New Earth Capital Group

United States
Renewable Energy & Clean Technology: Biofuels

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BlueFire Renewables, Inc.

Initiating Coverage with Speculative Buy

STOCK INITIATION

RATING:
Speculative Buy

BlueFire is a pioneer in the production of cellulosic ethanol for use as fuel. *In contrast with ethanol produced from corn or other foods*, cellulosic ethanol is produced from urban trash, rice and wheat straws, wood waste and other agricultural residues. This avoids the food-versus-fuel issues of corn ethanol, liberates ethanol production from its reliance on a single crop (i.e. corn in the U.S., sugar cane in Brazil), and allows for the placement of production facilities at sites such as landfills, near areas of *consumption* as opposed to sites concentrated near areas of corn *production*. **Cost-effective commercial-scale cellulosic ethanol production has the potential to radically alter the ethanol business and scale to a meaningful displacement of gasoline consumption.**

A unique aspect of BlueFire's process is its flexibility, both in range of feedstock materials as well as in range of end-products. The C5 and C6 sugars produced by BlueFire can be used to produce ethanol, biobutanol, and chemical esters such as ethyl levulinate, ethyl lactate, and ethyl citrate.

BlueFire is the designated recipient of $88 million in U.S. Department of Energy (DoE) grants. These funds will be used to build the company's first commercial-scale biorefinery in Fulton, MS, and, upon securing of additional financing, a second commercial-scale biorefinery in Lancaster, CA.

After 3+ years of development, BlueFire appears to have secured the various elements necessary to secure financing for its first commercial-scale biorefinery: permits, DoE grants, EPC contract, feedstock agreement, and off-take agreement. BlueFire's stock price has rebounded from a recent low of $0.05 on news of the various agreements. In our view, the stock has yet to fully reflect the company's significant progress.

BlueFire's vision is to develop a portfolio of cellulosic ethanol biorefineries based on its patented acid hydrolysis process. As with most groundbreaking technologies which require significant capital investment, BlueFire claims a long list of parties who express serious interest in developing and financing the company's *second* plant.

In addition, selling pressure on BlueFire shares may be tailing off, as a former owner appears to be done liquidating a sizable position. The company's share price declined sharply through the summer, partly due to consistent sales by former owner David Gelbaum (and his Quercus Trust), who owned as much as 15% of BlueFire at the peak. According to BlueFire, a company shareholder report dated Sept. 31, 2010 does not list David Gelbaum as a current shareholder.

Company Description

Headquartered in Irvine, California, incorporated in Nevada, BlueFire is the exclusive North American licensee of the Arkenol Technology. This is a patented process to produce ethanol and other fuels from cellulosic materials such as urban trash (post-sorted municipal solid waste), rice and wheat straws, wood waste and other agricultural residues. BlueFire has 9 full-time and 2 part-time employees. BlueFire is currently in the process of developing two cellulosic ethanol facilities in Fulton, MS and Lancaster, CA. The Fulton, MS facility will produce approximately 19 million gallons of ethanol per year from woody biomass, mill residue, and other cellulosic waste. The fully-permitted Lancaster, CA facility is designed to produce approximately 3.9 million gallons of ethanol per year from post-sorted cellulosic wastes diverted from Southern California's landfills.

Stock Data

Ticker/Exchange:	BFRE.OB/OTC BB
Price:	$0.48
52-week Range:	$0.05 – $1.05
Shares Outstanding (Nov. 15, 2010):	28,544,965
Market cap ($million):	$13.70
EV ($million):	$12.05
Avg. Daily Trading Vol. ($million):	$ 0.04
Short Interest:	14,300

Revenues (US$ million)

	2008A	2009A	2010E	2011E
Q1	$0.0 A	$0.058A	$0.288A	$0.850E
Q2	$0.144A	$0.068A	$0.177A	$0.850E
Q3	$0.123A	$3.980A	$0.075A	$0.550E
Q4	$0.808A	$0.212A	$0.100E	$0.250E
Total	**$1.076A**	**$4.318A**	**$0.639E**	**$2.500E**

Earnings per Share

	2008A	2009A	2010E	2011E
Q1	$(0.10)A	$(0.02)A	$ 0.05A	$(0.00)E
Q2	$(0.15)A	$(0.14)A	$ 0.00A	$(0.00)E
Q3	$(0.15)A	$ 0.14 A	$(0.05)A	$(0.01)E
Q4	$(0.11)A	$ 0.06 A	$(0.01)E	$(0.01)E
Total	**$(0.51)A**	**$ 0.04 A**	**$(0.02)E**	**$(0.02)E**
P/E	***NMF***	***12.0 x***	***NMF***	***NMF***

EBITDA (US$ million)

	2008A	2009A	2010E	2011E
Q1	$(2.80)A	$(0.82)A	$(0.60)A	$(0.10)E
Q2	$(4.21)A	$(0.78)A	$(0.38)A	$(0.08)E
Q3	$(4.31)A	$ 2.98 A	$(0.70)E	$(0.13)E
Q4	$(3.25)A	$(0.56) A	$(0.34)E	$(0.18)E
Total	**$(14.58)A**	**$0.81 A**	**$(2.03)E**	**$(0.49)E**
EV/EBITDA		***14.8 x***	***NMF***	***NMF***

Important Disclosures

New Earth Capital Group LLC was compensated by BlueFire for the publication of this report. In addition, the firm seeks to do business with companies covered by its research team. Consequently, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making an investment decision.

For analyst certification and other important disclosures, refer to the Disclosure Section, located at the end of this report.

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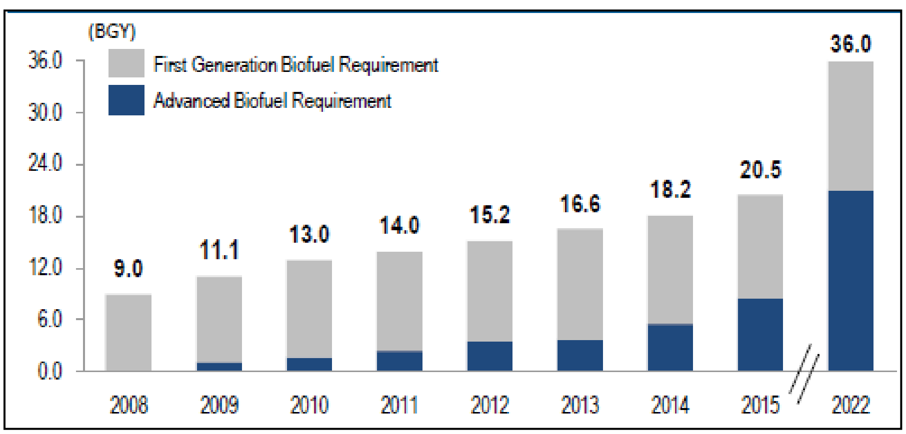
Figure 1: BFRE.OB (4-year stock price through December 10, 2010)

Source: Bigcharts.com

Figure 2: U.S. Renewable Fuel Volume Requirements for RFS2 (billion gallons per year)



Source: Green Plains Renewable Energy

Investment Thesis

We initiate coverage of BlueFire Renewables with a Speculative Buy rating. Our perception is that BlueFire has been off the radar screen of clean tech investors for some time (years, likely) as the company spent the past few years in development mode, trying to raise financing for its first commercial-scale biorefinery. Concurrently, investor interest has declined markedly for anything related to ethanol, as public corn ethanol companies have struggled and, in many cases, slid into bankruptcy.

We believe BlueFire deserves a new look. First and most importantly, this is not corn ethanol and the business model is not tied to the price of corn (or other food commodities). Second, while the path to capitalize on the $88 million in DoE grants has been difficult, BlueFire appears to have pulled together all the pieces necessary to finance and build its first commercial-scale biorefinery. This is likely to be the one in Fulton, MS. This is potentially the first commercial-scale facility for the production of cellulosic ethanol and would make BlueFire the industry leader. As the process relies on a patented, but fairly industrial approach to the breakdown of the cellulosic material (concentrated acid hydrolysis) rather than reliance on "superbugs" or specialized enzymes, we believe success with the first facility will speed the development of additional production facilities.

In our view, timing is as good as it gets. The selling pressure from Gelbaum's unloading of BlueFire shares was intense through the summer, driven – we suspect - by funding issues with companies in the Quercus Trust portfolio and largely regardless of BlueFire's progress. The result is a severely depressed share price, coinciding exactly with the emergence of the near-term catalyst of the anticipated launch of construction of the Fulton facility. The current equity market capitalization is less than the development dollars invested to date.

Over the next year, we expect BlueFire's share price will rise as the Fulton plant proceeds with construction and the media realizes that cellulosic ethanol has transitioned out of the research and design stage and into commercialization.

As the company executes along its expected path, BlueFire may make an attractive takeover candidate. A likely buyer would be a larger industrial company with interest in the sector and with the balance sheet and access to capital to accelerate construction of future production facilities.

Key Positives

- The U.S. continues to push for the increased use of ethanol to displace gasoline as transportation fuel. Recent studies by the U.S. Department of Energy (DoE) and U.S. Department of Agriculture (USDA) suggest the U.S. can produce enough biomass to produce enough ethanol – 60 billion gallons per year – to displace about 30% of current U.S. gasoline consumption by 2030[1].

- Legislated mandates and incentives continue to drive the industry. The Energy Policy Act of 2005 established a nationwide renewable fuels standard requiring use of 7.5 billion gallons of renewable fuel by 2012. The Energy Independence and Security Act of 2007 boosted this renewable fuels standard, requiring 36 billion gallons of annual renewable fuel use by 2022. Of this requirement, 21 billion gallons must be "advanced biofuels"—fuels that cut greenhouse gas emissions by at least 50%—***including 16 billion***[2] ***gallons of cellulosic biofuels*****, from the current base of *zero***.

- At the current forward ethanol price of roughly $3 ($2.06 Dec. 2011 futures price plus $1.01 cellulosic biofuel tax credit), the 16 billion gallons of cellulosic biofuels represents a new, unclaimed market of approximately $48 billion.

- BlueFire has a patented process for the production of ethanol from cellulosic waste materials. The process was proven and field-tested on a pilot scale, most notably by Japan's JGC Corporation over a continuous operating period of 4.5 years, providing an independent verification of the process' viability. This is unique among biofuels companies.

[1] *Research Advances: Cellulosic Ethanol*, National Renewable Energy Laboratory, March 2007
[2] Federal Register, Vol. 75, No. 58, March 26, 2010

- BlueFire's process does not rely on "superbugs", specialized enzymes, or other genetically modified organisms as other companies are developing. Those competing approaches are proving very difficult to refine for commercial production. In contrast, BlueFire's process uses sulfuric acid to break down the cellulose into C5 and C6 sugars that could then be used to make a variety of products, including ethanol, biobutanol, and chemical esters such as ethyl levulinate, ethyl lactate, and ethyl citrate. The process harbors less science risk, in our view, even as it offers greater flexibility in the range of feedstock that can be used.

- Cost-effective commercial-scale production of cellulosic ethanol has the potential to radically alter the ethanol business and scale to a meaningful displacement of gasoline consumption. Cellulosic ethanol avoids the food-versus-fuel issues of corn or sugar-cane ethanol, liberates ethanol production from its reliance on a single crop (i.e. corn in the U.S., sugar cane in Brazil), and allows for the placement of facilities at sites such as landfills, near areas of *consumption* as opposed to sites geographically concentrated near areas of corn *production*. This latter point is important; as ethanol cannot be moved in the existing pipeline infrastructure for gasoline, it can be expensive to transport from the growing areas of the midwest U.S. to the coastal population centers.

- With approximately 2,300[3] landfills currently operating or recently closed municipal solid waste (MSW) landfills in the U.S., the potential market for BlueFire production facilities is enormous, with the added benefit of extending the life of the landfills.

- BlueFire has invested nearly $19 million over the past five years in the development of its technology and plans for the Lancaster and Fulton biorefineries.

- Leveraging this investment is the $88 million in DoE grants awarded to BlueFire. These funds will be used to build the company's first commercial-scale biorefinery in Fulton, Mississippi, and, upon securing of additional financing, the company's second commercial-scale biorefinery in Lancaster, California. BlueFire is one of only four companies awarded funding from the DoE under the Energy Policy Act of 2005 to construct cellulosic ethanol production facilities.

- After 3+ years of development, BlueFire appears to have pulled together all of the pieces to build its first commercial-scale biorefinery: permits, DoE grants, EPC contract, feedstock agreement, and off-take agreement.

- BlueFire's vision is to develop a portfolio of these cellulosic ethanol biorefineries based on its patented acid hydrolysis process. BlueFire has a long list of parties who express serious interest in developing and financing the company's *second* plant. Clearly, the path to commercialization has been long and arduous. The difficulties of satisfying the conditions for the DoE grants are well-documented. Nevertheless, our impression is that BlueFire is emerging from development stage with promising, field-proven technology that can be replicated at a multitude of sites across the U.S.

- One of the benefits of cellulosic ethanol, as compared to corn ethanol, is that BlueFire would have fixed feedstock costs. This largely mitigates the risk of being subject to a "crush spread" as in the case of corn ethanol.

- Concurrent with the progress on Fulton, BlueFire has received excellent market validation from orders for its sugars from Solazyme, which is developing renewable fuels from algae.

- Selling pressure on BlueFire shares appears to be subsiding, as former owner David Gelbaum seems to be done selling shares. The company's share price declined sharply over the summer, partly due to consistent sales by former owner Gelbaum (and his Quercus Trust), who owned as much as 15% of BlueFire at the peak. A Form 4/A was filed on June 29, showing Gelbaum selling 2,585,556 shares. This should comprise the majority of Gelbaum's remaining stake. According to BlueFire, a company shareholder report dated September 31, 2010 does not list David Gelbaum as a current shareholder.

- BlueFire's stock price has rebounded from a recent low of $0.05 on news of the various agreements. In our view, however, the stock price has yet to fully reflect the company's significant progress over the last few months.

[3] United States Environmental Protection Agency (EPA), as of October 2010

Concerns

- Though cellulosic ethanol production has immense potential, it is a new industry. Cost-effective production of cellulosic ethanol has yet to be proven. As of Nov. 2009, there were no[4] ethanol plants in the U.S. distilling ethanol using the non-edible parts of plants such as corn stalks, grasses or wood chips. As noted by NREL, "All commercially available ethanol is made the 'easy' way using starchy products such as corn kernels because starches are much easier to break down and convert into the sugars needed to make ethanol. Cellulosic biomass contains sugars that are much harder to get because the plants combine the sugars into cellulose fibers and use these tougher fibers as structure to hold up the plant and protect the cells from outside attack— and in the case of woody biomass, it's the very cell structure that leads to the slow deterioration of wood." We translate this as: Extracting the sugars from woody biomass is possible, but difficult (read: costly).

- The construction of BlueFire's biorefineries will require significant project financing. BlueFire estimates the total cost of the bio-refineries, including contingencies, to be in the range of approximately $300 million to $310 million for the plant in Fulton, Mississippi and approximately $100 million to $120 million for the plant in Lancaster, California.

- The market for financing new ethanol plants is difficult and even more so for new technologies. In this case, the good news is that BlueFire appears to have assembled the many items required to finance its first biorefinery: the permits, DoE grants, EPC contract, feedstock agreement, and off-take agreement. This was a process that took years and is potentially a tremendous competitive advantage as few others have achieved as much.

- The profitability of BlueFire's projects under development may depend on ethanol's market price at time of production.

