

IGNITE

Scovan Engineering | June 2021 Volume 2

Scovan 
FORWARD ENGINEERING

ESG Strategy Roll Out

Renewable Natural Gas: A New Source of Clean Energy

HipVap: Game-changing Technology for SAGD

THermal POWER PLANT

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Designed and produced by fevercom.com for Scovan. Printed in Canada.



The ESG Alphabet: Innovation + Partnership = Value Creation

In this edition of IGNITE, we explore Alberta's energy ESG ethos via the innovative partners with which Scovan Engineering works – and how they're creating a vibrant ESG value chain.

In discussions about ESG, it's hard to understand why there isn't more focus around the **ESG value chain**—after all, ESG is fundamentally about creating value.

The value chain concept is simple enough: it's what your organization does to take inputs and turn them into higher value outputs.

Harvard professor Michael Porter has understood this for decades. In **Competitive Advantage**, Porter proposed companies use the value chain to examine how they did, what they did, to grasp more granularly the "whats" and "hows" of value creation. The concept goes beyond simple business intuition: it requires attention to detail of the smallest cogs and gears that move a business forward.

In the 1980s, it was pure-play business. But over the years, ESG bumped into CSV – creating shared value. Yet that "collision" was more about external voices telling companies CSV was something they ought to do. But times have changed.

Cast currently, the value chain concept aligns perfectly with businesses seeking to create value for multiple stakeholders through ESG thinking.



It's an important concept for two key reasons. First, it turns the idea of ESG from a burden to an opportunity. In other words, rather than a burden imposed by external forces, it flips that negative on its head and asks companies to constructively consider how ESG thinking can be a value creator. Second, it also reminds companies that the three letters represent the tip of an "alphabet iceberg." All letters and concepts they represent should move in a synchronous and strategic way to support environmental, social and governance principles.

TAKE "I". FOR "INNOVATION". ESG when paired with innovation is an incredibly important value creator. Without a corporate mindset that values innovation – and ensures it's enculturated – no matter hard a company might try, its ESG strategy is lip-service.

"P". FOR "PARTNERSHIPS". As the energy sector returns to some semblance of pre-pandemic and pre-downturn normalcy, it must do so fully embracing ESG thinking. Re-imagining and rethinking partnerships in ways that creatively re-engineer the normal customer-supplier relationship will underpin successful ESG thinking.

Viewed through an ESG value-chain-creation lens, a true partnership ethos can seamlessly link two corporate strategies into an integrated solution. That will come from transparency tools that mesh and consider how separate strategies can be aligned, right down to the smallest linkage.



At Colliers, we take great strides to understand, nurture, and celebrate diversity and inclusion.

Our vision is to ensure Colliers is an inclusive workplace where we can be authentic and do our best for our clients, our communities, and each other. We aim to develop and empower our people from all walks of life to think differently and embrace an inclusive culture, while providing creative real estate solutions to our clients.

Aly Lalani

Executive Vice President | Partner
Aly.Lalani@colliers.com
Ph: 403 298 0410
Mobile: 403 680 4636

Leigh Kirnbauer

Vice President | Partner
Leigh.Kirnbauer@colliers.com
Ph: 403 298 0408
Mobile: 403 554 7324

Jane Taylor

Associate | Transaction Manager
Jane.V.Taylor@colliers.com
Ph: 403 298 0420
Mobile: 403 836 1102

Cassie Van Kessel

Office Project Specialist
cassie.vankessel@colliers.com
Ph: 403 298 0406

Accelerating success.

2021 International Women's Day Forum:

Choose to Challenge

By Donovan Nielsen, President, Scovan Engineering

“A challenged world is an alert world and from challenge comes change. So let's all choose to challenge.”

In celebration of International Women's Day, Scovan was proud to host its 3rd annual International Women's Day Forum. Scovan brought together industry professionals to participate in a virtual event to celebrate women's achievement in the energy industry, raise awareness against bias and highlight the accomplishments we have made thus far.

The theme for the event this year was Challenge and Resilience. How to navigate through challenging times, and find that resilience to manage change. Our speakers shared their personal stories through the many stages of their career and made a meaningful impact on our audience members.



While we focus this day on highlighting the progress we have made in gender equality and to celebrate the strong women that have made an impact in our lives, we must recognize that we live in a privileged world with opportunities that don't exist everywhere. Canada is widely recognized as one of the countries with the highest quality of life. And it's not uncommon for us to hear about Calgary being one of the most livable cities in the world. What other industry is debated on a daily basis on a global scale? Yes, energy comes with its challenges but it also comes with opportunities that are beyond most people's reach. We are lucky. We are privileged. And we need to remember the context from which we speak.

But not everyone has the same story and not everyone has the same opportunity. We need to push ourselves beyond our comfort zone and to realize that progress towards equality here does not mean there is equality everywhere.

Last year we learned more about a term called unconscious bias and the dangerous role it plays in our society.

Unconscious biases are social stereotypes about certain groups of people that each of us form outside of our own conscious awareness. Everyone holds unconscious beliefs about various social and identity groups, and these biases stem from one's tendency to organize

social worlds by categorizing.

Unconscious bias is far more prevalent than conscious prejudice and often incompatible with one's conscious values. Unconscious biases can contradict what we say and what we do. This is yet another way that we exclude certain social groups and people.

Certain scenarios can activate unconscious attitudes and beliefs. For example, biases may be more prevalent when multi-tasking or working under time pressure, or when experiencing stress and anxiety from uncertainty. This has been a challenging year and one in which we've all had to learn to cope and it is my hope that we haven't allowed it to impact our will to challenge.

An example of an unconscious bias is hiring in the workplace.

History has shown us that men are all-too-often given preferential treatment over women in the workplace. One study found that both men and women prefer male candidates. So much so that, the study found that a man is 1.5 times more likely to be hired than a woman. This is a problem, and perhaps even more so in the STEM fields we work in like engineering. But we need to choose to be better.

A challenged world is an alert world. Individually, we're all responsible for our own thoughts and actions whether conscious or unconscious – all day, every day.

Gender is a pre-written book, and this is your chance to add your own chapter. To call out racism and sexism. Choose to create history, and not to be created by it. We all have our part to play and a voice to be heard. Let's work together to make a difference.

During our event, we celebrated some of the truly exceptional women in our city and heard their stories about challenge and resilience. We may not be able to change our social biases over night but we will do our part to continue to raise awareness and choose to accelerate gender parity.

We are proud to support the not-for-profit organization Canada Bridges with net proceeds from this event. Canada Bridges supports young people to be catalysts for change in their communities and supports indigenous youth to be leaders in their community.



