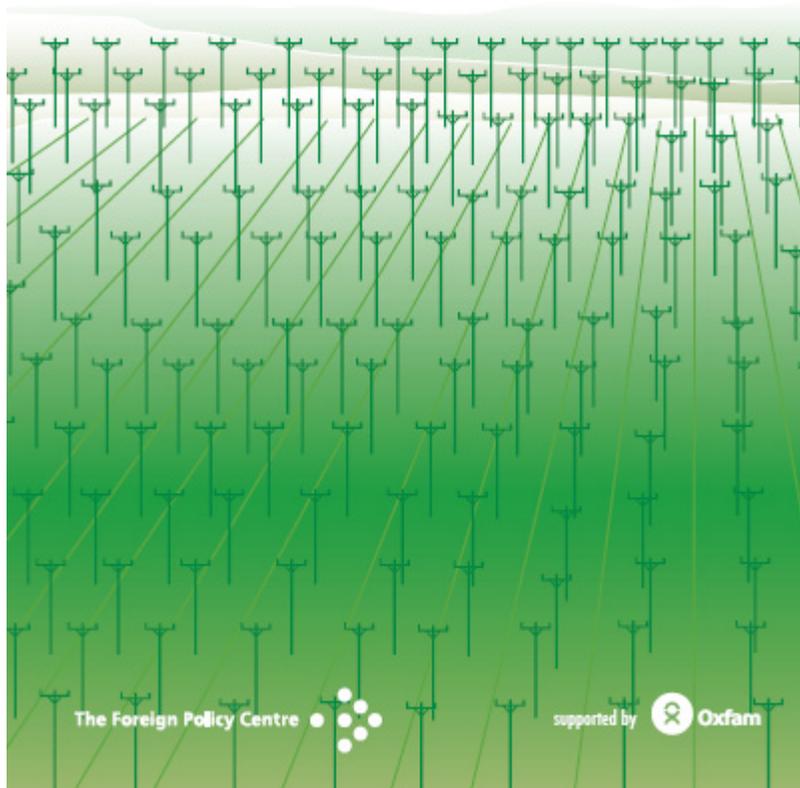


**BIO-ENERGY AND CAP REFORM:
THE GAINS TO EUROPE AND AFRICA**
DAN PLESCH, GREG AUSTIN, FIONA GRANT, STEPHEN SULLIVAN

**Bio-Energy and CAP Reform:
The Gains to Europe and Africa**

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EXECUTIVE SUMMARY

In December 2005 at world trade talks in Hong Kong, the EU agreed – along with the USA and Japan – to end farm trade subsidies by 2013. On the eve of the talks, the EU released a biomass action plan which provides another lever for ending subsidies in agriculture to support Europe's energy security. Even modest new efforts to increase biomass energy use could reduce projected EU energy imports in 2010 by as much as 12 per cent. The moves would boost rural employment by creating up to 300,000 new jobs.

The process for ending farm trade subsidies by 2013 is hostage to complex bargaining arrangements in two quite different spheres. The first, within the framework of the World Trade Organisation, links reductions in EU farm subsidies not only to cuts in US and Japanese farm subsidies but also to a liberalisation by developing countries of their barriers to trade in services and investment. The second, within the framework of the EU itself, links a phasing out of the subsidies not only to the interests of affected farmers and bigger commercial entities but also to larger issues of the entire EU budget process.

At the same time, many developing countries suffer quite negative effects from high energy prices: a sustained ten dollar increase in the price of oil per barrel can reduce the GDP of some African countries by as much as three per cent in the following year. The EU itself is trying to make important adjustments in its own patterns of energy use in order to mitigate global climate change and enhance energy security.

This pamphlet argues that the EU can find a new impulse for more rapid progress in all of these spheres through a policy of redirecting the price subsidies from sugar and some other crops to support of biomass energy production, especially for ethanol vehicle fuel and heating.

The Common Agricultural Policy (CAP), the framework through which the EU price subsidies are made, is widely regarded within Europe, the USA and among many developing countries as a highly corrupted one. The EU has begun to reform the CAP so that it can meet its original goal of supporting rural communities and promoting rural development. But the process of CAP reform is slow and highly

controversial. The administration of CAP remains mired in secrecy; middle men, as much as farmers, are now key beneficiaries of it. The CAP is an affront to modern standards of transparency and accountability at the national level and, at the international level, to the principles of an open trading system and the G-8/EU commitments to promoting development of the poorest countries. The EU spends more on CAP than on aid to the developing countries.

Biomass energy production can be an engine of regeneration of rural communities at the same time as sustaining production of crops like sugar that are currently regarded as the main 'villain' in the CAP drama. On the one hand, biomass industries normally result in a high proportion of profits being retained in the area of production. In some cases, as much as 80 per cent of profits remain within 50 miles of the source of the biomass crops. On the other hand, the diversion of EU-produced sugar from its current end uses to production of ethanol for transport fuel on the scale seen in Brazil or the USA could reduce the need for the EU to prop up sugar sale prices through large scale subsidies and other trade barriers.

The EU also stands to make gains in energy security from the decentralisation and diversification of supply that greater use of some forms of biomass energy can provide.

An important spin-off from a greater EU engagement with biomass energy production will be a greater capacity to support the energy production capacity of developing countries, many of which are mainly agricultural economies that have a far greater reliance on biomass than EU countries. Reduction of the burdens on developing economies imposed by high oil prices has not figured as prominently as it might in its development assistance policies.

The EU is facing historic choices in how it manages farm support, energy use and climate change mitigation. It faces a choice between allowing national priorities and disaggregated interest groups (such as the agriculture lobby) to set the agenda or trying to set a unified pan-European, integrated approach. The considerations raised in this pamphlet suggest that the latter course is the only viable one. National governments throughout the EU, like local governments and community stakeholders, especially farmers' groups, will be a vital

part of framing forward action. But there needs to be a common EU vision. Part of that vision must be a commitment to more rapid and more radical moves.

The course of action recommended in this pamphlet is in many respects a simple one. At the same time, implementation will require detailed elaboration involving the many stakeholders, and this consultation will need to be informed by expert analysis of the national and international issues in economic, political and social domains.

This pamphlet does not seek to replicate specific recommendations on linking farm subsidies to greater support for biomass that are already on the table through various mechanisms. Rather, the pamphlet identifies several strategic recommendations for EU leaders, including in parliaments. The strategic recommendations are followed by some sample measures that could be implemented fairly promptly.

Recommendations

The EU should commit now to additional and urgent reform measures in the CAP that promote rapid take-up of biomass energy use in ways that reduce the negative effects on agricultural trade of poorer countries created by price subsidies.

Leading members of the EU (such as the UK) that support a radical reform of CAP and of the EU budget should commission a specialist assessment of the various options for shifting farm subsidies under CAP to vigorous promotion of biomass production as part of a comprehensive package of rural development measures. EU leaders must not limit their consideration of CAP reform only to traditional agricultural trade aspects but bring into play issues of energy security and rural development. There should be a short time frame on this assessment, say six months.

In terms of lower level measures that could be investigated in the shorter term, three areas of policy stand out for immediate attention.

The EU, member states and regional authorities should give immediate tax relief and other support to investment in biomass processing facilities, especially large scale plants for ethanol, and to new distribution networks for biomass products.

Measures which provide some form of tradable credits in biomass energy will allow for the operation of market forces.

The EU must use its own more rapid shift to biomass use as a new lever of change in its support policies to developing countries seeking energy security. The EU must make renewable energy programmes a higher priority in its development assistance. In Africa, where the EU has just promised to double aid disbursements for the next five years, the EU could agree to spend ten per cent of the new funds (some \$2 billion per year) on promotion of new biomass crop plantings and more efficient biomass energy production.

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In the year following a \$10 oil-price increase ... the loss of GDP averages 0.8 per cent in Asia and 1.6 per cent in very poor highly indebted countries. The annual loss of GDP in the Sub-Saharan African countries would be more than 3 per cent.

International Energy Agency
2004

In the short term, conventional biofuel production processes in IEA countries could help reduce oil use and thence greenhouse gas emissions, although the costs may be high. In the longer term, possibly within the next decade, advances in biofuel production and the use of new feedstocks could lead to greater, more cost-effective reductions. Countries such as Brazil are already producing relatively low-cost biofuels with substantial reductions in fossil energy use and greenhouse gas emissions.

International Energy Agency
May 2004

In New York, Governor George Pataki issued an executive order that requires all state agencies and public authorities to increase their purchase and use of biofuels for heating their facilities and fueling their vehicles. The order mandates that by 2012, biodiesel must supply 10 percent of the fuel used in the state fleet, at which time biodiesel will also supply at least 5 percent of the heating fuel used in state buildings.

November 2005

Research that has been undertaken in the UK suggests that there is a lack of understanding generally about biomass as a renewable energy resource.

Scottish Executive
December 2005

Introduction

Two of the most pressing global issues facing the European Union (EU) and its member states are increasing dependence on the import of energy, principally oil and gas, and the continuing poverty of millions of people in the developing world. These two problems have rarely been linked in public statements by the EU. The possibility of strong synergies between the policies needed to address the first (energy security at home) with poverty eradication has never been seriously addressed in any detail by the EU.¹

The EU recognises that one factor in the persistence of poverty in developing countries is their inability to compete in trade in agricultural goods on an equal footing because of farm subsidies and tariffs imposed by the major traders (EU, USA and Japan). This pamphlet investigates the nexus between policies needed to address the energy security of Europe and those involved in reducing the subsidies the EU currently applies to agricultural trade. In recent years, the UK has spent as much money undermining the trade prospects of developing countries through farms subsidies as it has on its development assistance to developing countries. The two policies are not just out of synchronisation. They are diametrically opposed.

