Biofuels Policy in the European Union

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Abstract

The European Union (EU) is the main focus of policy development and coordination at a continental level for its 27 Member States (EU-27). This includes energy, environmental and agricultural policy. Biofuels have been promoted by the EU using various policy mechanisms for over a decade. Fuel insecurity and environmental factors have driven the EU to set mandatory targets which are to be met by 2020. One of the targets specifies that 10% of final energy consumption in the transport sector must be met by renewables by 2020. The 2009 Climate and Energy Package, which mandates the target, replaces and updates much of the previous policies dealing with biofuels.

The 10% renewables target for transport is expected to be met predominantly by first generation biofuels and lead to significant increases in biofuel consumption within the EU. This growth in demand is likely to be met by higher volumes of imports as well as increased domestic production. The 10% target has received heightened public attention as concerns were raised about its sustainability. To tackle this issue, mandatory sustainability criteria have been included in the legislation. Serious questions remain, however, about the feasibility of their application and their effectiveness. The issues of indirect land use change and social sustainability have not been entirely dealt with by the Directive, but must be reported on by the Commission and Member States. Further analysis is required to provide sound methods of quantification to allow these issues to be incorporated into policy.

History of Biofuels Policy in the European Union

Biofuels were first promoted at an EU level with the introduction of The Directive on the promotion of the use of biofuels or other renewable fuels for transport (2003/30/EC). The Directive set indicative targets for the percentage share biofuels should achieve in the total volume of fuel consumed in EU transport (2% by 2005 and 5.75% by 2010). Member States were free to determine how they would meet the targets and were required to submit annual reports indicating the progress made towards reaching them. The Energy Taxation Directive (2003/96/EC), passed in the same year, allowed tax exemptions and tax reductions under certain conditions to permit Member States to favour biofuels in this way if desired.

Although the targets were only indicative, biofuel use more than doubled between 2003 and 2005 (The German Marshall Fund of the United States, 2007). Despite this mini boom, by 2005 the share of biofuels in the EU’s transportation fuel total had reached only 1.4%, falling short of the 2% target (Schnepf, 2006).
In February 2006, the European Commission released the communication “An EU Strategy for Biofuels” (COM(2006) 34 final) based on the Biomass Action Plan (COM(2005) 628 final). This strategy set out seven strategic policy areas to facilitate the development of biofuels in both the EU and developing countries. These areas included support to research and development; support to developing countries; a study into trade and custom opportunities available to support biofuels; and available mechanisms to increase demand for biofuels. Under the last heading, the Commission stressed the importance of national targets, use obligations and ensuring the sustainable production of biofuels.

In 2007 the Renewable Energy Roadmap proposed a legally binding target of 20% for renewables as a contribution to total energy consumption by 2020, with a minimum target for biofuels of at least 10% of overall consumption of petrol and diesel in transport. In March 2007 this recommendation was endorsed as EU leaders committed to transform Europe into a highly energy-efficient and low-carbon economy. They pledged to cut CO₂ emissions to 30% below 1990 levels by 2020, upon the agreement of a comprehensive global accord. The EU also committed to reduce its emissions to 20% below 1990 levels regardless of a global agreement. These emission targets included three key energy objectives:

- A 20% reduction in energy consumption through improved energy efficiency by 2020
- A 20% share of renewable energy in gross energy consumption by 2020
- A 10% share of consumption of petrol and diesel in transport to be met by biofuels by 2020

In January 2008 the European Commission proposed a package of legislative measures to implement those targets pledged in March 2007. Following negotiations the binding measures were agreed by EU leaders and the European Parliament in December 2008. The package, which came to be known as the “Climate and Energy Package”, was adopted in April 2009. Its goals, which became known as the “20-20-20 targets”, are intended to ensure that the EU meets its pledges made at Kyoto and to set the stage for further global negotiations (European Union, 2009).

During the negotiation procedure in 2008 many of the Commission’s proposals were altered to address the concerns of various stakeholders and Member States. Although the overall targets remained the same many of the details were changed, and in some cases weakened. The main change to the proposal with regards to biofuels was the widening of the remit of the 10% target. The target, which originally stated that 10% of transport fuel should be met by biofuels, was changed to state that 10% of the energy in transport must be sourced from renewable resources. This change in wording allows electricity and hydrogen to be included in the target, in the hope that it will act as an incentive for developing these technologies.

