a member of the Bio-Industrial Park Sarnia at ARLANXEO.

Date Facility commissioned: 1997

Workforce: 30



NOVA CHEMICALS

NOVA Chemicals operates three manufacturing facilities and one corporate office in Sarnia-Lambton. The Corunna Site produces 1.8 billion pounds of ethylene and 700 million pounds of co-products annually. Corunna provides feedstock to the Moore and St. Clair River sites to be converted into 1.3 billion pounds of polyethylene.

The Corunna Site produces ethylene and co-products including propylene, butadiene and benzene. The Moore Site converts ethylene, supplied by Corunna Site, to manufacture low-density and high-density polyethylene resins. The St. Clair River Site uses the proprietary SCLAIRTECHTM technology to manufacture high-density and linear-low-density polyethylene resin.

The St. Clair River Site also features a pilot plant to support and further develop Advanced SCLAIRTECHTM technology. The pilot plant tests new catalysts and polyethylene products in preparation for commercial scale-up.

Resin from the Moore and St. Clair River polyethylene sites are transported to end-product manufacturers via rail and truck in the form of small pellets. End products from the polyethylene resin include bags and liners, caps and closures, food packaging and rotomolded goods.

In 2017, NOVA Chemicals announced a capital investment of approximately \$2 billion for two new projects in St. Clair Township: a new polyethylene facility and the next phase in the expansion of the Corunna Site cracker.

A second Advanced SCLAIRTECHTM technology facility (AST2) will be located at the new Rokeby Site, adjacent to Corunna Site. Expected capacity is approximately one billion pounds of polyethylene per year. The Corunna Cracker Expansion (Phase 3) is linked to the new polyethylene facility as it will provide ethylene feedstock. The expansion will increase the exiting unit's current ethylene capacity by more than fifty percent. Expected completion is targeted for late 2021.

Date Facility commissioned: 1977 (Corunna, Moore), 1959 (St. Clair River), exp. 2021 (Rokeby)

Workforce: 500 (Corunna), 170 (Moore), 128 (St. Clair River)



PEMBINA PIPELINE CORPORATION

Owned and operated by Pembina Pipeline Corporation, a leading transportation and midstream service provider, the Corunna Facility provides extensive natural gas liquids storage and Terminaling capability situated in the Sarnia-Corunna area. The facility services include 6-million barrels of underground cavern storage, rail and truck Terminaling, and extensive connectivity to major pipelines and other facilities.

Date Facility Commissioned: 1975

Workforce: 30



PLAINS MIDSTREAM CANADA

Located in Sarnia, the facility is a large natural gas liquids fractionation plant with a total capacity of 130,000 barrels per day. The facility produces a variety of natural gas liquids (NGLs), including propane, butane, isobutane, pentane and condensate. Raw materials are obtained primarily through the Enbridge and Kalkaska (Michigan) pipelines, with smaller amounts through the Cochin pipeline and from local refineries. The facility distributes product to customers via rail, truck and pipeline systems.

Date Facility Commissioned: 1970

Workforce: 95 Full-Time, 20-30 Contractors



SHELL CANADA LIMITED

Shell's Sarnia Manufacturing Centre consists of a refinery and chemical plant located in Corunna. The facilities refine 75,000 barrels per day of raw crude oil into a range of petroleum products such as gasoline, diesel, jet fuel, distillates, liquid petroleum gas, heavy oil, pure chemicals and solvents. The facilities refining processes include distillation, catalytic cracking, thermal cracking and catalytic reforming. Facility upgrades, including a new flare system and gasoline hydrotreating process unit, made Shell the first nation-wide refiner capable of producing low-sulphur gasoline. Shell also operates docking facilities on the St. Clair River capable of refueling ships up to 1,000 feet in length.

Date Facility Commissioned: 1952

Workforce: 350

SUNCOR ENERGY INC

Located along the St. Clair River in Sarnia, the Suncor Sarnia Refinery is an 85,000 barrel per day operation that produces gasoline, kerosene, bunker/fuel oil, jet and diesel fuels and asphalt. Facilities on site provide capabilities to produce chemicals such as benzene, toluene, mixed xylene, orthoxylene, and solvents, which are widely used in the production of plastics and pharmaceuticals. Major capital upgrades have enabled the refinery to meet low-sulphur fuel standards and increased the capacity to process synthetic crude oil from Suncor's oil sands operations in Fort McMurray Alberta.

Suncor also operates Canada's largest ethanol facility, the St. Clair Ethanol Plant in St. Clair Township. With a production capacity of 400 million litres per year, the ethanol produced at the facility is blended into Petro-Canada gasoline. As a feedstock, the plant requires 40 million bushels of corn annually, which represents approximately twenty percent of Ontario's annual corn crop.

