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CREATING VALUE FOR TODAY AND TOMORROW THROUGH ESG

covan

Sustainable Collaboration: Market Outlook

Building the Western Economic Corridor

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Call for artists: Scovan is looking for a local Indigenous artist to feature in a future issue of IGNITE. Submit your name to Lindsay. Hill@scovan.ca IGNITE © 2023 Scovan Inc. For questions about subscription, advertising opportunities or being featured in IGNITE, contact Valerie Stewart Valerie.Stewart@scovan.ca Designed and produced by fever1995.com for Scovan. Printed in Canada

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FOREWARD By Kendall dilling, president, pathways alliance

Collaboration at the heart of Pathways Alliance emission reduction efforts

The theme of this issue of Ignite - Collaborative Sustainability - is timely and important as Canada works to establish its place as a leader in emissions reduction efforts and responding to the world's continued need for responsibly produced energy.

The Pathways Alliance recognizes it will take as much extensive collaboration to build public confidence in carbon capture and storage (CCS) as a proven and ready-to-use technology as it will to actually construct the CCS project it is proposing for northeastern Alberta. Yet that's exactly what the alliance of Canada's six largest oil sands companies intends to do.

Expectations are high for the oil sands industry to work together – and with governments – to reduce carbon dioxide (CO_2) emissions from operations to help Canada meet its climate change goals.

This isn't a time for business as usual. Pathways Alliance members understand their responsibility and appreciate the importance of accelerating the oil sands' evolution to continue being a preferred global supplier of responsibly produced, lower-carbon energy to help meet the world's energy needs for decades to come.

To achieve that vision, Pathways Alliance – comprised of Canadian Natural, Cenovus Energy, ConocoPhillips Canada, Imperial, MEG Energy and Suncor Energy – is proposing to build Is its CCS project in northeastern Alberta that would be one of the largest in the world.

Once fully built, it would have capacity to transport captured CO₂ from more than 20 oil sands facilities to a hub in the Cold Lake region for safe underground storage.

The project is anticipated to reduce annual net CO₂ emissions by about 10 to 12 million tonnes per year from the first 14 facilities that are expected to be online by 2030. That's about half of Pathways Alliance's overall goal of reducing emissions from operations by 22 million tonnes a year by the end of this decade.

The potential to reduce another 30 million tonnes from operations in later stages of the plan makes this CCS project an essential part of the Pathways' 2050 goal of net zero emissions from operations.

Achieving net zero emissions from oil sands production will require multiple pathways, including deploying existing technologies such as carbon capture, while also advancing other process improvements and technologies such as hydrogen, direct-air capture and possibly the safe deployment of emissions-free small modular nuclear reactors.

We appreciate Scovan's work in putting this issue of Ignite together and look forward to the insight and ideas of all those who have contributed.

Only when we all work together – industries, governments, Indigenous communities, and non-governmental organizations alike – will Canada be able to achieve both our full economic potential and our net zero goals.



LAND ACKNOWLEDGEMENT

In the spirit of respect, reciprocity and truth, we honour and acknowledge the traditional Treaty 7 and Treaty 6 territories in which our Scovan community lives and works.

Treaty 7 territory—the traditional and ancestral territory of the Blackfoot Confederacy: Kainai, Piikani and Siksika as well as the Tsuu T'ina Nation and Stoney Nakoda First Nation. Treaty 6 territory—the traditional and ancestral territory of the Cree, Dene, Blackfoot, Saulteaux and Nakota Sioux.

We acknowledge that this territory is home to the Métis Nation of Alberta, Regions 2, 3 and 4 within the historical Northwest Métis homeland. Finally, we acknowledge all Nations – Indigenous and non – who live, work and play on this land, and who honour and celebrate this territory.

As Scovan progresses our ESG plan we renew our committment to creating sustainable relationships with Indigenous communities wherever we operate.



MANIFESTING CHANGE IN THE WORKPLACE AND BEYOND

BY NINA FRAMPTON, SYSTEMS OPTIMIZATION ENGINEER, SCOVAN

Each year, we recognize International Women's Day (IWD), where people around the world gather to celebrate women's accomplishments and champion gender equality. For the past five years, Scovan has hosted an annual event to honour this occasion, serving as a platform to spotlight achievements and raise awareness about gender bias through shared stories and distinguished keynote speakers. This year's event featured: Susan Anderson, Senior Vice-President of People Services at Cenovus; Bethanne Slaughter, West Area Vice President of Emerson Automation Solutions; and Kleo Landucci, CEO & President of CrescentView Investments Ltd. They spoke candidly about instances where their gender impacted their professional trajectory, the strategies they used to overcome adversity, and how they succeeded during trying times. The discussions were poignant, highlighting the importance of women seizing opportunities, recognizing their value, and advocating for themselves, as well as the vital role that male allies play in supporting and elevating women. Based on the feedback we received from attendees, we are confident that the speakers' stories were a valuable source of knowledge and inspiration, and we are grateful for the opportunity to share them.





For those who were unable to attend, we encourage you to view the event recording on Scovan's YouTube channel: https://www.youtube.com/watch?v=89BvL_U4ywc

Scovan's 2023 IWD Forum centred on the theme 'Manifest,' which urges women to lead their lives with purpose and intention and actively pursue their goals. 'Manifest' underscores the significance of setting objectives and taking constructive steps toward realizing them. To manifest change, one requires courage, perseverance, and belief in oneself. This theme is especially relevant today as women continue to contend for equal pay, opportunities, and representation in leadership positions.

I recently had a discussion with some of my male colleagues about the iron ring that engineers in Canada typically wear. Most said they refrained from wearing their rings to avoid being judged based on their profession. This prompted me to reflect on my own reasons for wearing mine and led me to realize that it had become a habit formed during my early years as an EIT working on-site in Fort McMurray. While working in the field or the office, I frequently encountered situations where I was mistaken for an administrative assistant based on my gender and requested to fetch coffee and take notes, unlike my male counterparts. The iron ring, therefore, became a tangible representation of my capabilities that allowed me to demonstrate to myself and others that I was equally competent and deserving of a place at the table. It gave me a sense of legitimacy that I lacked without it, primarily because women comprise only 14% of all professional engineers in Alberta.

