



Environmental and Social Sustainability Standards in California's Low Carbon Fuel Standard

Introduction

Climate change has famously been called “the greatest market failure the world has ever seen (Stern, 2006).” GHG emissions impose a substantial negative impact on people and the environment but are not priced into the transactions responsible for their emission, thus creating an externality. Programs such as the LCFS are attempting to address and reduce this externality, but may inadvertently create other environmental and social externalities if effectuated without consideration for the sustainability¹ impacts that might co-occur from the production and use of low-GHG technologies and alternative fuels.

Some of these impacts will be positive externalities or “win-win” situations. For example, where comprehensive emissions accounting creates incentives not to produce fuels from previously forested land because of its high GHG content, the environmental and social services derived from that forest are preserved. Protecting these lands for their carbon content—as is being done through the European Commission’s (EC) “Renewable Energy Directive” (RED)—accrues positive externalities by protecting the lands’ ecosystem values and generating environmental benefits ranging from habitat retention for migrating species to filtering contaminants from surface waters.

There are, however, a preponderance of cases in which GHG emissions reductions are inversely correlated with negative impacts on other environmental and social parameters. For example, new understandings of market-mediated or ‘indirect’ land use change (iLUC) (Hertel et al., 2010; Searchinger et al., 2008) indicate that producing biofuels on currently cultivated land leads to extensification of

¹ The term “sustainable” is the source of much debate in environment and development circles. Rather than interrogate the term here, we will defer to the Brundtland Report from the World Commission on Environment and Development (Brundtland, 1987), which defined sustainability as an activity that meets the “needs of the present without compromising the ability of future generations to meet their needs.” In practice, the sustainability standards discussed here aim broadly to ensure that alternative fuel development does not occur at the expense of long-term environmental and social well-being. This report does not extensively address the issue of economic sustainability, but FoE recognizes this aspect of sustainability and will address this in future reports and LCFS Sustainability Workgroup meetings.

agriculture, bringing about new habitat degradation. Similarly, the imperative to increase yields in order to minimize the cropland required for biofuels due to iLUC battles is likely to cause growers to intensify use of synthetic inputs, employ GMO crop technologies or to irrigate biofuel crops that could otherwise be grown in rain fed conditions. In a more complex case, incentives to reduce GHG emissions can incentivize sugarcane farmers not to burn their fields prior to harvest. This means reduced air pollution, but also means that the fields must be harvested mechanically rather than by hand, reducing unskilled jobs. Clearly, there is a likely potential for tradeoffs between GHG reduction and other social, environmental, and economic imperatives.

A report from the International Food Policy Research Institute (IFPRI) perhaps explained this issue best when it said:

Because most of the environmental and social benefits and costs of bioenergy are not priced in the market, leaving bioenergy development entirely to the private sector, the market will lead to bioenergy production and processes that fail to achieve the best environmental and social outcomes (Hazell and Pachauri, 2006).

This statement is referring to the market for energy, but the same could be said for the carbon market that is effectively created by the LCFS for low-carbon fuels.

The Low Carbon Fuel Standard and Biofuels

California's Low Carbon Fuel Standard (LCFS) calls for a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020, which will largely be met through an increase of biofuel production and use, especially in the early years of the standard's implementation. For example, the LCFS outlines four scenarios for achieving GHG emission reductions from gasoline, each of which includes substantial contributions from ethanol. These scenarios include a broad range, from 2.2 billion gallons to 3.1 billion gallons per year by 2020 (CEC, 2011).

However, the growing shift from conventional petroleum to various renewable or alternative fuel substitutes, especially biofuels (and corn ethanol in particular), carries with it a range of environmental, social, and economic risks. Friends of the Earth (FoE) is working with the California Air Resources Board (ARB) and other stakeholders to ensure that reductions in carbon intensity of fuels consumed in California pursuant to the LCFS, especially through the increased use of biofuels, are not made at the expense of, and are complementary to, other environmental and social imperatives.

In this report, we will concentrate almost exclusively on the issue of biofuels and sustainability. Although the LCFS sustainability process considers the environmental and social impacts of a variety of

alternative fuel types, this report will concentrate on an analysis of biofuels sustainability specifically for the following reasons:

1. California's Low Carbon Fuel Standard sets a target of 10 percent reduction below the petroleum baseline for the overall blend of light duty transportation fuels in California; however, due to limited distribution and automobile infrastructure now in place for natural gas, hydrogen, and electrification, it is expected that biofuels will be used in abundance to meet the Standard in the early years of the program.
2. Biofuels have taken a prominent role in low carbon fuel programs and renewable fuel mandates around the world. Despite the legitimate concerns raised about the environmental and social impacts resulting from their production and consumption, biofuel mandates and supply-side and demand-side government support for biofuels have continued to proliferate. For example, the EU's Renewable Energy Directive (EU-RED) calls for biofuels to make up ten percent of EU transportation fuel by 2010. The US Renewable Fuel Standard (RFS2) will dramatically increase the total amount of biofuels consumed in the U.S. by 2022, the majority of which will be met through corn ethanol.
3. The proliferation of bioenergy production, and its attendant shift and expansion in agricultural activity, raises a number of environmental concerns – ranging from greenhouse gas emissions to deforestation (due to direct and indirect land use change), increased water use, soil degradation, and biodiversity impacts, to name just a few. Biofuel production can also raise critical social risks, including diminished food security and loss of land rights (i.e. land grabs) as international demand for agricultural commodities compounds existing land and productivity constraints.
4. Despite increases in production within California, a large expansion in biofuel consumption will lead to large-scale imports of biofuels and biofuel feedstocks from the U.S. Midwest and abroad. The vast majority of the foreign expansion will come from the Global South, where there are longer growing seasons and less competition from existing commodity agriculture. These regions often have less stringent land-use and pollution regulations to protect their environments and their populations from the damage that could be wrought if this expansion is to proceed unmitigated and unconstrained by sustainability safeguards.

These represent just a few of the reasons why it is essential that ARB implements sustainability measures, especially *mandatory* sustainability measures (more in Recommendation #1 below), as part of

the LCFS in order to safeguard the global community and environment from unsustainable and destructive industry practices related to biofuel production. Even though biofuels have been promoted as an environmentally sustainable solution to our transportation energy demands, unfortunately, it has become increasingly clear that biofuels are not meeting their environmental promises and that so-called “advanced” biofuels are even further away from commercial scale than once imagined. Meanwhile, researchers and policymakers are coming to better understand the environmental harms of biofuels, including: 1) the relatively high level of greenhouse gas emissions resulting from most agriculturally produced biofuels, when direct and indirect land use changes are accounted for; 2) land use pressures leading to the destruction of sensitive ecosystems and forests; 3) rising costs of foodstuffs worldwide; and 4) increased agricultural impacts such as pesticide contamination, soil erosion, and nitrogen runoff contributing to marine dead zones. In developing countries, a major problem regarding food insecurity is sharpening as the impacts of climate change in terms of drought and flood are already being felt, just as the global displacement of food crops for biofuel crops is reaching all-time highs.

Opponents have argued that adding sustainability standards to the LCFS will diminish its efficacy in achieving the primary goal of carbon reduction and that sustainability concerns are best addressed in separate forums. While it might, in an ideal world, be more efficient to create independent policies to address the various carbon, environmental, and social concerns that are raised regarding fuel use, ARB is limited in its ability to do so. For example, although creating an LCFS in California is likely to incentivize the use of biofuels from, for example, Indonesia, potentially causing detrimental effects to Indonesian rainforests, ARB has no authority to create comprehensive and enforceable forest management regulations in Indonesia. Its ability to create sustainability mandates or incentives is limited to fuels sold into or within California. In light of this limitation, ARB should do whatever it can to make sure that its policies do not contribute to making a bad situation worse. As the seminal Brundtland Report (1987) argues, “...sustainability requires the enforcement of wider responsibilities for the impacts of decisions.” It is incumbent upon ARB, therefore, to consider these “wider responsibilities” as it proceeds in the implementation of fuel directives under the LCFS.

