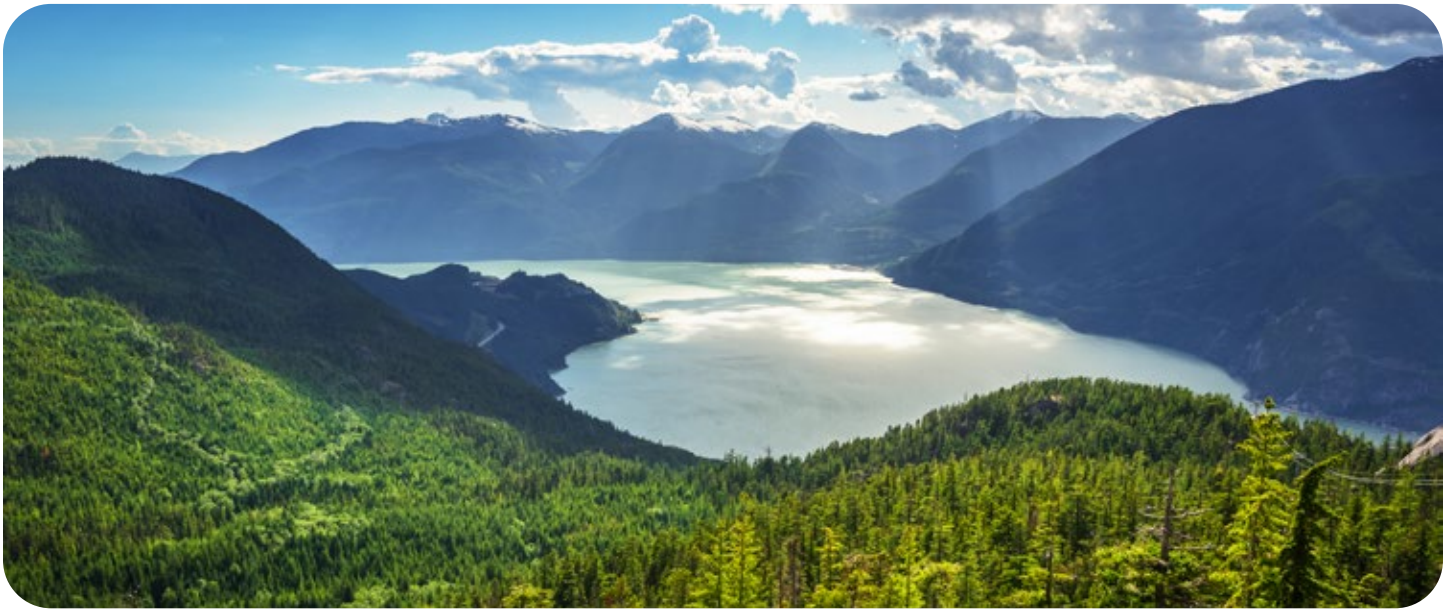
Regaining Global Energy Innovation Leadership



Blessed with natural resources and the desire to improve how we live, Albertans have become global leaders in responsible energy production. Our engineers believe deeply that the continued investment in clean technology in oil and gas is the only path forward to reduce environmental impact while meeting global demand.

Rich Bush
Business Development Manager, AIP Industries Inc.

CALGARY – Canadian energy innovation should not – and cannot – stop when oil prices are low.

Canada was once a global energy innovation epicentre. It needs to once more be recognized for its leadership in the development of cleaner, more energy efficient and socially responsible oil and gas industrial processes.

It also needs to help Canadians understand the petroleum sector's value-added dimensions – those elements of its activity that extend widely and deeply across the Canadian economy in ways that contribute directly to our quality of living.

That is the aspiration of this letter's signatories. And it is why we're issuing this public outreach.

Collectively, we represent a group of western Canadian group "cleantech" industrial innovators who, over the last decade, have designed and engineered new petroleum technologies and processes using an interdisciplinary approach and constructively progressing our sector's push toward ever-cleaner technologies and innovations.

Our collective goal is to drive better economic results using the experience of simplified designs, which in turn enables better-quality products and byproducts with demonstrably reduced environmental footprints.

The continued scale-up and commercial deployment of these technologies can significantly mitigate the looming micro and macro challenges that have plagued the oil and gas industry over the past few years – challenges which in turn exert profoundly negative impacts on regional and national economies.

These challenges include:

- The requirement for significant capital investment to upgrade facilities to meet evolving regulatory demands and market drivers affecting major transportation industries.
- Higher ongoing operating costs related to the use of conventional – and in some instances antiquated – processing techniques and technologies.
- The inability to nimbly pivot to shifts in market demand; Canada in particular suffers from lack of refining and upgrading facilities because of high costs.
- Decreased energy investment, which impacts available funding to advance research and development activities. This exacerbates industry knowledge gaps, which in turn has a lagging effect on Canadian intellectual property development.
- Stigmatization and marginalization of the energy industry's future being correlated to high carbon-dioxide, methane and other GHG emissions.

