Bioenergy and Bioresource: Open Access 2022, Vol. 03, Issue 02, 006 **Opinion**

Biomass Compression for Transport to Biorefinery

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Abstract

The Liquid fossil fuels (1) enable transportation, (2) power mobile work platforms, and (3) power on-demand for highly variable demands (seasonal heat and peak power). Describes a system that replaces liquid fossil fuels with drop-in biofuels such as gasoline, diesel, and jet fuel. There is no net influx of carbon dioxide into the atmosphere due to the burning of biofuels, as growing biomass removes carbon dioxide from the air. In addition, when properly managed, biofuel systems can isolate large amounts of carbon as soil organic matter, improve soil fertility and provide other environmental services. In the United States, liquid biofuels have the potential to replace all liquid fossil fuels. The required system has two main functions. First, the heat and hydrogen for converting biomass to high quality liquid fuels is provided by external low carbon energy sources, nuclear power, or fossil fuels with carbon recovery and sequestration. Second, it requires a very large biore finery to effectively compete with fossil fuels. This is equivalent to 250,000 barrels of oil refinery per day.

Introduction

Liquid fossil fuels (hydrocarbons) with biofuels are produced in large-scale bioprocessing plants, where nuclear power provides the necessary heat and hydrogen. Biofuels are fully compatible with existing fossil fuel infrastructure and are functionally equivalent to gasoline, diesel and kerosene. The paper outlines the system and the main limitations that lead to its specific design features: (1) 250,000 barrels of biorefinery per day for forced economies of scale, (2) large inputs is nuclear heat and hydrogen to maximize hydrocarbons per unit feedstock. And thus ensuring sufficient biomass feedstock to meet the global demand for liquid fuels and (3) warehouses to enhance locally produced biomass into an economically transportable storage intermediate product input for large bioprocessing plants. At the component level of the system, such as a biorefinery or a storage facility, there are a number of process options where detailed technical and economic assessments will guide process choices.

The largest source of biomass on the planet is lignocellulosic materials, with about 100 billion tons/year of biomass (containing about 40%-50% carbon) produced worldwide through photosynthesis. Biomass is a source of energy and also a source of carbon. Since plants remove carbon dioxide from the atmosphere, there is no net addition of carbon dioxide to the atmosphere by burning biofuels. Therefore, biofuels have the potential to approach zero net addition of carbon to the atmosphere.

Converting biomass to biofuel based on high quality liquid hydrocarbons is very energy intensive. If biomass is the source of carbon and also an energy source to produce liquid biofuels, more than half of the biomass must be burned to provide energy for metabolism. However, if external energy sources are available, the energy content of liquid hydrocarbon fuels derived from biomass can be twice the energy content of the original biomass. Some biomass sources have low energy value (sludge, plastic, municipal waste, etc.) but high carbon content when considered as carbon feedstock. The combination of inherently low-carbon biomass with low-carbon heat and hydrogen from nuclear power drives the global biofuel system further towards low-carbon emissions.

Many specialists have proposed burning biomass with CCS as a manner to put off carbon dioxide (CO_2) from the atmosphere. The economics could maximum possibly rely upon a carbon tax in which a charge in greenbacks in step with ton of CO_2 could be paid for getting rid of CO_2 from the air and sequestering it. However, the fee of CO_2 sequestration is pretty depending on the dimensions at which that is finished and the attention of CO_2 with inside the enter flow. Nuclear biorefinery flow sheets allow variable manufacturing of fuels and almost natural CO_2 streams at a big scale for low-fee CCS. A marketplace for sequestered CO_2 could offer a huge extra sales flow at instances of low seasonal call for fuels or extra biomass feedstock manufacturing with low prices.

Conclusion

The biggest challenge is the widespread belief that biofuels compete directly with food production, even though national biomass resource assessments take into account future demand for food, feed, and energy. Livestock and fiber. In addition, advanced biofuel production will use non-food sources such as grasses and crop residues. The reality is that the main challenge facing Western agriculture for more than 50 years has been to find markets for persistent surpluses, not to meet food shortages.

The second challenge is integration among the farming, refinery and nuclear power communities. Likewise, a significant challenge in commercialization is that intermediate product warehouses and bioprocessing plants must be built at the same time. All parts of the system must progress at roughly the same rate for the entire system to function properly.

Third, the implementation and licensing progress for nuclear power plants is still slow. The use of the existing family of light-water reactors by nuclear power plants is an option for a shorter-term demonstration of zero-carbon bioprocessing plants.

Techno-economic challenges include commercialization of technologies to convert cellulose biomass into economically transportable, dense, and storage intermediates that enable bioprocessing plants large-scale research and technology development for a single-refinery plant-scale biorefinery. The biofuel process that produces hydrocarbon oil requires refining; therefore, the background refining processes for petroleum and biofuels will be the same or identical.

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