ISCC- PRIMA Conference
Low Carbon Feedstocks and Biodiesel Opportunities in California

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Introduction to Crimson Renewable Energy

- Largest producer of ultra-low carbon biodiesel in California, located in Bakersfield
- BQ-9000 Certified since 2012
- Producing Chevron and KM specification biodiesel since 2011
- “Feedstock Indifferent,” focused on ultra-low carbon intensity feedstocks
- Serving major oil companies (i.e. Chevron, Tesoro, Valero, Shell, etc), fuel wholesalers, truck stop operators
- Rail Accessible: inbound and outbound, BNSF & UP
- Affiliated with Crimson Midstream LP, largest crude oil pipeline operator in California with additional US Gulf Coast pipeline assets
LCFS – GREET 2.0 and Pathway CI

- LCFS Carbon Intensity (“CI”), and therefore economic values, are determined via the ARB’s GREET 2.0 model that evaluates the entire lifecycle of the fuel
- GREET 2.0 pathways first took effect Apr 1, 2016; the BIOD default pathways discontinued effective Jan 1, 2017
- Major Factors in the final CI Calculation; need 2 years of data:
  - Feedstock type (including any Indirect Land Use Change effects) and yields
  - Energy and chemical usage
  - Transportation distances for feedstock and finished fuel
- GREET 2.0 pathways are producer AND facility specific
- Some results from GREET 2.0
  - Corn-based Ethanol and virgin veg oil based Biodiesel got better CI due to reduced ILUC impact
  - 4 CI pathway for Distillers Corn Oil Biodiesel went away
  - Animal Fat based Biodiesel CIs did not change much
  - Generally lowest CI Biodiesel is now Used Cooking Oil based Biodiesel
  - Mass balancing still allowed
LCFS – the New “Biodiesel Gold Rush”

LCFS has created a large, growing market and highly competitive global destination for biodiesel as well as Renewable Diesel.
LCFS – Limitations to the New Biodiesel Gold Rush

- **ADF (Alternative Diesel Fuel) regs** that start Jan 1, 2018 will be a market limiting factor
  - ADF caps biodiesel at max B5 April 1 – Oct 30 and max B10 Nov 1 thru Mar 30
  - If biodiesel has a cetane of 56+, it is considered high saturation biodiesel and can be used at B10 year-round
  - Additives can certified to allow for use up to B20
  - Additional reporting requirements (submit monthly data quarterly)
  - Sunsets in 2023

- **Lack of Blending Infrastructure and Blending Costs**
  - Renewable fuels aren’t necessarily a priority for midstream operators currently
  - KM terminal blending costs are very high
  - Generally refinery racks are not blending biodiesel

- **Current POET Ethanol lawsuit**
“POET argued that the California Air Resources Board (ARB) acted in bad faith by not completely addressing the CEQA violations as directed by the Court and are seeking a suspension of the LCFS to 2013 levels and a complete severance of biodiesel from the regulation.” – California Biodiesel Alliance

“The Attorney General’s office...argued that ARB did act in good faith by adopting the Alternative Diesel Fuel regulation... and the NOx issues related to biodiesel. The Attorney General argued POET’s remedy would harm the biodiesel industry and others who are not to blame for the unintended mistakes of the ARB. She also argued POET’s remedy would have negative impacts on the environment.”

- California Biodiesel Alliance

Four possible outcomes – decision due June 23 at the latest:

1. Complete suspension or halt of the LCFS Program – highly unlikely
2. Freeze of LCFS at a prior year’s compliance level
3. Severance of biodiesel from the LCFS program
4. Court rules in favor of CARB and nothing happens – highly unlikely

Very confident ARB will resolve the issue to Court’s satisfaction but it is a question of timing
Low Carbon Feedstocks

Biodiesel produced from low or ultra low carbon feedstocks range from 8.6 to 41 CI
- Animal Fats (tallow, poultry, choice white grease, mutton) – 29 to 41 CI
- Distillers Corn Oil - 28 to 38 CI
- UCO / Yellow Grease – 8.6 to 28 CI
- Brown Grease / Trap grease -?

