

## **1 How should a biofuel sustainability system be designed?**

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As noted in the Introduction, UOP feels that the most important factors in designing a biofuel sustainability system are that it offer a level playing field to all technologies (technology neutrality), that it lead to an economically sustainable biofuels industry through a measured rate of adoption supported by impact assessments to identify potential unintended consequences. In addition, maintaining fuel quality at or above current levels must be a part of all biofuels standards and procedures.

### ***1.1 Do you think the “possible way forward” described above is feasible?***

In general, the elements of the “possible way forward” are feasible and reasonable, with the following additional comments:

All incentive/support systems, policies and procedures must avoid discrimination between imports and domestic production. In order to achieve a sustainable industry, policies must be designed to promote rather than discourage trade. Policies and criteria must be developed that place identical administrative and documentation burdens on domestic and imported biofuel production.

UOP supports the application of objective sustainability criteria (part a). Of the proposed criteria, UOP agrees that Criterion 1 (Box 1) must include LCA or WTW-type analysis and that the analysis must encompass all greenhouse gases, not just CO<sub>2</sub>. Furthermore, these analyses should be applied to all biofuels and not be restricted to ethanol and FAME biodiesel.

UOP supports the linkage of sustainability criteria to national biofuels targets and incentives (part b). While UOP does not support the long-term application of subsidies or other incentives, short-term incentives can accelerate technology innovation and development. Any incentives or support must be technology-neutral and apply only to those technologies which will contribute to the overall sustainability objectives. National biofuel targets are only meaningful to the extent that they realistically promote sustainable technologies; therefore, it is appropriate to apply sustainability criteria to both national biofuels targets and to incentives—as long as the criteria are defined in a technology-neutral fashion. Clear standards should apply, including CEN standards that are performance-based, rather than molecule-specific. EU standards should be coordinated with major global standards bodies like ASTM in order to facilitate open international trade in biofuels.

UOP supports the establishment of clear procedures for Member States to ensure that biofuels criteria are met (part c). Common requirements across Member States for reporting, verification and monitoring compliance with sustainability standards will facilitate trade in biofuels and feedstocks. All procedural requirements must be technology-neutral to avoid suppression of new technologies.

### ***1.2 What do you think the administrative burden of an approach like the “possible way forward” would be?***

UOP's only concern about administrative burden is the need to assure that policies, including tariffs, are uniformly applied across technologies

### ***1.3 Please give your general comments on the “possible way forward” and how it could be implemented. Does it give an adequate level of assurance that biofuels will be sustainably produced?***

In general, UOP considers the “possible way forward” to be viable as long as it maintains technology neutrality, so that sustainability criteria and associated administrative procedures provide a level playing field for all technologies and not be designed with only “additive” biofuels, e.g. FAME biodiesel and ethanol, in mind.

Biofuels targets should be defined with respect to the total transportation fuel pool, rather than imposing a requirement that all fuel sold contain a specific fraction of biofuels. This will allow the

market to identify the most efficient and least expensive combinations of technologies, thereby increasing the probability of meeting biofuels targets in an economically sustainable fashion.

Any implemented policy should be based on the premise that long-term sustainability requires both environmental *and* economic sustainability. Policies should foster technology development that will lead to an industry that can compete in an open marketplace. The role of incentives and mandates should be to encourage rather than maintain a biofuels industry. Any subsidies or other incentives should be phased out over time as commercialization costs come down in response to improved economies of scale.

To ensure that biofuels production is truly sustainable, policies need to account for all potential impacts. Before finalizing policies, impact assessments will be needed that take into account their potential impacts on such factors as fuel price, fuel pool quality, availability of raw materials, ease of integration with existing refining and vehicle technologies and assets, and competitive value chains such as food production.

***1.4 Should carbon stock differences between land uses be taken into account under criterion 1? If so, what method should be used to determine how the land in question would have been used if it had not been used to produce raw material for biofuels?***

UOP is not in a position to comment on land use policies and strategies.

