The 10 Most Bizarre Biofuels Stories of 2012

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By JIM LANE, Editor & Publisher, *Biofuels Digest*

OK, we're lucky to be here in so many ways. December 19th came and went, the Mayan calendar ended, and planet Earth is still here. But lucky we are to have been here throughout 2012, to witness 10 of the most unusual biofuels schemes and technology dreams ever devised.

The 2012 candidates had some formidable competition from previous years to contend with in making 2012 more memorable than any other in sheer inventiveness. Consider 2010?s "bunnies for biofuels:" [1] "Sweden's got a common problem: too many bunnies, breeding like, well, rabbits. Sweden's got an unusual solution, trap 'em, kill 'em, and burn 'em to generate power."

Or 2008-09?s scheme to turn waste liposuction fat into biodiesel [2]. Or the Prince of Wales' effort to turn below-market quality wine into ethanol fuels [2].

But it's been one for the books. Trains to nowhere, Grease Thief manhunts, camel-tummy microbes, briquettes against the Taliban, kudzu's comeback, and more highlight a strange and wondrous year in bio-based inventiveness. Some of these are plain crazy or wrong — some, genuinely inspired, if directly out of left field. You be the judge.

1.) You're Riding on the RIN Train

This story is still unfolding, but here are the essentials [3]: A company is under investigation for transporting the same shipment of biodiesel across the U.S. border 24 times in a compressed period of time in order to generate renewable fuel credits,

also known as renewable identification numbers (RINs). Once the fuel was "imported," it was "re-exported" back to the U.S.

The catch from a RIN point of view? The company in question, Verdeo, said it was perfectly legal to generate (at the time, $1) biodiesel RINs in the import process and retire (at the time, worth pennies) ethanol RINs in the export process. The total value of the scheme is suspected to run as high as $288 million in RIN credits — the EPA, which is investigating, isn't saying much at this point.

2.) Selling False RINs Means You Can Buy, Not Keep, Patton Tank

In Texas, court records show that the CEO of Absolute Fuel, [4] one of the companies indicted for selling false RINs, used more than $30 million in revenues to buy a wide variety of luxury goods, ranging from a $1.6 million Jetstream personal jet to several homes, and of course, $355,000 on a demilitarized Patton tank.

This month, the case headed for resolution when former Absolute Fuels CEO Jeffrey David Gunselman pleaded guilty in federal court to 51 wire fraud and 24 money laundering counts related to a $41 million biodiesel fraud investigation, as well as to four counts of making false statements in violation of the Clean Air Act.

3.) Dragnet! The Grease Thief Manhunt

In Massachusetts, police went searching for two suspects [5] who allegedly stole cooking grease from a Boston-area restaurant to sell it for biodiesel fuel. Here's the police blotter report: The employees at Café Pacific reported that, while closing at approximately 4:54 a.m., they heard noises from the rear of the building. Upon investigating the noise, the employees spotted two males in an unmarked car siphoning grease from the cooking oil containers. The suspects were described as Hispanic males wearing dark clothing. They jumped into a Ford van when they saw the employees and drove away.

4.) Kudzu: I'm Not Just a Pest, I'm a Feedstock

In Alabama, Inventure's chemical engineers [6], based at the University of Alabama's business incubator, are exploring the use of kudzu as a feedstock for ethanol production. The vines, which are spreading across the South, can be turned into a sugary syrupy-like substance that then can be distilled into ethanol. The syrup can also be produced from algae, wood chips, and other organic waste.

5.) New Anti-Taliban Super-Weapon: Wood Pellets?

In November, we heard from Robert Haston of Florida, who wrote: "I flew 220 medevac [medical evacuation] missions in Afghanistan last spring/summer [7]. The Taliban could shoot at us with near impunity because of the brush- and tree-covered irrigation ditches. Once the leaves fall off (AKA deer season), the Taliban can't hide from our airpower, so they pretty much close up shop.

"So I asked why [do Afghanistan landscapes], unlike any other I've seen, grow so

much brush and trees? It turns out that they [are used] for cooking fuel. Meanwhile, they burn off crop waste."

The solution? "Crop waste briquette mills. These run at a profit around the world, particularly in low-wage countries. We would also trade improved cook stoves (which cut the need for fuel in half) in exchange for raw materials.

"Then the farmers could grow more food instead of brush, saving precious water. One thousandth of what we spent on the war last year would easily fuel all of Afghanistan's cooking needs and eliminate the need to grow fuel wood. Even if this only reduced the Taliban's effectiveness by 10 percent, this would be 100 times more effective than our current methods."

6.) Growing Magnetic Algae

In New Mexico, a group of Los Alamos National Laboratory (LANL) researchers [8] have genetically engineered "magnetic" algae to investigate alternative, more efficient harvesting and lipid extraction methods for biofuels.

At LANL, the researchers took a gene that is known to form magnetic nanoparticles in magnetotactic bacteria and expressed it in green algae, where a permanent magnet can be used to separate the transformed algae from a solution.

7.) Camel Tummy Microbes Key to Fuel Generation?

In the United Arab Emirates (UAE), researchers at the Masdar Institute of Science and Technology [9] are researching the microbes found in camels' stomachs to determine which produce the most methane and could therefore be the most beneficial for biogas production. Waste from the date-production process is seen as a key feedstock for biogas production in the region.

8.) Transforming Chicago's Marina City into an Algae Hub

In this year's International Algae Competition, [10] the Green Loop project landed the Abundance Prize and Best Video awards for an algae-based strategy for a new sustainable model in urban areas, reimagining one of the most iconic buildings in the Loop of Chicago: the Marina City Towers.

This environmental vision is committed to the Chicago Climate Action Plan by growing algae, absorbing CO2, harvesting energy, filtering water and producing food onsite.

9.) The Artificial Leaf

In Washington, the American Chemical Society (ACS) reports that a detailed description of the development [11] of the first practical artificial leaf appears in the ACS journal, *Accounts of Chemical Research*. The article notes that, unlike earlier devices, which used costly ingredients, the new device is made from inexpensive materials, and employs low-cost engineering and manufacturing processes.

To make these devices more widely available, Nocera replaced the platinum catalyst that produces hydrogen gas with a less expensive nickel-molybdenum-zinc compound. On the other side of the leaf, a cobalt film generates oxygen gas. Nocera notes that all of these materials are abundant on Earth, unlike the rare and expensive platinum, noble metal oxides and semiconducting materials others have used.

10.) The Xtreme Algae-Eating Fungus that May Save the World

In Montana, a researcher at Montana State University has discovered a fungus [12], which could become a future participant in biofuel production, that is fond of eating algae and comes from an extreme zone in Yellowstone. When the fungus is dried out, it oozes an oil of high percentage lipids containing a ratio of oleic and steric acids that's nearly ideal for biofuels.

What's your take? Please feel free to comment below! Copyright 2013; Biofuels Digest [13]

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