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Canada

CANADA'S CLEANTECH INDUSTRY: BRINGING INNOVATIVE DIGITAL SOLUTIONS TO THE OIL AND GAS SECTOR



Canadian companies in the oil and gas industry are introducing significant cost savings and efficiencies into their operations by adopting customized digital tools and flexible solutions.

These solutions are driving Canada's sustainable energy future by establishing baselines on environmental performance, enhancing monitoring to improve maintenance and inspections, and developing predictive models to forecast environmental risks, operational issues and equipment failures.

Canadian companies are also using digital technology to build immersive training environments in the oil and gas industry that capture data to inform critical, high-risk safety training scenarios, which enable privileged learning-by-doing outcomes. Canadian digital technology is key to protecting employees, predicting equipment failures – and reducing environmental impacts of these failures – and reducing production upsets throughout operations.

CANADA'S ECOSYSTEM DRIVING DIGITAL CLEANTECH

Canada's **Clean Resource Innovation Network (CRIN)** was formed to bring together organizations working independently and often duplicating efforts. CRIN was awarded a contribution from the government's Strategic Innovation Fund to drive cleantech development in Canada. Other organizations driving cleantech development are Canada's Oil Sands Innovation Alliance, an alliance of oil sands companies that have invested \$1.4 billion in technologies to improve environmental performance, and the Petroleum Technology Alliance Canada, a hydrocarbon industry association that facilitates technology development to enhance environmental stewardship.

Digital companies work with data-rich oil and gas companies to transform complex data into custom-designed interactive visualizations and user interfaces to improve strategic planning, decision making and communication capabilities. Once these solutions are developed, they can be exported globally and used in other industrial markets that have similar data requirements. If a solution can succeed in Canada's extreme temperatures, it has a better chance of success in more moderate climates.

NOTEWORTHY CANADIAN CLEANTECH OIL AND GAS COMPANIES

> Stream Systems

Simulation and optimization for supply and business value chain

> AUTOSOL

Industrial software for data acquisition and automation

> MultiSensor Scientific

Affordable methane leak imaging detection, quantification and reporting

> Nexus Space Canada

Satellite-based superspectral imaging data and analytics services

> Quantum Design and Technologies

Design company specializing in product and process optimization

> Osperity

AI-enabled industrial visual monitoring

> Enersoft

Rock scanning and AI for resource geology

> Acceleware

Revolutionary radio-frequency heavy oil production technology

> Willowglen Systems

Progressive industrial automation solutions leveraging AI

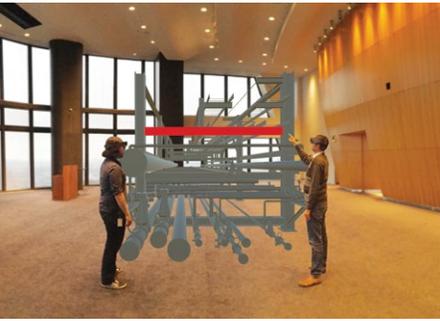
> Bluesource

Developer of renewable energy and emission reduction projects



DIGITAL SOLUTIONS FOR THE OIL AND GAS SECTOR

CANADIAN COMPANIES WORKING GLOBALLY



VIZWORX > vizworx.com

VizworX uses advanced technology to solve clients' business challenges and transform their business. For example, **VizworX** developed Panoptica, a model review tool that dramatically improves infrastructure designs. In the oil and gas industry, it has provided millions of dollars in benefits, both by reducing rework and other wastage during construction and by improving the overall environmental footprint of the resulting facility. Panoptica uses augmented reality to enable reviewers to perform a site visit of the completed facility before construction has even begun. It is in the early stages of a global rollout by a number of companies, particularly in Saudi Arabia and Brazil.

CRUX OCM > cruxocm.com

Crux OCM uses machine learning, real-time optimization and traditional control methodologies to enable autonomous control room operations of midstream oil and gas assets. The benefits of an automated control room are:

- > **throughput:** expand throughput production capacity by 10% by increasing the use of existing assets through autopilot capabilities
- > **power:** increase energy efficiency by 10% by using real-time power control in the control room
- > **safety:** improve safety performance by 20% by using automation to increase consistency and reliability of operation



cruxOCM



CANADIAN UNMANNED AERIAL VEHICLES > canadianuavs.com

Every day thousands of staff-hours are spent driving to remote sites to assess oil and gas assets. Once on site, workers endure safety risks, and the data obtained isn't scalable, sharable or predictive. Unmanned aerial vehicles (UAVs) are the solution to overcome these challenges when satellite imagery doesn't have a high enough resolution or when ground-based observation is inefficient or unsafe. **Canadian UAVs** proprietary data-collection technology enables large-scale methane, heat and other emissions to be tracked in high fidelity through different elevations to generate historical and predictive modelling at scale.

Based in Alberta, **Canadian UAVs** leverages its depth in domestic and international military and commercial operations to provide scalable and actionable data acquisition. In 2018, **Canadian UAVs** was granted the first long-range UAV flight permit by Transport Canada. In 2020, **Canadian UAVs** will have large-scale beyond visual line of sight flights in the oil sands region for real-time, on-demand asset inspections. As an advanced Canadian operator, **Canadian UAVs** is driving aerospace advancement in one of the most heavily regulated regions of the world, and its solutions can be exported worldwide.

GUILDONE > guild1.co

In 2018, **GuildOne** conducted the world's first blockchain oil and gas royalty transaction using ConTracks, its patent-pending smart contract technology. Leveraging ConTracks' scalability and flexibility, **GuildOne** is developing new use cases—such as joint ventures, authorizations for expenditure and road use allowances—that can be applied in a number of global industries, including energy.

GuildOne is also collaborating with oil and gas industry partners to develop an integrated data platform that will securely upload, store and manage environmental performance measurement for the purpose of automating real-time transactions, such as submission of regulatory reporting and the generation and sale of environmental performance credits.

GuildOne

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