

# LEGAL ANALYSIS OF THE EUROPEAN UNION SUSTAINABILITY CRITERIA FOR BIOFUELS

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## ABSTRACT

This paper provides a legal analysis and review of the European Union (EU) sustainability criteria for biofuels, presented in Directive 2009/28/EC. The paper discusses the EU sustainability criteria as a tool that could be efficiently utilized to operationalize and implement the concepts of sustainable development and sustainability in an industrial setting.

The results of the analysis highlight that to safeguard the sustainable quality of biofuels and their production, the list of the EU sustainability criteria should be elaborated further. Other criteria that regulate various aspects of environmental, social and economic sustainability need be added. For example, there is a need for further elaboration of the sustainable agricultural practices and tolerable use of water resources. Furthermore, as long as the EU requirements to fulfill the sustainability criteria have global impacts, the perspective of the involved actors from other regions and countries should be taken into account. Practical possibilities of the involved actors, their costs for the implementation of the sustainability criteria and regional differences should also be considered.

More generally, the paper suggests that the list of sustainability criteria, incorporated in a legal framework, should neither be too long, nor too short. A long list is not easy to implement. For a short list, as illustrated by the EU, it could be difficult to guarantee sustainability. Consequently, to the extent possible, the legislated list of sustainability criteria should be complemented by non-binding recommendations, explanations and guidelines. Furthermore, before making the suggested sustainability criteria legally binding, possible conflicts between different interests and contradictions with the already existing regulations from neighboring spheres of law should be investigated as a matter of necessity.

**Keywords:** Sustainability, Sustainability criteria, Biofuels, Directive 2009/28/EC.

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## 1. INTRODUCTION

In the energy sector, the EU has developed an ambitious policy<sup>1</sup> to increase the share of renewable energy in its final energy consumption to 20 per cent by 2020.<sup>2</sup> The policy includes a 10 per cent binding target for the use of renewable energy in the transport sector for each EU Member State.<sup>3</sup> Renewable energy could come from a variety of sources, but for the transport sector the main source is biofuels.<sup>4</sup> The central legal framework, which contains regulations in this area, is Directive 2009/28/EC.

It has thus been suggested to partially replace traditional fossil fuels with biofuels in the transport sector. This has been viewed as a promising solution to difficulties connected with the extraction and supply of oil, as well as for the reduction of GHG emissions. With time, it has become understandable that the quality of biofuels and their production methods need to be sustainable.<sup>5</sup> The material, from which biofuels are produced, for example energy crops of an agricultural origin, should follow certain sustainability standards. Regulating these issues with the help of sustainability criteria and introducing a legal framework aimed to support the fulfillment of these criteria has been suggested by the EU policy-makers as a possible strategy to minimize environmental damage and promote sustainability in the transport sector.

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- 1 S Boeters, J Koornneef, "Supply of Renewable Energy Sources and the Cost of EU Climate Policy" (2011) 33 (5) *Energy Economics* 1024.
  - 2 The EU's dependence on energy imports is estimated around 53 % and is expected to rise reaching 70 % by 2020. This is especially true for oil and gas consumption, which will increasingly come from sources at greater distances from EU, with possible geopolitical risks, in AN Menegaki, "Growth and Renewable Energy in Europe: A Random Effect Model with Evidence for Neutrality Hypothesis" (2011) 33 (2) *Energy Economics* 257.
  - 3 C Egenhofer, M Alessi, *EU Policy on Climate Change Mitigation since Copenhagen and the Economic Crisis* (CEPS Working Document No. 380, 5 March 2013) 2; M Schut, C Leeuwis, A van Paassen, *Ex Ante Scale Dynamics Analysis in the Policy Debate on Sustainable Biofuels in Mozambique* (2013) 18 (1) *Ecology and Society* 3.
  - 4 H Pacini, L Assunção, J van Dam, JrR Toneto, *The price for biofuels sustainability* (Energy Policy, 59, August 2013) 900; the alternative and complementary approach to biofuels can be the use of electric cars charged on electricity from renewable sources, though the share of this type of cars is expected to be modest in the near future, in A Lendle, M Schaus, *Sustainability Criteria in the EU Renewable Energy Directive: Consistent with WTO Rules?* (an ICTSD Project on WTO Jurisprudence and Sustainable Development, ICTSD information note No. 2, September 2010) 1; with respect to the promotion of biofuels, EU pursues four main goals: to fulfill the climate change commitments of the Kyoto Protocol and its follow-up agreements; to reduce the dependency on mineral oil imports; to strengthen the agricultural sector; and to facilitate the development of rural areas. The first three goals are especially highlighted in P Buschmann, *The EU Renewable Energy Directive 2009/28/EC and its Sustainability Criteria - An Effective Approach to Alleviate Climate Change? The Case of Indonesian Palm Oil* (WWU Münster, UT Enschede 2011) 12.
  - 5 S Schlegel, T Kaphengst, *European Union Policy on Bioenergy and the Role of Sustainability Criteria and Certification Systems* (2007) 5 (2) *Journal of Agricultural and Food Industrial Organization* 11.

Among the mechanisms and operational elements to achieve the 20 per cent and 10 per cent binding targets for renewable energy in Directive 2009/28/EC includes calculation methodology for the binding targets, co-operation mechanisms for the achievement of the binding targets, sustainability criteria for biofuels, mechanisms to control the fulfillment of the sustainability criteria, and monitoring procedures for providing transparency and information. Within this framework, the EU sustainability criteria for biofuels can be seen as a tool for promoting and safeguarding sustainable development and sustainability in the energy sector.

