

## LOW CARBON FUEL STANDARD SUSTAINABILITY WORKPLAN

When the Air Resources Board (ARB or Board) approved the Low Carbon Fuel Standard (LCFS) on April 23, 2009, the Board directed staff in Resolution 09-31 to work with the Interagency Forest Work Group (IFWG), appropriate state agencies, environmental advocates, regulated parties, and other interested stakeholders to present a workplan to the Board by December 2009 for developing sustainability provisions to be used in implementing the LCFS regulation. The workplan is to provide a framework for how sustainability provisions could be incorporated and enforced in the LCFS program, and it should include a schedule for finalizing feasible and appropriate sustainability provisions by no later than December 2011.

### I. Importance of LCFS Sustainability Provisions

The LCFS regulation will reduce the carbon intensity of transportation fuels by at least 10 percent by 2020. To accomplish this goal, alternative, lower-carbon-intensity (CI) transportation fuels must replace petroleum-based fuels. Examples of these alternative fuels are cellulosic ethanol, biodiesel, alternative diesel, electricity, natural gas, and hydrogen. Since the LCFS will create a higher demand for these alternative fuels, it is important for staff to address the sustainable production of these fuels.

Sustainability is generally considered to be the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs. A scientific definition is the long term viability of natural resource consumption in balance with the supporting ecosystem. The three major components of sustainability are environmental, social, and economic sustainability.

#### Environmental Sustainability

Environmental sustainability ensures that the production and delivery of alternative fuels do not harm natural resources, such as land, water, and air. For liquid biofuels, sustainability includes the cultivation, collection, and processing of feedstocks, as well as the distribution of the biofuels themselves. Land impacts include those affecting soil quality, soil erosion, and loss of biodiversity; water impacts take into account water quality and availability; and air impacts can include increased emissions of criteria pollutants (such as nitrogen oxides and particulate matter), toxic air pollutants, and greenhouse gases (GHGs).

The Board-approved LCFS regulation contains provisions that already address some of these environmental sustainability issues. By its very design, the LCFS will result in a net reduction of greenhouse gases by taking into account the full lifecycle GHG emissions of alternative transportation fuels. For each fuel pathway, the LCFS requires the analysis of both direct effects and indirect effects when determining the carbon intensity of the fuel.

Direct effects take into account farming practices (e.g., frequency and type of fertilizer used), crop yields, harvesting practices, transportation of the feedstock, the type of fuel-production process used, its efficiency and fuel use, the value of co-products generated, and the transport and distribution of the fuel. Biofuels that are energy-intensive to produce and distribute will have higher CI values and be of less value when complying with the LCFS standards.

ARB staff has only identified one indirect effect that generates significant quantities of GHGs: land use change effects. A land use change effect is initially triggered by a significant increase in the demand for a crop-based biofuel. When farmland devoted to food and feed production is diverted to the production of that biofuel crop, supplies of the displaced food and feed crops are reduced. Supply reductions cause prices to rise, which, in turn, stimulates increased production. If that production takes place on land formerly in non-agricultural uses, a land-use-change impact results. The specific impact consists of the carbon released to the atmosphere from the lost cover vegetation and disturbed soils in the periods following the land use conversion.

The analysis of indirect land use effects is relatively new and controversial. The Board directed staff, through Resolution 09-31, to convene an expert workgroup to assist us in refining and improving the land use and indirect effect analysis of transportation fuels. This workgroup will evaluate key factors that might impact the land use values for biofuels including agricultural yield improvements, co-product credits, land emission factors, food price elasticity, and other relevant factors.

Although the LCFS does address some environmental impacts through the analysis of fuel pathways, it does not yet address environmental sustainability issues such as biodiversity; protection of specified sensitive lands; biomass collection volumes; the definition of “renewable biomass”; water quality and adequate water supplies; soil quality and erosion, and localized air quality impacts. The California Environmental Quality Act (CEQA) addresses many these potential impacts in California; however, these impacts must be some of the sustainability issues addressed within the next two years.