Although policy is mandated at a continental level by the European Union, Member States are largely free to determine how best to implement the policy frameworks and meet the targets set. Table 1 shows consumption levels of biofuels in countries with the highest use in 2008.
Table 1: Highest consumption levels of biofuels in the EU by country in 2008 (in toe, for use in transport)

<table>
<thead>
<tr>
<th>Country</th>
<th>Bioethanol</th>
<th>Biodiesel</th>
<th>Total Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>4020000</td>
<td>2477983</td>
<td>3257186</td>
</tr>
<tr>
<td>France</td>
<td>403510</td>
<td>2020690</td>
<td>2424200</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>105189</td>
<td>691335</td>
<td>796524</td>
</tr>
<tr>
<td>Spain</td>
<td>125000</td>
<td>519000</td>
<td>644000</td>
</tr>
<tr>
<td>Italy</td>
<td>-</td>
<td>557280</td>
<td>557280</td>
</tr>
<tr>
<td>Poland</td>
<td>213968</td>
<td>340560</td>
<td>459354</td>
</tr>
</tbody>
</table>

Source: (EurObservER, 2009)

Main Mechanisms used to Support Biofuels within the EU

The promotion of biofuels in the EU has been implemented using various policy instruments. Several directives have dealt with differing aspects of the biofuels production chain. The Energy Taxation Directive, for example, allowed Member States to exempt biofuels from being taxed; the Fuel Quality Directives allowed blending and the Common Agricultural Policy supported the growth of energy crops. The list below gives the main tools which are/have been used to promote biofuels in the EU.

- EU Climate and Energy Package Text adopted in the sitting of 17th December 2008
- Common Agricultural Policy

The Energy Taxation Directive passed in 2003 allowed Member States to apply, for the first time, differentiating tax rates to biofuels or to exempt them from being taxed. This enabled Member States to offer support to biofuels by reducing the cost difference between fossil fuels and biofuels. Member States applied the tax exemption scheme in a variety of ways to differing degrees. The success of its implementation also varied widely between states, with some Member States achieving high levels of penetration, whilst others were less successful (Pelkmans and Govaerts, 2009).

Despite the variable success, partial or total tax exemptions for biofuels have been vital in promoting biofuels in the EU. All Member States who have succeeded in achieving high biofuel penetration rates have, or have had, differentiating tax schemes in place (Pelkmans, 2008). Tax exemption schemes have been most successful in States with high fossil-fuel tax rates (Pelkmans, 2008). This is due to the fact that, for biofuels to be economically competitive with fossil fuels, a tax exemption must be applied that is large enough to cover their higher production costs. For tax exemption schemes to work well, the fossil fuel tax must be high enough to result in fossil fuels price which is higher (after tax) than the price of biofuels (with or without partial tax).
Whilst such schemes have been successful in introducing and increasing the levels of biofuels, their application has resulted in significant revenue losses for governments (Pelkmans, 2008). Consequently, a trend of Member States switching from tax exemption schemes to obligation schemes can currently be observed (Pelkmans and Govaerts, 2009). Obligation schemes prescribe the mandatory uptake of biofuels in the market. Here, fuel suppliers are required to achieve a certain share of biofuels in their total sales. In such schemes, the additional costs are carried by the fuel suppliers and ultimately by the transport users instead of being met by the government. Since 2005 twelve EU Member States, accounting for almost 90% of biofuel consumption in the EU, have switched from tax exemption schemes to obligation schemes (Pelkmans, 2008). Although this mechanism has previously been a key tool used by the EU to promote biofuels, the current shift towards obligation schemes signals not only that its importance is likely to decrease in the future, but also the increasing unwillingness of the EU and its Member States to bear the cost of environmental policy.

The Fuel Quality Directives have also played an important role in increasing the market penetration of biofuels. They established fuel specifications for petrol and diesel and made allowances for the incorporation of biofuels. Blending limits were also set for biodiesel and ethanol (Schnepf, 2006). The most recent change to the Fuel Quality Directive was its revision, adopted in December 2008. The new Fuel Quality Directive (2009/30/EC) amends Directive (98/70/EC) and enables higher blends of biofuels in petrol and diesel, such as the establishment of a new petrol blend allowing up to 10% ethanol. It also contains an obligation for fuel suppliers to reduce the lifecycle emissions of their fuels by 6% by 2020 compared to 2010 fossil fuel emission levels. The obligation is likely to promote the use of biofuels as it will encourage suppliers to use increasing levels of biofuels in their fuel mix due to their superior greenhouse gas emission performance (Londo, 2009).