Other prominent institutional frameworks for sustainable biofuels that could be compared with the EU approach, are the Dutch Cramer Criteria, the UK Renewable Transport Fuels Obligation (RTFO), and Version 0 of the Global Principles and Criteria for Sustainable Biofuels Production, created by the Roundtable on Sustainable Biofuels (RSB).<sup>6</sup> Arguably, the EU sustainability criteria for biofuels are not the same as the Dutch criteria, and the Dutch framework is not the same as the UK framework, although they have been developed at the same level of the administrative scale.<sup>7</sup>

The objective of this article is to add to the understanding of how sustainability criteria can be used in a legal context as a tool to promote, implement and safeguard sustainability in an industrial sector. The central research questions are: What are potentially strong versus weak sides of the EU approach to the sustainability criteria? and What general suggestions for the future development of this approach can be made? The objective is achieved through the analysis of different traits and features of the EU approach to the sustainability criteria for biofuels. The technical side of what makes the production of biofuels sustainable is left aside, including the question whether the EU sustainability criteria hinder the production of sustainable biofuels from the point of view of natural science. It is not considered the task of law to investigate this issue.

This article consists of six sections, this introduction being the first. In the second section, the content of the EU sustainability criteria for biofuels from Directive 2009/28/EC is examined. The third section considers the development of the EU approach to the sustainability criteria after Directive 2009/28/EC. Following this, the fourth section contains an analysis of the EU sustainability criteria for biofuels. Strong and weak sides of the EU approach

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6 M Schut, C Leeuwis, A van Paassen, *Ex Ante Scale Dynamics Analysis in the Policy Debate on Sustainable Biofuels in Mozambique* (2013) 18 (1) *Ecology and Society* 5.

7 *Ibid.* 9.

are highlighted and discussed. In the fifth section, suggestions for the future development of the EU sustainability criteria are discussed. Finally, generalizing reflections and conclusions on the research topic are provided in the last section.

## 2. THE EU SUSTAINABILITY CRITERIA FOR BIOFUELS IN DIRECTIVE 2009/28/EC<sup>8</sup>

The core regulations on the sustainability criteria for biofuels<sup>9</sup> and their implementation can be found in Articles 17, 18 and 19 of Directive 2009/28/EC. Article 17 consists of nine paragraphs and dwells upon the material content of the legislated sustainability criteria. Article 18 “Verification of compliance with the sustainability criteria” sets the requirements to control the fulfillment of the sustainability criteria. Article 19 explains the methodology for the calculation of the GHG impacts of biofuels.

The sustainability criteria in Article 17 can be divided into two main groups, according to their content and purpose. They are the requirements (a) on the GHG emission savings from the use of biofuels in comparison to the traditional fossil fuels,<sup>10</sup> and (b) on the land use during the production of energy crops for biofuels.<sup>11</sup> To fulfill the sustainability criterion on the GHG emission savings, the reduction of GHG emissions generated through the use of a specific biofuel instead of a traditional fossil fuel has to be above a certain threshold.<sup>12</sup> A minimum savings rate of 35 per cent applied from the very beginning. For installations that were in operation before 23 January

8 The list of the sustainability criteria for biofuels from Directive 2009/28/EC is almost identically repeated in Directive 2009/30/EC.

9 The sustainability criteria in Directive 2009/28/EC apply not only for liquid and gaseous biofuels, but also to bioliquids used for other energy purposes than transport; for further commentaries see A Lendle, M Schaus, *Sustainability Criteria in the EU Renewable Energy Directive: Consistent with WTO Rules?* (an ICTSD Project on WTO Jurisprudence and Sustainable Development, ICTSD information note No. 2, September 2010) 2; there are expectations that these criteria may be extended to include solid biofuels in the future, V Schueler, U Weddige, T Beringer, L Gamba, P Lamers, *Global Biomass Potentials under Sustainability Restrictions Defined by the European Renewable Energy Directive 2009/28/EC* (GCB Bioenergy, 5, 6 2013) 1.

10 Article 17.2.

11 Article 17.3 – 17.5; A Uslu, J Stralen, B Elbersen, C Panoutsou, U Fritsche, H Böttcher, *Bioenergy scenarios that contribute to a sustainable energy future in the EU27* (Biofuels, Bioproducts and Biorefining, 7, 2, 164-172 2013) 166.

12 Article 17.2; the calculation of life cycle emissions of GHGs includes carbon dioxide (CO<sub>2</sub>) of fossil origin, methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O); for more information on this issue see the research of LM Tufvesson, M Lantz, P Börjesson, *Environmental performance of biogas produced from industrial residues including competition with animal feed-life-cycle calculations according to different methodologies and standards* (Journal of Cleaner Production, vol. 53 2013) 215.

2008, a grace period was introduced, which expired on 1 April 2013. From 2017, all biofuels will have to fulfill a 50 per cent threshold, and from 2018 the threshold will increase to 60 per cent.<sup>13</sup> The requirement in the last sentence is relevant for installations that will start operating in 2017 or later.

