

Briefing Note

# 02

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## Snake oil or climate cure: The effect of public funding on European bioenergy



The Costa Pinto production plant set up to produce both sugar and ethanol fuel and other types of alcohol in Piracicaba, Sao Paulo, Brazil.

Image: Mariordo

If European Union targets are met, by the year 2020, 20 per cent of the EU's energy consumption will come from renewable sources. In an attempt to achieve this target, the EU is investing heavily in new sources of energy, including bioenergy. This briefing note examines where public funding for the bioenergy sector is coming from, where it is going, and what the effects of this investment might be on the environment.

It concludes that none of the three main reasons for including bioenergy as an important part of the EU's energy policy are being satisfactorily addressed by existing policies and recommends that the EU therefore reconsiders its funding for bioenergy.

## 1. Introduction

Through the recent adoption of the Renewable Energy Directive,<sup>1</sup> EU Member States have committed themselves to ensure that 20 per cent of the EU's energy consumption comes from renewable sources by 2020. This will require substantial investment in new sources of energy. Although the EU is continuing to invest in hydro, wind and solar energy, there is a particular emphasis on bioenergy because biomass for electricity and heating seems to have advantages over other renewable sources. In 2009, a relatively small proportion of Europe's energy needs comes from renewable energy, and the majority of renewable energy production comes from biomass (of which wood products for heating and electricity account for almost 80 per cent). This trend seems set to continue.

One crucial reason why bioenergy is so attractive to countries which have until now depended on burning fossil fuels is that biomass can be used in existing coal-fired power plants, with only minor adjustments to the plants.<sup>2</sup> Unlike other renewables – such as solar, wind and wave power – the infrastructure either already exists, or can be replicated easily from existing models. This could mean then that use of bioenergy will allow us to sustain our old polluting industries and lifestyles, and leave it to a future generation to make more radical changes or face the consequences.

Another problem is that production of some forms of biomass can have damaging effects on the environment, and not make any significant contribution to decreasing carbon emissions. In some cases, when conversion of biomass into bioenergy is taken into account, emissions might even be bigger when compared with fossil fuels. Meeting the 20

per cent target in Europe, therefore, may do little or nothing to slow global climate change as emissions will be moved rather than halted.

So is EU money being used to fund bioenergy initiatives which might lead to negative environmental impacts? To answer this question, this briefing document looks at public funding for the European bioenergy sector – where the money is coming from, how it is being spent, and who is benefiting – and what the effects of this financial support may be.

## 2. Public financing of bioenergy

In the space of just a few years, bioenergy has become big business worldwide. Cumulative global investments in the production of the two most common biofuels – biodiesel and bioethanol – have been estimated at around €62 billion globally up to the end of 2008.<sup>3</sup> Part of this money comes from government support, especially in Australia, China, Indonesia, the United States, and the EU.

In the EU, biofuels are seen as an important part of overall energy policy for three reasons: (1) because it is hoped they can reduce the EU's dependency on foreign sources of energy; (2) to give farmers new outlets for agricultural products; and (3) to reduce greenhouse gas emissions (GHG). A recent study<sup>4</sup> has estimated that, in 2006, government support for biofuels in the EU amounted to €3.7 billion. About one third of the support was for bioethanol and two-thirds for biodiesel. Due to the lack of complete data, these estimations are most likely to be an under rather than an overestimation (see section 2.6).

### Box 1: Terminology

**Bioenergy** is energy derived from biological sources, to be used for heat, electricity or vehicle fuel. Within the context of bioenergy, biomass generally refers to organic matter from plants and animals, including agricultural and municipal waste products.

**Biofuel** essentially refers to liquid or gaseous fuel for transport produced from biomass. Environmental and social NGOs prefer to use the term 'agrofuels' to describe the large-scale monoculture crops used for the production of liquid fuels from biomass

**Bioliquids** means liquid fuel for energy purposes, including electricity and heating and cooling, produced from biomass.



People protesting against agrofuels at the G20 meeting in London August 2009.

Image: Campaign against climate change

Support has come in a wide variety of forms including fuel excise tax exemptions and other tax breaks, market price support, project subsidies, financial support for research, guarantees for equipment, and capital grants. Support also comes from a wide variety of different sources; and as EU Member States strive to reach the 20 per cent target for renewable energy, the sums of money involved are likely to continue to rise.

## 2.1. Rural development policy

At the end of 2008, the EU agricultural ministers agreed on a Health Check to modernise, simplify and streamline the Common Agricultural Policy (CAP). Since the Health Check, there has been no specific support for bioenergy under the first pillar (the market support measures) of the CAP such as through the energy crop scheme.

