

TERU Focus Report - Low Carbon Fuel Standard Re-Adoption

California's Next Steps for LCFS after Court Pushed the Pause Button

March 17, 2014 -- Michael Theroux

Introduction

California's Low Carbon Fuel Standard (LCFS), as proposed, is a global scale attempt to guide the transport fuels market toward significant greenhouse gas (GHG) reduction. The California Air Resources Board (CARB) approved the regulation in 2009, but the program hit a snag last year when the Fifth Appellate Court found problems with environmental impact and administrative procedures compliance, and "hit the pause button" on implementation.

In the eight months since the court ruling, CARB staff have redeveloped the program and is proposing that the agency's Board "re-adopt" the revised LCFS, formalizing a suite of changes to address the court's concerns and to strengthen transport fuels market certainty. In preparation for CARB's March 28, 2014 Board Meeting consideration, staff released numerous detailed documents and hosted two key workshops on March 11, 2014 to acquaint industry, other agencies, and the general public with the proposed revisions and potential implications of re-adoption. If indeed the Board re-adopts the program as proposed, staff expects that implementation of the major changes won't begin until 2015. It is more likely that this will remain an effort open to repeated revision and refinement; already, the number of opportunities for comment and public engagement are multiplying.

Teru participated in both workshops; this Focus report provides a condensed review highlighting aspects we feel are most pertinent to our interests in conversion of wastes and residuals into low carbon fuels.

Petro Refining Takes (another) Hit

At the top of the list of new concepts being considered in the revised program are numerous changes to the manner in which the state will count, monitor, cajole, threaten, and penalize the entrenched petroleum industry into reducing its greenhouse gas emissions across the board. Anyone making or selling gasoline, diesel, blendstock, or other petro-sourced fuel products in the state gets a piece of the action. Not all diesel is the same, despite the industry's attempt to sell the idea of one Carbon Intensity (CI) value fits all crude. The source is important, and so is the production methodology used to get that crude ready for market. It stands to reason that the more money you spend to buy better crude and to clean it up, the lower the inherent CI value. CARB does not really intend to allow "market forces" to dictate what comes into the state with impunity; either spend the money on the front end and plan on selling "good crude" or pay the LCFS piper.

You can't manage what you don't count, and CARB will require participating refineries to work toward much better accounting and characterization of inputs and outputs. Among the targets: refineries must provide sources and volumes of major intermediary refinery feedstocks and blendstocks, and of finished products supplied by outside refineries.

Waste and Residual Sourced Petro Refinery Feedstock

One way current petro-based oil and gas markets can be nudged toward producing and selling lower CI transport fuels is through use of renewable inputs to the refining process. "Green Crude" derived through pyrolysis of biomass can be directly fed into the refining cycle. So can a wealth of other waste and residuals derived hydrocarbons. A new approach is gaining favor: identifying economical ways to generate hydrogen (critical to refinery "reforming" to final products) from those same sustainable waste-sourced materials.

Green Feedstock Alternatives: How Much is Actually Available?

Using green crude, bio-hydrogen, or even biomethane from conversion of renewable and (at least) sustainable sources raises a different question. How much of this sort of material is actually available in the current marketplace, and how much can become available during the course of the LCFS program? CARB isn't the only agency trying to answer this question and the answer is not readily available. Working toward defining "waste," the agency plans to engage both public and private interested parties in an on-going effort to identify, document, and track proposed and real-time production of such low-CI additives, blendstocks, and hydrocarbon sources.

We can expect a considerable portion of LCFS program funding generated from fees placed upon petroleum refineries and other regulated parties to support waste and biomass conversion efforts. Coupled with the parallel Cap and Trade program and its support for "offset protocols", the multi-agency intent to "nudge" the marketplace may become a very significant "shove" toward the mandated GHG targets as the 2020 timeline for 10% reduction looms nearer.

LCFS Pathway Process Revisions

The LCFS methodology uses a life-cycle assessment (LCA) process to ascertain greenhouse gas and other impacts associated with production and supply of California's transport fuels. CI values are assigned as noted for varying types of petroleum-sourced fuels, and these can then be compared with CI values researched and posted for any number of non-petroleum sourced alternative fuels. Many complain that the ever-increasing number of "pathways" now being identified, proposed by developers, and analyzed and added to the legal "look-up table" will over-load CARB's ability to monitor and maintain the detail. Yet as we stated in our 2011 [Interim Guide to the LCFS](#), we feel it is far better to open the doors to inventive, entrepreneurial expansion of low carbon fuels than to take the position, as other state agencies maintain, that if they don't understand the process, it can't be allowed.

In the current revisions, a two tiered application process would be established for purposes of improving access to and understanding of existing low carbon fuels production methods or pathways. A series of "bins" would be designated with incremental CI values; applicants would be slotted into a specific bin according to the CI value of their proposed method. Tier One pathways include starch and sugar-based ethanol, transesterification-produced biodiesel, renewable diesel, natural gas, and electricity. Tier Two is designed to provide a berth for next-generation fuels, and includes cellulosic alcohols, biomethane, hydrogen, drop-in fuels, and an "other" category left open for innovation beyond the current known fuels.