### Social Sustainability

Social sustainability includes the consideration of labor rights, income distribution, working conditions, the land rights of indigenous people, environmental justice, and food prices and food security. The concern is that the LCFS, by creating a market for low-CI alternative fuels, may attract biofuels that come at the expense of adverse social impacts. These potential social impacts must be addressed as part of staff’s sustainability analyses over the next two years.

The United Kingdom, the European Union, and the Netherlands have been tackling sustainability issues of biofuels because of their own mandates for biofuel use. Unlike Europe, which imports nearly all of its biofuels, the United States is expected to produce most of its own biofuels. Nevertheless, ARB is committed to working with our national

and international partners to address potential social issues arising from the worldwide demand of biofuels. To this end, staff is gathering information on current international activities and identifying contacts with whom to engage. Staff proposes to introduce itself (and the LCFS), and participate/monitor the pertinent sustainability activities of these entities.

### Economic Sustainability

Economic sustainability should also be considered when addressing the production and use of alternative fuels. Economic sustainability overlaps previously mentioned social concerns regarding food prices and food security, but it also includes creating an economic environment in which alternative fuels can be produced and distributed on a long-term basis. Economic incentives, such as grants and tax credits, help in this regard; however, any market is more likely to thrive when uncertainty is removed to the greatest extent possible. To that end, staff will work with alternative fuel producers and distributors, petroleum-based transportation fuel providers (such as refineries and distributors), and other affected parties to address the economic sustainability of meeting the LCFS standards. Staff believes that the LCFS can improve California's economy by attracting investment in biofuel production within the State.

## **II. Key Elements for Addressing Sustainability within the LCFS**

As staff initiates the effort to develop sustainability provisions to be used in implementing the LCFS regulation, it is premature to determine if the provisions will be regulatory in nature (i.e., incorporated into the LCFS regulation), or a set of policies approved by the Board to establish a sustainability framework for the LCFS, or both. In any of these scenarios, there must be an overall framework for addressing sustainability.

A report<sup>1</sup> published by researchers at the University of California at Davis (UC Davis) examined a range of sustainability requirements for biofuels and considered a possible framework for LCFS sustainability provisions. This section briefly discusses some of the key elements of the proposed sustainability framework.

The study reviewed sustainability requirements and criteria being implemented or proposed by governments promoting biofuel programs—particularly the United Kingdom and the European Union. The study also reviewed the sustainability principles and criteria proposed by the Roundtable on Sustainable Biofuels (RSB). RSB is an international initiative involving stakeholders across the entire biofuel supply chain,

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<sup>1</sup> Yeh, S.; Summer, D.; Kaffka, S.; Ogden, J.; Jenkins, B. *Implementing Performance-Based Sustainability Requirements for the Low Carbon Fuel Standard – Key Design Elements and Policy Considerations*; Research Report UCD-ITS-RR-09-05; Institute of Transportation Studies, University of California, Davis: Davis, CA, 2009.

nongovernmental organizations, experts, governments, and inter-governmental agencies.

Some of the key elements identified in the study for a sustainability provision include:

- Principles and criteria
- Benchmarking and/or third-party certification requirements
- Supply chain and reporting requirements
- Legality

### Principles and Criteria

Setting sustainability standards requires the adoption of principles and criteria by which sustainability can be measured. Principles may address specific impacts, such as soil, water, and air impacts; human and labor rights; food prices and security; and conservation of specific natural resources. Within these principles lie the criteria that are the essential elements of a sustainability provision. Examples may include defining eligible “renewable biomass,” requiring that workers' wages and working conditions respect all applicable laws and international conventions, or requiring biofuel production to not withdraw surface or groundwater resources beyond replenishment capacities.

The California Energy Commission (CEC), in response to recent legislation<sup>2</sup>, has been developing sustainability principles and criteria for its Alternative and Renewable Fuel and Technology Program. The intent of the program is “to develop and deploy alternative and renewable fuel and advanced transportation technologies to achieve the State’s climate change policies, reduce petroleum use, increase the use of alternative fuels and spur the development of in-state bioenergy sources.”<sup>3</sup> Since the program awards public funds for projects that meet these objectives, CEC staff has had to develop sustainability metrics through which funding priorities are determined. ARB staff commends the CEC accomplishments and will continue to work closely with CEC staff on sustainability issues common to both agencies.