Article 17.3 – 17.5 of Directive 2009/28/EC specifies the three sustainability criteria for land use, naming the types of land from which energy crops for biofuels shall not originate. Lands with high biodiversity values are protected under Article 17.3, lands with high carbon stocks are protected under Article 17.4, and peatlands – under Article 17.5. More exact, biofuels shall not be produced from raw materials obtained from land with high biodiversity value, which includes primary forest and other wooded land, areas designated for nature protection or the protection of rare, threatened or endangered ecosystems or species, and highly bio-diverse grasslands. Secondly, biofuels shall not be made from raw materials obtained from land with high carbon stock, namely wetlands, continuously forested areas, or land spanning more than one hectare with a certain minimum canopy cover. Thirdly, biofuels shall not be made from raw material obtained from peatland, unless evidence is provided that the cultivation and harvesting of that raw material does not involve drainage of previously undrained soil. These sustainability criteria are to be based on the status of land in January 2008.

Biofuels produced from waste and residues, e.g. other than agricultural and forestry residues, need only fulfill the GHG emission savings sustainability criterion, which is formulated in Article 17.2.<sup>14</sup> This limitation can be explained by the fact that the other sustainability criteria in Directive 2009/28/EC, which deal with the land-use requirements, are not relevant for the production of biofuels of this type.

The sustainability criteria in Article 17 are the same in all the EU Member States. They must be fulfilled cumulatively, and are applied equally to the EU produced and imported biofuels.<sup>15</sup> This implies that biofuels can be imported into EU, even if they do not meet the sustainability criteria, and a parallel market of unsustainable biofuels can be established. However, biofuels must comply with the sustainability criteria, in order to be counted towards the mandatory 2020 renewable energy targets and to be eligible

13 EM Basse, *Environmental Reviews and Case Studies: The Legal Design of Sustainability Criteria on Biofuels Used by the European Union* (Environmental Practice, 1-12 2013) 4.

14 Article 17.1.

15 This idea is particularly highlighted in COM (2008) 30, *20 20 by 2020 Europe's Climate Change Opportunity*; S Afionis, LC Stringer, "The European Union Leadership in Biofuels Regulation: Europe as a Normative Power?" (2012) 32 *Journal of Cleaner Production* pp. 114 – 123.

for financial support,<sup>16</sup> e.g. in the form of governmental subsidies. Biofuels produced from waste count double towards the 2020 targets.<sup>17</sup>

The Member States have no right to impose stricter sustainability criteria than those expressed in Directive 2009/28/EC.<sup>18</sup> In the related EU policy documents, it was emphasized that the EU approach to the sustainability criteria aims for a complete harmonization of the biofuel sustainability criteria in EU, with the purpose to ensure that no criteria adopted individually by the Member States may constitute an obstacle to trade.<sup>19</sup>

### 3. DEVELOPMENTS AFTER DIRECTIVE 2009/28/EC

Since Directive 2009/28/EC came into force, the EU Commission has adopted a number of Decisions and Communications with the purpose of commenting on the content of the sustainability criteria for biofuels and to guide their implementation.<sup>20</sup> In October 2012, EU proposed changes to its policy for sustainable transport biofuels.<sup>21</sup> It was promoted to minimize the climate impact of biofuels through limiting the use of biofuels of an agricultural origin,<sup>22</sup> which can be counted towards the 10 per cent target for renewable energy in the transport sector by 2020, to the consumption level of 5 per cent.<sup>23</sup> Among other important aspects, such as to minimize the GHG emissions during the production of biofuels and the impact of the

16 Article 17.1.

17 Article 21.2; Energy Community, *New Details: Secretariat holds a Workshop on the Implementation of the RES Directive 2009/28/EC* (25-04-2013); the EU regulations do not prohibit trade of non-sustainable biofuels, see EM Basse, *Environmental Reviews and Case Studies: The Legal Design of Sustainability Criteria on Biofuels Used by the European Union* (2013) 1 Environmental Practice, 1-12.

18 This is due to the fact that the sustainability criteria were adopted according to Article 95 of the EC Treaty. Today this provision corresponds to Article 114 in the Treaty on the Functioning of the European Union (C 326/47, OJ C 326, 26.10.2012), which contained the EU internal market regulations.

19 COM (2008) 0019, *Proposal for a Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources*.

20 As an example, a policy package from 2010 can be named. It consists of Communication (2010/C 160/01) on voluntary schemes and default values in the EU biofuels and bioliquids sustainability scheme, Communication (2010/C 160/02) on the practical implementation of the EU biofuels and bioliquids sustainability scheme and on counting rules for biofuels, and Decision C(2010) 3751 on guidelines for the calculation of land carbon stocks.

21 COM (2012) 595 final, *Proposal for a Directive of the European Parliament and of the Council amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources*.

22 This includes biofuels and bioliquids produced from cereal and other starch rich crops, sugars and oil crops, see COM (2012) 595 final, 14.

23 *Ibid.*; H Pacini, L Assunção, J van Dam, JrR Toneto, *The Price for Biofuels Sustainability* (Energy Policy, 59, August 2013) 902.

indirect land-use changes, the EU Commission underlined that the primary objectives of Directive 2009/28/EC are the protection of the environment and the functioning of the internal market.<sup>24</sup>

There is an opinion that though the EU proposal of 2012 fosters technological development and seeks to avoid putting pressure on such significant sustainability issues as the health of the environment and food production, it constrains the situation for producers who have invested in the production and certification of sustainable biofuels of an agricultural origin.<sup>25</sup>

#### 4. ANALYSIS OF THE EU SUSTAINABILITY CRITERIA FOR BIOFUELS

The EU sustainability criteria create a substantial demand for produced biofuels in the EU Member States and in other parts of the world. They add to setting an international trend for this production branch.<sup>26</sup> There have been many discussions on the material content and choice of the EU sustainability criteria by experts and scientists from different fields. Calls have been made for sustainability criteria, consistent with and relevant for the agricultural sector in general.<sup>27</sup> The purpose of this section is to analyze the EU sustainability criteria for biofuels from a legal perspective, as well as to highlight and research their potentially strong and weak sides.