In a perfect world, gender-based assumptions and discrimination would not be imposed on women. It is my sincere hope that, with concerted efforts and the passage of time, such biases regarding gender-specific work roles will gradually diminish. I firmly believe that events like International Women's Day (IWD) and the resulting discussions - both on and offstage - are instrumental in driving this change. These forums remind us all that each of us holds the power to shape a better future. By advocating for our rights, supporting one another, and collaborating towards common goals, we can achieve a world where women are viewed as equals in all facets of life.



THE SCOVAN TEAM THAT MAKES IT HAPPEN

"

Today and every day, we must uncover, recognize, and discuss our experiences to lead the way toward positive change and manifest a better future.



CREATING VALUE FOR TODAY AND TOMORROW THROUGH ESG

BY VALERIE STEWART, VICE PRESIDENT BUSINESS DEVELOPMENT, SCOVAN INC.

There has never been a more important time to build trust and connect your organization, your people and your clients to the world. ESG practices identify your values and provide a framework to execute and communicate your highest priorities to your stakeholders. Those companies that are out performing their peers integrate their enterprise value and ESG performance. Strong ESG performance leads to improved client retention, cost of capital and overall market reputation. The oil and gas industry has seen increasing pressures to develop meaningful ESG strategies to develop sustainable energy practices while delivering long term value for their shareholders.

At Scovan, Environmental, Social, Governance has always been a priority. Over the last decade we have been actively working to develop technologies, implement practices to reduce environmental footprint of our designs, and give back to the communities we serve. We foster innovation through our Fresh Friday sessions, where we actively develop new ideas to improve processes, explore new technologies, and evaluate new markets. Our unwavering commitment to this cause has led to the creation of Scovan's inaugural ESG strategy document in 2022, which serves as a blueprint to further advance and elevate our ESG efforts.

Challenging the business of Energy, Scovan is driving innovation through the development of a unique set of products to address industry challenges. Our current suite of products includes:

HipVap: An Indirect Fired Steam Generator that generates steam direct from produced water. The technology reduces water consumption, disposal rates, greenhouse gas emissions, land use, and costs by eliminating conventional SAGD water treatment processes.

PadX: A modular SAGD well pad design that minimizes carbon footprint and maximizes efficiency through an intelligent, templated, and reliable design and lean manufacturing strategy. PadX offers the greatest economic value for the entire lifecycle of the pad.

ORSIL: A technology that manages SAGD facility waste streams on-site.









Environmental

We pride ourselves on implementing technology, efficiency, and environmentally conscious practices into every project we undertake. Through our design philosophy of modularization, reduction of steel, smaller transport loads for modules and lean manufacturing approach, we are reducing our energy consumption and carbon footprint. We are committed to supporting our clients long term target to achieve net-zero GHG emissions by 2050.

At Scovan we believe in investing in new technology to help facilitate the energy transition. We are developing a Center or Excellence at our Ponoka fabrication facility to build and trial new technology in real world applications. Examples include a pilot for Solar Steam that is producing renewable heat for industrial clients so that they can reduce carbon emissions while lowering costs.

Social

Scovan places a high priority on the physical and mental health of its employees, implementing systems that promote open dialogue and continuous improvement to enhance health and safety practices. These efforts have contributed to developing a corporate practice to monitor early indicators for safety and well-being and moving closer to a safe and healthy future. In addition, we actively engage in various community initiatives, such as supporting local charities and nonprofits and hosting and sponsoring events. We believe in the value of a diverse and inclusive workforce, and provide equal opportunity for advancement for all. Through collaborative efforts, Scovan aims to contribute to the communities where we work, empowering individuals and fostering sustainable growth.

Examples include:

- Commitment to inclusive hiring through partnership with Maskwacis Bi-Annual Career Fair
- Supporting Women centered and Indigenous focused non-profit organizations such as Verna J. Kirkness Education Foundation, Blackfoot Tech Council, and Canada Bridges through our annual International Women's Day forum.
- Our leadership team consists of 40% female leaders, while 27% of our greater management team are women. Additionally, our company is made up of 32% visible minorities.

Governance

To promote a healthy organizational culture and achieve operational excellence, accountability is essential. Leadership by example fosters ownership, teamwork, and engagement, all of which are critical to our success. Our Right People, Right Seats Assessment ensures that individuals align with our Core Values and are in suitable roles.

We update annually and live by our Professional Practice Management Plan (PPMP) to maintain quality of engineering deliverables and our engineering obligations.

Our Human Resources Employee Handbook is the basis of our culture, who we are, our processes and the importance of accountability. This is updated annually.



HIPVAP: THE FUTURE OF SUSTAINABLE STEAM GENERATION TECHNOLOGY

BY ASHTON BARG, P.ENG., MBA, PRODUCT DEVELOPMENT MANAGER

In IGNITE V2 we introduced Scovan's HipVap technology. At that point, the technology was in early -stage development, and we were looking forward to beginning a demonstration project to test a commercial scale HipVap IFSG exchanger over a 12+ month period. Since then, HipVap was recognized by Alberta Innovates and awarded funding in the TIER Economic Recovery Program's first cohort of innovative technologies. Alberta Innovates' TIER Economic Recovery Program consists of "shovel-ready" projects that will accelerate innovation in support of GHG emissions reduction, increase long-term economic competitiveness and stimulate growth in critically important sectors of Alberta's economy. HipVap was also invited to participate in the Full Project Proposal (FPP) stage of CRIN's Reducing Environmental Footprint funding competition. 68 applications were reviewed and only 22 projects invited to the FPP stage. Scovan's HipVap Artificial Intelligence application was one of the few selected to the next stage of this rigorous process.

Scovan's HipVap commercial demonstration project launched in 2022 and looks to find completion in 2023. The project is a significant milestone in the advancement of sustainable steam generation technology. It showcases a 100 TPD steam unit operating at a SAGD facility, which will verify the efficacy of Scovan's design in converting produced water into steam without the need for conventional water treatment processes.