The main assumption in the pamphlet is one about domestic politics. The governments in the EU that currently disburse large amounts of farm subsidies to keep rural production alive need to find new ways to get those funds into their rural communities at the same time as the funds are redirected away from the current subsidies that so distort the agricultural trading potential of poorer countries. The pamphlet argues that this can be done through a redirection of the funds to support new fuel crops, new biomass production of other

¹ There are short references to the possible impact on the Common Agricultural Policy and developing country trade of greater EU reliance on renewable energy sources in the European Commission's 'Biomass Action Plan' released as a provisional version on 7 December 2005. For the text, see http://europa.eu.int/comm/energy/res/biomass_action_plan/doc/2005_12_07_comm_biomass_action_plan_en.pdf.

sorts (for heating),² and the new rural infrastructure and industrial capacity to process those products into energy.

Thus, there are several planks of EU policy, currently un-aligned, that could be brought together to meet agreed goals for reform of farm subsidies, energy security for EU countries, and trade gains for developing countries. One inevitable consequence of a move in this direction would be to help developing countries themselves achieve energy security through greater reliance on renewable energy sources.

The EU has already given a strong commitment to significant policy change in these broad areas of policy, not least its promise at the world trade talks in December 2005 – along with the USA and Japan – to end farm trade subsidies by 2013.

On energy security at home, the European Union, in partnership with the USA, committed itself on 29 June 2005 to 'stronger actions to increase energy security'.³ On the energy needs of poorer countries, the EU and US both recognised in the same statement that 'one of the greatest needs for developing countries today is to provide the basic energy services necessary to lift their citizens out of poverty'. They agreed to help developing countries 'reduce poverty by promoting energy efficient policies and the use of renewable energy sources'.

In the interests of climate change mitigation and environmental protection, the EU has committed itself to a collective 2010 target of 22 per cent of power consumption from renewable sources, including biomass. (The national contributions to that target vary considerably

² 'Biomass' is a term used for organic materials that act as a source of energy either by being converted to liquid fuel for the transport sector or by being burnt in power plants. Wood burning is one of the oldest forms of fuel. Energy crops include conventional crops such as wheat and oil seed rape and dedicated energy crops such as short rotation willow coppice, grasses and forestry products. Biomass includes in addition to energy crops, woody biomass and the residues of the wood working industry, agricultural residues and agrifood effluents, manures as well as the organic fraction of municipal solid waste or source, separated household waste and sewage sludge. A more technical definition is: 'All non-fossil-based living or dead organisms and organic materials that have an intrinsic chemical energy content'. See Elsevier, *Encyclopedia of Energy*, 2004, <http://www.bera1.org/cyclopediaofEnergy.pdf>.

³ EU-US Summit Communique, 20 June 2005, <http://www.eu2005.lu/n/actualites/communiqués/2005/06/20ue-us05/>.

for a host of reasons: 70 per cent for Austria, 21 per cent for France and 10 per cent for the UK.) For biofuels' share of all fuel consumption, the Commission has set a non-mandatory target for 2010 of 5.75 per cent. There is no EU target for biomass share of heating production.

In the interests of fair global trade in agriculture, the EU has committed itself to reducing 'those farm subsidies which distort international trade and harm the interests of developing countries'.⁴ In October 2005, in advance of the trade talks in Hong Kong, EU Trade Commissioner Peter Mandelson and EU Agriculture Commissioner Mariann Fischer Boel offered to cut farm subsidies by an average of up to 70 and 80 per cent and to reduce agricultural tariffs by between 35 and 60 per cent depending on the product.⁵ At the talks, the EU agreed to cut farm trade subsidies completely by 2013.

The window of opportunity to address how the nexus between farm subsidies, energy security and developing country interests is now wide open. The WTO has just agreed to end farm trade subsidies.⁶ The G8 at Gleneagles in July 2005 committed itself both to improving assistance to developing countries and advancing global energy security, and the protection of the climate, through among other things, recourse to renewable energy sources. The UK has already produced a biomass policy report. There are many other circumstances, not least a projected steady increase in global demand for food and rising prices for oil, that make prompt and effective consideration of this new nexus both an opportunity and a necessity.

A strategy that led to improved global markets for developing country trade in agriculture by shifting EU production towards fuel crops and other biomass outputs would have other benefits. These would

⁴ See European Commission, 'EU Agricultural Trade Policy in the Round', 17 November 2005, accessible from: http://trade-info.cec.eu.int/doclib/cfm/doclib_type.cfm?type=10.

⁵ See <http://europa.eu.int/rapid/pressReleasesAction.do?reference=SPEECH/05/655&format=HTML&aged=0&language=EN&guiLanguage=en>.

⁶ 'We agree to ensure the parallel elimination of all forms of export subsidies and disciplines on all export measures with equivalent effect to be completed by the end of 2013.' See Final Declaration, Hong Kong Ministerial Meeting, December 2005, http://www.wto.org/english/thewto_e/minist_e/min05_e/final_text_e.htm.

include reducing greenhouse gas emissions and improving the EU's energy security.

The pamphlet has four main sections. The first section gives a broad global overview of biomass use for energy. The second section looks at the current state of play and projected policy environment for EU official support to biomass industries. The third section addresses the question of whether existing farm subsidies that so negatively distort the trade potential of developing countries can be shifted to support measures for energy production from biomass. This section argues that the framework of the Common Agricultural Policy (CAP), which is often painted as the 'villain' in this drama of agriculture subsidies, can support a shift to new biomass sources. One part of this section illustrates the argument with more specific reference to current sugar subsidies, seen by most as the 'arch villain' in the drama. The fourth section reviews in brief the very small place that support of biomass plays in existing EU development assistance programmes. The pamphlet concludes with a brief recap of the main argument and policy recommendations.

Biomass in the World: New Agriculture for New Energy

Biomass is a term used for organic materials that act as a source of energy either by being converted to liquid fuel for the transport sector or by being burnt in power. Biomass is the only natural, renewable carbon resource existing in sufficient quantities large enough to be used as a substitute for fossil fuels: 'Unlike fossil fuel deposits, biomass is renewable in the sense that only a short period of time is needed to replace what is used as an energy resource'.⁷ This pamphlet uses the term 'bioenergy' as short-hand for biomass energy.

Bioenergy does produce carbon dioxide emissions, but in the case of fuel crops these emissions are counteracted by re-absorption by the plants grown to replace them. Fuel crops are therefore theoretically 'emissions neutral' in the cycle of production and use, but actually

⁷ *Encyclopedia of Energy*.

produce a net cut in emissions to the extent that they eliminate a unit of fossil fuel consumption for the first time.

Compared to other renewable energy sources that are intermittent, such as wind and solar, biomass energy sources have the advantage of being storable with present technology. In addition, production units can range from small scale up to multi-megawatt size. Biomass, unlike other renewables and nuclear power, has the potential for continuous generation of electricity.

The production of energy from biomass, with the exception of anaerobic digestion, involves the production of useable volumes of heat. This production of heat alone can give energy extraction efficiencies of 80 per cent or more and is not limited to particular parts of the country, unlike geothermal systems.

Some International Comparisons

Energy produced from biomass is already a standard feature of daily life around the planet, though the patterns of use are quite variable depending on the location. Biomass energy can be highly competitive economically, according to the market conditions and government policy settings. For example, since the Brazilian Ethanol Programme was launched in 1975, it remains the largest commercial application of biomass for energy production in the world.⁸ In response to oil shocks, the government introduced tax incentives that made ethanol fuel prices at the pump and ethanol-powered car prices highly attractive to consumers. Since 1979, 5.4 million ethanol powered cars have entered the Brazilian market.

Table 1 on the next page shows a comparison of biomass share of total energy consumption for the top ten energy consuming countries, five additional industrialised countries and five developing countries. (The countries are listed in order of total energy consumption.) The use of biomass in developing countries is addressed in more detail in the second to last section of this pamphlet.

⁸ See for details: [http://www.renewables2004.de/ppt/Presentation4-SessionIVB\(11-12.30h\)-LaRovere.ppt](http://www.renewables2004.de/ppt/Presentation4-SessionIVB(11-12.30h)-LaRovere.ppt).

The comparisons indicate at a very crude level that some industrialised countries (such as the UK, Japan and South Korea) are a long way short of their potential for transition to biomass. These laggard countries are a long way behind both EU leaders (Latvia and Finland), but also behind a developing country like Brazil which has a total energy consumption not much smaller. The UK is a long way behind the USA, France and Germany in the field of biomass use, biomass technology and biomass awareness. Of particular note, biomass energy has surpassed hydropower in the USA as the primary source of renewable electric power.⁹

Table 1: Biomass share of Total Energy Consumption¹⁰

Country	Total Consumption (eJ/yr)	Biomass Share (%)	Country	Total Consumption (eJ/yr)	Biomass Share (%)
USA	99.85	3.4	Brazil*	7.80	23.9
China*	47.25	19.6	Indonesia	6.32	32.6
Russia*	26.18	1.2	Australia	4.78	4.9
Japan	22.78	1.1	Sth Africa	4.67	11.6
India*	20.84	41.2	Vietnam	1.60	61.2
Germany	14.74	2.5	Finland	1.44	20.4
France	11.16	4.4	Austria	1.24	10.9
Canada	10.90	4.5	New Z'land	0.81	6.5
UK	10.10	0.9	Tanzania	0.67	93.6
Sth Korea	8.41	1.1	Latvia	0.16	22.4

More importantly, the comparisons in Table 1 suggest (again at a crude level) that technological advances and growth of biomass use in developed countries will be especially important to developing countries since they rely heavily on biomass for their energy needs.

