



New Generation Green Technology for Reduced Emissions and Energy Efficiency in Liquid Fuels

William B. Choi, President

CANADA:

World Trade Center
404-999 Canada Place
Vancouver, BC, V6C 3E2
Phone: 604.808.9356

SOUTH KOREA:

Gangnam Finance Center, 41F
737 Yeoksam-dong
Gangnam-gu, Seoul, Korea
Phone: +82.2.2008.3288
Fax: +82.2.2008.3289

E-mail: info@cbwilliams.com

Contents

Introduction	2
Executive Summary	3
The Problem	3
New Generation Energy Technology	4
<i>The Scope of Opportunity</i>	4
Patent Pending Catalate	5
Patent Pending Catalate Amplifier™	6
Known Results	7
Conclusion	8

Introduction

Fuel can be actively treated to increase energy output, reduce carbon emissions and wear and tear on equipment and parts.

Problem Statement

Increasing demands on current fuel based energy sources have resulted in industry volatility. Scientific evidence on the need to reduce consumption and carbon emissions has compounded the issue. A multitude of disparate, competing and changing green energy solutions has made investment in new technology complex for industrial users. Most new green energy technology are not integrated systems or require massive infusions of new infrastructure that challenge return on investment (ROI).

Previous Options

To garner more efficiency, industry has used various formulations, fuel additives and switched to alternate forms of energy. Each has its pros and cons though fuel based systems have embedded infrastructures that make newer energy less economic.

CB Williams Catalate Amplifier Solution

An in-line 'pipe' treats liquids and fuels post production and/ or pre or post storage.

Benefit 1

CB Williams' Catalate Amplifier unit increases energy efficiency for producers and large industrial users.

Benefit 2

End users create reduced carbon emissions.

Benefit 3

Better lubrication properties throughout the client system, easing wear and tear on parts and equipment.

Executive Summary

The Catalate Amplifier is an in-line catalyst treatment system for industrial users of liquid energy. The Catalate Amplifier referred to in this paper shall reflect it's applications to liquid fuels. Catalate technology is a molecular laser catalyst technology based on the concept of using a modulated laser beam for material microstructure enhancement. The result is a more coherent micro- structure that yields improved energy efficiency and reduces carbon emissions, thus improving both the bottom line and carbon footprints for users.

Industrial users of fuel based energy can integrate the Catalate Amplifier to speed implementation, increasing return on investment (ROI) for the producer and industrial client, exposing both to new green technology option without increasing costs. The Catalate Amplifier has undergone preliminary testing in both Canada and Korea. The company plans to do further third party testing and work with key strategic partners on the road to commercialization.

The Problem

Worldwide problems with non-renewable energy continue unabated while governments and industry struggle to introduce, reduce, re-use and renew energy strategies. Consumers are educated about their individual and societal responsibilities to reduce their carbon and energy use footprints. The arguments for green technology are compelling and new renewable sources of energy are required. However, much of our industrial complex will remain dependant on fuel based resources for years to come. There are also a multitude of uses for fuel based energy that may or may not be directly related to carbon emissions – petroleum has diverse uses.

If industry will continue to use petroleum and fuel based energy – is there a technique to render this energy more efficient? There have been a variety of fuel additives that can cause maintenance problems for equipment and that have only marginal ROI. The industry has seen many new energy implementations fail to meet their anticipated ROI. Time and again, we have seen excellent potential applications compromised by high costs, limited functionality and less than desired applicability. Consistent power, range of application, cost per watt combined with challenges of simultaneous integration to the power grid, limited bidirectional capabilities, incompatible architectures and expensive infrastructure combine to limit energy retrofits and new construction of high potential projects from moving past the pilot stage.

This new generation energy technology treats the fuel or liquid in process before it reaches the end user or consumer. An in-line 'pipe' treats the fuel with an inert process - small, fast and inexpensive implementation coupled with flow meter tools that facilitate

The Scope of Opportunity

What if an energy producer could generate up to 35% more efficiency from current production?

How would extending energy efficiency increase the solution value to end- users and stakeholders?

Would the application of new generation energy technology complement energy use reduction programs?

What if the new generation energy technology also resulted in reduced carbon emissions?

retrofits or integration into existing production or storage facilities can make a significant impact on project ROIs and the outlook for broader implementations and applications.

There are myriad challenges for the energy producer and industrial user. While every project buyer looks to the ROI of the green energy – consumer and government demands and regulation force decision makers to review every application. Regulations on what the producer and industrial user are required to do are growing exponentially as clients look for green systems that will decrease their carbon footprint over the lifetime of the system with no ‘greenwash’. Increasingly, industrial users are challenged to keep pace with the ever evolving technologies and customer expectations.

In the end, it is the end-user client who bears the burden of the competing technological forces. Stretched to determine which investment is best able to extend their infrastructure dollars, often the solution is to wait. Catalate holds the promise of an appropriate, inexpensive solution and advanced technology that improves the return on investment for industrial clients.

What are the Challenges?

