



May 9th, 2014

Attention:
John Curtis & Jim Duffy
California Air & Resources Board
Alternative Fuels Section

BrightSource Energy's Informal Comments on the Workshop to Discuss Refinery and Crude Oil Provisions as well as the Proposed Language on Innovative Crude Production

I. Introduction

BrightSource Energy, Inc. ("BrightSource") appreciates the opportunity to comment on the proposed amendments to the section of Low Carbon Fuel Standard ("LCFS") regulation regarding the Innovative Crude Provisions. The LCFS is a transformational regulation which concurrently encourages greenhouse gas emissions reductions as well as stimulates the deployment of new clean energy technologies in the oil production, refining and transportation sectors. The proposed amendments to the Innovative Crude Provisions will further those initiatives by creating a more certain investment environment and providing investment signals to those entities most appropriate to implement.

BrightSource is a leading provider of solar thermal steam and electricity generation technology. The company's technology employs a field of mirrors which direct sunlight on a solar receiver steam generator located atop a tower. These mirrors, known as heliostats, are individually controlled by the company's proprietary software in order to create precise steam temperatures and pressures for steam and/or electricity generation, specified for a given application. In 2011, BrightSource completed the installation of a 29 MW-thermal facility at the Chevron Coalinga oil field in California - the world's largest solar steam generator for enhanced oil recovery, which continues to operate successfully and at design specifications.

II. Comments and Recommendations on Proposed Innovative Crude Provisions

BrightSource provides the following specific comments and recommendations related to the proposed amendments to the Innovative Crude Provisions of the LCFS regulation:



- *Crude Producer Participation as a Regulated Entity*

BrightSource supports the amendment allowing for crude producers to opt-in as a Regulated Entity and therefore directly receive LCFS credits, rather than the current provision limiting receipt of credits to refiners. This change removes the largest, most fundamental barrier to investment in Innovative Crude production methods by granting LCFS credits to the entities with direct decision making control over Innovative Crude investments.

- *Requirements or Limitations on Ownership of Innovative Crude Production Equipment*

Staff has made it clear to BrightSource that only Regulated Entities may be the recipient of LCFS credits, i.e., oil producers and oil refiners. BrightSource fears that this may inhibit investment in innovative technologies, specifically solar steam generation, but it understands that creating a limited exception for Innovative Crude credits is challenging. However, Staff and/or the Board should clarify to commercial parties interested in the production of Innovative Crude that while LCFS credits may only be granted to a Regulated Entity, a third-party facility owner may sell steam and/or electricity to a Regulated Entity, which receives the LCFS credits associated with the resultant Innovative Crude production.

- *LCFS Market Data Transparency*

Generation of LCFS credits from Innovative Crude production is currently limited to Regulated Entities. As a result, Regulated Entities possess significant leverage in commercial negotiations with potential counterparties in and/or sellers of equipment and services to projects producing Innovative Crude credits. Staff has explained that there are no prohibitions against Regulated Entities conveying economic value to third parties as a proxy for LCFS credit generation; however, these third parties have no direct control over the timing and value of monetization of LCFS credits. In lieu of expanding the scope of allowable Regulated Entities, Staff and the Board can assist in the development of innovative contracting structures between Regulated Entities and potential counterparties by significantly increasing the data transparency regarding not only LCFS credit transactions, but also other LCFS historical and forward market data that may assist in projecting LCFS credit value. BrightSource would welcome further discussion with Staff and stakeholders to determine what types of market data provisions and disclosure would enable greater Innovative Crude production.



- *Adjustment to Minimum Threshold Requirement*

The current LCFS regulation includes a 1.0 gram of CO₂ / MJ threshold for the minimum amount of CO₂ reduction in order for an Innovative Crude project to qualify for receipt of LCFS credits. While the presentation given on April 18, 2014, by LCFS Staff proposed to “remove or substantially reduce the 1.0 gram of CO₂ / MJ threshold for CI reduction,” the proposed amendment language does not specifically mention the removal or existence of such minimum thresholds. BrightSource suggests that the regulation specifically address the threshold. At this time, BrightSource does not propose what a minimum threshold might be, or if it should remain unchanged for all or a sub-set of the Innovative Crude methods, but BrightSource would encourages further discussion on an appropriate threshold that is workable for stakeholder parties and promotes the reduction of carbon intensity through the deployment of the contemplated technologies.

- *Aligning Investment Time Horizon of Innovative Crude Projects with Commercial Realities of Crude Producer Contracting*

The renewable resource projects proposed as contributing to the production of Innovative Crude, under the current and proposed LCFS regulation, have substantial investment horizons, requiring reasonable economic value certainty, sometimes greater than twenty years. These projects, which are presumably encouraged by the Innovative Crude Provisions, will be largely captive investments, which can serve only a single entity. This is precisely the case for solar steam enhanced oil recovery projects, whereas even an on-site electric generating facility may be able to sell its output to multiple counterparties.