Bioenergy in the Developing World: The Lion's Share

Over two billion people in the developing world use biomass for the majority of their household energy needs. In some countries,

⁹ See US Department of Energy, 'The Biomass Economy', <http://devafdc.nrel.gov/pdfs/6748.pdf>.

¹⁰ *Encyclopedia of Energy*, citing IEA report from 2002. The data presented in Mtoe were converted to EJ/year using a multiplier of 0.043412. The data for those countries marked with an asterisk are for 1999; the remaining data are for 2000.

biomass is the primary source of all energy in the entire economy. For example, as shown in Table 3, biomass accounts for 93.6 per cent of total energy consumption in Tanzania. While per capita energy consumption is considerably less in developing countries than in industrialised ones, the rate of growth in developing world energy consumption is three to four times greater.¹¹

In developing countries, particularly rural areas, biomass is widely used in households for heat and cooking. Yet its use is generally both highly inefficient and detrimental to the health of those most exposed to it. Moreover, with the global threat of deforestation – caused by the clearing of land for agriculture and for commercial timber – shortages of wood fuel are set to emerge. Resulting desertification threatens communities dependent on wood fuel, who do not benefit from the support required to regenerate the trees and shrubs.

In terms of efficiency, a study by Energy Conversion and Management estimates that 326 million tonnes of biomass fuel could be saved through efficiency improvements in China, India, Nepal, Pakistan, the Philippines, Sri Lanka and Vietnam alone.¹² This can be done through introducing more efficient stoves into communities. Stoves can be improved through constructing a chimney to remove smoke from the kitchen.

In recent decades, many programmes have been established to distribute improved stove technologies in developing countries. In China, over 177 million such stoves have been installed so far. In India, over 25 million improved stoves had been installed by 2003.¹³ Also in terms of biomass for electricity generation and co-generation for electricity and heat, these emerging economies have taken a lead. India has launched the world's largest cogeneration programme for sugar mills. Facilities have also been introduced for improved transportation of biomass.

¹¹ <http://europa.eu.int/scadplus/leg/en/lvb/r12008.htm>.

¹² S. C. Bhattacharya, R. A. Attalage, M Augustus Leon, G. Q. Amur, P. A. Salam and C. Thanawat, 'Potential of biomass fuel conservation in selected Asian countries', in *Energy Conversion and Management*, (1999) 40, pp. 1141-1162.

¹³ Ministry of Non-conventional Energy Sources (MNES), India, <http://mnes.nic.in/frame.htm?majorprog.htm>.

Trade in Bioenergy and Related Technologies

Many biomass products, and all of the associated production plants and technologies, can be traded internationally. For example, while Sweden is one of the largest producers in Europe of biodiesel, it is also a large importer of the finished product. Germany, also a large producer, imports significant amounts of the rapeseed it needs for production.¹⁴ Pakistan, Brazil and Guatemala are the biggest exporters of ethanol to the EU. Pakistan and six other countries export ethanol to the EU under a no tax regime because of a dispensation given in EU counter-narcotics policy. In the EU, Italy and the Netherlands are the biggest ethanol importers.

Since biomass energy products and agricultural inputs can be traded, any policy shift toward subsidised production will need to be evaluated for its potentially negative effects on the agricultural trade prospects of developing countries. Annex 10 of the provisional version of the EU biomass action plan released in December 2005 gives an overview of EU trade relations in ethanol.¹⁵

Advantages of Bioenergy: Rural Communities Win!

One of the important distinguishing features of biomass production compared with fossil fuels is that the former sets up new chains of investment and supply that can benefit rural communities. According to one industry source, in the USA, 80 per cent of all revenue generated by an ethanol facility is spent within a 50 mile radius of the plant, thereby creating substantial pockets of rural economic development'.¹⁶ This potential is borne out by a range of studies. An assessment for the US Southeast concluded that industrial wood energy generated 71,000 jobs and one billion dollars of income annually. Another scenario-based assessment conducted for the state of Wisconsin identified the potential for three times more jobs,

¹⁴ See US Department of Agriculture, 'EU-25 Oilseeds and Products: Biofuels in the European Union 2005', 23 March 2005.

¹⁵ See http://europa.eu.int/comm/energy/res/biomass_action_plan/doc/2005_12_07_comm_biomass_action_plan_en.pdf.

¹⁶ BBI International, http://www.bbibiobiofuels.com/ethanol_info/study.html.

earnings, and sales in Wisconsin than the same level of imported fossil fuel usage.¹⁷

The European Commission has assessed that even a conservatively estimated increase in biomass use in the EU would by 2010 produce up to 300,000 new jobs, mostly in rural areas. Biomass energy is many times more employment intensive than fossil fuels: 50-100 times more jobs for bio-fuels and 10-20 times for bio-electricity.¹⁸

The potential economic impact on rural communities in Europe of a shift to production of inputs for biodiesel is high. According to a study commissioned by several local authorities and other agencies in Scotland, small scale production of crushed oilseed for biodiesel at low capital cost but with higher production costs than larger scale production, the economic impact on the rural economy would be good if there were sufficient production to stimulate a supply chain.¹⁹

Limitations of Bioenergy: The Policy Settings?

Unlike gas, though like oil, biomass energy has to be stored by the user. Transportation of it is expensive due to the bulky nature of the produce. Biomass energy use has economic and environmental impacts and affects carbon emissions balances. There are important constraints on the transition to biomass energy, but these have been overcome in many countries through effective policy.

¹⁷ This study assumed a 75 per cent increase in the state's renewable energy use by 2010 (775 MW of new electric generating capacity to supply electricity to 500,000 Wisconsin homes and 379 million litres (100 million gallons) per year of new ethanol production to supply gasohol to 45 per cent of Wisconsin's automobiles. New investment was equivalent to 62,234 more job-years of net employment, \$1.2 billion in higher wages, and \$4.6 billion in additional output. Over the operating life of the technologies analysed, about \$2 billion in avoided payments for imported fuels would remain in Wisconsin to pay for the state-supplied renewable resources, labour, and technologies. Wood, corn, and waste biomass contributed 47 per cent of the increase in net employment. See *Encyclopedia of Energy*.

¹⁸ EU Biomass Action Plan released on 7 December 2005, http://europa.eu.int/comm/energy/res/biomass_action_plan/doc/2005_12_07_comm_biomass_action_plan_en.pdf.

¹⁹ E. Booth, J. Booth, P. Cook, B. Ferguson and K. Walker, 'Economic Evaluation of Biodiesel Production from Oilseed Rape grown in North and East Scotland: Executive Summary', SAC Consultancy Division, October 2005. <http://www.sac.ac.uk/mainrep/pdfs/biodieselreportssummary.pdf>.

The UK Biomass Task Force 2005 Report recognises that recent changes in oil fuel prices had changed the relative cost of biomass energy. In some circumstances biomass may even now be the best option, though this is rarely recognised by investors. According to the report, the potential supply of usable biomass is large²⁰ and the potential to use biomass to reduce UK CO₂ emissions is significant. And the use of biomass contributes to energy security and rural development.

The main constraints have not been market forces as much as lack of knowledge and lack of imagination. The UK report found that:

In spite of more than one-third of primary energy being used for heat there has been a lack of recognition of the role of renewable heat in policy delivery. The approach could be characterised as - no targets; no concerted policy; no strategy; and, limited support for development.²¹

The report also found that energy crops 'have been a victim of the stop-start approach to biomass energy' inflicted by Government: 'this has created uncertainty in the industry and has not led to the level of progress needed to pull through the new varieties which have been in development'. The report advocated a need to ensure that 'biomass energy is driven by market development and has access to a full range of feedstocks which offer the potential to utilise the most appropriate feedstocks for the situation'. The report called for greater public recognition of the investments already made by the private sector 'in response to Government direction to develop energy crops as feedstocks for heat, electricity and in co-firing'.

²⁰ *The Biomass Task Force report to Government*, October 2005. 'Our vision statement suggests that around 1 million hectares of land may be available for non-food uses in general. This could mean, on current yields, around 8 million tonnes of energy crops. Around 5-6 million tonnes of wood waste is currently generated per annum. Of this around 1.4 million tonnes were recovered in 2004. Studies suggest that an additional 1.5 million tonnes of high quality waste wood and around 2-3 million tonnes of contaminated waste wood could potentially be recovered. Waste, which has substantial resources, needs to be quantified to include dry and wet waste via Anaerobic Digestion.'

²¹ Foreword by Sir Ben Gill, *The Biomass Task Force report to Government*, October 2005.

