

# Burning questions

## Certainties and uncertainties concerning agrofuels

DPRN (2010)

Summary of the discussion at a DPRN<sup>1</sup> expert meeting on 18-02-2010, The Hague

Organised by the Dutch Agrofuels Platform: Both ENDS, Natureandpoverty.net/IUCN NL, AISSR/UvA,

Cordaid, Mekon Ecology, Alterra, ETC, Law and Governance Group/WUR, CML/RUL and CIS/VU

### Introduction

Within the framework of the Development Policy and Review Network (DPRN), the Dutch Agrofuels Platform organised a meeting between scientists, NGO representatives and policy makers in The Hague on 18 February 2010. The purpose of the meeting was to bring scientists and policy makers together, whereby scientists could present and discuss the status of science, and discuss uncertainties and assumptions related to agrofuels with policymakers. The central question was:

*What are the certainties and uncertainties related to agrofuel production and its effects, and how can policymakers deal with these?*

In the morning session, the discussion focused on the findings of science, while the afternoon session focused on their implications for Dutch and European policies. The meeting was closed, and held under Chatham House Rule, encouraging all participants to speak freely and from a personal and professional perspective. Among the 25 participants (see Annex 1), there were 11 scientists, 10 NGO representatives, 1 consultant and 2 senior policymakers. Some participants are also member of the Committee for Biomass Sustainability Matters (Commission Corbey). This report summarizes the main discussions that took place during the meeting.

### The scope of the discussion

Although the discussion also touched upon the use of biomass for other purposes (e.g., electricity generation and production of bioplastics), it focussed primarily on agrofuels, i.e., liquid fuels produced from agricultural commodities. This, because the Renewable Energy Directive (RED) of the European Union is the main driver for the production and use of agrofuels. The reasons for Dutch and European governments to stimulate the use of agrofuels are: (i) to meet the policy objectives of reducing GHG emissions in the transport sector; and (ii) the need to become less dependent on fossil oil reserves. An *underlying* motivation for this policy is related to the assumption that agrofuel production

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<sup>1</sup> The Development Policy Review network (<http://www.DPRN.nl>) promotes informed debate and synergy between scientists, policymakers, development practitioners and entrepreneurs. DPRN has a web portal which provides searchable access to development expertise in the Netherlands and Belgium (<http://www.global-connections.nl>) and a repository for publications of Dutch development organizations (<http://www.Search4Dev.nl>).

will revitalise the agricultural sector in various European countries (e.g., the Netherlands, UK, Germany and France).

The debate was organised around three key themes: (i) Necessity of agrofuels from a GHG reduction and energy scarcity perspective (ii) Opportunities and risks; and (iii) Governance and governability. Annex 2 presents the guiding questions that were used to structure the discussion.

## **1. Necessity of agrofuels**

### *Demand*

Even though electricity is likely to become more important in the transport sector, the demand for liquid fuels is not going to disappear in the short or medium term (vis-à-vis current engines used). The demand for energy in the transport sector is still growing fast and the dependency on fossil fuels is high. Moreover, energy diversification is a policy goal of the Dutch and European governments, which implies that biofuels will be part of the energy mix, especially in the transport sector. First generation biofuels (mostly agrofuels) are not indispensable in theory, as the alternatives are electricity and hydrogen. But at the moment battery-based vehicles have a limited range and are therefore not suitable for long distance transport by trucks. For the moment, biodiesel would be necessary.

Reference was made to the Scientific American (November 2009), which outlines a scenario whereby global energy needs can be met 100% from wind, solar, geothermal and hydro in 2013 at costs competitive in relation to current price levels of fossil fuels. This would solve our electricity needs, but not the need for transport fuels. Moreover, in practice there are strong vested interests in the production and processing of first generation biofuels (e.g., biodiesel and ethanol plants throughout Europe and in the Netherlands in the harbours of Rotterdam and Amsterdam). This creates a so-called “lock-in effect”, which makes a shift to second and third generation biofuels more difficult.