The biggest challenges are typically not with the new green technologies, but integrating them with existing fuel based infrastructure. Too many times projects with excellent application functionality are delivered, only to be limited by the capabilities and shortcomings of the hardware layers.

No one green technology is applicable to all uses and applications. Fuel based systems will not disappear – even with the advent of solar, wind, and tidal power. In an effort to extend the initial investment, industrial users require efficiencies in their existing systems while they continue the journey toward reducing dependence on non-renewable resources.

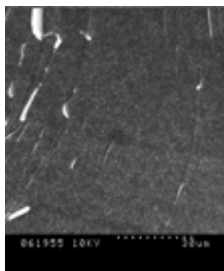
New Generation Energy Technology

What if an energy producer or industrial user could treat their existing fuel based resources to increase efficiency by up to 35%

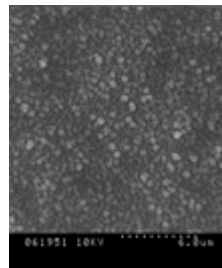
while concurrently reducing carbon emissions?

Catalate™ technology is founded on the principles of bio-energy transformation and semi-conductor laser treatment. However, the Catalate technology also involves electromagnetism which is the foundation behind being able to read data from hard disks. It has been demonstrated in prototype that the Catalate treatment changes the electrical conductivity of the treated fluids. Electromagnetism allows very small magnetic changes to convert into changes in electrical resistance without changing the chemical properties. As such, Catalate does not require the additions or subtraction of chemicals and no filtration system is required.

Based on continuous chemical and physics concepts, only CB Williams has fully integrated the technologies based on the pioneering work of Dr. Thomas Saito, a leader in the field of bio-energetics. After a career with the Japan Miyata Patent Developing Co., specializing in the magnetic filtrations devices and the development of ionic parts for the fuel enhancement and performance of automobiles, Dr Saito conducted a series of "water-tech" breakthroughs in Japan, Korea, and Europe. After settling in Canada, he continued his research in molecular structures. Catalate is the result of years of study and research. CB Williams is the corporate engineering and business development team charged with commercializing the Catalate technology and processes based on Dr. Saito's life work.



**Figure 1 BEFORE Image,
Micro Structure CONTROLLED
(Guelph)**



**Figure 2 Micro Structure, After Catalate
Process Treatment**

Patent Pending Catalate

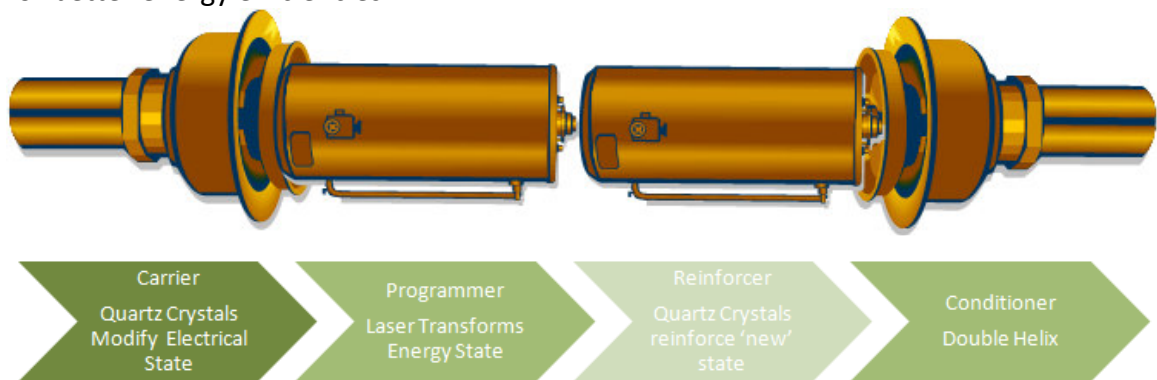
The Catalate™ technology is based on the principle of aligning micro- structures with frequency and optical transformation. Ostensibly, the electrical conductivity is affected by ionization - the process by which an atom or molecule loses or gains electrons, acquiring an electric charge or changing an existing charge. Ionization occurs via passing the liquid or fuel through the modulated laser based treatment process.

The initial PCT application for Catalate is pending in Japan due to Dr. Saito's long association with the Japanese scientific community, the extensive work done in the bio-energy ionization field in Japan and CB Williams in depth knowledge of the Japanese patent process. This experience and knowledge will result in a superior and supportable global patent.

On final patent filing, appropriate technical details will be made available to interested parties.

Patent Pending Catalate Amplifier™

The Amplifier is the 'in-line' unit that uses Catalate processes to treat liquid or fuel for better energy efficiencies.



There are four (4) processes performed by the Catalate Amplifier – all monitored and controlled with flow meters and software.

- Carrier Process
- Programming Process
- Reinforcement
- Conditioning

Recognizing that the end client will purchase the customized application that suits their particular environment, the Amplifier was designed as an 'in-line' part to allow simplified implementation.

In the end, neither Catalate nor the Amplifier unit will be appropriate in every application. However, the current CB Williams' Amplifier design allows its use

wherever fuel or liquids pass through a pipe. The Amplifier treats fuel before it hits any electrical or mechanical parts – the treated fluids decrease the loads on mechanical parts due to their enhanced lubrication – which run smoother and decreases ancillary loads which consume energy.

