

# State Of Play In Renewable Fuels Market

**I**N the ongoing struggle between oil refiners, “conventional” ethanol producers, cellulosic biogas generators, and other parties to shape the federal Renewable Fuels Standard (RFS), three blows recently were struck that might lead to a brighter biogas future. Two may be short-term. The third could have broader implications.

First, on May 30 the U.S. Environmental Protection Agency, which administers the RFS, finalized its so-called “E15 rule” allowing — but not requiring — gasoline containing 15 percent rather than 10 percent ethanol to be sold during summer months without special vapor pressure controls in smog areas where E15 formerly was prohibited. The final rule was rushed to meet the June 1 summer gas season in accord with Administration pledges to help corn growers hammered by Midwest floods and the Administration’s trade tariffs. It was opposed by environmental groups but touted by EPA and ethanol industry officials as allowing “more renewable fuel to be blended into the fuel supply” and enabling “year-round demand growth of at least 200 million [more] gallons ... as only the starting point.”



However, the rule itself anticipates far more modest effects than a 5 percent increase in ethanol markets. It asserts that multiple constraints — market barriers, limited ability of current filling stations and vehicle engines to handle E15, necessary infrastructure modifications, and uncertain demand for “voluntary” E15 — likely will produce marginal industry benefits as well as marginal smog effects. Oil industry

groups facing further erosion of gasoline markets predictably differed, announcing their intent to challenge the rule as “arbitrary” on the day the rule was announced.

If and when the rule encourages infrastructure investments, it also could expand markets for other renewable fuels like compressed biogas from AD facilities. Reasons include:

- The more infrastructure there is for ethanol, the more infrastructure there also may be for renewable natural gas (RNG) in terms of pipeline or tanker transport, fueling stations, and storage facilities.
- Adverse mechanical and environmental impacts related to ethanol’s corrosiveness and life cycle analyses may encourage switches to RNG.
- Cellulosic biogas from AD and landfills becoming price competitive (or better) with ethanol in more markets.
- Increased investor/user familiarity with any gasoline alternative tends to lift all boats.

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*New report projects sharply increased biogas demand and supply that could benefit anaerobic digester (AD) developers — amid tensions that may undercut its forecasts.*

*Michael H. Levin*

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## MARKET “REFORMS”

Second, the E15 rule accelerated Administration decisions on a clutch of proposed “market reforms” meant to prevent asserted “RINs market manipulation.” The White House directed EPA to pursue these reforms last October. RINs (tradeable Renewable Identification Numbers or certificates) are a potentially critical revenue stream for AD and other facilities that can produce compressed or liquid vehicle fuel.

The need to prevent profiteering “manipulation” was problematic from the start. This was because RINs demand and RINs prices already were at his-

toric lows due to the Administration's issuance of "economic hardship" compliance exemptions (known as "waivers") to "small refineries" — including some owned by oil majors — at nearly quadruple those exemptions' historic rate (see Box).

Despite the White House directive, EPA found no evidence that RINs price levels or volatility resulted from intentional hoarding or other manipulation, rather than "normal swings" characterizing a market where government announcements can have outsize effects because the government uniquely determines both supply and demand. It declined to adopt proposals that might have stifled RINs market liquidity — e.g., eliminating brokers' ability to hold or sell RINs, capping the amount of RINs any regulated refiner could hold, or requiring RINs to be retired instantly rather than yearly. Those proposals were deferred for "further study," apparently forever.

Instead EPA merely required narrow additional reporting where an enterprise's RINs holdings exceed 3 percent of an applicable fuel-specific annual national Renewable Volume Obligation (RVO) and any affiliate of that enterprise holds more than 130 percent of its individual RINs obligation for the year. This action imposed no new substantive mandates. It also applied only to the ethanol segment of the renewable fuels market, leaving AD and other bio-fuel producers unscathed.