- The DoE's Renewable Energy Loan Guarantee Program (as established by the 2005 energy bill) has been defined by inaction and obstruction and is largely seen as a complete failure to date in terms of bringing next generation biofuel technologies to the marketplace.

- BlueFire will need to raise additional capital to fund its operations over the next several months. As of September 30, 2010, BlueFire had cash and cash equivalents of approximately $518,000. However, as of November 15, 2010, cash had declined to approximately $98,000. (source: BlueFire 3Q 2010 10-Q)

About the Company

BlueFire Renewables, Inc. is the North American licensee of the Arkenol technology for production of cellulosic ethanol for use as fuel. The Arkenol technology is a patented Concentrated Acid Hydrolysis Technology Process for the conversion of cellulosic waste materials to simple sugars, which can then be used to create ethanol (and other products such as biobutanol and ethyl levulinate), for use as fuel. BlueFire claims to be the only cellulose-to-ethanol company worldwide with demonstrated production of ethanol from urban trash (post-sorted MSW), rice and wheat straws, wood waste and other agricultural residues. BlueFire is one of four ethanol companies awarded funding from the U.S. Department of Energy to construct cellulosic ethanol production facilities.

[4] *NREL Breaks Down Walls for Biofuels*, National Renewable Energy Laboratory, November 30, 2009

Quick Facts

Predecessor company organized	March 28, 2006
Reverse merger	June 27, 2006
Began trading on Pink Sheets	July 11, 2006
Began trading OTCBB	June 19, 2007
Executive offices	Irvine, California

Biofuels Notes

Biobutanol is butanol (a 4-carbon alcohol) produced from biomass feedstocks. Currently, butanol's primary use is as an industrial solvent in products such as lacquers and enamels. Like ethanol, biobutanol is a liquid alcohol fuel that can be used in today's gasoline-powered internal combustion engines. The properties of biobutanol make it highly amenable to blending with gasoline. It is also compatible with ethanol blending and can improve the blending of ethanol with gasoline. The energy content of biobutanol is 10 to 20 percent lower than that of gasoline.

Under U.S. Environmental Protection Agency (EPA) regulations, biobutanol can be blended as an oxygenate with gasoline in concentrations up to 11.5% by volume (i.e., the EPA considers blends of 11.5% or less biobutanol with gasoline to be "substantially similar" to pure gasoline). Biobutanol proponents claim that today's vehicles can be fueled with high concentrations of biobutanol—up to 100%—with minor or no vehicle modifications, although testing of this claim has been limited.[5]

Ethanol is an alcohol fuel made from the sugars found in sugar cane or grains, such as corn, sorghum and barley. Corn is the main ingredient for ethanol in the U.S. due to its abundance and low price. Most ethanol is produced in the corn-growing states in the midwest U.S.[5]

Ethyl Lactate is a commercially available monobasic ester formed from lactic acid and ethanol. Lactate esters are nontoxic, biodegradable, and have excellent solvent properties. They can replace toxic and halogenated solvents for a wide range of industrial uses and in a multitude of common household products, including packaging, biodegradable plastics, paints, paint strippers, grease removers, and cleansers, as well as most semiconductor chips in computers and consumer electronics.[6]

Ethyl Levulinate (EL) is an ester of levulinic acid that is used as an oxygenate diesel additive. EL is prepared by esterifying levulinic acid with fuel-grade ethanol. EL has high lubricity, a reduced sulphur content, and an oxygen content of 33%. An EL/diesel blend yields a significantly cleaner burning diesel fuel.[7]

Triethyl Citrate is used as a high boiling solvent, plasticizer for vinyl resins and cellulose acetates, and food additive. It is widely used in cosmetics, lacquers and as a fragrance carrier.[8]

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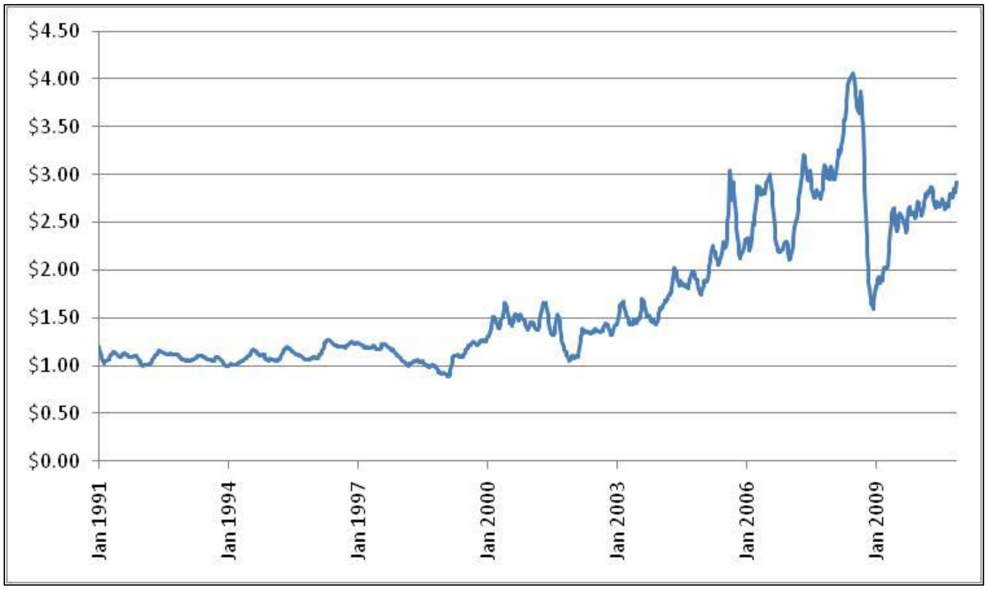
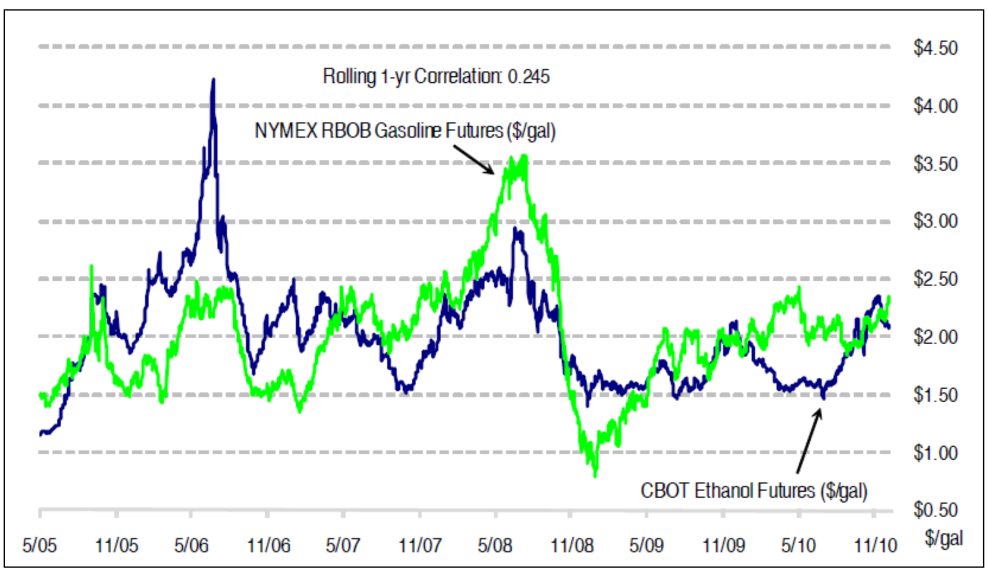
[5] U.S. Department of Energy
[6] U.S. Department of Energy, Argonne National Laboratory
[7] Carbolea Research Group, University of Limerick, Ireland
[8] Chemicalland21.com

Figure 3: Weekly U.S. Regular Conventional Retail Gasoline Prices (U.S. Dollars per Gallon)



Source: Energy Information Administration

Figure 4: CBOT Ethanol Nearest Futures versus NYMEX RBOB Gasoline Nearest Futures (U.S. Dollars per Gallon)



Source: CME Group, Ethanol Outlook Report, December 6, 2010

Industry Highlights

BlueFire is the North American licensee of the Arkenol technology for production of cellulosic ethanol for use as fuel. While the license is for North America, we anticipate that the company will focus on building biorefineries primarily in the U.S., at least for the next three to five years. Accordingly, we focus our industry analysis on the potential demand in the U.S.

Tremendous Demand for Cellulosic Ethanol

The U.S. offers an enormous market for a gasoline substitute. Some quick facts:

- The U.S. is the world's largest consumer of petroleum, accounting for roughly 22% of the global market.
- The U.S. consumes almost 20 million barrels of petroleum per day.
- The U.S. imports approximately 50% of its petroleum consumption.
- Motor gasoline comprises 46% of petroleum consumption. (Diesel fuels comprise an additional 16%.)

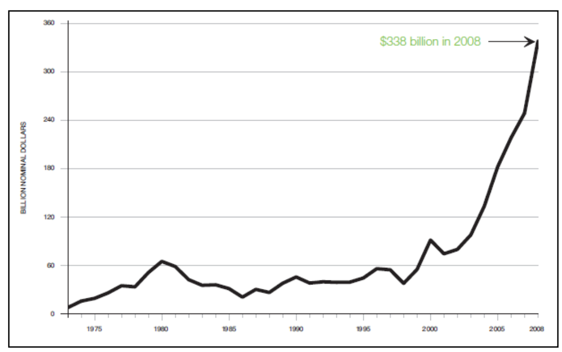
As ethanol offers a direct substitute for gasoline (not diesel fuel), the *potential* market size for ethanol is the 9 million barrels (378 million gallons) per day or almost 138 billion gallons per year of motor gasoline consumed in the U.S. At current gasoline prices of roughly $3 per gallon (in reality, approximately 14% of the price of a gallon of gas is for taxes), this implies an annual U.S. market potential for ethanol of $414 billion.

Figure 5: U.S. consumption of petroleum

Million barrels per day	2008	AEO2010 Reference case
Petroleum demand	19.52	20.86
Motor gasoline	8.99	9.06
Jet fuel	1.54	1.84
Distillate fuel	3.94	4.91
Residual fuel	0.62	0.67
Other	4.43	4.37
Crude oil imports	9.75	8.88

Source: U.S. Energy Information Administration, DoE

Figure 6: Cost of Crude Oil Imports (billions of U.S. dollars)



Source: Clean Fuels Development Coalition, Ethanol Fact Book, 2010

For the foreseeable future, we anticipate that the focus of biofuel substitution for petroleum will be on reducing imported oil, rather than supplanting domestic production, for all the good reasons commonly cited: national security, ending support for unfriendly governments and dictators, worries about the trade deficit. We note that of the $417 billion deficit in U.S. trade in goods in the first eight months of 2010 (January-August), crude oil imports comprised $170 billion, *or an astounding 41% of the total*. We believe this is an issue that will continue to receive attention.

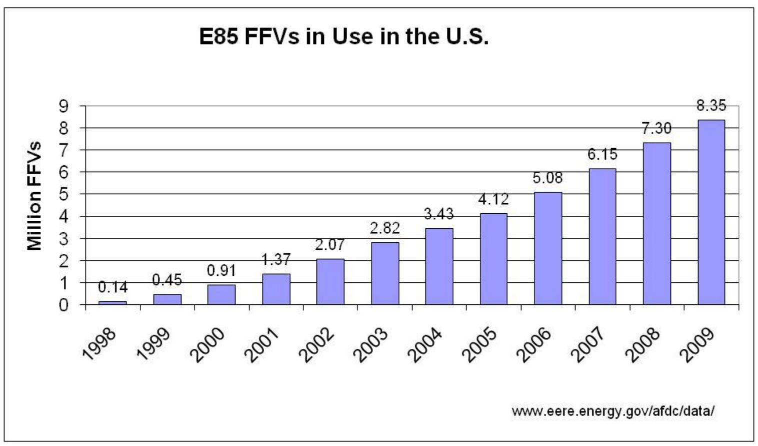
Even assuming that domestic oil production is not substituted, the potential market for ethanol remains enormous. In this case, the market for ethanol would be approximately 50% of the 9 million barrels per day of motor gasoline consumed. At current gasoline prices of roughly $3 per gallon, this implies an annual U.S. market of $207 billion.

The Blend Wall and Other Limits

In spite of ethanol's potential to replace gasoline in full, the current reality is that U.S. automobiles are not made to use fuel of 100% ethanol. Current U.S. regulations allow ethanol blending into gasoline at 10% or less by volume (classified as E10 fuel), in line with the EPA's current determination that only blends of 10% ethanol are safe in unmodified gasoline engines, for fear of corrosion of conventional gas engines at higher percentages. According to the DoE, low-level ethanol blends such as E10 already constitute much of the gasoline sold in the U.S. Low-level blends require no special fueling equipment and can be used in any gasoline-powered vehicle.

Rising sales of "flex-fuel" vehicles enable an increased use of ethanol, as they can use a blend of up to 85% ethanol by volume (E85). Unfortunately, the market penetration is very low at present. Of the 238 million[9] cars and light trucks registered in the U.S. (137.08 and 101.24 million, respectively), there were only 8.35 million flex-fuel vehicles in operation. Even more unfortunate, many flex-fuel cars and trucks are not labeled as such, depressing public awareness of the potential for increased ethanol use.

Figure 7: E85 Flex-Fuel Vehicles in Use in the U.S.



Source: U.S. Department of Energy

Also worth noting is the lower energy content of ethanol. According to the Environmental Protection Agency (EPA), a gallon of pure ethanol (E100) contains 34% less energy than a gallon of gasoline. Consequently, a 10% volume replacement equals a 6-7% displacement of gasoline, minus any fossil fuels used in the growing and processing of the feedstock.

To date, almost all of the ethanol consumed as fuel in the U.S. has been derived from corn. From 2000 to 2010, corn ethanol production grew from less than 2 billion gallons to an expected 12 billion gallons in 2010. There are now a reported 201 ethanol plants in at least 27 states, almost all using corn as a feedstock.

Perhaps surprisingly, therefore, the ethanol industry is nearing market saturation to supply E10, relative to the U.S. annual consumption of nearly 140 billion gallons of gasoline.

Some Good News on the Blend Wall

In an encouraging sign, on October 13, 2010, the EPA partially granted a waiver request application submitted in March 2009 under section 211(f)(4) of the Clean Air Act by Growth Energy (a coalition of U.S. ethanol supporters) and 54 ethanol manufacturers. This partial waiver will allow fuel and fuel additive manufacturers to introduce into commerce gasoline that contains greater than 10% ethanol by volume (E10) and up to 15% ethanol by volume (E15) for use in certain motor vehicles once certain other conditions are

[9] Registrations for 2008. Source: U.S. Department of Energy, Transportation Energy Data Book: Edition 29, 2010

fulfilled. The EPA notes that there are a number of additional steps that must be completed – some not under EPA control – to allow the sale and distribution of E15. These additional steps "include but are not limited to submission of a complete E15 fuels registration application by industry, and changes to some states' laws to allow for the use of E15".

Initially, the waiver for E15 is approved only for use in model year 2007 and newer light-duty motor vehicles, which includes passenger cars, light-duty trucks, and medium-duty passenger vehicles. Additional tests are being conducted to determine whether to extend E15 to older motor vehicles, heavy-duty highway engines and vehicles (e.g., delivery trucks), highway and off-highway motorcycles, and off-road engines, vehicles, and equipment (e.g., boats, snowmobiles, and lawnmowers).