On a positive note, these challenges have created "home-grown" Western Canadian innovators who have tasked themselves with developing new technologies designed to create resilient economic efficiencies while also mitigating environmental impact. There has been extensive emphasis on greenhouse gas and effluent waste stream reductions – and in some cases, these new innovations even generate carbon credits. This accords with prevailing sentiments in consumer demand and expectations.

These next-generation technologies consciously compete against conventional processing methods like hydrogenation/hydro-treating, biodiesel refining, hydrogen sulfide removal and the conversion of dry natural gas to methanol, among others. Other innovations include ancillary services such as rotary drill cuttings separation systems to minimize fluid loss. In many cases, these process technologies are supported by next-generation software designed to measure, quantify, offset and monetize emissions across a variety of industries.

Several new technologies have been developed to meet global environmental regulatory demand drivers. These include lower sulfur and cetane levels in transportation fuels, reductions in NOx, Sox and heavy metals, as well as reductions in sour gas flaring. These innovations have been realized through introducing organic materials and processes including catalysts, reagents, steam reforming and thermal depolymerization; these approaches help offset or negate the use of harsh synthetics used in conventional processes. Some processes even recycle waste products, including municipal solid waste and cellulosic materials such as wet organics. They also repurpose GHG feedstocks, converting them into renewable transportation fuels and sustainable and valuable solid commodities.

Canada needs to demonstrate that it continues to be the pillar of responsible and sustainable Energy Innovation and development . Our technologies are borne out of necessity; focused on adapting operating conditions to create efficiencies to suit evolving climate change, regulatory and even shifts in market while still recognizing the realities of oil and gas economic demand drivers. Clean Technology is mechanism, or a bridge for the foreseeable future to carbon neutrality and as these technologies continue on their path towards commercialization, will also serve as a means to economic prosperity, diversification and job creation.

Kerri McGrath

President & CEO,
International Ultrasonic Technologies Inc.

This approach – working creatively and sustainably within existing industrial process frameworks to redefine and reinvent them – also create a challenge: it is often difficult to communicate with investors and other stakeholders how uniquely differentiated these technologies are from their conventional counterparts. As a result, their unique attributes vis a vis mitigating environment impact and increasing health and safety make it challenging to demonstrate their viability at commercial scale.

Yes, we are a technology-based group of innovators. Yet we fall outside the prevailing definition of digital innovation. Nor can we be defined as renewable innovators. Instead, we occupy an important space along the innovation spectrum: we are committed to environmental stewardship while remaining underpinned by entrepreneurial drive.

Simply put, we are clean-technology industrialists – and we are critically important to Canada's industrial evolution.

But evolutionary thinking must sometimes be propelled by constructively revolutionary thinking.

Our group represents the "middle ground" between carbon neutrality and prevailing attitudes towards the upstream, midstream and downstream sectors. Today, approximately 80 per cent of global energy use derives from hydrocarbons. By 2040 energy usage is expected to rise as much as 35 per cent due to increasing population and higher economic activity.

What is needed? Common sense suggests a middle-ground balanced approach, bridging that demand growth with new innovations that drive the sustainable evolutions of our industrial systems. Canadian industrial innovators can be leaders in this space.

Most our group's technologies are advanced beyond research and development; they are either in the front-end engineering and design (FEED) phases or are already fully commercial and seeking early adopters. Energy companies, reeling under pandemic pressures, desperately need highly efficient but equally economic innovations to regain their equilibrium – innovations that drive and evolve the boundaries of conventional industrial processes.

Our group's members believe we are at important innovation cross-roads, at which it is obvious down which exciting paths Canadians must navigate if we are to regain our position as a recognized global leader of sustainable and responsible energy innovation. This is particularly salient in a low-carbon, energy systems transitioning world that foregrounds climate and eco-system health.

To that end, we must work collaboratively with governments, regulators, politicians, industry and the public to create the flexible

and dynamic frameworks that will support investment and innovation – frameworks in which industrial innovators, manufacturers, engineering firms and the rest of the industrial ecosystem players can aspire to succeed. These frameworks must move us beyond our current fractious and fragmented state.

These frameworks would drive enhanced investment into "clean technology energy innovation" in a way that explicitly articulates the prime role of industrial innovators. Such frameworks would help bridge knowledge gaps and create investor confidence by allowing innovators to more rapidly meet new clean-tech demands. Such frameworks would also help create new partnerships and collaborations and act as a talent draw.

This means more than just investment into pipelines, orphaned wells, carbon capture and methane-emissions reduction. This means framing an overarching world-view and perspective of technologies that serve to bridge the gap to carbon neutrality when compared against existing conventional process methods.

These new technologies, properly adopted, would also serve to help energy companies work more effectively in highly pressured commodity-price environments, while maintaining a commitment to environmental sustainability – both of which are key to investment attraction.

In closing, our core membership as a clean-technology group is growing. We are attracting attention not only from fellow innovators and entrepreneurs, but also from the important support network of professional services organizations which are critical actors in a vibrant innovation ecosystem. We are part of an ecosystem that includes digital and applications innovators, but our role and function embedded within conventional industrial processes defines us uniquely.

We're ready, willing and able to stand up and be counted.

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