In addition to biofuels, biomass is used for co-firing in electricity production. Furthermore, demand for biomass for the production of higher value products, such as bioplastics, is expected to grow. The agrofuel debate should thus also be discussed in the wider context of a bio-based economy, i.e., including purposes other than energy.

Various countries (both in the North and in the South) pursue their own bio-based economy to become less dependent on the import of (expensive) fossil fuels. Currently, however, most agrofuel producing countries tend to focus on the export, rather than using agrofuels for their own domestic purposes. The demand for agrofuels is artificially triggered by policy measures, but as soon as the price of fossil fuels will increase, demand will naturally increase. The question is: how much additional demand is triggered by European Union countries - for which import of agrofuels is necessary - and is this additional demand desirable from a land-use perspective? And to what extent can

the Dutch government realistically envision to positively influence agrofuel developments?

During the discussion it was mentioned that the FAO estimated that in 2050 an additional 70 million hectares will be converted into agricultural production to meet the demand for food of which 120 million ha in the South and minus 50 million in the North. This raises the question why the North would take 50 million ha out of production given the rising demand for food, fuel and fiber and given the worry to trigger negative social and biodiversity impacts in the South. A recent WAB study by WUR estimates that replacing 10% of all liquid fuels (globally) with biofuels would require between 100 and 170 million ha. There is serious doubt if such an amount is or will become really available without endangering food production or loss of biodiversity.

In general, participants are not against the 'bio-based economy' to reduce dependence on oil, but note that smart choices will need to be made (i.e., for which end uses are we going to use what type of biomass), considering the fact that the amount of biomass that can be sustainably produced is limited. Multiple uses of biomass sources will be indispensable. However, the Renewable Energy Directive – even though it is unique as an obligatory standard for biofuels at EU level- does not appropriately control undesired effects and therefore risks to not attain its goal: to reduce GHG-emissions.

### *Reduction of GHG emissions*

Although the main economic reason for agrofuel demand is to diversify the energy strategy, the second main reason is the need to reduce GHG emissions in the transport sector. But does the use of agrofuels actually contribute to reducing GHG emissions? Scientists highlight two problems with the methods that are currently used to calculate GHG emissions. First, when calculating the GHG-balance of direct land-use change there is no accepted method to include changes in N<sub>2</sub>O emissions from the soil. Second, there is no unambiguous and widely accepted method to measure the GHG effects of indirect land-use changes (ILUC). The scientists present at the discussion expect that virtually all agrofuels with a direct land claim (mainly the first generation agrofuels) have a negative GHG balance if all effects of ILUC would be taken into account. The use of waste and residue streams (to produce agrofuels and generation of electricity) has more potential to contribute to climate change mitigation. Participants agree that, while the biobased economy is here to stay, most first-generation agrofuels are not GHG-efficient, given that they trigger indirect land use changes. This leads to the question of opportunities and risks.

## **2. Opportunities and Risks**

### *Models*

The outcomes of models concerning the potential of global biomass production vary enormously. A small percentage in changing meat consumption can have huge impact on the calculated outcomes. In the first place, the models differ in the type of information

they aim to present. One type of model is looking at the maximum biomass potential. Such a model looks at land suitability and finds a theoretical maximum, but does not include whether it is realistic and within what timeframe. Such models do not incorporate one of the main drivers of expansion, which is infrastructure. Moreover, most do not include actual or expected land use and social factors or exclude protected high biodiversity areas from exploitation as production area. . In general, the potential is strongly overestimated. Basing policy decisions on such models is considered risky.

For models of the global potential of biomass production to become realistic, a wide range of considerations would need to be included, such as the above mentioned. And, including more considerations generally translates into downsizing the outcome. This is not to say that there is no potential for agricultural growth. Globally, an estimated 18% of the land is used for agriculture, while 10% is protected and not less than 72% lies somewhere in between.<sup>2</sup> Participants agree that there is (at least some) room for both agricultural intensification and agricultural expansion without threatening biodiversity or livelihoods. The key question is how to regulate this. At various moments participant remarked that 'good governance' and 'strong governments' are *the* crucial factors for a sustainable agricultural intensification or expansion.