In creating a responsible fuels policy, it is important that we retain a broad view of the environmental and social interconnections that exist across the life cycle of a fuel, and consciously work to avoid unanticipated, negative consequences of these new policies. As noted in the Brundtland Report (1987):

[s]ectoral organizations tend to pursue sectoral objectives and to treat their impacts on other sectors as side effects....Many of the environment and development problems that confront us

have their roots in this sectoral fragmentation of responsibility... sustainability requires the enforcement of wider responsibilities for the impacts of decisions.

We appreciate that ARB, through its sustainability process, is attempting to avoid this type of policy myopia by evaluating and taking action to mitigate the environmental and social impacts of biofuels and other energy carriers incentivized under the Low Carbon Fuel Standard. In its sustainability proceedings, ARB has assumed responsibility for considering the broad implications of actions taken under the LCFS, rather than exclusively concentrating on reducing carbon intensity at all costs. In the interest of assisting ARB in this effort, this paper outlines a number of recommendations detailing the tools necessary for ARB to use to mitigate the environmental and social impacts that may result from implementation of the LCFS.

Recommendations

- 1. Mandatory, comprehensive sustainability criteria must be applied to all alternative fuels regulated under the LCFS.**

Mandatory sustainability requirements are the strongest safeguard against any detrimental social or environmental impacts that might ensue from implementation of the LCFS. If an Obligated Fuel Supplier is not able to show or prove that their fuels meet these requirements, that fuel batch should be barred from inclusion or credit under the LCFS. Friends of the Earth recognizes that there are arguable limits concerning the extent to which ARB can apply mandatory sustainability rules to the LCFS. In particular, mandating sustainability parameters for low carbon fuels could be interpreted as distinguishing among “like” products based solely upon production and processing methods (PPM), triggering a WTO violation. There are also concerns that sustainability mandates could be constrained by national commerce clause limitations.

However, even though the WTO has not yet ruled specifically on this issue, dispute history indicates that some types of PPM-based regulations would not be found in violation. For example, a dispute on shrimping methods (WTO, 1998) found that a PPM-based policy designed to protect turtles provisionally qualified for exemption under GATT since turtles were a shared “exhaustible natural resource.” Clean air has also been found to be an exhaustible natural resource (WTO, 1996) and it is probable that a

stable climate would qualify similarly.² Furthermore, mandatory policies based on life cycle GHG emissions are inherently PPM-based. Significantly, despite potential trade or commerce litigation concerns, given the clear environmental and societal harm associated with carbon emissions and with producing alternative fuels, agencies have begun to regulate on the basis of carbon intensity *and* mandatory sustainability, as is evidenced by the European Union’s EU-RED (Renewable Energy Directive) (see Appendix 1 for a summary description of this program). It is significant to note that this key alternative fuel policy is currently being implemented globally and contains *mandatory* sustainability limits, which the LCFS should emulate and, ultimately, take much farther in terms of depth and breadth.

For example, the European Union’s Renewable Energy Directive (EU-RED) specifies land related criteria restrictions on areas that can be sourced for biofuels. EU-RED includes both mandatory rules and reporting requirements, which were formally implemented in December of 2010, and include the following:

- A) The greenhouse gas emission savings from the use of biofuels and bioliquids ... shall be at least 35%. This figure ramps up over time to a 60% reduction.
- B) Biofuels and bioliquids... shall not be made from raw material obtained from land with high biodiversity value, namely land that had one of the following statuses in or after January 2008:
 - a. Primary forests
 - b. Areas legally designated for protection of nature or of rare ecosystems or species
 - c. Highly biodiverse grasslands
- C) Biofuels and bioliquids... shall not be made from raw material obtained from land with high carbon stock, namely land that had one of the following statuses in January 2008:
 - a. Wetlands
 - b. Continuously forested areas
 - c. Peat lands
- D) Biofuels and bioliquids derived from agricultural raw materials cultivated within the EU, must be grown in accordance with EC rule no. 73/2009 which sets out “minimum requirements for good agricultural and environmental practices.”

EU-RED is to be commended for including some mandatory criteria into its sustainability program. Clearly, the EU-RED’s mandatory sustainability standards provide a starting-point example and model of a regulatory body successfully requiring fuel providers to adhere to a mandatory sustainability scheme,

² The contents of this document are not represented and should not be construed as legal counsel provided to ARB by Friends of the Earth.

however much of the actual sustainability standard itself falls short as it is neither complete, comprehensive, nor far-reaching enough (see Recommendation #2 for information on comprehensive standards).

Friends of the Earth supports ARB's leadership in establishing mandatory sustainability standards by recognizing that there are fundamental resources that should not be compromised and negative impacts that should not be sanctioned in search of low carbon fuels. For such critically important environmental and social issues, we believe that ARB can develop comprehensive, mandatory standards that would reasonably be expected to be found compliant within legal structures such as the WTO.

2. Mandatory sustainability standards must be comprehensive and address both environmental and social concerns.

In developing a sustainability standard, values (*criteria*) are selected to define if an outcome is unsustainable, and measurable impacts of concern (*indicators*) are decided upon. These criteria, taken together, form the *standard*. FoE has reviewed the literature on standards being developed for sustainability governance (Dehue et al., 2007; Schmitz, 2007; Smeets et al., 2008; Spatari et al., 2008; Van Dam et al., 2007; Yeh et al., 2009). As a result of this review, a list of criteria has emerged which FoE broadly considers necessary for inclusion in a comprehensive sustainability scheme (this list includes tracking and reporting criteria).

Under the LCFS, producers should be required to meet the following mandatory criteria:

1. Legality
 - Prove baseline compliance with relevant local laws and regulations, as well as relevant international laws and agreements, including social, environmental, land rights, labor and water issues³
2. GHG Emissions
 - Ensure that biofuels contribute towards climate change mitigation by significantly reducing lifecycle GHG emissions compared to fossil fuel use

³ Many of the sustainability provisions listed can and should go above and beyond local and national laws and regulations as one of the main drivers of biofuel production in the Global South is that local and national laws are often made up of sub-par environmental and social standards.