The current Rural Development Regulation aims to promote sustainable rural development. The regulation includes over 40 possible measures, including bioenergy related ones. The specific amount of support for the area of bioenergy is as yet unknown. The Health Check increased the amount of money transferred to the second pillar of the CAP - Rural Development - to reinforce programmes in the fields of climate change and renewable energy as well as others.

The revised strategic guidelines<sup>5</sup> state that agriculture and forestry can make an important contribution to bioenergy, carbon sequestration and further reducing GHG emissions.

## 2.2. Cohesion Policy

The EU's Cohesion Policy aims to help reduce the disparities between development levels of different regions and countries within the European Community. The policy should contribute to increasing growth, competitiveness and employment by incorporating the EU's priorities for sustainable development and promoting the goal of protecting and improving the environment.<sup>6</sup> Under the Cohesion Policy, €105 billion has been allocated to environmental measures for the period 2007–13, in three main areas: basic environmental infrastructures; energy and climate change; and eco-innovation, including 'green technologies'. Its guidelines specifically support 'the development and use of renewables and alternative technologies such as wind, solar and biomass'. €1.8 billion<sup>7</sup> is planned to be spent on biomass actions over the period 2007-2013, with projects in Italy, Poland and the Czech Republic accounting for around €900 million of this.<sup>8</sup>

## 2.3. Capital grants

Many Member States also provide subsidies for production-related capital – usually as a percentage of the investment costs incurred when preparing to produce biofuels. Grants are also given to build plants to demonstrate the commercial feasibility of a process. These grants are administered through a wide range of national agencies. In the UK, for instance, the 5th Round of the Bio-energy Capital Grants Scheme – funded by the Department of Energy & Climate Change (DECC) - was very popular with two thirds of the 232 applications received, being successful.<sup>9</sup> In the rest of Europe, biofuel-related grants may be provided through environmental programmes related to the promotion of renewable energy (Germany, Cyprus, Ireland, Portugal); or through programmes related to encouraging economic development in rural and resource-poor regions (e.g. in Austria, Estonia and Latvia), among others.<sup>10</sup>

## 2.4. Excise tax exemptions ('support for consumption')

Different Member States provide a variety of incentives to encourage biofuel consumption. Tax relief and obligations to blend are the two most common instruments used by Member States to promote biofuels, with important developments having taken place over the last two years. The exemption from fuel excise taxes is embodied in the 'energy taxation directive' of 2003 (Directive EC 2003/96). In 2005 - 2006 all Member States, except Finland, used tax exemptions.<sup>11</sup> According to a study by the Global Subsidies Initiative (GSI), these tax exemptions account for the largest share of support for biofuels by the EU and its Member States and amounted to almost 3 billion Euro of the estimated 3.7 billion Euro of public support for biofuels in 2006.<sup>12</sup>

## 2.5. Research and development

Funding for research into the production and use of biofuels has come from initiatives such as the EU's Sixth and Seventh Framework Programmes (2002–6 and 2007–13). The Sixth Framework Programme reportedly provided €68 million to 'support research in the area of biomass to develop second-generation biofuels, new technologies for clean and cost-efficient power generation from biomass, integrated biomass use through bio-refineries and overcoming market barriers'. Fourteen biofuel projects have been approved for a total cost of €89.1, with the European Commission contributing €48.8 million.<sup>13</sup> An estimated €61.5 million has been approved to boost agrofuel research through the Seventh Framework Programme.<sup>14</sup>

To complement the Seventh Framework Programme, a Competitiveness and Innovation Programme (CIP) has been created.<sup>15</sup> Under the third pillar of the CIP – designed to foster energy efficiency, promotion of new and renewable energy sources and new energy sources in transport – support to biofuels should be available under the ALTENER programme (to support the integration of new and renewable energy sources) and the STEER programme (to support energy efficiency and the use of new and renewable energy sources in transport).<sup>16</sup>

As of 2007, individual countries (e.g. Austria, Denmark, Finland, France, Germany, Latvia, the Netherlands, Poland, Spain and Sweden) all had their own national programmes supporting research into biofuel technology.<sup>17</sup>

## 2.6. The European Investment Bank and European export credit agencies

The figure of €3.7 billion in public support for biofuels in 2006, mentioned earlier, is likely to be an underestimate for at least two reasons. First, as GSI (which calculated the figure) admitted, it is difficult to obtain accurate figures, and 'many subsidies are under-reported'. Secondly, not all sources of funding are covered by the GSI's study, which contains no mention of funding by the European Investment Bank (EIB) or the European export credit agencies (ECAs).<sup>18</sup>

The EIB is a public financial institution, owned and funded by the EU's 27 Member States to meet the policy goals of the European Union. Between 2004 and 2008 it provided loans worth a total value of €567 million to five bioenergy projects,<sup>19</sup> and in June 2007 the European Council adopted a policy which included a target to lend €800 million annually to renewable energy projects. At the same time it pledged to raise the financing share of the total costs for renewable energy projects from 50 to 75 per cent, especially for 'emerging renewable energy technologies', including biomass and biofuels.<sup>20</sup> Its aim in this were to increase energy efficiency and reduce GHG emissions, but there are serious concerns that many of the projects currently financed will, if unchanged, not meet the EU's own targets for GHG emission savings (see Section 4 below).