##### *4.1 Strong Sides of the EU Approach to the Sustainability Criteria*

The EU approach to sustainable biofuels is based on a legal framework with a limited number of sustainability criteria, which address urgent environmental concerns. It is an important judicial initiative internationally. It is a step forward in gaining experience on how to promote, protect and control environmentally sustainable products and their production. The established sustainability criteria create a link between the concepts of sustainable development and sustainability and their practical implementation in an industrial branch. To a certain extent, the sustainability criteria for biofuels ensure that this industry will develop in an environmentally sustainable way in the foreseeable future.

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24 COM (2012) 595 final, 5.

25 H Pacini, L Assunção, J van Dam, JrR Toneto, *The Price for Biofuels Sustainability*, op.cit at 902.

26 Biomass Technology Group, BTG, *Sustainability Criteria & Certification Systems for Biomass Production* (final report, project No. 1386, the Netherlands 2008) 89.

27 T Howes, *Directive 2009/28/EC* (Institute for European Studies, Brussels University Press 2010) 141.

Directive 2009/28/EC constitutes the central legal act in this area. It provides an explicit and well-established connection between the environmental goal of the EU policy for biofuels, presented in the form of the 2020 binding targets for renewable energy, and the list of the sustainability criteria, which function as an operational tool to achieve this goal. This connection seems to be productive and fulfills its purpose: the 2020 binding targets provide an important incitement to follow the sustainability criteria.

The content of the sustainability criteria is clearly formulated. They are not dubious or elusive. The strict minimum threshold for GHG emission savings and the land-use requirements, which the sustainability criteria set, are grounded in detailed and encompassing scientific data. Articles 18 and 19 contain explicit requirements on how the fulfillment of the sustainability criteria is to be controlled. Some researchers point out that the EU approach contains strong control mechanisms, which demand the EU Commission and the Member States to report on measures taken to respect the sustainability criteria and their impact on additional sustainability issues, such as the increased pressure on food security, developmental tendencies in countries outside EU, respect of land-use rights and protection of air, soil, water and biodiversity.<sup>28</sup> These control mechanisms make the EU approach responsive to aspects that need further elaboration. They create a solid platform for the reconsideration of the achieved results and an ongoing evaluation.

#### *4.2 Weak Sides of the EU Approach to the Sustainability Criteria*

There are a number of weak sides in the EU approach to the sustainability criteria for biofuels, which should be thoroughly considered. To start with, the list of the EU sustainability criteria and the issues that they address are not enough to guarantee the sustainable quality and sustainable production of biofuels.<sup>29</sup> This is the problem that needs to be addressed in the future. Large-scale biofuel production can cause soil and water degradation, as well as air pollution.<sup>30</sup> The regulation of these issues is left outside the scope of the EU sustainability criteria. Directive 2009/28/EC merely requests research and evaluation of these questions.<sup>31</sup> Even other more specific aspects of environmental protection can

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28 P Buschmann, *The EU Renewable Energy Directive 2009/28/EC and its Sustainability Criteria - An Effective Approach to Alleviate Climate Change? The Case of Indonesian Palm Oil* (WWU Münster, UT Enschede 2011) 34.

29 P Börjesson, K Ericsson, L di Lucia, L Nilsson, M Åhman, *Hållbara drivmedel – finns de?* (rapport N. 66, November 2008, Lund University, Sweden 2008) 92.

30 S Afionis, LC Stringer, "The European Union Leadership in Biofuels Regulation: Europe as a Normative Power?" (2012) 32 *Journal of Cleaner Production* 114 – 123.

31 Article 18.9.b.



be added to the list of the sustainability criteria for biofuels. As an example, impacts on the function of soil and soil fertility, effects on water quality and water supply, an environmentally sound use of fertilizers and pesticides, and the reduction of the emissions that cause acidification, eutrophication and ozone destruction can be named.<sup>32</sup> Enclosure of these aspects into the EU list of the sustainability criteria needs to be discussed.

Generally formulated sustainability criteria, as in the EU policy for biofuels, do not reflect regional special traits and features, such as variations in climate, soil quality, infrastructure and economic development. However, these variations can cause differences in production processes, which can result in difficulties in the implementation of the sustainability criteria and assessment of their fulfillment. On the contrary, a law that is very much detailed has a risk to quickly become out of date, and, as a consequence, contra-productive to its environmental goal.<sup>33</sup> An often changing legal framework is not able to create stability and certainty.

There is an explanation that EU has chosen not to make a more detailed list of the sustainability criteria, because it would be unable to justify trade-distorting measures of this kind to the WTO.<sup>34</sup> As a result, these issues were merely included in reporting and monitoring requirements for the Member States.<sup>35</sup> It can be speculated that only a limited number of binding sustainability criteria would hold ground in case of a potential WTO conflict. Future legal development will show to what extent the EU sustainability criteria for biofuels are compatible with the WTO regulations. Probably, the WTO would legally accept the right of its members to set restrictions of an environmental character for imported products. Such a decision would answer the environmental demands of our planet.

Among the important environmental concerns, which have not been addressed by the EU sustainability criteria, there is the issue of the indirect land-use change (iLUC) caused by the biofuel production.<sup>36</sup> This has been

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32 B Eickhout, GJ van den Born, J Notenboom, M van Oorschot, JPM Ros, DP van Vuuren, HJ Westhoek, *Local and global consequences of the EU renewable directive for biofuels. Testing the sustainability criteria* (A report of the Netherlands Environmental Assessment Agency 2008) 23.