- Meet the LCFS mandate: use of CA-GREET model to calculate lifecycle GHG emissions and achieve at least a 10% reduction by 2020
 - Preserve above and below ground carbon stock:
 - 1) Evidence must be provided that biomass production has not caused direct land-use change with a carbon payback time exceeding 10 years
 - 2) Evidence must be provided that fuels were made from feedstock that is additional to existing production for the purposes of avoiding indirect land use change; production is considered "additional" if it occurs on previously uncultivated land, results from yield improvements, or uses waste products as its feedstock
3. Land use
- Provide detailed information on where feedstock production is occurring, including information on whether any direct or indirect land use change has occurred
 - Determine state of land prior to January, 2008
 - Determine types of ecosystems present and general level of health
 - Locate refining plant sites through transparent, public and open processes
 - Ensure procedures are put in place to consult and communicate with local populations and interest groups on plans and activities that may negatively affect the legal or customary rights, property, resources, or livelihoods of local peoples
4. Food Security vs. Fuel
- Determine non-fuel provisioning services from land (food, feed, fiber) past and present, and in regions of poverty, ensure that biofuel production shall contribute to the social and economic development of local, rural, indigenous peoples and communities as *self-defined*
 - Implement strategies to enhance local food security, especially in food insecure regions
 - Utilize the FAO (Food and Agriculture Organization of the UN) four pillars of food concept to establish a baseline of food accessibility, food availability, food utilization and stability of food supply for the population
5. Soil Conservation
- Seek agricultural practices that maintain soil health, safeguard soil productive capacity and reverse degradation (if applicable)
 - Avoid runoff; employ erosion prevention and mitigation practices

- Maintain and improve soil nutrient balance (maintain and improve soil organic matter)
 - Maintain and improve soil pH
 - Maintain and improve soil structure
 - Prevent salinisation
 - Avoid or decrease use of synthetic fertilizers and/or pesticides used in the production process, with an emphasis on barring use of chemicals on the WHO's 1a and 1b lists
 - Comply with the Stockholm Convention's list of forbidden pesticides
6. Biodiversity & Habitat Conservation
- No destruction of habitat, buffer zones, ecological corridors and High Conservation Value (HCV) or High Biodiversity Value (HBV) lands, which in many cases may include forest lands, peat lands, mangroves, wetlands and native grasslands
 - No increase in incidence of invasive species as listed in the Global Invasive Species Database⁴
 - No disturbance impacts associated with production or collection of feedstocks or refining activities
 - Maintain or enhance ecosystem functions and services that are directly affected by biofuel operations
 - Maintain or enhance conservation values of local, regional or global importance within the potential or existing area of operation
 - No habitat fragmentation
 - As a baseline, no conversion of high biodiversity and other natural areas after January 1st, 2008
 - Documentation of the status of rare, threatened or endangered species (resident, migratory or otherwise) and high conservation value habitats in and around the production site
 - Documented and implemented management plan on how to avoid damage to or disturbance of the above-mentioned species and habitats
7. Water Impacts
- Maintain or enhance the quality of water resources, including reducing water usage where possible through efficiency measures, appropriate irrigation techniques etc. used for biofuel production

⁴ <http://www.issg.org/database/welcome/>

- Determine specific amounts / limits of agrochemical applications and runoff control (if any)
 - Determine irrigation method and water source(s)
 - Determine refinery/irrigation withdrawal and proof of water rights; do not deplete groundwater sources and maintain quality of surface and groundwater
 - Ensure locally appropriate water use
 - Identify waterborne refinery emissions (if any)
 - Complete a water management plan to ensure efficient water use
 - Reuse and recycle waste water where appropriate
8. Air Pollution
- Sources, species, and volumes of pollutants must be identified and characterized from feedstock production and refining activities
 - Identify open-air biomass burning and mitigate
 - Identify truck trips associated with fuel production
9. Technology and Inputs
- Information on technologies used in any phase of production will be made publicly available
 - GMO technology should be barred from use
 - Ensure that technologies and inputs used in agricultural practices minimize damages to the environment and people
 - Safety in storage, handling and disposal of chemicals and fuels wastes /byproducts (which cannot be reused or recycled) will be ensured
10. Human, Land and Labor rights
- Fulfillment of ILO labor standards and conventions and the UN Declaration on Human Rights: i.e. right to bargain and organize, no discrimination based on race, caste, national origin, religion, gender, age, disability, sexual orientation, marital status, union membership, those with HIV/AIDS, and seasonal, migrant and temporary workers
 - Ensure freedom of association and the right to collective bargaining must be upheld; workers exercising this right must not be discriminated against or suffer repercussions
 - Follow the UN Comprehensive Human Rights Guidelines on Development-Based Displacement for guidance on land rights

- Ensure that human and labor rights are not violated and the well-being of workers is generally promoted
- Ensure that workers are free of discrimination, in employment or opportunity, with respect to gender, wages, working conditions, and social benefits
- Identify wages paid to all workers in the supply chain
- Bar child labor involvement
- In the case of young workers (ages 15-17), the work carried out shall not be hazardous or dangerous to their health and safety; work shall not jeopardize their educational, moral, social and physical development
- Ensure access to potable drinking water, clean latrines, a clean place to eat, protective clothing and gear and medical care; accommodations provided must be clean, safe and meet the basic needs of workers
- Hazards must be minimized in the workplace and preventative measures put in place to minimize risks; records must be maintained of accidents which are audited by third-party compliance inspectors
- Determine status of land rights (i.e. method and source of land procurement) to guard against land grabs; disputed land will not be used
- Ensure that no slave labor or forced labor of any kind is practiced
- Uphold conditions of occupational safety and health for workers, following internationally-recognized standards. If national requirements exist, the higher of the two standards will be used
- Whether labor is subcontracted or temporary, the operator must demonstrate that the subcontractor is protected under the same environmental, social and labor standards as required for fully-employed or formally contracted labor

11. Monitoring and Tracking

- Environmental and social impact assessments must be completed by facilities producing and/or refining biofuel feedstocks
- Risks must be assessed and planned for
- Independent, third-party auditors must be employed to evaluate the monitoring, tracking and reporting
- FPIC (Free, Prior and Informed Consent) will be followed
- Transparency: documents will be made publicly available

For all of the above criteria, in the case of most biofuels, the risk of their sustainability not being achieved lies largely in the agricultural production phase of the life cycle. FoE agrees that the majority of sustainability concerns, and the largest potential for harm, arise at this point in the supply chain therefore making it essential for ARB to focus its sustainability standard-making efforts here (see Recommendation #3 below). However, it is essential that ARB also implement appropriate sustainability criteria throughout the supply chain to ensure full lifecycle sustainability of fuels, including the refining and transport stages of biofuel production / dissemination.

3. As part of a larger mandatory sustainability program, tracking and reporting of all criteria must be performed down to the field level⁵.

Any sustainability program with mandatory, comprehensive criteria required of fuel suppliers will necessarily include mandatory reporting *down to the field level* in order to achieve environmental and social performance goals. Effective tracking and reporting requirements, including complete environmental and social impact assessments for sustainability parameters, provide industrial transparency for government bodies and concerned stakeholders. Detailed reporting requirements could provide information on, for example, where farming or extraction of feedstocks is occurring, what kind of farming or extraction practices are being used, what soil erosion control measures are being taken, how ecosystems are being impacted, how much water is being used, what type and mass of pollutant load is being discharged, what labor practices are in use, etc. This then can be used to determine what lands are being impacted, whether species or their habitat are being negatively impacted (i.e. biodiversity impacts), how much water is being used in water-deficient areas, how much soil and pollutants are moving into waterways, how much air pollution is occurring, if there are labor abuses occurring etc. By collecting information on the various processes that occur in the lifecycle of producing a fuel, ARB can shed light on the real-world implications of the LCFS and the realities of the industries it seeks to influence, allowing the agency to better understand the market and the impact of the LCFS regulation. Of course, the development of robust auditing and compliance mechanisms will need to be paired with reporting and tracking to ensure accuracy (see Recommendation # 4 below).

Mandatory tracking and reporting requirements can also be considered an interim step towards mandatory standards implementation, allowing harmonization between jurisdictions, minimizing

⁵ We recognize that many biofuel production systems don't originate at the field level (e.g. waste oils which are repurposed and refined for biofuel use or algae-based biofuels etc.). We are using the term 'field level' in this paper as short hand to indicate the supply chain origination of the fuel.

leakage (see Recommendation #8), and creating “learning by doing,” wherein regulators can develop criteria and systems for accreditation as stepping stones before they become mandatory. Through tracking and reporting, producers across the supply chain can also become familiar with the sustainability parameters of their production and can identify areas of concern or improvement in advance of mandatory implementation, including opportunities for efficiency gains. In short, Obligated Fuel Suppliers come to better understand their liabilities in a carbon-constrained world and can make early investments to position themselves strategically in light of expected future obligations and requirements.