“From challenge comes change, so let's all choose to challenge.”

How will you help forge a gender equal world?

Celebrate women's achievement. Raise awareness against bias. And take action for equality.

Visit [YouTube.com](https://www.youtube.com) to watch: 2021 Scovan's International Women's Day Event

Scovan's International Women's Day Forum 2021

A special thank you to our speakers



Andrea Decore, LL.B. Vice President, Strategy & Corporate Development, Suncor Energy



Gayathri Shukla, P.Eng, MBA
Manager, Digital Strategy and Innovation, Suncor Energy/
Founder, Campfire Kinship



Shana Boyd, P.Eng. Senior Manager of Engineering for Pembina Pipeline Corporation.



And thank you to our MC and IWD Conference Chair,
Valerie Stewart, MBA, VP Strategy and Development,
Scovan Engineering



SolarSteam: Meeting ESG Targets

through Renewable Heat

By Apostol Radev, CEO and Co-Founder, SolarSteam

If heavy industry was a country, it would be the largest producer of greenhouse gases on Earth. The global trend to integrate Environment, Social, Governance (ESG) strategies is one of the most significant tools available for companies interested in reversing this impact. SolarSteam Inc., a Calgary based renewable company with a vision to developing the lowest cost renewable heat, represents a transformational cleantech solution which is data driven, sustainable, net zero focused, integrates artificial intelligence and machine learning and aligns with global parameters for evidence based validation of ESG focus areas.



segments presents an opportunity to enable Alberta's Large Final Emitters (LFEs) to establish Alberta as the next big market for concentrated solar heat and become leaders in ESG.

As a new Canadian, Apostol Radev, CEO & Co-Founder of SolarSteam, has come to understand and be proud that Alberta has been blessed with vast reserves of natural resources, a rich Aboriginal history and a culture that has made its people resourceful, persistent and hospitable to others. SolarSteam's team is driven by the great entrepreneurship and innovation in Alberta's energy industry, and they firmly believe that

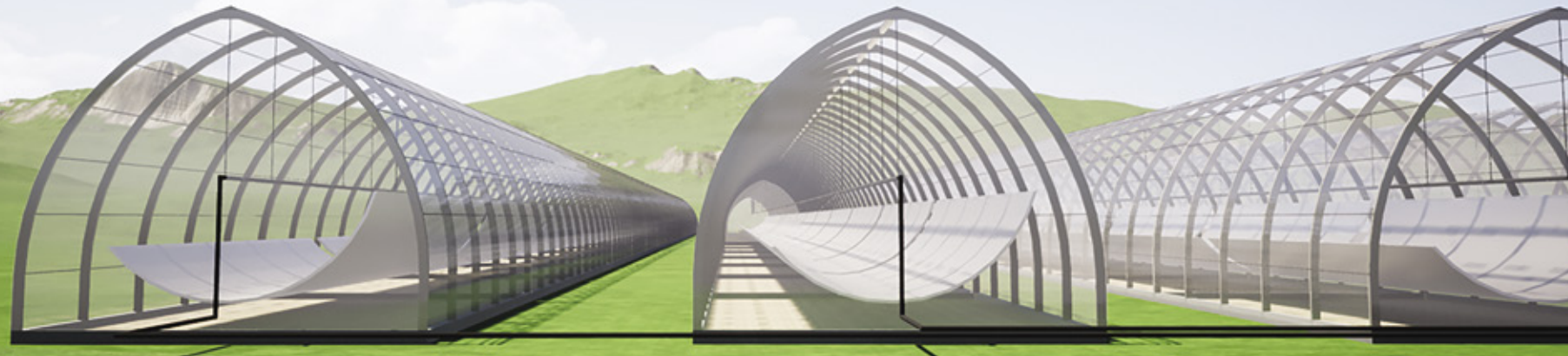
SolarSteam system provides the ability to integrate a transformative low carbon technology and digital technology to build a unique solution that improves performance, reduces costs and supports energy transition, while contributing to cost competitiveness, advances sustainability and environmental stewardship, and promotes social diversity and equality, especially in a post COVID-19 economy.

the local spirit and skill set will build the bridge to one unified and diverse sustainable energy sector.

Globally, producers spend up to \$40 billion dollars a year on steam and hot water, and industry process heat demands are set to increase. SolarSteam's solution reduces energy costs by up to 40%, while significantly reducing CO2 emissions.

These are challenging times for the energy sector in Canada, but responding to this new reality should be taken as an opportunity to put Alberta oil and gas skill sets back to work. The changing ESG policy landscape in the country is creating new drivers from a business risk management and investment perspective. Furthermore, the business case for integrating a climate dimension on a corporate level is a lot stronger than it used to be. The GHG emissions reduction benefit of generating renewable heat using SolarSteam's technology across various heat intensive industry

SolarSteam's system uses solar collectors to concentrate sunlight in order to generate hot water and steam. A transparent membrane enclosure increase efficiency by keeping the collectors clean and reduces capital cost by allowing for lightweight materials that don't require rigid and expensive foundations and controls. SolarSteam's generators will operate in conjunction with existing boilers and use boiler feed water to provide direct hot water and steam generation.



“ SolarSteam’s solution reduces energy costs by up to 40%, while significantly reducing CO₂ emissions. ”

Over the last 3 years SolarSteam has been collaborating with a multi-billion-dollar company with significant operations in Alberta, Canada and a strong ESG mandate. This company has provided in-kind and financial support with respect to preliminary evaluation and design of the technology and has papered its intent to evaluate results of the pilot with the intention of becoming a beachhead market adopter. Other markets that SolarSteam is collaborating with include sustainable food development in the Caribbean, district heating operators in Canada and cosmetics producers in Europe.

SolarSteam is collaborating with Scovan Engineering and Gemini Fabrication to complete final commercialization efforts for deploying a field system in Alberta. This first of a kind deployment will validate SolarSteam’s technology ability to support global ESG alignment with United National SDGs, Global Reporting Initiative, Task force on Climate Related Financial Disclosure and Sustainable Accounting Standards Board to enable our early adopters to advance their ESG mandates.

SolarSteam is currently working with one of the top research institutes in the US, the National Renewable Energy Laboratories (NREL) through the Canada/NREL Cleantech Accelerator Program being hosted by the Consulate General of Canada in Denver. SolarSteam is also one of the finalists presenting at NREL Industry Growth Forum conference (virtual) April 20-22, 2021.

SolarSteam enables the emerging energy transition by achieving Environment goals that reduce GHG emissions by up to 50% compared to fossil fuel powered heat generation. Integrating the solution creates Social value by creating high quality jobs. Best of all SolarSteam deployment support Governance goals such as improving financial performance by as much as 40%, data driven reporting and alignment with global performance standards.