***1.5 As described in the “possible way forward”, criterion 3 focusses on land uses associated with exceptional biodiversity. Should the criterion be extended to apply to land that is adjacent to land uses associated with exceptional biodiversity? If so, why? How could this land be defined?***

UOP is not in a position to comment on land use policies and strategies.

***1.6 How could the term “exceptional biodiversity” be defined in a way that is scientifically based, transparent and non-discriminatory?***

UOP is not in a position to comment on land use policies and strategies.

## **2 How should overall effects on land use be monitored**

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***2.1 Please give your comments on the “possible way forward” described above. If you think the problem should be tackled in a different way, please say how.***

UOP is not in a position to comment on land use monitoring and reporting.

***2.2 Do you think it is possible to link indirect land use effects to individual consignments of biofuel? If so, please say how.***

UOP is not in a position to comment on land use monitoring and reporting.

## **3 How should the use of second-generation biofuels be encouraged?**

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As noted in the introduction, UOP considers it very important to clarify the distinction between first- and second-generation biofuels. First-generation biofuels are those existing and near-term technologies which use sugars and oils from food crops as feedstocks. Second-generation biofuels are emerging technologies that derive fuels from lignocellulosic materials contained in non-food feedstocks, such as agricultural and forest wastes, prairie and switch grass, or inedible vegetable and algal oils.

The primary feedstocks for first-generation biofuel technologies are sugar cane, sugar beets and corn (ethanol), and vegetable oils such as corn, soy, palm or rapeseed (FAME biodiesel). The impact of first-generation biofuels can be understood by considering the requirements of 10% biofuel substitution from food crops. 10% diesel substitution would require 33 M hectares of rapeseed and 10% gasoline substitution would require 7.7 M hectares of sugar beet production. Taken together, these requirements are the equivalent of dedicating the land mass of Belgium and Germany to rapeseed and sugar beet cultivation. Large-scale adoption of biofuels will require a transition to second-generation technologies which do not compete with the food value chain and obtain higher yields of fuel per unit land mass.

Policies to encourage biofuel development should include assessments of fuel quality and compatibility with existing refinery and transportation infrastructure, as well as current vehicle technologies. The International Energy Agency (IEA) projects that fossil-based fuels will comprise 90% of global transport fuels through 2030. Therefore, production of biofuels that are compatible with current gasoline and diesel fuels will be the most effective way to ensure their widespread adoption.

While investments can accelerate technology development, scale-up and commercialization through mechanisms such as R&D funding, loan guarantees, or supply agreements (for example), it is important to emphasize that the resulting technologies must ultimately be economically sustainable in their own right.

### ***3.1 How should second-generation biofuels be defined?***

***Should the definition be based on:***

**(a) The type of raw materials from which biofuels are made (for example, “biofuel from cellulosic material”)?**

As outlined above, UOP believes that second-generation biofuels should be defined as those that utilize feedstocks that cannot be used for food. These may include the waste from food crops, such as corn stover, other agricultural and forest waste, and inedible oils derived from plants and algae.

**(b) The type of technology used to produce the biofuel (for example, “biofuels produced using a production technique that is capable of handling cellulosic material”)?**

UOP believes that the classification of biofuels should be based on feedstock rather than any specific production technique. Because technologies evolve over time, definitions based on production technique will reduce incentives to develop more efficient and cost-competitive processing routes.

**(c) Other criteria (please give details)?**

As noted above, fuel quality and characteristics are important criteria in assessing any biofuel technology.

### ***3.2 Please give your comments on the “possible way forward”. If you think the problem should be tackled in a different way, please say how.***

In general, UOP believes that free market economies are essential to the creation of a vital and sustainable biofuels industry. Government policies should therefore be used to create a level playing field among competing technologies and ensure that the broader societal needs are met. While UOP does not favor incentives, to the extent that they may be used to foster innovation and encourage technology development that will meet long-term objectives, they must be technology

neutral and based on objective outcomes and standards. Any such incentives must be phased out over time as technologies mature and transition into the marketplace.

