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The Sustainability of Biofuels: Limits of the Meta-Standard Approach

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The Sustainability of Biofuels: Limits of the Meta-Standard Approach

Jolene Lin

Abstract

The promotion of biofuels as a clean fuel alternative has been a significant aspect of the global quest for clean development. However, the quick-fix has proven to be problematic as food security and environmental concerns emerge. To address these concerns, European Union Renewable Energy Directive (EC Directive 2009/28/EC) contains sustainability criteria that biofuels must fulfill to be counted towards attainment of European Union or national renewable energy obligations or to be eligible for financial support. The European Commission has adopted the 'meta-standard' approach as the compliance mechanism. The 'meta-standard' approach relies heavily on voluntary certification schemes and is an example of regulatory 'out-sourcing' to private actors in European clean development governance. This paper critically examines the limitations of the 'meta-standard' approach, draws comparisons with governance of the Clean Development Mechanism, and argues that a much more robust regulatory framework is needed if we are to pay more than lip service to the notion of sustainable development.

Key words: Biofuels, Climate Change, European Union, Governance, Voluntary Certification

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Abbreviations and acronyms

CDM	Clean Development Mechanism
CER	Certified Emissions Reduction
DOE	Designated Operational Entity
EU	European Union
EC	European Community
GHG	Greenhouse gas
UNFCCC	United Nations Framework Convention on Climate Change
US	United States

Introduction

Climate change has prompted a wide array of policy responses ranging from the creation of carbon markets to adaptation programmes for vulnerable communities. Few of these policies have invited the degree of controversy that surrounds biofuels as emerging evidence of the adverse environmental and social impacts of biofuel production indicates that biofuels may not be the climate change panacea that policy-makers had made them out to be. Uncertainty about the true costs and benefits of biofuels, however, has meant that pro-biofuel policies have not been reversed. Instead, measures to ensure the environmental sustainability of biofuels are being introduced. The European Union (EU) biofuels and bioliquids sustainability scheme will be "the most comprehensive and advanced binding sustainability scheme of its kind anywhere in the world" when the Renewable Energy Directive comes into effect in December 2010 (European Commission, 2010).

This paper argues that the 'meta-standard' approach adopted in the EU sustainability scheme is an innovative addition to the EU's environmental governance toolkit. From a global governance perspective, the EU meta-standard will aid the process of streamlining the proliferation of certification schemes and harmonizing global standards. This will reduce transaction costs for biofuels producers and promote the growth of a sustainable biofuels industry. However, given the close resemblance between the heavy reliance on auditors in the sustainability scheme and that placed on designated operational entities (DOEs) in the Clean Development Mechanism (CDM), this paper argues that the same problems that threaten the integrity of the CDM verification process are likely to emerge in the EU sustainability scheme. It is therefore necessary to reevaluate the wisdom of extensive reliance on voluntary schemes to perform environmental monitoring functions. A multilateral agreement featuring comprehensive and mandatory sustainability standards is necessary if the EU intends to take the environmental and social concerns created by its biofuel policy seriously.

Part I of this paper provides a brief background on biofuels and the sustainability concerns associated with their production. The EU sustainability scheme is examined in Part II. Part III argues that the meta-standard approach will promote harmonisation of global sustainability standards which will, in turn, aid the development of a sustainable biofuels industry. However, the heavy reliance placed on private auditors to verify compliance with the sustainability criteria gives rise to concerns about the integrity of the audit process. Part IV examines the need for a multilateral solution and draws some conclusions.

Part I: Setting the Background

Biofuels are combustible materials directly or indirectly derived from biomass, commonly produced from plants, animals, micro-organisms as well as organic wastes (UNEP 2009, p. 25). Bioethanol and biodiesel are the dominant types of biofuel for transport (UNEP 2009, p. 34)[1]. The use of other transport biofuels such as biogas and pure plant oil is currently restricted to pilot schemes. The United States, Brazil and the EU dominate world production of transport biofuels. The US is the leading producer of ethanol from corn. Brazil is the main producer of ethanol from sugar cane. The EU, particularly Germany, produces half of the global supply of biodiesel (from rapeseed).