According to the EPA, there are two types of conditions for implementing the partial waiver decision, those for mitigating the potential for misfueling of E15 in all vehicles, engines and equipment for which E15 is not approved, and those addressing fuel and ethanol quality. The following conditions are to be met prior to the introduction of E15 into commerce. (Source: EPA)

Fuel quality conditions:

- Ethanol used for E15 must meet ASTM International D4806-10.
- The Reid Vapor Pressure for E15 is limited to 9.0 psi during the summertime.

Misfueling mitigation conditions:

- Labels must be placed on E15 retail dispensers indicating that E15 use is only for MY2007 and newer vehicles.
- Product Transfer Documents (PTDs) must accompany all transfers of fuels for E15 use.
- Parties involved in manufacture of E15 must participate in a survey of compliance at fuel retail dispensing facilities to ensure proper labeling of dispensers.
- Parties must submit plan addressing conditions to EPA for approval.

Near to Medium Term, Legislated Mandates Drive Demand, While Incentives Provide Support

The Energy Policy Act of 2005 established a nationwide renewable fuels standard (RFS) requiring use of 7.5 billion gallons of renewable fuel by 2012. The Independence and Security Energy Act (EISA) of 2007 boosted this renewable fuels standard substantially, requiring 36 billion gallons of annual renewable fuel use by 2022 (RFS2). We note that 36 billion gallons of annual renewable fuel use would represent a 26% displacement of current U.S. gasoline consumption (though a smaller percentage in terms of energy output).

Of this requirement, 21 billion gallons must be "advanced biofuels"—fuels that cut greenhouse gas emissions by at least 50%—including 16 billion gallons of cellulosic biofuels, up from a base of zero currently.

At the current forward ethanol price of roughly $3 ($2.06 Dec. 2011 futures price plus $1.01 cellulosic biofuel tax credit), the 16 billion gallons of cellulosic biofuels represents a new, unclaimed market of approximately $48 billion to be created over the next 12 years. Considering the capital investment required to yield $48 billion worth of cellulosic ethanol in 2022, this represents an enormous growth potential for the sector's pioneers.

Figure 8: EISA Renewable Fuel Volume Requirements (billion gallons)

Year	Cellulosic biofuel requirement	Biomass-based diesel requirement	Total Advanced biofuel requirement	Total renewable fuel requirement
2008	n/a	n/a	n/a	9.0
2009	n/a	0.5	0.6	11.1
2010	0.1	0.65	0.95	12.95
2011	0.25	0.80	1.35	13.95
2012	0.5	1.0	2.0	15.2
2013	1.0	a	2.75	16.55
2014	1.75	a	3.75	18.15
2015	3.0	a	5.5	20.5
2016	4.25	a	7.25	22.25
2017	5.5	a	9.0	24.0
2018	7.0	a	11.0	26.0
2019	8.5	a	13.0	28.0
2020	10.5	a	15.0	30.0
2021	13.5	a	18.0	33.0
2022	16.0	a	21.0	36.0
2023+	b	b	b	b

[a] *To be determined by EPA through a future rulemaking, but no less than 1.0 billion gallons.*
[b] *To be determined by EPA through a future rulemaking.*

Source: EPA Regulatory Announcement, February 2010

Relevant Federal Incentives and Legislation

Cellulosic Biofuel Producer Tax Credit

A cellulosic biofuel producer that is registered with the Internal Revenue Service (IRS) may be eligible for a **tax incentive in the amount of up to $1.01 per gallon of cellulosic biofuel** that is: sold and used by the purchaser in the purchaser's trade or business to produce a cellulosic biofuel mixture; sold and used by the purchaser as a fuel in a trade or business; sold at retail for use as a motor vehicle fuel; used by the producer in a trade or business to produce a cellulosic biofuel mixture; or used by the producer as a fuel in a trade or business. If the cellulosic biofuel also qualifies for alcohol fuel tax credits, the credit amount is reduced to $0.46 per gallon for biofuel that is ethanol and $0.41 per gallon if the biofuel is not ethanol. Cellulosic biofuel is defined as liquid fuel produced from any lignocellulosic or hemicellulosic matter that is available on a renewable basis, and meets U.S. Environmental Protection Agency fuel and fuel additive registration requirements. Alcohol with a proof of less than 150, fuel with a water or sediment content of more than 4%, and fuel with an ash content of more than 1% are not considered cellulosic biofuels. The incentive is allowed as a credit against the producer's income tax liability. Under current law, only qualified fuel produced in the U.S. between January 1, 2009, and December 31, 2012, for use in the U.S. may be eligible. For more information, see IRS Publication 510 and IRS Forms 637 and 6478, which are available via the IRS Web site. (Reference Public Law 111-152, Section 1408; Public Law 110-234, Section 15321; and 26 U.S. Code 40)

Renewable Fuel Standard (RFS) Program

The national RFS Program was developed to increase the volume of renewable fuel that is blended into transportation fuels. As required by the Energy Policy Act of 2005, the U.S. Environmental Protection Agency (EPA) finalized RFS Program regulations, effective September 1, 2007. The Energy Independence and Security Act of 2007, signed into law in December 2007, increased and expanded this standard.
(Note: The RFS2 standards entered into effect on July 1, 2010.)

In 2010, 12.95 billion gallons of renewable fuel must be used, increasing to 36 billion gallons per year by 2022. Beginning in 2010, a certain percentage of the renewable fuel blended into transportation fuels must be cellulosic biofuel, biomass-based diesel, and advanced biofuel. Cellulosic biofuel is defined as any renewable fuel derived from cellulose, hemicellulose, or lignin, and achieves a 60% greenhouse gas (GHG) emissions reduction. Biomass-based diesel is defined as a renewable transportation fuel, transportation fuel additive, heating oil, or jet fuel that meets the definition of either biodiesel or non-ester renewable diesel, and achieves a 50% GHG emissions reduction. If intended for use in a motor vehicle it must also be registered with EPA as a motor vehicle fuel or fuel additive. Renewable fuel that is co-processed with petroleum is not considered biomass-based diesel. Advanced biofuel is defined as any renewable fuel, other than ethanol derived from corn, and achieves a 50% GHG emissions reduction.

Each year, EPA will determine the Renewable Volume Obligation (RVO) for parties required to participate in the RFS Program. This standard is calculated as a percentage, by dividing the amount of renewable fuel (gallons) required by the RFS to be blended into gasoline for a given year by the amount of gasoline/transportation fuel expected to be used during that year. **Any party that produces gasoline for use in the U.S., including refiners, importers, and blenders (other than oxygenate blenders), is considered an obligated party under the RFS Program**. Parties that do not produce, import, or market fuels within the 48 contiguous states are exempt from the renewable fuel tracking program. Small refineries and refiners are also exempt from the program until 2011. A small refinery is defined as one that processes fewer than 75,000 barrels of crude oil per day, has a total crude capacity of less than 150,000 barrels per day, and employs fewer than 1,500 employees company-wide.

To facilitate and track compliance with the RFS, a producer or importer of renewable fuel must generate Renewable Identification Numbers (RINs) to represent renewable fuels produced or imported by the entity on or after September 1, 2007, assigned by gallon or batch. Assigned RINs are transferred when ownership of a batch of fuel occurs, but not when fuel only changes custody. A trading program is in place to allow obligated parties to comply with the annual RVO requirements through the purchase of RINs. Obligated parties must register with the EPA in order to participate in the trading program. For each calendar year, an obligated party must demonstrate that it has sufficient RINs to cover its RVO. RINs may only be used for compliance purposes in the calendar year they are generated or the following year. Obligated parties must report their ownership of RINs to the EPA's Office of Transportation and Air Quality on a quarterly and annual basis. (Reference 42 U.S. Code 7545(o) and 40 CFR 80.1100-80.1167)

Source: U.S. Department of Energy

A Few Words on Corn Ethanol

In 2009, the U.S. produced 10.75 billion gallons of ethanol, primarily as corn starch ethanol. The expectation for 2010 is for the United States to produce approximately 12 billion gallons of ethanol, versus the RFS2 requirement of 12.95 billion gallons of renewable fuels. According to the ethanol industry trade group Renewable Fuels Association (RFA), as of November 2010, there were 204 ethanol refineries with a nameplate capacity of 13.8 billion gallons per year. In addition, there were facilities under construction that would add another 0.8 billion gallons of capacity of corn starch ethanol. As a result, the U.S. will soon have the installed capacity to produce up to the 15 billion gallons of corn-starch ethanol that is allowed by RFS2.

Figure 9: U.S. Annual Ethanol Production

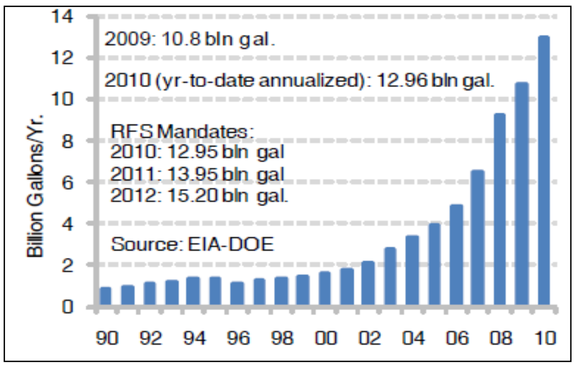
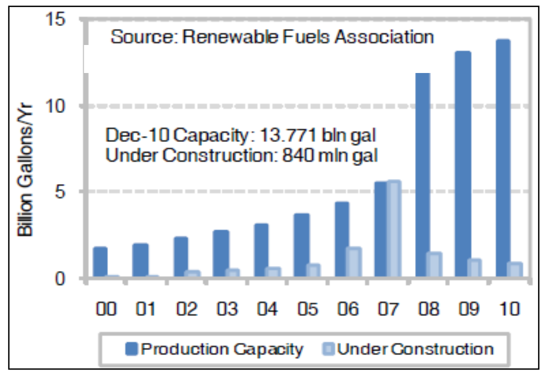


Figure 10: U.S. Ethanol Plant Capacity & Construction



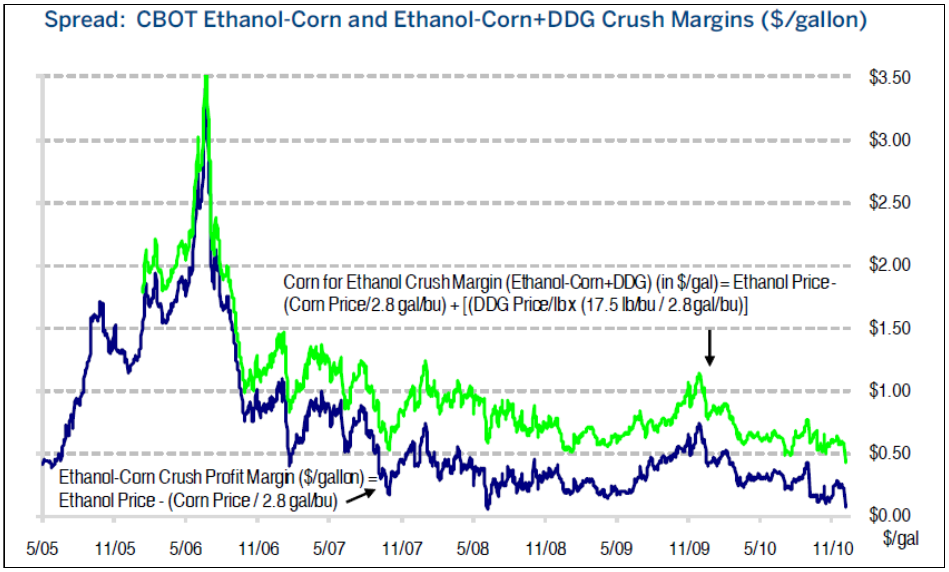
Source: CME Group, Ethanol Outlook Report, Week of December 6, 2010

Regardless of the RFS2 ceiling, corn ethanol can only displace so much of U.S. petroleum consumption. The U.S. is estimated to consume 30% of its corn crop to displace 6% of the country's gasoline consumption. Even if the U.S. used 100% of its corn crop for ethanol production, the country would still grow enough to offset only a fraction of its gasoline needs. Also, corn ethanol production is energy and water intensive. The processes of growing, harvesting, transporting, pre-treating, fermenting, and distilling require copious amounts of fresh water, nutrients, pesticides, and energy. Additionally, corn ethanol, concentrated near the centers of corn production and lacking pipelines for distribution, suffers the added burden of a potentially very costly distribution to the more populated coastal areas of the U.S.

Finally, the economics of corn ethanol production swing wildly, as the producers are price-takers on both the corn input and the ethanol output. If the price of corn rises sharply, profitability can deteriorate rapidly. Corn ethanol producers are subject to this "crush spread"[10] between the price of corn and the price of the ethanol.

[10] The simple crush spread is calculated as 2.8 times the ethanol price minus the corn price per bushel and is represented by the blue line in the chart. The green line factors in a value for the DDG, which can be fed to livestock.

Figure 11: Corn Ethanol Crush Spread



Note: DDG refers to distillers dried grains, which is the residue following distillation of the corn.

Source: CME Group, Ethanol Outlook Report, Week of December 6, 2010

Why Cellulose?

Providing the cellular structure for trees and grasses, cellulose is the world's most abundant organic compound. In a 2005 study on biomass[11], the DoE and USDA estimated that the U.S. had over 1.3 billion dry tons per year of biomass potential on just forestland and agricultural land, the two largest potential biomass sources. This would be sufficient to produce biofuels to meet more than one-third of the demand for transportation fuels.

Forestlands in the contiguous United States were found to have the potential to produce 368 million dry tons annually, including:

- 52 million dry tons of fuel wood harvested from forests;
- 145 million dry tons of residues from wood processing mills and pulp and paper mills;
- 47 million dry tons of urban wood residues including construction and demolition debris;
- 64 million dry tons of residues from logging and site clearing operations; and
- 60 million dry tons of biomass from fuel treatment operations to reduce fire hazards.

Agricultural lands in the U.S. were found to have the potential to produce nearly 1 billion dry tons[12] of biomass annually and still continue to meet food, feed, and export demands. This projection includes:

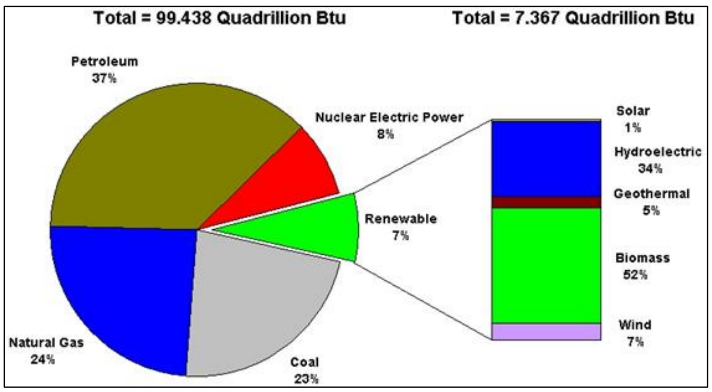
- 428 million dry tons of annual crop residues;
- 377 million dry tons of perennial crops;

[11] Biomass as Feedstock for a Bioenergy and Bioproducts Industry: The Technical Feasibility of a Billion-Ton Annual Supply, April 2005.
[12] Important assumptions that were made include the following: yields of corn, wheat, and other small grains were increased by 50 percent; the residue-to-grain ratio for soybeans was increased to 2:1; harvest technology was capable of recovering 75 percent of annual crop residues (when removal is sustainable); all cropland was managed with no-till methods; 55 million acres of cropland, idle cropland, and cropland pasture were dedicated to the production of perennial bioenergy crops; all manure in excess of that which can be applied on-farm for soil improvement under anticipated EPA restrictions was used for biofuel; and all other available residues were utilized.