Bioenergy Tomorrow: Role of Technology

There has to be a new vision of technological advance for promotion of biomass. According to a US assessment, 'biomass can't fully replace the huge volumes of petroleum and other fossil fuels that we now use, but it can provide fuels and chemicals comparable to those derived from petroleum. American farmers and foresters can fuel as well as feed and house America—in a sustainable fashion'.²² The USA has an established vision for biomass and backs it with investment in R&D.²³

There is a strong contrast between the promotion of biomass technological advance in the USA and that in the EU, particularly in the UK. In fact, the UK sits at the bottom of the table in international comparisons of major countries in terms of most categories of energy R&D.²⁴ Between them and individually, the USA and Japan have far more impressive spending rates on R&D for renewable energy sources than the EU. The trend in energy R&D spending in general, and for renewables, has been largely negative for the past twenty years in key countries, including the UK. According to the study cited above in this paragraph:

The historical apex of renewable energy R&D investment occurred in the early 1980s following the OPEC oil supply shocks, investments in several countries (e.g., the U.S., Italy, Canada, Netherlands, France, and Spain) began to rise again in the mid-1990s and, in many cases, continue to grow.²⁵

²² 'The Biomass Economy'.

²³ The US government set up its first renewable energy laboratory in 1974 and this was renamed in 1991 as the National Renewable Energy Laboratory (NREL) and designated as a national laboratory of the US Department of Energy (DOE). It is the principal research laboratory for the DOE's Office of Energy Efficiency and Renewable Energy which provides the majority of its total funding of some US\$200 million per year. Other funders that contribute to this total include the US Environmental Protection Agency (EPA), the World Bank, the US National Science Foundation (NSF), the United Nations Foundation, and the US Agency for International Development (USAID).

²⁴ Paul Runcie, *Energy R&D Investment Patterns in IEA Countries: An Update*, October 2005, <http://www.globalchange.umd.edu/publications/PNWD-3581.pdf>.

²⁵ *Ibid.* p. 9.

The main exception for renewables R&D spending in the EU has been wind energy R&D, but even here the increase has been devoted mainly to deployment of systems.

Bioenergy in Europe

On 7 December 2005, the European Commission released a provisional version of its Biomass Action Plan, a paper which advocated the need for the EU 'to respond strongly' to the challenge posed by Europe's increased dependency on imported energy. This paper noted that the European Council in Spring 2004 concluded that increased use of renewable energy is essential for 'environmental and competitiveness reasons'.

The Current Picture

The paper noted that the EU currently meets four per cent of its energy needs from biomass. It assessed that if the EU made full use of its potential, it could increase its biomass use by 2010 by a factor of around 2.6. At the same time, the Commission assessed that the EU was not likely to realise its full potential in this area, but more likely to double its use. This section sketches current EU use of biomass.

In one sector of bioenergy, Europe is the leading global producer. In 2004, there were 11 countries among the EU 25 producing biodiesel. The growth curve has been very steep, with Germany's 2004 production increasing by almost 45 per cent. One of the main reasons for this rapid growth in Germany has been a tax-free regime for biodiesel. Germany overtook France as the EU leader in biodiesel production in part because of the latter's less favourable tax regimes and regulatory environment.

In another biofuel sector, ethanol, Europe is also active and even though its production is small compared with that of Brazil or the USA, the ethanol industry is also growing at a fast rate: about 16 per cent in 2004 over 2003 in terms of volume. Europe produced about four times more biodiesel by volume than ethanol. Like the biodiesel market, there are powerful regulatory constraints on the ethanol market in many countries of Europe. These need radical overhaul.

As for biomass heating, the situation in Europe is somewhat similar: a strong commercial sector in some countries and a virtually non-existent one in others. Although biomass-fired electricity is at or below the margin of profitability, the use of biomass to provide heat in industrial and commercial settings, with continuous demand, already looks to be competitive with oil and gas.²⁶ Biomass already provides a significant share of EU heating: some 13 per cent in 2002 as shown in Table 2 below.²⁷

Biomass-fired electricity is at or below the margin of profitability. At present, it provides only a small share (1.3 per cent) of EU electricity, as shown in Table 3 below.

Table 2: Heat in the EU

Source	Amount (TJ)	Share (%)
- coal	253682	23.7
- oil	67524	6.3
- gas	475003	44.3
- biomass	139767	13.0
- waste	100251	9.4
- nuclear	0	0.0
- geothermal	474	0.0
- solar thermal	37	0.0
- other sources	35159	3.3
Total Heat Production	1071897	100.0
Energy Sector	5651	
Distribution Losses	91488	
Total Final Consumption	974758	
Industry	231703	23.8
Agriculture	10503	1.1
Commerce and Public Services	165981	17.0
Residential	503191	51.6
Other Non-Specified	63380	6.5

²⁶ Renewable Heat and Heat from Combined Heat and Power Plants – Study and Analysis, Future Energy Solutions (FES) from AEA Technology, August 2005. This report suggests that the current costs of creating heat for commercial continuous demand are £21MWh from biomass, £18MWh from gas and £22MWh from oil. Equivalent figures for industrial heat are £17MWh (biomass), £20MWh (oil) and £27MWh (gas).

²⁷ See IEA Statistics, <http://www.iea.org/Textbase/stats/heatdata.asp?country=European+Union&SubmitA=Submit>.

Table 3: EU Electricity²⁸

Source	Unit: GWh	Share (%)
- coal	712939	26.6
- oil	168823	6.3
- gas	496707	18.5
- biomass	33939	1.3
- waste	22290	0.8
- nuclear	893809	33.3
- hydro	309805	11.6
- geothermal	4761	0.2
- solar PV	279	0.0
- solar thermal	0	0.0
- other sources	37180	1.4
Total Electricity Production	2680532	100.0
Domestic Supply	2726585	
Heat Plants	3536	
Energy Sector	251465	
Distribution Losses	165221	
Total Final Consumption	2306363	100.0
Industry	967915	42.0
Transport	61545	2.7
Agriculture	37306	1.6
Commerce and Public Services	569444	24.7
Residential	664645	28.8
Other Non-Specified	5508	0.2

EU Initiatives for Bioenergy

The EU set policy in renewable energy in 1997 and this was followed by a series of legal directives and further policy papers from 2001 onwards:

- 1997 white paper: *Energy for the Future: Renewable Sources of Energy*²⁹ set an overall target of 12 per cent for renewables' share of total power by 2010 across the EU. It outlined a 'Bioenergy Initiative for Transport, Heat and Electricity', in order to increase the market share for liquid bio-fuels above 0.3 per cent. The paper identified reduction of production costs of bio-fuels as a high priority since they were at that time three times the price of conventional fuels. The paper also recognised the

²⁸ Source: IEA Statistics, <http://www.iea.org/Textbase/stats/electricitydata.asp?country=European+Union&SubmitA=Submit>.

²⁹ European Commission, 'Energy for the future: Renewable Sources of Energy – White Paper for a Community Strategy and Action Plan', COM (97) 599, 1997.

need for a high rate of tax relief and subsidised raw material production, along with encouragement for take-up through demonstration programmes and 'fair' access to the electricity market.

- 2000 green paper: *Towards a European Strategy for Security of Energy Supply*, the Commission set the objective of 20 per cent substitution of conventional fuels by alternative fuels in the road transport sector by 2020.³⁰
- 2002: *Intelligent Energy for Europe Programme (2003-2006)*,³¹ to follow the framework programme ended on 31 December 2002. With a budget of around 200 million EURO this programme implements the strategy outlined in the green paper.
- 2003 Commission directive: *Promotion of the use of biofuels or other renewable fuels for transport*³² set an indicative target for the share of biofuels in total fuel consumption at two per cent in 2005 and 5.75 per cent in 2010 of total fuel consumption in the transport sector in the EU.
- January 2004: an additional annual aid payment of EUR 45 per hectare for energy crops was introduced as part of the recent round of CAP reform.³³

³⁰ European Commission, Green Paper, 'Towards a European strategy for security of energy supply, final', COM (2000)769, 2000.

³¹ European Commission, 'Adopting a multi-annual programme for action in the field of energy: "Intelligent Energy for Europe" Programme (2003 – 2006)', COM (2002) 169 final/2, 2002.

³² European Commission, 'Promotion of the use of biofuels or other renewable fuels for transport', Directive 2003/30/EC.

³³ To be eligible for the subsidy, the crops need to be covered by a contract with a processing company or the farmers must process the product themselves. Evaluating the effectiveness of this subsidy is difficult since it was only introduced in January 2004. Aside from the price, a limiting factor is that the subsidy is available for a Europe-wide maximum of 1,500,000 hectares of set-aside land.

EU Biomass Consultation

Between February and March 2005, the Commission's Directorate General for Transport and Energy (TREN) produced a consultation report in preparation for the drafting of its biomass action plan.³⁴ Among hundreds of recommendations touching on other matters, the Commission received 47 proposals for amendment to the CAP regulations, which were 'seen as a major barrier for bioenergy growth'. These submissions are not available on the public record from the Commission. In particular, the Commission identified proposals for support for short-rotation forestry and herbaceous energy crops to be increased, mainly in terms of increasing the size of the supported land area. The Commission cited the view in the proposals that this would also provide benefits in other areas of policy, such as environment (CO₂ reduction) and rural development.