33 This idea is expressed in S Westerlund, *Miljörättsliga grundfrågor 2.0* (Institutet för miljö rätt, IMIR, Björklinge 2003) 98.

34 EB Lydgate (2012), *Biofuels, sustainability, and trade-related regulatory Chill* (2012) *Journal of International Economic Law*, 15, pp. 1–24 (2012) 160.

35 S Afonis, LC Stringer, op.cit at 118.

36 A Uslu, J Stralen, B Elbersen, C Panoutsou, U Fritsche, H Böttcher, *Bioenergy scenarios that contribute to a sustainable energy future in the EU27* (Biofuels, Bioproducts and Biorefining, 7, 2, 164-172 2013) 167.

considered as a very significant weakness of the EU approach to the sustainability criteria,<sup>37</sup> because iLUC has a decisive impact on the environmental sustainability and viability of biofuels. It bears the potential to reduce the contribution of biofuels to the achievement of the 2020 targets for renewable energy. In addition, iLUC can have long-lasting negative environmental effects on soil, water and air quality, as well as on biodiversity.<sup>38</sup>

Estimating the GHG impact due to iLUC is rather complex.<sup>39</sup> Some researchers have perceived potential sustainability criteria on iLUC as “too ambitious,” and have argued that they could “scare away investors”.<sup>40</sup> Other analyses have shown that it is a problem that iLUC is actually not included in the EU sustainability criteria that deal with the calculation of GHG emissions and biodiversity consequences. Farming of energy crops for biofuel production is displacing current agricultural food and feed production, as well as production of forest-related products, such as fiber and timber, to other areas, which leads to iLUC effects. There is also a risk that this displacement can move previous agricultural production to areas outside of a country, making it very complicated to estimate the consequences.<sup>41</sup>

There are still other uncertainties regarding the development of the EU sustainability criteria.<sup>42</sup> Some studies have analyzed effects of an increased biofuel production on GHG emissions and land-use change (LUC) in global general and partial models.<sup>43</sup> The results suggest that in addition to biofuel-specific sustainability criteria, strict land-use policies should be established to reduce GHG emissions and the loss of biodiversity and habitats.<sup>44</sup>

37 P Buschmann, *The EU Renewable Energy Directive 2009/28/EC and its Sustainability Criteria - An Effective Approach to Alleviate Climate Change? The Case of Indonesian Palm Oil* (WWU Münster, UT Enschede 2011) 35.

38 Ibid.

39 A Uslu, J Stralen, B Elbersen, C Panoutsou, U Fritsche, H Böttcher, *Bioenergy scenarios that contribute to a sustainable energy future in the EU27* (Biofuels, Bioproducts and Biorefining, 7, 2, 164-172 2013) 167.

40 M Schut, C Leeuwis, A van Paassen, *Ex Ante Scale Dynamics Analysis in the Policy Debate on Sustainable Biofuels in Mozambique* (Ecology and Society, 18, 1 2013) 3.

41 EM Basse, *Environmental Reviews and Case Studies: The Legal Design of Sustainability Criteria on Biofuels Used by the European Union* (2013) Environmental Practice 9.

42 J Fabeny, J Romero, D Ross, *Synthesizing the Biofuel Policies of Europe* (the Elliott School of International Affairs 2008) 32; EM Basse, *ibid* at 8.

43 See for example the research of P Havlík, UA Schneider, E Schmid, B Böttcher, S Fritz, S Skalský et al., *Global land-use implications of first and second generation biofuel targets* (Energy Policy 39:5690–5702 2011) and A Popp, M Krause, JP Dietrich, H Lotze-Campen, M Leimbach, T Beringer, N Bauer, *Additional CO2 emissions from land use change — Forest conservation as a precondition for sustainable production of second generation bioenergy* (Ecological Economics, 74, 64-70 2012).

44 H Böttcher, S Frank, P Havlík, B Elbersen, *Future GHG emissions more efficiently controlled by land use policies than by bioenergy sustainability criteria* (Biofuels, Bioproducts and Biorefining 2013) 116.

There is a point of view that land-use policies and the involved planning and monitoring of land use should be sustainable. They should target sustainability irrespectively of how the land is aimed to be used and what types of crops will possibly be farmed there.<sup>45</sup> It has been suggested that these issues need to be addressed more directly, focusing on knowledge and understanding of local situations. High-quality scientific guidance is important.<sup>46</sup>

A number of researchers argue that the potential effects of the EU policy for biofuels on global land use with negative implications on GHG emissions cannot be regulated through the sustainability criteria only.<sup>47</sup> Other efficient tools and policies should be added, for example targeting GHG emissions from deforestation and biodiversity loss at a more global level. Böttcher et al. (2013) means that the challenge of sustainable biofuel supply is to avoid a leakage of biomass production for biofuels to neighboring sectors not covered by the sustainability criteria, for example, timber, food and feed sectors.<sup>48</sup>

Another weak side of the EU approach to the sustainability criteria for biofuels is in its methodology for calculating GHG emissions. The current calculation method presented in Article 19 of Directive 2009/28/EC has a limited perspective. For example, the actual utilization of industrial residues is not included in the calculations.<sup>49</sup> Possibly, the guidelines of the Commissions for calculating GHG emissions, especially GHG emissions caused by land use changes need to be revised to make sure no misleading incentives for conversion of grasslands and forests to oil palm plantations are given.<sup>50</sup>

An opinion has been expressed that EU has not framed its policy for sustainable biofuels in light of possible developmental trends and impacts on other regions and countries that would be involved in the biofuel pro-

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45 N Scarlat, J-F Dallemand, *Recent developments of biofuels/bioenergy sustainability certification: A global overview* (Energy Policy, March 2011, vol. 39, issue 3, pp. 1630-1646 2010) 1645.