### Benchmarking and/or Third-Party Certification

Incorporating sustainability provisions into the LCFS must be more than a guiding philosophy or overall policy. A baseline or benchmark must be identified against which the environmental, social, and economic impacts of alternative fuel production can be measured. Currently, there are a number of organizations that have established, or are establishing, benchmarks for biofuel sustainability. For example, there are several certifying organizations that explicitly address forestry products:

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<sup>2</sup> Assembly Bill 1118 (Núñez, Chapter 750, Statutes of 2007) and Assembly Bill 109 (Núñez, Chapter 351, Statutes of 2008).

<sup>3</sup> CEC. *Investment Plan for the Alternative and Renewable Fuel and Vehicle Technology Program*; CEC-600-2009-008-CMF; California Energy Commission: Sacramento, CA, 2009

- Forest Stewardship Council (FSC)
- Programme for the Endorsement of Forest Certification (PEFC) schemes
- American Tree Farm Systems (ATFS)
- Sustainable Forestry Initiative (SFI)
- Canadian Standards Association (CSA)

Certifying organizations for other biofuels include:

- Roundtable on Sustainable Biofuels (RSB)
- Roundtable on Responsible Soy (RTRS)
- Roundtable on Sustainable Palm Oil (RSPO)
- Council on Sustainable Biomass Production (CSBP)
- Better Sugarcane Initiative (BSI)
- Western Renewable Energy Generation Information System (WREGIS)
- Sustainable Biodiesel Alliance (SBA)
- Sustainable Agriculture Network (SAN)

Whether ARB establishes its own sustainability principles and criteria to which the standards of certifying organizations must be benchmarked, or accepts the certification of some of the organizations as proof of sustainability, staff must follow the development of sustainability standards developed by other countries, organizations, or industry groups that can serve as models for California.

#### Supply Chain (Chain of Custody) Requirements and Reporting Requirements

Tracking biofuel feedstocks through the entire process of harvesting, collecting, and converting them to biofuels, then distributing the biofuels themselves, can be complicated. However, to ensure that biofuels are being produced in a sustainable manner, some chain of custody (CoC) method must be used to track them. Generally, the three types of CoC methods are segregation, book-and-claim, and mass-balance.

The segregation system is the strictest, requiring certified commodities to be fully traceable and completely separated from non-certified. As applied to the LCFS, completely segregating feedstocks and the resultant biofuels produced is impractical for all but the smallest of batches of biofuels.

With a book-and-claim method, feedstocks and biofuels are not traceable to the source. Certificates ensure that the biofuels were produced and introduced into the fuels market, but their ultimate use is unknown. Electricity markets use this method for tracking renewable energy credits. Producers of renewable energy guarantee the production of renewable energy through a certification process. The certified credits are traded in the market, but the specific source of the renewable electricity cannot be traced once the electricity is put into the electrical grid.

With the mass-balance method, certified and non-certified feedstocks and biofuels can be mixed, but certifications for the feedstocks and biofuels must stay with the finished products along the supply chain. This method may be more amenable to the LCFS. The LCFS requires all regulated parties to report quarterly specific fuel pathway information, such as fuel type, blendstocks (if applicable), feedstock type, fuel quantity (in megajoules), federal renewable identification number (RIN), if applicable, feedstock origin, process information, and fuel carbon intensity. Perhaps a third-party sustainability certification can accompany this feedstock/biofuel data.

### Legality

When developing sustainability standards, caution must be used so that rules of the World Trade Organization (WTO) are not violated. The WTO requires that regulations and standards should neither create unnecessary barriers nor discriminate against products with the same physical properties but with different production process and production methods (PPM).

Studies<sup>4</sup> examining the WTO issue generally concluded the following:

- Some of the sustainability principles and criteria may violate this WTO PPM rule.
- A reporting obligation for companies to deliver information on the sustainability of their biomass is considered feasible under WTO law. Therefore, a proposed sustainability framework that requires reporting is unlikely to violate WTO rules.
- Minimum demands for biodiversity and environment may have a medium-high risk of violating WTO rules.
- Minimum demands on economic prosperity and well-being will be in violation of the WTO, except for extreme human rights violations (e.g., slavery).