For clients in the energy sector, carbon reduction and its associated costs are pressing concerns. The HipVap process is less energy intensive than the typical processes currently used in the SAGD industry. By reducing the "wasted energy" associated with the inefficiencies in these processes, HipVap has reduced CO₂ emissions. Preliminary calculations have shown that this can reduce the emissions for a 33,000 BPD SAGD facility by between 50,000 and 85,000 Tonnes per year. We utilized our Indirect Fired Steam Generator (IFSG) technology to gather baseline results with boiler feed water and have now moved on to testing untreated produced water. In addition, Scovan has incorporated Artificial Intelligence and Machine Learning enhancements to the design, enabling commercial operations to be analyzed and optimized. Scovan has prepared an information package detailing the tests being conducted to verify the efficacy of the HipVap technology, which can be obtained by contacting info@scovan.ca. Steady-state testing will continue until December 2023.

In conjunction with the demonstration project, Scovan has engineered a full-scale, commercial-size HipVap system capable of producing 1000 TPD of steam. All major mechanical equipment for the process has been sized for this capacity, and we have prepared a Class IV cost estimate for the package. Our engineering and fabrication capabilities enable us to customize the system according to specific needs such as steam production volume, pressure ratings, heat integration, water quality, pad equipment balance, brownfield/greenfield conditions, and facility expansion or well pad steam requirements, among other factors. Scovan is poised to partner with producers to conduct Front-End Engineering and Design (FEED) studies. The investment in a FEED study can be credited towards the purchase of a HipVap system in the future, making it an attractive and cost-effective option for our customers.

Because HipVap eliminates the need for water treatment, it can drastically reduce the amount of equipment required to generate steam compared to alternative methods, such as Warm Lime Softening (WLS) and Advanced Once Through Steam Generator (OTSG) or an Evaporator and Drum Boiler process.

Our organization's unwavering dedication to innovation and tailormade solutions makes us an excellent partner for producers aiming to reduce their carbon footprint while streamlining their operations. Since water treatment is not required with HipVap, following is a chart of how the technology drastically reduces the amount of equipment required to generate steam compared to a WLS + OTSG or a Evap + Drum Boiler method.



De-oiling Treatment

Water Treatment

Steam Generation

REPLACE THIS:

WITH THIS:

WLS/OTSG

or Evap/Drum Boiler

- PW/Glycol Exchanger Skid
- ORF Reed Tank
- Produced Water Surge Tank
- Surge Tank/Desand Skim/Floor Drain Pump Skid
- Produced Water Separator System
- ORF Feed/Skim/Wash Water Pump Skid
- Oil Removal Filter #
- Oil Removal Filter #2
- De-Oiled Water Tank
- Disposal/ORF Backwash Pump Skid
- Injection/PW Injection Pump Skid
- De-Oiled Water/Skim Pump Skid
- Desand Tanks
- Raw Water Tank
- Raw Water Ion Exchanger Skic
- Soft Water Tank
- Soft/Utility Water Pump/Make-up Water Heater Skid
- Source Water SAC Backwash/Raw Water Pump/Heater/Filter Skid
- Evaporator Package
- Utility BFW Pump/Utility Boiler Skid
- Chemical Injection Pump Skids
- Chemical Tanks

• Boiler Feed Water Tank

- BFW Booster Pump Skid
- High Pressure BFW Pump Skid
- Steam Generators
- Steam Generator Blowdown
 Exchanger Skid
- Blowdown Tank
- Blowdown Recycle Pump Skid
- Blowdown Separator
- Steam Silencer Skid

PW Cooler

- ORF Feed Tank
- Produced Water Surge Tank
- Surge Tank/Desand Skim/Floor Drain
 Pump Skid
- Produced Water Separator System
- ORF Feed/Skim/Wash Water Pump Skid
- Oil Removal Filter #1
- Oil Removal Filter #2
- De-Oiled Water Tank
- Disposal/ORF Backwash Pump Skid
- Injection/PW Injection Pump Skid
- De-Oiled Water/Skim Pump Skid
- Desand Tanks
- Lime Feed Package
- Magox Feed Package
- WLS
- WLS Overflow Tank
- WLS Overflow Tank Pump
- After Filters Package
- WAC Primary Package
- WAC Polish Package
- Dirty Backwash Tank
- Dirty Backwash Pump
- Backwash Pump
- BFW/BD Exchange
- BFW Tank
- BFW Tank Pump
- OTSGs
- LP Steam Separator

Hip/Vap System

FEED Tank

- Chemical Injection Pump Skids
- Chemical Tanks

- Hot Oil Heater + Heat Medium Fill
- Hot Oil Expansion Drum
- LP + HP HO Recirculation Drum
- IFSG Preheater
- IFSG Heater
- Steam Separator
- Flash Vapour Condenser
- Recovered Condensate Drum
- HP Feed Pump
- IFSG Recirculation Pump
- RC Pump



CREATING OPPORTUNITIES FOR BOARD READY WOMEN

BY JENNIFER KOURY, DIRECTOR, BOARD READY WOMEN

Creating Opportunities for Women on Boards

Despite notable improvement in gender representation on boards in developed nations, Canada has yet to achieve comparable progress, with Alberta trailing even further behind. Women currently occupy only 23% of board seats for companies based in Alberta listed on the TSX Composite Index, in contrast to the national average of 24%.

The case for diversity in corporate leadership and on boards is indisputable, yet the number of women in these roles remains disproportionately low. A consolidated strategy is needed to create opportunities for women in board positions. Alberta boasts a pool of highly skilled and capable women who possess the potential to make significant contributions to the public, private, and not-for-profit sectors across Canada. Women's participation at the executive level can positively impact a company's financial performance. As such, it is imperative to leverage this talent.

Board Ready Women (BRW) was established in 2018 with the mission of increasing female representation on Canadian boards across all industries. We recognize the challenges that board-aspiring women face and seek to support them in securing positions where they can leverage their skills, experience, and character to make a significant contribution. We are achieving this goal by building a robust network through quarterly skill-building and knowledgesharing seminars featuring influential and high-profile speakers from diverse backgrounds, including CEOs, executives, recruiters, board consultants, journalists, board members, and politicians. BRW also facilitates networking opportunities with "Board Ready" and "Board Experienced" female and male counterparts to heighten gender diversity awareness in boardrooms.