Other, *effect models* look at the implications of current demand and trends. These models are based on calculated trends in the global increase of demand for food and feed and assume a certain increase in agricultural productivity. Outcomes are very sensitive for small changes in predictions of agricultural intensification or changing diets. Basically, models are used to describe IF-THEN relationships, but most of the models that are currently used were not set up or suitable to answer policy questions related to indirect land-use changes. Many models seem to rely on overly optimistic trends, using predictions of food demand based on linear extrapolations of data that are outdated (FAO have adjusted their predictions, but models are still based on the old FAO data). Scientists emphasize that models should not be perceived as predictions of the future – they do not present a certain truth. Many of the parameters put into models are in some way or another related to policy decision-making and scientists urge policymakers to read these studies more carefully as it would help them to base their policy decisions on more solid ground and take uncertainties into account. Policymakers, on their turn, stress that they need scenarios that lay out the options: “If you want to attain this, you will have to do this”.

A major disadvantage of effect models is that they seldom take into account short-term socio- economic impacts such as a rise in food prices. This could lead to an underestimation of such impacts. Another flaw is that some models assume agricultural expansion on 'marginal or degraded' lands. Given the commercial realities of investors this is highly unlikely (as they require huge inputs to become productive). Furthermore, such inputs –such as fertilizer (i.e. nitrogen) - may have strong GHG emission consequences. Furthermore, such lands are not seldom in use for other purposes such as temporary pasture lands, or may contain unique biodiversity (cf Brazilian cerrado).

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<sup>2</sup> In the future, some lands may become more or less suitable for agricultural production due to climate change.

### *Agrofuel production in the wider agricultural context*

The extent to which increased future demand for agricultural products will ultimately lead to expansion of agricultural lands depends strongly on technological improvements (intensification) and land-use regulation, including the protection of natural areas. Some participants stress that the importance of agrofuel production is limited when seen from the perspective of total global agricultural production. Using the argument that crops grown for biofuels presently account for only 2% of the global agricultural acreage, they claim that the production of energy crops “plays only a minor role, when compared to, for example, global meat consumption”. Virtually all scientists present at the meeting, however, while acknowledging the huge effect of meat production, agree that the use of crops for biofuels is likely to contribute *significantly* to the growth of the global agricultural acreage in the near future, and warn for downplaying the potential impacts.

Some participants question the usefulness of distinguishing between production of crops for biofuels and crops grown for other purposes: “For a farmer producing oil palm, it makes no difference whether the raw material is used for food or fuel”. The production systems are part of the same agricultural realities and impact upon each other. Therefore, all purposes should be taken into account and brought into a wider debate on the implications and sustainability of agricultural development, and, if you may, a bio-based economy. Other participants argue that a distinction between energy crops and other crops is necessary in order to understand that the production of crops for energy purposes is flawed in relation to its objective, i.e., reducing GHG emissions. “The production of biofuels results in extra agricultural expansion, which leads to extra GHG emissions through, among others, deforestation and release of greenhouse gasses from soils, and it thus fails to meet its objective”.

Increased production of agricultural crops for biofuels may lead to a further increase of food prices. While this would mean higher incomes for net food producers, it would have negative effects for the food security of the majority of people, as most people in the world are net food consumers. When talking about food security a distinction needs to be made between short-term effects on food security in developing countries and food security of the world population in the long-term. Furthermore, whether or not agrofuels pose a direct threat to food security clearly depends on technological developments. Some claim that increased demand for biofuels triggers agricultural innovations. Others note that the demand for agricultural commodities is rising spectacularly anyway and stress that the possibilities of intensification are not endless, especially because of the limited availability of essential inputs (nutrients, water) .

## **3. Governance**

### *Governability and sovereignty*

To what extent are effects controllable and/or is there a political will to control effects to begin with? When considering this question, it is important to not just focus on production in the South, but to address production in Europe as well. Europe should not take land out of production and shift the burden to the South. And, Europe should not put demands on Southern countries which it does not apply for its own member states. For

example, the Netherlands refuses to dictate what crop is grown where and leaves that to the commercial farmer. In addition, short-term economic profits mostly prevail over the protection of biodiversity (reference is made to the Prime Minister who stated that protection of Natura 2000 areas is hindering economic development).