None of this would have been possible without the support of the GreenSTEM program by the Government of Alberta which enables entrepreneurship and provides a two-year commercialization runway for “deep technology” companies involved in science-based innovation.



SCOVAN ENGINEERING INC. AND HIVE INNOVATIONS INC. AGREE TO MERGE TO FORM SCOVAN

Greater Alignment. Stronger Vision. Immense Value.

Scovan is once again advancing the emerging energy and energy innovation space by merging with Hive. The new combined company will allow for more aligned synergies and offer a stronger value proposition to our partners.

Visit scovan.ca/blog/merger to read the full announcement.

Vertical Integration. Powering Innovation.





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Living Our Values: Focus on Environmental, Social, Governance

By Martin San Jose, Director of Human Resources

“We are passionate about developing projects with clean, renewable energy, while protecting the environment and giving back to the community.”

There is a global movement right now for a better environment, a more equitable society, and transparent leadership. This is no longer the minority, but it is quickly becoming the majority. Beyond our investment into innovation and technology, Scovan is committed to making a difference in areas of Environmental, Social, and Governance, otherwise referred to as ESG.

The E in ESG, environmental criteria, includes the energy our company takes in and the waste it discharges, the resources it needs, and the consequences for living beings as a result. Not least, Environmental encompasses carbon emissions and climate change. Every company uses energy and resources; every company affects, and is affected by, the environment. Scovan is working with various new clean technology providers to develop sustainable solutions for the energy industry. For example, Scovan recently refined the development of HipVap, a novel steam generating technology that reduces water consumption, reduces GHG emissions, and improves overall process performance. This technology has the potential to create transformative change in the heavy oil industry.

S, social criteria, addresses the relationships your company has and the reputation it fosters with people and institutions in the communities where you do business. Social includes labour relations and diversity and inclusion. Every company operates within a broader, diverse society. A great example of our commitment to creating social value is our leadership for International Woman's Day. Over the last three years we have hosted an International Women's Day forum



to celebrate women's achievement, raise awareness against bias and take action for equality.

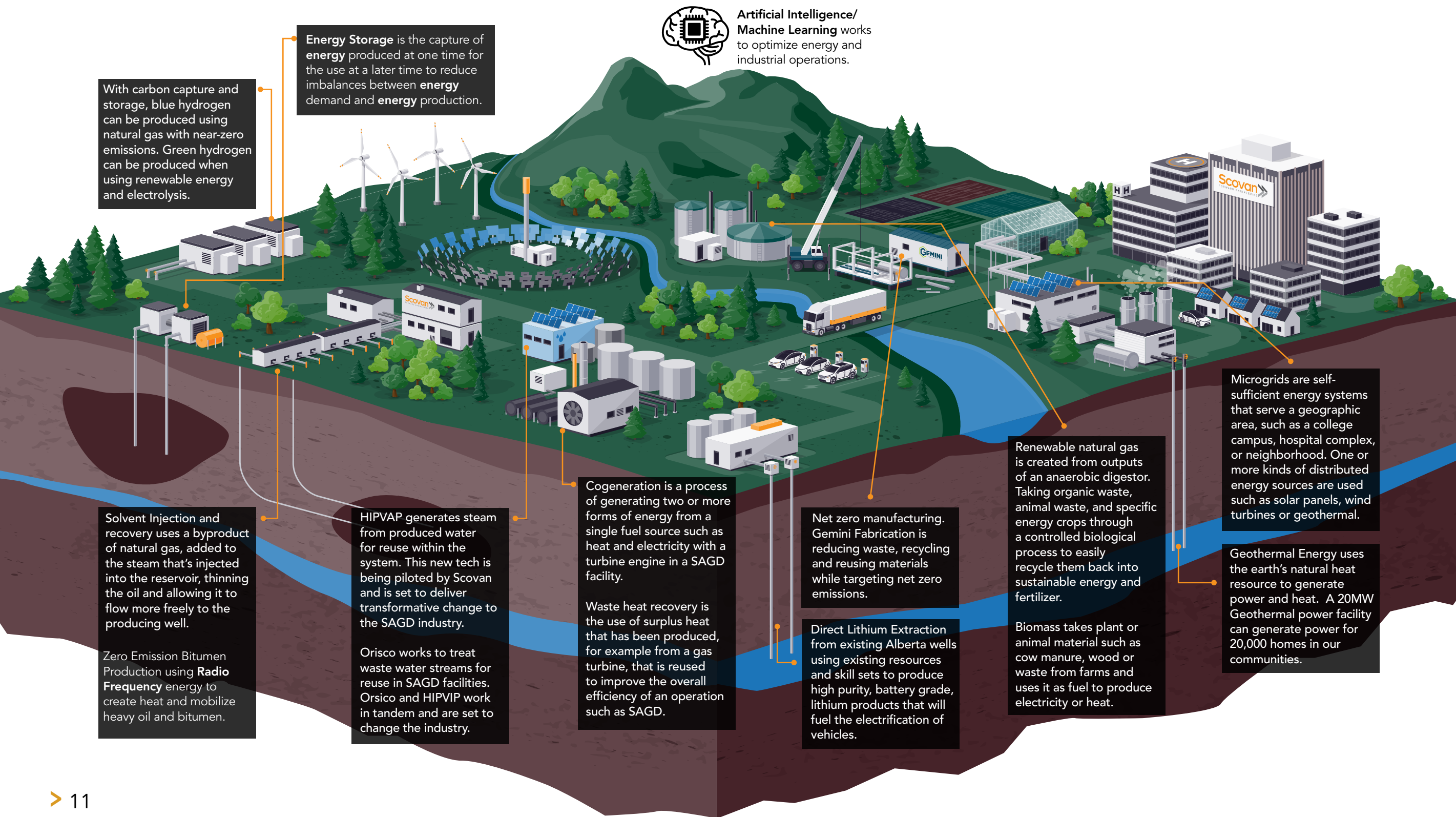
G, governance, is the internal system of practices, controls, and procedures your company adopts in order to govern itself, make effective decisions, comply with the law, and meet the needs of external stakeholders. Every company, which is itself a legal creation, requires governance.

Scovan and the group of companies, Hive Innovations and Gemini Fabrication, intends to set aggressive yet achievable targets in areas such as reducing waste, eliminating emissions, expanding community relations, building diversity, and providing ethical leadership for the projects we work on. However, we need to do more than simply be an advocate for innovation that advances the principals of ESG. We need to be intentional about setting targets and incorporating strategies that will make a meaningful difference, both now and in the future.