BRW connects board-aspiring women with "Board Experienced" mentors who provide valuable insights and help them advance their careers.

We connect accomplished members with extensive professional backgrounds and diverse experience with top recruiters and provide access to valuable resources, such as board opportunities, communication tools, and other relevant information to further assist them in their pursuits.

By providing these resources, we aim to increase the number of Canadian women in board positions. Since our inception in July 2018, more than 300 women have become part of the BRW network, and we are seeing discernible and substantial improvements. Our members' feedback is encouraging, with 26% of our network joining boards, 62% making valuable connections, and 73% achieving greater preparedness to serve on boards, as reported by our members.

BRW is thrilled with the success it's achieved in such a short period, but recognizes that there is much more work to be done. To expand our reach and impact, we have joined forces with the federal government to support the 50-30 Challenge initiative, which seeks to promote gender diversity on boards and senior management teams and create more opportunities for women. Additionally, we have established partnerships with several organizations, including Axis Connects, Alberta Women's Science Network (AWSN), GeoWomen Calgary, The Association of Professional Engineers and Geoscientists of Alberta (APEGA), Calgary Women in Energy, Women in Energy Council (WEC), Equal Futures Network, and Women in Mining Canada (WIMC), with whom we announced a collaboration with last year.

We hope you will join us on our continued journey to raise awareness among men and women about the importance of diversity and inclusion in corporate communities. Together, we can improve female representation on boards and forge the connections necessary to position women in roles where they can make a meaningful impact.

Visit us at: <u>www.boardreadywomen.com</u>



Working to Increase Indigenous Students in STEM



The Verna J. Kirkness Education Foundation provides week long, immersive educational experiences for Indigenous teens within universities across Canada. We are addressing the underrepresentation of First Nations, Métis, and Inuit students in STEM programming by developing motivated role models who go on to graduate from high school and attend post secondary. *Join us.*

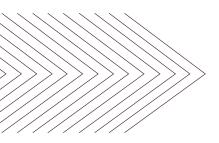
www.vernajkirkness.org





DEVELOPING THE NEXT GENERATION GENERATION OF INDIGENOUS LEADERS

BY MORGAN LABOUCAN, BA., PROGRAM COORDINATOR, VERNA J. KIRKNESS EDUCATION FOUNDATION



In 2008, the Family Food Research Foundation was established to raise graduation rates among Indigenous students in postsecondary science programs. The Foundation underwent a significant transformation in 2010 when Dr. Verna J. Kirkness, a renowned Indigenous educator, joined and agreed to lend her name to the organization. Soon after, the Verna J. Kirkness Education Foundation (VJKF) was born with the goal of increasing the number of Indigenous students graduating from pure and applied science, engineering, and mathematics programs across Canada.

VJKF proudly partners with several esteemed post-secondary institutions across Canada, including the University of British Columbia, the University of Saskatchewan, and the University of Manitoba. The Foundation aims to address the underrepresentation of Indigenous students in Canadian universities by offering VJKF Program scholarships to students in grades 11 and 12. These scholarships provide students with the opportunity to spend a week at one of our partner universities, where they can interact with and learn from professors, live in residence, meet role models and mentors, learn about the support systems available to them, and gain hands-on research experience. Since 2010, 617 students have participated in VJKF's week-long program. A survey conducted in 2022 revealed that among the participants who completed high school, 98.7% obtained their diplomas. Additionally, 87.9% of these graduates went on to pursue higher education at universities or colleges, with 55% of them selecting a major or minor in science, technology, math, or engineering.

As a proud member of the Driftpile Cree Nation and a former VKFJ program participant, I can attest to the enduring impact this Foundation has on students' lives. Initially, I was hesitant to apply as I did not have a strong affinity for math or biology and had limited engineering knowledge. However, my experience in the VJKF Program at the University of Manitoba in 2016 changed my life. Between 2016 and 2021, I had the privilege of working as a summer student for VJKF while completing my Bachelor of Arts degree at the University of Calgary. In 2018, I joined the Board of Directors to bring a young, Indigenous female perspective to the Foundation's mission. In 2022, I was appointed as the Foundation's Program Coordinator.

The profound influence that the VJKF program has on the lives of its participants cannot be overstated. Only this year did I realize that attending the VJKF program was the first time I was exposed to my cultural roots without experiencing any shame associated with my Indigenous identity. For many of our Kirkness Scholars, what was intended to be a week-long program has transformed into an unceasing journey that continues to shape their lives.

Having reviewed this year's student application essays, I was moved by the remarkable display of self-advocacy, curiosity, and a shared desire for change. We are immensely grateful for the unwavering support of our sponsors and donors, whose generosity has allowed us to award 110 program scholarships for our upcoming May 2023 programs through the Verna J. Kirkness Education Foundation (VJKF).

We are committed to cultivating sustainable connections between Indigenous students and post-secondary educational institutions in Canada as we work to nurture the next generation of Indigenous leaders in STEM.

Scovan is proud to support the VJKF as the non-profit organization from our International Women's Day Forum.





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HOW AI IS CHANGING THE WAY WE WORK BY JULIA OKONKWO, PROJECT ENGINEER, SCOVAN

Artificial Intelligence (AI) has made remarkable strides in recent years, prompting businesses to acknowledge the potential benefits of incorporating this technology into their operations. The integration of AI has resulted in substantial improvements in productivity, efficiency, and overall growth in several industries. Nevertheless, it is crucial to adopt a strategic, thoughtful approach to implementing AI in the workplace to ensure that the technology supports organizational objectives and enhances the skills and capabilities of employees rather than replacing them.

Utilizing AI tools in the workplace offers several advantages, including enhanced productivity and efficiency. Al-driven systems can automate repetitive tasks, freeing up employees to concentrate on more intricate, value-added work. Al can facilitate the analysis

A Look at the Impact of Automation

of vast datasets that would otherwise be challenging for humans to manage, improving decision-making accuracy and capabilities. By streamlining workflows, AI reduces the time required to complete certain tasks, resulting in faster turnaround times, improved customer responsiveness, and increased satisfaction.