These WTO constraints reinforce the need for ARB to work collaboratively with national and international partners when addressing sustainability provisions for the LCFS.

The UC Davis study (Yeh et al) concluded:

A sustainability scheme can only be effective if the proposed framework is robust but not excessively complicated, and the criteria are measurable and verifiable. It also needs to acknowledge the limitations of resources, politics, and California's legal jurisdiction and be consistent with international efforts in sustainability criteria. Government assistance in facilitating information sharing, certification, and capacity will be crucial for the development of the sustainability criteria.

ARB staff concurs with this assessment.

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<sup>4</sup> See Reference 1 (Yeh et al) for attributed studies.

### **III. ARB Process for Addressing Sustainability Provisions for LCFS**

In developing sustainability provisions for the Low Carbon Fuel Standard, ARB staff will:

1. Work with the Interagency Forest Work Group (IFWG), appropriate state agencies, environmental advocates, regulated parties, and other interested stakeholders in an open, transparent, and fully participatory process.
2. Work with national and international partners to address potential social issues arising from the worldwide demand of biofuels.
3. Work with alternative fuel producers and distributors, petroleum-based transportation fuel providers (such as refineries and distributors), and other affected parties to address the economic sustainability of meeting the LCFS standards, especially as it pertains to the California economy.
4. Follow the development of benchmark systems developed by other countries, organizations, or industry groups that can serve as models for California.
5. Determine how the sustainability provisions can incentivize sustainable fuels.
6. Comply with Health and Safety Code section 38562(b), enacted by AB 32, that requires the ARB, to the extent feasible, to ensure that activities undertaken do not disproportionately impact low-income communities and to consider overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health.
7. Prioritize efforts in a manner that focuses on California's natural resources, such as forests, water, and land use, while recognizing national and international sustainability activities.

**IV. Proposed Schedule for LCFS Sustainability Workplan**

<b>Date</b>	<b>Action</b>
January 2010	<ul style="list-style-type: none"> <li>• Work with CEC staff to identify near-term sustainability research opportunities.</li> </ul>
February 2010	<ul style="list-style-type: none"> <li>• Form an LCFS Sustainability Work Group (SWG) consisting of representatives from IFWG, appropriate state agencies, environmental advocates, regulated parties, and other interested parties to provide input on the development of the LCFS sustainability provisions.                             <ul style="list-style-type: none"> <li>– Establish protocols for SWG</li> <li>– Establish overall workload</li> </ul> </li> </ul>
April 2010	<ul style="list-style-type: none"> <li>• Identify and discuss sustainability issues related to forests.</li> <li>• Develop definition of “renewable biomass.”</li> </ul>
June – Dec 2010	<ul style="list-style-type: none"> <li>• Assess third-party certifiers for potential acceptance of benchmarks.</li> <li>• Design compliance framework, including chain of custody and reporting requirements.</li> </ul>
August 2010	<ul style="list-style-type: none"> <li>• Identify and discuss sustainability issues related to State’s water resources.</li> <li>• Identify and discuss sustainability issues related to State’s agricultural lands and associated land use.</li> </ul>
Oct - Dec 2010	<ul style="list-style-type: none"> <li>• Draft language related to forest, water, and land use sustainability provisions.</li> </ul>
January 2011	<ul style="list-style-type: none"> <li>• Conduct a public workshop to discuss accomplishments and future activities.</li> </ul>
March 2011	<ul style="list-style-type: none"> <li>• Determine incentives available for biofuels.</li> <li>• Draft language related to social sustainability</li> </ul>
May 2011	<ul style="list-style-type: none"> <li>• Complete first draft of environmental, economic, and social sustainability provisions</li> <li>• Determine approach to incorporating provisions (regulatory/policy)</li> </ul>
July – Sept 2011	<ul style="list-style-type: none"> <li>• Conduct public workshops on draft sustainability provisions</li> </ul>
October 2011	<ul style="list-style-type: none"> <li>• Release proposed regulation and/or policy document, initiating formal 45-day public comment period (if applicable)</li> </ul>
December 2011	<ul style="list-style-type: none"> <li>• Present LCFS sustainability recommendation to the Board</li> </ul>