Scovan will be setting ESG targets that fit within our industry and it will become part of our regular strategy, communications, and measurements of success. While we are already undertaking many initiatives that support ESG efforts, a more formal ESG strategy is being development between Scovan and the group of companies over the next few months.

Scovan is committed to delivering sustainable solutions to the emerging energy industry while protecting our planet and giving back to the community. We are doing that in an environmentally responsible, safe, and effective way that helps our clients contribute to a low carbon energy future and the circular economy.

Building a circular economy for a low carbon future



Circular Economy

A circular economy is an economic system aimed at eliminating waste and the continual use of resources, benefitting businesses, society, and the environment. Circular systems employ re-use, sharing, repair, refurbishment, remanufacturing and recycling to create a closed-loop system, minimizing the use of resource inputs and the creation of waste, pollution and carbon emissions. This regenerative approach is in contrast to the traditional linear economy, which has a "take, make, dispose" model of production.

Communities

Addressing the Social aspect of ESG through measuring the sustainability and social impact of an organization or business. We look to the diversity in, support of and impact on our local, national, Indigenous and workforce communities. Each aspect of our economy has the ability to impact the way in which we consume and live and therefore our future. Creating sustainable relationships with community is the goal.

Innovation

At Scovan, innovation goes far beyond simply using technology to create efficiency. Innovation is a mindset as well and it's at the heart of our approach and ability to plan for a circular economy and low carbon future. We have developed an Innovation Roadmap for Scovan and Gemini to assist us in understanding what the future might look like, to set targets and goals, and to guide us as we develop next steps and investments. Our goal is to create action-based solutions that enhance economic prosperity, improve environmental quality and protect the social structures that contribute to our high quality of life.

Environmental

We have been contributing to solutions that address sustainability, decarbonization, energy innovation and overall environmental integrity in a multitude of ways. We are supporting and investing in new technologies that contribute to reducing GHG emissions and help re-use waste products for energy that contribute to the circular economy. Some examples include:

- Waste to Energy through biomass and biogas
- Renewable Natural Gas
- Cogeneration and waste heat recovery
- Geothermal district heating and power generation
- Carbon capture utilization and storage (CCUS)
- Zero emissions bitumen production
- Advanced compressed air Energy Storage
- Blue, grey, green Hydrogen generation
- Concentrated solar thermal, solar to steam
- Micro grids and distributed power generation
- Bitumen beyond combustion
- Direct Lithium Extraction
- Sustainable Water management and wastewater treatment
- Artificial intelligence for operations optimization

“We integrate transparency, inclusion and collaboration into all that we do in an effort to ensure integrity for everyone.”

SOLAR THERMAL PLANT



From an internal perspective, Scovan is unique and has a special approach to projects. We want to focus more on what gives us our competitive advantage and how we utilize innovation and ESG targets to do projects better. We have grouped our systems into three major categories. These are:

- The digitization of projects, including:
 - Intelligent 3D models
 - Augmented reality
 - CAD Shacks to support our partners
 - Monday.com and our Digital Control Centers
- Our Rapid Deployment approach to projects, including:
 - Specifications, Standards and Workflows
 - Replication strategies and leveraging past work
 - The use of templated designs
 - Our approach to modularization
- The ICE initiative (Initiate, Cultivate and Execute), including:
 - The strong emphasis we place on culture and people
 - Building out a 10 year Innovation Roadmap, that integrates a 3-horizon model
 - Corporate committees to govern intentional growth and development

Social

A large part of our unique culture is derived from the social value we endeavour to build in all that we do. We cover a large spectrum of activities that improves the lives of our employees, our clients and the communities we work in. Some examples include:

- Team building activities like our Fresh Friday's that gather everyone together to focus on innovation advancements
- Enabling our people to volunteer with student education organizations like the Green Learning Canada Foundation
- Hosting an annual International Women's Day Forum
- Integrating novel start-up technology companies to create employment opportunities that also advance solution development
- Olympic athlete sponsorships
- Employee professional development and learning

Our Covid response was quick and decisive with minimal downtime for our staff and clients. We were able to transition our employees to remote working environments that provided excellent access to digital working tools and provide them with a safe and secure working environment should they need to visit the office. All with minimal interruption to all aspects of company operations. With stringent protocols in place, daily digital mental wellness check in's along with consistent and clear communication on the evolving situation, our teams continue to flourish and perform in these challenging times.

Governance

Good governance is critical to the success of our business and our ability to deliver high-quality solutions. We believe effective governance starts with a strong leadership and management team. We integrate transparency, inclusion and collaboration into all that we do in an effort to ensure integrity for everyone. Here are a few examples:

- We follow employee selection processes that are predicated on gender equality and diversity, and that ensure the right people are in the right place doing the right work
- We have developed company policies, an employee handbook and internal mechanisms that reflect an atmosphere of professionalism, respect and opportunity
- We follow state of the art accounting practices to ensure accuracy, transparency and ethical business practices
- People are the core of our success. We have a fair and market competitive compensation model that rewards our employees for meeting corporate year end targets.
- A comprehensive benefits plan exist for our employees well being
- We offer opportunities for training and mentorship to ensure that our employees health and safety certificates are up to date and relevant
- We strictly abide by regulations, safety standards and other compliance requirements
- The board of directors works with the management team and identifies risk assessment and mitigation, reviews long term strategic and operational planning, executive development and regulatory compliance, safety compliance, financial reporting and information and technology and security

Governance is an essential ingredient in value creation, risk management and instills a higher sense of purpose for everyone, improving overall company performance.

At Scovan and Gemini Fabrication, we see ESG is an opportunity to embed innovation, resiliency and longevity into a vibrant, exciting and rapidly changing future.

Renewable Natural Gas:

A New Source of Clean Energy

By Jay Zwierschke, President and CEO, Matter Global Solutions Inc.



“For the circular economy to thrive, every day needs to be Earth Day.”

Canada is a country rich in natural resources; our exploration and energy sectors are cutting edge, with our industry leaders ranking among some of the world's most innovative and successful companies. With global initiatives and the current ambitious mandates to develop climate change and circular economy technologies, Canadian businesses are in a unique position to accelerate the shift and build on our strengths.