Al has the ability to produce data that would otherwise be challenging to obtain through manual analysis. By analyzing large amounts of data, AI can detect patterns and trends, providing businesses with an in-depth look into consumer behaviour and market trends. Leveraging such insights allows firms to make better-informed decisions, resulting in improved performance.

In recent months, we've seen an astronomical rise in the popularity of ChatGPT, a state-of-the-art language model that has the potential to revolutionize the way businesses operate in today's digital age. Its advanced natural language processing capabilities allow it to understand and respond to complex gueries in a human-like manner, making it an invaluable tool for enhancing productivity and efficiency in the workplace. ChatGPT allows firms to automate routine tasks, streamline customer support processes, and gain valuable insights from large volumes of unstructured data. Moreover, its ability to learn and adapt over time makes it a highly scalable solution that can evolve alongside a business's changing needs. With ChatGPT, organizations can unlock new levels of innovation and creativity, ultimately driving greater success and growth.

Although there are numerous benefits associated with integrating Al into business operations, companies must ensure that this technology is aligned with their goals and values. Al should not be implemented merely for the sake of using the latest technology. Instead, firms should thoroughly evaluate their needs and identify areas where AI can augment existing processes and improve business outcomes. Companies must ensure that AI systems are transparent and explainable, with established guidelines and procedures for data handling and decision-making.

The EPFC industry can benefit significantly from Al integration. Al-powered systems can assist with analyzing energy usage and demand, allowing for a more efficient distribution of resources. Similarly, AI can help develop new technologies and techniques, improving the overall efficiency and sustainability of the industry. As the EPFC industry continues to grow and evolve, Al integration will become increasingly important in propelling innovation and growth.



SUSTAINABLE COLLABORATION: MARKET OUTLOOK

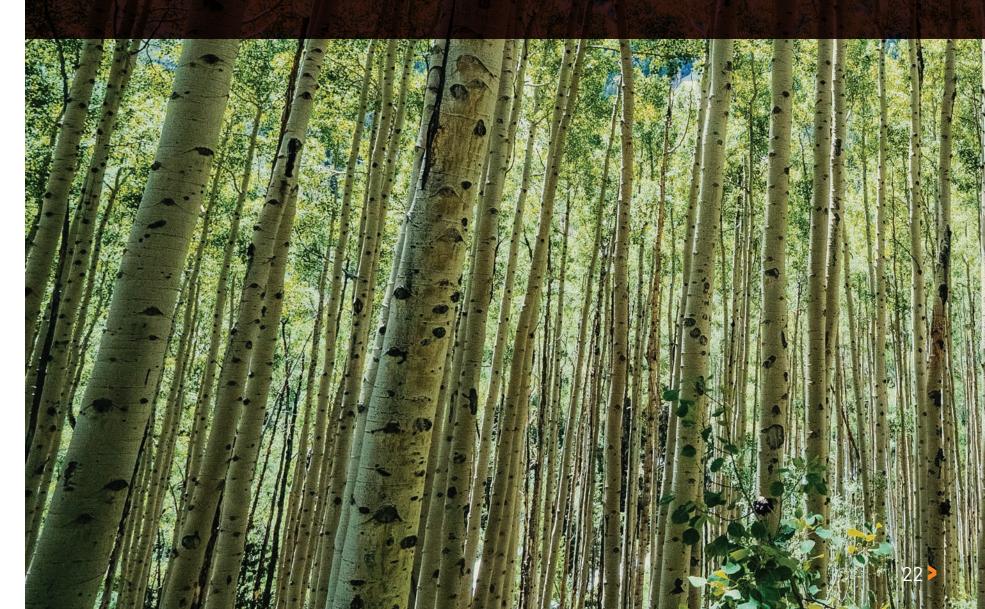
BY: ELMIEN WINGERT, CPA, CAVP CORPORATE SERVICES, CANADIAN ASSOCIATION OF PETROLEUM PRODUCERS (CAPP) Canada has gained a reputation for prioritizing the safety and sustainability of its citizens' lives, all of which are underpinned by the country's energy security. Over the past two decades, Canada has experienced monumental shifts in areas such as inflation, labour markets, and climate change. These changes have posed significant challenges to the energy industry. However, they have also presented opportunities for growth and renewal within the sector.

Inflation rates have been relatively stable in Canada over the last two decades, hovering around the Bank of Canada's 2% target. However, the unprecedented effects of the COVID-19 pandemic threw the global economy into disarray. In response, the Bank of Canada implemented one of the steepest and fastest tightening cycles to combat rising inflation by raising interest rates.

Energy costs are a major determinant of inflation, given that global oil and natural gas prices can exert upward pressure on costs throughout the economy. As a top oil and natural gas producer, Canada can shield itself from global commodity price swings by investing in infrastructure that facilitates the efficient transportation of its energy resources across the country. This approach would allow Canada to exercise greater control over its energy costs and security.

According to the Canadian Association of Petroleum Producers (CAPP), investment in upstream oil and natural gas production is projected to soar to \$40.0 billion in 2023, surpassing pre-pandemic levels and growing over 80% since 2020's low of \$22.0 billion. To ensure sustainable, long-term investment in energy, it is essential to strike a balance between allocating funds for growth projects and implementing sensible capital management and cost controls.

The pandemic created a significant imbalance in the labour market, resulting in a record unemployment rate of 9.5% in 2020 - the highest in 20 years. The situation has since improved, and the labour market has tightened, with demand exceeding supply and unemployment rates hovering around 5%. Canada's energy sector has always attracted talented individuals, both nationally and internationally. To sustain this trend, the industry must optimize its workforce and create meaningful opportunities for new immigrants, Indigenous peoples, women, and youth to flourish. Promoting diversity and inclusion is vital to the industry's overall sustainability and social responsibility. Canadians and visitors rightfully expect a clean environment, unpolluted air and water, and sustainable resource development practices. It is our generation's duty to protect and steward our natural surroundings. Canadian oil and gas producers have stepped up to the challenge by becoming leading investors in clean technology. The energy industry must remain at the forefront of innovation to achieve sustainable, long-term development. In this regard, Canada's energy sector is taking a leadership role in responsible oil and natural gas production and decarbonization initiatives by investing in carbon capture utilization and storage, solvent processes, waste heat recovery, and electrification to reduce emissions and enhance overall environmental performance.