Biofuels in Europe have also, until recently, been supported through agricultural policies. Since 1998 support has been available to domestic producers of biofuel feedstock. This support, established within the Common Agricultural Policy (CAP), was available through two instruments. Firstly, the Energy Crop Scheme which began in 2004 provided a direct subsidy of up to 45€/ha for farmers within the EU. This direct subsidy was available for a defined maximum area, which was finally reached in 2007. Once this limit was reached, however, virtually no energy crops were grown outside the scheme, i.e. without the subsidy support (Pelkmans and Govaerts, 2009). Secondly, energy crops could also be grown on Set-aside land. In the EU, set-aside accounted for 10% of a farmer’s land and could not be used for production under EU agricultural law. The CAP reform in 1992 allowed the production of non-food crops on set-aside land without losing the subsidy. In the Common Agricultural Policy Health Check in 2008 the EU agreed to abolish both the Energy Crop Scheme and the compulsory Set-Aside Scheme. The abolishment of compulsory set-aside came into force shortly afterwards and the Energy Crop Scheme will terminate in 2010. Consequently, by the end of 2010, there will be no remaining mechanisms to directly encourage the production of biomass feed stock in the EU.

The effect that the abolishment of these support mechanisms will have on the cultivation of biofuel feedstock in the EU is currently unknown. Biomass production and agricultural policy are inextricably linked and it is widely recognised that any changes in agricultural policy are likely to have significant effects on the biomass stock produced and thus the cost and the amount of biofuels available (Sipilä et al., 2008). The annulment of the support for biofuels previously provided through CAP signals a future demise in the importance of agricultural policy for biofuels. The consequences of these changes are not yet fully understood, although it may have been a telling sign in 2007, when the maximum area for the energy crop scheme was reached, that virtually no further energy crops were grown
without its support (Pelkmans and Govaerts, 2009). On the other hand it is assumed that strong demand created by the mandatory targets should enable farmers to economically produce biomass stock without financial support (Pelkmans and Govaerts, 2009).

The previously described mechanisms have contributed significantly towards the development of biofuels during the last ten years. The recent *Climate and Energy Package*, however, nullifies or updates much of the previous legislation. Its implementation will have a profound impact on how biofuels are used and the level of market penetration achieved in the future. Within the package, the *Renewables Directive* has arguably the highest significance with regards to biofuels. The *Directive* deals with biofuels in several ways, the most noteworthy being the mandatory target which states that 10% of final energy consumption in transport should be met by renewable energy by 2020. Another important aspect of the *Directive* is the mandatory sustainability criteria to which all biofuels are subject. This aspect in particular has received high publicity and its detailing in the *Directive* has left serious questions open regarding indirect land use change and potential clashes with trading laws (European Federation for Transport and Environment, 2009a; Swinbank, 2009).

**The 10% target**

The transport sector is vital to every nation’s economy and that of the EU is no exception. What is perhaps notable about the EU’s transport sector is the extent to which it is dependent on fuel imports. The EU’s transport sector imports 98% of its fuel (Biofuels Research Advisory Council, 2006), 80% of which is sourced from Russia, Saudi Arabia, Libya, Iran and Norway (Boel, 2008). High import rates, combined with imports sourced predominantly from politically unstable countries, exposes the EUs’ transport sector to risk both politically and economically. This results in a sector which is highly vulnerable to both political and economic variations. The transport sector is also a major emitter of greenhouse gasses, contributing to 28% of the EU’s total emissions (European Federation for Transport and Environment, 2009b).

Mandatory targets are deemed necessary by the EU to create a secure investing climate and to ensure its climate change goals are reached (European Union, 2009). Although the EU set a standard target for renewable energy consumption (20% of total energy consumption must be derived from renewables), it was felt that an explicit target was required for the transport sector, due to its unique features. Firstly, oil dependence in the transport sectors is one of the most serious issues of energy insecurity faced by the EU. Secondly biofuels, and renewable energy in the transport sector in general, have higher production costs compared to other forms of renewable energy. There is a risk therefore that, if no specified requirement existed, other cheaper forms of renewable energy may be used that are applicable in other sectors but do not tackle the fuel insecurity or the rising emissions of the transport sector (European Commission, 2008).

Whilst perhaps the best justified of the *Climate and Energy Package* targets, the 10% target has received the most criticism. Heightened public attention and heated discussion reached its peak during the summer of 2008 when multiple parties urged the EU to abolish its targets on a back drop of soaring food prices and issues of sustainability (European Federation for Transport and Environment, 2009a).