We have seen the markets go through transitions, such as the electrical power industry, as wind and solar have journeyed through the development and alternative stages to their current highly competitive state, where clean energy leads the way compared to fossil-based fuels. The next big mover is biomass as a renewable, low-carbon feedstock to bring about the cleantech's subsequent transformation. Biomass has an extensive range and broad in its applications and source, with unique and unconventional advantages from existing resources. Biomass can supply energy, particularly renewable natural gas ("RNG") based on market drivers, green chemicals and fuels, hydrogen and have a significant impact on reducing the effects of greenhouse gases on our environment. Biomass includes organic waste, agricultural waste (manure, crop residues), energy crops, forestry waste, and by-products from industry and commercial activities all have tremendous value and carbon reduction capabilities.

RNG and hydrogen's growth drivers are coming from government policies, technology companies, stakeholder groups, and a portion of the industry, creating a pathway for a dynamic, new source of clean energy. FortisBC is leading the North American market regarding RNG with an ambitious open market approach and desirable long-term contracts to secure market share. Additionally, Quebec is chasing the Canadian RNG market with similar contract offerings and mandates to green their pipelines and provide low-carbon options. California and many other states are using a credit approach to procure RNG, creating an active spot market scenario and increasing the need for extensive supply. FortisBC has already exceeded its goal of 5% RNG of its distribution capacity and is now focused on a 15% objective, a significant initiative that is driving RNG growth in Canada.

Matter Global Solutions Inc. ("Matter") is a waste conversion technology company with a focus on anaerobic digestion ("AD") and



advanced gasification to RNG and hydrogen as an essential platform to drive the circular economy and reduce the release of carbon into our atmosphere. Matter has developed a first-of-its-kind project in Clayhurst, BC (near Fort St. John) using its partner technology OWS, from Belgium. Matter and OWS have designed and planned the implementation of a dry digester to produce over 250,000 GJ's of RNG under contract to FortisBC, with British Columbia Utility Commission approval in place. This project is an excellent example of circular economy mandates utilizing agricultural wastes, crop management applications, and organic fertilizer (digestate) utilization. Nothing goes to waste, and the

process is focused on renewable resources and new applications that will reduce the impact of climate change. Additional projects are being developed in BC to meet the growing need for RNG and repurpose waste biomass utilizing proprietary advanced gasification developed by Matter. Matters gasification technology will focus on converting forestry waste into syngas, a process gas composition of hydrogen, methane, and carbon monoxide that can be additionally converted into pipeline quality methane or hydrogen with Woods', Vesta's methanation system. The platform of anaerobic digestion and gasification is a synergistic approach to redirecting biomass into a circular economy strategy and supplying the market with extensive clean energy.

Matters aims to create a new paradigm for change; as mentioned earlier in this article, Canada has been a leader in traditional energy development. We now have the opportunity and the mandate to redefine an industry. With the high growth potential and significant use of RNG from AD and gasification, Matter is focused on options such as BC, Alberta, and Ontario as growth markets for RNG and hydrogen.

According to Sir Richard Branson, "For the circular economy to thrive, every day needs to be Earth Day." The Matter team will utilize advanced conversion technologies and collaborate with Scovan Engineering to rapidly embrace this challenge. Matter has allocated its resources to develop projects and the best available technologies for economic and environmental performance while aligning with Scovan Engineering's design and construction expertise to provide the projects that exceed investment and performance goals.

HipVap: Game-Changing Technology for SAGD



By Jane Cavanagh P.Eng. Manager of Innovations for HipVap

HipVap Technologies Inc., a Scovan Engineering technology partner, is leading the design, fabrication, installation, and operation of the HipVap Indirect Fired Steam Generator (IFSG) commercial prototype in Alberta. The HipVap commercial pilot will be a single production-scale IFSG unit, providing innovative produced water steam generation, coupled with the ORSIL disposal water treatment system. The unit will be installed and operated at a Steam Assisted Gravity Drainage (SAGD) facility near Bonnyville, Alberta. Once commercialized, the IFSG will reduce water consumption, water disposal rates, direct greenhouse gas (GHG) emissions, land use, and the cost per barrel of oil produced.

The IFSG eliminates the need for conventional SAGD water treatment processes for produced water, including produced water-cooling systems, to generate steam from produced water. As these systems are maintenance intensive, their removal offers operational cost savings, capital costs savings and significantly improves plant up-time. Additional benefits of the HipVap technology include reducing GHG's and total land footprint of facilities. With the oil-sands industry's drive to increase their environmental social governance (ESG) outlook and near-term commitments to achieve net-zero emissions, the HipVap IFSG will be a critical technology in supporting these initiatives.

THIS INCLUDES:

- Reduced source water consumption and disposal by 1100m³/d and reduced GHG emissions of 280tCO₂e/d for a 33,000 bopd facility based on warm lime softening. This is based on the ability to operate at a net water blowdown rate of less than 4% versus the current 8%
- Improved operations and reliability
- Prevention of scaling and tube failures (longer on-line time)
- More reliable on-stream time due to fewer unit operations
- Utilization of heat integration – energy savings (removal of produced water cooling)
- Reduced chemical usage and reduced solids disposal due to avoidance of calcium carbonate and magnesium oxide use
- No sludge ponds
- Significantly reduced CPF land use
- More economically competitive SAGD operations that will pay royalties sooner. For a 33,000 bopd facility, the capital cost is estimated to decrease by 24%

The HipVap technology can be a solution for both greenfield and brownfield in-situ facilities going forward and assist to both improve metrics and ESG considerations for these projects.

THERE IS IMMEDIATE OPPORTUNITY IN THE FOLLOWING AREAS:

- Small scale greenfield pad operations
- Pad based development expansions
- Pad developments with limited access to CPF facilities (steam distribution distance)
- SAGD facilities with produced water treatment limitations
- Pilot facilities

“The IFSG is a transformative technology that will lead to positive economic, climate change and environmental benefits.”

The HipVap demonstration project will test a commercial scale IFSG exchanger for approximately 12 months.

THE PROJECT HAS 3 KEY OBJECTIVES:

- Design-build a commercial sized IFSG heat exchanger and test in an operating SAGD environment with variable produced water quality to determine the best design parameters
- Engineer, install and operate the IFSG balance of plant equipment, including a hot oil heater, steam separator, flash tanks, pumps and associated blowdown system to validate the produced water steam generation process design, validate CAPEX and OPEX, and identify any challenges for commercial development
- Evaluate and measure the effectiveness of the ORSIL technology to reduce blowdown waste, disposal cost and environmental impacts of produced water waste

HipVap is proud to be working with an awesome team of contributing partners for the execution phase of this project including Scovan Engineering, Gemini Fabrication, Strathcona Resources, Drishya AI Labs, and Orsico.

