

## Focus on Fuels

### In This Issue

[TM&C Services](#)

[Renewable Fuel Producers](#)

March 2018

Volume 8, Issue 4

### Why Aren't More United States Oil Refiners Renewable Fuel Producers, Also?

The question of the day is, "Why don't more refiners own renewable fuel production facilities?" Like all broad questions, there are a myriad of answers. But I'm willing to step into the discussion since I don't actually own either renewable fuel facilities or a refinery. Currently, about 35% of renewable fuel producing facilities are owned by facility consolidators like the large commodity trading firms Archer, Daniels Midland and Poet. Some refiners have also invested in renewable fuel facilities, most notably Valero. With the current renewable fuel standard program in the United States, which requires a growing amount of renewable fuel be added to transportation fuel, it would seem logical that petroleum refiners would integrate ethanol and biodiesel plants into their refining system. After all, renewable fuel is just another transportation fuel, not that dissimilar to gasoline and diesel.



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### TM&C Services in Fuel Regulations

TM&C provides a full range of services in its fuels regulatory practice. Some of these services are listed below.

- Preparing, reviewing and submitting fuels reports, including CDX submissions.
- Facility audits for compliance with fuels programs.
- Interaction with EPA to pose fuels-related questions.
- Industry specialist assistance for required gasoline attestations.

### Current Refining and Renewable Fuel Producing Structure

#### *Refining*

The petroleum industry has a long history dating back to the late 1800s. It began like many industries with many participants and a cottage industry structure. Folks found the oil, knowing it had applications to produce kerosene and lubricants. But the industry rapidly grew in size and complexity as demand for transportation fuels exploded with the development of the internal combustion engine and the conversion of many naval fleets from coal to marine fuel oils. Refineries that were typically sited near the production fields and were frequently quite small by today's standards were replaced by very large refineries that were closer to the points of consumption or were sited on the water to allow marine delivery of crude oil. Pipelines were laid from the producing facilities to carry crude oil to these refineries and finished product pipelines were laid to carry products away from the refineries.

Typical company structure, which initially had large producers of crude oil building and operating their own refineries, quickly morphed into the smaller players being absorbed by the larger companies. This led to Rockefeller's enormous Standard Oil Trust. Typical corporate structure of this behemoth and the subsequent parts that resulted from the breakup of

- Industry specialist assistance for in-line blending audits.
- Assistance in setting up a fuels compliance group/program.
- Personnel reviews of compliance-related groups.
- Compliance status reviews and recommendations.
- Negotiations/consultation during EPA enforcement actions.
- 3rd-Party Engineering reviews.
- Due diligence reviews of facilities and companies in RFS RINs Program.

the Trust was to have almost complete vertical integration with refining being owned by the oil producer. This structure remained until the late 20th century when more and more of the vertically integrated oil companies began stripping marketing and logistical assets from the central company operations of crude oil production and refining. Eventually, it became typical that even refining had to stand on its own, and the age of the independent refiner began. Today, many refineries are either owned by stand-alone refiners or are limited-liability companies with independent financials from the prior integrated company. Crude capacity of United States refineries is shown in Table 1.

Table 1  
Selected Refining Assets in the United States

Refinery/Refinery System	Crude Capacity	
	Barrels per day	Million gallons per year
Valero	2,175,000	~33,000
Marathon	1,881,000	~29,000
ExxonMobil	1,700,000	~26,000
Andeavor	1,100,000	~17,000
Others	11,690,000	~179,000
Total	18,546,000	~284,000
Average size refinery	~130,000	~2,000

Source: Oil and Gas Journal Worldwide Refining Survey 1/18

### *Renewable Fuel Industry*

The renewable fuel industry looks much more like the early oil industry in terms of structure. There are many small facilities sometimes owned by local renewable feedstock producers along with a few very large systems owned by a single entity. A list of some of the renewable fuel production facilities and ownership are shown in Tables 2 and 3.

Table 2  
 Select Ethanol Renewable Fuel Facilities in the United States

Owner	Capacity, million gallons per year
<i>Large Non-Refiners(number of facilities)</i>	
Archer Daniels Midland Co. (8)	1,719
POET Biorefining (27)	1,629
Green Plains Inc. (17)	1,475
Pacific Ethanol, Inc. (9)	605
Cargill, Inc. (3)	360
<i>Large Refiners</i>	
Valero Renewable Fuels (11)	1,400
Flint Hills Resources, LLC (7)	840
<i>Others</i>	
Other Facilities (134)	8,216
<b>Total (216)</b>	<b>16,241</b>
<b>Average facility size</b>	<b>75</b>

Source: Renewable Fuel Association website 1/23/18

Table 3  
 Select Biodiesel Facilities in the United States

Owner	Capacity, million gallons per year
<i>Large Non-Refiners</i>	
REG (10)	365
World Energy (4)	225
Louis Dreyfus Agricultural Industries LLC	90
Archer Daniels Midland Co.	85
Cargill	56
<i>Refiners</i>	
Delek (2)	27
CHS	5
<i>Others</i>	
Other Facilities (104)	1,661
<b>Total (124)</b>	<b>2,514</b>
<b>Average facility size</b>	<b>20</b>

Source: Biodiesel Magazine 12/13/2017

The tables show that the size and ownership of the production facilities in the biodiesel industry in the United States are much different than those in the ethanol industry structure. Total biodiesel production capacity is only about 15% of the ethanol producing capacity. The biodiesel and ethanol industry structures are also much different than the refining industry.

