Bioenergy and waste incineration in the Renewables Obligation & implications of the Consultation

Note: A Scottish Government consultation on changes to the Renewables Obligation banding (i.e. changes to which types of energy classed as renewable should attract which level of subsidies) was published on 21st October and runs until 13th January 2012. The consultation paper can be downloaded from www.scotland.gov.uk/Publications/2011/10/27123530/8. For a discussion of the impacts of ROCs for bioenergy and waste, see www.biofuelwatch.org.uk/2011/rocs_impacts .

Summary

Biomass and bioliquids (i.e. liquid biofuels, mainly vegetable oil) qualify as 'renewable energy' and are eligible for financial support through the scheme. This is in spite of well-documented concerns that their widespread use results in widespread environmental and human rights abuses (see Biofuelwatch's September 2011 briefing, 'Bioenergy and Waste Incineration in the Renewables Obligation: A Summary of Impacts'[1]). Waste incineration also qualifies for subsidies through this scheme, even though under EU legislation, energy from fossil-fuel derived waste cannot be classed as renewable and its inclusion in the Renewables Obligation may therefore be open to challenge.

This briefing seeks to explain what the different bands for biomass, bioliquids, waste, and anaerobic digestion (biogas) mean, what the Scottish Government has proposed, and what the implications of the proposed new bands are for bioenergy deployment in Scotland, as well as for waste incineration.

Significant changes proposed to the financing of bioenergy include:

1. The possibility of a cap on individual 'large-scale' dedicated biomass plants and biomass CHP plants. This could see subsidised taken away from the controversial Forth Energy proposals, which would make them financially unviable, but could see more small scale plants which effectively burn the same tonnage as a combined total. Furthermore, this is only a proposal, and one which Forth Energy and other companies will no doubt be lobbying against them.
2. New subsidies for enhanced biomass co-firing. This sees fossil fuel suppliers encouraged to switch to biomass and could result in power stations such as Longannet and Cockenzie burning at least 540MW biomass (equivalent to around 5 million tonnes of wood) per year.
3. The Burning of bioliquids remain a serious threat. In the rest of the UK, there is a proposed cap for overall subsidies (ROCs) for electricity from bioliquids. This cap would still allow the equivalent of 5x50 MW power stations to be built. Experience in Germany and Italy has shown that palm oil is the only economically feasible feedstock for such plants and under the proposed cap, 110,000 hectares of new oil palm plantations would still be needed (even more land if other types of vegetable oil were burnt). Although there are no bioliquids power stations in Scotland currently, the knock on effect of there being a cap in England and Wales and no cap in Scotland could be that developers who cannot attract subsidies for bioliquids south of the border will move north, resulting in destructive fuels such as palm oil being burned in Scotland.

[1] Biofuelwatch Briefing, 'Bionenergy and Waste Incineration in the Renewables Obligation: A Summary of Impacts' (Sept 2011), available at http://www.biofuelwatch.org.uk/category/reports/

The Scottish Government's stated policy on biomass is to have biomass deployed in heat-only or CHP schemes, off gas-grid, at a scale appropriate to make best use of both the available heat, and of local supply.

This can only be achieved if subsidies are removed from all forms of biomass electricity. This is because the effect of subsidies is to create a guaranteed and, overall, uncapped market for biomass which encourages a demand-led approach to biomass rather than an approach led by what can be sustainably supplied. ROCs create an insatiable appetite for biomass and undermine the Government's own position on biomass, so to stay true to its word, it must back away from ROCs for Biomass, bioliquids, and biogas. Meantime, the Scottish Government appears to have overlooked the dangers of future biofuel (most likely palm oil) power stations in Scotland. The Government has come out in criticism over the UK's ambition for biomass. It must now give effect to its rhetoric with concrete action, by removing the subsidies available for biomass and bioliquids, and focusing on curbing our demand for energy in the Scotland.

At the same time, the Government should stop rewarding electricity from waste incineration with subsidies, since waste incineration causes a particularly large range of dangerous toxins being emitted, undermine recycling and increase overall resource use, and, in the case of fossil-fuel derived waste, cannot be defined as renewable under EU legislation.

(1)Policy Context

What is the Renewables Obligation and the banding review?

