

Making a greener community: Potentials of possible Alton biogas plant discussed

by Cory Davenport, Contributing Writer
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ALTON - Alton's current wastewater treatment plant is among the worst engineers have ever seen, Alton Mayor Brant Walker said Thursday afternoon.

Wastewater treatment plant manager Steve Gibson said the plant's needed upgrades may cost as much as \$12-\$14 million, and they must be done as soon as possible before a catastrophic failure can occur. Such a failure could cost the city even more money due to environmental impacts and the transportation of solid wastes, which usually decompose in the plant's digester.

Since the plant needs a nearly-complete overhaul anyway, Gibson and Walker were looking toward creating a resource recovery center, which would convert solid wastes and wastewater into revenue for the City of Alton through using renewable energy credits in both the federal market and in the State of California, as well as fertilizers and advanced biofuels.

To explain more of the costs, benefits and functions of both the possible plant and the credit trading network, two representatives of Iowa-based Ecoengineers came to Alton to make a presentation. Ecoengineers Regulatory Consultant John Sens and Senior Engineer Brad Pleima educated a group of Alton alderpersons, department heads and members of the media regarding several functions of the possible plant and its products.

Initially, the cost to build the plant may be as much as \$33.5 million. That exact price will not be known until the city enters phase two of the product and begins securing "feedstock sources," which will contribute biosolids to the plant. If enough of them are

found, construction may begin on a modular complex, which may cost as much as \$33.5 million.

That money may be generated through both loans and private-public partnerships. Pleima said such loans on a state level may be extremely accessible at low interest rates.

"This is exactly the kind of stuff states want to see happen," he said. "It is something making marketable products out of what would otherwise have been waste."

Once it has been built, Pleima and Sens estimated the plant could generate as much as \$7.16 million a year in profits. They suggested utilizing that profit to pay the debt incurred at construction, however, because the majority of that impressive revenue will be generated by Renewable Identification Numbers (RINs), which are the currency of the Renewable Fuel Standard (RFS), which is the federal program with the goal of having 36 billion gallons of renewable fuel transportation by 2022.

What is the RFS and what are RINs?

The goal of the RFS program, which is regulated through the federal Environmental Protection Agency (EPA), is to replace a portion of fossil fuels currently used in transportation in the U.S. with biofuels. This will reduce U.S. dependence on foreign oil sources and incentivize the development of advanced biofuels, which have a greenhouse gas reduction of at least 50 percent. The ultimate goal is to have 36 billion gallons of renewable fuel by 2022.

A RIN is proof biofuels were used in transportation. Each RIN has a heat value of one gallon of ethanol, which is the majority of the biofuel utilized in the American RFS program. Petroleum refiners and importers are required through the program to purchase a certain amount of RINs each year to prove compliance with the RFS.

Not all biofuels are created equal, however. Ethanol, the most common biofuel, which is made of corn byproducts, offsets greenhouse gas emissions by only 20 percent. This classifies it as a "D6" biofuel. RINs based on D6 biofuels are currently selling at less than \$1 on the RIN credit marketplace.

Alton's resource recovery wastewater treatment plant will not be creating ethanol. Instead, the fuels created by the plant will fall into the D4 and D3 biofuels. D4 biofuels include sugarcane ethanol, renewable diesel and biodiesel, and offsets as much as 50 percent of greenhouse gas emissions. D3, which goes on the RIN market at \$2.70 a credit in today's market, offsets as much as 60 percent of greenhouse gas production and is made of cellulosic ethanol, cellulosic diesel and renewable electricity.

"It's made of more cellulosic parts of the plant," Sens said. "There is not as much cellulose in the kernels of corn as there is in the stalks. Therefore the stalks would make a more cellulosic fuel than the starch in the kernels."

Creating D3 grade biofuels will be lucrative to Alton, because the RFS mandated 19.28 billion gallons of biofuel in 2017. Those numbers are generated using the capacity of the U.S. to manufacture the biodiesel, and therefore cannot be overly ambitious.