- 87 million dry tons of grains used for biofuels; and
- 106 million dry tons of animal manures, process residues, and other miscellaneous feedstocks.

The role of biomass in the production of energy is not new in the U.S. As a matter of fact, biomass contributes more energy in the U.S. than hydroelectric power. Of course, this is largely for the production of electricity. Using biomass as a source for biofuels represents the new opportunity.

Figure 12: Renewable Energy Consumption in the Nation's Energy Supply, 2008



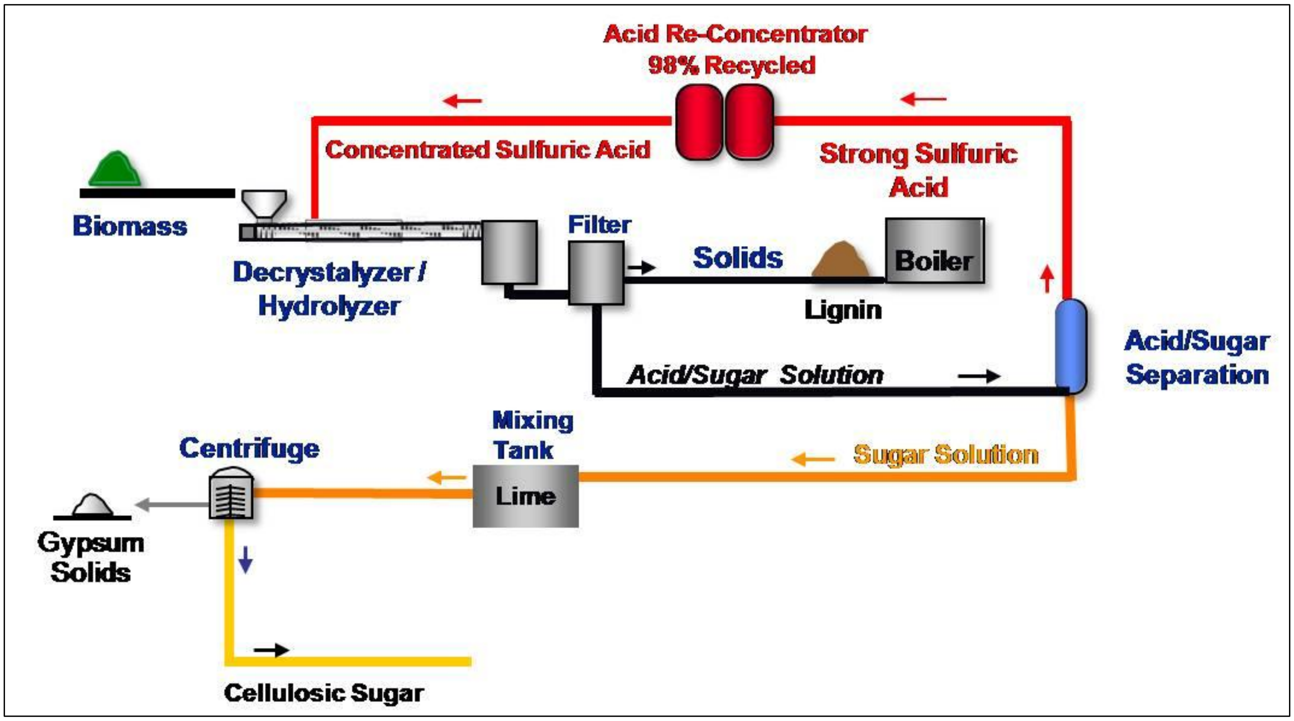
Source: U.S. DOE Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels; released August 2010

Company Analysis

BlueFire Renewables is the North American licensee of the Arkenol process for converting cellulosic biomass and materials into fermentable simple sugars. This patented Concentrated Acid Hydrolysis[13] Process enables the manufacture of renewable fuels from a variety of feedstocks, such as wood waste, grass and other green clippings, newsprint, paper mill waste, grain and rice straw. Application of the process can be used to create a wide array of products, including ethanol, food products, medical products, and specialty chemicals. However, BlueFire (as a licensee) is set up to focus on the use of the sugars for the production of renewable fuels.

[13] Hydrolysis is a chemical process in which a molecule is split into two parts by the addition of a molecule of water. One fragment of the parent molecule gains a hydrogen ion (H^+) from the additional water molecule. The other group collects the remaining hydroxyl group (OH^-).

Figure 13: The BlueFire Concentrated Acid Hydrolysis Process



Source: BlueFire Renewables

This patented Concentrated Acid Hydrolysis Process has been in development since 1992, but is based on a process that dates back to the early 1900s. At its most basic level, the process is as follows:

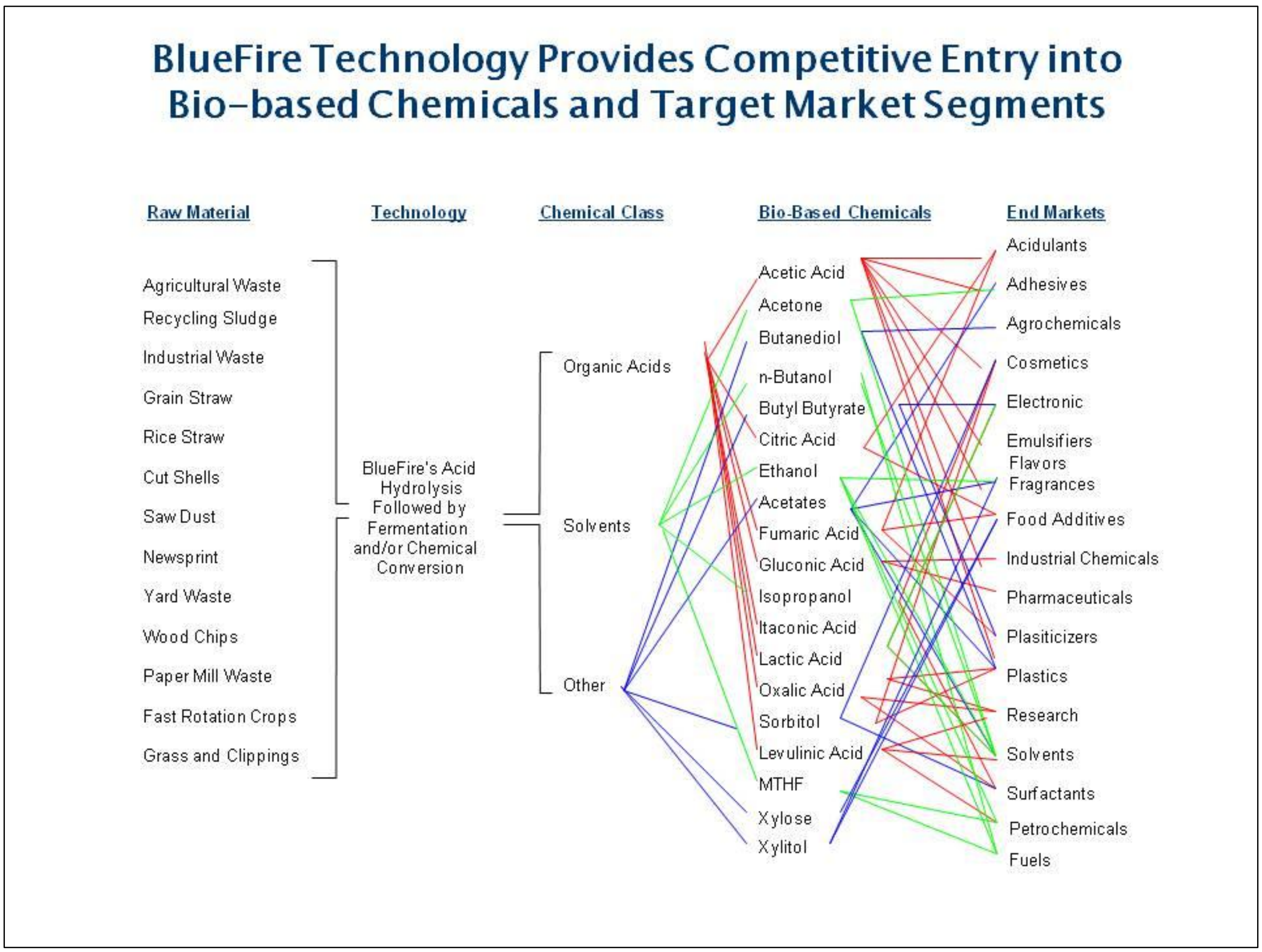
1. Incoming biomass feedstocks are cleaned and ground to reduce the particle size for the process equipment.
2. The pretreated material is then dried to a moisture content consistent with the acid concentration requirements for breaking down the biomass.
3. The biomass is then hydrolyzed (degrading the chemical bonds of the cellulose) with sulfuric acid at a 70% concentration to produce hexose and pentose (C6 and C5) sugars at the high concentrations necessary for commercial fermentation.
4. The insoluble materials left are separated by filtering and pressing into a cake and further processed into fuel for other beneficial uses.
5. The remaining acid-sugar solution is separated into its acid and sugar components.
6. The separated sulfuric acid is re-circulated and re-concentrated to the level required to break down the incoming biomass.
7. The small quantity of acid left in the sugar solution is neutralized with lime to make hydrated gypsum which can be used as an agricultural soil conditioner. At this point, the process has produced a clean stream of mixed sugars (both C6 and C5) for fermentation.
8. In an ethanol production plant, naturally-occurring yeast, which Arkenol has specifically cultured by a proprietary method to ferment the mixed sugar stream, is mixed with nutrients and added to the sugar solution where it efficiently converts both the C6 and C5 sugars to fermentation beer (an ethanol, yeast and water mixture) and carbon dioxide.
9. The yeast culture is separated from the fermentation beer by a centrifuge and returned to the fermentation tanks for reuse.
10. Ethanol is separated from the now clear fermentation beer by conventional distillation technology, dehydrated to 200 proof and denatured with unleaded gasoline to produce the final fuel-grade ethanol product.

11. The still bottoms, containing principally water and unfermented sugar, is returned to the process for economic water use and for further conversion of the sugars.

Put simply, the process separates the biomass into its two main constituents: cellulose and hemicellulose (the main building blocks of plant life) and lignin (the "glue" that holds the building blocks together), converts the cellulose and hemicellulose to sugars, ferments them and purifies the fermentation liquids into ethanol and other end-products.

There is a clear competitive advantage in BlueFire's process: flexibility on both the front end (a multitude of feedstocks) and flexibility of end-products (since the simple sugars can be used to make a multitude of end-products). Our understanding is that rival cellulosic ethanol processes can be very narrow in their application, relying on specific enzymes or other agents to work on very specific pathways, requiring a narrow limit on acceptable feedstocks and generating very specific products at the back-end.

Figure 14: The BlueFire Process Has Both Feedstock and End-Product Flexibility



Source: BlueFire Renewables

The Arkenol technology is owned by the major shareholder of BFRE. The license to the technology is available on a perpetual basis, subject to certain conditions and licensing fees (3% royalties on gross revenues) to Arkenol.

BlueFire has 25 international patents, including 12 or 15 base patents in different countries and 10 additional secondary patents.

BlueFire Renewables is currently in the process of developing two cellulosic ethanol facilities in Fulton, Mississippi and Lancaster, California. The fully-permitted Fulton, MS facility will produce approximately 19 million gallons of ethanol per year from woody biomass, mill residue, and other cellulosic waste. The fully-permitted Lancaster, CA facility will use post-sorted cellulosic wastes diverted from Southern California's landfills to produce approximately 3.9 million gallons of ethanol per year.

Department of Energy Grants

BlueFire is the recipient of $87.56 million in DoE grants for the construction of its biorefineries, one of only four ethanol companies awarded funding from the DoE to construct a commercial-scale cellulosic ethanol production facility. This is an exceptional validation of BlueFire's process and technology.

In February 2007, BlueFire was awarded a grant for up to $40 million from the DoE's cellulosic ethanol grant program to develop a solid waste biorefinery project at a landfill in Southern California. During October 2007, BlueFire finalized Award 1 for a total approved budget of just under $10 million with the DoE. The award is a 60%/40% cost share, whereby 40% of approved costs may be reimbursed by the DoE pursuant to the total $40 million award announced in February 2007.

In December 2009, as a result of the American Recovery and Reinvestment Act, the DoE increased Award 2 to a total of $81 million for Phase II of its DoE Biorefinery project. This is in addition to a renegotiated Phase I funding for development of the DoE Biorefinery of approximately $7 million out of the previously announced $10 million total. This raised the total eligible funds for the DoE-funded biorefinery to $87.56 million. BlueFire has completed negotiations with the DoE for Phase II of its DoE Biorefinery project and the funds have been obligated.

Through September 2010, BlueFire had received reimbursements of approximately $7,201,000 under these awards.

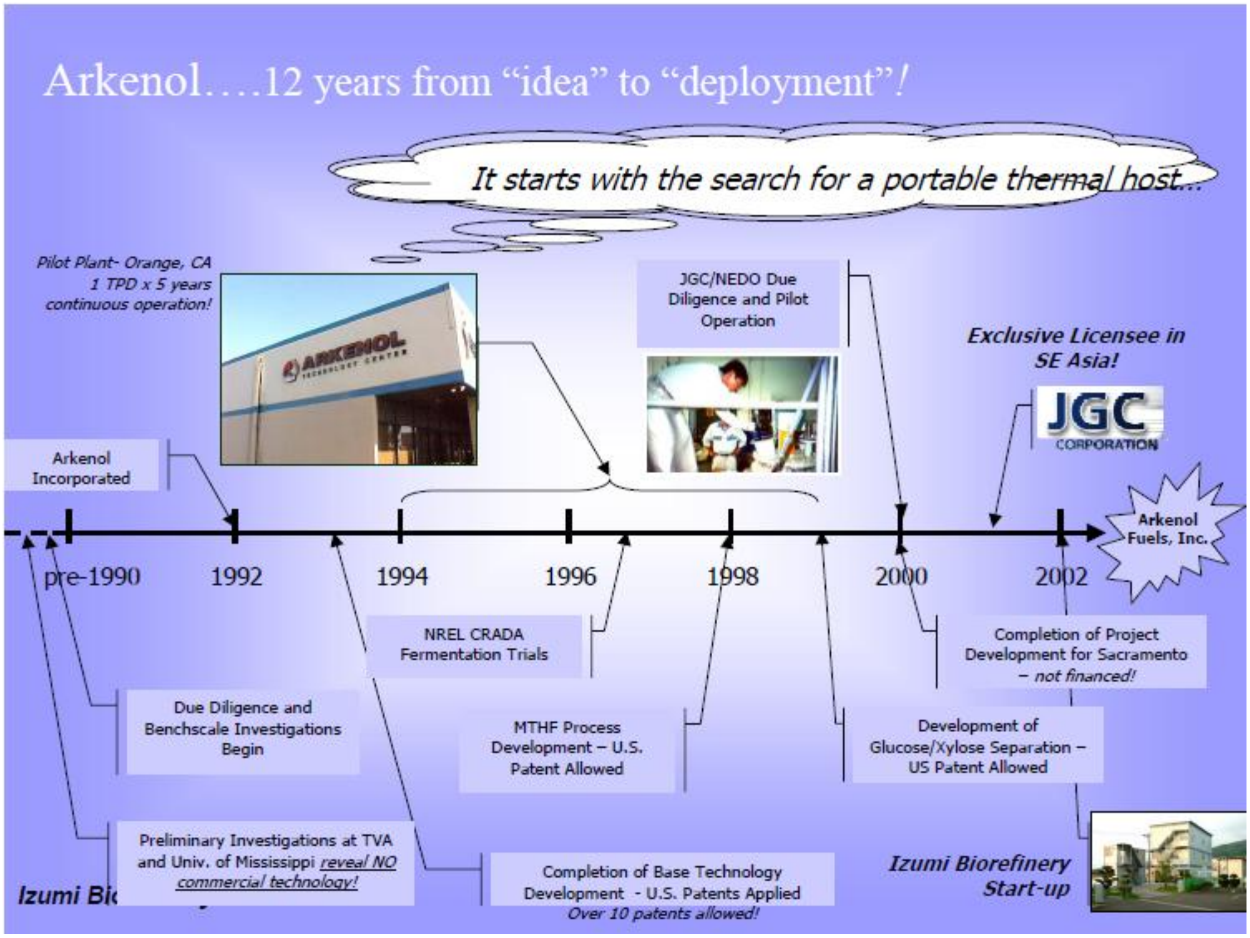
We note that BlueFire developed its plans initially for the Lancaster, CA biorefinery. However, as BlueFire's second project, to be located in Fulton, MS, gained momentum and state support, it looks increasingly likely that the Fulton biorefinery will be built before the Lancaster facility. Accordingly, BlueFire has applied the development work on Lancaster to the Fulton project and the DoE grant will be used to develop the Fulton facility.