The Renewables Obligation is the main subsidy scheme for electricity from energy classed as renewable. It sets a minimum level of renewable electricity - 12.4% at present - which energy companies must supply and which rises every year. Companies receive subsidies in the form of Renewable Obligation Certificates (ROCs) for every megawatt hour of renewable electricity they produce. The money for this is raised through a surcharge on electricity bills. Companies which fail to reach the target have to either purchase ROCs from companies that exceeded their target or make a 'buy-out' payment. Although the overall scheme is set out in primary legislation, the Secretary of State has wide-reaching powers to decide which types of renewable energy should be eligible for which subsidies. In Scotland and Northern Ireland, those powers are devolved although the Scottish Government and the Northern Ireland Executive have so far adopted the same rules as DECC for England and Wales.

The EU Renewable Energy Directive requires 20% of all energy to be produced from renewables by 2020. Different targets apply to different member states – the one for the UK is 15%. However, there is no requirement on governments like that in the UK to subsidise bioenergy or any particular type of energy classed as renewable and the target could quite legally be met through sustainable wind, solar and tidal energy.

The Scottish Government is currently conducting a review of the banding levels for renewable energy technologies through The Renewables Obligation (Scotland) Order 2011 Consultation on Review of ROC Bands October 2011. The consultation is available at http://www.scotland.gov.uk/Publications/2011/10/27123530/0.

Over the last year, ROCs have been trading at a value of £48.70 each on average.[2] ***Companies get ROCs for all of the electricity they produced from sources classed as 'renewable' – even if they are only fulfilling their legal requirement to generate (at present) 12.4% of their overall electricity that way.***

Here are some examples of how many subsidies are available to companies:

Bioliquids power station: There are no current bioliquids proposed in Scotland, but several are planned south of the border, and there is nothing to stop developers from moving north. This is particularly the case because DECC are proposing to cap overall subsidies for electricity from bioliquids in England and Wales, but the Scottish Government has not even acknowledged any concerns over bioliquids in their Consultation. Companies which could no longer get ROCs for bioliquids in England and Wales might therefore in future move their plans

[2] E-Roc Online Auction Service, available at http://www.e-roc.co.uk/trackrecord.htm

to Scotland. If ***W4B***, who have planning permission for two biofuel power stations with a combined capacity of 68MW (in Portland and Bristol) go ahead and burn palm oil in both, they would receive ***£53 million in subsidies a year*** through ROCs (assuming each power station will operate for 8000 hours a year and the palm oil they intend to use qualifies as an 'energy crop').

Dedicated biomass power station: If ***Forth Energy*** get permission for and build the four biomass power stations which they have proposed, with a combined capacity of 500 MW, then they would get at least ***£290 million a year in subsidies*** (based on 1.5 ROCs per MWh). If some of the biomass comes from 'energy crops' then they will receive even more ROCs.

Biomass co-firing facility: ***Drax*** currently receives an estimated £43 million a year for burning over 1 million tonnes of mainly imported biomass. If ***Peel Energy*** get permission for a new coal-and-biomass power station in Ayrshire, they would burn even more biomass and receive far more subsidies than Drax today.

The outcome of the consultation will have an important impact on whether Scotland will be producing its renewable energy from genuine sources or from destructive bioenergy. Biofuelwatch calls for the removal of ROCs from biomass, biofuels and waste incineration, coupled with genuine efforts by the Scottish Government to reduce overall energy consumption. It recognises that other energy technologies classified under the Renewables Obligation Order, including wind, tidal, wave, and solar, classify as genuine renewable energy and that they should have an important place in Scotland's energy mix.

Will the outcome of the Scottish Consultation be different from the UK one?

So far, Scottish governments have simply rubber-stamped whichever rules DECC have decided on for England and Wales. Current rules for ROCs are thus identical across Britain. The Scottish Government's 2020 Routemap for Renewable Energy states that biomass must be treated as a 'limited resource' and that it should be "deployed in the most efficient manner, namely as heat or CHP which demonstrate 90% and 50-70% efficiencies respectively".[3]

This appears incompatible with any ROCs for biomass, since those favour burning as much as possible for electricity. Subsidies create a guaranteed market for biomass which encourages a demand-led approach to biomass rather than an approach led by what can be sustainably supplied. ROCs create an insatiable appetite for biomass and undermine the Government's own position on biomass. Nonetheless, the previous Scottish government, with a virtually identical formal policy, had announced support for long-term ROCs for biomass because they wanted the subsidy regime to be aligned with that in England and Wales.[4]

(2) The Proposals

How high are the subsidies for bioenergy, and what is proposed by the Scottish Government?