THE KEY MILESTONES FOR THE PROJECT ARE AS FOLLOWS:

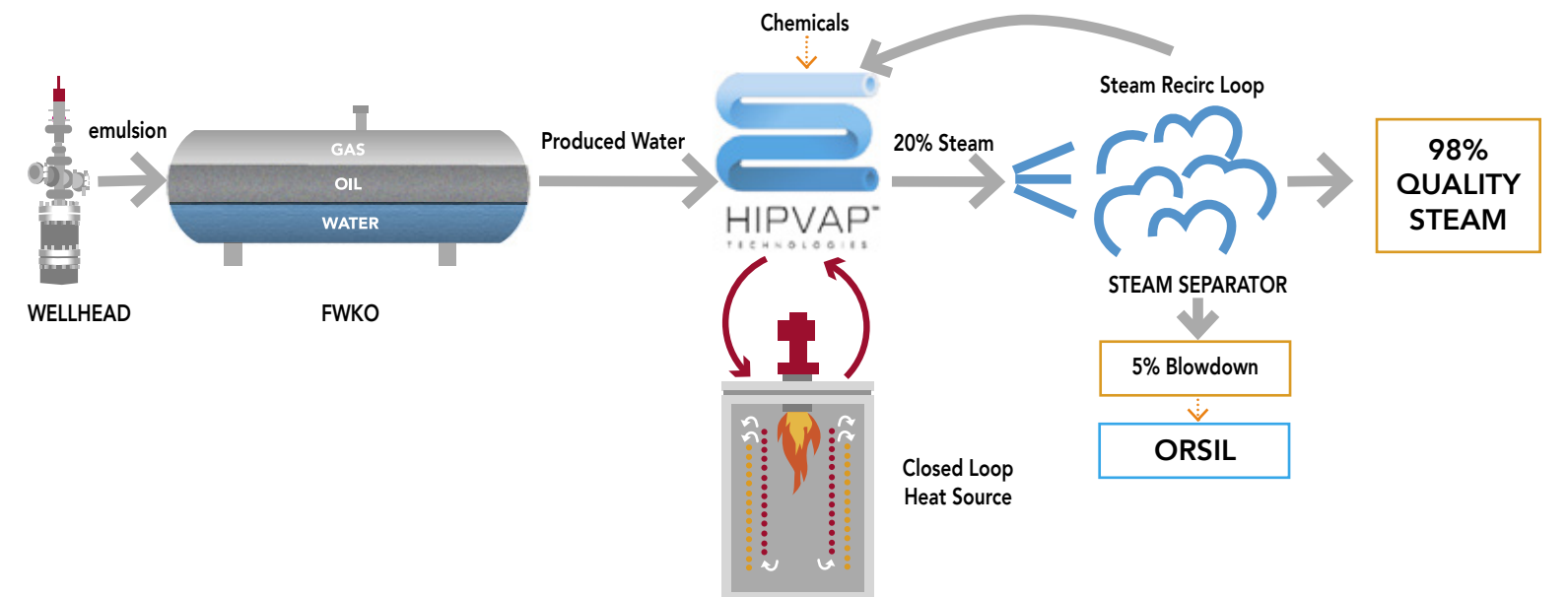
- Project Kick-off – January 2021
- Field Construction – September 2021
- Commissioning – November 2021
- First Test and Operational Balancing – December 2021
- Operate, Test, and Optimize – January 2022 to December 2022
- Final Project Reporting – February 2023

Contact www.hipvaptech.com to learn more.

HipVap IFSG Technology

BENEFITS INCLUDE:

- ✓ Reduced equipment required for steam generation resulting in less capital, lower footprint, an overall ESG benefits
- ✓ Reduced GHG Emissions by up to 1.2 M Tonnes CO₂e per year through both efficient steam generation and blowdown improvements
- ✓ Process blowdown waste to lower disposal cost and reduced makeup water requirement



REDUCE ENVIRONMENTAL IMPACTS BY FABRICATING WITH GEMINI

Gemini Fabrication conducts business in a way that focuses on providing solutions that mitigate environmental impacts of operational activities. Gemini meets and even exceeds environmental regulations placed on our industrial activities, which means you can rest easy knowing Gemini is assisting you in reaching your own ESG targets.

TRAVIS SHARPE
Director, Business Development

traviss@geminfab.ca
Phone: 587-850-0453
Mobile: 403-651-8300

TASHA CORDEL
Project Manager

tashac@geminfab.ca
Phone: 587-850-0453
Mobile: 403-704-5982



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Adding Value by

Integrating Sustainability

As an engineer, I have always enjoyed the opportunity to creatively solve problems. In the world of Environmental, Social, and Governance (ESG) practices, the problems that need solving have become increasingly complex. From Company A focusing on cutting operating greenhouse gas (GHG) emissions, to Company B surprising its workers with an extra week off to help with burnout, it can be difficult to know where to start, let alone where to focus. As the environment and sustainability coordinator at Strathcona Resources I get to assess how technical aspects of our operations affect non-technical pillars of the business. While I will focus on the 'E' aspects of my role for this article, it isn't to the exclusion of the 'S' or 'G' pillars.



First and foremost, materiality identifies which metrics and variables to home in on. Restaurants and brewing companies should be concerned with food and beverage safety, but that doesn't really apply to an oil and gas exploration and production (E&P) company. Environmental emissions, especially carbon dioxide and GHG emissions are instead at the forefront. That makes the next step completely and transparently quantifying where GHG emissions are coming from, and which variables are driving changes to emissions intensity. For example, steam oil ratio (SOR) and resulting operational changes at a steam assisted gravity drainage (SAGD) operation are important variables to quantify. GHG emissions sources vary by field, making reduction approaches different, which is why initial quantification informs the next steps of forecasting and emissions reduction. Good, bad, or indifferent, a carbon pricing environment creates an opportunity to proactively manage emissions reductions projects. High graded emissions reduction projects double as projects with a large return on investment as we navigate our carbon tax exposure.

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“Strong ESG driven projects create a positive feedback loop that ultimately adds value to an organization.”

Essentially, strong ESG driven projects create a positive feedback loop that ultimately adds value to an organization. Take a new technology application that reduces environmental emissions for instance. Emissions reduction projects tend to lower energy consumption, can sometimes reduce water intake or unnecessary waste, and each of those in turn reduces operating costs (either from direct energy use or lower waste-disposal costs). Subsequently more sustainable facilities, equipment, pad sites, etc. are not only the mark of optimized assets, but they can also mitigate the risks of investments that don't pay off due to longer-term environmental issues. Consistently investing in best-in-class, efficient projects can prevent stranded asset write-downs. Meanwhile, competitors who haven't invested and continue with energy hungry projects will fall behind over time as they pay for unnecessary wastage. Especially within the current environment of carbon pricing, emissions reduction projects (and companies that support them) can potentially earn subsidies or government grants. Stronger government relations can then develop and a company demonstrating responsible resource development can realize better access to resources and even strengthen community relationships. Finally, the opportunity to work on new exciting projects boosts employee motivation, keeping employees engaged, and can even lead to attracting new talent. Those engaged and motivated employees, facing favourable community and government relationships, with capital to invest thanks to reduced operating costs, can then assess new emissions reduction projects, completing the positive feedback loop.

