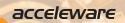# Acceleware is a clean-tech focused company committed to a
cleaner global energy future

We believe that oil can, and should, be developed as cleanly, responsibly and economically as possible. Our commercial pilot project for RF XL is slated to commence heating as early as the second half of 2020, with full commercialization targeted in 2023.

- The commercial pilot project to be completed at Broadview Energy's Marwayne, AB site has been awarded non-repayable grants of $5.25 million from Sustainable Development Technology Canada ("SDTC") and $5.0 million from Emissions Reduction Alberta ("ERA"), along with $2 million in project funding from a major oil sands producer (undisclosed). SDTC and ERA continue to support Acceleware given the nature of the RF XL technology, with SDTC increasing its investment by 5% and ERA relaxing holdback requirements as part of their COVID-19 response initiatives.

- RF XL technology is being piloted to offer a clean, high-tech and low-cost production solution for the oil and gas industry, with corresponding creation of highly-skilled jobs.

- RF XL technology is a transformative innovation that uses radio frequency (RF) energy to heat and mobilize heavy oil and bitumen, resulting in **low-cost, low-carbon production.**

  o RF XL uses electromagnetic energy to create steam in-situ using water that is naturally present within the reservoir, essentially acting as an underground microwave oven.

  o RF XL can quickly help bring Canadian oil production in-line with global environmental expectations, **reduce GHG emissions from oil production by up to 100%**, and address bio-diversity concerns.

- Acceleware is a local, Alberta growth story, focused on the creation of a modernized, high-tech way to re-energize Canada's energy sector, and position the country as a leader in driving a cleaner global energy future.

- Acceleware is currently authoring a white paper with Canadian Solar on achieving **profitable zero-GHG production of heavy oil powered by solar energy**, in conjunction with the Global Energy Show.

- Acceleware was recently nominated a finalist in the Daily Oil Bulletin's 2020 Environmental Excellence Awards in the subcategory of Clean-tech: Land, which recognizes those industry leaders who are focused on divergent ways of reducing their impacts on the landscape, and is a past winner of the Global Petroleum Show's award for Emerging Clean Technology.

RF XL can help address many of the current challenges
facing Canada's oil and gas industry

Lowering Environmental Footprint:

- Compared to steam assisted gravity drainage ("SAGD"), RF XL can **reduce GHG emissions by 25% to 100%**, eliminate freshwater usage, reduce land usage by 67%, and improve energy efficiency by 40% to 60%.

- RF XL meets and exceeds all regulatory and safety requirements, including Alberta Energy Regulator (AER), International Commission on Non-Ionizing Radiation Protection (ICNIRP) and Alberta Environment and Parks (AEP).

Managing Impact of Extremely Low Oil Prices:

- Deployment of RF XL can result in 50% lower capital cost intensity due to significantly lower requirements for surface facilities and 40% lower operating costs compared to SAGD, with lower fluid handing and treatment costs, as well as less maintenance.

- RF XL is expected to reduce the break-even production cost per barrel for heavy oil and oil sands **by at least $10** which will be critical for Canada's energy industry as it moves beyond the current COVID-19 and commodity price situation.

Access to Capital:

- Energy companies seeking access to Canada's Large Employer Emergency Financing Facility (LEEFF) program have the opportunity to join Acceleware's consortium. This would give such companies tangible initiatives to aid in their reporting on climate disclosure including details of how future operations will support national sustainability goals.

- With sovereign wealth funds and other large institutions restricting investment in oil and gas companies because of greenhouse gas emissions, implementing measures to reduce emissions can offer differentiation while helping to strengthen companies' ESG performance.

Benefits for all Albertans, Canadians and the World

- RF XL has application beyond Alberta's oil sands – it can be used in many heavy oil reservoirs around the world, from California, to Latin America, the Middle East and Asia. In addition, RF XL can be deployed as a standalone or easily integrated with existing SAGD projects.

- Acceleware's vision is to demonstrate how innovation can position Canada as a global leader in clean technology. RF XL technology adoption could result in the relatively rapid creation of thousands of highly skilled, diverse, advanced clean-tech jobs in Alberta to support the deployment of the technology in Canada and around the world. In addition, if successful, Acceleware could hasten the transition of Alberta's and Canada's workforce to be a supplier of skills for a clean energy future in areas such as high-power electronics, digital optimization and artificial intelligence, contributing to the creation of a clean-tech hub in Canada. This would foster the success of innovative start-ups and unlock the opportunity for collaboration with post-secondary institutions to train people on greener, high-tech jobs needed for a cleaner global energy future.

History & Milestones

2004
Acceleware was founded and pioneered the use of the graphics processing unit ("GPU") as a compute platform. The first product, AxFDTD™, continues to be sold to many Fortune 500 companies such as Blackberry, Samsung, LG, Nikon, Merck, Boeing and Lockheed Martin.

2008-2009
In 2008, Acceleware entered the seismic imaging market with a GPU accelerated Kirchhoff Time Migration solution, followed by a Reverse Time Migration ("RTM") library, AxRTM™ in 2009.

2010
Acceleware identified a growing need to dramatically reduce the cost of production and the environmental impact of heavy oil and oil sands production. In 2010, Acceleware began working to develop new ways to apply RF energy to mobilize heavy oil and oil sands. With very promising test results, the company has been aggressively developing this game-changing innovation, working with several heavy oil and oil sands operators around the world.

Having identified changing environmental and economic priorities in the global energy sector, Acceleware commenced development of RF heating as a cost-effective, clean-tech solution for heavy oil and oil sands production. Although the potential for RF as an EOR technique had been contemplated as early as 1948, technological challenges and poor economic performance have hindered a viable path to commercialization–until now.

As part of Acceleware's RF R&D, we integrated our AxFDTD EM modeling platform with STARS reservoir modeling software from Computer Modeling Group to create AxHeat, an application that enables heavy oil producers to accurately model the impact of using RF heating to mobilize in-situ heavy oil reserves.

In 2010, we were engaged by a major US-based oil company to provide analysis on past RF heating tests and design input on future tests. Results and lessons learned from these tests led to Acceleware shifting focus and resources to developing an entirely new, proprietary and transformative approach to RF heating – RF XL.

2015-2017
Having completed numerous tests and filed several patent applications for two different technology platforms between 2010 and 2015, Acceleware announced a partnership with GE Research in 2016 to further test and commercialize its patent-pending RF heating technology.

2018-May 2020
In July 2018, Acceleware entered into an agreement with Prosper Petroleum to conduct a commercial-scale test of RF XL at Prosper's Rigel site, situated in northeast Alberta near to Fort McKay First Nations (FMFN) treaty lands. Prosper faced opposition for their project and despite efforts through 2018, 2019 and into early 2020, delays in gaining regulatory approval for the Rigel SAGD project culminated in Acceleware terminating the agreement in May, 2020. The Company completed funding agreements with SDTC and ERA to secure $10 million in non-repayable funding for the test in addition to an agreement with a major oil sands producer who will provide $2 million in financial support along with technical guidance for the project.

May 2020
Acceleware signed an agreement with Broadview Energy to partner on the commercial-scale pilot deployment at Broadview's Marwayne asset. Broadview is a private oil and gas company, led by John Festival. John and his team bring extensive industry knowledge and heavy oil operating experience to the project. They will provide technical services and support to Acceleware for the duration of the RF-XL heating test. Broadview recognizes that RF-XL technology will bring the economics and environmental performance of heavy oil and oil sands projects to the top tier of global energy plays. The test at Marwayne is expected to commence heating as early as late 2020, followed by commercialization anticipated in 2023.

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