46 H Böttcher, S Frank, P Havlík, B Elbersen, op.cit at 123.

47 Ibid.

48 Ibid.

49 LM Tufvesson, M Lantz, P Börjesson, *Environmental performance of biogas produced from industrial residues including competition with animal feed–life-cycle calculations according to different methodologies and standards* (2013) 53 *Journal of Cleaner Production* 221.

50 AM Hennecke, M Faist, J Reinhardt, V Junquera, J Neeft, H Fehrenbach, *Biofuel greenhouse gas calculations under the European Renewable Energy Directive—A comparison of the BioGrace tool vs. the tool of the Roundtable on Sustainable Biofuels*, (Applied Energy, 102, 55-62 2013) 61.

duction, for example for Africa<sup>51</sup> and Indonesia.<sup>52</sup> The recent analysis of the specific case of Indonesian palm oil stresses that the EU sustainability criteria do not adequately consider the impact of its measures on third countries like Indonesia, although the EU 2020 targets are not likely to be achieved without their contribution.<sup>53</sup> Extensive consultations with the biofuel producing countries outside the EU can be recommended.<sup>54</sup> Possibly, the Clean Development Mechanism (CDM) could serve as a model that shows how biofuel-exporting countries could become involved. The previous experience indicates that it would take a considerable effort to develop sustainability criteria or a sustainability standard for a single type of biofuel.<sup>55</sup>

It has not come out from the EU policy documents to what extent costs for the fulfillment of the EU sustainability criteria and proving compliance with them, which is the responsibility of the involved producers, have been taken into account by the EU policy-makers. Pacini et al. (2013) distinguishes between direct and indirect costs for producers. Direct costs, according to this research group, include certification fees, information costs, costs for changes to management systems and auditing fees. Indirect costs consist of internal adaptation costs.<sup>56</sup> Pacini et al. warns that both the direct and indirect costs can be high. This can become a problem for producers in less favored regions.<sup>57</sup>

Caution has been expressed that biofuels that fulfill the EU sustainability criteria will comprise a small higher price segment, while the uncertified products will probably supply the rest of the market.<sup>58</sup> This can mean that in spite of the legislated sustainability criteria, the issue of the sustainable quality of biofuels and their sustainable production would not be resolved.

Taking the perspective of the involved actors into account, as well as their practical knowledge and possibilities, it should be mentioned that the scope of the EU sustainability criteria, and especially the calculation meth-

51 M Schut, C Leeuwis, A van Paassen, *Ex Ante Scale Dynamics Analysis in the Policy Debate on Sustainable Biofuels in Mozambique* (Ecology and Society, 18, 1 2013) 3.

52 P Buschmann, *The EU Renewable Energy Directive 2009/28/EC and its Sustainability Criteria - An Effective Approach to Alleviate Climate Change? The Case of Indonesian Palm Oil* (WWU Münster, UT Enschede 2011) 35.

53 Ibid.

54 Biomass Technology Group, BTG, *Sustainability Criteria & Certification Systems for Biomass Production* (final report, project No. 1386, the Netherlands 2008) 93.

55 Ibid.

56 For further information see H Pacini, L Assunção, J van Dam, JrR Toneto, *The price for biofuels sustainability* (Energy Policy, 59, August 2013) 900.

57 Ibid. 902.

58 J Lin, *The Sustainability of Biofuels: Limits of the Meta-Standard Approach* (Working Paper 011, December 2010) 10; F Pelsy, *The European Commission 2008 Directive Proposal on Biofuels: A Critique* (Environment and Development Journal 2008) 131.

odology for GHG emissions, can be complicated for an ordinary producer. They can be difficult to follow. Evidently, the EU sustainability criteria for biofuels require more commentaries and explanations, for example in the form of more detailed guidelines issued in separate policy documents. Further simplifications are also needed.

Finally, a framework with sustainability criteria that lacks accompanying indicators and proper measuring and evaluation mechanisms can be hard to supervise, monitor and control. Serious enforcement and implementation difficulties can take place. The EU approach to the sustainability criteria for biofuels has many weak points in this respect. For the three EU sustainability criteria for land use, indicators and measuring and evaluation mechanisms are not thoroughly developed. For some issues of land use there are scientific data gaps.

## 5. SUGGESTIONS FOR THE FUTURE DEVELOPMENT OF THE EU APPROACH TO THE SUSTAINABILITY CRITERIA

The whole EU framework for transport biofuels is under development and constant improvement. The EU sustainability criteria should be regarded as a minimum list of criteria, which function to ensure rational GHG emission savings and avoid major environmental impacts on land use and biodiversity. They create a substantial demand for sustainably produced biofuels in the EU Member States and have influence on the international consumption of biofuels.<sup>59</sup> It can be recommended to continue with the development of the EU legally binding sustainability criteria. This will create favorable conditions for the market to develop completing voluntary sustainability standards.