As concerns about climate change and energy security dovetailed in the past decade, governments encouraged the production and use of biofuels as a fossil fuel alternative, leading to the development of an industry worth some five billion euros annually (Harrison, 2010a). Policies including blending quotas or targets and price support mechanisms were introduced to stimulate demand in many jurisdictions. By 2006, at

least 36 provinces/municipalities and 17 countries had introduced mandates for blending biofuels into vehicle fuels (UNEP 2009, p.35)[2]. For example, in 2005, the US Congress adopted the first federal Renewable Fuel Standard which required gasoline importers, blenders and refiners to blend up to 4 billion gallons of biofuels into gasoline in 2005 and to increase the amount up to 7.5 billion gallons by 2012 (Energy Policy Act 2005). The success of the Renewable Fuel Standard led to the introduction of more ambitious blending requirements in the Energy Independence and Security Act of 2007[3]. The Malaysian Biofuel Industry Act 2007 aims to facilitate development of the domestic biodiesel industry, specifically palm biodiesel, and biodiesel projects are eligible for tax incentives under the Promotion of Investments Act 1986[4]. In the UK, supply of biofuels is encouraged by the Renewable Transport Fuels Obligation (RTFO). The RTFO requires 3.25% (by volume) of transport fuels to be delivered from renewable sources by 2009/10 (The Renewable Transport Fuel Obligation (Amendment) Order 2009).

Sustainability Concerns

Championed as a panacea to climate change, an agent for rural economic regeneration, and a means to securing energy independence, biofuels have not turned out to be the perfect solution to these policy concerns. Questions surrounding the environmental and social costs of biofuel production have overshadowed earlier optimism as evidence of the role of biofuels in rising food prices, accelerating deforestation and doubts about the climate benefits continue to emerge[5].

One can draw a distinction between "carbon" and "non-carbon" sustainability concerns. Carbon concerns refer to the net greenhouse gas (GHG) savings of biofuels compared to fossil fuels. This mainly depends on the feedstock and conversion technology. Negative GHG savings (ie: increased GHG emissions) may result when production takes place on converted grazing land. CONCAWE, et al. (2006), for example, show that, while the largest potential for expanding EU agricultural production for biofuels would be to convert existing grazing land, there are "very serious greenhouse gas consequences" (p. 29) such that "[p]lanting biofuels crops on grazing land would probably not pay off in GHG terms for decades" (p. 30). Non-carbon concerns refer to the environmental and social effects of biofuel production apart from the issue of GHG emissions. The direct non-carbon effects of biofuel feedstock production include habitat destruction (particularly in the Amazon region for soy and Southeast Asia for palm), local air, water and soil impacts, labour exploitation and loss of land rights for indigenous peoples where new plantations to produce biofuel feedstock are established (Renewable Fuels Agency 2008, p. 18). The indirect effects of biofuels include rising agricultural commodity prices and the consequential impact on food security, and the displacement of agricultural production onto uncultivated lands with impacts on biodiversity (Renewable Fuels Agency 2008, p. 19). Table one sets out the significant environmental impacts associated with selected biofuel crops.

Table 1. Significant environmental impacts that have been associated with selected biofuel crops [6]

Crop	Environmental Impacts
Palm Oil	• Forest conversion and species loss • Fire damage to natural forest resulting from uncontrolled fires • Soil erosion and loss of fertility • Pollution / contamination from agro-chemical and palm oil mill effluent
Soya	• Natural habitat conversion and species loss • Fire damage resulting from uncontrolled fires • Soil erosion and loss of fertility • Use of agro-chemicals
Sugar	• Natural habitat conversion (wetlands and cerrado in particular) • Water abstraction • Loss of soil fertility • Water pollution • Pollution from burning cane fields. • Air pollution and solid waste from processing cane

In the United Kingdom, concerns about the sustainability of biofuel production led to the commission of a review by the UK Renewable Fuels Agency. The *Gallagher Review of the indirect effects of biofuels production* was published in July 2008. Amongst its recommendations was that "[t]he introduction of biofuels should be significantly slowed until adequate controls to address displacement effects are implemented and are demonstrated to be effective" (Renewable Fuels Agency 2008, p. 8). The review concludes that "it should be possible to establish a genuinely sustainable industry provided that *robust, comprehensive and mandatory sustainability standards* are developed and implemented" (Renewable Fuels Agency 2008, p. 9; my emphasis) and "[t]he immediate focus for policy should be on implementing the necessary controls and conditions that will enable the industry to develop sustainably" (Renewable Fuels Agency 2008, p. 10). These recommendations should be borne in mind as we discuss the EU sustainability scheme below.