The Gallagher Report (Renewable Fuels Agency, 2008), written by a panel of UK government experts, called on the EU to completely drop its mandatory targets and to substantially reduce its indicative targets. It also claimed that there was no proof that the targets could or would be
sustainable and that they would have an impact on food prices, particularly in the developing world. Other international organisations have also published reports raising a variety of concerns, including the International Energy Agency (IEA), the Food and Agricultural Organisation of the UN (FAO), the Organisation for Economic Co-operation and Development (OECD) and the European Environmental Agency (EEA) (European Federation for Transport and Environment, 2009a). These reports also raised issues such as food security, sustainability of production and commodity prices among others and most called for the EU to drop its targets.

Despite the criticism and the large debate, which was also heated within the EU (EurActiv, 2008), the target survived and remained in the final Directive. The Directive, which was adopted in April 2009, must be met by all Member States by 2020.

**Sustainability Criteria**

A large proportion of the criticism surrounding the 10% target focused on the sustainability of biofuels and their potential unintended social effects, particularly on food prices.

The EU, since first announcing its intention to set a mandatory biofuels target, has maintained that any production or use of biofuels must be sustainable (European Federation for Transport and Environment, 2009a). The Renewables Directive (2009/28/EC) aims to ensure this ambition is met through the use of mandatory sustainability criteria. The criteria set out three main requirements which biofuels must meet in order to be counted towards the target, or to be eligible to receive tax rebates or subsidies:

- The greenhouse gas emission savings from the use of biofuels and bioliquids must be at least 35% (rising to 50% in 2017) compared to fossil fuels.
- The feedstock of the biofuel is not to be derived from land with high biodiversity value such as highly biodiverse grassland.
- The feedstock of the biofuel is not to be derived from land with a high carbon stock.

These criteria apply to biofuels and bioliquids and for both imported and domestically produced feedstock (European Union, 2009).

The sustainability criteria laid out by the Directive focus on ensuring that biofuels give greenhouse gas emission savings and on protecting biodiversity. The Directive sets out a method for calculating life cycle greenhouse gas emissions and includes a list of default values for savings achieved using different biofuel production pathways. CO₂ emissions resulting from direct land conversion are to be counted in the life cycle analysis of biofuels.

Although the Directive aims to ensure the sustainability of biofuels through the use of sustainability criteria, many feel that those included in the Directive are weak and leave many loopholes open (Ernsting, 2009; European Federation for Transport and Environment, 2009a). The problem lies in the detail; in particular how the Directive defines the land type which is to be protected. Highly biodiverse and high carbon stock areas are defined so that many such areas fall outside the scope of the Directives definition and thus outside of its protection (European Federation for Transport and Environment, 2009a). For example the EU rejected the internationally recognised forest definition, endorsed by the FAO among others, in favour of its own definition of a 30% canopy cover. This variation in definition could potentially result in up to 50% of global forested areas falling outside the
protection of the sustainability criteria and thus being open to conversion for biofuels (European Federation for Transport and Environment, 2009a).

Another strong criticism against the sustainability criteria used in the Directive is their inability to deal with the social effects of increased biofuel production including: food insecurity, volatile commodity prices, poor working conditions and violations of land rights among others (Ernsting, 2009).

Fixed social criteria had been proposed by the EU, however they were dropped from the final Directive as doubts remained whether they were in line with the rules of the World Trade Organisation (WTO) (Swinbank, 2009). It is also possible that the current sustainability criteria described in the Directive are also in conflict with the rules of the WTO when applied to imports. No claim has yet been made against the EU, however it is thought that aspects of the Directive may leave the EU exposed to a challenge before the WTO.

Although there are no direct mechanisms provided to control potential social impacts in the current Directive, it does require the Commission and Member States to report and take action on these issues. The Commission is required to report biannually to the European Parliament and the Council on: the impact of social sustainability in the Community and in third countries; the impact of the Community’s biofuel policy on the availability of foodstuffs at affordable prices, particularly in developing countries and on wider development issues. The Commission is then required to propose and take corrective action in the event that negative effects are reported (European Union, 2009).

An important argument against the inclusion of social criteria in the sustainability criteria is the current lack of knowledge about the pathways linking causes and effects. It is difficult and unwise to base policy decisions, which aim to avoid the negative consequences of biofuels on certain criteria, when the contributing factors are not yet fully understood or quantifiable.