Subsequent elaborations in the list of the EU sustainability criteria can be aimed to expand it and integrate other aspects, relevant for sustainable biofuel production. To my mind, Directive 2009/28/EC has included the sustainability criteria for biofuels in a very limited number, and they all are of an environmental character. Socio-economic criteria have got almost no development. Further development of the sustainability criteria and sustainability principles for biofuels that deal with environmental, social and economic aspects of biofuel production, as well as their incorporation in the EU legal acts are required. Costs for this can be substantial, going up

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<sup>59</sup> Biomass Technology Group, BTG, *Sustainability Criteria & Certification Systems for Biomass Production* (Final Report, project No. 1386, the Netherlands 2008) xii.

to additional 8 – 65 per cent. The expenses will be strongly related to the operational scale, the strictness of the proposed sustainability criteria, their number and the expertise required to check their fulfillment adequately.<sup>60</sup>

To make the content and purpose of the EU sustainability criteria more precise, clear definitions of what sustainable biofuels and sustainable production of biofuels are, need to be added in the EU approach. These definitions can later serve as harmonizing descriptions or assessment indicators in relation to the sustainability criteria and environmental goals of the legal framework, in which they are included.

Amendments to the EU policy for biofuels are likely in the future. Particularly, they can improve the assessment of the impacts, which the sustainability criteria have. They can address unwanted iLUC effects of energy crops farming and better protect high bio-diverse grasslands.<sup>61</sup> Some researchers see the inclusion of iLUC effects in legislation and tools for their control and monitoring as an important task for future work.<sup>62</sup> There is advice to improve approaches for data collection, control and monitoring regarding all types of the sustainability criteria, as well as to develop central data banks, which could be used to share knowledge and competence across regions and existing sustainability requirements.<sup>63</sup> It should be taken into account that different types of biofuels and different production processes require different sustainability criteria.<sup>64</sup> Consequently, they need different indicators and measuring instruments.

More generally, the EU policy for biofuels should include a comprehensive approach that integrates energy efficiency, energy sufficiency, the reduction of GHG emissions and various aspects of environmental protection. The reduction of GHG emissions can be achieved e.g. through introducing an international regime with a price setting for GHG emissions. There are anticipations

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60 J van Dam, M Junginger, A Faaij, I Jürgens, G Best, U Fritsche, *Overview of recent developments in sustainable biomass certification* (Biomass and Bioenergy, 32(8), 749-780 2008) 770.

61 V Schueler, U Weddige, T Beringer, L Gamba, P Lamers, *Global biomass potentials under sustainability restrictions defined by the European Renewable Energy Directive 2009/28/EC* (GCB Bioenergy, 5, 6 2013) 9.

62 AM Hennecke, M Faist, J Reinhardt, V Junquera, J Neeft, H Fehrenbach, *Biofuel greenhouse gas calculations under the European Renewable Energy Directive – A comparison of the BioGrace tool vs. the tool of the Roundtable on Sustainable Biofuels* (Applied Energy, 102, 55-62 2013) 61.

63 K Matus, *Assessing Challenges for Implementation of Biofuels Sustainability Criteria* (Inter-American Development Bank and United Nations Environment Program, Seminar on Assessing the Challenges for Implementation of Biofuels Sustainability Criteria, 25 – 26th January, 2010 - IDB Washington DC, IDB, UNEP 2010) 15 – 16.

64 N Scarlat, J-F Dallemand, *Recent developments of biofuels/bioenergy sustainability certification: A global overview* (Energy Policy, March 2011, vol. 39, issue 3, pp. 1630-1646 2010) 1643.

that such an approach can slow down the biofuel boom and help avoid environmental misuse.<sup>65</sup> Among the primary aims of the EU policy development can be to strengthen the environmental advantages of this source of energy and substantially reduce the production of unsustainable biofuels. An analysis of the existing frameworks with sustainability criteria for biofuels and similar products can provide information about the direction of the development.<sup>66</sup>

EU, on the basis of its approach to biofuels, has the potential to push forward and guide international work at sustainable development and sustainability in this sector, with a special influence issues such as:

- a) harmonization between the existing legal frameworks and voluntary sustainability standards for biofuels, in order to avoid overlapping regulations and double work, which can lead to counterproductive results;
- b) equal conditions for producers, suppliers, distributors and other involved actors, so that they follow approximately the same sustainability criteria; and
- c) minimizing the number of States that do not recognize or follow sustainability criteria.<sup>67</sup>

An opinion has been expressed that no distinction should be made between biofuels produced within and outside EU. The introduction of the EU minimum list of the sustainability criteria in Directive 2009/28/EC can motivate the involved actors to develop voluntary sustainability standards and additional sustainability criteria, with the purpose to verify their biofuel production according to the EU requirements.<sup>68</sup> The role of developing countries and other involved actors at different levels should not be underestimated in this process. Researchers from Mozambique have pointed out that the debate on biofuels should be of an international character. They have expressed an expectation that the EU policy-makers would reflect the needs of major biofuel markets outside EU.<sup>69</sup>

65 F Ekardt, H von Bredow, *Managing the Ecological and Social Ambivalences of Bioenergy: Sustainability Criteria Versus Extended Carbon Markets* (the Economic, Social and Political Elements of Climate Change, Climate Change Management, ed. W Filho, part 3, chapter 29, pp. 455-480 2011) 476.

66 Biomass Technology Group, BTG, *Sustainability Criteria & Certification Systems for Biomass Production* (Final Report, Project No. 1386, The Netherlands 2008) 101.

67 Ibid. 3.

68 Ibid. 91.

69 M Schut, C Leeuwis, A van Paassen, *Ex Ante Scale Dynamics Analysis in the Policy Debate on Sustainable Biofuels in Mozambique* (Ecology and Society, 18, 1 2013) 8.