Of those 19.28 billion gallons, only 311,000,000 is mandated to be D3. However, due to the offsets of D3 grade biofuels, they can also count toward D5 and D6, while the inverse is not true. Therefore, Alton's plant would be churning a grade of fuel, which would count toward nearly every fuel grade's quota.

RIN credits are put on the market and purchased by petroleum refiners and importers to meet their mandated obligations. As much as 20 percent of each year's RINs may come from the previous year, but RINs expire after two years.

The RIN market also fluctuates, much like any commodity market. Sens said it moves at a nearly daily basis, and experiences large fluctuations based on politics and economics. After former U.S. President Barrack Obama extended the RFS program, rates increased. When current U.S. President Donald Trump was elected, however, they dropped.

Despite those worries, however, Trump has promised to retain the RFS and the EPA has also regained as much as 99 percent of their funding, which also assuaged worries of the RFS program failing.

In order to qualify for RIN credits, Alton's plant would have to apply for approval and submit supplemental documents. They would then face EPA approval and review, which could take between three months and three years.

"When it comes to newer technologies, the three years can be more likely," Sens said. "Since this has been done a few times, it should be closer to the three-month mark than three years."

Recent years have shown an increase in such plants across the country after advance biofuels were included and separated in the RFS in 2014. This promised more revenue generation from the construction of such plants. Sens and Pleima said this change has caused engineers to research and educate communities regarding the change over the last two years, causing more municipalities to come aboard.

Low Carbon Fuel Standard (LCFS)

Besides RIN, Alton could also make revenue by exporting biofuels to California by way of the Enable Mississippi Transmission Interstate Pipeline. Because of the use of the pipeline, Alton's fuels may see a small penalty for possible methane lost over distance, but would not suffer the penalties of using such carbon intensive transportation measures as trucks and trains.

The LCFS is set and enforced by the California Air Resources Board, which was established in 1967. The LCFS has the goal of lowering greenhouse gas emissions by as much as 10 percent by 2020. The program has since been extended to 2030.

It also incentivizes the creation of low carbon fuels and is performance-based. Instead of separating fuels by greenhouse gas offsets, the program instead takes into account the entire carbon footprint of the operation. It is thus described as "fuel neutral."

Many states, such as Oregon, are also mimicking California's LCFS. Sens and Pleima said Illinois may do the same in the future, as may the St. Louis Metro Area. If those things are done and deemed profitable, less exporting to California could be considered. As of now, however, California's program awards importers as long as the fuel is used within the State of California for transportation.

Like RINs, California LCFS credits are utilized to meet mandated obligations of businesses, but unlike RINs, LCFS credits do not expire. Credits created during the program's 2011 inception are still valid. Because of this, many traders will stockpile LCFS credits in a banking system and await price fluctuations. Currently, LCFS credits are trading for as much as \$90 each, and have seen heights of more than \$120. The credits are capped, however, at \$200.

To be approved for LCFS credits, the Alton plant would have to send documents and have a lifecycle modelling done before approval by the California Air Resources Board - a process, which may take between three months and a year.

Like RINs, LCFS credits are also dictated by market fluctuations. Similar factors causing the increase and decline of RIN prices also cause similar reactions with LCFS credits.

What will Alton do now?

Whether or not Alton decides to take this model, the current wastewater treatment facility needs replaced. It was built in 1954, and would require millions in work. Because of this, Walker and Gibson would much rather replace it with this idea, which would generate revenue for the city, and help improve its reputation as a "green community."

If the Alton City Council approves, Alton will move into phase two of the project, which will require securing feedstocks, researching needs, looking at construction costs and many other variables.

Once construction starts, it may take as few as two years to complete, partially due to its modular design. Once funding is secured, as many as 188 construction jobs could be created for its building process.

If the plant is approved and constructed, Alton could make revenue streams from each of those credits, the fuel itself and even fertilizer solids such as nitrogen and phosphorus, which can be separated from the waste by machine and packaged in concentrated pellets. That packaging gives farmers a more concentrated fertilizer, which is even less likely to run-off.

Ecoengineers also estimates Alton could generate as much as \$133 million in revenue after the initial 20-year cycle has finished - assuming the U.S. government still supports and incentivizes the usage of renewable energy and the continual decline of fossil fuels.