It is important to note that mandatory reporting and tracking should not be used as a substitute for mandatory adherence to standards, which should involve meaningful penalties and fines if not adhered to. The primary drawback of relying on reporting to govern sustainability is that regulatory intent may not always translate into a regulatory reality. Simply requiring tracking and reporting of information regarding the environmental and social impacts of fuel supply chains does not necessarily lead to improved outcomes in these areas, which is why *requiring adherence to mandatory sustainability criteria* (as outlined in Recommendation #1) is the most secure way for ARB to ensure that the LCFS is achieving robust sustainability performance .

The experience of the United Kingdom’s Renewable Transport Fuel Obligation (RTFO), with its sustainability reporting requirement, bears out this concern (the UK Department for Transport now manages the RTFO; the Renewable Fuels Agency (RFA) which originally governed the RTFO was dismantled in the Spring of 2011, presumably due to budgetary constraints). Having commenced in April 2008, the RTFO is the UK’s primary policy focused on the expansion and sustainability of renewable fuel for transport. The RTFO’s aim is to expand the reach of renewable fuel by requiring that 5.26 percent of all road vehicle fuel be supplied from renewable sources by 2013. The Department for Transport expects this expansion will lead to a reduction in the GHG intensity of transport but does not set a specific, binding, GHG-reduction target.

The reporting structure of the RTFO requires fuel suppliers to report on both net GHG savings and sustainability impacts associated with their fuel production. In addition, the Department for Transport monitors and reports on indirect impacts. However, in the latest annual report of the RTFO, even though it was found that tracking and auditing of sustainability data has greatly improved as a result of the reporting requirement, an August 2010 article by the BBC states that "The Renewable Fuels Agency says it is disappointed that the vast majority of biofuels sold on UK forecourts do not conform to environmental standards" (Kniver, 2010). In 2010, the RFA publicly stated that fuel suppliers in the UK

were meeting legally binding volume targets for renewable fuels, but some were falling 'well short' on achieving voluntary sustainability standards. These lessons learned through implementation of the RTFO should underscore for ARB the need to move away from a voluntary sustainability scheme for the LCFS, and towards a mandatory one. The improvement in tracking of data are essential for the many reasons listed in the previous section, but insofar as these systems seek to improve performance, we have insufficient evidence as to their efficacy.

Field-level tracking:

As stated above, without sustainability reporting from the field level, regulators will ultimately be left in the dark as to the environmental and social impacts resulting from implementation of the Standard. As the UK's RTFO Technical Guidance document states, "The principle environmental and social risks arising from biofuel production arise at the plantation."⁶ In order for sustainability principles to be upheld, regulated parties must report on sustainability metrics along the entire fuel supply chain, from the field-level to the end-user, especially given that the vast majority of sustainability concerns originate, and only can be measured at the supply chain origination or point of production.

A number of current alternative fuel mandates require reporting from the field-level up, including the UK's RTFO and the EU's RED. There are numerous other reporting and tracking models, such as the USDA's National Organics Program (NOP), which have developed extensive farm-level mechanisms to track, report and verify that foodstuffs produced meet standards. These systems can be examined further to see what can be best emulated in the LCFS.

Monitoring from the field-level will ensure the implementation of sustainability safeguards outlined in the LCFS Sustainability Workplan, which includes tracking the impacts of biofuel production based on a range of metrics including land impacts, such as soil quality and erosion, conversion of ecologically sensitive lands such as virgin forests and grasslands, increased use of synthetic pesticides and fertilizers, water quality and availability, biodiversity loss (species loss and extinction / preservation), and air quality impacts including increased greenhouse gases (GHGs) and criteria pollutants emissions (such as nitrogen oxides and particulate matter).⁷ This reporting should include detailed and accurate information from feedstock producers (e.g. farmers), crushers, refineries and fuel producers.

⁶ "Carbon and Sustainability reporting within the RTFO." Technical Guidance Part 1 Version 3.2 April 2010. p25

⁷ Low Carbon Fuel Standard Sustainability Workplan (draft)
http://www.arb.ca.gov/fuels/lcfs/012010sust_wp.pdf p1-2

Interestingly, field-level reporting is important for every type of biofuel, including those that would seem most benign: biofuels sourced from “waste”. Waste biofuels are often touted as “advanced” biofuels that are less environmentally impactful than biofuels made from virgin food crops. However, without accurate tracking and reporting down to the field-level or supply chain origination, the ways in which biofuels made from “waste” materials create risks of environmental or social detriment would not be apparent. One example is removal of crop residues from fields for production of ligno-cellulosic fuels. This has the potential to harm soil fertility and structure, leading to erosion, water pollution, and increased reliance on chemical inputs. Similarly, removal of small trees and shrubs from forests may be conducted with the stated goals of promoting fire suppression and increasing biomass collection. This biomass, however, is an important component of the forest ecosystem, and its removal can have detrimental effects on the remaining system and actually increase the potential and incidence of fire.⁸ These external effects of biofuel production are not currently priced into the markets in which such fuels are sold, so outside instruments must be implemented if these concerns are to be addressed.

The California Energy Commission agrees with this viewpoint. As the state’s AB 118 Alternative and Renewable Fuel and Vehicle Technology Program 2011-2012 Investment Plan states:

California will likely continue to depend on imported biofuel feedstocks and finished products to help meet GHG goals for the transportation sector. Investigating international environmental issues will be critical to ensure that all fuels used in California are sustainably produced. In-country field assessments of industry practices for the harvest and production of Southeast Asia oil palm, cane ethanol and oil palm in Brazil and greater South America, and African oil palm are needed to meet this goal. It is also important that there are field tests of international sustainability programs and third-party audits of international biofuels and feedstocks subject to sustainability certification programs along with examinations of habitat conservation and restoration efforts for areas affected by plantation development. (CEC, 2011)

- 4. ARB must enforce sustainability provisions through rigorous third-party verification of data reported on by Obligated Fuel Suppliers.**

⁸ FoE believes that sustainability concerns dictate that certain critical habitat areas, such as national and state forests, which provide the last significant intact forest ecosystems in the U.S., should not be subject to biomass removal pressures. ARB should consider minimum land use requirements for ecologically sensitive lands as essential to ensuring that sustainability principles are upheld in the LCFS.

ARB must develop an auditing and enforcement system wherein regulated parties will credibly expect repercussions for either intentional or inadvertent violations. This compliance mechanism should be flexible to account for differences in scale, national context, and local concerns, but must be credible in order to effect positive change in the fuel system. Such a system should be expanded not only to include GHG accounting, but also to encompass broader sustainability concerns. ARB can contract with third-party auditors, or obligated fuel suppliers can use certification schemes (that satisfy ARB's standards) which employ third-party, independent auditing systems.

5. Transparency in reporting must be made mandatory.

Transparency⁹, when reporting on sustainability metrics, simply means making the outcome of such reporting, the data and information gathered, publically available in a user-friendly and easily accessible manner. By making information publically available such as feedstock sources and volumes produced by each Obligated Fuel Supplier, ARB will provide a further incentive (on top of compliance with mandatory standards) for producers to perform well within the sustainability metrics it requires. There is a vital potential link between tracking and reporting, third-party verification of data, transparency of results, and improved sustainability performance. It is not a given that transparency of performance *necessarily* leads to better performance, but it is a step in the right direction especially as an interim steps towards compliance with mandatory requirements. Data gathered from tracking and reporting from individual producers should be made publicly available and transparent so that advocates and members of the NGO / environmental community can understand the impacts of the Standard and identify best/worst actors in a publicly open manner. ARB should also work to publicize this information through annual, macro-level reports in order to put pressure on operators to improve their performance.