Of strong interest: Tier Two would also include first-generation fuels such as sugar based ethanol that are instead produced using "qualified innovative methods" (yet to be defined). In *this* category, we find reforming of low-CI "process energy" such as biogas into advanced fuels. Carbon capture and storage (CCS) would fall within Tier Two, as would electricity used as a fuel that is produced from dedicated renewable methods. Finally, Tier Two is the proposed "home" of low carbon fuels produced by conversion of waste or residual feedstock. Of course, "waste" can be defined a hundred different ways. In introducing this stage of the proposed re-adoption, CARB staff announced plans to form a working group to lock down what is, and what is not, a waste, clarification which can be a boon to refineries for identifying CI value and GHG emissions reductions options.

Feedstock Chain of Custody

Particularly with the proposed Tier Two LCFS Pathway application and registration process, staff has emphasized the need for improved data quality and quantity to ensure accuracy and facilitate external validation. One critical aspect of application process enhancements would be stringent requirements that LCA parameters be documented, and this includes verifiable tracking of the chain of custody as feedstock materials are gathered, pre-treated as needed, and delivered for conversion to low-CI fuels. Lack of definitive chain of custody data for waste-sourced feedstock has complicated LCA assessment for past applications, and to a degree, compromised the validity of ultra-low CI values for waste conversion fuels.

Methods of calculation would probably follow a version of the new LCA modeling tools developed by Argonne National Laboratory known as the Greenhouse gases, Regulated Emissions, and Energy use in Transportation (GREET). If use of the new, purportedly more accurate (and data-intensive) GREET tools are approved, CARB also proposed to recalculate existing regulated pathways, a revision that is expected raise the CI value for many regulated parties' fuels.

Cost Containment and Market Stabilization

The emerging CI credit market has all the earmarks of a program that could experience wild swings in availability of tradable credits, and could initiate or at least complicate equally dramatic price fluctuations. CARB staff has proposed two "cost containment provisions" to counteract and manage this potential, in order to increase market stability and surety. Alternative credit options would become available near years-end, if and when insufficient CI credits were available to offset obligations. Option 1 is described as a Credit Clearance whereby regulated parties could carry cumulative GHG compliance deficits over into the next year by purchasing from a state-managed "pledged credit" pool. Option 2 is a Credit Window, which would allow regulated parties to purchase and retire "compliance-only" credits valued at a rate pre-established by CARB.

With both options, the funds raised are seen as a source of support for project development to encourage additional low-CI fuel production. The nature of disbursements have yet to be defined, other than conceptually being a distribution to low-CI fuel producers to further incentivize production.

Indirect Land Use Changes (iLUC)

On the global low carbon fuel scene, one of the most controversial and least understood aspects has to do with environmental and economic "collateral damage" attributable to low carbon fuels production. The European community has struggled with this concept for years and recently settled on preliminary modifications to their underlying renewable / sustainable fuels regulations. Of the LCFS related activities underway in the western region of North America, only California is aggressively working to define and implement iLUC metrics as an element of the broader LCFS. Oregon, Washington, and British Columbia appear to be waiting for California to "work the bugs out" of this complex issue. CARB staff dedicated the entire second half day workshop to iLUC considerations.

Staff has used the Global Trade Analysis Program (GTAP) to estimate iLUC associated with low carbon fuels production. On the surface, the intent of monitoring iLUC is to push the market toward less intrusive, less disruptive land use methods, away from whole-sale land-grabs and abrupt conversions from native landscape to farmed fuel feedstock. Unfortunately, global biofuels production has remained at the crux of this argument. In this argument, we also find rooted the debate of Food vs. Fuel, a topic that can so confuse iLUC examination as to result in a "hands-off" caution, despite overarching scientific agreement that with few (although very notable) exceptions, biofuels production can actually *support* surrounding agricultural activities. One prime example of this mutualism: developing a viable biofuel feedstock supply market for rejected "culls" from fruit and vegetable production reduces risk and improves the farmer's overall economic profile.

General agreement holds that high iLUC values indicate non-sustainable production regardless of the underlying GHG implications. For those of us not well versed in complex socio-enviro-economic modeling, the level of detail seems beyond comprehension. It would also seem that among those who profess their understanding, there is very little consensus *anywhere* regarding the proper analytical model, the data collection methods, or the analyses of the resulting data.

CARB is rather courageously pushing forward on the issue by posing numerous scenarios as to what iLUC might actually mean in terms of a numerical weighting on low carbon fuel CI values. Staff admits iLUC assessments and proposed valuations are only preliminary; ranges are being identified for a wide range of low CI fuels pathways and methods for determining those values (as the 2009 LCFS regulation mandates) will remain under discussion.

Parting Shots

If the iLUC debate illuminates anything, it is that regardless the resulting CI of a fuel, the social and environmental processes necessary for its production must be demonstrably *sustainable*. Whether we assess the "elasticity" of crop production for more or less food versus fuel, the cumulative acreage conversion from forest to biocropping, the variability of waste usage or really any other socio-environmental parameter, low carbon fuels production must be able to prove a first preamble of "do no harm".

In the heat of the workshop debate over iLUC metrics and methods, CARB staff made it quite clear that in their opinion, the entire program is naturally favoring conversion of waste and residual feedstock as the least contentious, most beneficial "pathway" yet assessed for production of low-iLUC, low-CI, low carbon fuels.

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