**Indirect Land Use Change**

A significant part of the summer 2008 biofuels debate focused on indirect land use change and its exclusion from the EU sustainability criteria (European Environmental Bureau, 2009). Indirect land Use Change (ILUC) is not accounted for in the Renewables Directive and therefore the emissions resulting from ILUC are not included in the greenhouse gas life cycle analysis calculations. In addition, biodiverse lands and land with high carbon content, which are protected against direct land use change, are not protected against ILUC.

The Directive does, however, require the Commission to review the impact of indirect land use change and suggest ways to minimise it by the end of 2010. It urges the Commission to propose a methodology or factor for including these indirect effects into the GHG calculation methodology. The Parliament should decide on this proposal in 2012 at the latest. Attention must also be paid to direct and indirect land use change in both national reporting and in the EU biannual reporting. The Commission is also required to consider indirect land use change during bilateral agreements (European Union, 2009).

Once again a major problem with including such criteria is the lack of understanding of the mechanisms (Laurent and Larat, 2009). ILUC is an acknowledged problem (European Federation for Transport and Environment, 2009a; Searchinger et al., 2008), however it is difficult to quantify and
the science is not yet advanced enough to allow robust policy statements to be made (Laurent and Larat, 2009). Several methods of incorporating ILUC have been tabled by various parties during stakeholder workshops; so far however, the stakeholders have failed to agree on a common suitable method (Laurent and Larat, 2009).

For all of the areas in which the Commission is required to report, it must, upon finding adverse impacts, suggest and adopt corrective measures (European Union, 2009). There is no direction or specification given, however, to suggest what these might or should be.

Although the EU, through its requirement for constant monitoring and assessment, aims to deal with any unknown consequences that may arise, it has in fact created an extremely complex piece of legislation (European Federation for Transport and Environment, 2009a) which fails to provide an obvious emergency break (Londo, 2009). The Commission’s obligation to report and make necessary changes adds further ambiguity to the Directive. This ambiguity ironically leads to increasing uncertainty, undermining one of the EU’s key arguments for setting mandatory targets; to provide certainty for investors (Londo, 2009).

**Second Generation Biofuels**

It is perceived that second generation biofuels will offer greater greenhouse gas emission savings than their first generation predecessors and will be producible using much more efficient and environmentally friendly methods (Maniantis, 2009). Due to the fact that advanced biofuels are more expensive to produce than first generation biofuels, the Directive allows Member States and fuel distributors to double count any contribution of biofuels produced from wastes, residues, non-food cellulosic material and lignocellulosic material. This means biofuels produced from second generation biofuels will count for twice their volume/energy contribution towards the target. Consequently, Member States can theoretically achieve their target obligations by achieving only a 5% biofuels share when those biofuels are second generation.

This double counting has raised concerns over the potential dampening effect it may have on the ambition level of those required to meet the target (Londo, 2009). If the EU would be able to introduce a 20% share of second generation biofuel in the total biofuels mix, an 8.6% biofuels share would suffice to meet the 10% target (Londo, 2009). Although this would potentially reduce the volume of biofuels in the mix, it should provide the same or higher greenhouse gas emissions savings as a 10% share met only by first generation fuels. This relies, however, on predictions being correct about the GHG emission savings of second generation biofuels.

Although the 10% target refers to all renewable energy in transport, including hydrogen and electricity, it is questionable whether electricity and hydrogen will be able to provide a substantial share of the 10% (Londo, 2009). Due to currently available technology, it is expected that second generation biofuels will also not be able to significantly contribute towards the target. It is therefore expected that, at least in the short term, the majority of the 10% target will have to be met by first generation biofuels (Swinbank, 2009).
Imports

According to a study by Imperial College Consultants for the Renewable Energy Association, the EU-27 will need 35.6m tonnes of biofuels in 2020 to meet its targets. The study found that the EU cannot meet this demand through domestically grown crops alone (ENDS Report 418, 2009). AGRINERGY support this opinion and agree that demand cannot be met by domestically available land and therefore must be met by imports (AGRINERGY, 2008). In contrast, the EU Directive states that “while it would be technically possible for the Community to meet its target using only domestic produce, it is both likely and desirable that the target will be met through a combination of domestic production and imports” (European Union, 2009). Despite the discrepancy regarding whether the EU could meet the increased demand domestically or not, it seems that all agree that biofuel imports are liable to play a role and that they will likely increase. Current data suggest that approximately 14% of biodiesel and around 37% of ethanol consumed in the EU are imported (Table 1). These figures also indicate that imports have achieved a significant penetration level in the EU biofuel market despite unfavourable import duties (Swinbank, 2009).

Table 1: Imports as a percentage share of the EU’s biodiesel and bioethanol markets; and biodiesel and bioethanol as a percentage share of the EU’s diesel and petrol markets.