Part II: The EU Sustainability Scheme

The Renewable Energy Directive sets a 10% target for renewable energy in transport that applies to all Member States[7]. The sustainability criteria for biofuels are laid down in Article 17[8]. The criteria apply to both domestically produced and imported biofuels. Compliance with these criteria is not a precondition for biofuels being placed on the EU market, thus biofuels may be imported even if the criteria are not met. However, compliance with the sustainability criteria is required in order for the biofuel in question to count towards attainment of EU or national renewable energy obligations or to be eligible for financial support or State aid (European Commission Directive 2009/28/EC, Article 17(1)). As the sustainability criteria were adopted under Article 95 of the EC Treaty, Member States are not permitted to adopt additional criteria or exclude biofuels on sustainability grounds other than those set out in the Renewable Energy Directive (European Commission Directive 2009/28/EC, Preamble, paragraph 94).

The Sustainability Criteria

The sustainability criteria are as follows:

1. Sustainably produced biofuels must achieve GHG emissions savings of at least 35%, rising to 50% from 2017. From 1 January 2018, GHG savings must be at least 60% for biofuels produced in installations which started production after 1 January 2017 (European Commission Directive 2009/28/EC, Article 17(2));
2. Sustainably produced biofuels must not derive from raw materials obtained from land enjoying high biodiversity value (such status as determined in January 2008), for example, primary forest and highly biodiverse grassland (Article 17(3));
3. Sustainably produced biofuels must not be made from raw materials obtained from land with high carbon stock which refers to, for example, land which was considered wetlands and continuously forested areas in January 2008 and no longer has that status (Article 17(4));
4. Sustainably produced biofuels must not be produced from crops grown on land that was peatland in January 2008, unless it is shown that cultivation of the crops did not involve draining previously undrained soil (Article 17(5)).

The Commission is required to report to the European Parliament and the Council every two years on the implementation of measures taken to fulfill these sustainability criteria as well as the impact of the European Community's biofuels policy on a range of concerns such as food prices in developing countries and land-use rights (Article 17(7)). The first reports are due in 2012 (Article 17(7)).

Implementation Framework

In June 2010, the European Commission issued two Communications that provide guidance on the practical implementation of the sustainability criteria. The *Communication from the Commission on voluntary schemes and default values in the EU biofuels and bioliquids sustainability scheme* (hereafter, Commission Guidelines) provides two options for economic operators to demonstrate compliance to Member States: the first is the option to use recognised voluntary schemes or international agreements and the second is the use of default values or predetermined values to show compliance with the GHG savings criterion. Discussion in this paper will focus on the first option.

According to paragraph 2.2 of the Commission Guidelines, economic operators can use any voluntary scheme that is recognised by the Commission to cover some or all of the sustainability criteria and has the requisite verification system in place. Voluntary schemes and standards developed by the private sector, civil society organisations and governments will be "benchmarked" against the sustainability criteria. Benchmarking determines whether an economic operator can use part or all of a standard to demonstrate compliance with the sustainability criteria. The Commission is keen to promote the recognition of a broad range of standards. As such, it will assess a voluntary scheme even if one covering the same feedstock or geographical area has already been recognised (Commission Guidelines, paragraph 2.1). The onus is on an economic operator to maintain an auditable system and prepare the information for auditing purposes (Commission Guidelines, paragraph 2.2.1). On its part, the voluntary scheme is expected to audit an economic operator's performance before permitting its participation in the scheme and to carry out regular audits thereafter. Paragraph 2.2.2 of the Commission Guidelines states that the audits should be conducted by third-party, independent and qualified parties who can carry out a risk analysis, propose a

verification plan and seek the requisite evidence from the economic operator before issuing verification conclusions.