Where businesses are the consumer of fuels and such businesses have a publicly recognizable brand to protect over the long term, (true of retailers, less so for producers), they may choose to improve their purchasing practices to promote their environmental reputations or to reduce reputation risk (Vogel, 2005; Weil et al., 2006). In other words, transparency of reporting based on a rigorous sustainability criteria may serve to motivate fuel providers to source their fuels from more sustainable outfits (above and beyond meeting mandatory standards) where otherwise they would not be incentivized to do so.

An important part of promoting transparency involves requiring monthly, quarterly and annual

⁹ Transparency refers to open communication; information that is visible to anyone who searches for it. One example of transparency in the RTFO is the list of obligated suppliers as these companies are listed on the Department for Transport website.

producer reports (with 3rd party, independent review) from Obligated Fuel Suppliers. These reports will provide valuable information to policy makers and researchers about the state of the renewable fuel system -- information that can be brought to bear on everything from investment decisions to regulatory design. If reporting generates information of significant detriment associated with low carbon fuel production, regulators can take this information into account, adjusting the LCFS as appropriate to avoid such impacts. Furthermore, advocates¹⁰ can use information derived from mandatory reporting to identify important impacts and to underscore the need for regulated entities or the regulators to improve the producer's performance or the regulation itself.

Case Study: The UK's Annual RTFO Report: The reporting structure of the RTFO requires fuel suppliers to report both net GHG savings and sustainability measures on a monthly, quarterly and annual basis. In addition, the Department for Transport monitors and reports on indirect impacts, and releases annual reports on the approaches through which suppliers can reduce their risk of causing iLUC and other sustainability infractions, which is something FoE urges ARB to do as part of implementing a mandatory sustainability scheme (see Recommendation # 6 below).

The UK Department for Transport is currently using this reporting system as a stepping stone to a mandatory sustainability system for GHG reductions and sustainability, and has made this clear to industry from the inception of the RTFO. The reporting requirement was instituted with the intention that rules would become mandatory after the third year of the regulation. This ramp-up period allows UK producers and blenders to familiarize themselves with the regulatory landscape and the details of their own supply chains before the imposition of mandatory limits via EU-RED. Another goal was that the three year reporting period would allow other governments to "catch up" to the UK, creating more harmonization and preventing imbalanced pressure on UK producers.

This hoped-for regulatory harmonization is coming to pass, as this year is the first year of UK obligations under the European Commission's Renewable Energy Directive (RED), which contains mandatory sustainability rules. In anticipation of this, the Department for Transport is working to develop a "RED-ready approach" to ensure that RTFO-compliant fuels will also be compliant with the

¹⁰ The primary target of transparency is not the average consumer. Added information about the relative environmental and social performance of their fuel purchasing choices has not been demonstrated to meaningfully impact a large number of consumer decisions. These same consumers have been knowingly buying petroleum fuel for decades despite oil wars, spills, and climate change. Advocates, defined here generally as NGO representatives or stakeholders with no potential to gain economically from the LCFS, play an important role in leading consumer choices and influencing producers and policy makers.

RED in year three of the RTFO. The RTFO reporting requirement will remain in effect, as it addresses a broader array of parameters than are captured in the three mandatory sustainability rules under RED.

Under the RTFO reporting requirement, operators must submit monthly reports detailing the amount and type of fuel produced, feedstock, country of origin, any sustainability certifications (referred to as Environmental Qualifying Standards or EQS) received, land use as of RTFO inception, fuel life cycle carbon intensity, accuracy level of estimates, and RED readiness. Producers must also submit quarterly and annual reports that aggregate and analyze this data and include information on the actions operators have taken to source sustainable or lower-carbon fuels, including those with low iLUC risk. Modified obligations are imposed on smaller producers to reduce their reporting burden, including waiving the required annual aggregate report. Similarly, in order to encourage the use of waste and by-products, no reporting is required if the biofuel represents less than 10 percent of total farm or factory gate value¹¹.

Table 1: Targets for the three key aspects of the RTFO sustainability reporting scheme (RFA, 2010).

Annual operator targets	Targets			Achieved ¹
	2008-2009	2009-2010	2010-2011	2008-2009
Percentage of feedstock meeting a Qualifying Environmental Standard	30%	50%	80%	24%
Annual GHG saving of fuel supplied	40%	45%	50%	47%
Data reporting of renewable fuel characteristics	50%	70%	90%	69%

In order to ensure transparency, the Department for Transport publishes individual supplier performance reports on an annual basis, identifying worst and best actors by company name. In the European Commission’s Renewable Energy Directive (EU-RED), member states are responsible for ensuring that these rules are met when biofuels are used for compliance with national targets, or where

¹¹ The concept of a “waste product” is a contentious one, especially given that many so-called “wastes” do have alternate uses. The Renewable Fuels Agency—and now Department for Transport—has defined, for purposes of the RTFO, a material as a waste if it represents less than 10% of the total value of goods produced under the RTFO. This is based on the debatable assumption that such an economically insignificant co-product will not play an important role in production decisions.

producers benefit from national support schemes¹². Operators must show compliance with these mandatory criteria either by providing data to the relevant national authority, complying with an existing bi- or multi-lateral agreement, or using a recognized certification scheme for sustainability. These sustainability certification schemes are recognized through an assessment process that benchmarks their criteria and ensures that they “have a strong and auditable documentation management system, and adequate standard of independent auditing of producers (EC, 2009b).”

However, as discussed earlier in this paper, although transparency in reporting is an extremely important policy tool, in most cases, it alone has not been shown to improve the sustainability performance of fuels. Transparency in reporting must be part of a larger mandatory sustainability program to be an effective strategy which safeguards the global environment from unsustainable practices associated with biofuel production.

6. Mandatory ARB reporting on macro-scale impacts of the LCFS will help create a flexible system designed for continuous improvement.

ARB should report annually on the macro-scale impacts of the Standard, based on mandatory reporting data received from Obligated Fuel Suppliers. This will create regulatory transparency as well as generate information on aggregate impacts that may be beyond the purview of individual operators. This will mean collecting, aggregating and analyzing data on land prices, ownership/tenure, land use change, deforestation, vegetation type, cropping patterns, food price and availability, and water resource status. ARB should also create a provision for periodically reviewing and adjusting the LCFS to mitigate or avoid substantial identified harms. This macro reporting will ensure continuous improvement so that the standard becomes more stringent, broader, and binding over time.

Some of the necessary data may be readily available; other information regarding, for example, macro-scale land use changes, deforestation, and watershed impacts may require the use of tools such as remote sensing and GIS for monitoring and compliance trends. Beyond the immediate regulatory benefits of this transparency, the data gleaned from this reporting would be useful to researchers in

¹² ‘Support scheme’ is defined in the Directive as “any instrument...that promotes the use of energy from renewable sources by reducing the cost of that energy, increasing the price at which it can be sold, or increasing, by means of a renewable energy obligation or otherwise, the volume of such energy purchased. This includes, but is not restricted to, investment aid, tax exemptions or reductions, tax refunds, renewable energy obligation support schemes including those using green certificates, and direct price support schemes including feed-in tariffs and premium payments.”

improving the evolving science upon which these policies are based. The availability of the above data also allows for contextual understanding of results reported on by individual operators. For example, if an operator reports that it is growing a biomass crop on what was formerly grain-producing land, this would be expected to impact grain prices and food security. Without a more general understanding of food prices and availability in the region where that producer is located—information that an individual producer might not be able to furnish—ARB will not be able to determine whether it is operating in a sustainable fashion given its local context. Therefore, ARB should develop its own data-gathering, analysis, and reporting plan as part of its sustainability program. ARB should also consider creating a bi-annual process, with stakeholder input, regarding the macro-level impacts of the program, and what, if any, changes in the LCFS program should occur to address those impacts.

