SLWDB
SARNIA LAMBTON WORKFORCE DEVELOPMENT BOARD

Understanding the Workforce and Skill Needs in Clean Energy

A Report by the Sarnia Lambton Workforce Development Board
December 2024

Acknowledgments

The views expressed in this publication are the views of the Sarnia Lambton Workforce Development Board and do not necessarily reflect those of the Province. The Government of Ontario and its agencies are in no way bound by any recommendations contained in this document.

Mission
SLWDB is a diverse and dedicated organization, committed to identifying needs and facilitating solutions to attract, train and retain a viable workforce through community partnerships.

Vision
Growing Sarnia Lambton's workforce for tomorrow's economy.
SLWDB leads Sarnia Lambton in its approach to workforce development and labour market planning. The team actively engages organizations and community partners in local labour market projects. SLWDB also conducts consultations with business owners throughout the year in order to identify needs and facilitate solutions to grow the local workforce.

Network
SLWDB is one of 26 local planning board areas that make up Workforce Planning Ontario that are funded to conduct and disseminate local labour market research and engage community stakeholders in a planning process that supports local solutions to local issues.

This Employment Ontario project is funded in part by the Government of Canada and the Government of Ontario.

Table of Contents

Executive Summary

In 2024, under funding from the Ministry of Labour, Immigration, Training, and Skills Development, this project sought to explore the workforce and skills requirements in the clean energy sector in Sarnia Lambton. A panel of community partners identified 20 key stakeholders in the clean energy sector who were asked to participate in semi-structured interviews to discuss innovations, trends, workforce challenges, and training gaps.

The themes highlighted throughout the interviews describe the clean energy sector as one that is rapidly innovating, driven by advancements in hydrogen technologies, battery storage, and renewable natural gas. Additionally, these innovations require a skilled workforce equipped with specialized knowledge and training. Specific gaps were identified in workforce readiness, particularly in skilled trades, interdisciplinary expertise, and technical training for emerging technologies. Actionable solutions were proposed centering on the development of local training programs and strengthening community partnerships.

Introduction

The clean energy sector has been described as a cornerstone of Canada's commitment to achieving net-zero emissions by 2050. According to the Canada Energy Regulator (CER), Ontario plays a pivotal role in this sector. CER reported on several key initiatives that are underway including the procement of seven battery storage plants throughout Ontario as well as Ontario's robust availability of solar energy (https://tinyurl.com/8pb6xmar).

However, little is understood regarding how innovations in this sector will shift workforce needs in Sarnia Lambton. Exploring workforce needs and gaps is critical to ensuring the region's competitiveness in the evolving clean energy sector. If the demand for hydrogen technologies, battery storage, and renewable energy sources continue to rise, so too does the demand for a workforce equipped with the skills to support these innovations. Understanding these needs allows stakeholders to align training programs, address skill shortages, and seize economic opportunities.

This project was initiated to:

- Understand what, if any, are the current innovations in the clean energy sector.
- Identify workforce skills required to support the sector's growth.
- Highlight training gaps and propose actionable recommendations.

This report synthesizes insights from 20 expert interviews, providing a comprehensive analysis of workforce needs and recommendations to strengthen Sarnia Lambton's clean energy workforce.

Methods

Data for this report was collected through qualitative interviews with 20 experts in the clean energy sector and related fields, including industry leaders, educators, and policymakers. Each interview was transcribed and analyzed to identify recurring themes related to innovations, workforce skills, and training needs.

Thematic analysis, including coding of the data and grouping codes into broader themes, was conducted to highlight key challenges and opportunities, ensuring that the findings reflect the diverse perspectives of stakeholders.

Key Findings in Sarnia Lambton's Clean Energy Industry

This report details the key findings highlighted throughout the interviews. These findings illuminate key aspects of Sarnia Lambton's Clean Energy industry. These findings collectively help identify a diverse range of challenges and opportunities surrounding the following themes:

1. Innovations in Sarnia Lambton’s Clean Energy Sector Innovative Technologies.
2. Workforce Skills Needed in Sarnia Lambton’s Clean Energy Sector.
3. Training Gaps in Sarnia Lambton’s Clean Energy Sector.