The European export credit agencies are also (semi) public financial institutions, funded from the state budgets of their home countries to provide loans and guarantees to exporting companies. A recent study identified three ECAs (German-based Euler Hermes, EGAP in the Czech Republic, and OeKB in Austria) giving support to a total of five bioenergy projects in the period 2004-2008. The sums involved in two of the projects are unknown, but support to the other three projects amounted to €34 million. The support was in the form of export guarantees or credit lines for projects such as the procurement and construction of two biomass power plants in Brazil, the supply of equipment to a biomass power plant in Sri Lanka, and the construction of a biowaste fermenting plant for energy production in Singapore.<sup>21</sup>

### 3. Who's who in the bioenergy sector

Of the 20 largest biofuels producers worldwide, seven have their headquarters in Europe (see Table 1). Five of these are among the largest twelve biofuels producers in the world: Diester Industries, Abengoa, Tereos, VerBio, and Biopetrol Industries.

Diester Industries is part of Prolea, the French oil and protein crops organisation. It uses rapeseed and sunflowers, from over 80,000 producers<sup>23</sup> for the production of biodiesel, and its production capacity is due to reach 2 million tonnes by the end of 2009.

Abengoa, the world's fifth largest biofuels producer, has eleven bioenergy plants globally and is present in over 70 countries worldwide. Its subsidiary, Abengoa Bioenergy, is the largest ethanol producer in Europe, as well as being active in the US and Brazil. In the period 2004–8 it received a loan from the EIB to the tune of €109 million.<sup>24</sup> Abengoa has six more biofuel plants under construction.

Tereos, the world's eighth largest biofuels producer, is based in Lille, France. It uses beet, cane and cereals as input, and produces over 1 million tonnes of alcohol/ethanol a year. It is a cooperative group: the beet growers are both the company's suppliers and shareholders. Tereos produces

sugars, starch products, alcohol and bio-ethanol and has 32 industrial facilities. It is based in 3 continents: Europe, Latin America (Brazil) and Africa.<sup>25</sup>

Vereinigte BioEnergie, or VerBio, is the 11th largest producer of biofuels, and uses rapeseed oil, soybean oil and fatty acids to produce biodiesel. The feedstock it produces for bioethanol is rye. It has received €10 million funding from the German ECA Euler Hermes to pay for imports.<sup>26</sup>

The annual capacity of the world's 12th largest producer of biofuels, Biopetrol Industries, is set to rise from 750,000 tonnes to 1 million tonnes, with the expansion of its plant in Rotterdam. It mainly uses European-grown rapeseed as feedstock, but its production facilities can be converted to use other raw materials such as soy and palm oil.<sup>27</sup>

Among the other major biofuels companies, Finland's Neste Oil has three biodiesel plants under construction, with a capacity of 1.77 million tonnes a year. Europe's three largest power and heat producers from biomass are also Finnish: Pohjolan Voima, Alholmens Kraft, and Lahti Energia. Together they have twelve plants, using black liquor, wood, peat, refuse fuels, biomass, shredded tyres and plastics, and with a total production capacity of over 900 MW, more than the combined total capacity of the six largest power and heat producers from biomass in the United States.<sup>28</sup>

**Table 1**  
**Main biofuels producers in Europe<sup>22</sup>**

Biofuels producer	Country of origin	Type	Number of plants	Production capacity (1000 tonnes/year)
Diester Industries	France	Biodiesel	12	2,000
Abengoa	Spain	Bioethanol/biodiesel	11	1,522
Tereos (including Acucar Guarani)	France	Bioethanol	11	1,027
VerBio	Germany	Biodiesel/bioethanol	4	750
Biopetrol Industries	Switzerland	Biodiesel	3	750
Crop Energies	Germany	Bioethanol	3	600
Louis Dreyfus	France	Biodiesel/bioethanol	4	385

## 4. Is EU money being used for projects which fail to meet EU sustainability criteria?

As this briefing note has demonstrated, the European bioenergy sector is supported by tax breaks and large amounts of EU money, and therefore it would be reasonable to expect that projects being funded should follow the policy guidelines of the European Union.