Some 38 proposals called for the harmonising of bioenergy trade regulations at EU level and the creation of an EU bioenergy market. The Commission summarised the proposals to the effect that the lack of coherent trade framework at EU level for bio-feedstocks, solid biofuels, transport biofuels, bioelectricity, etc., similar to that for fossil fuels, is the major reason for the lack of well-functioning bioenergy market in the EU. Bioenergy trade is often inefficient or blocked by artificial barriers.

The consultation produced 31 proposals that called for stability and a long-term perspective in bioenergy support policies. Since these are decisive factors for investors, there were calls to avoid flooding the market with too many regulations.

The consultation produced 20 proposals calling for import restrictions (tariffs and non-tariff measures) on bioenergy in order to 'secure the development of the emerging bioenergy industry in the EU'. This was particularly relevant for the imports of ethanol, for which larger supply at lower cost (compared to the EU) is available through import.

Other proposals noted that the slow or partial implementation at national level of EU regulatory acts that promote bioenergy was a

³⁴ Assessment of the responses to the questionnaire on the EU Biomass Action Plan, DG Joint Research Centre, Institute for Energy (SETRIS).

major reason for the delayed growth of bioenergy in the member states.

The consultation received proposals for country-specific action. For the UK, the proposals were as follows:

- Promote bioheat and small-scale CHP via bioheat renewable obligation certificates;
- Simplify and harmonise the administrative (renewables obligations), tax and funding procedures and regulations;
- Bio-residues from forestry, agriculture and other similar sectors not to be considered as waste, but as fuels;
- Consider external costs of fossil fuels and the advantages of bioenergy/energy saving, CO₂ credits and trading;
- Promote energy crops cultivation nearby power and heating plants;
- Raise awareness for public authorities to use bioenergy;
- Support the development of bioenergy technologies e.g. via capital grants for processing facilities;
- No or lower excise duty for transport biofuels, extended in time;
- Establish, support and optimise supply chains, with particular attention to vegetable and animal residues;
- Standardisation of bioenergy fuels and technologies;
- Mandatory targets and blending shares for biofuels, introduction of transport biofuels renewable certificates;
- Drop the duty on pure plant oil;
- Promote biomass co-firing with coal, increase biomass co-firing fraction;
- Open the natural gas transmission grid to biogas.

UK Biomass Report

In 2004, the UK launched a study to help its private sector develop biomass energy in support of the country's renewable energy targets and sustainable farming objectives. The final report of the Biomass Task Force was published on 25 October 2005.³⁵ It made a series of recommendations including:

³⁵ *Biomass Task Force: Report to Government*, London, 2005, <http://www.defra.gov.uk/farm/acu/energy/biomass-taskforce/btf-finalreport.pdf>.

- A second round of the Bio-energy Infrastructure Scheme;³⁶
- The development of producer groups or co-operatives, with initial responsibility being taken by the RDAs to analyse the infrastructure needs in their region and seek to facilitate supply chain development;
- The establishment of quality standards and certification to ensure that feedstocks of appropriate quality to be used within given conversion technologies;
- The use of life cycle analysis to ensure that the carbon impacts of different options are understood;
- The continuation of the Energy Crops Scheme, including planting grants and producer group support;
- The amendment of the Entry Level Scheme to recognise the biodiversity and other environmental benefits of energy crops;
- The need for research into new feedstock options, such as short rotation forestry.

The report also made a series of recommendations for the EU. It called for careful analysis of options under the Common Agriculture Policy to promote bioenergy. It noted that existing measures (the continuation of set-aside and the 'bureaucracy associated with the m45/hectare energy crops payment') are 'regarded by many as market distortions and barriers rather than helpful support'. It called for better EU cooperation and the introduction of appropriate support by Member States, including regulation to help stimulate activity.

EU Biomass Action Plan: December 2005

In releasing the EU's Biomass Action Plan³⁷ on 7 December 2005, Commissioner for Energy, Andris Piebalgs, said it had three goals:

- Cut greenhouse gas emissions;
- Protect jobs in rural areas and;

³⁶ This was a government scheme to provide grants to farmers, foresters and businesses to help develop the supply chain needed to harvest, store, process and supply energy crops and woodfuel to endusers. The last application window closed in February 2005.

³⁷ For the text of the EU Biomass Action Plan released on 7 December 2005, see http://europa.eu.int/comm/energy/res/biomass_action_plan/doc/2005_12_07_comm_biomass_action_plan_en.pdf.

- Reduce Europe's dependence on imported energy.³⁸

The plan included a large number of measures, including:

- Promotion of 'biofuels obligations', through which suppliers include a minimum proportion of transport biofuels in the fuel they place on the market;
- An open trade ('balanced approach') in transport biofuels, ensuring that market opportunities are open both domestic producers and foreign producers – including those from least developed countries;
- Examining how biofuel use could count towards CO₂ emission targets for car fleets;
- Reporting on how certificates could be used to ensure minimum standards of cultivation for the raw materials used to make transport biofuels;
- Investment in research in second generation biofuels, especially production of liquid fuels out of wood and waste materials;
- Work towards a proposal for Community legislation to encourage the use of renewable energy in heating (the missing piece of the jigsaw alongside existing legislation on renewable energy in transport and electricity);
- Reviews of how fuel standards could be improved to encourage the use of biomass for transport, heating and electricity generation;
- A campaign to inform farmers and forest owners about energy crops.

Of particular note to developing countries, the Action Plan said that the EU would provide special support to those that want to produce and use transport biofuels.

There were a number of specific measures affecting the EU's rural support policies and the future reform of the CAP. These included:

- Assess the implementation of the existing energy crop scheme;

³⁸ See <http://www.managenergy.net/products/R876.htm>.

- Finance a campaign to inform farmers and forest holders about the properties of energy crops and the opportunities they offer;
- Bring forward a forestry action plan in which energy use of forest material will play an important part;
- Review the impact of the energy use of wood and wood residues on forest based industries;
- Consider how the waste framework legislation could be amended to facilitate the use of clean wastes as fuel;
- Review how the animal by-products legislation could be amended in order to facilitate the authorisation and approval of alternative processes for the production of biogas and other biofuels.

Progress towards EU targets

The potential of energy farming remains to be realised despite strong support in some EU circles. The European Biomass Association estimates that, taking into account a projected increase in energy consumption, the growth rate of renewable energy sources must double if the EU target of 12 per cent share is to be met by 2010.³⁹ Biomass market penetration alone has to be tripled, with current electricity production from biomass falling well short of the sub-target of 19 per cent by 2010. A 2003 study suggests that the situation is even more disappointing than these figures suggest. It concluded that only 7 per cent of the proposed increase in bioenergy use has been achieved in 15 years.⁴⁰

Progress within the EU on reduction of greenhouse gas emissions has similarly been poor. The European Environment Agency stated in its 2002 report that decreases in greenhouse gases in the EU have been insufficient, with a shortfall of 3.3 per cent to reach the EU target of 8 per cent reduction between 1990 and 2010.⁴¹

As far as the UK is concerned, progress on use of biofuels has been summarised by the government in 2005 as follows:

³⁹ AEBIOM manifesto 2004.

⁴⁰ H. Kopetz, 'Bioenergy in Europe', in proceedings of the Nordic Bioenergy Conference, 2003.

⁴¹ EEA, 2002: Energy and environment in the European Union, Environmental issue report, No 31.

- Negligible quantities of bioethanol were used in road transport until the introduction of a duty incentive in January 2005;
- The UK is well on course to meet its target of 0.3 per cent of total UK fuel sales by the end of 2005. This would represent a ten-fold increase on 2004 sales.⁴²

The UK report cited here noted that although the European Commission does not require member states to set a 2010 target until July 2007, 'responses to the UK's public consultation indicated a strong preference to set a target as soon as possible'. As a result, the government announced that it is considering a possible target for 2010 and the measures needed to meet any target, including a possible Renewables Transport Fuel Obligation.

Fair Farm Trade as Stimulus to Bioenergy

The EU's Common Agricultural Policy (CAP) and the reform processes currently under way in it provide a policy framework that can deliver a significant new stimulus to production and use of biomass energy. The CAP has become much more than a framework for delivering farm subsidies. It is now a 'comprehensive rural development policy which supports the diversification, restructuring and evolution of rural areas and economies' throughout the EU.⁴³ A 'strengthened rural development policy with more EU money' is a fundamental part of the policies agreed by the EU in its CAP reform package announced in 2003.⁴⁴ EU leaders have significant room for manoeuvre in delivering a wholesale transfer of much of the money currently being spent on subsidies, especially in respect of sugar, to rural communities in ways that stimulate biomass energy production.

⁴² See 'UK Report to the Commission on Biofuels 2005', 5 July 2005, http://europa.eu.int/comm/energy/res/legislation/doc/biofuels/member_states/rapports_2005/2003_30_uk_report_en.pdf.

⁴³ European Commission, *The Common Agricultural Policy Explained*, http://europa.eu.int/comm/agriculture/publi/capexplained/cap_en.pdf.

⁴⁴ See http://europa.eu.int/comm/agriculture/capreform/index_en.htm.

One of the virtues of CAP is that, in terms of financial flows, it has been a national programme operating under the cover of an intergovernmental EU-wide strategy for rural and agricultural development.

Most importantly, in the consideration of reform of the Common Agricultural Policy, leaders have not given bio-energy farming the attention it deserves. There has been some recognition of the need to stimulate the biomass industry through CAP.