Part III: The meta-standard approach

The concept of a 'meta-standard' is central to the Commission's regulatory approach[9]. Dehue et al. (2007, p. 4) explain that the idea of this mode of regulation is that "compliance with the meta-standard is achieved through existing standards". The meta-standard defines what is considered a sustainably produced biofuel according to a set of criteria. "Instead of requiring producers to be certified to the Meta-Standard directly, compliance with the Meta-Standard can be achieved through certification to existing standards which have proven to provide a sufficient guarantee that (most of) the…criteria of the Meta-Standard are complied with" (Dehue et al. 2007, p. 4; see also Schlegel and Kaphengst 2007, p.8). In order to provide sufficient guarantee that a standard meets the criteria of the meta-standard (and is therefore a 'qualifying standard'), a standard has to be benchmarked against the meta-standard. Further, in order to ensure that the criteria of the qualifying standard are complied with in practice, the standard must have auditing and verification procedures in place. Therefore, if a voluntary standard such as the Greenergy Bioethanol Sustainability Standard for Brazilian Sugarcane meets all of the EU sustainability criteria (the meta-standard), the European Commission will recognise the Greenergy Standard as a 'qualifying standard'. An economic operator that complies with (and is certified by) a 'qualifying standard' can use such certification to demonstrate compliance with the EU sustainability criteria.

The benefits of the meta-standard approach are fairly obvious. Many standards (the Forest Stewardship Council, the Sustainable Agriculture Network/Rainforest Alliance, the Basel Criteria for Responsible Soy Production, just to name a few) developed by civil society organizations and business alliances to promote sustainable practices in feedstock production already exist. The use of a meta-standard essentially avoids reinventing the wheel. This leads to the second benefit, which is, saving time and costs. Developing a sustainability standard through a multi-stakeholder process can take several years and is costly. The resort to a meta-standard avoids wasting resources on duplicative efforts. Existing sustainability standards already have producer acceptance, and the use of a meta-standard avoids the situation whereby producers have to be certified in accordance to multiple standards. Voluntary certification as a business practice does not normally fall foul of international trade rules. As such, the use of a meta-standard for biofuels certification also reduces the likelihood of falling foul of World Trade Organization rules which prohibit the use of technical regulations as non-tariff trade barriers and discriminatory treatment of imported products (Endres 2010, pp. 108-111). There is a particular negative perception in developing countries that voluntary codes are a disguised form of trade discrimination (Krut and Gleckman, 1998).

Finally, the promulgation of a meta-standard by a major market like the EU will contribute to the harmonization of sustainability standards and reduce the problems created by a proliferation of certification schemes. The existence of a plethora of certification schemes has caused producers and operators concern about the prohibitive costs associated with multiple certification (which will have a disproportionate effect on small-scale producers in developing countries) and how voluntary standards fit into regulatory regimes (Matus 2010, p. 5). The creation of meta-standards which act as benchmarking systems provides some consolidation of the voluntary standards market[10].

The difficulties of ensuring that the sustainability criteria are effectively applied do not stem so much from the use of a meta-standard approach *per se* as from the reliance on voluntary certification schemes to monitor land-use change and complex industrial processes. Pelsy (2008, p. 131) draws on the experience of forest certification schemes to suggest that the inadequacies in these private mechanisms are likely to play out in the biofuels context. For example, the difficulties of developing an effective chain of custody that checks wood products from the forest through to the finished product should not be underestimated. Wood products are often smuggled with the aid of corrupt local enforcement officers, and shipping documents can be forged easily. Certification has also led to a segmentation of the forestry products market. The certified sustainable products comprise a small higher price segment, while the uncertified products supply the rest of the market. Pelsy (2008, p. 131) further argues that biofuels certification schemes could easily suffer from more loopholes than the forestry schemes since the production of biofuels is far more complex to assess.

Comparison with the Clean Development Mechanism project cycle

The Clean Development Mechanism (CDM) governance framework also relies on private entities to perform monitoring and auditing functions. These third-party auditors, referred to as Designated Operational Entities (DOEs), are involved in two stages of the CDM project cycle: (1) the validation stage and (2) verification. At the validation stage, the responsibility of a DOE is to validate a CDM project by independently evaluating the project design against the CDM requirements, including a substantive review of the baseline and monitoring methodology, and assuring that an adequate monitoring plan is in place to safeguard against the overstatement of emissions reductions[11]. At the verification stage, another DOE verifies the amount of emissions reductions before it submits a report to the CDM Executive Board accompanied by a request for the issuance of Certified Emissions Reductions (CERs). Despite the two-step verification process, it has been shown that there is a 27% risk of validation/verification error (Hart, 2007). This may be unavoidable because of the inherent uncertainty involved in predicting GHG reductions by projects, technical and knowledge constraints and a lack of guidance on verification and validation standards. However, this should signal similar concerns in the biofuels context.