Worldwide, there tends to be a significant gap between rules and realities. We can develop norms and criteria, but the reality is that implementation is more difficult and often lags behind. In fact, we are still at the very beginning of putting sustainability standards in practice. This issue becomes even more relevant in countries that lack a well-functioning government. Many agreements and rules cannot be implemented due to situations that are unforeseen, such as disasters, failing governments and wars. In some countries the juridical framework is paralysed resulting from thousands of land conflicts. Governments of producing countries do not always act in the interest of its citizen. Our discussion on criteria is then bypassing the land-use and political realities in producing countries, not least because it is impossible to oblige non-EU producing countries to adhere to criteria meant to control indirect land-use changes, as it directly touches upon sovereignty of countries. It is argued that the principle of national sovereignty is often tabled (by political-economic elites from both producer developing countries and OECD importing countries) for self-serving reasons, for example as an argument for non-interference with complex issues such as trade regulation (non-trade concerns), land rights and land-use planning. The current (RED) criteria used for biofuels are straightforward and acceptable when they relate directly to the product and direct land-use change. Under WTO-ruling, such a direct demand on product quality and sustainability is allowed if it applies to all countries and producers. However, certification is more complicated as soon as ILUC criteria are introduced, as these will touch upon a country's wider agricultural policies and thus its sovereignty. This creates a dilemma. ILUC concerns are considered legitimate but demands concerning ILUC might be not acceptable under WTO-rules. Including spatial planning requirements (e.g., making an enforced zoning system mandatory to protect areas mentioned in RED, but not stating what to produce, where and how) into sustainability criteria might be a way forward in solving the dilemma of sovereignty, sustainability and GHG-reduction.

Does sovereignty imply that the Netherlands cannot take a clear stand? Does it mean that the Netherlands should not get involved in trying to improve governability of effects? Some stress that WTO-rules are not the only governing principle because they allow for international and bilateral agreements. Reference is made to existing agreements such as those on climate change, nature conservation (e.g. Convention on Biological Diversity), human rights and labour (e.g. ILO). The question then becomes to what extent agreements (at global, European, or bilateral levels) can be used to address the negative effects of land-use changes. The Global Bio-Energy Partnership (GBEP) might lead to an international agreement between nations on what sustainability entails. Also, the Netherlands might facilitate - through the European Union - bilateral agreements with non-EU producing countries (similar to the 'Everything but Arms' - agreement).

### *Pros and cons of blending targets*

*Pro:* According to some, legally defined blending targets offer a unique and unprecedented legal opportunity to implement obligatory sustainability criteria for agrofuels. This, in turn, should have positive effects on wider agricultural production. Proponents of the blending targets thus hope that (elements of) the biofuel regulation will spill over to the wider agricultural sector, i.e., setting sustainability criteria for the bio-based economy. The question therefore is how similar arrangements can be used for other commodities. Further, proponents of the blending targets note that the regulations can be adjusted to create extra incentives for second-generation biofuels (which has already happened in the Netherlands). Finally, it is argued that the unwanted effects of current import of biofuels in the Netherlands should not be exaggerated, noting that most of the ethanol imported in the Netherlands comes from Brazilian sugarcane (performing relatively well in terms of its GHG balance) and that about half of the biodiesel used in the Netherlands is derived from residual fats.

*Con:* Other participants are of the opinion that the current blending targets form a poor policy tool, as the sustainability criteria are weak and risks associated with agricultural expansion are large. Some participants argue for abolishing the blending targets all together. They are not convinced by the argument that blending targets provide an entry point to implement sustainability criteria. “Why would you want to increase the demand for agricultural products artificially if you know that the use of agrofuels will not contribute to significant GHG emission reductions, has unacceptable social implications (e.g. human rights and land rights violations), while it will inevitably lead to extra agricultural expansion, possibly at the expense of biodiversity, food security and smallholder agriculture?” They argue it is better to invest in productivity and sustainability of the agricultural sector as such, and in various initiatives that are already in place to pursue sustainability of trade chains..