These policy guidelines include that biofuels and bioliquids have to meet certain sustainability criteria in order for Member States to count them as part of the renewable energy target or to be eligible for tax exemptions.<sup>29</sup> The sustainability criteria include a GHG savings threshold, as well as a number of environmental criteria defining 'no-go areas' (to protect biodiversity-rich lands) and 'no-conversion areas' (to protect carbon-rich areas from conversion).

The definitions of the no-go areas and the no-conversion areas are weak and contain many loopholes and there are no mandatory social criteria. Due to this, most NGOs, including FERN, do not think the current sustainability criteria provide sufficient guidance to ensure biofuel production does not have negative environmental, social or climate impacts.

The sustainability criteria also set a threshold for GHG savings, but again there is a loophole. The extent to which GHG emissions can be reduced by using agrofuels depends to a large extent on land uses and the land use change involved, but the directive does not yet address the carbon impact of indirect land use change (ILUC) resulting from additional biofuel cultivation. This means that a large part of the emissions released by agrofuels are not counted. This is particularly concerning given that the main justification for public policies supporting biofuels is that they reduce GHG emissions.<sup>30</sup> If the issue of ILUC is not properly addressed by EU policymakers, funding might be spent on biofuels that actually increase emissions.

On top of this, public money has already been used to fund research into developing genetically modified (GM) trees, specifically to reduce their amount of lignin to make them easier to use as a biofuel. Very little is known about the impacts that GM trees would have if they are released or escape into the natural ecosystem.<sup>31</sup> The promotion of biofuel production in Latin America for the European market may lead to the further expansion of monoculture tree plantations, destroying natural habitats and replacing small-scale farming systems.

According to the Renewable Energy Directive of January 2008, GHG emission savings from the use of biofuels and other bioliquids must be at least 35 per cent for new installations. Installations already in operation in January 2008 must meet the 35 per cent target by April 2013; and from 2017, GHG emission savings will have to be 50 per cent for all installations in existence at that time, increasing to 60 per cent for any installation built in or after 2017.

In addition to all the shortcomings with the sustainability criteria and the GHG methodology outlined before, FERN's recent study into the EIB and European ECAs financing of bioenergy found that at best, some of the companies being financed meet the EC's GHG thresholds in the short term. If changes are not made to their way of operating, some companies will fail to meet the future GHG targets.<sup>32</sup> The ECA-funded company VerBio, for instance, produces biodiesel based mainly on rapeseed, which will not meet the GHG target from 2017, unless technological changes will improve the GHG performance.<sup>33</sup>

## 5. Conclusions and recommendations

At the beginning of this briefing note it was stated that there were three main reasons why biofuels were seen as an important part of the EU's energy policy, let us now look at these individually:

### Reducing the EU's dependency on foreign sources of energy:

This does not seem to be the case as while some bioenergy may come from local production, an increasing amount is set to be imported.

### Giving farmers new outlets for agricultural products:

Similarly to the above point, although there may be an increase in Europe grown rapeseed or GM trees an important part of the energy will come from imports and growing energy in Europe on a large scale could have very negative effects on biodiversity.

### Reducing greenhouse gas emissions:

Although certain biofuel production pathways will meet the EU's targets for 2017 GHG emission savings, many currently won't (including some types of wheat ethanol, palm oil and rapeseed biodiesel, and hydrotreated vegetable oil from palm oil). What's more important however, is that current measuring of GHG savings are questionable because the impact of indirect land use change is not yet properly addressed. If land use change is not considered, it is likely that a large part of GHG emissions is being missed.

It must be remembered too that sustainability criteria do not answer these concerns as the environmental criteria are dubious and there are no mandatory social criteria.

For these reasons, we propose the following recommendations:

- Biomass should only be used where it is most efficient. This will mean scaling down policies that promote large-scale biofuels production and coming up with criteria that will improve the environmental impact of small scale production.
- Governments should prioritise research and financing of energy reduction and efficiency programmes. Renewable energy sources such as solar, wind and wave should be prioritised above biomass.
- The EC should assess whether funds used for bioenergy under the Cohesion Fund or Rural Development Fund are in line with stated EU policies on biodiversity conservation and rural development.
- Member States should encourage the use of the sorts of biomass with the largest GHG emission savings and the best environmental and social profile, and target their financial support accordingly.

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## Notes

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Increased biomass production through harmful practices such as stump uprooting would have a detrimental effect on biodiversity. Governments should prioritise research and financing of energy reduction and efficiency programmes. Renewable energy sources such as solar, wind and wave should be prioritised above biomass.

Image: László Maráz

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