Date Facility Commissioned: 1953 (Refinery), 2006 (Ethanol Facility)

Workforce: 300 (Refinery) 63 (Ethanol Facility)

TODA ADVANCED MATERIALS

Operated as Toda Advanced Materials (TODA) since 2007, the facility produces Nickel Hydroxide Powder to support the secondary battery industry across the globe. With a production capacity of 4000MT per year, target markets are Electric Vehicles (EV's) and Hybrid EV's, but products also find applications in Energy Storage Systems (ESS).

The new Sulphate Recovery Plant (SRP) was commissioned in 2017, removing sodium sulphate from TODA's wastewater stream, which is sold as a by-product of their Nickel Hydroxide production.

TODA is a member of the Bio-Industrial Park Sarnia at ARLANXEO.

Date Facility Commissioned: 1997

Workforce: 31

TRANSALTA

TransAlta's Sarnia Regional Cogeneration Plant was commissioned in 2003 when a new Power Island facility was integrated with two existing steam and power plants. Combined, the Sarnia plant has three Alstom 11N2 gas turbines, each capable of generating between 102 and 118 megawatts, two condensing steam turbines that can produce 120 megawatts, and back-pressure steam turbines capable of generating 56 megawatts. The plant also incorporates a gas-fired boiler, river water pump houses, and water treatment plants. TransAlta's Sarnia facility supplies steam and electricity to local industry and electricity to the Ontario market via the Independent Electricity System Operator (IESO).

The plant is located on the south part of a 268-acre parcel of land owned by TransAlta, known as the Bluewater Energy Park. The site is developed as a full-service business park with access to existing infrastructure and favourable electricity rates for prospective clients from various fields.

Date Facility Commissioned: 2003

Employees: 110

TABLE 1 - HYDROCARBON FEEDSTOCKS AND KEY INTERMEDIATES		
Feedstock	Source(s)	User(s)
Crude Oil	Western Canada via Enbridge Pipeline. Local oil fields (minor quantities) via truck	Imperial; Suncor; Shell; NOVA Chemicals (Corunna)
Natural Gas (Methane)	Western Canada via TransCanada Pipeline and Enbridge Gas Local gas fields (minor quantities) via Enbridge Gas. NOVA Chemicals (Corunna) by-product	CF Industries
Natural Gas Liquids	Western Canada via Enbridge Pipeline and Cochin Pipeline Michigan via Kalkaska Pipeline Marcellus Local refineries and other producers via pipeline and truck Pembina NGL Storage Marysville underground Storage Terminal	Plains Midstream; NOVA Chemicals (Corunna); Shell; Imperial; Suncor
C4's, Mixed	Local refineries NOVA Chemicals (Corunna)	Imperial; NOVA Chemicals (Corunna); ARLANXEO, Plains Midstream
C5's+, Mixed	Plains Midstream	Sales via Pipeline
Raffinate	Local refineries, ARLANXEO	Sold via Rail
Ethylene	Imperial NOVA Chemicals (Corunna)	Imperial; NOVA Chemicals (Moore & St. Clair River Site) INEOS Styrolution
Propylene	Imperial NOVA Chemicals (Corunna)	Imperial; Flint Hills Resources, Shell
Butylene, Normal	NOVA Chemicals (Corunna) ARLANXEO	Sold via Rail
1,3-Butadiene	NOVA Chemicals (Corunna) ARLANXEO	Sold via Rail
Benzene	Imperial NOVA Chemicals (Corunna) Shell Suncor Other facilities via Rail	INEOS Styrolution
Ethylbenzene	INEOS Styrolution	INEOS Styrolution
Styrene	INEOS Styrolution	Sold via Rail, Other INEOS INEOS Styrolution facilities; Customers

TABLE 2 - PLASTICS, RUBBERS AND LATICES PRODUCED IN THE SARNIA-LAMBTON PETROCHEMICAL AND REFINING COMPLEX		
Product	Producer(s)	Uses
Polyethylene Wide Variety of Grades, Densities and Types	Imperial Oil NOVA Chemicals (Moore, St. Clair River, and Rokeby Site)	Film; Rigid and Flexible Packaging; Pipe and Pipe Coatings; Barrels and Drums; Toys; Shrink Wrap; Wire and Cable Coating
Rubber, Butyl	ARLANXEO	Tire Inner Tubes; Reservoir Linings; Chewing Gum
Rubber, Halobutyl	ARLANXEO	Tubeless Tire Inner Liners; Pharmaceutical Closures; Tire Sidewalls
Reactive Polymers	DOW	Co-extrudable Adhesives for Packaging, Corrosion Protection, Tougheners, Compatibilizers