### *The need to make adjustments*

All participants agree that, within the European context, it is necessary (and possible) to adjust the current regulations. The Netherlands should play an active role to improve the Renewable Energy Directive criteria and guidelines (even if this implies confronting WTO regulations), as they are currently insufficient. There is an urgent need to include in the RED sustainability criteria: (i) indirect land use changes (ILUC); (ii) N<sub>2</sub>O emissions; and (iii) social criteria (e.g. ILO related). Also, incentives for second/third-generation biofuels can be further developed. Some participants note that Member States are currently not allowed to set higher sustainability criteria than the EU RED (for biofuels and bioliquids), which translates into a lack of incentives for producers to raise their standards.

Though everyone agrees that ILUC needs to be included in the criteria, scientific models to measure ILUC are not yet agreed upon and thus not appropriate. Some insist that the variations in methods are currently simply too large, making it impossible to implement on the short term. Others urge for rapid implementation of ILUC criteria, leaving room to improve the method along the way. With stricter criteria, it becomes questionable whether national blending targets can be attained. It thus requires a serious evaluation in

a couple of years. Empirical fact finding on the ground is needed in order to assess the effects of the policies. A possible outcome of the evaluation could be that the blending targets need to be lowered or abandoned.

### *Beyond the targets*

As soon as the production of agrofuels becomes commercially more profitable compared to fossil fuels (oil price), the blending targets will become irrelevant. How then to promote sustainable agrofuels? Some find that, ideally, the Netherlands should stop the import of uncertified agrofuels through Rotterdam harbour. However, this is considered a trade barrier and is not allowed by WTO regulations. Many participants agree that the Netherlands should take a bold and clear position concerning social and environmental principles in discussions on WTO regulations. The Netherlands could decide to only import certified biofuels, regardless of the blending targets. This would be opposed by economic parties and so far there is no political will to do so. On the contrary: the Netherlands promotes the harbour as the main gateway to Europe and wants to become a biofuel-hub.

### **Some points of concern raised at the meeting**

Bearing in mind current social and political conditions in producing countries (notably in the South, but also in the North), experiences so far show one cannot be overly confident about the potential to bend current modes of biofuel production towards sustainability. In addition, 'producing countries', 'governments' and 'societies' are not homogenous entities. The key questions that need to be addressed in order to achieve sustainable biofuel development are: who decides? Who represents who? And who wins and who loses? There is a need to address the position of smallholders, indigenous people and women since they are most likely to receive the blows of possible negative effects (deforestation, land grab, dismal labor conditions and social tensions) in anonymity. An option could be appropriate and enforced spatial land use planning as a pre-condition to prevent negative effects of agricultural expansion for local livelihoods and biodiversity. However, this cannot be enforced by the importing countries. One can not rely too much on certification if accompanying pre-conditions such as good governance and appropriate land-use planning in producing regions are not being met.

It is regrettable that the departments for agriculture (LNV: responsible for the bio-based economy) and economic affairs (EZ: responsible for domestic energy use) did not attend the discussion. It would have enriched the perspectives on the discussion. Several participants feel the Dutch government fails to be sufficiently coherent, and does not consider the risks of biofuel production seriously enough. Could the Netherlands calculate what its biofuel policy implies for its ecological footprint? Also, the EU should look at its evaluation milestones and create earlier opportunities to review the impacts – positive and negative – of the EU Renewable Energy Directive, allowing for timely measures.

The biofuel dossier should be approached within the wider context of a bio-based economy which includes the use of biomass for purposes other than energy and which will result in additional pressure on land. There is a need to reconsider biomass in the light of opportunity costs: it is crucial that investment choices promote energy options and technological routes which are truly future proof and help avoid lock-in effects. We should ask ourselves what is constraining the development of a truly sustainable energy sector using solar and wind energy? In the face of a growing population and its consumption levels, land is increasingly scarce. Even when good governance is in place, potential negative indirect effects of agricultural expansion are not fully controllable. The need to invest in alternatives that are not land-use intensive is emphasized by several participants, as to relief pressure on the world's scarce resources. It can be argued that, as a matter of principle, biological substance should not be used for energy. In stead, all energy needs should be met with the physical energy that is available in huge quantities (solar, wind, hydro). However, if biomass for energy is needed still, which most experts expect, its use for energy could be combined with various other uses, such as pharmaceuticals, plastic, and energy then would probably be last in the "cascade". Scientists should join hands in discussing each other's methods and assumptions, since this would allow for greater consensus and clarity. At the same time, policy makers should take into account the assumptions made – and often explained- in studies before using them as a basis for policy without further discussion.