There is also concern about the veracity of statements made by DOEs. A simple example of public listed companies may be used to illustrate this point. Public listed companies rely on accountants to audit their books and produce accounting statements that are relied upon by shareholders (incumbent and prospective), creditors, regulators and the company itself to comply with relevant laws and listing rules. Accountants are hired and paid for their services (often on a retainer basis) by the company that they audit. There is therefore the risk that accountants are less independent than they ought to be. The Enron saga serves as a reminder of this risk. However, information asymmetry prevents regulators and shareholders from monitoring the financial performance of the company themselves - the transaction costs of doing so will be a significant impediment to effective functioning of the market (Posner 1976, pp. 507-9; Halpern et al. pp. 133-6; Easterbrook and Fischel 1985 pp. 94-5)[12]. The system therefore relies on private law remedies, reputational concerns and public law regulation (or self-regulation subject to state oversight) to provide a web of checks, however precarious, to manage the risk of fraudulent or lax accounting practices. In the event that fraudulent accounting practices lead to the insolvency of a company, creditors can seek recourse from an insolvency regime, the licenses of accounting firms can be revoked and private law offers remedies. In the context of the CDM, we are concerned with fraudulent or negligent accounting practices leading to an over-declaration of CERs not backed by real GHG emission reductions ("hot air credits"). The only loser from the creation of hot air credits is the

environment, and the environment is not represented by any stakeholder in the CDM regime who has an incentive to rectify the situation except arguably the CDM Executive Board[13]. This can eventually lead to a collapse of the CDM system and we will be further from the goal of climate mitigation than ever before.

A similar structure of perverse incentives exists in the context of voluntary certification of biofuels. None of the parties – auditor, certification scheme, and the economic operator - have any real incentives to ensure the integrity of the verification process. Furthermore, while one might argue that the European Commission plays a supervisory function, the Commission does not wield any 'big sticks' over these private sector voluntary standards. Like the CDM Executive Board, it can revoke or suspend the recognition of a voluntary standard but this is a weak regulatory safeguard to pin an entire monitoring system on. Further, the meta-standard approach means that auditors are one more step removed from the Commission's supervisory realm (compared to the voluntary schemes), further diluting the influence, if any, of the Commission in this scheme of things. It can therefore be argued that while voluntary standards have an important role to play in engaging businesses and industry in sustainable development, there are limitations to what they can achieve and it would be prudent to consider if policymakers are placing a burden of regulatory responsibility that far outweighs what these voluntary standards are able or intended to achieve from the outset[14].

Part IV: The way forward

Slowing Down, Rethinking and Negotiating?

As the above discussion shows, addressing sustainability concerns through voluntary schemes and meta-standards is arguably an interim measure. A more rigorous regulatory framework will be required for the development of a global biofuels industry that is both economically effective and environmentally sound. The EU ought to reconsider the mandatory 10% biofuels target (that is set out in the Renewable Energy Directive) until more appropriate solutions to manage sustainability concerns are found[15]. Documents obtained from the Commission through freedom of information laws confirm that opinion within the Commission is divided amidst serious concerns that the current push to expand the use of biofuels is creating serious tensions that will disrupt agricultural commodity markets and food prices without generating significant environmental benefits (Harrison, 2010b). The precautionary principle would dictate reduction of the 10% target, as suggested in the Gallagher Report, until a clearer evidence-backed understanding of the issues emerges. It would also dictate caution against placing a significant bet on a single technology when there is a wide variety of other fuel substitutes and technologies that are possible options for the future.

Meanwhile, a parallel effort should be made to promote a multilateral agreement on mandatory sustainability standards for biofuels. The Commission Guidelines envision this possibility; it is stated in the second paragraph of the Guidelines that economic operators can demonstrate compliance with the sustainability criteria "[i]n accordance with the terms of a bilateral or multilateral agreement concluded by the Union with third countries and which the Commission has recognised for the purpose". There are already a number of on-going initiatives to promote harmonisation of biofuel standards, for example, the International Energy Agency Bioenergy Taskforce 40[16]. A global agreement sounds grander than it need be. It will, simply put, be a coordinated position amongst importing countries on minimum standards to ensure that the solution that biofuels represent does not become the problem itself. It should be noted that, presently, the EU and the US are major domestic producers of biofuel feedstock as well as the biggest importers. The debate on biofuels sustainability in the US is a few steps

behind, but a more active trans-Atlantic dialogue on this issue is needed. Moving towards a common position will be a significant step towards global coordination and ultimately, the promulgation of mandatory standards.