CAP Reform: More Radical Approaches Needed

The EU has launched a make-over of its agricultural policy under pressure from several directions. Born out of the post-war desire to guarantee European self-sufficiency in basic foodstuffs, CAP remained largely unchanged into the 1990s as a rigid, production-oriented policy. The proportion of the EU budget absorbed by CAP has dropped from two-thirds to under a half (around EUR 50 billion per year), and is set to drop to one third in ten years' time.⁴⁵ Yet agriculture accounts for less than two per cent of Europe's economic output.

A major reform agenda was agreed in March 1999, prompted by the need to prepare the CAP for the future enlargement of the EU to include the countries of Central and Eastern Europe. This agenda was viewed as a golden opportunity to move support for over-production towards a market-orientated, environmentally-friendly CAP, designed to promote efficient and sustainable farming.

At the conclusion of the Uruguay Round on world trade,⁴⁶ the EU was forced to agree a reduction on the value of export subsidies. It was also required to reach minimum access commitments for food from the developing world and to reduce domestic support payments that depended on the amount of food grown. These obligations have had a profound effect on the EU's review in 2003 of CAP reform, also known as the EU Mid-Term Review (MTR). The MTR, with some minor exceptions, did not alter the level of market price

⁴⁵ European Commission DG Agriculture, 'Common Agricultural Policy explained', October 2004.

⁴⁶ In the framework of the General Agreement on Tariffs and Trade, predecessor to the WTO.

support provided to EU farmers, notably leaving the two CAP 'untouchables' – dairy and sugar – largely untouched.

Critics of the CAP highlight that it makes wealthy European agribusinesses wealthier still and denies subsistence farmers in the developing world a chance to make a living. Wealthy individual British landowners do very well out of the CAP, in some cases netting more than £500,000 a year in public money. In one year, Tate & Lyle was the single largest beneficiary in England, with its various subsidiaries netting a total of just over £127 million.

In Spain in 2003, seven big landowners received a total of over EUR 14 million in farm subsidies. This is roughly the same amount that was shared among 12,700 smaller Spanish farms that same year (equivalent to the combined annual income of 90,000 peasants in Mozambique).⁴⁷ According to Oxfam Spain, the 'concentration of aid among the largest farmers has hurt family farms, 147,000 of which disappeared in Spain between 1999 and 2003'.

There are few up-to-date analyses of the impact of CAP on the European economies. Apart from data limitations, there is the question of the time delay between release of aggregated data and academic analysis. For example, a study published in March 2005 could only analyse data from 1988 to 2003 up to the end of 2003 and then only for the EU-15, not the full 2005 membership of 25.⁴⁸

In terms of transfers to individual farmers, the study results were surprising. Such payments increased in size at the same time as the number of recipients declined. This meant a 'sharp increase in the CAP transfers per person employed in the European agriculture (full time equivalent) from 6,600 euros in 1988/89 to 14,530 euros in 2002/03'. The study noted that there were significant differences between the distribution of this subsidy: a full time farmer in Denmark received eleven times more euros compared to a full time farmer in

⁴⁷ Tito Drago, 'AGRICULTURE-EU: Subsidies Hurt Poor Nations, Short-Change Family Farms, Says Oxfam', Inter Press Service News Agency, 18 March 2005, <http://www.ipsnews.net/africa/interna.asp?idnews=27935>.

⁴⁸ See George P. Zanas, 'Who Benefits from the CAP?', http://aei.pitt.edu/archive/00003070/01/WHO_BENEFITS_FROM_THE_CAP.pdf.

Portugal.⁴⁹ Producers in the UK, just below Denmark in this measure, receive the second highest amount.

There is an unstated assumption among many EU members that the subsidies within the CAP can only be addressed within the framework of agricultural and trade policy. It is this assumption that underpins the complex negotiating position of the EU on the liberalisation of agricultural policy, including trade, within the WTO. There are many good reasons, some already mentioned, for rejecting this presumption and attempting to find new approaches to CAP by considering cross-cutting issues, especially those arising from energy security and environmental concerns.

Two academic studies on how the CAP has been constituted throw some light on this possibility. The first argues that:

- The CAP is not as sectorised a policy field as it is commonly considered to be;
- The European Parliament has a role to play as an agent of change within the CAP;
- Change within the CAP is largely brought about by endogenous dynamics (internal to the EU) rather than exogenous ones.⁵⁰

The second argues that in addition to 'certain characteristics of the supply and demand of agricultural goods', one of the biggest determinants of the persistence of CAP subsidies is the 'permanent income' problem of farmers, backed up by their homogeneous preferences.⁵¹ Low profit margins in traditional agriculture drive farmers (especially the big ones) to organise themselves to become 'political rent-seekers'. There are several reinforcing factors. First, the farmers have great success in avoiding 'free-riding' because of the existence of a number of selective incentives. Second, politicians and bureaucrats are motivated to supply farmers with public support.

⁴⁹ Ibid. p.10.

⁵⁰ See Kennet Lynggaard, 'The Institutional Construction of a Policy Field: Illustrations from the Common Agricultural Policy', paper presented at the European Union Studies Association (EUSA) Biennial Conference: 2005 (9th), 31 March-2 April 2005.

⁵¹ Peter Nedergaard, 'Market failures and government failures: A theoretical model of the common agricultural policy', Paper for the EUSA Ninth Biennial International Conference, 31 March-2 April 2005, Austin, Texas, <http://aei.pitt.edu/archive/00002986/02/CAP-teori- ENDL.UDG - tilpasset PC.doc>.

Third, the 'expected opponents of agricultural support', such as consumers and taxpayers, 'are too weakly organised and too little interested in making any forceful counterweight to farmers and agricultural politicians'.

The study found that the 'general asymmetry between farmers and consumers is sharpened in the CAP because it is possible to push the costs of expansion of agricultural production to other Member States and countries outside the EU'. The study noted that 'many of the institutionalised counter-weights that exist at the national level, are either very weak or do not exist at the European level'. The study observed that 'this is why the political system of the European Union could be characterised as a 'super asymmetric' political system as far as agricultural policy decisions are concerned'.

Most importantly, the study notes that one of the biggest obstacles to CAP reform may be 'rational entrepreneurs' within the EU, such as the Commission.

Taken together, these academic studies suggest that EU leaders can afford to make a strategic adjustment in their view of what CAP represents and that there is much greater room for rapid reform of CAP than they have been willing to admit. But to bring about radical and rapid reform of CAP, they must mobilise non-rural voters behind reform and take on the bureaucratic and political organisations that 'irrationally' represent themselves as protectors of farmers' incomes.

CAP Secrecy: A European Disgrace

More fundamentally, the CAP is a policy shrouded in secrecy. As an Oxfam study noted in 2004, 'in no other sector do taxpayers spend so much and have so few rights to information about the use of their money'.⁵² The Commission refuses to release data on who receives the payments and the size of individual payments. The Commission says that the responsibility lies with the member states, but most of them likewise refuse to reveal the data. It was only in 2004, under pressure from a number of groups, including the Foreign Policy Centre, that the UK released its figures for the two preceding years.

⁵² Oxfam, Spotlight on Subsidies: Cereal Injustice under the CAP in Britain, Briefing Paper No. 55, January 2004, p. 1, http://www.oxfam.org.uk/what_we_do/issues/trade/downloads/bp55_subsidies.pdf.

The data revealed that out of more than 100,000 recipients in England, 2,269 received more than £100,000 in 2004, while 17,000 farms received less than £1000.

Stimulus Packages for Rural Development

CAP subsidies only have the potential to affect one element in the bioenergy chain – feedstock production. Yet, successful policy must encourage market take-up through processing and distribution stages. Policy towards energy crops has hitherto failed to align incentives to produce crops with frameworks in which to process and distribute them. New stimulus packages for biomass energy taken as part of CAP reform will need to look 'beyond the farm' to the broader 'commercial communities' in which the farms are situated.

Due to the predominantly decentralised implementation of biomass and feedstock high-transportation costs, industry development should focus at regional level, working to encourage local processing/distribution mechanisms and investment. Stimulus packages for rural development must embrace all aspects of local rural communities and be far-sighted enough to convince both farming and investment communities that the industry will endure and grow.

As mentioned above, the UK Biomass Task Force found that energy crops 'have been a victim of the stop-start approach to biomass energy' inflicted by Government: 'this has created uncertainty in the industry and has not led to the level of progress needed to pull through the new varieties which have been in development'. Future approaches to rural community development take-up must therefore be far-sighted, providing guarantees for investors and farmers alike that government support will be sustained for the next 15 to 20 years.

One study commissioned by Scottish regional councils illustrates the need for a more holistic approach to biofuel production at local level.⁵³ While Scottish agriculture is well-suited to growing oilseed rape, there are no processing facilities in Scotland for conversion to

⁵³ SAC Consultancy Division, Blue Prints for Profitable Farm Production in Post-CAP-Reform Scotland, October 2005.

biofuel, and crops must be transported either south or to the continent for crushing. This leads to lower rape prices and places Scottish growers at a disadvantage. The report makes a number of recommendations, centred on the need for local plants and creating an atmosphere of co-operation and confidence in the industry.

Risk involved in investing in a biofuel plant can be reduced considerably by forming a joint-venture company which would bring together all elements of the production chain. The New Generation Co-operative (NGC) model, for example, has been used extensively in the USA and secures farmer involvement, thus supply of feedstocks.⁵⁴ Co-operatives have the opportunity to join together in branding biofuel produce, promoting the locality of the feedstock source and generating a sense of loyalty in the community.