Comprehensive annual reports based on collected sustainability data will also create an invaluable database of information that will be crucial for adapting the standard if needed and in formulating future fuel policies. As stated above, the LCFS regulatory system should be flexible and comprehensive enough to encompass and adapt to later developments and technologies as well as lessons learned through implementation. However, the danger in flexibility is that it may lead to a lower or less-stringent degree of compliance with sustainability requirements. Therefore it is essential that ARB continues to adapt appropriately to changing markets, but does not allow standards to fall in terms of rigor.

As an example, in the EU-RED, recognizing that many important impacts of bioenergy production and use are beyond the purview of individual producers, the European Commission, which administers EU-RED, requires that member states collect data and report in detail on the macro-scale impacts of their consumption patterns. The Commission is then expected to report to the European Parliament every two years, beginning in 2012 on the impacts of the RED on social welfare both within the community and in other countries -- including reporting on food price effects, land rights, land use change, and implementation of International Labour Organization (ILO) conventions.

7. Third-party sustainability certification systems must be benchmarked against ARB's meta-standard.

While recognizing the importance of certification schemes for sustainability, not all certification systems are uniformly credible, and it is imperative that ARB thoroughly benchmark these schemes against strong internally-defined environmental and social standards, and only incentivize uptake of

those certifiers found to be sufficiently rigorous. The incorporation of third-party certifiers into the LCFS regulatory scheme underscores the importance of developing and establishing comprehensive and strong standards against which certifiers can be benchmarked.

Well-designed certification systems may be able to ensure a high level of environmental and social performance from certified supply chains. However, without mandatory sustainability criteria in place (i.e. if ARB allows for voluntary sustainability standards), the impact of these systems is largely limited by consumers' willingness to pay for the improved performance. Unfortunately, there is little documented evidence that the average consumer will make the "virtuous" consumption choice. Many researchers have shown that the record of consumer consciousness in such circumstances is poor across a variety of product classes (O'Rourke, 2005; Vogel, 2005). This is different than organic agriculture, for example, which is perceived to carry some private health and food quality benefits. An added difficulty is that when fuels are sold from fueling stations, they will generally appear to be homogenous in nature, with no means for a consumer to distinguish certified from non-certified fuels. This again underscores the importance of implementing mandatory sustainability standards across all fuels in order to level the playing field in terms of price and availability.

On that note, perhaps the most important manner in which ARB and other regulators can improve the environmental outcomes of biofuels consumed in the state is by creating regulations and legislation that internalize environmental costs. In other words, policies that mandate improved environmental performance (LCFS is an example) shrink the price differential between certified products and those in the general marketplace, making it easier for certified goods to compete.

8. Avoid leakage and shuffling between markets.

The scope of the adopted sustainability framework should extend as broadly as possible. Ideally, all types of energy production in California, as well as non-energy uses of biomass, would fall under a harmonized policy to avoid leakage and shuffling between markets. Although a potential for leakage (the movement of higher carbon or non-sustainable fuels to other non- or lesser- regulated markets) exists, this potential is not a compelling reason for California to forego action. Importantly, by taking action, California can remove a large market for high carbon and unsustainably produced fuels. As other jurisdictions follow California's lead, the market for high carbon and unsustainably produced fuels will narrow. Producers, investors, and fuel retailers will respond to this changing market, adjusting their production, investment, and purchasing decisions to match changing market conditions. The leakage

argument will soon lose its legitimacy. If, however, California does not act on sustainability concerns, then the next regulator who approaches the question of transport fuel sustainability will have the same excuse. California can and should be the leader on this issue.

9. ARB can help small producers meet mandatory sustainability standards by allowing for group certification.

Provisions could be made so that small or marginal operators are not disadvantaged or excluded by the sustainability system created by ARB. This could include the adoption of group certification. These systems should include flexibility to accommodate varying socio-economic conditions. However, any modifications should not involve exemptions of any kind—all producers must be required to meet sustainability criteria established by ARB.

10. Create regulatory convergence.

In order to create the regulatory convergence that will increase efficiencies and improve environmental and social outcomes in the global fuel system, ARB should work with other agencies to align standards, to the extent that ARB maintains rigorous and mandatory standards and doesn't backslide in the effort to "harmonize". The most obvious and immediate action toward this goal would be the development of an inter-agency working group to ensure that ARB, the California Energy Commission, and the Public Utilities Commission (PUC) are working in concert to harmonize sustainability standards across agencies, sectors and programs (e.g. AB 118). This can then lead to collaboration and harmonization nationwide and even internationally. This convergence would have the effect of increasing efficiency and decreasing cost to operators as well as reducing the effects of leakage and shuffling as discussed above.

Conclusion

ARB has a golden opportunity to make the Low Carbon Fuel Standard an international model of effective governance by ensuring that all light duty transportation fuels consumed in the State of California be produced in a manner that adheres to comprehensive and mandatory sustainability criteria. A voluntary system simply will not be effective in safeguarding global environmental and public

health from the well-documented lifecycle impacts arising from biofuel production and consumption. It is incumbent upon ARB to create regulations that address climate change effectively, but ultimately create a truly sustainable world for future generations. Friends of the Earth urges ARB to take a strong stand on this issue and require Obligated Fuel Suppliers to meet comprehensive, rigorous and mandatory sustainability performance standards under the Low Carbon Fuel Standard.

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ACRONYMS:

ARB	Air Resources Board (California)
BSI.....	Better Sugarcane Initiative
CEC.....	California Energy Commission
CI.....	Carbon Intensity
EISA.....	Energy Independence and Security Act (USA)
EPA	Environmental Protection Agency (USA)
EC.....	European Commission
EU	European Union
FQD.....	Fuel Quality Directive (EU)
GHG	Greenhouse Gas
IFPRI.....	International Food Policy Research Institute
ILUC	Indirect Land Use Change
LCFS	Low Carbon Fuel Standard
LUC	Land Use Change
PPM	Production and Processing Methods
PUC.....	Public Utilities Commission
RED	Renewable Energy Directive (EU)
RFA.....	Renewable Fuels Agency (UK)
RFS.....	Renewable Fuel Standard (USA)
RIN.....	Renewable Identification Number
RSB.....	Roundtable on Sustainable Biofuels
RSPO	Roundtable on Sustainable Palm Oil
RTFO	Renewable Transport Fuel Obligation (UK)
RTRS.....	Roundtable on Responsible Soy

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Appendix 1: A Sampling of Existing Systems Governing or Certifying the Sustainability of Biofuels

Renewable Transport Fuel Obligation (RTFO)

The UK’s Renewable Transport Fuel Obligation (RTFO) aims to reduce carbon emissions from road transport by requiring fossil fuel suppliers to produce Renewable Transport Fuel Certificates (RTFCs) demonstrating that a specified percentage of their total fuel sales are renewable. In order to obtain a Renewable Transport Fuel Certificate (RTFC), suppliers submit a carbon and sustainability report to the Department for Transport on a regular basis. Reporting under the RTFO is based on a sustainability meta-standard, which comprises 7 principles¹³.