Many over-governmental institutions and NGOs are currently formulating their viewpoints on how to regulate biofuel sustainability and its production with the help of sustainability criteria. There seems to be a broad understanding that a uniform approach, with the grounds in what EU has achieved so far, would be very effective.<sup>70</sup> It can be advisable to proceed with the work at the EU policy for biofuels and to create necessary conditions, so that the market develops sustainability criteria and voluntary sustainability standards on its own, probably combining the minimum legally binding criteria and additional voluntary sustainability criteria. Only to make references to the EU sustainability criteria in voluntary sustainability standards can be insufficient.<sup>71</sup> In case it is legally possible, and if environmental risks are sufficiently low, certain types of biofuels could be excluded from being regulated with the help of sustainability criteria.

## 6. REFLECTIONS AND CONCLUSIONS

Recognizing that low carbon renewable energy will be an important part of any sustainable energy sector in the future, EU has introduced a comprehensive and robust legal framework with the sustainability criteria for biofuels. The EU sustainability criteria and supplementary elements for their implementation and enforcement can primarily be found in Directive 2009/28/EC.<sup>72</sup> This Directive has a potential to become one of the most ambitious legal frameworks with sustainability criteria in the world, if it is efficiently transposed and followed in the national laws of the Member States.<sup>73</sup> The EU Commission provided guidelines for the use of the sustainability criteria in June 2010.<sup>74</sup> The challenge is now to succeed in the implementation and enforcement at the national level, with concrete actions on the ground.<sup>75</sup>

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70 Biomass Technology Group, BTG, *Sustainability Criteria & Certification Systems for Biomass Production* (final report, project No. 1386, the Netherlands 2008) 3.

71 Ibid. 90.

72 The list of the sustainability criteria from Directive 2009/28/EC is almost identically repeated in Directive 2009/30/EC.

73 European Solar Thermal Industry Federation, ESTIF, *RES Directive* (2013); SEC (2011) 129 final, *Report on the operation of the mass balance verification method for the biofuels and bioliquids sustainability scheme in accordance with Article 18(2) of Directive*, 2.

74 See e.g. Communication (2010/C 160/01) on voluntary schemes and default values in the EU biofuels and bioliquids sustainability scheme, and Communication (2010/C 160/02) on the practical implementation of the EU biofuels and bioliquids sustainability scheme and on counting rules for biofuels; see also COM (2011) 31 final, *Renewable Energy: Progressing towards the 2020 target*, 6.

75 COM (2011) 31 final, *Renewable Energy: Progressing towards the 2020 target*, 14.



The EU list of the sustainability criteria for biofuels can be characterized as one of the internationally strictest for this type of renewable energy. Without going too much in details, it can be pointed out that this list should be developed further, in order to safeguard the sustainable quality of biofuels and their production. Criteria that regulate sustainable use of soil and water can be added. More particularly, sustainable agricultural practices and tolerable use of fertilizers can be prescribed. The control and monitoring mechanisms of the fulfillment of the sustainability criteria could also be elaborated and incorporated in the EU framework. Clear definitions of what sustainable biofuels and sustainable production of biofuels are, need to be added.

Due to the fact that the EU policy for biofuels has global impacts, it should take into account the perspective of the involved actors from other regions and countries. Practical possibilities of the involved actors, their costs for the implementation of the sustainability criteria and regional differences should be considered. Further research on various sustainability issues concerning biofuels, possibly of an inter-disciplinary character, can be recommended. Relatively simple and detailed approaches to measure, control and assess the fulfillment of the sustainability criteria should be developed.

More general conclusions about using sustainability criteria in a legal context can be made. The experience of EU indicates that a legislated list of sustainability criteria should regulate the most important issues that answer for the sustainable quality of a product and its sustainable production. Otherwise the aim of including sustainability criteria in a legal framework is not fully achieved. The list of sustainability criteria should neither be too long, nor too short. A long list is not easy to implement. For a short list, and the EU case illustrates this, it is difficult to guarantee sustainability. To the extent possible, the legislated list of sustainability criteria should be completed by non-binding recommendations, explanations and guidelines.

Before making the suggested sustainability criteria legally binding, possible conflicts between different interests and contradictions with the already existing regulations from neighboring spheres of law should be researched. In the long run, these conflicts and contradictions can become a hinder in the implementation and enforcement of the legislated sustainability criteria.

The analysis of the EU approach to the sustainability criteria has also shown that one of the main difficulties in the implementation of sustainability criteria for an internationally traded product is how the fulfillment of these criteria is controlled. Limitations of what is sustainable versus practically

possible to control should be considered and respected. In the case of bio-fuels, theoretically well-built control mechanisms would fail to fulfill their function, if it is not practically possible to control each link in the biofuel production chain.

On the basis of Directive 2009/28/EC, it can be suggested that better international coordination is required to improve coherence and efficiency in the development of harmonized sustainability criteria. Setting up strategies of good practice and integrating sustainability criteria in global trading mechanisms may be other effective ways to ensure this.<sup>76</sup> There is a point of view, and I fully agree with it, that a legal framework with sustainability criteria or a voluntary sustainability standard should be linked to the development of advanced technology and production methods.<sup>77</sup>

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76 J van Dam, M Junginger, A Faaij, I Jürgens, G Best, U Fritsche, "Overview of Recent Developments in Sustainable Biomass Certification" (2008) 32 (8) *Biomass and Bioenergy* 776.

77 *Ibid.*