### *Refining vs. Renewable Fuel Industry Structure*

Petroleum refineries on average are 30-40 times larger and much more capital intensive than renewable fuel plants. The average refinery in the United States has a crude capacity of about 130,000 barrels per day or 2 billion gallons per year versus the average renewable fuel plant capacity of ~3,600 B/D or 55 million gallons per year. Petroleum refineries are continuous processes where natural fermenting batch processes are typical in the renewable fuel industry; however, there are many similarities in that the processes require heating and cooling, handling flammable liquids, similar logistics to a point and a vast market where the products can be sold. So why don't more refiners have their own renewable fuel divisions?

### **Petroleum Refinery Ownership of Renewable Fuel Facilities**

The first question that should be asked is, "Why should a petroleum refiner want to own a renewable fuel facility?" Some of the driving forces in that direction would be (1) the refiner is already in the transportation fuel business, and renewable fuels are just another type of transportation fuel, (2) the refiner has the expertise to produce renewable fuel with just a little additional information on the fermentation process, and (3) the current renewable fuel program is structured to penalize refiners that must buy renewable fuel - theoretically, at a higher price than would be required if there were no program, in order to generate credits known as RINs to prove the refiner's renewable fuel use. These costs for the industry are theoretically on the order of \$10-12 billion per year or 6-10 cents per gallon of transportation fuel. So what are the reasons that a refiner would not want to own renewable fuel producing facilities?

One reason to not own a renewable fuel production facility is that it is not the petroleum refiner's core business. Not unlike the divestment that has characterized the petroleum industry for the last several decades, refiners are not in the business of producing alcohols or biodiesels. Another reason is that the typical biofuel production facility is in the middle of the United States near the agricultural centers where the renewable feedstocks are grown and generally away from the refining centers on the coasts. In addition, it is difficult to move biofuels by pipeline, the typical method for moving petroleum products and feedstocks. Refiners must become experts at rail movements for the longer hauls. It is even more foreign to the refiner to handle nonliquid feedstocks like corn or grain to the production facility. In addition, any renewable fuel used for transportation fuel backs out some fraction of petroleum fuel. Refiners would see renewable fuel as a replacement fuel eventually making their huge investments in refineries worthless; however, none of these reasons are as important as the big Kahuna reason.

The current driver to force renewable fuel into transportation fuels is not market driven but is the government's renewable fuel standard program. The future of the program depends on a government process that can result in very quick changes in the program. Until there is some certainty in the ultimate program, refiners will be hesitant to invest in renewable fuel facilities. The program was originally set to require 36 billion gallons of ethanol equivalent renewable fuel in the transportation pool by 2022.

That target appears to be unlikely to be met. In fact, with the recent bankruptcy petition of PES to relieve them of their RFS obligation in 2017 and the scramble by small refiners to opt out of the program, the RFS program looks more and more vulnerable to significant revision. Uncertainty is always a feature of government mandates and uncertainty is a killer for approval of capital investment. Until the government puts the RFS program on an economic driven basis, most refiners will hesitate to take the plunge into renewable fuel facility ownership.

But, within the big reason for refiners to not invest in renewable fuel production facilities lies the solution. The transportation fuel industry required some capital investment to allow the blending of ethanol in gasoline and biodiesel in diesel. That investment has been made, and the renewable fuel industry did not have to make that investment because of the RFS regulations. A solution to the current dilemma might be to allow the market to make the choice of whether to use renewable fuels. A transition program could be to continue the current regulatory mandate to use 10% ethanol and about 4-5% biodiesel, but allow the market place to decide if more renewable fuel should be added to the transportation pool. Assuming the market does signal more renewable fuel, the regulatory program could be reduced or eliminated since economics would drive the demand. This is not unprecedented even in the near term. When the RFS program began and the mandated renewable fuel was ramping up and less than 10% of the pool, ethanol above the mandated amount was added to the transportation fuels solely on the economic benefit. In that environment, RIN values were extremely low on the order of 5 cents per gallon. The cost of the program at that time was low and much less controversial.

Also, over the last several weeks, there have been significant discussions at the highest levels, including the President of the United States, to consider options that might ease the perceived financial burdens of independent refiners like Philadelphia Energy Solutions. Some changes to the program that can be made administratively without legislative action are expected in the near future.

Whatever the future holds, Turner, Mason & Company is here to answer your questions in any of these areas. Give us a call.

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