At this point, the focus of the company is to build these two initial plants as proof that the technology works and ethanol can be produced profitably at scale. Subsequent facilities are likely to be larger in an effort to capture economies of scale.

Company History

The underlying technology for BlueFire Renewables is Arkenol's patented Concentrated Acid Hydrolysis Process. The process has been in development since before 1990 and been proven in two pilot plant operations, the first at a pilot plant in Orange, California, the second at a pilot plant in Izumi, Japan, which operated continuously for five years.

Figure 15: BlueFire Was Born from Development Efforts at Arkenol



Source:BlueFire Renewables

The latter project was achieved with funding from Japan’s NEDO (New Energy and Industrial Technology Development Organization). NEDO undertakes the development of new energy and energy-conservation technologies, verification of technical results, and introduction/dissemination of new technologies (e.g., support for introduction). (Source: NEDO)

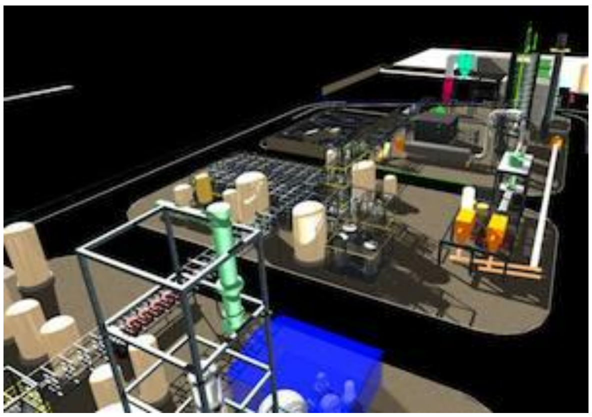
The Izumi biorefinery was undertaken by Japan’s JGC Corporation, a leading global engineering company founded in 1928 and a participant in over 20,000 projects in approximately 70 countries. The facility was sited next to a 35-year old NEDO ethanol purification facility, started production in September 2002, and operated continuously for 4.5 years. The facility was small, increasing from an initial 100 liters of ethanol per day to a capacity of 300 liters per day in 2004. Though it was small, the production served as an important third-party validation of the technology.

In addition, the Izumi biorefinery enables BlueFire to make the claim of being the only company to have actually produced cellulosic ethanol in any significant quantity.

Lancaster, California

BlueFire has an agreement with the city of Los Angeles to build an ethanol facility near the city of Lancaster, California. In Feb. 2009, the Antelope Valley Air Quality Management District issued all required Authority to Construct Air Permits for BlueFire's planned cellulosic ethanol biorefinery in Lancaster, CA. The air permit is comprised of 28 individual permits and was the final environmental permit necessary for BlueFire Renewables to proceed into final design and construction of the plant.

Figure 16: Artist rendering of BlueFire's proposed Lancaster, CA facility



Source: BlueFire Renewables

Unfortunately, BlueFire did not receive any DoE grants for the Lancaster facility. Therefore, while the company was set to build the Lancaster plant first, the process bogged down. Certainly, the business climate in California hasn't helped, with the sharp economic downturn and state and municipal budget shortfalls. In addition, while Mississippi has been generous in providing help to facilitate the Fulton plant, California has a variety of disincentives, from taxes to difficulties in re-permitting for any changes once permits have been issued.

BlueFire owns a 10-acre land parcel in Lancaster (at an approximate value of $109K). The site is located adjacent to a Waste Management landfill, which is envisioned to provide free feedstock. The company factors in a bit of feedstock cost to account for any transportation of post-sorted MSW (the green bin in Los Angeles County). The facility needs only 200 to 250 tons per day depending on the materials' moisture content.

On the positive side, the facility is fully permitted, including air permits which are extremely difficult to secure. The project is shovel-ready. On the negative side, the project awaits financing. These facilities don't scale down very well and Lancaster has a capacity of only 3.9 million gallons per year of cellulosic ethanol. BlueFire estimates the cost of the facility at between $100 million and $125 million, far higher than the original cost estimate of $30 million to $40 million due to significant design changes. (As an example, the boiler itself is $12 million and needs to run at less than optimal operations because of emissions.) At project cost of $100 million, with roughly $12 million potential revenue per year (4 million gallons x $3 per gallon), the facility is likely to require some level of grant award and loan guarantee in order to be funded.

On the 10 acres in Lancaster, a facility of 4 million gallons appears to be the maximum size. In order to expand, BlueFire would need to buy more land and secure new permits, not just a modification. This would require the company to start the permitting process again. Last time, according to the company, it took 22 months to get all the permits. In addition, should it desire a bigger facility, there have been signals that BlueFire might be required to buy more land to create a nature preserve to protect local species.

With all this in mind, we believe it is likely that Fulton, MS will be the first plant to be built by BlueFire. Fortunately, according to the company, about 60% of the design and engineering work done for Lancaster was portable to future projects including Fulton, with the rest being site-specific.

Fulton, Mississippi

The Fulton biorefinery is designed to process approximately 700 metric dry tons annually of woody biomass, mill residue, and other cellulosic waste available in the region as feedstock for the production of approximately 19 million gallons of ethanol per year.

On November 10, 2010, BlueFire announced that it had received the final permit for its Fulton biorefinery, allowing construction to begin. BlueFire now has the necessary air, wastewater, and storm water permits from the Mississippi Department of Environmental Quality (MDEQ), a wetlands permit from the U.S. Army Corps of Engineers, and a Certificate of Permit Coverage under Mississippi's storm water general permit from the MDEQ. A Final Environmental Assessment and Finding of No Significant Impact was obtained from the DoE on June 4, 2010.

The site appears to be ideal for the plant, within an industrial park where infrastructure exists or requires only minimum upgrades to serve the project. The project site, controlled under a long term lease with Itawamba County, has access to rail, interstate highways and barge for flexibility in receiving materials and shipping products.

With issuance of the required permits, the County, jointly with the city of Fulton, has commenced work on the initial activities of clearing, rough grading and drainage improvements under a contract with Century Construction, a Mississippi based contractor. The work by Century was expected to take about 120 days.

On September 20, 2010, BlueFire announced an off-take agreement with Tenaska BioFuels, LLC for the purchase and sale of all ethanol produced at the Fulton biorefinery. Pricing of the 15-year contract follows a market-based formula structured to capture the premium allowed for cellulosic ethanol compared to corn-based ethanol, giving BlueFire a creditworthy contract to support financing of the project. Despite the long-term nature of the contract, BlueFire is not precluded from the upside in the coming years as fuel prices rise. Tenaska BioFuels, LLC, a marketing affiliate of Tenaska, provides procurement and marketing, supply chain management, physical delivery, and financial services to customers in the agriculture and energy markets, including the ethanol and biodiesel industries. Founded in 1987 and privately held, Tenaska is one of the largest independent power producers in the U.S. Tenaska had $7.9 billion in gross operating revenues in 2009 and 6.7 gigawatts of capacity in 17 power generating plants at end-2009.

Also on September 20, 2010, the Company announced a contract with Cooper Marine & Timberlands to provide feedstock for the Fulton biorefinery for a period of up to 15 years. Under the agreement, Cooper Marine & Timberlands will supply the project with all of the feedstock required to produce approximately 19 million gallons of ethanol per year from locally sourced cellulosic materials such as wood chips, forest residual chips, pre-commercial thinnings and urban wood waste such as construction waste, storm debris, land clearing or manufactured wood waste from furniture manufacturing. Headquartered in Mobile, Alabama, Cooper Marine & Timberlands is in the business of producing wood chips for sale in both domestic and international markets. The company has four chip mill sites in Mississippi and Alabama. Cooper Marine & Timberlands is part of the Cooper/T. Smith group of companies, one of America's oldest (founded in 1905) and largest stevedoring and maritime related firms with operations on all three U.S. coasts encompassing 38 ports and foreign operations in Venezuela, Brazil, Colombia, Canada, and Mexico.

On October 5, 2010, BlueFire announced that it had finalized and signed an Engineering, Procurement and Construction ("EPC") contract for the Fulton biorefinery. The facility will be engineered and built by Wanzek Construction, a Fargo, North Dakota-based heavy industrial contractor founded in 1971 and acquired by MasTec, Inc. (NYSE:MTZ) in 2008. BlueFire had been working with Wanzek on the planned Lancaster facility, so the company has some familiarity with BlueFire's technology and development plans.

At the time of its acquisition by MasTec, Wanzek was deriving a significant portion of its revenue from wind farm construction, having completed, or in the process of completing, work on projects representing over 1,100 turbines and nearly 2,000 megawatts of power generating capacity. In addition, Wanzek had a long track record in the construction of natural gas processing plants and compression stations and in the construction of industrial process plants, including biofuel plants. Wanzek had trailing 12-month revenue of $303 million as of June 30, 2008.

In business over 75 years, MasTec, Inc. is a leading specialty contractor for communications companies, utilities and governments throughout the U.S. Revenues for MasTec were $1.62 billion in 2009.

The EPC contract for the Fulton biorefinery is for a fixed price of $296 million. This amount includes an approximately $100 million biomass power plant as part of the facility. According to BlueFire, the contract was negotiated in a manner to be appealing for non-recourse project bank financing and serves as a final key project contract agreement to move forward with both the DoE and USDA Loan Guarantee Programs.

Figure 17: Progress on BlueFire's Fulton biorefinery

All permits received	✓	State of Mississippi
Off-take agreement	✓	Tenaska BioFuels
Feedstock agreement	✓	Cooper Marine & Timberlands
EPC fixed-price contract	✓	Wanzek Construction (sub of MasTec)
Financing	Applied for loan guarantees	Both DOE & USDA

Source: Compiled from BlueFire filings

The financing for Fulton remains the final hurdle. On August 4, 2010, BlueFire submitted a loan guarantee request to the USDA for $250 million for the Fulton biorefinery . The application is under review to determine if it meets the requirements set forth in the Section 9003 Loan Guarantee program. No time line is available for response on the application.

On September 10, 2010, BlueFire submitted the phase two application under the DoE Loan Guarantee Program. This phase requires more detail on contracts and engineering as well as environmental and general program requirements. This application was submitted pursuant to a letter BlueFire received during the third quarter inviting the Company to submit a phase two application. A phase-two submittal is allowed only after the initial phase-one application is deemed to have met the initial threshold requirements for the loan guarantee program.

Once financing is secured, construction can commence as early as January 2011. The build-out is planned for 18 to 24 months, such that the facility ramps in the fourth quarter of 2012 and achieves full production in the first quarter of 2013.

The plant life is designed to be 20 years. Major equipment to be replaced includes the decrystalizer, with a swap of blades first from front to back, then replaced every 7 years. According to the company, each piece of equipment in the plant can be sourced from no less than 3 vendors, although some pieces of equipment are customized.

Competition

In its March 2010 publication of the updated RFS rules, the EPA published the following summary of some of the cellulosic biofuel companies with near-term commercialization plans in North America.

(We note that current initial production for BlueFire is estimated in early 2013 for the Fulton plant. Therefore, the 2013 figure shown for BlueFire should be higher than zero, while the 2014 figure should probably be closer to Fulton's 19 million gallons per year output.)

Figure 18: EPA Estimates of Potential Growth in Cellulosic Biofuel Capacity by Company and Year

Cellulosic Company	Biofuel(s)	Capacity Expansion Plans (MGY)					
		Today	Dec-10	Dec-11	Dec-12	Dec-13	2014+
Abengoa	Ethanol	0.02	0.02	0.02	16.02	16.02	16.02
AE Biofuels	Ethanol	0.15	0.15	15.15	20.15	20.15	20.15
BlueFire Ethanol	Ethanol	-	-	-	-	-	22.90
Cello Energy	Diesel	-	20.00	20.00	20.00	20.00	120.00
CMEC / SunOpta	Ethanol	-	-	-	-	-	10.00
Coskata	Ethanol	0.04	0.04	0.04	50.04	50.04	100.04
Dynamotive[a]	BioOil	9.00	9.00	9.00	9.00	9.00	9.00
Enerkem	Ethanol	-	1.30	11.30	21.30	21.30	41.30
Fiberight	Ethanol	-	2.00	6.50	6.50	6.50	6.50
Flambeau River Biofuels	Diesel	-	-	-	8.00	8.00	8.00
Fulcrum Bioenergy	Ethanol	-	-	-	10.50	10.50	10.50
Inbicon / Great River Energy	Ethanol	-	-	-	-	20.00	20.00
INEOS Bio / New Planet Energy	Ethanol	-	-	8.00	8.00	8.00	8.00
Iogen	Ethanol	0.50	0.50	0.50	23.50	23.50	23.50
KL Energy	Ethanol	1.50	1.50	1.50	1.50	1.50	6.50
Mascoma Corporation	Ethanol	0.20	0.20	0.20	2.20	20.20	80.20
New Page	Diesel	-	-	-	2.50	2.50	2.50
Ohio River Clean Fuels / Baard[b]	Diesel, Naphtha	-	-	-	-	-	17.00
Pacific Ethanol	Ethanol	-	-	-	-	-	2.70
POET Biorefining	Ethanol	0.02	0.02	25.02	25.02	25.02	25.02
Range Fuels	Methanol, Ethanol	-	4.00	4.00	30.00	30.00	100.00
Rentech[c]	Diesel	-	-	0.15	7.15	7.15	7.15
Vercipia (Verenium/BP JV)	Ethanol	1.40	1.40	1.40	37.40	37.40	37.40
Maximum Plant Capacity (MGY)		**12.83**	**40.13**	**102.78**	**298.78**	**336.78**	**694.38**

[a]Capacity has been estimated.
[b]Plant will co-process biomass and coal. It is unclear at this time how much fuel would come from biomass and potentially qualify as cellulosic biofuel.
[c]Includes Clearfuels demo plant and Silvagas commercial plant.

