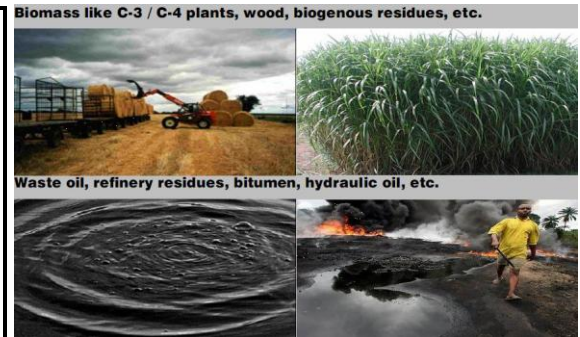


**A Catalytic Depolymerization (CDP) Hybrid Production Plant for convert woody, aquatic and landfill waste (MSW) feedstock into value added heating oils and transportation fuels.**



Biomass like C-3 / C-4 plants, wood, biogenous residues, etc.

Waste oil, refinery residues, bitumen, hydraulic oil, etc.

## Relevance and Merit

The U.S. EPA Renewable Fuel Standard (RFS) for transportation fuels sets minimum levels of renewable fuels that must be blended and produced into transportation fuels from 2006 to 2022. The Obama Administration has projected that the US alone will need to construct 500 advanced bioenergy plants between 2011 and 2022 to comply with the Renewable Fuel Standard of 21 billion gallons per year of Advanced Biofuels by 2022. These first pilot-scale and commercial-scale plants will carve out the business models and demonstrate the sustainability and viability of these new technologies. The RFS levels for advanced biofuels production will drive the creation of a major new industry, creating a foundation for future technology development and commercial growth. The biofuels industry is moving toward feedstock options such as woody types, human and animal wastes streams, jatropha seeds, palm oil and algae type to name a few. These feedstocks do not have much influence on food markets supply and pricing thus they do not influence or fuel the “food vs. fuel” controversy. Also, the oil yield and

quality of these potential feedstocks are much higher than the conventional feedstocks used in the biofuel industry. To that end, it is the goal and mission of Biofuels Technologies Enterprises Inc. (BTE) to become established and seated as a major player and fuels producer for the coming years.

## Goals & Potential

BTE is an Alternate Energy company with offices in Maryland, USA, and with the goals of bringing economically viable, renewable, sustainable, and environmentally friendly alternate energies, such as transportation and heating fuels, to the consumer marketplace. Our mission is to help communities, cities, and countries become more energy independent by utilizing locally available biomass in the production of BioCrude Oil as a replacement for imported fossil crude oil. The BioCrude Oil, to be produced at co-located oil refineries with diversified BioCrude Oil feeds, is to be refined into “clean and green” high-quality transportation fuels like gasoline, diesel, jet kerosene, and the many chemical and products that are currently made from a barrel of

imported fossil crude oil for a fraction of the price, and at a price that does not fluctuate with political and economic swings in the economy. Additionally, our solution is extremely environmentally safe and significantly reduces greenhouse gas emissions.

From a jobs creation aspect, it can be seen that the BTE Energy Solution will create thousands of direct and indirect long-term stable jobs in local communities wherever our plants will be located. The majority of these long-term and stable jobs are created by the BTE directly, BTE franchises, biomass collections, transportation, and support operations of the company as well as local community contractors. Our alternate energy solution will literally enable the creation of thousands of entrepreneurial biomass collection businesses that will be spawned in cities and local communities across our great nation and thus strengthening local economies as well as providing energy and fuels to the local and nearby communities as well within the region.

**(DISCLAIMER: This material is not an offer or the solicitation of an offer to sell or buy any security.)**

Biofuels Technologies Enterprises (BTE), was founded for the purpose of transforming abundant renewable biomass and waste stream feedstocks into a high-energy one-to-one replacement for fossil crude oil which is refined into clean, affordable, and renewable transportation fuels to meet tomorrows energy needs.



## Project Technology

We are working to construct a Catalytic Depolymerization (CDP) production plant for producing various ASTM compliant drop-in replacement transportation fuels from various waste woody, algae aquatic type, and other non-food/waste based feedstock to be used for replacing petroleum based transportation fuels into synthetic fuels like gasoline, diesel, and jet kerosene, as well as for the production of the many chemicals stemming from a standard barrel of fossil crude oil.