### **Final remark**

Where some believe "the train (i.e. policy-induced agrofuel production) should be stopped", others argue the "train should be steered into the right direction". Although the discussion clearly revealed these two different positions, there is consensus that sustainability criteria urgently need further improvement, and that blending targets will need to be re-evaluated based on their actual effects on the ground. Existing sustainability criteria will need to account for indirect land-use changes. The Netherlands and the EU should put achieving quality before quantity – if it appears that quality does not allow quantity to be raised, the blending targets have to be adjusted.

## Annex: List of participants

1. Martha Bakker , Wageningen University
2. Prem Bindraban, Wageningen University
3. Sjaak Conijn, Wageningen University
4. Ralph Brieskorn, Ministry of Housing, Spacial Planning and the Environment
5. Ton Dietz, University of Amsterdam
6. Heleen van den Hombergh, International Union for the Conservation of Nature, Natureandpoverty.net,
7. Otto Hospes, Wageningen University
8. Peter de Koning, Mekon Ecology
9. Koen Kusters, University of Amsterdam
10. Madelon Meijer, Oxfam Novib
11. Dicky de Morree Cordaid
12. Kor Voorzee Cordaid
13. Tim Mulder, ETC Foundation
14. Ella Lammers, Agentschap NL , Secr. Commissie Corbey,
15. Hans van Meijl LEI/Wageningen University
16. Danielle de Nie, International Union for the Conservation of Nature
17. Jan Ros, Planbureau voor de Leefomgeving
18. Theo vd Sande, Ministry of Foreign Affairs
19. Sarah Stattman Wageningen University
20. Pita Verweij, Copernicus Instituut
21. Willem Wiskerke, Stichting Natuur en Milieu
22. Karen Witsenburg, Both ENDS
23. Paul Wolvekamp, Both ENDS
24. Leo van der Vlist Netherlands Centre for Indigenous Peoples
25. Gerrie van de Ven, Wageningen University
26. Kim de Vries, University of Amsterdam

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## **27. Annex 2. Guiding questions**

### **What determines the need for biofuels?**

1. GHG emission reduction:
  - is balance positive or negative?
  - Are the criteria by the RED about the GHG balance sufficient?
2. Growing demand:
  - Do we need biomass next to fossil fuels, or are there also alternatives like wind, solar and biogas?

### **Opportunities and Risks:**

1. assumptions in models
  - a. are models dependable?
  - b. Are they sensitive to great margins? Is precautionary principle applicable?
- 2, land potential
  - 9 billion people need food. Can biomass production expand on only marginal or fallow land? To what extent do these crops pose a threat on food security?
  - Is production on marginal land feasible and realistic?
2. income for countries, farmers.
  - a. Does agrofuelindustry stimulate the agricultural sector, is it profitable for countries, farmers, in non-OECD countries and small farmers?
  - b. Are foreign investments in agrofuel industry economically advantageous for countries, (tax of FDI) and farmers (access to land, market etc).
  - c. Prices: what effect does agrofuelindustry have on prices of food and land? Who are the winners and losers?
  - d.

### **Governance:**

1. Sovereignty and free market.
  - Is corporate responsibility in development countries improved to guarantee sustainability? Or are inequality and conflicts over land and resources the guiding principles?
  - Is good governance attainable in the global competition over agrofuels?
3. Governance:
  - a. Is the RED sufficient for agrofuels or are there other solutions for GHG ambitions, social criteria, sustainability and macro-effects of biofuel production?
  - b. What is known about controlling through reporting, certification, land use planning and bilateral agreements?