Biodiesel from conventional feedstocks such as Soybean or Canola oil range from 49.2 to 61.9
- Canola Oil – 51.3 to 61.9 CI
- Soybean Oil – 49.2 to 60 CI

"Low Carbon" inputs to US Biodiesel Production (mm lbs)
Domestic U.S. Biodiesel Feedstock Utilization

Inputs to US Domestic Biodiesel Production (millions of pounds)

- Virgin Vegetable Oil: Soybean, Canola
- Corn Oil
- Recycled and Animal Feedstocks: Poultry, Tallow, White Grease, Yellow Grease

Legend:
- Blue: Virgin Vegetable Oil
- Orange: Corn Oil
- Green: Recycled and Animal Feedstocks
So….Does LCFS Impact Feedstock Prices?

Major driver for feedstocks pricing is first and foremost the SBO market
  - This is in turn driven by Palm Oil, USD strength/weakness, weather but total US biodiesel production is also a major factor
  - Where would SBO prices if there was no LCFS?

Total U.S. demand (biodiesel, feed, oleo) for fats and oils drives feedstock price, not LCFS

Per USDA, total 2015 DCO production was ~ 2.96bn lbs (~395mm gal).
  - Biodiesel demand was about 35% of total domestic DCO production
  - Will UCO usage come down in 2017 without the 4 CI?

If there was no LCFS, would REG buy less UCO, Yellow Grease or DCO?

Nonetheless LCFS does have an impact
  - LCFS likely pushes up the basis for UCO/Yellow grease and DCO vs SBO, especially regionally where very large volume RD producers operate
  - Transnational impacts -- European and other demand
  - Capped by substitution effect
What concerns me about LCFS?

- Program stability is paramount. Is LCFS here to stay?
  - Will annual carbon reduction targets be changed?
  - More lawsuits? Another voter proposition?

- Will there be enough renewable fuel to allow obligated parties to meet LCFS carbon reduction requirements?

- We all love high LCFS prices right? Be careful what you ask for...
  - Will there be an LCFS version on 2013 “RINSanity” emerge?
  - Recall that RINSANITY nearly ‘broke’ RFS2 and EPA was forced to significantly alter objectives
  - Makes cheating very tempting – cheating undermines the program

- Regulatory burden
  - Unrealistic goals, too costly,
  - Making producers and their supply chains track and report things that ultimately provide little or no real benefit,
Sustainability Certification

- Sustainability certification has been advocated as a means of legitimizing questionable biofuel feedstocks or questionable production regions.
- Sustainability Certification seems to be confused with verification of feedstocks (i.e. feedstock double counting, is it really UCO?)
- Sustainability Certification doesn’t actually improve the sustainability of U.S. produced biofuels which aggregate data already tell us are far superior to fossil fuels and imports.
- Sustainability certification isn’t necessary to assure consumers that U.S. produced biodiesel is sustainable.
  - The U.S. already has strict environmental standards, advanced labor rules, a strong and non-corrupt judicial system;
  - Biodiesel feedstocks in the U.S. feedstocks are byproducts or co-products of other industries, and nobody is cutting down forest to grow soybeans
  - Asking a soy farmer to certify his entire crop would be like asking McDonalds to certify French fires on the odd chance that a portion of their excess oil might be used in the LCFS.
- Proving sustainability of biofuels produced in developing countries and/or with certain feedstocks for European or American consumers might be a different story.
Sustainability Certification, if you must….

- “Certifying” the sustainability of a single fuel option is meaningless.
  - The goal should be to achieve a more sustainable outcome relative to all options at hand.
  - To do this, we need to embrace the more advanced concept of relative sustainability
    -- See: ASTM E3066

- To assess relative sustainability, all options, including petroleum must be evaluated using the exact same metrics.

- How far does one need to go?

- Asking U.S. soybean farmers to report the fertilizer used on each field to the ARB or a third party auditor is impractical, unnecessary (provides no real benefit), and will be largely impossible
THANK YOU

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