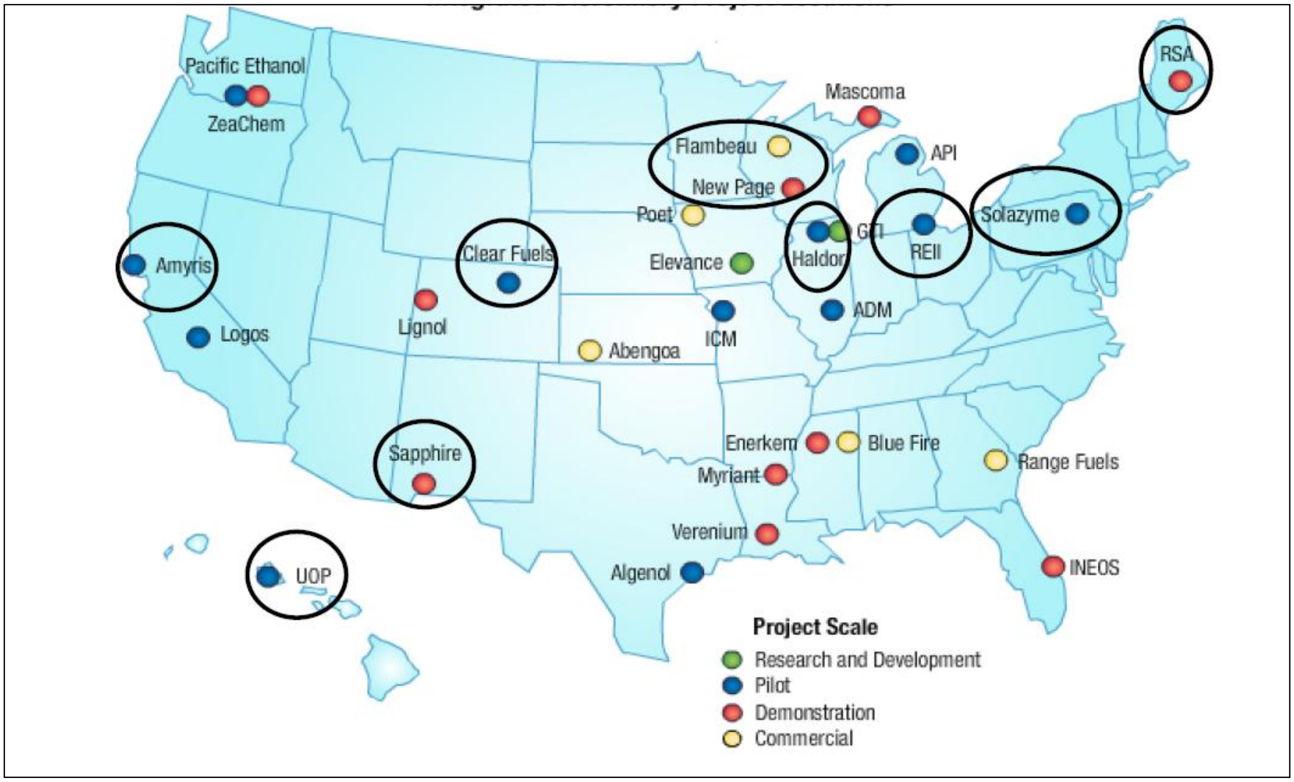
Source: EPA, Federal Register Vol. 75, No. 58, March 26, 2010

Certainly, there has been much discussion and lab work on cellulosic ethanol, but the reality is that little is produced today and none at commercial scale. We expect a number of companies will begin to build production facilities over the next two or three years, as the RFS requirements provide the initial mandate-and-incentives push. In addition, we expect to see a variety of approaches.

In August 2010, Poet LLC, the largest U.S. ethanol producer, reportedly "kicked off the collection of corn cobs, leaves and husks to store the biomass needed for its Project Liberty cellulosic ethanol plant in Emmetsburg, Iowa". The 25 million gallon per year plant, slated to begin production in early 2012, aims to convert corn harvest waste into ethanol, "providing farmers with about 10% of additional revenue per acre and producing cellulosic ethanol with a 111% reduction in greenhouse gas emissions versus gasoline". Poet claims to have reduced the cost of cellulosic ethanol to $2.35 per gallon from $4.13 per gallon, and intends to further reduce the cost to $2.00 per gallon by the time the plant starts operation. Poet intends to eventually roll out its Project Liberty corn waste cellulosic technology to other plants across the country and to modify the technology to work with wood chips and switchgrass.

Other companies are de-emphasizing cellulosic ethanol in favor of other products, likely to provide them necessary cash flow while the companies work to reduce production costs. An example appears to be Zeachem, which broke ground on a new 250,000 gallon per year plant in Oregon. Combining thermochemical and biological processes, Zeachem separates plant material into cellulose, hemicellulose, and lignin, then employs a microbe found in termite guts to convert cellulose and hemicellulose into acetic acid, the signature ingredient of vinegar, rather than alcohol. The lignin is cooked to extract hydrogen, which can be subsequently combined with the acetic acid to produce ethanol. Alternatively, the acetic acid can be used to produce other chemicals, such as food-grade ethyl acetate, which sells for higher value than ethanol. The markets for these specialty chemicals are smaller than the market for cellulosic ethanol, but the higher values achieved may provide the time and cash flow necessary for these companies to continue to work on lowering their production costs.

Figure 19: DoE Plot of Locations of Integrated Biorefinery Projects



Source: U.S. Department of Energy

How Does BlueFire Compare?

In a study published in June 2010[14], NREL published some cost comparison figures for a variety of processes in an "nth Plant Cost Analysis", detailing ethanol yield, byproduct credit, total project investment, total installed equipment cost, and estimated product value. (See following table.) Economic analysis was performed for an "nth plant" (mature technology) to obtain total investment and product value (PV), which is defined as value of the product needed for a net present value of zero with a 10% internal rate of return.

Of the initial 35 technologies reviewed, seven scenarios of process variations were selected: four variations involved pretreatment (dilute acid, two-stage dilute acid, hot water, and ammonia fiber explosion) and three variations involved downstream processes (pervaporation, separate 5-carbon and 6-carbon sugar fermentation, and on-site enzyme production). All seven scenarios are variations of the lignocellulosic ethanol process, selected by NREL "because it is well studied and portions of the process have been tested at pilot scales".

[14] Techno-Economic Analysis of Biochemical Scenarios for Production of Cellulosic Ethanol, NREL, June 2010.

Process designs were constrained to public data published in 2007 or earlier. Unfortunately, as a result, BlueFire's process was not included in the NREL study. We were able to get figures from BlueFire to provide some basis for comparison.

Figure 20: Product Value for Various Pretreatment and Downstream Process Variations

Process Variations	Total Capital Investment ($MM)	Total Installed Equipment Cost ($MM)	Ethanol Yield (Gal/MT)[a]	Ethanol Production (MM Gal/Yr)[b]	Electricity Export ($MM/Yr)	Product Value ($/Gal)[c]
Dilute Acid Pretreatment (base case)	376	164	76.3 (288.8)	53.4 (202.2)	11.7	3.40 (0.90)
Dilute Acid Pretreatment (high solids)	389	169	72.5 (274.5)	50.8 (192.1)	12.6	3.60 (0.95)
Two-Stage Dilute Acid Pretreatment	391	173	46.8 (177.5)	32.8 (124.2)	16.8	4.38 (1.16)
Hot Water Pretreatment	361	156	55.8 (211.0)	39.0 (147.7)	11.3	4.44 (1.21)
AFEX Pretreatment	386	167	65.9 (249.7)	46.2 (174.8)	16.9	3.69 (0.97)
Pervaporation-Distillation	501	209	76.9 (291.3)	53.9 (203.9)	13.6	3.75 (0.99)
Separate C5 and C6 Fermentation	386	168	79.3 (300)	55.5 (210.1)	6.5	3.67 (0.97)
On-site Enzyme Production	434	188	67.7 (256.3)	47.4 (179.4)	-0.8	3.54 (0.94)

Values in parentheses are in [a] liter/MT, [b] million liter/year, [c] $/liter.

Source: NREL

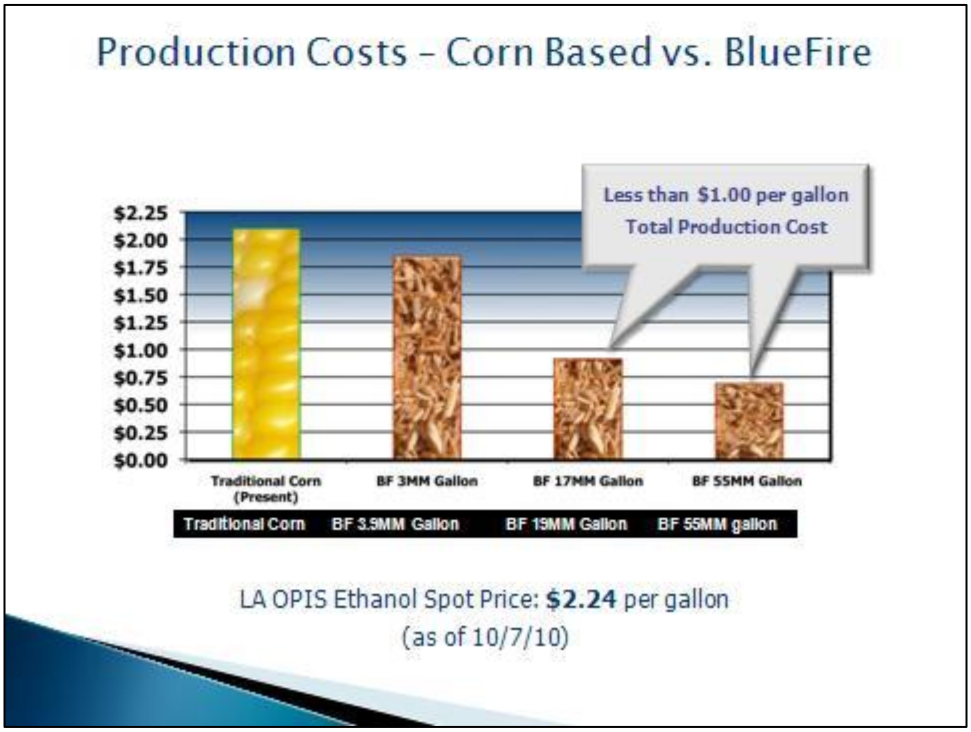
Comparable figures for BlueFire's process are as follows:

Arkenol Concentrated Acid Hydrolysis	400	155	88 (333)	55 (208)	3.5	1.2 (0.32)

Source: BlueFire

As the above figures illustrate, BlueFire compares very favorably in its product value costs. We note that the data for all the processes is speculative by nature and incorporates many assumptions to derive figures for an n^{th} plant. As noted by NREL, "The cellulosic ethanol process is a new technology, for which a pioneer plant is expected to be significantly more expensive than the n^{th} plant. To assess the impact of technology maturity on pioneer plant cost, a cost growth analysis was performed following a method documented in a RAND Corporation report. This methodology attempts to incorporate added expenses and start-up time for a new process. There is some subjectivity in choosing the parameters for the pioneer plant analysis, so a range of parameters was used to estimate pioneer plant costs for three scenarios: optimistic, most probable, and pessimistic. The PV obtained from cost-growth analysis is substantially larger for a pioneer plant, increasing from $3.40/gal (which is $5.15/gallon of gasoline equivalent or GGE), before including added expenses, to $5.01/gal ($7.59/GGE), $5.76/gal ($8.72/GGE), and $7.08/gal ($10.71/GGE) for the optimistic, most probable, and pessimistic scenarios, respectively."

Figure 21: Production Costs: BlueFire versus Corn Ethanol



Source: BlueFire Renewables

Management & Personnel

BlueFire is a small, development-stage company with only nine full-time employees. The company's management team has been very stable, with the main executives having been in place since the company's inception in March 2006.

Arnold R. Klann – Chairman, President and CEO - Mr. Klann is the co-founder and CEO of both BlueFire and Arkenol, Inc. (the patent holder behind the technology). Klann has been BlueFire's Chairman and CEO since BlueFire's inception in March 2006. Mr. Klann has been President of ARK Energy, Inc. and Arkenol, Inc. from January 1989 to present.

Mr. Klann's specialty is frontier technology development. He has over 35 years of experience in bringing new technologies to market. He has been active in technology development and commercialization, corporate management, and project finance.

Klann has been responsible for the successful development or acquisition of over 610 megawatts of natural gas-fired cogeneration facilities. In addition, he has been the driving force behind the research and development effort leading to the commercialization of the Arkenol technology. Prior to founding ARK Energy, he successfully launched three businesses and managed complex teams for project development and operation. Areas of technical expertise include cogeneration development using natural gas-fired and solid fuels technologies, ocean thermal energy conversion, and offshore oil exploration design and operations.

Mr. Klann's experience spans deep ocean mining with Global Marine Inc, weapons systems, power generation from the ocean, frontier and deep water oil exploration with the OffShore company, waste fuels power generation with GWF Power Systems and now, bio chemicals and fuels from waste. As Vice President of Engineering and Product Development for GWF Power Systems Company, Klann led technical commercialization, development and permitting activities for eight petroleum coke and coal-fired power plants. Mr. Klann has an AA from Lakeland College in Electrical Engineering.

John Cuzens - Chief Technology Officer and Senior Vice President - Mr. Cuzens is the Chief Technology Officer for both BlueFire Ethanol and Arkenol, Inc. Mr. Cuzens has been BlueFire's Chief Technology Officer and Senior Vice President since BlueFire's inception in March 2006. Mr. Cuzens was a Director from March 2006 until his resignation from the Board of Directors in July 2007.

He was with ARK Energy and Arkenol from 1991 to 1997 and is the co-inventor on seven of Arkenol's eight U.S. foundation patents for the conversion of cellulosic materials into fermentable sugar products using a modified strong acid hydrolysis process.

Cuzens' career includes the successful completion of tens of projects valued cumulatively at more than a billion dollars. He has more than twenty years of project management experience punctuated frequently with engineering or R&D management assignments. Mr. Cuzens has served a Director of Projects for Wahlco Inc. and Manager of Engineering and Project Management for Applied Utility Systems, both engineering and fabrication companies producing environmental mitigation systems. He also served as Director of engineering and manufacturing for Hydrogen Burner Technology, a leader in partial oxidation production of hydrogen for process and fuel cell technologies. He was the lead Project Manager for Ultrasystems Engineers and Constructors in the process and biochemical division leading multimillion dollar R&D pilot plant construction projects for Fischer Tropsch and landfill gas benefaction facilities as well as project liaison for ethanol from grain and cheese whey facilities. His experience spans the power production, petrochemical, biotech and fuel cell industries. Mr. Cuzens has a B.S. Chemical Engineering degree from the University of California at Berkeley. He is a State of California Registered Professional Mechanical Engineer, 1980, License No. 20891 and State of California Contractors "A" License Responsible Managing Employee for ARK Energy, Inc. No.A700016.

Necitas Sumait – Senior Vice President and Director - Mrs. Sumait has been a Director and Senior Vice President since the company's inception in March 2006. Prior to this, Mrs. Sumait was Vice President of ARK Energy/Arkenol from December 1992 to July 2006. Mrs. Sumait has a MBA in Technological Management from Illinois Institute of Technology and a B.S. in Biology from De Paul University.

Christopher Scott - Chief Financial Officer - Mr. Scott has been CFO since March 2007. Prior to this, from 2002 to March 2007, Mr. Scott was most recently the CFO/CCO and FinOp of Westcap Securities, Inc, an NASD Member broker/dealer and investment bank headquartered in Irvine, CA. Mr. Scott currently holds the Series 7, 63, 24, and Series 27 NASD licenses. From 1997 to 2002, Mr.

Scott was a General Securities and Registered Options Principal at First Allied Securities Inc. Mr. Scott earned his Bachelor's Degree in Business Administration, with a concentration in Finance, from CSU, Fullerton.