The Catalate Amplifier is designed to be used in industrial applications – with any industrial complex that produces or uses bio-fuels, diesel, gasoline, or oil in pre or post production and or storage. The unique electromagnetic and electrochemical ‘programming’ is attained with the Amplifier unit. A particularly important property of this process is that only a fraction of the treated material is needed to be mixed with the bulk of the product. For example, only 5 to 10% of the necessary fuel has to be treated in order to produce the benefits. The technology will be made available via a variety of business models: Carbon Credits (CDM, CER and VER), Fee for Service and Licensing. CB Williams is engaging with key industrial strategic partners to hasten the commercialization process.

While the technology is capable to working in vehicles – we do not plan on pursuing this market due to the cost of development, although there has been discussions with a major automobile maker. Rather, we believe the more cost effective method is to treat the fuel in storage or before it arrives at the vehicle.

Other Uses for Catalate?

Our path to market will require further testing on the road to commercialization. As yet, while the science is solid, though as with many new technologies, there are as yet, unknowns that require further investigation and third party testing.

Known Results

Carbon Emissions

Testing of a heavy duty, 6 cylinder diesel Caterpillar vehicle at the Ontario Drive Clean Program reported a 4.3% drop in emission opacityⁱ. Follow on internal testing in Canada and Korea show similar and improved results.

Treatment of Coal

Initial testing on coal samples as investigated at the University of Guelph’s Laboratory, under the supervision of Dr. Alexandra Smith, professor and head of the SEM lab indicate that the treated sample exhibits a finer micro-structure than the un-treated sample. Further testing is required to determine the extent to which these changes affect carbon emissions in coal.

Lubricants

Third Party testing by Petro Laboratories in Brampton, Ontario used Standard Falex Pin and Vee Block Methods (Designation D3233) to determine if treatment reduces friction on a shaft under pressure. In this test, the lubrication properties are enhanced, making the shaft under test to sustain a higher force before braking. The test was done with one type of oil and the comparison was between "before" and "after" treatment, not between different types of oil (treated and un-treated). While mechanical lubrication properties in this particular case are enhanced, more testing is required.

CB Williams has also done preliminary testing with batteries – with positive results but do not have thorough understanding of how the Catalate technology theory applies to a battery.

How Mature is the Technology?

Catalate and the Catalate Amplifier are undergoing strategic partnerships in certain regions for commercialization viability. While Amplifier prototypes have been field tested with positive results, the liquid and fuel based systems are more advanced than other applications. In our commercialization plan, we have accounted for thorough field and third party testing.

As a result, we have chosen to focus on the in-line Amplifier that has a known effect and a single, repeatable process. We know that based on the success of current field trials that the process does increase energy efficiency and reduce carbon emissions. We also know that Catalate has so far had no effect on nitrous oxide emissions.

While in theory, Catalate should also be applicable to electrical processes, we have not focused on this process and expect it will require more research and development. In essence, Catalate technology can be used wherever energy efficiencies are required. How that technology is applied, pre or post generation, and the mechanical processes are not yet contemplated for any energy beyond fuel based systems. Electrical, solar, wind are all part of future technology extensions along with treatment of non-energy related liquid products.

Conclusion

Integrating appropriate new generation technology into fuel based resource production, storage and delivery requires a hardware and monitoring software that integrate into existing vertical solutions quickly and economically. The goal is to extend energy efficiency and reduce carbon emissions without increasing costs to enhance the

energy capabilities and attractiveness for producers and industrial users. The end game is to go beyond retaining current infrastructure and clients but to also garnering new customers and deepening the relationship between production efficiency by reducing equipment wear and tear and improving energy efficiency. Finally, improving end user outcomes is a distinct possibility with fast implementation that exposes producers to new technologies that may improve how the Catalate Amplifier is used, deployed and how Catalate technology itself is developed in future.

About the Author – William Byung-Bu Choi

William earned his Global MBA at Yonsei University in Seoul, Korea and attended Keio Business School in Tokyo Japan. He worked in entrepreneurial ventures with PriceWaterhouseCoopers before returning to the family business where he recognized the importance of the work of colleague, Dr. Thomas Saito. Choi and Saito joined forces to commercialize Catalate technology in late 2007 and incorporated CB Williams Energy Group in early 2008.

About CB Williams

Headquartered in Vancouver, BC Canada with a Korean office, CB Williams Energy Group was formed to solve the corporate energy crisis with its advanced catalyst technologies and multiple formulations based on its Catalate technology, resulting in increased energy efficiency and reduced carbon emissions. At time of writing, CB Williams' Catalate Amplifier has been prototyped and has entered into strategic partnerships for scalability phase and commercialization viability.

ⁱ "Opacity" means the degree of light-obscuring capability of emissions of visible air contaminants expressed as a percentage. Ontario Standards require <30% emissions for a pass. The vehicle tested had a 'before' treatment rating of 4.3% opacity and an 'after' treatment rating of zero.