## RNG COALITION REPORT

Third, just before the E15 rule was announced the Renewable Natural Gas Coalition released a credible third-party report, "Renewable Natural Gas Supply and Demand for Transportation," prepared by Bates White Economic



Bates-White  
report

Consulting. Circulated to Congressional staff before its public

release, the report apparently was developed in part as a response to a stream of Administration steps that threatened to undercut RINs markets and biogas development. It seems to explode historically low government estimates of cellulosic biogas supply and demand. But its findings go well beyond that.

## What The Report Addresses

The report confirms that the U.S. Department of Energy's Short-Term Energy Outlooks (STEOs) for cellulosic biogas production — from which EPA partly determines the volume of "cellulosic gas" refiners must blend each year — understate both current production capacity and potential near-term production. It indicates that natural gas vehicle demand in 2018 was about

1.1 billion ethanol gallon equivalents (EGE) — more than twice the STEO estimate. The report also concludes that biogas production grew 30 percent each year from 2015 to reach over 300 million EGE in 2018, and that natural gas vehicle demand should reach 1.8 to 2.5 billion EGE by 2025. It suggests that undeveloped sources of biogas with economic and environmental advantages over "geologic" natural gas could more than supply this demand.

Based on independent analysis plus reviews of studies by NREL and other entities, the Bates-White report further concludes that:

- Dairy and swine farms have "technical potential" to produce about 2.2 million EGE annually.

- "Incremental" biogas production (solely from landfill, agricultural waste, and other facilities with no current RNG projects) could total 4.8 million EGE.

- Emergent biogas markets beyond the transport sector could help absorb such production.

- Displacing diesel fuel at only 25 percent of currently unconverted U.S. municipal transit buses would generate 200 million EGE additional biogas demand.

- Vehicle fleets like school buses, delivery vans and medium-haul plus over-the-road trucks remain major underserved markets for biogas.

- Each 100 million EGE of renewable fuel production on average creates about 550 permanent jobs paying nearly \$70,000 — a particularly big benefit when biogas facilities are sited in hard-pressed rural areas.

- Vehicles fueled with biogas are competitive with electric vehicles (EVs) in carbon dioxide equivalent (CO<sub>2</sub>-e) reductions on a life cycle basis, and can surpass EVs in areas with high fossil-fueled electricity emissions.

- AD projects have been rated negative for carbon intensity under the California Low Carbon Fuel Standard program, meaning they *affirmatively subtract* CO<sub>2</sub>-e from the atmosphere.

- Biogas markets are increasingly diverse. They now include industrial process heating, hydrogen production, and plastics manufacturing in addition to electricity generation, direct gas use and transport-related vehicle fuels.

- Biogas market growth is self-reinforcing due to increased familiarity and the "second in line" effect — the more demand is satisfied, the more infrastruc-

**Table 1. Biogas/RNG potential from swine and dairy farms<sup>1</sup>**

Animal Sector	Candidate Farms	Potential Biogas mmBtu/yr	RNG Potential, Millions EGE
Swine	5,409	71,484,000	928
Dairy	2,704	100,124,000	1,300
Total	8,113	171,608,000	2,229

<sup>1</sup>Bates-White report, “RNG Supply and Demand for Transportation,” p. 29, Table 5.

ture and investment become available, the more economies of scale come into play to reduce costs, and the more new customers and markets tend to arise.

- Predictable incentives — notably, more accurate (not understated) RVOs, a RINs market not subject to repeated regulatory shock effects, and reliable (not erratically extended) renewable energy related tax credits like those for CNG fueling stations or advanced biofuel production — are important to sustain such growth.

Several tables from the report (Tables 1, 2 and 3 in this article) summarize some of the Bates-White data.

#### What’s Not Addressed

“Renewable Natural Gas Supply and Demand for Transportation” may be as

interesting for what it does not directly say. For example, it:

- Touches on but does not attempt to address the potentially large gap between “technically possible” and “economically feasible” biogas production.