Chris Nichols – Director (Chairman, Compensation Committee) - Mr. Nichols has been a Director since the company's inception in March 2006. Mr. Nichols is currently the Chairman of the Board and Chief Executive Officer of Advanced Growing Systems, Inc. Since 2003 Mr. Nichols was the Senior Vice President of Westcap Securities' Private Client Group. Prior to this, Mr. Nichols was a Registered Representative at Fisher Investments from December 2002 to October 2003. He was a Registered Representative with Interfirst Capital Corporation from 1997 to 2002. Mr. Nichols is a graduate of California State University in Fullerton with a B.A. degree in Marketing.

Victor Doolan – Director (Chairman, Audit Committee) - Mr. Doolan served for approximately three years as president of Volvo Cars North America until his retirement in March 2005. Prior to joining Volvo, Mr. Doolan served as the Executive Director of the Premier Automotive Group, the luxury division of Ford Motor Company from July 1999 to June 2002. Mr. Doolan also enjoyed a 23-year career with BMW, culminating with his service as President of BMW of North America from September 1993 to July 1999. Mr. Doolan has worked in the automotive industry for approximately 36 years. Mr. Doolan currently serves on the Board of Directors for Sonic Automotive, Inc.

William Davis - VP Project Management – Prior to Mr. Davis' work at BlueFire, he was Director of Power Plant Project Development for Diamond Energy from 2001 to 2006. Prior to this he was VP of Business Development for Oxbow Power. He has over 30 years in the energy business and was an energy advisor to the Governor of California. He has been involved in domestic and international power project development. Mr. Davis is a registered Architect in three states and graduated from California State University at San Luis Obispo with a Bachelors of Architecture and a Masters of Science in Architecture.

Richard Klann – Director of Business Development & Marketing - Richard Klann joined the BlueFire team initially as the Investor Relations contact in February 2008 and now heads up Business Development & Marketing. He has over 7 years of experience in banking and finance. Before joining BlueFire, Mr. Klann was a banker and client manager at Ironstone Bank, a commercial bank located in Newport Beach, CA, specializing in lending and corporate finance. Prior to that, he was a client manager and lending specialist at Bank of America. Mr. Klann also handles marketing and merchandising as well as drives a Pro Stock drag race car for Motown Missile Racing, a team which spans 40 years of racing. Mr. Klann earned his Bachelors Degree in Economics, with a minor in Political Science, from Cal State Fullerton.

Executive Compensation

As presented in the following table, the executive compensation packages appear fairly moderate for a company based in Southern California and operating in clean technology. We do not view any of the executive compensation packages as excessive.

Figure 22: Compensation Table (in U.S. dollars)

Name	Position	Year	Salary	Bonus	Stock Awards[1]	Options Awards	All Other	Total
Arnold Klann	Chairman, CEO & President	2009	226,000	-	5,250	-	-	231,250
		2008	226,000	-	24,600	-	-	250,600
Necitas Sumait	Director, Secretary & SVP	2009	180,000	-	5,250	-	-	185,250
		2008	176,500	-	24,600	-	-	201,100
John Cuzens	Treasurer & SVP	2009	180,000	-	-	-	-	180,000
		2008	175,250	-	-	-	-	175,250
Christopher Scott	CFO	2009	155,833	-	-	-	-	155,833
		2008	163,750	-	-	-	-	163,750
Chris Nichols	Director	2009	5,000	-	5,250	-	-	10,250
		2008	5,000	-	24,600	-	-	29,600
Joseph Emas	Director	2009	5,000	-	5,250	-	-	10,250

		2008	5,000	-	24,600	-	-	29,600
Victor Doolan	Director	2009	5,000	-	5,250	-	-	10,250
		2008	5,000	-	24,600	-	-	29,600

[1]Stock awards reflect value of shares of restricted common stock received as compensation as Director. Value based on Black-Sholes valuation model at date of grant.

Source: BlueFire 2009 10K filing

Financial Analysis

Management has funded operations primarily through:

- proceeds received in connection with the reverse merger in June 2006, with the concurrent equity round raising $1 million;
- loans from its majority shareholder;
- the issuance of convertible notes with warrants in July and in August 2007;
- issuance of 689,655 shares of common stock in August 2007;
- the private placement of 5,740,741 shares of common stock in December 2007 for net proceeds of approximately $14,500,000; and
- Department of Energy reimbursements commencing in 2008 and extending through present.

Management estimates the total cost of the bio-refineries, including contingencies to be in the range of approximately $300 million to $310 million for the DoE plant in Fulton, Mississippi, and approximately $100 million to $120 million for the Lancaster, California plant.

As the process to develop its refineries has been longer than anticipated, BlueFire has seen its cash resources decline steadily. According to a note in its most recent 10-Q, BlueFire had less than $100 thousand in cash available as of November 15. This is a concern and we note it as such.

Discussions with BlueFire management reveal the possibility of a fairly quick $5 million cash infusion from the DoE funds upon the securing of debt financing. To our understanding, the cash infusion would result from the following:

1. securing of a loan guarantee from either the DoE or the USDA;
2. the subsequent securing of debt financing for the Fulton biorefinery;
3. the recognition of funds invested in Fulton’s development as project assets; and
4. a draw from the DoE grant for the 40% cost share against these project assets.

According to BlueFire management, this would result in a $5 million cash infusion into BlueFire, without the need for an equity raise at the current depressed valuation.

With the current minimal staff – BlueFire has only nine full-time employees, according to a recent note – these funds should be sufficient for corporate operations for some time. In its most recent 10-Q, BlueFire noted that general and administrative expenses should total $1.8 million over the 12-month period of fourth quarter 2010 through third quarter 2011. This is before any potential cost saving measures such as salary deferrals and the like.

As for revenues, BlueFire should begin to recognize revenues from sugar sales to Solazyme in early 2011. Solazyme is a California-based (Bay Area) biofuels producer that uses a heterotrophic pathway (fermentation) utilizing algae to produce oil. Its principal feedstock is sugar, which is used to feed the algae. Solazyme has contracted with BlueFire for approximately $1.5 million of sugars, to be delivered over the course of approximately nine months in 2011. These sugar sales are the bulk of the revenues in our BlueFire forecast for 2011.

While the sugar sales will be very important in establishing a potential revenue stream for BlueFire, we do not expect the sugar sales to contribute very much initially to profits. Our model assumes a 10% gross margin on the initial sugar sales to Solazyme.

Barring additional contracts for sugars, BlueFire will begin to recognize a meaningful level of revenues once production begins at Fulton. This is envisioned for the beginning of 2013; construction of Fulton is anticipated to begin in the first months of 2011 and last for 18 months. The final months of 2012 are envisioned as startup and ramp time.

On current specs, the Fulton biorefinery should result in revenues of $57 million per year:

Annual revenues of $57 million = 19 million gallons per year at $3 per gallon

According to BlueFire management, production costs are envisioned to be roughly $1 per gallon, not including financing costs.

Model

BlueFire Renewables, Inc.

New Earth Capital Group LLC

George Santana, CFA

Fiscal period	FY '08(A)	Q1 '09(A)	Q2 '09(A)	Q3 '09(A)	Q4 '09(A)	FY '09(A)	Q1 '10(A)	Q2 '10(A)	Q3 '10(A)	Q4 '10(E)	FY '10(E)	Q1 '11(E)	Q2 '11(E)	Q3 '11(E)	Q4 '11(E)	FY '11(E)
Period ends	Dec '08	Mar '09	Jun '09	Sept '09	Dec '09	Dec '09	Mar '10	Jun '10	Sept '10	Dec '10	Dec '10	Mar '11	Jun '11	Sept '11	Dec '11	Dec '11
Income Statement (U.S.$000s except EPS)																
Revenues:																
Consulting fees	-	15	-	-	5	20	13	34	-	-	47	-	-	-	-	-
DOE grant	1,076	44	68	3,980	207	4,299	275	141	75	100	591	250	250	250	250	1,000
DOE - unbilled grant revenue	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-
Sugar sales	-	-	-	-	-	-	-	-	-	-	-	600	600	300	-	1,500
Total Revenues	**1,076**	**58**	**68**	**3,980**	**212**	**4,318**	**288**	**177**	**75**	**100**	**639**	**850**	**850**	**550**	**250**	**2,500**
COGS	-	-	-	-	-	-	-	-	-	-	-	540	540	270	-	1,350
Total cost of goods sold	-	-	-	-	-	-	-	-	-	-	-	540	540	270	-	1,350
Gross Profit	**1,076**	**58**	**68**	**3,980**	**212**	**4,318**	**288**	**177**	**75**	**100**	**639**	**310**	**310**	**280**	**250**	**1,150**
Project development	10,535	310	333	304	360	1,307	483	233	241	-	957	-	-	-	-	-
General and administrative	4,136	577	520	702	421	2,220	414	328	543	451	1,736	415	398	418	439	1,670
Related party license fee	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total operating costs and expenses	15,672	887	854	1,006	781	3,527	896	561	784	451	2,693	415	398	418	439	1,670
Operating Income (Loss)	**(14,596)**	**(829)**	**(786)**	**2,974**	**(568)**	**791**	**(608)**	**(384)**	**(710)**	**(351)**	**(2,053)**	**(105)**	**(88)**	**(138)**	**(189)**	**(520)**
Gain (loss) change fair value of warrant liability	-	197	(3,109)	1,096	2,384	567	1,888	309	(847)	-	1,349	-	-	-	-	-
Financing related charge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amortization of debt discount	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest expense	-	-	-	-	-	-	-	-	-	-	-	-	(30)	(30)	(30)	(90)
Interest income	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Related party interest expense	-	-	-	(0)	(0)	(1)	-	-	-	-	-	-	-	-	-	-
Loss on extinguishment of debt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loss on the retirements of warrants	-	-	-	-	(147)	(147)	-	-	-	-	-	-	-	-	-	-
Other income (expense), net	225	6	2	0	1	8	0	0	1	-	1	-	-	-	-	-
Income (loss) before tax and minority interest	**(14,371)**	**(626)**	**(3,894)**	**4,070**	**1,669**	**1,219**	**1,280**	**(75)**	**(1,556)**	**(351)**	**(703)**	**(105)**	**(118)**	**(168)**	**(219)**	**(610)**
Provision (benefit) for income taxes	0	0	0	0	83	83	0	0	0	0	0	0	0	0	0	0
Income (loss) before minority interest	**(14,371)**	**(626)**	**(3,894)**	**4,070**	**1,586**	**1,136**	**1,280**	**(75)**	**(1,556)**	**(351)**	**(703)**	**(105)**	**(118)**	**(168)**	**(219)**	**(610)**
Minority interest	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Income (Loss)	**(14,371)**	**(626)**	**(3,894)**	**4,070**	**1,586**	**1,136**	**1,280**	**(75)**	**(1,556)**	**(351)**	**(703)**	**(105)**	**(118)**	**(168)**	**(219)**	**(610)**
GAAP EPS	**(0.51)**	**(0.02)**	**(0.14)**	**0.14**	**0.06**	**0.04**	**0.05**	**(0.00)**	**(0.05)**	**(0.01)**	**(0.02)**	**(0.00)**	**(0.00)**	**(0.01)**	**(0.01)**	**(0.02)**
Basic shares outstanding	28,065	28,101	28,105	28,143	28,290	28,160	28,265	28,363	28,508	28,622	28,439	28,736	28,851	28,967	29,083	28,909
Diluted shares outstanding	28,065	28,101	28,105	28,143	28,290	28,160	28,265	28,363	28,508	28,622	28,439	28,736	28,851	28,967	29,083	28,909
EBITDA	(14,576)	(823)	(780)	2,980	(562)	814	(602)	(378)	(703)	(344)	(2,027)	(97)	(80)	(130)	(180)	(488)