Key Finding 1: Innovations in Sarnia Lambton’s Clean Energy Sector Innovative Technologies

1. **Hydrogen Technologies:** The region’s industrial base supports advancements in green hydrogen production and storage, leveraging existing infrastructure. Current projects focus on integrating hydrogen into industrial processes to replace fossil fuels.
2. **Battery Storage and Recycling:** Companies are developing air-aluminum and zinc-air batteries, emphasizing sustainability and efficiency. Recycling batteries to recover valuable materials aligns with a circular economy approach.
3. **Carbon Capture and Utilization:** Local industries are exploring technologies to sequester CO2 and convert it into valuable products such as building materials and renewable fuels.
4. **Renewable Natural Gas (RNG):** Growth in renewable natural gas through anaerobic digestion offers sustainable solutions for waste management and energy generation.

Key Finding 2: Workforce Skills Needed

1. **Skilled Trades:** High demand exists for electricians, pipefitters, and HVAC technicians who are trained to work with clean energy systems.
2. **Interdisciplinary Expertise:** Workers must integrate knowledge of mechanics, programming, and electrical systems to meet the demands of advanced technologies like hydrogen and battery systems.
3. **Project Management:** Large-scale clean energy projects require skilled project managers to oversee implementation, timelines, and budgets.
4. **Safety and Compliance:** Training in safety standards specific to hydrogen and battery technologies is critical to ensuring worker and environmental safety.

Key Finding 3: Training Gaps

1. **Hydrogen-Specific Training:** There is a lack of programs focusing on hydrogen production, storage, and safety.
2. **Battery Management:** Specialized courses in battery recycling and storage systems are needed to meet growing demand.
3. **Micro-Credentials:** Flexible, short-term programs for rapid upskilling in clean energy technologies can address immediate workforce needs.

Key recommendations in Sarnia Lambton's Clean Energy Industry

The key stakeholders interviewed shared what they would define as the most important recommendations to address some of the gaps and challenges identified above:

1. **Develop Specialized Training Programs**
    - Create targeted courses in hydrogen technologies, energy storage, and renewable natural gas.
    - Partner with educational institutions to expand clean energy curricula.

2. **Expand Micro-Credentials and Flexible Learning**
    - Introduce modular, highly flexible learning models to address immediate workforce needs.
    - Develop certifications for safety and compliance in emerging technologies.

3. **Strengthen Collaboration Among Stakeholders**
    - Establish a Clean Energy Workforce Alliance to align training programs with industry demands.
    - Advocate for funding to support workforce development initiatives.

4. **Promote Careers in Clean Energy**
    - Engage youth through high school programs that showcase clean energy career pathways.
    - Host community events to raise awareness about the region’s leadership in clean energy.

5. **Leverage Community Resources**
    - Create apprenticeship and mentorship opportunities by partnering with local industries.
    - Develop centralized platforms for workforce training and resource-sharing to streamline efforts.

Expanded Collaborative Efforts

The experts interviewed defined Sarnia Lambton as making "impressive strides" in the clean energy sector. However, they also identified the need for more collaboration among industry leaders, educational institutions, and government agencies. Enhanced collaboration is essential to align workforce training with the evolving demands of the clean energy sector. By working together, stakeholders can bridge skill gaps, streamline training opportunities, and strengthen the region's competitiveness in clean energy innovation.

Key Collaborative Strategies

1. **Establishing a Clean Energy Workforce Alliance**
    - This alliance would bring together representatives from industries, educational institutions, and policymakers to regularly assess workforce needs and align training programs accordingly.
    - A shared database of skill requirements and training opportunities could ensure resources are directed effectively.
2. **Partnering with Educational Institutions**
    - Institutions can adapt curricula to include hands-on training for clean energy technologies like hydrogen and battery management.
    - Collaborations with high schools can introduce clean energy career pathways, inspiring youth to explore opportunities in this sector.