Canada's oil and natural gas industry has always been resilient and innovative, adapting to shifting paradigms and seismic forces. Sensible capital management and investments in future growth, diversity, and inclusion to manage the demands of the labour market and advancements in new technologies to address climate change meaningfully and sustainably are necessary for long-term success.



BY TANNER MILNER, BUSINESS DEVELOPMENT MANAGER, SCOVAN



WITH STAN ROSS, PRESIDENT & CEO, RECOVER

رد **Q&A WITH RECOVER INC.**

Tanner Milner: Can you tell us a little bit about Recover's beginnings and where you as an organization are today? What do you do?

Stan Ross: Recover was founded in 2008 with a mandate to develop a technological solution to the longstanding liability of oil based drilling waste.

Today, Recover is a leading Waste-to-Fuel company focused on recycling oil based drilling waste, which is created nearly every time a well is drilled. Recover's first-of-a-kind Lodgepole Facility, operating in Western Canada, culminates fifteen years of research and development and the successful commercialization of the Corporation's Waste-to-Fuel technology.

TM: What makes Recover unique? How do you do what you do? Can you explain the technology utilized to recover marketable product from drilling waste?

SR: Recover is competing in a technologically under developed area. While some niche technologies have tried to fill the technological gap (for example, thermal recovery, high speed centrifuges and vacuum shakers), all are constrained by effectiveness or operating costs. Thermal processes apply heat to the drilling waste in an effort to evaporate the diesel phase - a process that comes with high energy inputs. Getting the diesel to boil off in its fractions requires tremendous energy, increasing the carbon footprint of the recovered diesel. Centrifuges and vacuum shakers are limited by effectiveness in that, they can only recover the free liquids. Given this area lacked a technological solution, industry defaulted to managing the liability with landfilling. Recover has a multi-phase solvent extraction process, a time-proven technique leveraged worldwide to recover many materials.

Recover has adapted the solvent extraction technique to function on oil based drilling waste. Through our specialized application, the solvent dissolves oil-based mud into solution. That liquid phase is sent to a distillation tower where the solvent evaporates (at a low temperature) and is converted from vapour to a liquid for reuse. Since the base oil (diesel) has a higher boiling point, it is collected in the tower bottom and reusable as a low-sulfur fuel.

TM: Scovan was involved in some of the early stages with Recover, on a Debottlenecking Project in 2019. How did that project go?

SR: The Debottlenecking Project was commissioned to remove any of the bottlenecks in the original facility design. Scovan was the lead engineering firm and the project was completed on time and on budget. The project was commissioned to prove two metrics:

- The business plan is commercially viable.

Following our commissioning of the Debottlenecking Project (and following the COVID shutdown), both of these metrics have been fully proven. In fact, Recover recently achieved two significant milestones including, the production of >11mm litres of base oil and avoidance of 100,000 metric tonnes of CO₂e.

• The technology worked at the designed throughput;

TM: How important is it for Recover to work with companies, both up and down-stream of your business in a collaborative, mutually beneficial way? What are you doing to foster these relationships with vendors, partners, and clients?

SR: Recover is a proud partner of the Western Economic Corridor ("WEC"). WEC is a Brazeau County initiative, intended to attract clean-tech companies to situate operations in this new industrial cluster area. Recover agreed to participate because we believe in the area and recognize, collaboration is essential to success and Recover was the benefactor of such collaboration while we were developing our clean-tech. Not only did Recover find vendors in Brazeau County who were willing to help design and build proprietary process equipment, but we also found other innovators, like that of Mojo Trucking and HVO, both located in Drayton Valley. Mojo Trucking has been a leader in the development of sealed trailer designs which allow for the safe and effective transport of oil based drilling waste. HVO demonstrated that Recover's cleaned waste (RecoverDry[™]) worked really well as a stabilization material for daylighting waste streams. By recycling RecoverDry™ as a stabilization material, the use of biogenic materials is avoided, further reducing GHG emissions.





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SR: Recover is actively pursuing a US expansion and we have received a permit from the Railroad Commission of Texas to build its next facility in the heart of the busiest market in the world. Construction of this facility is scheduled to start later this year and the facility will be located directly on a landfill in Howard County Texas. This facility will be capable of producing more than 12,000,000 gallons per year of negative carbon intensity distillate fuel, while avoiding over 400,000 tonnes of GHG emissions per year. This project will mark the start of a long and prosperous growth phase resulting in the recycling of waste, reducing landfill volumes and substantial reductions in GHG emissions.

Recover plans to replicate its existing technology in North America to more than twenty possible expansion sites where there is limited, if any, competition and upon full commercial rollout Recover could avoid upwards of 8 million tonnes of GHG emissions annually while producing more than 240,000,000 gallons per year of negative carbon intensity distillate fuel. Recover is committed to playing a pivotal role in the fight against climate change through the expansion of its proprietary technology to maximize the recycling of waste and avoidance of GHG emissions.







TM: What does the future have in store for Recover?

TM: How does being a Canadian based business impact your ability to grow and succeed with a focus on American-based infrastructure projects?

SR: In our experience, it doesn't matter if you're based-in and expanding-to the US or Canada. Your technology needs to be economical to be sustainable. The Recover team doesn't subscribe to being green at any cost - if any process costs more than the status quo, you won't get buy in. We have been really happy with the reception for Recover and we believe it's because of our approach of a zero dollar processing fee. Recover uses the recovered base oil as our revenue stream, while promoting recycling efforts, reducing landfillable volumes and avoiding green house gas emissions. 'Being better' with the same (or a lower) cost point gets you buy in.

Scovan delivered front end engineering services which resulted in Recover obtaining a permit for our first US facility. With a permit in-hand and our state of technology readiness, Recover was able to secure a feedstock agreement with a large US based landfill operator and off-take agreements with a local drilling fluids wholesaler and a large US based refiner.