- Tends to treat “biogas fuel” as monolithic despite disputes about the life cycle efficacies of corn-derived ethanol versus other renewable fuels.

- Does not deal with the impacts of low wholesale electricity rates or low RINs prices on future AD development. Nor does it note that “high RINs prices” operate — in fact, were meant to operate — to encourage refiners to build their own biogas facilities or help finance independent ones, not “punish” them with costs

**Table 2. NREL estimated U.S. potential RNG production by source<sup>1</sup>**

Source	RNG Potential, Millions of EGE/yr
Landfills	1,498
Wastewater	1,427
Animal manure	1,162
Other organic waste	706
Total	4,794

<sup>1</sup>Bates-White report, “RNG Supply and Demand for Transportation,” p. 30, Table 6.

**Table 3. Lifecycle emissions of CO<sub>2</sub>e per gasoline gallon equivalent<sup>1</sup>**

Fuel	CO <sub>2</sub> Equivalent g/GGE
RNG (landfill)	1,637
Biodiesel (soybean)	4,193
Corn ethanol	6,578
CNG (geologic)	8,767
Gasoline (E10)	10,785
Low-sulfur diesel	10,951
Electricity (U.S. avg)	16,604

Source: GREET Model. <sup>1</sup>Bates-White report, “RNG Supply and Demand for Transportation,” p. 34, Table 8.

## RINs “Hardship” Waivers

**U**nder the Renewable Fuels Act (“RFA”), the U.S. EPA sets yearly Renewable Volume Obligations (“RVOs”) that determine nationwide demand for renewable fuels. RVOs then are allocated to individual refiners, who must blend the allocated amounts or meet their obligations by acquiring RINs.

The RFA has long authorized “undue economic hardship” waivers for “small refiners” processing less than 75,000 barrels/day of crude oil. But waivers not only depress demand for RINs and lower RINs prices by exempting their recipients from having to acquire “covering” RINs — they also can distort the Act’s scheme by depressing renewable fuel production, resulting in issuance of artificially low RVOs by EPA. Thus their use was meant to be strictly limited. Under criteria set in 2011 by the U.S. Department of Energy (DoE), no waiver should be granted by EPA unless a refinery applicant receives passing scores in two separate categories: 1) “structural” hardships related to (e.g.) its sec-

tor’s access to credit or capital and to other lines of business that might cushion RINs economic impacts; and 2) “firm-specific viability impacts” of having to acquire covering RINs.

Previous EPA waivers followed DoE’s dual criteria, generally were supported by more than a dozen pages of Federal Register analysis, and were granted to small refineries at an average of roughly 3/year. Beginning in May 2017, EPA dramatically accelerated this pace by granting two-page waivers based solely on structural factors, without reference to refinery-specific RINs impacts or those refineries’ ability to pass RINs costs to their customers. As of mid-June, EPA cumulatively had granted or actively was considering over 50 such “new-era” waivers, including waivers to “small refineries” owned

by Exxon and billionaire Carl Icahn. For RVO years 2016-17, EPA granted 19 of 20

such waiver requests, some retroactively. These actions have triggered Congressional inquiries and several lawsuits, most of which are in process.



“Grassley Questions Hardship RFS Exemption Review Process at DOE”



Further reading on this topic

they generally can pass to consumers anyway.

In addition, the report does not mention the potentially important “renewable electricity” pathway by which biogas producers whose outputs fuel generators to power electric vehicles may generate RINs — a route (the “e-RINs pathway”) EPA endorsed years ago but has not yet activated. And it threatens to reignite past battles between potential allies by tacitly characterizing both corn ethanol and “geologic” — i.e., shale — gas as inferior to RNG.

Still, the report’s potential impacts are worth noting. If it helps drive biogas demand by encouraging EPA to increase the agency’s annual RVOs for cellulosic biofuel, that result would be more than enough. ■

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