Growth Y/Y	Dec '08	Mar '09	Jun '09	Sept '09	Dec '09	Dec '09	Mar '10	Jun '10	Sept '10	Dec '10	Dec '10	Mar '11	Jun '11	Sept '11	Dec '11	Dec '11
Revenues						301.5%	395.2%	160.6%	-98.1%	-52.9%	-85.2%	195.1%	381.6%	635.4%	150.0%	291.0%
Gross Profit						301.5%	395.2%	160.6%	-98.1%	-52.9%	-85.2%	7.6%	75.6%	274.4%	150.0%	79.9%
General & admin expenses						-46.3%	-28.3%	-37.0%	-22.6%	7.2%	-21.8%	0.3%	21.5%	-23.0%	-2.6%	-3.8%
Total operating costs and expenses						-77.5%	1.1%	-34.3%	-22.0%	-42.2%	-23.7%	-53.7%	-29.0%	-46.7%	-2.6%	-38.0%
Operating Income						-105.4%	-26.6%	-51.1%	-123.9%	-38.2%	-359.6%	-82.8%	-77.0%	-80.5%	-46.1%	-74.7%
Net Income						-107.9%	-304.4%	-98.1%	-138.2%	-122.1%	-161.9%	-108.2%	56.8%	-89.2%	-37.6%	-13.2%
GAAP EPS						-107.9%	-303.2%	-98.1%	-137.8%	-121.9%	-160.1%	-108.1%	54.2%	-89.4%	-38.6%	-13.0%
EBITDA						-105.6%	-26.8%	-51.5%	-123.6%	-38.8%	-349.0%	-83.8%	-78.7%	-81.5%	-47.5%	-75.9%
Growth Q/Q (sequential)	**Dec '08**	**Mar '09**	**Jun '09**	**Sept '09**	**Dec '09**	**Dec '09**	**Mar '10**	**Jun '10**	**Sept '10**	**Dec '10**	**Dec '10**	**Mar '11**	**Jun '11**	**Sept '11**	**Dec '11**	**Dec '11**
Revenues			16.4%	5776.7%	-94.7%		35.6%	-38.7%	-57.6%	33.7%		750.0%	0.0%	-35.3%	-54.5%	
Gross Profit			16.4%	5776.7%	-94.7%		35.6%	-38.7%	-57.6%	33.7%		210.0%	0.0%	-9.7%	-10.7%	
General & admin expenses			-9.8%	34.9%	-40.1%		-1.6%	-20.7%	65.7%	-17.0%		-8.0%	-4.0%	5.0%	5.0%	
Total operating costs and expenses			-3.7%	17.8%	-22.4%		14.8%	-37.4%	39.8%	-42.5%		-8.0%	-4.0%	5.0%	5.0%	
Operating Income			-5.1%	-478.3%	-119.1%		7.1%	-36.8%	84.6%	-50.5%		-70.1%	-15.8%	56.5%	36.8%	
Net Income			522.0%	-204.5%	-61.0%		-19.3%	-105.9%	1963.6%	-77.5%		-70.1%	12.8%	42.2%	30.3%	
GAAP EPS			521.9%	-204.4%	-61.2%		-19.3%	-105.9%	1953.1%	-77.5%		-70.2%	12.3%	41.6%	29.8%	
EBITDA			-5.2%	-481.9%	-118.9%		7.1%	-37.2%	86.0%	-51.1%		-71.7%	-17.4%	61.6%	38.9%	
Margins	**Dec '08**	**Mar '09**	**Jun '09**	**Sept '09**	**Dec '09**	**Dec '09**	**Mar '10**	**Jun '10**	**Sept '10**	**Dec '10**	**Dec '10**	**Mar '11**	**Jun '11**	**Sept '11**	**Dec '11**	**Dec '11**
Gross margin	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	36.5%	36.5%	50.9%	100.0%	46.0%
General & admin expenses	384.6%	992.0%	768.4%	17.6%	198.0%	51.4%	143.6%	185.8%	726.5%	450.9%	271.5%	48.8%	46.9%	76.0%	175.6%	66.8%
Total operating costs and expenses	1457.1%	1524.8%	1260.8%	25.3%	367.5%	81.7%	311.2%	317.8%	1048.9%	450.9%	421.2%	48.8%	46.9%	76.0%	175.6%	66.8%
Operating margin	-1357.1%	-1424.8%	-1160.8%	74.7%	-267.5%	18.3%	-211.2%	-217.8%	-948.9%	-350.9%	-321.2%	-12.3%	-10.4%	-25.1%	-75.6%	-20.8%
EBITDA margin	-1355.2%	-1414.8%	-1152.2%	74.9%	-264.7%	18.9%	-209.0%	-214.2%	-940.2%	-343.8%	-317.1%	-11.5%	-9.5%	-23.6%	-72.2%	-19.5%
Net margin	-1336.2%	-1076.3%	-5749.9%	102.3%	746.9%	26.3%	444.3%	-42.7%	-2081.0%	-350.9%	-109.9%	-12.3%	-13.9%	-30.6%	-87.6%	-24.4%
Revenues	**Dec '08**	**Mar '09**	**Jun '09**	**Sept '09**	**Dec '09**	**Dec '09**	**Mar '10**	**Jun '10**	**Sept '10**	**Dec '10**	**Dec '10**	**Mar '11**	**Jun '11**	**Sept '11**	**Dec '11**	**Dec '11**
Sugar sales												600	600	300		
Costs of production	**Dec '08**	**Mar '09**	**Jun '09**	**Sept '09**	**Dec '09**	**Dec '09**	**Mar '10**	**Jun '10**	**Sept '10**	**Dec '10**	**Dec '10**	**Mar '11**	**Jun '11**	**Sept '11**	**Dec '11**	**Dec '11**
Gross margin - sugar sales												10.0%	10.0%	10.0%	10.0%	
Operating expenses & other items	**Dec '08**	**Mar '09**	**Jun '09**	**Sept '09**	**Dec '09**	**Dec '09**	**Mar '10**	**Jun '10**	**Sept '10**	**Dec '10**	**Dec '10**	**Mar '11**	**Jun '11**	**Sept '11**	**Dec '11**	**Dec '11**
General & admin expenses, Q/Q growth			-9.8%	34.9%	-40.1%		-1.6%	-20.7%	65.7%	-17.0%		-8.0%	-4.0%	5.0%	5.0%	
Interest rate on cash		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	
Interest rate on debt		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	12.0%		12.0%	12.0%	12.0%	12.0%	
Tax Rate	0.0%	0.0%	0.0%	0.0%	5.0%	6.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DSOs	0	23	0	0	0	0	4	16	0	0	0	0	0	0	0	0
Days of inventory	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Days payables outstanding	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	NMF	270
Total Capex	(55)	0	0	0	(5)	(5)	(1)	(10)	(623)	(50)	(684)	(50)	(50)	(50)	(50)	(200)
Net Increase (decrease) in cash	(10,032)	(1,423)	(879)	(594)	2,742	(155)	(834)	(356)	(1,137)	(427)	(2,754)	860	(153)	(203)	(253)	251
Cash & investments	3,000	1,576	697	103	2,845	2,845	2,010	1,654	518	91	91	951	798	595	342	342
Selected Cash Flow Items	**Dec '08**	**Mar '09**	**Jun '09**	**Sept '09**	**Dec '09**	**Dec '09**	**Mar '10**	**Jun '10**	**Sept '10**	**Dec '10**	**Dec '10**	**Mar '11**	**Jun '11**	**Sept '11**	**Dec '11**	**Dec '11**
EBIT (GAAP)	**(14,596)**	**(829)**	**(786)**	**2,974**	**(568)**	**791**	**(608)**	**(384)**	**(710)**	**(351)**	**(2,053)**	**(105)**	**(88)**	**(138)**	**(189)**	**(520)**
Depreciation and amortization	20	6	6	6	6	23	6	6	6	7	26	7	8	8	9	32
EBITDA Unadj.	**(14,576)**	**(823)**	**(780)**	**2,980**	**(562)**	**814**	**(602)**	**(378)**	**(703)**	**(344)**	**(2,027)**	**(97)**	**(80)**	**(130)**	**(180)**	**(488)**
Add back one-time items	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EBITDA Adj.	(14,576)	(823)	(780)	2,980	(562)	814	(602)	(378)	(703)	(344)	(2,027)	(97)	(80)	(130)	(180)	(488)
Add back stock-based compensation	3,956	-	17	205	11	232	14	20	7	7	48	7	7	7	7	29
Non-Cash Interest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EBITDAS	**(10,620)**	**(823)**	**(763)**	**3,184**	**(551)**	**1,047**	**(589)**	**(358)**	**(696)**	**(337)**	**(1,980)**	**(90)**	**(73)**	**(123)**	**(173)**	**(459)**
Net Income	(14,371)	(626)	(3,894)	4,070	1,586	1,136	1,280	(75)	(1,556)	(351)	(703)	(105)	(118)	(168)	(219)	(610)
Change in Working Capital	519	(606)	(118)	(3,953)	3,926	(751)	(220)	26	491	(40)	257	-	-	-	-	-
Depreciation & amortization	20	6	6	6	6	23	6	6	6	7	26	7	8	8	9	32
Stock-based compensation expense	3,956	-	17	205	11	232	14	20	7	7	48	7	7	7	7	29
Capital expenditures	(55)	-	-	-	(5)	(5)	(1)	(10)	(623)	(50)	(684)	(50)	(50)	(50)	(50)	(200)
FCF *(pro forma net income + D&A - capitalized costs)*	(9,931)	(1,226)	(3,989)	327	5,524	636	1,078	(33)	(1,675)	(427)	(1,056)	(140)	(153)	(203)	(253)	(749)

Balance Sheet	Dec '08	Mar '09	Jun '09	Sept '09	Dec '09	Dec '09	Mar '10	Jun '10	Sept '10	Dec '10	Dec '10	Mar '11	Jun '11	Sept '11	Dec '11	Dec '11
Cash	3,000	1,576	697	103	2,845	2,845	2,010	1,654	518	91	91	951	798	595	342	342
DOE grant receivable	692	44	68	3,980	207	207	275	445	410	410	410	410	410	410	410	410
Accounts receivable	-	15	-	-	-	-	13	32	-	-	-	-	-	-	-	-
Inventory	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Advances to suppliers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Due from related party	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prepaid VAT on purchases	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prepaid expenses	90	71	87	89	51	51	55	68	39	39	39	39	39	39	39	39
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total current assets	**3,781**	**1,706**	**852**	**4,172**	**3,103**	**3,103**	**2,353**	**2,199**	**966**	**540**	**540**	**1,400**	**1,246**	**1,044**	**790**	**790**
Property and equipment - gross	*207*	*207*	*207*	*207*	*212*	*212*	*213*	*561*	*946*	*996*	*996*	*1,046*	*1,096*	*1,146*	*1,196*	*1,196*
Accumulated depreciation	*(21)*	*(27)*	*(32)*	*(38)*	*(44)*	*(44)*	*(50)*	*(56)*	*(63)*	*(70)*	*(70)*	*(77)*	*(85)*	*(93)*	*(102)*	*(102)*
Property and equipment - net	186	180	175	169	168	168	163	504	883	926	926	968	1,010	1,052	1,093	1,093
Intangible assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Advances to suppliers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Investment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred tax asset	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Debt issuance costs	-	-	-	-	150	150	175	189	498	498	498	498	498	498	498	498
Total assets	**3,968**	**1,886**	**1,026**	**4,340**	**3,421**	**3,421**	**2,691**	**2,893**	**2,347**	**1,964**	**1,964**	**2,866**	**2,755**	**2,594**	**2,382**	**2,382**
Loans payable	-	-	-	-	-	-	-	-	-	-	-	1,000	1,000	1,000	1,000	1,000
Accounts payable	712	424	337	314	336	336	270	901	1,040	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Accrued liabilities	174	173	168	151	245	245	175	111	128	128	128	128	128	128	128	128
License fee payable to related party	970	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Advances from customers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Income taxes payable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	175	-	-	-	-	-	-	-	-	-	-	-	-
Total current liabilities	**1,856**	**597**	**504**	**640**	**581**	**581**	**445**	**1,012**	**1,168**	**1,128**	**1,128**	**2,128**	**2,128**	**2,128**	**2,128**	**2,128**
Outstanding warrant liability	-	2,718	5,828	4,732	2,274	2,274	387	78	925	925	925	925	925	925	925	925
Long term borrowings	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accrued warranty costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total liabilities	**1,856**	**3,315**	**6,332**	**5,372**	**2,855**	**2,855**	**832**	**1,090**	**2,093**	**2,053**	**2,053**	**3,053**	**3,053**	**3,053**	**3,053**	**3,053**
Preferred stock	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stockholders' equity	2,112	(1,429)	(5,306)	(1,031)	566	566	1,859	1,803	254	(90)	(90)	(187)	(298)	(459)	(671)	(671)
Total liabilities and stockholders' equity	**3,968**	**1,886**	**1,026**	**4,340**	**3,421**	**3,421**	**2,691**	**2,893**	**2,347**	**1,964**	**1,964**	**2,866**	**2,755**	**2,594**	**2,382**	**2,382**

Cash flow statement - quarterly	Dec '08	Mar '09	Jun '09	Sept '09	Dec '09	Dec '09	Mar '10	Jun '10	Sept '10	Dec '10	Dec '10	Mar '11	Jun '11	Sept '11	Dec '11	Dec '11
Net income (loss)	(14,371)	(626)	(3,894)	4,070	1,586	1,136	1,280	(75)	(1,556)	(351)	(703)	(105)	(118)	(168)	(219)	(610)
Depreciation & amortization	20	6	6	6	6	23	6	6	6	7	26	7	8	8	9	32
Stock-based compensation expense	3,956	-	17	205	11	232	14	20	7	7	48	7	7	7	7	29
Allowance for doubtful accounts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Equity in affiliates	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Impairment charges	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Change in value of warrant liability	-	(197)	3,109	(1,096)	(2,237)	(421)	(1,888)	(309)	847	-	(1,349)	-	-	-	-	-
Changes in working capital	***519***	***(606)***	***(118)***	***(3,953)***	***3,926***	***(751)***	***(220)***	***26***	***491***	***(40)***	***257***	-	-	-	-	-
DOE receivables	(692)	648	(24)	(3,912)	3,773	485	(68)	18	109	-	59	-	-	-	-	-
Accounts receivable	49	(15)	15	-	-	-	(13)	(19)	32	-	-	-	-	-	-	-
Inventory	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Advances to suppliers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amount due from related parties	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prepaid expenses and other assets	(73)	19	(16)	(2)	38	39	(4)	(29)	44	-	12	-	-	-	-	-
Accounts payable, accrued & other liabilities	235	(1,259)	878	(39)	116	(305)	(136)	56	306	(40)	186	-	-	-	-	-
Advance from customers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	970	-	(970)	-	-	(970)	-	-	-	-	-	-	-	-	-	-
Net cash provided by (used in) operating activities	**(9,875)**	**(1,423)**	**(879)**	**(769)**	**3,292**	**220**	**(809)**	**(332)**	**(205)**	**(377)**	**(1,722)**	**(90)**	**(103)**	**(153)**	**(203)**	**(549)**
Acquisition of PP&E	(55)	-	-	-	(5)	(5)	(1)	(10)	(623)	(50)	(684)	(50)	(50)	(50)	(50)	(200)
Restricted cash & investments decrease	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net cash provided by (used in) investing activities	**(55)**	**-**	**-**	**-**	**(5)**	**(5)**	**(1)**	**(10)**	**(623)**	**(50)**	**(684)**	**(50)**	**(50)**	**(50)**	**(50)**	**(200)**
Proceeds (payment) from debt	-	-	-	-	-	-	-	-	-	-	-	1,000	-	-	-	1,000
Sale of common stock, net of issuance costs	(102)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from stock options and warrants exercised	-	-	-	-	(220)	(220)	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	175	(325)	(150)	(25)	(14)	(309)	-	(348)	-	-	-	-	-
Net cash provided by (used in) financing activities	**(102)**	**-**	**-**	**175**	**(545)**	**(370)**	**(25)**	**(14)**	**(309)**	**-**	**(348)**	**1,000**	**-**	**-**	**-**	**1,000**
Effect of exchange rate changes on cash and cash eq	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net increase (decrease) in cash	**(10,032)**	**(1,423)**	**(879)**	**(594)**	**2,742**	**(155)**	**(834)**	**(356)**	**(1,137)**	**(427)**	**(2,754)**	**860**	**(153)**	**(203)**	**(253)**	**251**
Cash at beginning of period	13,032	3,000	1,576	697	103	3,000	2,845	2,010	1,654	518	2,845	91	951	798	595	91
Cash at end of period	3,000	1,576	697	103	2,845	2,845	2,010	1,654	518	91	91	951	798	595	342	342

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Risks & Considerations

- Cellulosic ethanol production is a new industry. Cellulosic ethanol producers have yet to prove cost effective production at scale. As of Nov. 2009, there were no ethanol plants in the U.S. distilling ethanol using the non-edible parts of plants such as corn stalks, grasses or wood chips.
- The construction of BlueFire's biorefineries will require significant project financing. BlueFire estimates the total cost of the bio-refineries, including contingencies, to be in the range of approximately $300 million to $310 million for the plant in Fulton, Mississippi and approximately $100 million to $120 million for the plant in Lancaster, California.

- The market for financing new ethanol plants is difficult and even more so for new technologies such as cellulosic ethanol. In this case, the good news is that BlueFire appears to have assembled the many items required to finance its first biorefinery: the permits, DoE grants, EPC contract, feedstock agreement, and off-take agreement. This was a process that took years and is potentially a tremendous competitive advantage..

- The profitability of BlueFire's projects under development may depend on the market price of ethanol at the time of production.

- The DoE's Renewable Energy Loan Guarantee Program (as established by the 2005 energy bill) has been defined by inaction and obstruction and is largely seen as a complete failure to date in terms of bringing next generation biofuel technologies to the marketplace.

- BlueFire will need to raise additional capital to fund its operations over the next several months. As of September 30, 2010, BlueFire had cash and cash equivalents of approximately $518,000. However, as of November 15, 2010, cash had declined to approximately $98,000. (source: BlueFire 3Q 2010 10-Q)

New Earth Capital Group LLC Rating System

Speculative Buy: This rating is reserved for companies we believe have tremendous potential, but whose stocks are illiquid or whose equity market capitalizations are very small, often in the definition of a nano cap (below $50 million in market cap). In general, for stocks ranked in this category, we expect the stock to provide a total return of 50% or more within a 12-month period. However, because of the illiquid nature of the stock's trading and/or the nano cap nature of the investment, we caution that these investments may not be suitable for all parties.

Strong Buy: We expect the stock to provide a total return of 30% or more within a 12-month period.

Buy: We expect the stock to provide a total return of between 10% and 30% within a 12-month period.

Neutral: We expect the stock to provide a total return of between minus 10% and plus 10% within a 12-month period.

Sell: We expect the stock to provide a total return of minus 10% or worse within a 12-month period.

Total return is defined as price appreciation plus dividend yield.

Other Important Disclosures

Our analysts use various valuation methodologies including discounted cash flow, price/earnings (P/E), enterprise value/EBITDA, and P/E to growth rate, among others. Risks to our price targets include failure to achieve financial results, product risk, regulatory risk, general market conditions, and the risk of a change in economic conditions.

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