It is difficult to predict what changes are coming. The inventor of the internal combustion engine got to work on horseback, and the inventor of the lightbulb worked under the glow of candlelight. People improving the existing energy supply (non-renewable and renewable alike) need to drive cars and heat their homes with what is currently available to them, recognizing full well that participating in the world as it does not exempt or disqualify them from trying to improve it. Maybe the future holds favourable Canadian tax credit positions for new technology pushes into carbon capture and storage, or blue hydrogen deployment. Maybe international energy operators will be held to the same regulatory and social standards already present in Canadian operations and market shares will shift to meet globally growing demand. Either way, changes are inevitable and integrating ESG practices and sustainability into business practices will position any company to resiliently handle the changing energy landscape.

SOLAR-CHEMICAL PUMP
CONFIGURATION AT
STRATHCONA'S KAKWA FIELD





Embracing Youth as Leaders of Today

By Alyssa Lindsay, Executive Director, Canada Bridges

Think about your days as a youth. Did you have dreams and ideas about what change was needed? Was there limitless potential on your horizon? Did you have support to grow your own voice and become who you are today? Did you experience challenges along the way that changed your course? What if all youth had the opportunity to bring energy, optimism and vision and live it out in our organizations and communities?

In our society today, youth are usually represented only in very small ways in decision-making processes, organizations and social structures. Often, when they are recognized or included, it is as an add-on or side piece that does not have real power. Certain youth demographics are even less represented than others. For Indigenous youth, for example, the effects of intergenerational trauma, lower levels of resources in First Nations communities, and



systemic racism all contribute to challenges with accessing the connections and power needed to create change for themselves and others. At the same time, these youth often have the wisest perspectives, deepest insights, and greatest awareness of the changes that are needed in our communities.

Canada Bridges is a registered charity that recognizes youth not just as leaders of the future, but as leaders of today. Instead of being viewed as a problem that needs fixing, or individuals who need training, we see youth as part of the solution to the broad social, economic and environmental challenges that we all have responsibility for. Youth bring outside of the box thinking, creativity, and a willingness to take risks and step beyond the status quo. Youth with diverse backgrounds bring even greater perspectives and willingness to challenge what needs to change.

At Canada Bridges, we have seen how youth have changed our organization, and we know that youth will be the force to change our communities and our world. Over the last 10 years, we have worked with youth from across Alberta, and for the last 6 years have prioritized invitations to work with youth from the Siksika and Iyârhe Nakoda Nations, as well as in Mohkinstsis (Calgary). Through this work, youth have taken on change projects in a wide range of sectors and communities from energy transition to Indigenous language preservation. Youth lead the work, not just participate in it, and our organization has become much stronger using this approach: our board, our programming, and our community presence have all been strengthened by including youth as leaders.

For the last two years, Canada Bridges has been invited to be part of the International Women’s Day celebration at Scovan. We are thankful for this partnership and shared value in supporting youth to show up, stand up and be heard. In return, we would like to open an invitation to everyone in the Scovan community to join us on June 19, 2021, at A Youth Explosion, where Indigenous youth from across Treaty 7 will share their voices, ideas and passion at a drive-in and online event. This event is free and open to the public. **Please sign up for our newsletter for ticket announcements! www.canadabridges.com**

Change is before us on so many fronts right now, and youth are needed more than ever. Let’s all commit to keep moving away from seeing youth as inexperienced and needing to learn, to having insights, passion, and ideas that drive the changes we all need and want to make. How are you creating space for youth leadership within your industry, organizations, and teams today?

“When we work together, we’re connected with each other and coming together to an agreement to what we could do for a community or to create change. Older generations have tried different ways of doing things. Newer generation has modern ideas.”

Sandis Twoyoungman, Iyârhe Nakoda Nation

Delivering a Low Carbon Future through Fresh Fridays

By Valerie Stewart, MBA, VP Strategy and Development,
Scovan Engineering

Organizations that don't keep up with their customers' needs will die. Sadly, our industry has been slow to evolve and it is now forced to fight for its life. This provocative and incentivizing statement has led many firms to dive into the innovation process. Unfortunately, most jump in without first asking why, how, or what they are seeking to change. Others learn the words to say but then simply hope they can wait out a recession and continue on with what they've always done after things pick up again.



Innovation doesn't just happen by itself, it needs to be intentionally part of our culture. We need to be thoughtful in creating an environment that promotes out-of-the-box thinking and a safe environment in which to do it. Fresh Fridays are one of the ways that we have chosen to invest in the future.

In 1965, the average tenure of companies on the S&P 500 was 33 years. By 1990, it was 20 years. It's forecast to shrink to 14 years by 2026. In fact, it's predicted that about 50 percent of the S&P 500 will be replaced over the next 10 years.

What does all of this mean for leaders and organizational decision-makers? First, it's a reminder of a general principle: A company cannot endure in the long term without reinventing itself. This means we have to be vigilant for weakening foundations in our business model, or the shifting needs of our customer base.

But not every innovation needs to be on such a grand scale as the companies that are dominating the S&P 500. Incremental improvements like adjusting an existing design, improving the way **teams work**, or embracing a **different process**, or technology can all help progress a company in creating new value. The trick to get started is to answer one simple question: *is it safe to try?*

At Scovan and Gemini Fabrications, we are building a 10-year Innovation roadmap and using Fresh Fridays to do this collaboratively. Fresh Fridays contribute to keeping us informed and ahead of the curve on transformative new technologies and energy trends. In addition, Fresh Fridays contribute to our collective culture, promotes engagement and teamwork and develops leaders.

The Innovation Roadmap is a vision for addressing incremental, transformative and disruptive solutions, predicated on addressing client challenges, using a defined list of criteria to evaluate emerging technologies, embracing a low carbon economy, integrating the cleantech development sector and addressing the rising cost of carbon and regulations like the Low Carbon Fuel Standard.

Over the last year, we have added to the experience by including different guest speakers who have joined the collaborative workshop series to focus on innovation advancement and provide a diverse perspective to our discussions.