According to Biofuelwatch calculations, currently proposed and approved biomass power stations would, if they are all built, attract over £3 billion in subsidies through ROCs every year across the UK. In Scotland, current operating biomass stations and proposed ones would, if they are all built, attract £500,000,000 in subsidies through ROCs every year.

[3] The Scottish Government, '2020 Routemap for Renewable Energy in Scotland', July 2011, available at http://www.scotland.gov.uk/Resource/Doc/917/0118802.pdf

[4] The Scottish Government, 'Renewables Obligation (Scotland) Order Consultation - Scottish Government Response', available at http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Energy-sources/19185/17612/ROSC1210R

The Scottish Government proposes the following subsidy levels through the consultation:

Proposed biomass ROC banding from April 2013:	
Standard co-firing (up to 15%)	0.5 (no change)
Co-firing with CHP or energy crops	1 (no change)
Co-firing with CHP and energy crops	1.5 (no change)
Enhanced co-firing/conversion (15% and above)	1 (new incentive for co-firing 15% or more biomass with coal)
Coal to biomass conversion (complete, not co-firing)	1 (1.5 at present)
Dedicated biomass (i.e. biomass only power plants)	1.5 (as at present) until April 2016, then 1.4
Dedicated biomass with CHP	2 (as at present) until April 2015, then 1.5
Energy crops burnt in dedicated biomass plants	2 (as at present) until April 2015, then 1.9 until April 2016, then 1.8
Anaerobic digestion (biogas)	2 (as at present) until April 2015, then 1.9 until April 2016, then 1.8
Energy from waste with CHP	0.5 (down from 1)
Advanced pyrolysis and gasification of biomass and waste	2 (as at present) until April 2015, then 1.9 until April 2016, then 1.8
Standard pyrolysis and gasification of biomass and waste	0.5 (down from 1)
Electricity from landfill gas	No future ROCs (0.25 at present)

Note:
Liquid biofuels for electricity generation (bioliquids) are included in the definition of biomass above.

In summary, the significant changes proposed with regards to bioenergy are:

1. The possibility of a cap on individual 'large-scale' dedicated biomass plants and biomass CHP plants. This could see subsidised taken away from the controversial Forth Energy proposals, which would make them financially unviable, but could see more small scale plants which effectively burn the same tonnage as a combined total.
2. New subsidies for enhanced biomass co-firing, i.e. co-firing 15% or more biomass with coal. This sees fossil fuel suppliers encouraged to switch to biomass and could see power stations such as Longannet and Cockenzie given the go-ahead to burn 550MW biomass (equivalent to around 5.5 million tonnes of wood) per year.
3. The burning of bioliquids remains subsidised, as bioliquids fall under the definition of 'biomass' and 'energy crops'. In the rest of the UK, there is a proposed cap on bioliquids; so this open banding could see biofuels burned in power stations as well as in cars in Scotland is developers are forced to move north of the border.

(3)Definitions

What is classed as Combined Heat and Power (CHP) under the Renewables Obligation?

A power station can be classed as '***CHP***' and receive a higher rate of ROCs even if it only captures a small amount of heat and if its overall efficiency is as low as 35% and efficiency savings compared to electricity-only production are only 10%. By comparison, under the EU Cogeneration Directive, power plants should achieve 70% efficiency and, furthermore, the EU Renewable Energy Directive states that, for biomass, governments should promote efficiencies of at least 85% in the residential and commercial sectors and at least 70% for industry.

What is the definition of 'energy crops' under the Renewables Obligation?

The term '***energy crops***' covers crops and trees grown primarily for the purpose of bioenergy. This would include short-rotation coppicing (e.g. miscanthus or willow), rapeseed oil, but also palm oil from 'younger' plantations, established for the biofuel market or imported eucalyptus from 'dedicated bioenergy plantations'. This is a special incentive for monoculture plantations in the UK and abroad. Note that energy crops currently receive the highest number of ROCs – the same as offshore wind and double the number for onshore wind power.