Conclusion

This article has attempted to shed light on the EU's attempt to address the environmental and social consequences of expanding the use of biofuels. The meta-standard approach has its benefits and was dictated by pragmatic concerns such as reducing the possibility of falling foul of international trade rules. However, it is not clear that the sustainability criteria can be effectively implemented. The difficulties do not stem so much from the use of a meta-standard approach *per se* as from the reliance on voluntary certification schemes to monitor land-use change and complex industrial processes. A comparison with the role of the DOEs in the CDM governance structure reveals that the same set of perverse incentives exist in the biofuels context and are likely to generate the same monitoring and verification problems. The EU approach can only be an interim measure and this paper has argued that the 10% biofuels target as set out in the Renewable Energy Directive should be set aside until a clearer understanding of the impacts of biofuel production emerges. Meanwhile, efforts to conclude an international agreement containing mandatory sustainability standards should be intensified. Whatever the inadequacies of international law enforcement, entrusting environmental protection to voluntary certification schemes seems to be the riskier proposition.

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[1] The statistics presented in the rest of this paragraph are also cited from this source.

[2] Most mandates require blending 10%-15% ethanol with gasoline, or blending 2%-5% biodiesel with petroleum diesel.

[3] The petroleum industry is required to blend at least 36 billion gallons of biofuels into gasoline by 2022 (Energy Independence and Security Act of 2007, Section 202)

[4] See Lopez and Laan (2008) for an excellent analysis of the Malaysian biofuels industry.

[5] On 8 March 2010, for example, four non-governmental organisations filed a lawsuit against the European Commission for withholding documents which they claim will add to a growing dossier of evidence that biofuels could pose a serious threat to food security and worsen the problem of deforestation (EurActiv, 2010).

[6] The table is reproduced from Clay (2005); cited in Edinburgh Centre for Carbon Management et al (2006, p. 11)

[7] European Commission Directive 2009/28/EC, Article 3(4): "Each Member State shall ensure that the share of energy from renewable sources in all forms of transport in 2020 is at least 10 % of the final consumption of energy in transport in that Member State". See Paragraph 16 of the preamble to the Directive for the reasoning behind a fixed 10% target for all Member States as opposed to varied national targets (which is the case for renewable energy).

[8] The criteria are also set out in the Fuel Quality Directive (Article 7(b) of Directive 98/70/EC as amended by Directive 2009/30/EC) for consistency.

[9] I am grateful to Prof. Joanne Scott and Dr. Veerle Heyvaert for their comments on 'meta-regulation' and to Dr. Kira Matus for clarifying the term 'meta-standard'. The concept of 'meta-regulation' is discussed in the law and regulation literature. See, for example, Parker (2002); Scott (2003); Gunningham (2009). Parker describes meta-regulation as the 'regulation of self-regulation'. Regulated entities are required to "evaluate and report on their own self-regulation strategies so that regulatory agencies can determine whether the ultimate substantive objective of regulation are being met" (Parker 2002, p. 245). The term 'meta-standard' is, however, relatively unknown in the regulation literature, and is clearly not a form of meta-regulation.

[10] An interesting analogy can be drawn with similar harmonization efforts in the voluntary carbon market; see Passero (2009).

[11] The DOE's scope of work is set out in Section E of United Nations Framework Convention on Climate Change Decision 3/CP. 7/CMP.1 (UNFCCC 2005). The criteria that a Project Design Document must meet are set out in Appendix B of the Decision.

[12] I am grateful to my colleague Thomas Cheng for referring me to the relevant literature.
[13] See Voigt (2009) for discussion of the role of the Executive Board as guardian of the environmental integrity of the CDM.
[14] See Wood (2006) for an excellent discussion on the role that voluntary codes can and should play in environmental law and policy.
[15] There has been discussion of such a retreat from the 10% target; see Traynor (2008).
[16] http://www.bioenergytrade.org/

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