Take-up partnerships could be modelled on the EU's own Campaign for Take-off for renewable energy generally, and its successor Campaign for Sustainable Energy, which puts particular emphasis on the importance of partnership initiatives and pilot studies.

Especially when dealing with domestic use, it is necessary to run a public awareness campaign to notify users that alternatives to gas and oil exist; that these can be cost-effective, and that grants to encourage uptake also exist. Overcoming public inertia is necessary before manufacturers will enter the marketplace in significant numbers and drive costs down. Rural constituencies will be important partners in that process. In early 2005, the UK announced a £12 million programme over two years to change public opinion on climate change, but this had not yet commenced by the end of the year nor was its projected linkage to promotion of renewables, like biomass, evident by that time either. At the same time, governments must introduce regulatory packages that will give commercial suppliers and investors in all parts of the production and distribution chain the necessary confidence about short, medium and long term

⁵⁴ <http://www.extension.iastate.edu/agdm/wholefarm/html/c5-112.html>

Unlike traditional cooperatives, in which start-up expenses are minimal and growth is financed through members' retained earnings, permanent equity to fund NGC start-up and growth is financed through the sale of delivery rights. These delivery rights represent a member's right to deliver a specific amount of commodities to the cooperative. Members benefit in proportion to their use, and nearly all NGCs are democratically controlled through one member, one vote.

regimes so that they can make the necessary decisions supportive of a move to biomass energy.

CAP Reform in Sugar: For Energy, Not Sweetness

There is a strange disconnect between the development of alternative fuels in Europe and the picture on the other side of the Atlantic. The USA and Brazil have a vibrant ethanol industry (produced from sugar and wheat) and use significant amounts of it in their transport fuels. By contrast, Europe has a weak ethanol industry. There is vast potential to develop an ethanol industry in Europe.

Wheat and sugar beet are grown throughout the EU and can be used for the production of bioethanol, yet only 446,140 tons were produced in 2003. In the EU25, 14 per cent of land⁵⁵ is dedicated to wheat, 1.5 per cent is dedicated to sugar beet. Sugar beet yields substantially more ethanol per hectare than wheat and is slightly cheaper to produce. The potential ethanol yield for wheat across this region is 2,323 litres/hectare in old member states. For sugar beet it is 6,331 litres/hectare in the EU15. Production levels are slightly lower in new member states. BTG Biomass technology group assumes that if priority is given to effective land use, 70 per cent of bio-ethanol would be produced from beet and 30 per cent from wheat.⁵⁶

What might the effect be if, for argument's sake, all of the EU's wheat and sugar were converted to bioethanol?

European Commission statistics state that 23.384 million hectares of land were used for common wheat production across the EU25 in 2004. If production efficiency in new member states were to match that of old member states, i.e. 2,323 litres per hectare, then 54.3 billion litres of ethanol could be produced across the EU from wheat. Similarly, 2.416 million hectares of land were used to produce sugar beet in the EU25 in 2004. Taking potential yield to be 6,331 litres/hectare, potential EU ethanol production could be 15.3 billion

⁵⁵ The total area of land is what the EU defines as the Utilised Agricultural Area (UAA).

⁵⁶ BTG biomass technology group BV, *Bio-energy's role in the EU Energy market: A view of developments until 2020*, 2004.

litres per year. (For comparison, from the 1996-1997 harvest, Brazil produced 14.16 billion litres of ethanol.)⁵⁷

The potential of wheat and sugar to contribute to the European transport industry is significant. Of course, this model pushes the equation to extremes, neglecting issues of diversified land use, biodiversity and food security. Yet, it is useful in order to illustrate that the EU has much more indigenous transport fuel at its disposal than is often perceived. It also demonstrates that the EU's indicative targets for the take-up of biofuels (two per cent by 2005 and 5.75 per cent by 2010) are very achievable, indeed modest.

The EU CAP sugar policy is worth over £1 billion annually and is the 'worst' remaining excess of CAP policy. Its inflated price guarantees, export refunds and high import tariffs around sugar production are criticised by aid agencies as one of the most damaging trade distortions for the developing world. The guaranteed price within the EU is three times higher than the world price of EUR 157 per ton.

One of the best independent analyses of the distorting effect of EU (and US and Japanese) sugar subsidies is a 2004 World Bank Study.⁵⁸ It assesses global gains to all from liberalised sugar trade, concluding for example in the case of Brazil:

Brazilian producers gain the most from liberalization, around \$2.6 billion per year, but this is offset by a loss of \$1 billion to Brazilian consumers who pay higher prices after liberalization – leaving a net gain of \$1.6 billion for Brazil.

Oxfam estimates the price system gives the 27 largest sugar beet farmers in the UK an average of £137,595 a year of support. Production of sugar cane in the developing world is much cheaper than in Europe, but import duties create a tariff that has risen to as much as 150 per cent in 2003. (The effective tariff depends on world prices and varies over time.) While every household in the EU pays EUR 64 a year to support the sugar regime, two-thirds of people in

⁵⁷ G.M. Zanin and others, *Brazilian bioethanol program*, Chemical Engineering Department, State University of Maringa, Brazil, 2000.

⁵⁸ Donald Mitchell, 'Sugar Policies: Opportunities for Change', World Bank Development Prospects Group, February 2004, http://www-wds.worldbank.org/servlet/WDSContentServer/WDSContentServer/IB/2004/06/01/000009486_20040601165704/Rendered/PDF/wps3222sugar.pdf.

Mozambique – a country with a potentially lucrative sugar industry – live on less than \$2 a day. An estimated 20,000 jobs could be created in Mozambique if sugar trade distortions were scrapped.⁵⁹

Technology Flows to Poorer Countries

In its Biomass Action Plan of 7 December 2005, the EU committed itself to support developing countries make greater use of biomass energy. But there is a long way to travel in this area. Most EU effort in energy for developing countries is concentrated in non-renewable sources.

International institutions have only in recent years addressed means of promoting renewables internationally. The World Summit for Sustainable Development in Johannesburg in 2002 acknowledged for the first time that renewable energy is key to addressing not only climate change, but also poverty and economic development in poorer regions of the world.

The 2002 WSSD debated the following issues, but progress on all of them has been lacklustre:

- Proposals to set targets and timetables for the adoption of renewable and other clean sources of energy – including a proposal to ensure that renewable energy accounts for up to 15 percent of global energy supply by 2010;
- Language urging nations to phase out energy subsidies – including a proposal that developed countries reduce energy subsidies substantially by 2007;
- Efforts to encourage the transfer of environmentally-sound energy technologies to developing countries – including on preferential and concessional terms;
- Efforts to advance early ratification and implementation of the Kyoto Protocol to the UN Framework Convention on Climate Change, as well as greenhouse gas emissions reductions.

⁵⁹ Maxine Frith, 'Bitter Harvest: How EU Sugar Subsidies Devastate Africa', *The Independent*, 22 June 2005.

At WSSD, the EU launched an Energy Initiative which aims to encourage discussion and cooperation to integrate energy issues more effectively into relations with developing countries. The initiative seeks to contribute to providing the access to energy necessary for the achievement of the Millennium Development Goals.⁶⁰ Its other goals are:

- To raise political awareness among high level decision makers of the important role energy can play in poverty reduction;
- To clarify the need for energy services for poverty reduction and sustainable development;
- To make apparent the need for energy services in national/regional development strategies;
- To encourage the coherence and synergy of energy-related activities;
- To stimulate new resources (capital, technology, human resources) from the private sector, financial institutions, civil society and endusers.

The initiative foreshadowed actions at national, regional and international level in partnership with all public and private players. The proposed actions were to include:

- Institutional capacity building;
- Transfer of knowledge and skills;
- Technical cooperation;
- Market development.

The Initiative was intended to lead to an increase in financial aid for the energy sector in the developing countries. The Energy Initiative established the European Union Energy Facility, which has a budget of EUR 220 million, available as of 2006. It is designed to promote investment in energy services for those living under the poverty line. This fund is augmented by other funds for renewables, such as 'Intelligent Energy – Europe' and the 'Partnership and Dialogue Facility'. The facility is also supplemented by energy spending in normal EU development assistance programmes.

⁶⁰ For details see <http://europa.eu.int/scadplus/leg/en/lvb/r12008.htm>.

The new EU effort to support energy programmes under the initiative has however been quite slow, with one source noting in August 2005 that 'three years after the launch of the EU Energy Initiative for Poverty Alleviation, this initiative is gradually starting to operate. Its one-person secretariat in the EU Commission's General Directorate for Development (DG Development) has been expanded gradually to three persons'.⁶¹ But the EU programme is demand-driven. The EU cannot impose an agenda on its development partners.

There is not a 'one size fits all' solution. Assessing the effectiveness of improving energy infrastructure is difficult, especially when dealing with technologies that do not generate electricity. There is a plethora of biomass technologies, all with different roles, advantages and suited to different situations. Comparison is difficult. Nevertheless, action is possible if one builds upon the existing deployment of biomass in the developing world and its particular strength: small scale heat generation.