New Proposed Energy Crop Definition:

DECC 'are proposing to narrow the definition of "energy crops" to cover only a defined list of non-food crops, and to adopt a policy of grandfathering the energy crop uplift (as amended) from 1 April 2013'. It is expected that the Scottish Government will redefine energy crops in the same way. Energy crops will only include:

• short rotation coppice of the species Alder (Alnus), Birch (Betula), Hazel (Corylus avellana),

Ash (Fraxinus excelsior), Lime (Tilia cordata), Sweet chestnut (Castanea sativa), Sycamore

(Acer pseudoplatanus), Willow (Salix) or Poplar (Populus) and,

• perennial grasses of the species Miscanthus, Panicum or Phalaris

The new definition would apply to biomass burnt in existing and new power stations. Although palm oil or imported eucalyptus would no longer get an extra 0.5 ROCs per MWh, they'd still be eligible for significant ROCs for bioliquids and biomass, just not with that extra premium

How are bioliquids subsidised under the Renewables Obligation?

Bioliquids, which include vegetable oils combusted for use in power stations, are subsidised as 'biomass', or, if they meet the criteria stated above, classify as energy crops and are eligible to attract more subsidies under that category.

What is the definition of 'enhanced co-firing' under the Renewables Obligation?

Ordinary 'co-firing' means that biomass is combusted alongside fossil fuels. A station which contributes the most minimum percentage of combustion from biomass will still be classified as 'co-fired' power station. Co-firing will attract 0.5 ROCs per megawatt. This has so far only encouraged Drax to co-fire very large amounts of biomass. The power stations at Longannet and Cockenzie used to co-fire biomass, but subsidies were reduced in 2008 and biomass co-firing has since largely stopped.

Conversely, 'enhanced co-firing' means that biomass is combusted alongside fossil fuels, but the contribution of the biomass will be at least 15% of the total fuel combustion in the plant. Enhanced co-firing will be newly eligible for 1 ROC per megawatt hour.

When does waste classify as 'waste generation' and when does it classify as 'biomass'?

Waste that is at least 90% derived from "plant matter, animal matter, fungi or algae" is classed as 'biomass'. This includes electricity from burning for example chemically treated waste wood,

papermill sludge, chicken litter, sewage sludge and other often very toxic waste is subsidised as 'biomass'. Waste that is up to 90% derived from fossil fuels is classed as 'waste'. Note that biomass power stations burning organic waste must apply for planning permission under the Waste Incineration Directive, so effectively if granted permission would be able to switch to incinerating any kind of waste. And, as discussed above, energy from fossil-fuel derived waste is not classed as renewable under EU legislation.

For more details about ROCs for waste incineration, pyrolysis and gasification, see http://ukwin.org.uk/resources/rocs/, and for information about waste incineration in Scotland see Green Alternatives to Waste Incineration in Scotland, at: www.gainscotland.org.uk.

(4) Bioenergy: current usage in Scotland and prospects under the proposals

How many biomass power stations are either planned or receiving ROCs in Scotland? What will the effect of the Scottish Government Proposals be?

The following Table indicates the status quo for current biomass developments, either operating, in planning, approved, or proposed in Scotland:

Scottish Biomass Power Stations	Developer	Status	MW	Type	Tonnage of biomass required	Sourcing
Fort William Biomass Plant	Peel Energy	Proposed	18	electricity	240000	mainly domestic, possible imports
Grangemouth	Forth Energy	In Planning	100	mainly electricity	1500000	mainly imported virgin wood
Hunterston (co-firing)	Peel Energy	In Planning	224	co-firing	1600000	mainly imported virgin wood
Rosyth	Forth Energy	In Planning	100	mainly electricity	1000000	mainly imported virgin wood
Rothes, Morayshire	Helius	Approved	7.2	CHP	unknown	unknown
Leith	Forth Energy	In Planning	200	mainly electricity	1800000	mainly imported virgin wood
Dundee	Forth Energy	In Planning	100	mainly electricity	1000000	mainly imported virgin wood
Irvine Paper Mill	UPM	Operating	26	CHP	380000	virgin and waste wood, paper sludge
Longannet	Scottish Power	Proposed	25	electricity	135000	unknown
Steven's Croft	E.ON	Operating	44	electricity	480,000	Scottish wood, including virgin timber
Tullis Russel, Markinch, Fife	RWE	Under construction	45	CHP	400000	virgin and recycled wood, mainly imports, probably from North America
					Total: 8,535,000	

This combined total is more than 20 times the amount of wood that is available currently in Scotland, which is 0.4 million tonnes per year, according to the Wood Fuel Task Force. Across the UK, biomass accounted for 82.5% of all energy classed as renewable in 2010[5] and given the Governments' support for major bioenergy expansion south of the border, it is unlikely to become any less dominant in future.

Biomass electricity is unlikely to be viable without subsidies.