TM: What is your future outlook for the oil and gas industry in North America?

SR: Oil and gas will be an important part of global energy supply for the coming decades and we are gradually seeing more attention to ways of decarbonizing beyond replacing fossil fuels. Recover Inc. is at the forefront of the opportunities and challenges associated with decarbonizing drilling new wells, landfill avoidance and low carbon fuel production.

TM: Thanks for your time and insight into the work Recover is doing and how you are approaching the challenge of oil based drilling waste and providing an option that allows companies to deliver on ESG commitments. Scovan is proud to have been a part of your journey so far, we look forward to your future successes.

RACING FOR THE ULTIMATE TEAM BY OLIVIA MCMURRAY, P.ENG, PROCESS ENGINEER, SCOVAN

Rowing is often called the ultimate team sport - anyone who has seen an eight-person crew race in perfect synchrony will immediately understand why. More than a decade of rowing has taught me that great teams are not formed simply because a group of people do the same thing at the same time - successful teams are built on a foundation of collaboration and engagement.

One of the key principles at Scovan is Right People, Right Seats, which is exactly how rowing teams are formed as well. Although the goal is to have all crew members moving identically, each position in the boat has a special set of responsibilities and talents. As the "Stroke" person in both the pair and the four, my job was to establish an effective rhythm and steer the boat - analogous to being a process engineer responsible for a solid process design to start off a project. Athletes in the middle of the boat focus on power and pulling even harder when needed during a race - similar to the multidisciplinary teams of electrical, mechanical, design, procurement and fabrication teams at Scovan that provide the horsepower to execute projects. The "Bow" rower is responsible for building the race plan, watching their team to make technical changes, and calling for strategic moves during the race - just



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like project managers who lead their teams to success. Each team member has valuable knowledge and experience, but unless actions are taken in harmony they will not result in success.

A unique trait of rowing is that every athlete starts and finishes the race together. There are no first strings or anchor legs, no winning goal scorers or MVPs. Rowers don't wear jerseys emblazoned with names and numbers. Success is truly shared between team members, which is very similar to how projects are executed at Scovan. This mindset creates a culture of cooperation and encourages each team member to value everyone's contributions and support the work of their teammates.

Quality work requires effective execution, but it can be elevated by true engagement. Teams are stronger when they are connected by more than just tasks - they will help each other get through tough times and celebrate achievements together. Balancing 32 hours of work and 20+ hours of training per week was a heavy load, but it felt lighter due to the encouragement of my colleagues and teammates. At Scovan and on the national team, I felt that the environments were a great blend of striving for high performance but also supporting each other during the hard work. Overall, the experience made me tougher both physically and mentally, and I am inspired to keep pushing myself towards my career and rowing goals.

In conclusion, rowing epitomizes the essence of teamwork, but successful teams are built long before they hit the water. Skilled people in the right seats can achieve greatness when they are in a supportive and collaborative environment. Whether in rowing or project execution, the true strength lies in the collective effort of every team member.

Olivia McMurray has been with Scovan as a process engineer for 6 years, and recently returned from 3 months of training, selection, and competition with the Rowing Canada National Team. She competed in Chile at the Pan Am Games Qualification Regatta, finishing in 4th place in the Women's Four event and winning a Gold medal in the Women's Pair event.

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BUILDING THE WESTERN ECONOMIC CORRIDOR

BY REEVE GUYON, COUNCILLOR, BRAZEAU CO

Brazeau County, situated 90 minutes west of Edmonton, has significantly contributed to Alberta's economic growth over recent years, thanks to its thriving natural resource sectors and, specifically, the oil and gas industry before oilsands commercialization, Brazeau County held Alberta's largest known petroleum reserves. With a plethora of fossil fuel supply situated in the county, upstream and midstream companies played an integral role in establishing a robust industrial network, providing regional prosperity and employment opportunities for local residents and those of the greater Edmonton region. Ensuring the continuation and expansion of Brazeau's current industrial base remains paramount, in addition to robust economic diversification measures. This is especially the case as a shift in the global economy takes place, catalyzed by climate change and the ever-increasing importance of Environmental, Social, and Governance (ESG) on capital investment, potentially impacting the local economy.

To ensure a vibrant, thriving community for current residents and future generations, Brazeau County has refocused its attention on establishing and marketing a macro-level environment conducive to positive economic activity through the Western Economic Corridor (WEC) strategy.

Approved by Brazeau County Council in January 2022, the WEC represents an emerging industrial cluster within Alberta focused on cleantech investment attraction and commercialization. The notion of industrial ecosystems is not new to Alberta and is best exhibited by the Alberta Industrial Heartland and the Greenview Industrial Gateway, both of which focus, instead, on petroleum processing. Through the WEC, prospective cleantech investors have access to a robust industrial foundation that can enable significant partnership and scale-up opportunities, creating mutually beneficial outcomes. This is best exemplified by the Recover Lodgepole Waste Management project engineered by Scovan. Recover is WEC's landmark investor, who works with local oil companies to extract lost hydrocarbons from oil base drilling waste, mitigating the use of class-2 landfills.

In addition to partnership opportunities with the industrial base, prospective cleantech investors can also take advantage of pre-existing industrial infrastructure to support their operations, this includes:

- along Highways 22, 621, and 753;
- the Yellowhead and CANAMEX Highways
- Readily available utility network:
- Water;
- Power supply;
- 240 & 138 KV lines

benefits residents.

start-up companies, by:

- growth and development; and
- 2. Compose a large-scale marketing plan to raise awareness of the initiative.

To learn more about the WEC or partake in industry consultation, please contact Brian Senio and Kent Edney via email at

BRIAN@KORTE-CONSULTING.COM AND KEDNEY@BRAZEAU.AB.CA.