UOP has a specific concern that differential treatment of first and second generation biofuels with respect to fuel replacement mandates or tax incentives may lead to confusion in the industry and non-uniform application of policy across member states. It would be more effective to stimulate the development of second generation biofuels through support of research, development and engineering rather than applying different incentives to the resulting fuels themselves.

### ***3.3 Should second-generation biofuels only be able to benefit from these advantages if they also achieve a defined level of greenhouse gas savings?***

This is consistent with an outcomes-based approach, which takes into account fuel quality as well as impact. In this context, all greenhouse gases should be considered in a life-cycle type of analysis, rather than only CO<sub>2</sub>. This approach will allow the market to pick the winning technology, within the framework of concrete environmental objectives. An example of such an approach is being adopted in California, where the state is planning to utilize LCA experts to assign greenhouse gas values to a wide range of alternative fuels on a common basis, in order to meet the state's objective of reducing greenhouse gases by 10% by 2020.

## **4 What further action is needed to make it possible to achieve a 10% biofuel share?**

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### ***4.1 Should the legislation include measures to ensure that diesel containing 10% biodiesel (by volume) can be placed on the market, and is in fact placed on the market?***

It is UOP's opinion that the likelihood of meeting the target will be enhanced by defining the target as 10% of the total transportation fuel pool, rather than requiring that all fuel sold contain 10% biofuels. UOP believes that the market should be allowed to determine the best route to meeting targets with respect to environmental impact and alternative energy consumption. There are multiple routes to achieving a given objective, such as substitution of fossil fuels or greenhouse gas reduction. The role of governmental policies should be to clearly delineate objectives but not prescribe the method for achieving those objectives. It is important that policies include provisions for certifying technologies with respect to those objectives, including greenhouse gas footprint, environmental quality, fuel quality and impact on existing infrastructure and assets. For example, renewable fuels such as hydroprocessed vegetable oils that are completely equivalent to their fossil counterparts can be blended into the fuel pool with no impact on the existing fleet and can be transported within existing pipelines. They may be combined with fossil fuels in any proportion without affecting engine performance or longevity.

### ***4.2 Should the legislation include measures to encourage the use of ethanol and biodiesel in high blends? If so, what?***

As noted under 4.1, legislation should not promote any specific technologies such as FAME biodiesel or ethanol, particularly given the need for new technologies to move away from food-based feedstocks. Instead, all biofuels should be encouraged to utilize non-edible feedstocks, that are compatible with existing refining and fuel transportation infrastructure, and that facilitate high blends without impact on vehicle engines and that facilitate high blend volumes without engine impact. Any legislation should also be careful to encourage, rather than discourage, free trade in biofuels.

**4.3 *Should the legislation include measures to encourage the use of biomethane, methanol, and DME in transport? If so, what?***

The points noted under 4.1 and 4.2 apply equally to this question.

**4.4 *[omitted in original document]***

**4.5 *Should the legislation ask the Commission to review, by a given date, whether it is possible to be confident that the 10% target can be achieved through:***

- (a) Rules that allow 10% blending by volume of ethanol in ordinary petrol, plus**
- (b) Rules that allow 10% blending by volume of biodiesel in ordinary diesel, plus**
- (c) The four options listed under ‘other options for solving the problem’?**

***If so, what should the date be?***

***If the Review were to conclude that the target is unlikely to be met, what action should the Commission take?***

As noted under UOP’s responses to 4.1 and 4.2, it is important that the legislation be neutral with respect to technologies and focus instead on feedstock, environmental impact and fuel characteristics. In addition, the impacts of a target rate of adoption must be assessed carefully to identify and avoid or mitigate any potential unintended consequences.

**4.6 *More generally, what role should taxation play in the promotion of biofuels (considering different situations such as low blends, high blends, and second-generation biofuels)?***

Any incentive program, whether tax- or subsidy-based, must be technology neutral and defined by performance against clear criteria related to policy objectives. As outlined in the Introduction, incentive programs must be temporary and designed to cultivate an economically-sustainable biofuels industry rather than to provide on-going support for technologies which cannot successfully compete in the marketplace.