Municipal Solid Waste (MSW) consists of 80-90% of polymerized long chain hydrocarbon molecules. By de-polymerization, or “cracking”, the long molecules can be reduced to shorter length molecules with approx. 10-20 Carbon (C) atoms - equivalent to liquid diesel which is a fraction of crude oil. Accordingly this so-called synthetic diesel (or “second generation bio-diesel”) is identical, in its chemical and physical properties, to mineral or fossil diesel. In certain aspects, it is a superior product with a higher Cetane number with about 5% more power and the absence of impurities such as stearin or free carbon which is “black diesel smoke” without requiring a particle filter. The Cetane number is the performance rating of a diesel fuel, corresponding to the percentage of Cetane in a Cetane-methylnaphthalene mixture with the same ignition performance. A higher Cetane number indicates greater fuel efficiency. It can

also be called Cetane rating. The process has a by-product to Diesel “Kerosene; Gasoline and Fuel Oil” more fuel sources to drive vehicles and equipment.

What is known, so far, as “bio-diesel” is a process of producing diesel by simple etherification from expensive vegetable oils. This raw material base however is directly competing with the food industry and increasing demand for bio-fuels; therefore, making a huge impact on the rising oil and food prices.

On the contrary, with a new method of technology, waste can actually be used as the input material. Waste is, obviously, abundantly available and not only comes for free but often uses a “tipping or gate fee” as additional income.

Other researchers and/or companies have tried to come up with new solutions and continue to try to develop new methods; however, this revolutionary technology has been tested and is up and running at a fully operational facility.

For the first time in history, an alternative fuel source apart from fossil fuel is plentiful. In addition to the constant production availability and cheaper operating costs, there are many positive results in respect to CO<sup>2</sup> emissions and the understandable enrichment of our environment as a whole.

This technology can also be used to dig up old landfills and recycle the remaining material. Accordingly, no source-segregation of the MSW waste is required. Only hard materials (stones, glass, ceramics, metals and the like) have to be removed prior to processing.

Depending on the feedstock, the resulting biocrude oil can have a heating value comparable to bunker crude oil (30-40 MJ/kg) and can be used as home/business heating oils, or upgraded, via catalytic cracking and hydro-treating, and refined into higher value transportation fuels or chemical compounds.

The robust reaction conditions and process environment also makes the BTE CDP process well suited for the conversion of low-lipid, fast-growing algae that proliferate in wastewater treatment facilities. Additionally, integrating algae cultivation into a carbon dioxide waste system offers the synergetic benefit of providing nutrient remediation and Green House Gas (GHG) mitigation. Algae utilize these plentiful nutrients which would otherwise be released into the environment. By converting nutrient waste into a resource, we can further reduce environmental pollution, produce bioenergy, and preserve our natural resources.

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## Process Implementation

Originally BTE was going to initially utilize a technology, from Poland, which was “estimated”, by the manufacturer, to be less expensive and on the approximate \$80MM (USD) price range. It was later found out by BTE that the manufacturer has definite problems with pricing stability in that various the scaled up pricing changes and extreme underestimations made the manufacturer unreliable.

This is also coupled with current economic and destabilization problems currently facing Europe and thus speak to the security issues as well as if the manufacture would have actually had the capability to scale up to the desired plant levels. Basically, it comes down to the fact that the manufacturer could not meet the pricing estimates presented to BTE as well as not being able to meet the scalability and serviceability for the plant sizes that are needed for this project.

As such, BTE had to locate a new “America Made” technology that meets the scalability and serviceability needs of the project in addition to being able to produce the required ASTM compliant fuels with equipment that is further within the guidelines of the EPA RFS2 program for biomass/waste conversions to alternate fuels.

BTE has found such a viable replacement technology that will meet

the needs of our plant requirement. The catch is that this new technology comes with a more expensive price-tag, but can also meet the scalability and serviceability requirements needed.

The initial plant design is for a 1,000 bpd commercial production facility, that will be expanded to 2,500 bpd over 3- 5 years, which will produce transportation fuels and heating via the BTE CDP/FT direct "**Biomass-to-(Gasoline, Diesel, Jet Kerosene, and heating oils)**" process.