Our Innovation Roadmap will help us define needed solutions, deploy resources, make investment decisions, and ultimately provide greater value to our clients and the energy sector as we work to engage the emerging low carbon economy.

Speaker highlights include:



Jason Switzer, ED for the Alberta Cleantech Industry Alliance and Vice Chair for the Clean Resources Innovation Network (CRIN) talked about the remarkable innovation ecosystem we have in Alberta, how it's generating a wide range of cleantech solutions for the world and the importance of collaboration to get these solutions to market.



Dr. David Layzell, Director, Canadian Energy Systems Analysis Research (CESAR) Initiative at University of Calgary and Energy Systems Architect for the Transition Accelerator, talked about energy systems, the persuasive opportunity to diversify into hydrogen and what electrification represents as a low carbon economy alternative.



Paula McGarrigle, Co-founder and Managing Director Solas Energy Consulting Inc. delved into the renewables world and what it represents as a plethora of viable commercial solutions for decarbonization, expanding the energy systems matrix and the business case for embracing renewable energy electricity generation.



Jackson Hegland, President of Modern West and ED for the Methane Emissions Leadership Alliance spoke about the remarkable range of methane management solutions available today and about the importance of developing an Environmental, Social, Governance (ESG) strategy to provide a data driven and transparent measurement structure for communicating on how we are advancing sustainable, ethical and responsible solutions to market.



JP Jepp, Principal with Nexus Climate and Energy Strategies, described the implications of the energy transition we are all experiencing today and the potential that technologies and approaches associated with decarbonization, renewable energy, electrification, hydrogen and carbon capture represent.

“Fresh Fridays new purpose is to provide a training ground that will inspire creativity, challenge people to think fast, empower everyone to take swift action and innovate without dwelling on perfection.”

Financial Health & ESG Ambition –

Can they co-exist in the oil and gas industry?

By Jackson Hegland, Modern West Advisory, Methane Emissions Leadership Alliance, Carbon Connect International, Aspenwood Innovation

“Engagement and idea-sharing are critical to action. When a network of organizations works together, we can focus on scalable, economic solutions.”



but the Paris Agreement and new domestic regulations such as carbon pricing and clean fuel standards are also driving action. Social influence, technology availability, investor expectations, corporate culture and “premium product pricing” are pushing companies to adopt ESG reporting and performance improvements. These factors are creating new opportunities and risks, which are in turn accelerating corporate commitment to and investment in ESG.

In response to these stakeholder pressures, many organizations are releasing ESG reports, and leading companies are moving towards integrated reporting (combined ESG

& financial disclosures). ESG reporting will remain an increasing priority for all companies and in particular the oil and gas sector. Global voluntary standards continue to guide how companies report, with the Sustainability Accounting Standards Board (SASB) and the Task Force on Climate-related Financial Disclosures (TCFD) being the most highly valued by the investment community today. There are additional reporting standards that exist, making it confusing and overwhelming for companies. Further convergence and standardization of sustainability or ESG reporting will allow for improved consistency in reporting and data quality from company to company and in turn allow a more consistent comparison between disclosures. These reporting metrics are also improving industry's understanding of their ESG related risks and opportunities. This improved understanding allows companies to move quickly to improve ESG performance with concrete actions in air, land, water, and social impact. Large and mid-sized oil and gas companies are advanced in their ESG reporting and continue to evolve, but smaller cap companies still have catching up to do - not surprisingly they can be challenged to adopt ESG as they are more resource constrained.

Canada's oil and gas sector is poised to continue to be at the forefront of the global clean energy transition through world class environmental, social, and governance (ESG) performance and clean technology development. Today there are over 1,600 clean technology companies in Canada, many focused in our natural resource sector. This did not happen over night however, as investment into new technology over time is essential to world class performance.

Despite this strong historical performance, energy intensive sectors with high capital requirements like the oil and gas industry are at a point of convergence. How this sector marries sustained economic growth and corporate financial health with ever increasing environmental, social, governance (ESG) requirements is the challenge ahead.

There are several issues facing the industry that are influencing this convergence. Access to capital is perhaps the most prevalent,

Reporting is a necessary step and will drive improvement, but forward-looking action is also an imperative. Companies are setting ESG goals on a longer timeframe to support their forward ESG value proposition. “Net zero” and “carbon neutral” are the well highlighted longer-term goals, but these are far reaching. There is still a lot of work to do in the development of these ambitions, notably related to the lack of widely accepted quantification standards, as well as clear identification of boundaries related to net zero targets. In the near term the opportunity exists for companies to be setting targets to 2025 or 2030 that are ambitious, but achievable and put the company on better footing to be more ESG friendly and net zero aligned. The good news is this work will improve over time, and there are many tools available. A multitude of technology and service providers are readily available with solutions¹. In fact, investment by the oil and gas sector into ESG activities supports the growth and evolution of the cleantech sector, Indigenous communities and important stakeholder groups like landowners, employees, and communities. These are welcome benefits and needed outcomes from the ESG movement.

As demand for ESG disclosure from the investment community and social stakeholders continues to increase, so too does the demand for clean energy production. As it related to “energy transition or transformation”, in the oil and gas sector we are seeing two significant developments that are sure to catch any executive's attention. The first, and this is particularly relevant to Canadian natural gas producers, is that LNG importing countries like Singapore, Malaysia and Australia have set standards on the emissions intensity of the LNG they import. Second, and this may ultimately have a larger impact on emissions reduction activity than any of the other converging factor, is “premium pricing”. Some markets are slowly emerging in an effort to price low-emission intensity natural gas at a premium over higher emissions intensity molecules. There are outstanding questions about the methodologies and assumptions made in the quantification of

¹ Methane Emissions Leadership Alliance www.methanealliance.com



these benchmark emissions intensities, but work is underway to move towards greater standardization. Notably, we are working on a life-cycle assessment project for natural gas production in Alberta's Montney zone and we expect this work to serve as a baseline for future natural gas emissions intensity calculations throughout Canada. This project is supported with funding from Alberta Innovates (AI) and Emissions Reduction Alberta (ERA).

Which leads us to another important point – the ESG eco-system is supported by an incredible network. Partnerships between organizations like AI and ERA, among others, are helping to position Canada as an energy industry ESG leader. Engagement and idea sharing is critical to action. When the network of organizations works together, we can focus on scalable, economic solutions. This is where creativity and pragmatism merge. Building a leadership position in ESG performance requires commitment and creativity. Then, leveraging our network, building our knowledge, improving our quantification and reporting, focusing on available solutions, all contribute to the ability to make pragmatic business decisions that support the necessary financial health and ESG ambition our sector requires to support the world's energy needs now and into the future.



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