It is necessary to encourage localised, sustainable schemes for rural areas independently of national supply and distribution chains. The EU is ideally placed to provide training, certification and technical assistance for the development and roll-out of low capital cost measures such as fuel-efficient stoves. NGOs have already scored important successes in this field.⁶²

Expanding the awareness of larger-scale biomass technologies for more developed areas is also of importance, especially where feedstock can be produced from agricultural waste (such as at sugar mills). However, competition from cheaper, possibly non-renewable sources of energy makes this a more difficult avenue to pursue, especially considering the relatively high capital costs of many advanced biomass technologies.

The Johannesburg Renewable Energy Coalition will hopefully go some way to addressing the capital barriers to more advanced technologies, but it must be remembered that biomass will be competing with other renewable technologies possibly more suited to

⁶¹ See International Network for Sustainable Energy, August 2005, http://www.inforse.dk/europe/eu_einitiative.htm.

⁶² Oxfam, 'Stop the Dumping!', Briefing Paper, 2002, p. 31, http://www.oxfam.org.uk/what_we_do/where_we_work/sudan/emergency/stoves.htm.

large, centralised generation projects. Even on a small scale, the advantages of rapidly deployable, flexible solar/wind generators are considerable when it comes to electricity generation.

One area the EU could concentrate on is the promotion of small and medium-scale decentralised power generation from biomass. The savings in transmission and distribution costs can be weighed against the initial capital cost. Hybrid, remote area power systems (HRAPS), which capture energy from various renewable energy sources, have particular potential if supported through investment of funds and expertise.

In order to promote better use of biomass in poorer countries, the EU will have to work with other governments in making energy markets more transparent and through providing consistent access to new technologies. To this end, cooperation has to be established between public institutions, the private sector and international organisations such as the European Union. The development of regional energy infrastructures can offer the benefits of economies of scale, especially in small developing countries. Sharing the development and management of infrastructures can reduce transaction costs and improve competitiveness.

Conclusion and Recommendations

Most political leaders have probably heard of biomass energy, but few see it as a serious element in their considerations of energy security. Politicians need to become more familiar with the existing potential of energy farming and learn to say 'biomass energy'. The lack of awareness among political leaders in Europe of the extent of existing commercial production of biomass energy, both globally and in Europe, is extreme. There is little awareness of its potential, if supported by appropriate policy settings, to take a much larger share of the energy consumption in transport and heating. If the EU is looking for growth industries, this is one. The growth rate for biofuel production in 2004 compared with 2003 was 27.5 per cent.⁶³

⁶³ See 'Le Baromètre des biocarburants', *Systèmes solaires*, No. 167, June 2005, p. 39.

Looking ahead, EU leaders need to understand the three main determinants of future take-up of biomass energy:

- Technological innovation;
- Supply of bioenergy (availability of resource and supply chain);
- Demand for bioenergy (with consumer and regulatory aspects).

EU leaders need regimes which stimulate all three factors.

An important area for future research to help leaders move in this direction would be a comparative analysis of legislative regimes from around the world designed to promote biomass uptake. The IEA database on Global Renewable Energy Policy and Measures provides a comprehensive documentary foundation for this analysis.⁶⁴ The work would need to be supported by specialists with country and sector expertise.

The EU can and should move a large slice of the funding for its price support of agricultural products (especially for sugar) to measures that support the development of a biomass energy market. In so doing, the EU must resist pressure to impose trade restrictive or trade distorting measures. In making this shift, the EU must also avoid the imposition of complex new bureaucratic procedures.

As the UK Biomass Task Force has noted, 'keys to success include long-term messages, consistent support for implementation through capital grants or revenue support and appropriate use of regulation'. But above all, EU leaders must 'learn to love their biomass'.

There is huge potential and high political demand for the EU to shift the money that currently supports sugar production into measures to promote the large scale development of an ethanol industry. (Unlike the USA and Brazil, the EU has only a small ethanol industry.) If such a move were to be undertaken, the EU would need to break new ground in policy coordination between the transport and agriculture policy areas.

⁶⁴ See <http://www.iea.org/textbase/pamsdb/grindex.aspx>.

Thus, in giving a new boost to its biomass energy industry, the EU and its member states must take a global perspective of the issues. They must consider its competitive edge in the biomass energy industry from a liberalised trade perspective consistent with WTO rules and aspirations. They must also consider the impact of a more rapid shift to biomass energy on its climate change policies and its energy security. There are clear but underdeveloped synergies between greater biomass energy production and the rural development objectives of the CAP. There are gains to be made in energy security from the decentralisation of supply that greater use of some forms of biomass energy can provide.

The EU is facing historic choices in how it manages farm support, energy use and climate change mitigation. As it moves toward completion of the single market in energy and as it moves toward liberalised world trade (in both agriculture and services), it must decide how it will handle a number of convergent interests around biomass energy. In particular, it must ensure that its institutional foundations are adequate to the task. It is not reassuring that agriculture and energy policy are currently managed in near total isolation both in the Commission and most member states.

The EU faces the dilemma of allowing national priorities and disaggregated interest groups (such as the agriculture lobby) to set the agenda or trying to set a unified pan-European, integrated approach. The considerations raised in this pamphlet suggest that the latter course is the only viable one. Of course, national governments throughout the EU, like local governments and community stakeholders, especially farmers' groups, will be a vital part of framing forward action. But there needs to be a common EU vision.

There are now many recommendations on the table for both reform of CAP and reform of EU approaches to biomass energy. The EU has set out its approach on the latter in releasing its Biomass Action Plan. But the policy choices that flow from that need to be informed by consideration of the WTO talks on trade liberalisation and the EU commitment to eliminate farm trade subsidies by 2013. The Biomass Action Plan is a conservative document that under-rates the potential of EU biomass energy production, especially from sugar and wheat,

and takes no account of the need for CAP reform inherent in the 2013 WTO commitment.

This pamphlet does not seek to replicate the many specific recommendations on linking farm subsidies to greater support for biomass that are already on the table through various mechanisms. Rather, the pamphlet identifies several strategic recommendations for EU leaders, including the parliament. The strategic recommendations are followed by some sample measures that could be implemented fairly promptly.

The EU should commit now to additional and urgent reform measures in the CAP that promote rapid take-up of biomass energy use in ways that reduce the negative effects on agricultural trade of poorer countries created by price subsidies. This would help solve the contradiction between its farms subsidies which hurt many developing countries and its aid policies designed to help them. Such a commitment would also boost EU chances of meeting its climate change mitigation objectives. The commitment would also enhance EU energy security. But most importantly, such a commitment would provide important new rural development opportunities.

Leading members of the EU that support a radical overhaul of CAP and of the EU budget (such as the UK) should commission a specialist assessment of the way in which farm subsidies under CAP might be shifted to vigorous promotion of biomass production as part of a comprehensive package of rural development measures. The study would be all the more credible if it engaged a wide number of stakeholders in Europe, but the documentation received already for the Commission consultation on the Biomass Action Plan and the Plan itself, released in December 2005, provide a good start point. The time frame for such a study should be six months. Like-minded states who want significant budget reform in the EU, such as the Netherlands, Austria, Germany, Sweden and France should form a working group.

EU leaders must not limit their consideration of CAP reform only to agricultural issues and therefore must not allow DG Agriculture in the Commission to lead further policy work on the bigger budget issues. This is a question of the future direction of

the EU budget as a whole. One lesson of the Dutch referendum on the Constitution is that EU leaders have to find an answer posed by the No campaign: why does each Dutch person provide EUR 180 per year to the EU's budget, of which 40 per cent goes to CAP? There is now a new political imperative to revisit the entire CAP subsidy framework.

Studies of the institutional development of CAP referenced in this pamphlet suggest that the biggest influences for change might be internal to the EU institutions, rather than external, and that a sense of crisis is needed before fundamental policy change can be brought about.

Work on the bigger budget, energy and rural development issues should proceed hand in hand with work on the best mechanisms for bringing about the changes. This work is best led within the Commission by DG Agriculture but it must be supported by a robust engagement of leading member states and community groups.

Several areas of policy stand out for immediate attention. Subsidies (price support payments or even 'single farm payments') for biomass production are not the answer.

Measures that support investment in processing facilities, especially large scale generating plants, and distribution will be important. The best method of support for this will be to provide tax and other financial incentives for the formation of joint-venture companies or local cooperatives which would bring together all elements of the production chain. The whole chain requires the co-ordination of various governmental departments – those concerned with agriculture, environment and electricity generation – to ensure that construction of new production and distribution networks is not stalled waiting for one link to be developed. In addition, it is necessary to ensure that investors, generating companies and agri-business are communicating effectively, so that once the policy measures are in place the effects are actually delivered.

Beyond this basic approach, more complex measures, such as providing some form of tradable credits in biomass energy, might allow for the operation of market forces. Not only do these remove the need for large amounts of government intervention, but it is quite

possible to make them tradable across member states, allowing movement towards a single energy market. The delivering of security to investors through a guaranteed price (such as a feed in tariff) will have undesirable long term outcomes in terms of developments in technology and efficiency and is likely to hamper chances to expand and amalgamate energy markets.

The EU must use its own more rapid shift to biomass use as a new lever of change in its support policies to developing countries seeking energy security. The EU must make renewable energy programmes a higher priority in its development assistance. In Africa, where the EU has just promised to double aid disbursements for the next five years, the EU could agree to spend ten per cent of the new funds (some \$2 billion per year) on promotion of new biomass crop plantings and more efficient biomass energy production.

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