• Access to the provincially designated high-wide-load corridor route that runs

• Close proximity to major national and international transportation routes,

• Roughly 1-hour from the Edmonton International Airport;

Rail networks that run parallel with the Yellowhead Highway

Augmenting advantages presented by market access and utility infrastructure is a robust low-tax-low-regulatory regime that

WEC and the Brazeau County are committed to supporting new

1. Engage with the national cleantech sector to identify investment incentives that position the county as the national hub for cleantech investment, supporting start-up



CONNECTING INDUSTRY **AND FUTURE INNOVATORS:** FOSTERING **COLLABORATION**

BY CHOA EDITORIAL COMMITTEE

CHOA successfully hosted its inaugural Future Innovators Forum on March 29, 2023, serving as a bridge between academia, business leaders, human resources professionals, and numerous students aspiring to make an impact interested in innovation, energy transition, and our industry's future. The event's overarching theme was "Our Joint Future," which aimed to establish connections between the heavy oil and oil sands industry, students considering careers in our industry and the academic institutions they attend. Distinguished leaders, technical experts, and human resources professionals from the industry were in attendance.

The forum featured a thought-provoking keynote presentation by Dr. Brad Hayes, Outreach Director for the Canadian Society for Evolving Energy at the University of Alberta. Titled "The 21st Century Energy Transition: The Global Challenge of Our Time." He emphasized that energy is a cornerstone of modern life, with over 80% of our current consumption relying on fossil fuels. As the world's population continues to grow, finding sustainable ways to meet energy demands without compromising future generations' needs will become paramount.

Dr. Hayes explained that previous attempts at transitioning to renewable energy have only added new sources without effectively replacing existing ones. He detailed the complexity of energy supply chains and infrastructure, which cannot be quickly changed while

maintaining essential energy delivery. Furthermore, he noted that critical supply chains for new energy and storage technology are not yet in place. Dr. Hayes stressed that focusing solely on emissions reduction is not a comprehensive energy transition plan, as it fails to address energy availability, security, and affordability issues. He concluded by highlighting that it will take decades to replace our current systems and infrastructure, casting doubt on the achievability of a Net Zero society within the proposed timeframe.

Throughout the presentation, Dr. Hayes fostered a sense of optimism by highlighting the pivotal role collaboration between industry, the education system, and students can play in addressing the challenges posed by the energy transition. He recognized that students have the potential to be catalysts for change, leveraging their boundless creativity, knowledge, and passion to contribute significantly to the solution. By forging partnerships between academia and industry, we can empower students with the resources, guidance, and real-world experiences needed to spearhead innovation and advancement in energy transition.

The forum also included an industry panel discussion moderated by Katie Smith-Parent from Young Women In Energy (YWE). Panelists Valerie Stewart (Scovan), James Agate (Canadian Natural), Patricia Bailey (Pathways Alliance), Omar Khattab (Avatar Innovations), and Steve McCaffrey (MEG Energy) shared insights into their unique career paths in the industry. They shared many of the exciting initiatives for young people to start their careers in the energy industry for a variety of backgrounds. There is a space for everyone, from human resources to accounting and safety. They drew parallels between their experiences and the current environment for new professionals, expressing optimism about future prospects. The panelists emphasized that the industry's success has been driven by talented individuals, innovation, and an entrepreneurial spirit, which will continue to shape its future.

The event's success was made possible by the support of Title Sponsor CNRL and Event Sponsors Bantrel, GLJ, Halliburton, Scovan, Suncor, and Wood. CHOA extends its gratitude to these organizations for their commitment to Future Innovators. Our academic partners, including the University of Calgary, SAIT, Mount Royal University, and the University of Alberta, played a vital role in ensuring the forum's success. We sincerely thank them for their participation.

By fostering connections and facilitating meaningful discussions between industry professionals and future innovators, CHOA's Future Innovators Forum served as a catalyst for collaboration, knowledge exchange, and the cultivation of a promising future for our industry and its talented individuals.



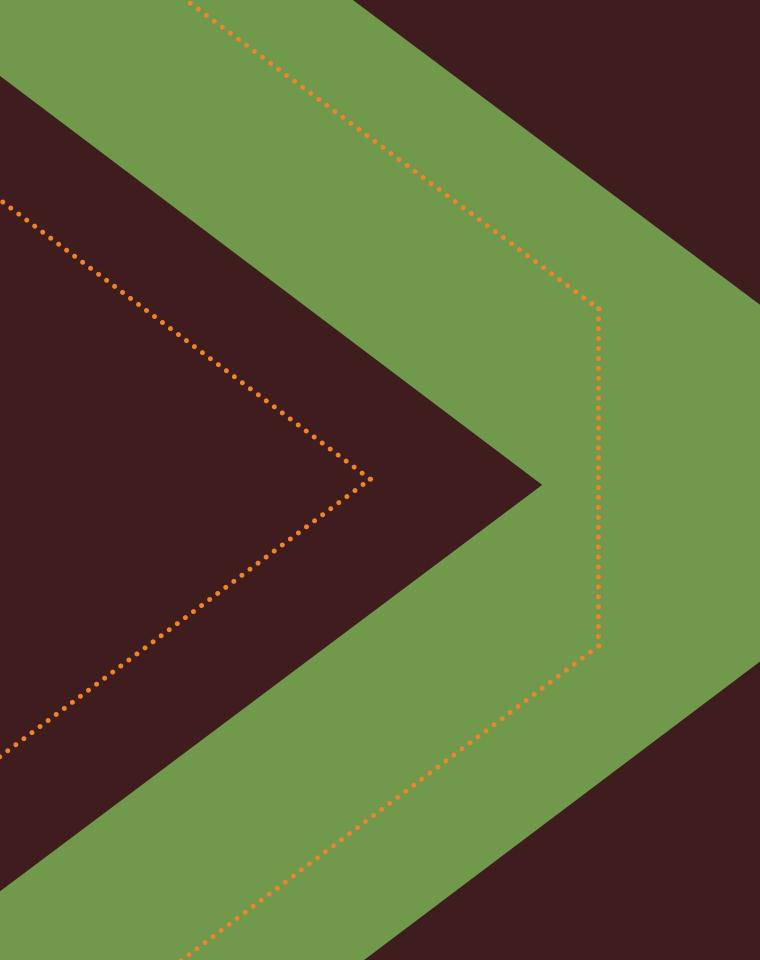






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