Environmental principles

Principle 1: Carbon Conservation

Biomass production will not destroy or damage large above or below ground carbon stocks

Criteria	Indicators
1.1 Preservation of above and below ground carbon stocks	Evidence that biomass production has not caused direct land use change with a carbon payback time exceeding 10 years. Evidence that the biomass production unit has not been established on soils with a large risk of significant soil stored carbon losses such as peat lands, mangroves, wetlands and certain grasslands.

Principle 2: Biodiversity Conservation

Biomass production will not lead to the destruction or damage of high biodiversity areas

Criteria	Indicators
2.1 Compliance with national laws and regulations relevant to biomass production in the area and surroundings where biomass production takes place.	Evidence of compliance with national and local laws and regulations with respect to: <ul style="list-style-type: none"> • Environmental Impact Assessment • Land ownership and land use rights • Forest and plantation management • Protected and gazetted areas • Nature and wild life conservation • Land use planning • National rules resulting from the adoption of CBD22 and CITES23. <p style="text-align: center;">The company should prove that:</p> <ul style="list-style-type: none"> • It is familiar with relevant national and local legislation • It complies with these legislations <p>It remains informed on changes in legislation.</p>
2.2 No conversion of high biodiversity areas after 1	Evidence that production does not take place in gazetted areas. Evidence that production does not take place in areas with one or more

¹³ RFA Technical Guidance (version 3) - Carbon and Sustainability reporting under the RTFO, pages 108-117
http://www.renewablefuelsagency.gov.uk/sites/rfa/files/RFA_C_and_S_TG_%20Part_One_v3_2.pdf

January, 2008.	<p>HCV areas:</p> <ul style="list-style-type: none"> • HCV 1, 2, 3 relating to important ecosystems and species • HCV 4, relating to important ecosystem services, especially in vulnerable areas • HCV 5, 6, relating to community livelihoods and cultural values. <p>Evidence that production does not take place in any areas of high biodiversity</p>
2.3 The status of rare, threatened or endangered species and high conservation value habitats, if any, that exist in the production site or that could be affected by it, shall be identified and their conservation taken into account in management plans and operations	<p>Documentation of the status of rare, threatened or endangered species (resident, migratory or otherwise) and high conservation value habitats in and around the production site.</p> <p>Documented and implemented management plan on how to avoid damage to or disturbance of the above mentioned species and habitats.</p>
RECOMMENDATION ONLY: Preservation and/or improvement of surrounding landscape	<p>Representative samples of existing ecosystems within the landscape shall be protected in their natural state and recorded on maps, appropriate to the scale and intensity of operations and the uniqueness of the affected resources.</p>

Principle 3: Soil Conservation

Biomass production does not lead to soil degradation

Criteria	Indicators
3.1 Compliance with national laws and regulations relevant to soil degradation and soil management	<p>Evidence of compliance with national and local laws and regulations with respect to:</p> <ul style="list-style-type: none"> • Environmental Impact Assessment • Waste storage and handling • Pesticides and agro-chemicals • Fertilizer • Soil erosion <p>Compliance with the Stockholm convention (list of forbidden pesticides). The company should prove that:</p> <ul style="list-style-type: none"> • It is familiar with relevant national and local legislation • It complies with these legislations <p>It remains informed on changes in legislation</p>
3.2 Application of good agricultural practices with respect to: <ul style="list-style-type: none"> • Prevention and control of erosion • Maintaining and improving soil nutrient balance 	<p>Documentation of soil management plan aimed at sustainable soil management, erosion prevention and erosion control.</p> <p>Annual documentation of applied good agricultural practices with respect to:</p> <ul style="list-style-type: none"> • Prevention and control of erosion • Maintaining and improving soil nutrient balance • Maintaining and improving soil organic matter • Maintaining and improving soil pH

<ul style="list-style-type: none"> • Maintaining and improving soil organic matter • Maintaining and improving soil pH • Maintaining and improving soil structure • Maintaining and improving soil biodiversity • Prevention of salinisation 	<ul style="list-style-type: none"> • Maintaining and improving soil structure • Maintaining and improving soil biodiversity • Prevention of salinisation
<p>RECOMMENDATION ONLY: The use of agricultural by-products does not jeopardize the function of local uses of the by-products, soil organic matter or soil nutrients balance.</p>	<ul style="list-style-type: none"> • Documentation that the use of by-products does not occur at the expense of important traditional uses (such as fodder, natural fertilizer, material, local fuel etc.) unless documentation is available that similar or better alternatives are available and are applied. • Documentation that the use of by-products does not occur at the expense of the soil nutrient balance or soil organic matter balance.

Principle 4: Sustainable Water Use

Biomass production does not lead to the contamination or depletion of water sources

Criteria	Indicators
4.1 Compliance with national laws and regulations relevant to contamination and depletion of water sources.	<p>Evidence of compliance with national and local laws and regulations with respect to:</p> <ul style="list-style-type: none"> • Environmental Impact Assessment • Waste storage and handling • Pesticides and agro-chemicals • Fertilizer • Irrigation and water usage <p>The company should prove that:</p> <ul style="list-style-type: none"> • It is familiar with relevant national and local legislation • It complies with these legislations <p>It remains informed on changes in legislation</p>
Application of good agricultural practices to reduce water usage and to maintain and improve water quality.	<p>Documentation of water management plan aimed at sustainable water use and prevention of water pollution.</p> <p>Annual documentation of applied good agricultural practices with respect to:</p> <ul style="list-style-type: none"> • Efficient water usage. • Responsible use of agro-chemicals <p>Waste discharge</p>
<p>Recommendations only</p> <p>Records of annual measurements of:</p> <ul style="list-style-type: none"> • Agrochemical inputs (input/ha/y), such as fertilizers and pesticides (specified per agrochemical) • Water sources used (liters/ha/y) 	

- BOD level of water on and nearby biomass production and processing.

Principle 5: Air Quality

Biomass production does not lead to air pollution

Criteria	Indicators
5.1 Compliance with national laws and regulations relevant to air emissions and burning practices	<p>Evidence of compliance with national and local laws and regulations with respect to:</p> <ul style="list-style-type: none"> • Environmental Impact Assessment • Air emissions • Waste management • Burning practices <p>The company should prove that:</p> <ul style="list-style-type: none"> • It is familiar with relevant national and local legislation • It complies with these legislations <p>It remains informed on changes in legislation</p>
5.2 No burning as part of land clearing or waste disposal	Evidence that no burning occurs as part of land clearing or waste disposal, except in specific situations such as described in the ASEAN guidelines on zero burning or other respected good agricultural practices

Social principles

Principle 6: Workers Rights

Biomass production does not adversely affect workers rights and working relationships