TABLE 3 - PETROLEUM AND PETROCHEMICAL PRODUCTS PRODUCED IN THE SARNIA-LAMBTON PETROCHEMICAL AND REFINING COMPLEX		
Product	Producer(s)	End Uses
Propane Butane, Iso Butane, Normal	Plains Midstream Shell Suncor Imperial	Fuel; Chemical Feedstock
Butane, Mixed	Imperial; NOVA Chemicals (Corunna), Shell	Fuel; Chemical Feedstock
1,3-Butadiene	ARLANXEO	Plastics, Latex, Rubber
Raffinate	ARLANXEO	Fuel
Hexane	Imperial	Oil Seed Extraction; Polymerization Medium
Gasolines, Various Grades	Imperial Shell Suncor	Auto and Aviation Fuel
Nonene	Imperial	Detergents; Plasticizers
Tetramer, Propylene	Imperial	Detergents; Plasticizers
Solvents, Petroleum	Imperial Shell Suncor	Paints; Dry Cleaning
Kerosene	Imperial Suncor	Fuel
Fuel Oil, Various Grades	Imperial NOVA Chemicals (Corunna) Shell Suncor	Stove Oil; Furnace Oil; Jet Fuel; Marine Fuel; Production of Carbon Black – not all companies produce all of these
Coke, Petroleum	Imperial	Fuel
Carbon Black	Cabot	Rubber; Plastics; Pigments; Inks
Toluene	Imperial, Suncor	Paints; Explosives; Pesticides
Xylene	Imperial, Suncor	Paints; Pesticides
Toluene/Xylene Mixtures	NOVA Chemicals (Corunna)	Paints; Pesticides
Isopropyl Alcohol	Shell	Printing Inks; Pharmaceuticals; Cosmetics; Household and Automotive Specialties
Styrene	INEOS Styrolution	Polystyrene feedstock
Pentane	Plains Midstream	Polystyrene feedstock, Fuels

TABLE 4 - INORGANIC CHEMICALS PRODUCED IN THE SARNIA-LAMBTON PETROCHEMICAL AND REFINING COMPLEX		
Product	Producer(s)	End Uses
Anhydrous Ammonia	CF Industries	Fertilizers; Chemical Intermediate; Household Cleaning Compounds; Refrigerant; Pulp and Paper; Plastics; Mining Products
Nitric Acid	CF Industries	Industrial Chemicals; Explosives; Metal Refining
Urea; Urea Sulphur Coated	CF Industries	Fertilizers; Runway Deicer
Aqua Ammonia	CF Industries	Fertilizers; Pulp and Paper; Household Cleansers; Pharmaceuticals
Nitrogen Solution Fertilizers	CF Industries	Liquid Fertilizers
Carbon Dioxide, Liquified	Air Liquide Canada Praxair	Food Freezing; Welding; Carbon Dioxide Lasers; Mould Hardening; Fire Abatement Systems, Beverage Carbonation
Argon Liquid	CF Industries	Various industrial processes
Hydrogen, Liquid Hydrogen, Compressed Gas	Air Products Praxair	Petroleum Refining; Metal, Food, Electronic and Pharmaceutical Industries
Diesel Exhaust Fluid	CF Industries	Transporation
Nitrogen, Compressed Gas	Praxair Air Liquide	Inert Gas
Oxygen	Praxair	Steel Making Industrial Chemicals
Sulphur	Imperial Shell Suncor	Fertilizers; Gunpowder; Chemical Intermediate
Nickel Hydroxide	TODA	Battery Manufactures
Sodium Sulphate	TODA	Detergents, Paper Pulping
Tungsten Metal Powders, Tungsten Carbides	H.C. Starck	Tool Making; Automotive; Energy; Oil and Gas; Hard Metals

TABLE 5 - RAW MATERIALS USED BUT NOT PRODUCED IN THE SARNIA-LAMBTON PETROCHEMICAL AND REFINING COMPLEX		
RAW MATERIAL	USER(S)	USES
Chlorine	ARLANXEO	Manufacture of Halobutyl Rubber
Hydrofluoric Acid	Suncor	Alkylation Agent in Refineries
Nitrogen, Liquid	Air Products	Production of Liquid Hydrogen; Chemical Processing Refrigerant
Methyl Chloride	ARLANXEO	Production of Butyl Rubber
Cyclohexane Octene	NOVA Chemicals (St. Clair Site)	Production of polyethylene
Bromine	ARLANXEO	Production of Halobutyl Rubber
Acetonitrile	ARLANXEO	Production of Butadiene
Isobutylene	ARLANXEO	Production of Butyl Rubber
Isoprene	ARLANXEO	Production of Butyl Rubber

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