



Benefit To The Theme of Sustainability: Genoil's hydroconversion upgrading technology can remove impurities from Crude oils which are harmful to the environment when burned turning into greenhouse gases. These impurities are Sulfur, Nitrogen and metals to name a few. The Genoil GHU reduces the carbon ratio in crude by adding hydrogen, thus Genoil's process is a carbon reduction technology.

The Genoil process can upgrade the entire world heavy oil reserves making this one of the largest business opportunities in the world. Genoil is facing the challenge of how to meet the world's energy needs while also reducing the impact of petroleum consumption on the environment. Crude oil has been the engine of the world's transportation needs since the early 20th century. This will continue for decades to come because oil is irreplaceable and 25% of the world's capital infrastructure investments are based on crude oil. Those sunken costs will ensure oil will be a predominant. Oil demand continues to grow about 3% every year even with all the alternate energy options coming to market. Every year crude oil is becoming heavier and dirtier due to the fact that light, sweet, higher quality crude oil reserves are depleting and thus its production is falling. In the past light oil reserves supplied the world's demand for transportation fuel, however there is currently a shortfall of around 10% of the world's demand. Total world reserves of light are 400 billion barrels, and 900 billion barrels of heavy.

The world bunker market is an enormous opportunity for Genoil as we can produce low sulfur bunker fuel and competitively price it against high sulfur bunker. Five million barrels a day of heavy oil is used as bunker fuel on vessels. The burning of this fuel is extremely harmful to the environment, and legislation is now being passed to outlaw it. Under International Maritime Organization (IMO) Marine Pollution (MARPOL) Convention 73/78, ships presently must burn bunker fuel with no more than 1.0% sulfur fuel oil in Emission Control Areas (ECA's) off N.W. Europe and North America. In January 2015 that requirement changes to 0.1% sulfur. In January 2020, for all ships in waters outside ECA's comes the requirement to burn 0.5% sulfur oil instead of current 3.5% sulfur. At the moment the only way to meet these coming low sulfur specs is to install stack gas scrubbers which deposit sulfur into the ocean, switch to LNG or to burn much higher priced Marine Gas Oil at approximately double the cost.

Light sweet crude oil burns much cleaner than heavier sour crude oil. Additionally, the light crude refines into more transportation fuel than the heavier crude. If a refinery changes from light crude to heavy the transportation fuel production would fall by 30% on average based on carbon rejection. This fact alone would hugely impact sustainability as the world oil production would have to grow 30% to meet existing demand. The results in Canada is that 30% of the daily oil production is returned to the mine as contaminated waste. Genoil if combined with an Integrated Gasification Combined Cycle Unit has zero waste. If used without the IGCC unit the process would produce Sulfur and other by products which can be disposed of without causing harm to the environment. Sulfur can be sold as fertilizer.

Canada is an excellent example of how Genoil's technology would benefit the environment. Every day Canada produces about 1.85 million barrels per day of heavy oil, however they use a carbon rejection (coking) technology to lighten it and make it saleable. This technology rejects around 560,000 barrels per day in waste (30% of their total heavy production). Coking removes 37% of the sulfur compared with 99.5% with Genoil's technology, and with Genoil's process there is no waste



on our volume output, so with Genoil's process those 560,000 rejected unutilized barrels would be sold to refineries for clean transportation fuel production. This is a truly shocking statistic. Unfortunately, many of the companies who spent billions of dollars in infrastructure in Canada refuse to acknowledge that there are more sustainable options out there than wasting 30% of their production.

The same thing that applies to crude oil applies to bunker fuel. Genoil's process can economically remove sulfur from low value fuel oil. It is the only technology that can. Genoil has signed an MOU with OW Bunker & Trading of Denmark and are currently negotiating a contract with them for a desulfurization unit to treat bunker fuel.

Scalability: The Genoil process is fully scalable and can provide enormous benefit to the world environment. The technology is based on a fixed bed reactor. Fixed bed reactors comprise of 85% of the worlds refineries and have been around since the 1950's. Genoil's patent is a 10% modification of the Fixed Bed Reactor, but it yields a big efficiency gain. These gains not only benefit the environment but the local communities and their economy as our process can create a less expensive fuel.

Here is the brief patent information:

1. Patent CA No. 2306069 (9-25-2007-9-29-2019), US No. 7001502 (2-21-2006-9-29-2019) : Process for treating crude using hydrogen in a special unit, : Special unit is a reactor that through high temperatures and high pressures breaks down the hydrocarbon molecules and adds hydrogen to the molecule.
2. *US 7510689 (3/31/2009-2/22/2027), US 8147677 (4/3/2012-9/18/2027) Method and apparatus for introducing fluids into a hydrocracking reactor.*

By super-saturating the carbon molecules with hydrogen in a special unit and forming a stable new molecule we take the desulfurization, demetalization, denitrogenation & conversion rates of the Fixed Bed Reactor to new heights while increasing it's operating efficiency by 75%.