Criteria	Indicators
6.1 Compliance with national law on working conditions and workers rights	Certification applicant must comply with all national law concerning working conditions and workers rights
6.2 Contracts	Certification applicant must supply all categories of employees (incl. temporary workers) with a legal contract in which the criteria below are registered
6.3 Provision of information	Certification applicant must show evidence that all workers are informed about their rights (incl. bargaining rights)
6.4 Subcontracting	When labor is contracted or subcontracted to provide services for the certification applicant, the certification applicant must demonstrate that the subcontractor provides its services under the same environmental, social and labor conditions as required for this standard
6.5 Freedom of association and right to collective bargaining	Certification applicant must guarantee the rights of workers to organize and negotiate their working conditions (as established in ILO conventions 87 en 98). Workers exercising this right must not be discriminated against or suffer repercussions
6.6 Child labor	Certification applicant must guarantee that no children below the age of 15 are employed. Children are allowed to work on family farms if not

	interfering with children’s educational, moral, social and physical development (the workday, inclusive of school and transport time, to be a maximum of 10 hours)
6.7 Young workers	The work carried out shall not be hazardous or dangerous to the health and safety of young workers (age 15 -17). It shall also not jeopardize their educational, moral, social and physical development
6.8 Health and Safety	All certification applicants must meet basic requirements including potable drinking water, clean latrines or toilettes, a clean place to eat, adequate protective equipment and access to adequate and accessible (physically and financially) medical care. Accommodation, where provided, shall be clean, safe, and meet the basic needs of the workers
	All certification applicants shall ensure that workers have received regular health and safety training appropriate to the work that they perform
	All certification applicants shall identify and inform workers of hazards, and adopt preventive measures to minimize hazards in the workplace and maintain records of accidents
6.9 Wages/ compensation	Wageworkers must be paid wages at least equivalent to the legal national minimum wage or the relevant industry standard, whichever is higher
6.10 Discrimination	Workers must be paid in cash, or in a form that is convenient to them and regularly
	In accordance with ILO Conventions 100 and 111, there must be no discrimination (distinction, exclusion, or preference) practiced that denies or impairs equality of opportunity, conditions, or treatment based on individual characteristics and group membership or association like: race, caste, national origin, religion, disability, gender, sexual orientation, union membership, political affiliation, age, marital status, those with HIV/AIDS, seasonal, migrant and temporary workers
6.11 Forced labor	In accordance with ILO Conventions 100 and 111, there must be no discrimination (distinction, exclusion, or preference) practiced that denies or impairs equality of opportunity, conditions, or treatment based on individual characteristics and group membership or association like: race, caste, national origin, religion, disability, gender, sexual orientation, union membership, political affiliation, age, marital status, those with HIV/AIDS, seasonal, migrant and temporary workers

Principle 7: Land rights

Biomass production does not adversely affect existing land rights and community relations

Criteria	Indicators
7.1 Land rights issues	The right to use the land can be demonstrated and does not diminish the legal or customary rights of other users and respects important areas for local people
7.2 Consultation and communication with local stakeholders	Procedures are in place to consult and communicate with local populations and interest groups on plans and activities that may negatively affect the legal or customary rights, property, resources, or livelihoods of local peoples

The European Union's Renewable Energy Directive (EU- RED)

The Renewable Energy Directive¹⁴ (EU-RED) and the Fuel Quality Directive¹⁵ (FQD) adopted by the European Union establish baseline mandatory environmental sustainability criteria that biofuels have to comply with. The sustainability criteria are the same in both Directives and include mandatory criteria as well as mandatory reporting requirements.

The EU-RED Directive establishes 4 sustainability criteria:

- 1) GHG emissions savings** (Article 17.2): Biofuels must achieve at least 35% GHG emissions saving (including GHG effect of land-use changes) relative to their fossil fuel equivalent
- 2) Biodiversity** (Article 17.3): Biofuels may not be made from raw material obtained from land with high biodiversity value in or after January 2008. Avoid loss of high biodiversity land:
 - forest undisturbed by significant human activity
 - highly biodiverse grassland
 - nature protection areas, unless compatible with nature protection
- 3) Carbon stock** (Article 17.4 and 17.5): Biofuels may not be made from raw material obtained from land with high carbon stock or land that was undrained peat land in or after January 2008. Avoid loss of high carbon-stock land:
 - wetland
 - continuously forested area
 - undrained peat land
- 4) Cross compliance** (Article 17.6): Biofuel feedstock grown in the European Community must be cultivated according to the EC's 'Cross Compliance' requirements

The EU-RED directive also requires the Commission to report on certain social sustainability aspects of labor standards.

Cramer Commission of the Netherlands

The first major biofuel sustainability effort originated with the Cramer Commission of The Netherlands in 2006. The Commission defined the sustainability of biomass¹⁶ using six themes. The first three themes are specific themes, relevant for biomass. The last three themes relate to the triple P approach (people, planet, profit), which are the starting-points for corporate social responsibility.

¹⁴ Renewable Energy Directive (Directive 2009/28/EC)

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:EN:PDF>

¹⁵ Fuel Quality Directive (Directive 2009/30/EC)

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0088:0113:EN:PDF>

¹⁶ Criteria for sustainable biomass production

http://www.globalproblems-globalsolutions-files.org/unf_website/PDF/criteria_sustainable_biomass_prod.pdf

Theme 1: Greenhouse gas balance

Criteria	Indicators
Net emission reduction compared with fossil reference, inclusive of application, is at least 50%. Here a strong differentiation of policy instruments is assumed, in which a better performance would lead to more financial support.	<ul style="list-style-type: none"> • Testing with the aid of calculation methods. • Use of standard values for different steps in standard chains.

Theme 2: Competition with food, local energy supply, medicines and building materials

Criteria	Indicators
Availability of biomass for food, local energy supply, building materials or medicines must not decrease.	<ul style="list-style-type: none"> • Comply with minimum requirements testable by means of performance indicators. These are developed on the basis of obligatory reporting from the period 2007-2010.

Theme 3: Biodiversity

Criteria	Indicators
No deterioration of protected areas or valuable ecosystems	<ul style="list-style-type: none"> • Comply with minimum requirements testable by means of performance indicators. These are developed on the basis of obligatory reporting from the period 2007-2010. • Further comply with the following requirement: Plantations must not be located in or in the immediate vicinity of protected areas or valuable ecosystems.
Insight into active protection of the local ecosystem	Reporting obligation on a “management plan for active protection of the local ecosystem”.

Theme 4: Economic prosperity

Criteria	Indicators
No negative effects on the local and regional economy	Comply with minimum requirements testable by means of performance indicators. These are developed on the basis of obligatory reports from the period 2007-2010.
Insight into the active contribution to the increase of local prosperity.	Reporting obligation on the way in which active contribution is made to local prosperity. Here an open and transparent communication is expected with and, in consultation with, the local population.

Theme 5: Social well-being

Criteria	Indicators
No negative effects on the social well-being of the workers and local population, taking into account:	
5a Working conditions of workers	Comply with Social Accountability 8000 and with the Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy compiled by the International Labor Organization.
5b Human Rights	Comply with the Universal Declaration of Human Rights (concerning: non-discrimination; freedom of association; child labor; forced and compulsory labor; disciplinary practices; security practices and indigenous rights).
5c Property rights and rights of use	Comply with the following requirements: <ul style="list-style-type: none"> • No land use without the consent of sufficiently informed original users. Land use is carefully described and officially laid down. • Official property and use, and customary law of the indigenous population is recognized and respected
5d Insight into the social circumstances of local population	Comply with minimum requirements testable by means of performance indicators. These have been developed on the basis of obligatory reports from the period 2007-2010.
Insight into the active contribution to improvement of social circumstances of local population	Reporting obligation in which is described how an active contribution to the social circumstances of the local population is made. Here an open and transparent communication is expected with and, in consultation with, the local population.
5e Integrity	Companies in the supply chain comply with the Business Principles for Countering Bribery.

Theme 6: Environment

Criteria	Indicators
No negative effects on the environment. This relates to:	
6a Waste Management	<ul style="list-style-type: none"> • Comply with local and national legislation and regulations. • Apply Good Agricultural Practice guidelines on integrated crop management.
6b Use of agro-chemicals (including fertilizer).	Comply with the strictest local, international and EU rules and regulations
6c Prevention of erosion and soil exhaustion	Comply with minimum requirements testable by means of performance indicators. These have been developed on

	the basis of obligatory reports from the period 2007-2010.
6d Insight into the conservation of quality and quantity of surface and ground water	Comply with minimum requirements testable by means of performance indicators. These have been developed on the basis of obligatory reports from the period 2007-2010.
6e Emission to air	Comply with EU regulations.