Proposals for biomass:

(1) The government proposes to remove subsidies from large scale dedicated biomass and dedicated biomass with CHP. This may be a welcome development as it could see large-scale plants like those of Forth Energy become financially unviable. ***However:***

a. The government has yet to say what this cap would be;

b. This may see the same amount of biomass consumed, but simply in more power stations which fall under the size threshold. Twenty 10MW power stations are still worse than one 50MW power station, so this cap cannot guarantee fewer imports. For example, in Germany, there are over 1000 small scale bioliquids power stations which run on palm oil;

c. Forth Energy and other companies will be lobbying strongly against any cap or for a loophole which would allow CHP plants to be exempt, thus allowing them to circumvent the cap even if they only capture a very small proportion of the heat.

(2) The government proposes to bring in new subsidies for enhanced co-firing of biomass at 1 ROC. This may allow fossil fuel stations such as Longannet and Cockenzie to switch to biomass. To be eligible for the subsidies, they would have to supply 15% biomass, i.e. for these two stations alone, which supply a combined 3600MW, this would be 540MW from biomass. This is very similar to the combined total of the Forth Energy proposals and so this sort of biomass combustion would be almost completely dependent on imported wood as well, potentially seeing millions of tonnes imported each year.

How many bioliquids (biofuels) power stations are either planned or receiving ROCs in Scotland? What is the potential effect of the Government's proposals?

So far, no biofuels power stations are operating in Scotland, and only one is operating and receiving ROCs in England. This is an 8 MW power station by Hargreaves subsidiary Rocpower in Wakefield. Due to problems with air pollution the power station has been operating only intermittently and well below its capacity.[6]

All planning applications for biofuel power stations have faced opposition which may be the reason why industry developments are well behind those in Italy and Germany where similar subsidies have lead to very large quantities of palm oil being burned for electricity and heat. CHP plants account for nearly half of all palm oil imports by Germany. On the other hand, W4B, who have permission to build two (largely) palm oil power stations have announced that they are waiting for the government's decision on ROCs banding at the end of 2011 before starting construction.

Experiences in the Netherlands have shown that electricity from biofuels is not economically viable without subsidies: There, significant quantities of palm oil were being burnt

[5] DECC, 'Renewable Sources of Energy', available at http://www.decc.gov.uk/assets/decc/11/stats/publications/dukes/2309-dukes-2011-chapter-7-renewable-sources.pdf

[6] For fuller details, see www.biofuelwatch.org.uk/wp-content/uploads/Biofuel-power-stations.pdf

for electricity until, in 2008, the Government changed the rules in a curb on palm oil subsidies. Today, no or virtually no biofuels are being burned for that purpose.

Proposals for bioliquids (biofuels): The Scottish Government continues to subsidise energy from biofuels. Dedicated energy crops at 2 ROCs, which will go to 1.9 ROCs and then 1.8 in 2015/16 and 2016/7. Energy crops with CHP are at 2 ROCs. Morever, bioliquids can also classify as biomass.

The UK government, in contrast, has proposed a 4% cap on the amount of bioliquids ROCs that can be used by an obligated supplier in a year. This is to prevent a high level of biofuels electricity generation, which may adversely affect other sectors such as transport, where a liquid fuel is necessary to meet the renewable energy targets. This would see a maximum of 400,000 tonnes of liquid fuel subsidised per year. Such an amount is still high – but in Scotland, no such cap has been proposed. This may have the effect of encouraging biofuels developers to seek to develop biofuels power stations in Scotland.

What have been the proposals for waste incineration in Scotland?

Electricity from waste, which can be derived from up to 90% fossil fuels, is currently eligible for one ROC per MWh as long as it is produced with Combined Heat and Power – using the very broad definition explained above. Furthermore, electricity produced from 'advanced gasification and pyrolysis' is eligible for 2 ROCs per MWh, whether it is produced from biomass or from mainly fossil-fuel origin waste. And electricity produced from standard pyrolysis or gasification, including from waste, attracts 1 ROC per MWh.

Currently, no waste incineration projects in Scotland receive ROCs; but recall that power stations which combust waste which is 90% derived from organic matter classifies as 'biomass'.

Proposals for 'waste with CHP': The Scottish Government proposes to reduce the subsidies for waste with CHP from 1 ROC to 0.5 ROCs. This may seem like good news: but effectively, as 'waste' by definition can be derived from up to 90% fossil fuels, even by the most conservative of thinking, all subsidies should be removed. And high subsidies for gasification and pyrolysis from waste as well as biomass remain in place, encouraging more investment in those unproven and polluting technologies.