The optimal reactor sizes are between 20,000- 50,000 barrels per day. We can upgrade the entire 900 billion barrels of proven heavy and sour reserves at a cost savings to the industry of 75%. The units can be placed independent of a refinery, in remote locations at the oil fields and at the receiving terminals. Our upgraders can be placed at refineries as well.

Business Potential: There is a viable model to achieve commercial success. For Crude Oil we would like to cite the example we are using for China with our partner Hebei Zhongjie Petrochemical a division of CNOOC. Total investment for the 19,500 barrel per day project is \$180 million. There is a profit spread of \$41.72 per barrel, and IRR of 57.3% and annual profit of \$248,433,705. For OW Bunker & Trading we can apply similar profitability for meeting new low sulfur bunker fuel standards around the world.

Innovation: The Genoil solution has a "zero waste" option which burns the resid in an Integrated Gasification Combined Cycle Unit from the GHU to produce all required utilities for our GHU plant. Coking and other hydrocrackers or visbreaking technologies were all designed exclusively for refineries. Genoil is unique because it was designed for both and is adaptable for remote locations needing no external source of utilities. Integration with an IGCC unit is unique to the



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industry, and was necessary in our approach to a Middle East client. Our business approach is also novel and unique to the industry in that we do not ask the client for an up front license fee or to pay up front costs. Our profit comes from the profit from the operation. In the Middle East we want to ally ourselves with strong partners to ensure we receive a good deal from the oil company for example. Each territory demands it's own strategy.

Commercialization: Genoil is a solution that is ready to be implemented now. Genoil has the backing of Technip a well known Engineering Procurement & Construction firm with around 50,000 employees. They will warrant Genoil's upgrader and put a performance "warranty wrap" on the project. It is unique in the industry that such a large firm "warranty wraps" our projects and stands behind it. With commercial backing of the warranty by such a large EPC Contractor who has a very strong balance sheet Genoil can advance to contract completion and will be able to obtain 100% project financing.

We are currently negotiating contracts with three large energy companies. In Russia we wrote Vagit Alekperov who organized a meeting with the head of the project execution department of Lukoil to finalize a 65,000 barrels per day project. They are Russia's number one oil company. This project is particularly exciting due to the total amount of Russian heavy crude reserves. To advance the solution to its full potential we also proposed to Mr. Alekperov to upgrade all the crude oil in the pipeline whereby increasing its value by around \$50.00 per barrel. This is strategically important to Russia & Genoil would like to do all the upgrading in Russia.

In April 2014 we signed an MOU for 20,000 bpd project with OW Bunker & Trading to be constructed in Rotterdam, they are the largest bunker trading company in the world. This is of vital importance to the marine shipping market as there is currently no cost effective way to produce low sulfur bunker fuel. As a result the shipping lines will be switching to Marine Gasoil which costs double the amount. This will put a huge strain on international trade. We are now negotiating our contract with them. We will save 40% over marine gasoil with our clean burning bunker.

In China, Genoil has a binding letter of intent to build a 19,500 bpd plant which will be built adjacent to Hebei Zhongjie Petrochemical's (Division of CNOOC) refinery in Huanghua City, Hebei in North Eastern China. Genoil has already spent several million dollars on engineering work for the project. Hebei Zhongjie is preparing a new agreement for Genoil at this time. Our CEO has met with the Chinese who offered financing for any major project with the Genoil Upgrader which includes the infrastructure such as pipelines provided the synthetic crude product goes to China. The total capacity they are looking for is 10 million barrels per day.

In the UAE Genoil has a relationship with the first born son of the Ruler Sheikh Khalifa. The company is called Genoil Emirates Environmental Protection Services LLC. The ruling family recognizes Genoil's importance for sustainability and the environment. The key is to preserve the resources as best we can and utilize them in the most efficient manner.

Each upgrading unit is custom designed to meet performance goals. Here are some of our performance highlights: Large API increase, capable of doubling or tripling API gravity. Viscosity reduction 99% which is important for pipeline operators (not desired for bunker fuel, so we wouldn't focus on viscosity for the bunker project). Desulfurization rates of 99.5%. Pitch conversion level of 92%, Demetalization rates of 98%, Conradson Carbon Reduction of 87%, Denitrogenation rates of 53% - important for the environment.