While oil fields are also long-lived assets with considerable operating stability, the commercial arrangements for the sale, and ultimate end-use, of the majority of a field’s crude oil production may not be long-lived or stable, especially for those fields not located in California. These circumstances create a potential, even likely, duration mismatch between renewable steam facility investment horizons and California crude delivery contracts for many candidate fields for Innovative Crude production.¹

BrightSource strongly urges LCFS Staff to consider accommodation within the Innovative Crude Provisions for solar and bio-mass steam enhanced oil recovery facilities. For example, an amended regulation may be written to allow for LCFS credit generation, from a solar or bio-mass steam generating facility, to be earned by any Regulated Entity (engaged in crude oil production) so long as it is selling *any* crude into the California transportation

¹ Further discussion with Staff may be warranted regarding a) the allocation of the steam production from a renewable facility to the portion of a field’s crude volumes contracted to California as well as b) the potential for minimum remaining durations of California crude contracts as of the date of renewable steam facility installation.



market.² (As electric generating facilities may be able to sell product to a regional electric grid and will offset retail energy costs regardless, this additional accommodation need not apply to these Innovative Crude production methods.)

In addition, the maximum threshold for generation of LCFS credits for Innovative Crude production would be set based on the *entire* field's carbon intensity (and maximum potential LCFS penalty) and not limited to the carbon intensity (and maximum potential LCFS penalty) associated with the portion of California crude. Without such provisions, a crude producer will avoid making investments in renewable steam generation projects to the extent that these investments effectively limit a producer's ability to sell its product to marketers and refiners *not* serving the California transportation fuel market. As a result, the intent to promote the Innovative Crude production methods will be thwarted by the regulation itself as producers will either under-invest in potentially sub-scale, less cost-effective projects or forego these investment altogether, both of which may lead to higher LCFS credit and societal costs to achieve the regulation's targets and goals.

- *Credit Ratio Certainty and Excess Generation Considerations for On-site Renewable Electricity Generation*

BrightSource strongly supports the proposed amendment to the LCFS regulation that extends Innovative Crude credits from the production of certain renewable electric sources. While BrightSource's technology is primarily applicable to solar steam generation for enhanced oil recovery, it may be optimal and thermally efficient for a facility employing BrightSource's technology to generate both solar thermal steam and electricity, using a steam turbine generator and its waste heat by-product, also known as co-generation. Therefore, this new source category for Innovative Crude credits is welcome as is the intent to fix the credit ratio of grams of CO₂ per kilowatt-hour of generation, currently proposed as 485 grams per kWh. To strengthen this provision as a means to encourage innovative methods, the regulation must explicitly commit to a constant ratio applicable to new facilities as of the date of their completion (which must be a clearly defined term) and provide sufficient advance notice - at least two years from Board authorization - for any anticipated changes to the ratio. The regulation should also clarify that there is no requirement for the on-site renewable electricity to displace on-site fossil-fueled generation, but rather it may offset electricity consumption from either on-site or regional grid sources.

In addition, Staff and proposed amendments to the regulation need to provide direction to stakeholders and potential crude producers regarding certain rules governing on-site electricity generation. Electricity demand at an oil field may fluctuate based on time of day and year, and the production of a renewable energy

² If an oil producer ceases to be an eligible Regulated Entity altogether, it should still be able to hold and sell LCFS credits.



resource may also vary based on resource availability and time of year. At any given time of day, the electric generating capacity of the on-site renewable resource may exceed the demand of the oil field, thus resulting in electricity flowing back to the regional grid, if interconnected to one. While BrightSource understands the intent of the LCFS regulation for innovative credits to be granted for providing electricity to an oil field for its crude production operations, it may be neither administratively efficient, nor logical from an emissions reduction perspective, to require every unit of electricity to be consumed on-site. BrightSource proposes that Innovative Crude credits from on-site renewable electricity to be limited by the total annual electricity consumption of the oil field. By doing so, the crude producer is only offsetting the emissions from and receiving credits for the electricity used to produce oil, but not receiving credits for excess generation which serves general demand on a regional grid, and more specifically, does not contribute ultimately to the carbon intensity of the California transportation fuel market.

III. Concluding Remarks

BrightSource thanks the LCFS Staff for its commitment to developing workable Innovative Crude Provisions and welcomes further opportunity to discuss the proposed amendments as well as the recommendations above.

Sincerely,

David Schlosberg

Senior Manager, Regulatory and Market Affairs
BrightSource Energy, Inc.