<table>
<thead>
<tr>
<th></th>
<th>2007 (e)</th>
<th>2008(e)</th>
<th>2009(f)</th>
<th>2010 (f)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodiesel imports as a % share of biodiesel market</td>
<td>12.3</td>
<td>14.9</td>
<td>14.1</td>
<td>14.0</td>
</tr>
<tr>
<td>Biodiesel as a % share of diesel markets</td>
<td>3.0</td>
<td>3.2</td>
<td>4.0</td>
<td>4.6</td>
</tr>
<tr>
<td>Bioethanol imports as a % share bioethanol market</td>
<td>37.4</td>
<td>37.7</td>
<td>39.1</td>
<td>35.0</td>
</tr>
<tr>
<td>Bioethanol as a % share of petrol markets</td>
<td>1.2</td>
<td>1.5</td>
<td>1.8</td>
<td>2.2</td>
</tr>
</tbody>
</table>

(e)=expected (f)=forecast (Swinbank, 2009)

Increasing demand for biofuel imports could bring new opportunities for developing countries, in particular those with climates more suitable for producing biomass feedstock. There is considerable scope for the production of biomass feedstock in developing countries (for local use and possibly internationally) to lead to significant economic development (FAO, 2008). This was found to be particularly true in regions of the South African Development Region (SADR). Mozambique and Zambia have been highlighted as countries where sufficient arable land is available to meet not only domestic food and fuel requirements, but with surplus land available which could potentially be used for exports. The expansion of bioenergy in rural areas has the potential to drive rural development, benefiting extensive rural populations; providing their needs are taken into account (Amezaga et al., 2009). Such developments must be properly controlled, as unmanaged increases in biofuel production have the potential to negatively impact the environment as well as the social wellbeing of local people. Increased demand for bioenergy in the EU has already led many developing countries to start to produce and process energy crops. These countries often lack the institutional capacity required to control the use of natural resources and to avoid the negative effects resulting from unsustainable bioenergy production (AGRINERGY, 2008). It is essential that increased global demand for biofuels does not lead to unsustainable production in developing countries, particularly when that country cannot satisfactorily meet its domestic food and fuel requirements.
Conclusions

The recent changes to EU policy are likely to have a significant impact on biofuel consumption in the EU as well as consequential effects abroad. The targets set by the EU require the increased use of biofuels in every Member State. It is unlikely that this growth in demand can or will be met purely by increased domestic supply. Therefore it is foreseeable that this increase in demand will be met, at least in part, by an increase in imports.

The likelihood that increased biofuel demand in the EU will be met at least partly by imports increases the pressure on the EU to ensure that it sources its fuels sustainably. This leads to potential conflict with the WTO when applying sustainability criteria to imports. The EU must resolve this issue before it can develop and expand its sustainability criteria to include social issues and ensure the sustainable development of biofuels.

Recent changes to agricultural policies, which previously supported energy crop production, generate additional questions about the role domestic production will play in meeting increasing demand. Whilst an increase in demand for imports in the EU may create opportunities for economic and rural development in developing countries, concerns have been raised over the likelihood that cheap biofuels, which are unsustainably produced, may be imported.

The sustainability criteria proposed by the EU, which aim to combat this problem, have been subject to widespread criticism and extensive discussion. Problems have been voiced not only about the measures that are in place, but also about significant factors which are not dealt with in the Directive. Social criteria and indirect land use change are hot topics, both of which are not dealt with in the Directive and face similar difficulties. Both are recognised problems but how to quantify their effects and incorporate them into policy remains a serious issue. Further research into this area is required to advance the science and understanding of the pathways linking causes and effects.

The recent changes made to EU policy have significant implications for biofuels. Many of the previously important mechanisms used to promote and encourage biofuels have been removed. These have been replaced by mandatory targets and obligations. It is hoped that demand created by the mandatory targets will be strong enough to ensure that the previously necessary support mechanisms will no longer be required. The change from support schemes to mandatory targets reduces the cost of policy mechanisms. This trend is visible not only at an EU level, but also within Member States, both of which are increasingly reluctant to bear the cost of their environmental policies.

Although the mechanisms for promoting biofuels are changing, and despite the serious questions remaining in the policy details, the use of biofuels in the EU is set to increase. New aspects to the Directive are likely to be added through the reporting procedure, and existing aspects are likely to evolve. One certainty is that the discussion concerning if, how and where biofuels should be used, is likely continue.
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