3. **Advocating for Policy Support**
    - Unified advocacy efforts can encourage provincial and federal governments to fund clean energy workforce initiatives. This includes grants for training programs, subsidies for apprenticeships, and tax incentives for industries investing in workforce development.

4. **Hosting Knowledge-Sharing Events**
    - Regular forums or conferences can provide a platform for stakeholders to share best practices, technological advancements, and workforce development strategies. This fosters innovation and ensures alignment across the region.

Conclusions

This report discusses the key themes experts in the clean energy sector generated in semi-structured, qualititative interviews. The most prevalent **themes** were articulated in this report and centre around the following:

- **Innovations in the Clean Energy Sector:** Innovations aren't coming to Sarnia Lambton, they are already here. They have reshaped Sarnia Lambton's industrial landscape and prsented opportunities for hydrogen production, carbon capture, and renewable energy storage.

- **Workforce Gaps:** There are current and future shortages in skilled trades predicted. The future clean energy workforce requires interdisciplinary skills and project management.

- **Training Needs:** Training gaps exist in hydrogen technologies, battery management, and clean energy safety standards.

Key experts were also able to reflect on the current challenges and suggest some actionable solutions to support growth in the clean energy sector. These **solutions** include:

- **Develop Specialized Training Programs:** Create targeted courses in hydrogen technologies, energy storage, and renewable natural gas. Partner with educational institutions to expand clean energy curriculum.

- **Expand Micro-Credentials and Flexible Learning**: Introduce modular, highly flexible learning models to address immediate workforce needs. Develop certifications for safety and compliance in emerging technologies.

- **Strengthen Collaboration Among Stakeholders:** Establish a Clean Energy Workforce Alliance to align training programs with industry demands. Advocate for funding to support workforce development initiatives.

- **Promote Careers in Clean Energy:** Engage youth through high school programs that showcase clean energy career pathways. Host community events to raise awareness about the region's leadership in clean energy.

- **Leverage Community Resources:** Create apprenticeship and mentorship opportunities by partnering with local industries. Develop centralized platforms for workforce training and resource-sharing to streamline efforts.

This report highlights the potential of clean energy innovations in Sarnia Lambton. By addressing workforce and training gaps, the region can position itself as a leader in Canada's clean energy transition. Collaboration among industries, educational institutions, and policymakers is critical to turning these recommendations into actionable strategies. This initiative underscores the importance of fostering partnerships and facilitating solutions to ensure Sarnia Lambton's workforce is prepared for the clean energy economy.

We welcome any feedback on this report: https://www.surveymonkey.com/r/7PT2SKQ

Green Hydrogen: Hydrogen produced using renewable energy sources, such as wind or solar power, through the process of electrolysis, which splits water into hydrogen and oxygen.
Battery Storage and Recycling: Techniques to store energy for later use and recycle batteries to recover valuable materials such as lithium, cobalt, and nickel, reducing environmental impact.
Carbon Capture and Utilization (CCU): Technologies that capture carbon dioxide emissions and convert them into useful products, such as fuels or construction materials.
Renewable Natural Gas (RNG): Methane gas produced from organic waste materials, including agricultural and municipal waste, used as a sustainable alternative to fossil fuels.
Micro-Credentials: Short, focused learning programs designed to provide specific skills or certifications in a particular area of expertise.
Net-Zero Emissions: A state where the amount of greenhouse gases emitted into the atmosphere is balanced by removal or offsetting measures, achieving a neutral carbon footprint.
Hydrogen Safety Standards: Protocols and regulations ensuring safe handling, storage, and transportation of hydrogen in industrial and domestic applications.
Air-Aluminum Batteries: A type of battery that uses aluminum and air to produce energy, known for high energy density and lightweight properties.
Electrolysis: A chemical process that uses electricity to split water into hydrogen and oxygen, forming the basis of green hydrogen production.

SARNIA LAMBTON WORKFORCE DEVELOPMENT BOARD

265 Front Street North, Suite 504
Sarnia, Ontario | N7T 7X1
Telephone: (519)-332-0000
Email: info@slwdb.org