All of the produced fuels can be blended into existing fuels or can be used as a drop-in replacement directly in existing automobiles, trucks, airplanes, power engines, and heating furnaces without modifications.

This implementation is for an initial 1000 barrel/day plant located in Frederick/Baltimore, Maryland, USA, and to be able to utilize ALL types of biomass, waste, and algae which include leaves, switch grass, crop wastes, algae, seaweeds, human and animal wastes streams, just to name a few.

The base process even has potential to utilize other types of waste streams like old tires, plastics, rubbers, coal, oil shale and even tar sands to recover fossil crude oil although not the direct focus at this time as we are currently mainly interested in non-food

competitive biomass and waste stream types.

Apart from MSW renewable biofuels may be produced from a large variety of input materials such as:

- All organic input materials (straw, grass, press cake from fruits and oil plants)
- Plastics of all kinds including PVC
- Paper
- Wood
- Car fluff (residues from car recycling)
- Tires
- Sewage Sludge
- Animal Manure
- Animal Waste and more

This technology can also be used to dig up old landfills and recycle the remaining material.

Accordingly, no source-segregation of the MSW waste is required. Only hard materials (stones, glass, ceramics, metals and the like) have to be removed prior to processing.

## Corporate Projections

Our projected production growth is for our BTE-Refinery co-located facility(s) going from 1,000 barrels/day (year 1) at \$0.90/gal, 2,500/barrels/day (year 3) at \$0.74/gal, and 5,000 barrels/day (year 5) at \$0.65/gal facilities will enable BTE to have a corporate production capacity of well over 100,000 barrels/day after 9 years operation with a targeted

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wholesale gate fuel (diesel) price of approximately \$3.26 gallon as example of the OPIS (Baltimore) Ultra-Low Sulfur Diesel (2/10/12).

These transportation fuels can be made available to the general public at very economical prices while still realizing substantial profits per gallon of product sold.

The co-location distributed bio-refinery model that is utilized in our business model will allow BTE to augment and enhance existing oil refineries by offering a smooth transition from fossil crude oil to BioCrude Oil which can make economical, cleaner, and renewable fuels while still creating thousands of local area jobs for each production facility that goes into operation.

To do this, we have assembled a collaborative team of world-class scientist from across 7 universities and 2 national laboratories, whom are all leaders in the biomass and biofuels industry to work closely with BTE towards the realization of this national effort.

In addition, BTE has also started forming industry partnerships with various business & industry companies as well as being a membership in the federally supported Commercial Aviation Alternate Fuels Initiative (CAAFI).

At present, the use of biomass/waste resources to produce petroleum infrastructure-compatible fuels is very appealing. Hydrocarbon biofuels can potentially be used without significant changes to the current fuel distribution and utilization infrastructure, including pipelines, pumping stations, and vehicles.

Given the relatively short time between now and 2017, the goal of 35 billion gallons per year of renewable fuels will be more readily met if hydrocarbon biofuels are part of the fuel mix.

### National and Environmental Benefits

The BTE plant has several merits to US, and Canada, which include:

- (a) Environmentally friendly, economical profitable and efficient conversion of biomass/waste/algae feedstock to renewable transportation fuels.
- (b) Lessen dependence on foreign energy sources and fossil oil imports,
- (c) The creation of thousands of long-term stable jobs while also economically stimulating local communities,
- (d) Promotes local entrepreneurship and stimulates business growth,
- (e) Reduction of carbon dioxide emission.

### Diesel, Gasoline, and Kerosene from CDP waste

Plastics (e.g. PVC, PET,...), used tyre, rubber, etc.



Organically waste, domestic waste, catering waste, fats, etc.



### Project Specifications

**Projected Cost:**

**\$150MM - \$170MM**

**Projected Payback:**

**7 - 9 Years**

**Initial Production:**

**400 tpd (1000 bpd)  
(approx. 17,000,000 gpy)**

**Contact Information:**

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**Current Customers:**

We currently have customer fuels offtake agreement contracts in place for more than 38+ million gallons of fuel products annually guaranteed for 10 years.

Additional multiple large scale customer contracts currently in process as well.

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