What have been the proposals for anaerobic digestion in Scotland?

2 ROCs are available for Anaerobic Digestion (the breakdown of organic matter to produce energy) regardless if the feedstock is waste, e.g. food waste, or crops grown for this purpose. Experience with similar subsidies in Germany shows that biogas from new dedicated monocultures, especially maize, are particularly likely to benefit from such generic subsidies. The vast majority of biogas in Germany is produced from energy crops and not from waste. The first UK plans for making biogas from whole maize plants have already been submitted, for example in Kenninghall in Norfolk.

Proposals for 'anaerobic digestion': The Scottish Government proposes to continue to subsidise anaerobic digestion at 2 ROCs, going to 1.9 ROCs in 2015/16 and 1.8 in 2016/7. Whilst there may be potential for anaerobic digestion from waste only, experience from Germany shows that the development of dedicated monocultures for use in anaerobic digestors is occurring. The definition of anaerobic digestion and other forms of composting as it stands allows for subsidies to be granted that allow monoculture plantations which are being grown for the purpose. In the Netherlands, by contrast, subsidies are only available for biogas from waste.

(5) Sustainability criteria

Will all biofuels, biomass and biogas be subsidised, regardless of how it is produced?

Biofuels are eligible for subsidies if they comply with very minimal 'sustainability and greenhouse gas standards' set out in the EU Renewable Energy Directive. The UK Government and the Scottish Government have both announced that they will introduce very similar standards for biomass and biogas, for the purpose of ROCs.

Those standards ignore, amongst other things, human rights, hunger, land rights, pesticide poisoning and many types of biodiversity destruction.

Moreover, under the sustainability criteria, greenhouse gas emissions from biomass combustion are not properly accounted for. The sustainability criteria require biomass and biofuels to deliver 60% greenhouse gas emissions savings as compared to fossil fuels, but they fail to factor in two significant sources of emissions.

Firstly, they do not take into account the carbon emissions associated with Indirect Land Use Change. Scientists have repeatedly warned that if indirect land use change is taken into consideration, biofuels and biomass may emit more carbon dioxide emissions than traditional fossil fuels.[7]

Secondly, they presume that biomass in 'carbon neutral' and as such do not count the carbon dioxide emissions which result from the combustion process. The European Environment Agency Scientific Committee recently found that this results in double counting, and warned, 'legislation that encourages substitution of fossil fuels by bioenergy, irrespective of the biomass source, may even result in increased carbon emissions – thereby accelerating global warming.'[8]

Regardless of what the standards say – there is no way of verifying whether companies meet them. Whatever claims they make – and get rubber-stamped by their consultants – will not be audited independently. And standards can never address the wider global impacts caused by an unsustainable overall demand for wood, plant oil and land.

It would be better for ROCs to be scrapped than for ROCs to be made available on the condition that the sustainability standards were strengthened: this is because firstly, the sustainability standards coupled with ROCs will never be able to tackle the root cause of the environmental degradation and social injustice unfolding as a result of biomass and bioliquids consumption, namely, the pressure that countries like the UK are putting on other countries' and communities' land due to their insatiable appetite for energy. This insatiable appetite is driven by ROCs.

Proposed: The Scottish Government says it will be liaising with OFGEM on the preparation of their consultation on Sustainability Criteria for Solid and Gaseous Biomass for Generators and ensuring that any issues around sustainability and life-cycle emissions associated with biomass production and use in the power sector are appropriately addressed. However, an approach based on a combination of ROCs plus any kind of sustainability criteria cannot ensure a respect for environmental and human rights, because ROCs by their nature encourage a boom in demand which leads to the large-scale acquisition of land overseas. Furthermore, compliance with the criteria cannot be easily verified and is not independently audited.

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[7] See, for example, the Union of Concerned Scientists open letter to the European Commission, 'International Scientists and Economists Statement on Biofuels and Land Use', available at http://www.ucsusa.org/global_warming/solutions/forest_solutions/EU-ILUC-Letter.html

[8] 'Opinion of the EEA Scientific Committee on Greenhouse Gas Accounting in Relation to Bioenergy' 15 September 2011, available at http://www.eea.europa.eu/about-us/governance/scientific-committee/sc-opinions/opinions-on-scientific-issues/sc-opinion-on-greenhouse-gas